



Mission 1: Digitalisation, innovation, competitiveness and culture

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Mission's main objectives:



Digitalisation of the public administration

✓

Digital transformation of the public sector, strengthening of the national security perimeter for **cyber**, implementation of data assets **interoperability**



Modernisation of the public administration

✓

Fostering a radical breakthrough of the public administration, promoting innovation, **skills and competencies** and performance-based evaluations.
Structural **simplification of administrative procedures**, reducing their duration and costs



Organisational innovation of the Judicial System

✓

Digitalisation of judicial proceedings and acceleration of the **timing of justice**, within the context of a shared reform framework

Mission's financing snapshot:

M1 - Digitalisation, Innovation, Competitiveness and Culture

	Resources (euro/mld)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
M1C1 Digitalisation, innovation and security in the PA	5.61	6.14	11.75	-	11.75
M1C2 Digitalization, Innovation and Competitiveness of the Production System	4.20	21.55	25.75	0.80	26.55
M1C3 Tourism and culture	0.30	7.70	8.00	-	8.00
TOTAL	10.11	35.39	45.5	0.80	46.3

Note: (b) includes existing resources under national FSC, to be devoted to specific measures.

1 M1C1 - Digitalisation, innovation and security in the PA

1. Description of the component

Summary box

Policy area: Public administration digitalisation, human resources and organisation. Digital citizenship. Reform of the Judicial System.

Objectives:

The component aims at a radical breakthrough in the Public Administration, fostering innovation and digital transformation through targeted investments and structural reforms. The proposed interventions combine investments in new equipment and services with important interventions in the organisation and in the human capital endowment of the PA, according to a proper complementarity and an articulated reform strategy.

The strategy takes into account both 2019 and 2020 CSR calls for improving the effectiveness of public administration and the efficiency of the judicial system.

The proposed reforms and investments under this component support the European Flagships ‘Modernise’ and “Scale-up” by equipping the public administration with modern, interoperable and safe infrastructures and services. The component also reflects the European Flagship ‘Reskill and upskill’, by providing skills and new digital competencies to civil servants and managers at different administrative levels as well as all citizens, including those segments of the population with lower digital competencies and currently more affected by the digital divide.

More specifically, the objectives and related investments and reforms as follows.

Reforms and investments:

1. Rationalise and consolidate the existing digital infrastructures for the **digitalisation of the Public Administration**, cloud computing and cybersecurity, with particular attention to the harmonisation and interoperability of platforms and data services. In addition, guarantee for all digital public services increasing levels of availability, efficiency and accessibility, improving the level of adoption and the level of citizens / businesses satisfaction (with direct impact on the Digital Public Services DESI Indicator) also thanks to a user centric and open approach in service design. Create a cashless community, encouraging the adoption of new payment technologies between commercial operators and citizens.

Reform 1.1: Simplification measures for the support and spread of digital administration;

Investment 1.1: Digital infrastructures and cybersecurity;

Investment 1.2: Data and interoperability;

Investment 1.3: Digital citizenship, enabling services and platforms;

2. Innovate the Italian public administration by accelerating and strengthening the reforms currently underway by acting in an integrated and systemic way thus moving from a cumbersome, slow and bureaucratic administration into a competent, capable and simple public administration.

Investment 2.1: Capable PA: human capital recruitment;

Investment 2.2: Competent PA: skills empowerment;

Investment 2.3: Simple and connected PA: simplify administrative procedures and digitise processes;

Investment 2.4: Smart PA: establishment of Territorial Hubs for recruitment, training, co-working and remote working.

3. Ameliorate the entire judicial system in order to increase economic competitiveness and spread the culture of legality, thus improving the resilience and recovery process of the country. This reform action will be accompanied by a temporary strengthening of the *Trial Office*.

Reform 3.1: Judicial system reform (see Appendix A);

Investment 3.1: Human capital recruitment to strengthen the «Trial Office» and to overcome disparities among the different courthouses;

Estimated costs:

EUR 11,750 million to be covered by RRF

MIC1 - Digitalisation, innovation and security in the PA

	Resources (euro/mld)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
Digitalisation of the PA	5.61	2.34	7.95	-	7.95
- <i>Digital infrastructures and cybersecurity</i>	0.05	1.20	1.25	-	1.25
- <i>Data and interoperability</i>	0.79	0.34	1.13	-	1.13
- <i>Digital citizenship, enabling services and platforms</i>	4.77	0.80	5.57	-	5.57
Modernization of the PA	-	1.50	1.50	-	1.50
- <i>Capable PA: human capital recruitment</i>	-	0.21	0.21	-	0.21
- <i>Competent PA: skills empowerment</i>	-	0.72	0.72	-	0.72
- <i>Simple and connected PA: simplify administrative procedures and digitised processes</i>	-	0.48	0.48	-	0.48
- <i>Smart PA: establishment of Territorial Hubs for recruitment, training, co-working and remote working</i>	-	0.10	0.10	-	0.10
Organisational innovation of the Judicial system	-	2.30	2.30	-	2.30
- <i>Human capital recruitment to strengthen the «Trial Office» and to overcome disparities among the different courthouses</i>	-	2.30	2.30	-	2.30
TOTAL	5.61	6.14	11.75	-	11.75

Note: (b) includes FSC existing resources, to be devoted to specific measures.

2. Main challenges and objectives

a) Main challenges

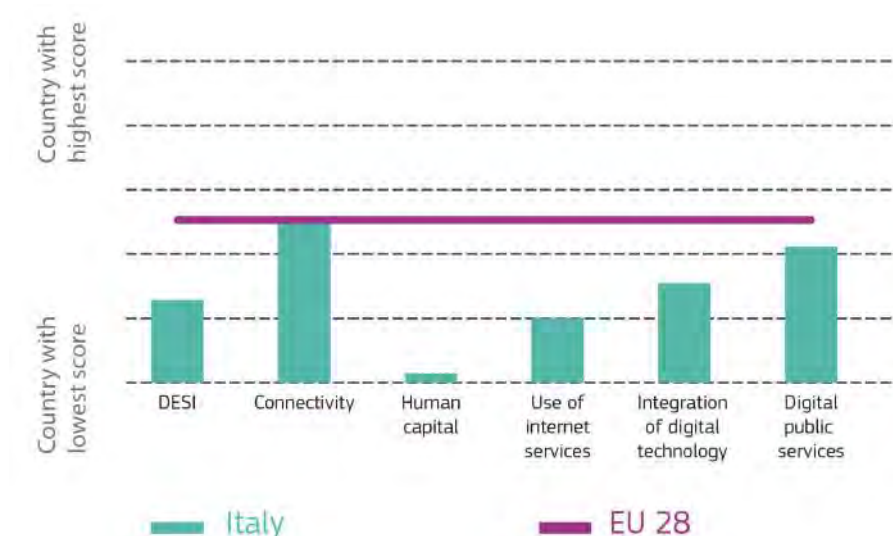
The health emergency crisis severely disrupted public sector service provision, intensifying a series of underlying problems and making even more urgent and compelling a coordinated response to the grand challenges the Italian public administration is facing. Consistently with the European Semester CSR from 2019 and 2020 Italy shall address the root causes of the following three main challenges.

The first challenge addresses the need for the digitalisation of the Italian Public Administration, to enhance its capacity to deliver secure, effective and efficient public services leveraging on enabling platforms and infrastructures and respond to the 2020 EU Semester CSR¹. Namely:

- **Untapped potential of digital services:** Overall, substantial progress has been made in terms of digital transformation at the national level.

¹ EU semester 2020: recommendation #3 and #4.

However, data depict a heterogeneous situation. On the one hand, the five top-level benchmarks considered in the ‘e-Government Benchmark 2020’ rank Italy above EU28 average (except for citizen cross-border mobility, see Figure 1).



Source: European Commission.

On the other hand, Eurostat data from 2019 show that - despite efforts - the promised benefits of digitization to citizens are still far from being achieved. The share of the Italian population actually using digital public services remains low. Indeed, only **23%** of Italian citizens used the internet for interaction with public authorities and only **14%** made full use of an online public service² in 2019 - scoring well below the already low EU average. By the same token, the ‘**DESI Index 2020**’ indicate that, as regards digital public services, Italy ranks 19th among EU MS, in particular being the least performing country in the EU when considering e-Government users (i.e. **32%** internet users needing to submit forms vs **67%** EU average). Italy underperforms the EU also in relation to the amount of data that is pre-filled in Public Services’ online forms (**Pre-filled forms** indicator 48% vs 59% EU Average).

Although the availability of online public services is very high (**92%**)³ there is still a fairly low uptake of digital services by citizens in the country.

To complement the evidence arising from the DESI Index, the Digital Agenda Observatory of the School of Management of the Polytechnic of Milan has replicated the DESI Index at Italian regional level, confirming the same results. A preliminary analysis of granular data from the eGov Benchmark suggests that Italy’s scores, in particular in relation to online availability of

² Eurostat Indicators: Individuals aged 16 to 74 using the Internet for interaction with public authorities (23% in 2019) and Internet use: submitting completed forms (14% in 2019)

³ eGovernment benchmarking 2020

digital services at local level, are negatively affected by the limited implementation of regional and local digital agendas. Moreover, also the highly limited interoperability between different systems and services of the Italian PAs - which hampers the once-only principle as it makes it necessary for citizens to provide their personal details several times - is frequently considered as one of the main causes. The low uptake of digital services among citizens is also due to the low level of digital skills among the Italian population (only 44 % of people aged 16-74 years have basic digital skills vs 57 % in the EU as a whole) as well as broadband connectivity scores below the EU average making it difficult to access to the more advanced digital public services in some areas of the country.

Significant action towards the eGovernment model and delivery of digital public services were carried out with specific policies in 2019. As part of the eIDAS regulatory environment the uptake of the **e-identity system** (Sistema Pubblico di Identità Digitale or SPID) significantly increased to reach 5.5 million citizens in January 2020 (from 3.4 million at the beginning of 2019) and with the impact of the pandemic crisis it reached a peak of 13 million enrolments in November 2020. However, the number of public administrations providing access to digital public services is of around 5.300 against a target of 10.000 public administrations⁴.

- **By developing cloud infrastructures** for the uptake of secure, energy-efficient, affordable and high-quality data processing capacities increasing the efficiency/effectiveness of public services delivery and addressing the twin green and digital transition. Cloud infrastructure will increase technological autonomy, raise security levels and at the same time align the country with the European data strategy⁵. Cloud transition - making available and potentially analysing the digital data of billions of devices on the network - today represents the most important challenge for the digitization of the country, underpinning the development of new technologies such as artificial intelligence. On the one hand, the development of a national cloud cannot be carried out in isolation but needs to take place in parallel and in synergy with the European GAIA-X project, promoted by Germany and France and in which Italy intends to play a leading role. GAIA-X aims to create a European standardisation forum to define the rules of operation of cloud services from the control of data processed and stored on the infrastructure, in line with the principle of "digital strategic autonomy", to the full decentralisation of data thanks to the latest technologies available (multi-edge, multi-cloud or edge-to-cloud). On the other hand, the first step to build up an efficient and

⁴ AGID - Avanzamento trasformazione digitale: <https://avanzamentodigitale.italia.it/it/progetto/spid>

⁵ European Commission - COM(2020) 67 final, Communication: Shaping Europe's digital future

secure cloud system is the rationalisation and consolidation of the existing digital infrastructures. Currently, the public administration digital infrastructures landscape is a significantly fragmented environment and suffers from a strong technological backwardness. In addition, 95% of the public administrations data centres distributed throughout the country inadequately meet minimum requirements for safety, reliability, processing capacity and efficiency⁶. Maintaining such inefficient infrastructure has high maintenance costs estimated at over 7.5 billion per year and exposes a large attackable surface to cybercrime. Another challenge pertains to the Italian public sector market for both demand and supply of cloud services. It is required to access secure, fair and competitive cloud services through the set-up of a procurement marketplace for data processing services and clarify the applicable cloud regulatory framework which in turn would support IT services providers, including innovative start-ups and SME.

- **Address cybersecurity growing challenges by reinforcing national capabilities.** Following the outbreak of the COVID-19 pandemic and the extensive use of digital tools, ensuring internet security and preventing cybercrime, data misuse or fraud became of even greater importance. In Italy the efficacy of measures adopted to protect networks and systems showed a patchy picture, with discrepancies persisting both horizontally — between public and private stakeholders — and vertically, within the same domain⁷. As part of the Cybersecurity Package, the Joint Communication on building a strong cybersecurity for the EU⁸ identified the need for greater resilience and strategic autonomy, boosting capabilities in terms of technology and skills, with the full involvement of all key actors such as the research organisations, laboratories and industry.
- **A fragmented data landscape and limited strategic re-use of data.** The digital infrastructures and the cloud are enabling technologies for the development of a sort of “country’s operating system”, which makes it possible to process large quantities of data and information that are necessary for managing and providing services to citizens and businesses. The increased capacity of archiving, storing and extracting data by the individual administration, however, is not sufficient for a rational and efficient use of this information assets, in the absence of standards and tools that allow full interoperability and sharing of information between PAs. Although Italy scores above EU average in terms of Open

⁶ Censimento del Patrimonio ICT della PA 2018-2019 – Agenzia per l’Italia Digitale

⁷ March 2017 – Piano Nazionale Per la Protezione Cibernetica e la Sicurezza Informatica

⁸ September 2017 – Joint Communication to the European Parliament and the Council - Resilience, Deterrence and Defence: Building strong cybersecurity for the EU

Data offering (77% against the EU average of 66%⁹), the real value of data lies in its use and re-use, and innovation in the field such as artificial intelligence. Data interoperability and quality, as well as its structure, authenticity and integrity - which are key for the exploitation of the data value - are set in a national interoperability framework, which will need further investments to be rolled out to the whole public administration. That stands true for both the use of public sector information by business (G2B) and the use of privately-held data by government authorities (B2G), as well as government to government (G2G) data exchanges which epitomise the long-standing challenge of silos work of the Italian PA. Government data assets are developed vertically and are rarely integrated or interconnected with other government units. Therefore, to effectively implement the once-only principle, it is necessary to make the databases interoperable and make them accessible through an API catalog that allows central and peripheral administrations, according to various authorisation levels, to draw on cloud data, to process them and provide services to citizens and businesses, who will thus be able to provide information "once only" to the Administration.

Moreover, the COVID-19 health emergency and confinement measures, by disrupting many public services magnified the need for **organisational innovation, remote working and public administration's human capital development** promoting agile work to ensure public services are designed, implemented, delivered and monitored according to users' quality expectations.

- **Strengthen human capital and address skills gaps.** As indicated in the CSR 2019 Italy needs to improve public administration effectiveness by investing in public employees' skills development. In Italy, skills shortages, obsolete workforce competencies, digital illiteracy, are more severe than in most other European countries¹⁰. There are significant gaps as regards Human Capital, compared to the EU average. 45% of Italian civil servants are over the age of 54 against 22% of the OECD average Italy scores very low levels of basic and advanced digital skills¹¹. Digital skills are lagging behind, training courses on digitization for public employees included just over 126,000 participants, equal to about 5% of the total¹². Closing a future skills

⁹ Digital Economy and Society Index (DESI) 2020 Italy

¹⁰ Paola Pisano – Declaration from the Minister for Technological Innovation and Digitalization 8 April 2020 - <https://ec.europa.eu/digital-single-market/en/news/italy-launches-its-national-coalition-digital-skills-and-jobs>

¹¹ Ministero dell'Economia e delle Finanze - Dipartimento della Ragioneria Generale dello Stato - Conto annuale <https://www.contoannuale.mef.gov.it/ext/Documents/DISTRIBUZIONE%20PER%20ETA'.pdf>

¹² The Minister for Technological Innovation and Digitalization - National Strategy for Digital Skills (2020), <https://innovazione.gov.it/assets/docs/DTD-1277-A-ALL1.pdf>

gap of this magnitude will require an array of approaches, from improving recruiting practices to upskilling and reskilling. Italy is going in that direction launching a project for strengthening the basic digital skills of civil servants “Digital Competencies for PA”¹³, involving an online platform for assessing the competence gap of civil servants in the digital domain in order to match individual eLearning courses. Yet further actions are needed to intensify and bring together efforts and address the human capital and skill gaps in the public administration. Out of the total public sector workforce 2,9% is under the age of 30, while over 60’s are about 16.9%, which is six times more than young people¹⁴. Considering the aging of the population and the approaching retirement age, the needs are growing steadily calling for an extraordinary plan for the hiring of temporary public employees with specific skills, in particular digital ones.

- **Reform the public work model.** To improve the delivery of public systems we need a public work system, greater motivation and performance management compensation systems. The Department of Public Function has developed guidelines for a new performance measurement and evaluation system framework¹⁵ but further actions are needed for the proper rollout and adoption from public administration.

The last challenge of this component concerns the **justice sector**. EU Semester CSR 2019 ¹⁶ requested Italy to “*reduce the length of civil trials at all instances by enforcing and streamlining procedural rules, including those under consideration by the legislator. Improve the effectiveness of the fight against corruption by reforming procedural rules to reduce the length of criminal trials*”. CSR 2020 recalled the “*need to improve the efficiency of the judicial system*” as an effective justice system is key for an attractive investment and business-friendly economy and will be crucial in the recovery process, also by enabling effective rescue and recovery frameworks.

In order to ensure the effectiveness of the Italian justice system reform, it is necessary on the one hand to reduce the backlog of proceedings and on the other hand to make full use of digital technologies. Indeed, despite the actions implemented to date and the provisions taken over the last few years, the Italian justice system continues to be characterised by its slow and cumbersome nature, especially with regards to the excessive length of both civil and criminal proceedings. The performance of the Italian justice system is still far from European averages. Within the field of civil law, in 2019 the total number of pending

¹³Italia 2025’, five-year strategy for innovation and digitalisation launched in 2019 includes ‘Digital Republic’, an initiative promoted and coordinated by the Ministry for Technological Innovation and Digitization. At the end of 2017, the Prime Minister’s Office — Department of Public Administration

¹⁴Forum PA 2020 <https://www.forumpa.it/riforma-pa/ricerca-fpa-sul-lavoro-pubblico-entro-il-2021-più-pensionati-che-dipendenti-smart-working-e-nuovi-concorsi-la-strada-per-innovare/>

¹⁵Presidenza del Consiglio dei Ministri - Dipartimento Funzione pubblica PCM - Linee guida per il Piano della performance Ministeri https://performance.gov.it/system/files/LG-Piano%20della%20performance-giugno%202017_0.pdf

¹⁶EU semester 2019 and 2020: recommendations #4.

cases amounted to 2.348.611 files, denoting a 23% decrease compared to 2014 and a 5% decrease compared to 2018.

Civil law pending cases

OFFICE	2014	2015	2016	2017	2018	2019
Supreme Court of Cassation	100.792	104.561	106.862	106.920	111.353	117.033
Court of Appeal	356.016	327.080	312.316	290.616	269.366	241.673
Ordinary Court	2.596.290	2.381.929	2.294.460	2.201.452	2.088.854	1.989.905
Total	3.053.098	2.813.570	2.713.638	2.598.988	2.469.573	2.348.611

As for pending cases, there has been a reduction in the "pathological backlog" or commonly defined "at Pinto risk". In fact, compared to 2018, in 2019, the number of cases pending for more than two years in the Courts of Appeal has decreased by 8%, while those pending for more than three years in the Ordinary Courts have decreased by 5%.

Within the field of criminal law, in 2019 the total number of pending cases amounted to 1.439.138 files, denoting a 11% decrease compared to 2014 and a 0,5% decrease compared to 2018.

Criminal law pending cases

OFFICE	2014	2015	2016	2017	2018	2019
Supreme Court of Cassation	34.143	35.984	30.354	30.236	24.609	23.579
Court of Appeal	260.748	257.504	268.445	275.596	271.247	263.319
Ordinary Courts	1.302.395	1.313.577	1.187.734	1.165.339	1.157.500	1.152.240
Total	1.597.286	1.607.065	1.486.533	1.471.171	1.453.356	1.439.138

Furthermore, according to the study conducted by the *European Commission for the efficiency of justice*, (CEPEJ 2020), the disposition times of the Italian Justice System are higher than the average of Member States of the Council of Europe.

Disposition time (days) – Civil and criminal law cases – Italy vs. other States of the Council of Europe

	First instance (civil e commercial)	Second instance (civil litigious) ^a	First criminal instance	Second criminal instance
Italy	527	863	361	850
UE (median)	201	141	122	104

Source: "European judicial systems CEPEJ Evaluation Report" 2020.

a) Data related to proceedings relating to voluntary jurisdiction (including the activity of the tutelary judge), separations and consensual divorce, special and brief proceedings that include injunctions, executive and insolvency procedures are not included.

The reforms provided by the Stability Law for 2019 are to be considered as a good starting point for making judicial proceedings more efficient, but the latter are still very distant and not comparable to European standards.

b) Objectives

The overall objectives of the component are to catalyse the digital transformation of the public sector. This will be done by strengthening the national security perimeter for cyber and implementing data assets interoperability. The aim is to foster a radical breakthrough of the public administration, promoting innovation, skills and competencies and performance-based evaluations. This will be complemented by a structural simplification of administrative procedures by reducing their duration. In the field of justice, the goal is to digitalise and accelerate the judicial proceedings and the judicial system, within the context of a shared reform framework. Horizontal goals are to enable investments with gender impact and targeting young people. The plan aims at securing the successful implementation of new investments while at the same time taking stock and fully executing selected reforms that were being initiated in the past years. More specifically, the targeted objectives for each area of intervention are the following:

1. Digitalisation of the public administration. The objective is to rationalise and consolidate the existing digital infrastructures of the Public Administration, fostering the uptake of cloud computing and strengthening cybersecurity, with particular attention to the harmonisation and interoperability of platforms and data services. Moreover, this area of intervention also focuses on the strengthening of digital citizenship, both through the improvement of the availability, efficiency and accessibility of all digital public services, and also by increasing the levels of citizens' digital competencies. The actions needed to ensure the uptake of modern and digital infrastructures and services by the PA can be grouped into the following three streams:

- *Digital infrastructures and cybersecurity.* In order to equip the Public Administration with reliable infrastructures and accompany central administrations towards a new logic of conservation and use of data and provision of services, an efficient and secure cloud system will be implemented. This investment will contribute to the European cloud initiative GAIA-X, laying the foundation for potential interoperability between Italy's State Cloud and other State or public entities clouds of other EU Member States. Particular attention will also be paid to the strengthening of the National Security Perimeter for Cyber, considering that the security of the country's digital ecosystem, with specific attention to ICT assets and essential operators, is the cornerstone for community growth and for the strategic development of technologies such as cloud computing and artificial intelligence.

- *Data and interoperability.* Fully leverage the country’s data assets by implementing the once-only principle ensuring interoperability and accessibility of data through a catalog of Application Programming Interfaces (APIs). This aspect is of great importance for companies’ re-use of critical data and their competitiveness at national and international level;
- *Digital citizenship, enabling services and platforms.* Improve digital public services levels of availability, efficiency and accessibility, thus increasing the level of adoption and the level of citizens / businesses satisfaction (with direct impact on the Digital Public Services DESI Indicator). The goal is to develop and disseminate enabling platforms such as digital identity systems. Moreover, this investment aims at tackling the digital divide and strengthening citizens’ digital competencies. To this end, a series of complementary initiatives – such as trainings, digital hubs, etc. – will be launched. Finally, the investment aims at the creation of a cashless community, through the set-up of a cashback scheme to improve product demand and crack down on tax evasion as well as raise the rate of digital payments in Italy to the EU average within three years. In particular, by a) providing incentives to citizens and businesses aimed at reducing the use of cash and spreading digital based payments tools; b) promoting and carrying out communication activities related to such incentives concerning the value of using digital payments.

2. Innovate the Italian public administration by accelerating and strengthening the reforms currently underway and move from a cumbersome, slow and bureaucratic administration into a:

- **Capable PA:** by hiring staff with needed skills and improving the public administration recruitment process matching the evolving needs of the public administration.
- **Competent PA:** investing in new organisational work models aimed at building and enhancing civil servants core competence and motivation with an upskilling and reskilling training program empowering current public administration staff with the necessary skills especially with a view on digital transformation;
- **Simple and connected PA:** Simplification of administrative procedures, digitalisation of processes and speeding up of complex procedures, with direct and measurable impacts on services to citizens and businesses and positive effects on the productivity of the private sector and the attractiveness of the country competent;
- **Smart PA:** through the creation of spaces (Territorial Hubs) equipped for recruitment, training, co-working and remote working.

3. Improve the Judicial System effectiveness to ensure higher legal certainty and citizens’ confidence in the judicial institution. More specifically, the investment aims at reducing the timing of judicial proceedings (civil and criminal) by acting on both internal factors (i.e. the redesign and digitalisation of the process) and external factors (i.e. organisational strengthening and human capital increased capacity).

The proposals included in the RRF are part of a broad national programme of structural reforms and investments that aim to improve the efficiency of the judicial system. More precisely, the programme is an extraordinary plan that involves all the aspects of the production process: human resources (judiciary and administrative personnel), infrastructure and technology, organisation and procedural and legal rules. Specifically, the main points of the strategy can be summarised as follows:

- the introduction of new mechanisms to accelerate the way in which civil proceedings are handled (i.e. by ensuring that there are defined timeframes in place);
- the digitalisation and streamlining of the criminal proceedings, in particular encouraging the recourse to alternative procedures;
- the completion of the digitalisation of the civil proceedings;
- the digitalisation of administrative procedures;
- the enhancement of tools for alternative dispute resolution;
- the increase of human resources in both quantitative and qualitative terms;
- the introduction of innovative personnel management tools to ensure a more flexible use of resources;
- the introduction of organisational tools aimed at ensuring more effective case management (mandatory plans to address backlogs in criminal matters, reorganisation of Prosecution Offices, strengthening of the Trial Office) and higher levels of efficiency in office management;
- refurbishing and rationalisation of workspaces to speed up the so-called “transit of files and workflows”, as well as to improve interactions with qualified users (lawyers) and citizens.

In general, the plan’s objective is to reduce the number of pending cases by 30%-40% in the civil courts, 20%-30% in the civil courts of appeal, 40%-50% in both the criminal courts and the criminal courts of appeal (note that the wide range of values is due to the uncertainty of the Covid-19 health crisis). This can be achieved through:

- the average annual increase of sentences (+4%/6% for civil courts, +3%/4% for civil courts of appeal, +11%/15% for criminal courts and +18%/25% for criminal courts of appeal)
- the reduction of disposition time (-21%/-41% for civil courts, -41%/-55% for civil courts of appeal, -7%/-38% for criminal courts, -18%/-45% for criminal courts of appeal).

c) National strategic context

The investments and reforms of this component are aligned with the core strategic direction for a modern, innovative and digital Public Administration “**Italy 2025. Strategy for technological innovation and digitalisation of the country**”, presented in December 2019 by the Minister for technological innovation and digitization and which is currently being developed. The strategy stresses the major role of a ‘control room’ for

the process of digitalisation of the PA and the strengthening of basic digital skills. The strategy was confirmed and substantiated with the Government the **2020 National Reform Plan** which includes in priority area 4 the innovation and digitization of the public administration, identifying the measures necessary to respond to the Country Specific Recommendations transmitted by the European Council and implement the Sustainable Development Goals (SDGs) of the 2030 Agenda of the United Nations.

Moreover, in July 2020, the AGID adopted a new “**Three Year Plan for Information Technology in the Public Administration 2020– 2022**¹⁷”. The document provides strategic and economic direction to national public administrations (PAs) by defining the strategic model of the evolution of its information system, operational guidelines for the development of e-government systems, and ICT investments of the public sector. It includes a specific action plan with identified targets, milestones and responsibilities in reference to digital services development, data, infrastructures, interoperability, cybersecurity areas. The objectives of the three-year Plan are based on the indications emerging from the new programming for the EU funds for 2021-2027, on the principles of the 2016-2020 **eGovernment Action Plan** and on the actions envisaged by the Tallinn eGovernment Declaration (2017-2021) and the **European Interoperability Strategy (ISA2)**¹⁸, providing MS with recommendations for the development of interoperable digital public services and the EU data Strategy¹⁹. Investments foreseen in such component will complement and support the implementation of such plan.

At the same time, Consip - the Italian central purchasing body – launched, in December 2019, a massive call for competition (overall amount €225 million) for the digital transformation of public bodies. In response to the COVID-19 pandemic, the Italian government has also further accelerated the transition to digital services. For instance, the recent ‘**Cura Italia**’ Decree introduced measures aimed at speeding up the procedures for technology purchases, thus supporting the launch of new online services for citizens and businesses and the adoption of smart working solutions for PA employees. Likewise, a Fund for Technological Innovation and digitalisation has been established under the ‘Rilancio’ Decree.

Some of the measures indicated in the National Reform Plan were translated concretely into national legislation such as the law decree “**Semplificazioni**” (Decreto Legislativo 76/2020), containing urgent measures for simplification and digital innovation. To provide greater impetus to the simplification of procedures, the Council of Ministers approved, on December 3, 2020, the “**Agenda 2020-2023**”, which is a simplification program to relaunch the economy and employment, moving towards a public administration that is simpler, faster and closer to its citizens.

¹⁷<https://docs.italia.it/italia/piano-triennale-ict/pianotriennale-ict-doc/it/2020-2022/index.html>

¹⁸European Commission (2019), European Interoperability Framework – Implementation Strategy {COM(2017) 134 final}.

¹⁹European Commission (2020), COM/2020/66 final, A European strategy for data

The actions planned as part of the Agenda concern the following areas: a) the simplification and re-engineering of procedures; b) the speeding up of procedures, c) Simplification through digitization d) implementation of targeted interventions to overcome bureaucratic obstacles in the key sectors of the recovery plan (environmental protection and green economy; construction and urban regeneration; ultra-broadband).

Italy also signed the joint Member States Declaration ‘Building the next generation cloud for business and public sector in Europe’ as well as the Berlin Declaration on Digital Society and Value-based Digital Government²⁰ and investments foreseen in this component will be implemented in line with these strategic orientations.

The innovation and digitalization strategy of the Italian public administration is also in line with the guidelines of the European Commission included in the “**Green Deal**” Communication of 11 December 2019 as the EU level is expected to evaluate "measures to improve energy efficiency and performance in terms of circular economy, from broadband networks to data centers and ICT devices". Such indications are also reaffirmed in the EU Communication “**Shaping Europe’s Digital Future**” (19 February 2020) which emphasizes that "data centers and telecommunications will have to improve their energy efficiency, make use of waste energy and use more renewable energy sources. They can and must achieve climate neutrality by 2030".

As far as the justice reform is concerned, the planned interventions fall within the scope of past measures undertaken to achieve a greater level of efficiency of the Italian justice system, with the goal of speeding up the length of proceedings, reducing the backlog and allowing our Country to adapt to the standards of other European countries.

The overall reform plan fits into a broader context of reorganisation of the justice system, with interventions aimed at acquiring additional human and capital resources and introducing innovative organisational measures to systemically address the causes of inefficiency.

In this direction, some measures already adopted with the law n. 145 of December 30, 2018 (“2019 Budget Law”) are worth mentioning. Among these, in particular, investments meant to increase the magistracy staff (followed by ministerial decrees for the redetermination of staff schemes for judiciary offices), as well as, with regards to administrative staff, the authorisation to temporarily hire 2,903 units in the three-year period 2019-2021. Furthermore, the Law n.160 of December 27, 2019 established flexible staff schemes to limit shortcomings within judiciary offices deriving from the absence of magistrates and to allow, for a limited time span, to appoint judges to those offices characterised by a considerable backlog of court proceedings, an extensive number of contingencies, and operating within socio-economic contexts with a widespread presence and infiltration capacity of organised crime.

²⁰Ministerial Berlin Declaration on Digital Society and Value-based Digital Government (8 December 2020)

3. Description of the reforms and investments of the component

1) Digitalisation of the public administration (1 reform & 3 investments).

Reform 1.1: Simplification measures for the support and spread of the digital administration (*Linked to Investment 1.1 Digital infrastructures and cybersecurity, Investment 1.2 Data and interoperability, Investment 1.3 Digital citizenship, enabling services and platforms*).

Challenges: The crisis generated by the pandemic has made the digitalisation of services aimed at citizens and businesses more urgent and the simplification of their relations with public administrations of fundamental importance in order to contribute to the economic revitalization of the country.

Objectives: The Reform contributes to boost the country's digitalization with the following specific objectives:

- **increase the spread of online public services**, facilitating and simplifying their access for citizens and businesses. In particular, the decree provides:
 - an extension of the scope of application of the digital domicile; the obligation for administrations to render all their services available in digital format (Article 24);
 - the obligation to cease all the online identification systems that differ from SPID digital identity and from the CIE (the electronic identity card) in order to build a single interface for citizens to access their digital services;
 - the simplification of electronic notifications and communications of documents related to civil, criminal, administrative, accounting and extrajudicial matters (Article 28)
 - provisions aimed at facilitating access to online services for people with disabilities (Article 29);
 - measures to promote the creation of a national *cloud* to protect Italy's technological autonomy with specific requirements set by the Agency for Digital Italy, to secure the digital infrastructures of Public Administrations and to guarantee the quality and security of data and digital services (Article 35);
- **simplify procedures**, improve efficiency and reduce the high costs for Public Administrations. In particular, the decree envisages:
 - the simplification of procedures for storing electronic documents (art. 25);
 - the introduction of a single digital platform for the notification of documents and communications from PAs to citizens and businesses (Article 26);
 - measures for the simplification and spread of the advanced electronic signature and digital identity for access to banking services (Article 27); the facilitation

of actions regarding personal data, specifically clarifying that the electronic certification of personal data is ensured by the Ministry of the Interior through the ANPR; the obligation for all Public Administrations to develop their own systems in order to allow remote access to employees (Article 31); the introduction of a technological code of conduct that governs the method of designing, developing and implementing digital projects, systems and services for public administrations, in compliance with regulations on national cyber security (Article 32); the possibility for public administrations to temporarily hire professionally qualified experts for developing and managing complex digital transformation processes (Article 32); simplification measures for managing, developing and operating the national digital data platform (Article 34);

- **the right to innovate for companies** that will benefit from simplified procedures for experimenting with innovative projects. In particular, simplification measures have been envisaged in order to grant companies, universities, research centres and university start-ups the authorisation to launch innovative projects (Article 36).

Implementation: The Reform has been adopted with the "Simplifications" decree, the law-decree n. 76 of 16 July 2020, which was converted into law n. 120 on 11 September 2020.

The Reform will be implemented through Investment 1.1 Digital infrastructures and cybersecurity, Investment 1.2 Data and interoperability, Investment 1.3 Digital citizenship, enabling services and platforms

Additionally, to support the legislative intervention, specific actions will be carried out to strengthen the administrative capacity for IT spending and overcome some impediments that could further slow down its implementation. More specifically these are:

- IT technical assistance / task force - Strengthening the public administrations, with the support of sectoral technical expertise (engineers, computer scientists ...) and / or real task forces, starting from the choice of the IT solutions. But also, in the stages of supplier selection (award procedure), it is needed to maintain a supervision to ensure the absence of conflicts of interest of the staff involved in technical support assistance;
- IT catalog / construction site initiatives - Launch initiatives that can be quickly carried out, also through the definition of a national catalog of IT services, which includes all the administrative tools necessary for prompt activation. The goal would be to target solutions that can contribute to achieving the objectives by reducing design times as much as possible as well as guarantee user-centric service design and provision;
- National IT network - Create a "National IT Network", as an institutional place for direct participatory involvement over operational and technical issues of all institutional stakeholders (central administrations, representation of Regions and Local Authorities) but also of all economic partnerships. The National Network,

enabling a continuous administrative and technical interaction between appointed members, will constitute a regular meeting place to implement IT initiatives, to identify and overcome challenges, exchange good practices and to address upcoming needs, including legislative ones, for simplification in the field of IT;

- Simplified costs - Simplify spending phases, activating standard methods for defining the cost of IT solutions (standard unit costs). Therefore, accelerating the financial reporting processes for all EU funds co-financed initiatives (e.g. RRF, Structural Funds, etc.).

Stakeholder involvement: The MID (Ministry of technological Innovation and Digitalisation) and the Agency for Digital Italy (AgID) as well as public administrations at all levels.

Timeline: 48 months.

Investment 1.1: Digital infrastructures and cybersecurity.

Challenges: Digital infrastructures and public administration services are significantly fragmented and suffer from a strong technological backwardness. In addition, the majority of data centres distributed throughout the Italian territory do not adequately meet requirements for safety, reliability, processing capacity and efficiency. Such a fragmentation translates into a limited supply and demand of new technologies, such as cloud-based services in the Italian public administration marketplace. It is therefore necessary to both support the creation of new cloud services for the PA, and also to facilitate the migration of the PA hardware and software towards the cloud, as to enable the provision of high-quality services to the citizens.

In addition, the upkeep of such an inefficient infrastructure is highly expensive and exposes a large attackable surface to cybercrime. The security of the national digital ecosystem, including especially the ICT infrastructure that supports the essential public functions and services, is a necessary requirement for the functioning of the entire national community. The capacity to respond rapidly and to prevent attacks and incidents is a key prerequisite for the development of the system competitiveness, the attraction of investments and ultimately the creation of occupation. In an international context of ever increasing number and typology of attacks, as highlighted by the 2020 report by the national association for ICT security, the creation of a system of cyber defence and internal and external intervention is therefore essential to ensure the secure digitalisation of both public administrations and businesses services.

However, current technical and operational structures suffer from a shortage of competencies, due to recurring difficulties in the hiring of highly trained human capital.

Objectives: The objective of the investment is the development of a reliable, secure,

energy-efficient and economically viable infrastructure to host the systems and data of the public administration, enabling a new logic of public services provision and data usage based on the cloud paradigm. The new infrastructure will increase the technological autonomy of the country and contribute to the European cloud GAIA – X laying the foundation for potential interoperability targets between Italy’s State Cloud and other State or public entities’ clouds of other EU Member States. In addition, the rationalisation of the existing digital infrastructure will generate significant savings in terms of maintenance and update costs within the first 3-4 years. Indeed, when fully operational, it is estimated that it will allow to cut such costs by approximately 40 to 50%.

In particular, the strengthening of Type A Data Centers - eligible for the “Poli Strategici Nazionali” as defined by the AgID census - will be a key goal of the effort to rationalise and consolidate energy efficient data centers and host the most strategic services of the Central PA. In this framework, the consolidation of the overall infrastructure supporting legal proceedings will be of particular importance.

Moreover, the investment will also aim at fostering the supply of cloud services to the public administration by IT providers, including especially innovative start-ups and SMEs, and also the provision of cloud services by the public administration to its citizens, supporting PAs at central, regional and local level in the migration of their current hardware and software systems to the cloud. The new infrastructure will be developed based on the highest standards of energy efficiency and environmental protection.

As far as cybersecurity is concerned, the investment aims at strengthening the national National Security Perimeter for Cyber (PSNC) through interventions on technology, processes, governance and awareness-raising to increase cyber defences and country resilience.

Implementation: The investment consists of the following key projects:

An infrastructure of excellence: Investments for the development of a highly reliable infrastructure on the national territory, also to enhance national defense infrastructures

The project will consist of the development and implementation of a reliable, secure, energy-efficient and economically viable network of data centers on the national territory, aimed at hosting the key strategic services of the PA. It is planned to develop 4 datacenters. It will be conducted by the Department of Digital Transformation (Dipartimento per la Trasformazione Digitale) of the Minister for technological innovation and digitalisation (Ministro per l’Innovazione tecnologica e la Digitalizzazione, MID) and other public administrations involved. It will include the following operational steps:

- The definition of tendering procedures (e.g. procurement strategy, technical criteria, administrative documentation). In particular, it is planned to publish two parallel EU-level public calls for competition for the development of the infrastructure;
- The development of the infrastructure on the national territory with a focus on

high reliability, in a view to rationalise and consolidate information management data centers and host the key strategic services of the Central PA;

- The gradual hosting of Central Public Administration data centers in the new infrastructure, so to enable the provision of the cloud services.

Strengthening the technological infrastructure to support the jurisdiction

In coherence with the development of the above-mentioned network of data centers, the investment will also encompass the rollout of the enabling infrastructures and secure IT systems for the justice system. More specifically:

- digitalisation of the archives relating to all civil proceedings and those of the Supreme Court of the last ten years in order to facilitate the digital processing of proceedings and, therefore, speed up judicial proceedings;
- digitalisation of proceedings due to unreasonable trial length (so-called “Pinto Law”);
- the construction of a Single National Justice Data Centre in which to concentrate all the IT services of the administration, so to ensure greater effectiveness in the overall functioning of the system;
- the creation of a proprietary geographic connectivity network, which is cheaper, safer and more efficient, allowing the administration to be independent from market trends, while increasing its level of security;
- the enhancement of connectivity, even remotely, in compliance with safety parameters in order to encourage delocalised work and the use of new technologies through:
 - the adaptation of a network infrastructure of some buildings, in order to acquire equipment suitable for new security measures;
 - the access control to the network, with authentication at various levels;
 - the updating of the system for managing access logs;
 - the acquisition of laptops and related accessories for justice personnel;
 - the adoption of a series of systems for securing notebooks;
- enhancement of digital tools available to juvenile justice professionals and communities operating locally.

These interventions fall within a framework that is already strongly focused on innovation, including especially the gradual and uniform digitalisation through the continuous development of both civil and criminal telematic proceedings.

The project will aim at the increase of cloud services in the public administration, through a coordinated support both on the supply side (i.e. supporting companies to develop new cloud services for the PA) and on the demand side (i.e. helping the PA adopt new cloud services in the framework of their digital transformation efforts). It will be conducted jointly by the Department of Digital Transformation (Dipartimento per la Trasformazione Digitale) of the Minister for technological innovation and digitalisation (Ministro per l’Innovazione tecnologica e la Digitalizzazione, MID) and the Agency for Digital Italy (Agenzia per l’Italia Digitale, AgID), with the participation of all involved PAs. The

project will be implemented through the following operational steps:

- First of all, a survey will explore the needs of public administrations for cloud services, building upon previous surveys that allowed to gauge the current use of cloud services and the key categories of services to be developed (i.e. municipal services for citizens, municipal services for enterprises, internal management tools for municipalities, school services, healthcare services);
- Cloud services will then be identified and suppliers engaged through 5 periodical calls for competition for innovative start-ups and SMEs, which will be centrally managed by the Control Unit;
- Finally, support to PAs will be provided in order to increase cloud-based services available and address their needs. In particular, support will be provided for the purchasing phase, in which 3 calls (1 for municipalities, 1 for healthcare authorities, 1 for schools) will be published, with the aim of selecting the public administrations that will receive funding for cloud services purchase.

Cloud enablement programme

In parallel and as a complement of the Cloud first line of action, this project will focus on the migration of the public administration hardware and software legacy systems to the cloud. It will provide support to public administrations to migrate (from assessment to execution) the services currently hosted on obsolete data centers to secure infrastructures of the PA and also to cloud services offered by the market (qualified and available in the Cloud Marketplace). It will be conducted by the Department of Digital Transformation (Dipartimento per la Trasformazione Digitale) of the Minister for technological innovation and digitalisation (Ministro per l'Innovazione tecnologica e la Digitalizzazione, MID) and all the involved PAs and it will include:

- The definition of the monitoring modalities;
- The publication of 7 calls (4 for municipalities based on demographic dimensional criteria, 1 for healthcare authorities, 1 for schools, 1 for universities and central public administrations) aimed at selecting the public administrations that will receive funding for the cloud migration
- The collection through a Project Portfolio Management Software of the migration plans submitted by public administrations
- The actual implementation of the approved migration plans, which will be subject to central monitoring by the Control Unit, with different targets and funds depending on the typology and size of the PA.

It is planned to have approximately 5.365 public administrations involved in the cloud enablement program.

Strengthening the National Security Perimeter for Cyber (PSNC) through interventions on technology, processes, governance and awareness-raising to increase cyber defences and country resilience

The project will be implemented through a joint effort of the Department of information for security (Dipartimento delle informazioni per la sicurezza, DIS), the Department of Digital Transformation (Dipartimento per la Trasformazione Digitale) of the Minister for technological innovation and digitalisation (Ministro per l'Innovazione tecnologica e la Digitalizzazione, MID), the Ministry of University and Research (Ministero dell'Università e della Ricerca, MUR) and the Ministry of Economic Development (Ministero dello Sviluppo Economico, MISE), under responsibility of the Presidency of the Council of Ministers. It will include the following lines of action:

- Hyper SOC, namely the implementation of a hyper monitoring system centered at the National CSIRT collecting and processing (in near real time) suspicious event patterns occurring on ICT assets hosting essential functions or services of the country belonging to the National Security Perimeter for Cyber (PSNC) organisations in order to early detect complex attack patterns. A high-performance-computing infrastructure will be used as computational setting. The output of the services implemented by the Hyper SOC will be available to EU and national authorities to build a EU Cyber Shield,
- Simulation tools based on AI / ML for assessing and forecasting effects of large-scale cyber crisis supporting the National Cyber Security Management Board (Nucleo Sicurezza Cibernetica Nazionale) and the EU Cyclone network members, to understand the physical impact on other critical infrastructures with potential crossborder effects. Once again, a high-performance-computing infrastructure will be used as computational setting.
- Maintenance of the Ontology and Taxonomies on which the contents exchanged with the perimeter subjects are based.
- Creation of a system for the modelling and tracking of the supply chain of software / hardware devices employed within ICT assets belonging to the PSNC, including the software tools. The target of the system is to minimise the risk that the supply chain will be an attack vector.
- Support to the upgrade of security structures within selected public administrations, in line with the security measures of the PSNC.
- Creation of cybersecurity labs network established by the "legge sul Perimetro di Sicurezza Nazionale Cibernetica (PSNC law, DL 105/2019)". The labs, accredited by the national Evaluation and Certification Centre (CVCN), will support the process of technology checking IT products employed within ICT assets running essential functions of the country. Funding priority will be given to those laboratories that will also support the activities related to European cybersecurity certification by ENISA working on certification schema and on verification of compliance to EU cybersecurity certification.
- Support for strengthening the capacities of the CVCN and of the Evaluation Centers (CVs) of the Ministry of Defense and the Ministry of the Interior, for the strengthening of the technological screening and the qualified procurement of products to

be used in the ICT assets of the PSNC.

- Support to the for the strengthening of the capabilities of cyber defense against internal and external threats to the PSNC, for the cyber defense system, aimed at the creation of innovative technological services and tools for cyber defense, cyber reaction, law enforcement and for the enhancement of the capabilities of the Intelligence Sector, of the Ministry of the Interior and of the Ministry of Defence.
- Upgrade of selected Operators of Essential Services (OES) according to guidelines set by Italian NIS authorities.
- Creation of Computer Emergency Response Teams (CERT) for each sector identified by the NIS Directive ensuring their interconnection with the Italian Computer Security Incident Response Team (CSIRT). Funding priority will be given to sectorial CERTs that will implement also ISAC functions in order to further develop ISACs network both at EU level and at national level.
- Creation of a high-performance-computing infrastructure to support the CSIRTs' AI and ML workloads and the ISAC Analysis activities.
- Creation of a government ISAC (Information Sharing Analysis Center) for for the analysis of large amounts of data, provided by the PSNC SOC, relating to cyber attacks to support the activities of the CSIRT, of the Cyber Security Management Board (Nucleo Sicurezza Cibernetica), of the National Cyber Security Development and Research Center and of the European Authorities in this sector, further developing ISAC's network both at EU level and at national level. The high-performance-computing infrastructure will be used for this purpose.
- Creation of a central Central Audit Unit (Nucleo centrale ispettivo) for the PSNC law.
- Strengthening of the Central Audit Unit (Nucleo centrale ispettivo) for the NIS provisions at each national authority. Strengthening of the governance and coordination infrastructures necessary for the functioning of the POC NIS.
- Creation of a central audit control unit (Nucleo centrale ispettivo) for the "essential cyber security measures" (Misure minime di Cyber sicurezza AGiD) to be applied to all the central and local Public Administrations not included in the PSNC.

Rationalization and consolidation of the digital infrastructure for the Defense Sector, based on open-source technological solutions for digitising processes related to personnel management

This implementation mean will be implemented by the Ministry of Defence, in cooperation with the Agency for Digital Italy (Agenzia per l'Italia Digitale, AgID), the Ministry of University and Research (Ministero dell'Università e della Ricerca, MUR) and the Ministry of Economic Development (Ministero dello Sviluppo Economico, MISE). It will consist of three main lines of action:

- the Private Cloud Project for the creation of a so-called *infostructure* the provision of services in private cloud mode

- The SCIPIO initiative for the creation of a laboratory for software evaluation, staff training, infostructure migration service provision
- the Digital Platform for Defense Personnel, aimed at the digitalisation of procedures and information relating to Defense personnel in compliance with security requirements imposed by the evolution of cyber threats

Strengthening of the connectivity network of operational structures, Digital telephone exchanges, Digitalisation of paper archives, Platform for the enablement of remote working, and Tracking system for personal protective equipment for the Department of Fire Corps, Public Rescue and Civil Defence of the Ministry of Interior [*PROJECT UNDER DISCUSSION*]

Ostia Green data center infrastructural works

Impediments: As far as the cloud services demand side is concerned, the personnel of the public administration is currently affected by a widespread lack of the necessary competencies for the management of these initiatives (technical skills and standards on new technologies, procurement procedures and requirements, etc.). Therefore, it will be necessary to complement the investment with trainings of the PAs personnel.

The cybersecurity public sector suffers from a lack of highly skilled personnel. For this reason, the investment will need to focus on training of required competencies and also on encouraging the return within the national boundaries of experts.

Target population: The primary beneficiaries of the investment will be the citizens, who will benefit from enhanced digital public services based on the cloud paradigm. In addition, the investment will also improve the functioning of PAs. Finally, the Cloud first line of action will also directly support private companies, including especially innovative start-ups and SMEs.

Citizens and businesses will also benefit from a justice system capable of guaranteeing the continuity of services and operators of the justice system who can use IT solutions and tools that facilitate electronic civil and criminal proceedings.

Regarding the strengthening of the PSNC, the security of the national digital ecosystem is an essential prerequisite for the functioning of the public administration and, more broadly, the entire national community, including also businesses and citizens.

Timeline: The implementation period is estimated to be 60 months, until December 2025.

Investment 1.2 Data and interoperability,

Challenges: The development of a new network of cloud data centers will enable the processing of large quantities of data for the provision of services to businesses and citi-

zens. However, the increased capacity in terms of storing and elaborating data will not be sufficient in order to shift to a new paradigm of data-driven services in the absence of full interoperability and information sharing between PAs.

Indeed, while in recent years substantial progress has been made in terms of digital transformation of the PA at the national level, the e-Government Benchmark 2020 and Eurostat data still highlight that Italy is struggling in the uptake of e-government services. Similarly, the DESI Index 2020 suggests that, as regards digital public services, Italy ranks poorly among EU MS, in particular when considering e-government users (i.e. online interaction between public authorities and internet users). The Italian delay in terms of usage of digital public services compared to other EU countries has been attributed in particular to the highly limited interoperability between different systems and services of the Italian PAs - which hampers the once-only principle as it makes necessary for citizens to provide their personal details several times.

Objectives: In order to effectively complete the implementation of the once-only principle, the main objective of this investment is to make PA databases interoperable and accessible through a catalog of Application Programming Interfaces (APIs). This will allow central and peripheral public administrations - based on different levels of authorisation - to access data, process them and provide end-to-end services to citizens and businesses, who will provide information to the PA “once-only”. In particular, through the implementation of the Single Digital Gateway citizens and businesses - including especially those from other EU countries - will be able to access information and a variety of digital public services.

Implementation: The investment will consist of the following key projects:

Leverage information assets of the country

The project will aim at mapping and analysing the country’s information assets, identifying datasets owners, use cases and useful best practices to foster dataspace. In addition, it will aim at ensuring the interoperability of shared data models, ontologies and core vocabularies, in a view to ease the creation of semantically and syntactically consistent cross-domain and cross border services, while their publication via a central catalogue will make them easily reusable for designing and supporting the deployment of services.

In particular, a working group including local and national administrations, universities, national agencies and category associations will be created in order to analyse and rank an extended set of relevant registries with respect to their ability to enable digital public services. The project will also focus on the existing dataset gaps with respect to European best practices. The information will be published on existing platforms to enrich the available knowledge about relevant datasets useful for the digitalisation of the country. The goals of the working group will be:

- to publish a report including findings of datasets specifications and their related

gaps;

- to publish an exhaustive documentation of the analysed datasets on a national platform.

Secondly, the project will entail the creation and implementation of a central catalogue for data schemes, ontologies and core vocabularies. Currently, this information is provided by different agencies in an uncoordinated and sometimes inconsistent way, moreover they are not directly usable for delivering digital services.

Finally, the project will include the enrichment of the catalogue, which will involve a collaboration between different agencies (including as an example the Ministry of Interior, INPS, ISTAT, Agenzia delle Entrate, AgID, and the Department of Digital Transformation).

Development of the interoperable national data platform and support to public administrations for the adoption of the interoperability model and integration of their APIs in the platform

The development of interoperable national data platform will completely digitise all administrative procedures and organisational interactions to exchange data between two entities. It will therefore enable a more efficient and consistent re-use of public data. In particular, it will include the following operational steps:

- Wide-ranging stakeholder engagement in order to analyse the requirements of the interoperability system;
- Design of technical features and launch of the interoperable national data platform with API catalogue, and integration of databases of national interest. The Platform will be developed following the openness and reusability principles of the European Interoperability Framework;
- Stabilisation of the platform, gradually increasing its size of PAs involved. A targeted effort will be made to integrate the Platform with a wide selection of APIs and agencies from central administrations, regions, top universities, metropolitan cities and local healthcare agencies, and to stimulate the creation and the reuse of tools and open source software in order to benefit also the entities not directly involved in the project.

After the development of the platform, public administrations for the adoption of the interoperability model and integration of their APIs in the platform will be identified and will receive support through the following:

- Provision of training and specialised support to help public administrations adopt the interoperability model and adapt their APIs. PAs will apply for funding for the integration of datasets and registries with the Interoperability Platforms deploying interoperable APIs. The selected agencies will be guided to co-design and co-invest in the integration com-

ponents, to reuse and publish open source software and to deploy secure APIs;

- Support for the necessary developments to integrate public administrations platforms with the national data platform, enabling the possibility for authorised subjects to access data and provide new data-driven services. The various targets will follow an iterative approach: first core registries and then progressively extending the range of included services to the more complex or decentralized ones.

Single Digital Gateway

The Single Digital Gateway aims at providing access to information, procedures, assistance and problem-solving services in accordance with Regulation 2018/1724/EC. It is expected to facilitate the digital transformation process in Italy as it requires to provide online access to the information, administrative procedures and assistance services that citizens and businesses need to get active in another EU country.

The Single Digital Gateway will have to guide citizens and companies to information on national and EU rules, rights and procedures and the websites where they can carry out these procedures online. Users looking for assistance will have to be guided towards problem-solving services.

The Regulation that brings the gateway into effect also requires that more administrative procedures can be performed online than currently, by users in their own country and cross-border users.

The ‘once-only principle’ (i.e. users should not have to submit to authorities documents or data already held by other authorities) will have to be applied to cross-border exchanges of evidence for a range of procedures in compliance with the implementing act and the technical specifications defined at European level as it specified in the Regulation itself. For these procedures, users will be given the option to request the direct exchange of evidence between authorities in different member states.

In order to be compliant with the Regulation and provide the expected value to citizens and business, a relevant effort needs to be delivered at national level, in order to overcome a few significant barriers:

- The list information and the procedures included in the scope implies the engagement of a large number of Public Administrations (approximately 9.000)
- A preliminary gap analysis has shown that the level of the quality of the information that are currently online is quite far from the target of the Regulation and most of the procedures in scope of the Regulation are not fully digitalised
- As highlighted by the eGovernment Benchmark 2018, prepared by the European Commission, Italy is characterized by a low level of Penetration and a medium-low level of digitization. Therefore, Italy is part of the non-consolidated eGov scenario,

a scenario where countries are not fully exploiting ICT opportunities. Italy is characterized by the lowest Penetration level in Europe: only 19% of individuals that submit official forms to administrative authorities used online forms.

The Single Digital Gateway Implementation is also quite complex as it requires the coordination with other actions already ongoing to be compliant with other key policies.²¹

The project will engage approximately 10.000 Public Administrations. A preliminary gap analysis has shown that the quality of the information that is currently online is quite far from the target of the Regulation and most of the required procedures are not fully digitalized. Due to the high number of involved Public Administration, the implementation is expected to be performed through different means:

- Strong Governance involving central Public Administration and aggregators
- Legislation simplification and adaptation to overlap obstacles to the Single Digital Gateway
- Implementation of national infrastructure/hubs to facilitate national and European interoperability
- Support to Public Administration for implementing the new procedure and information services
- Monitoring and fine tuning of the published information and services

Impediments: In order to allow public administrations to map their data assets, adopt the interoperability system, develop their APIs, integrate their data in the national data platform and make use of the search engine, significant technical competencies will be required.

Target population: The creation of a national data platform with an adequate technological infrastructure and common mechanisms between all actors involved (e.g. interoperability standards, security criteria, personal data protection requirements, etc.) will allow to build a nation-wide trusted federation of data providers and data users. For this reason, the targeted population is expected to be particularly wide. The primary targets of the investments will be citizens and businesses, which will benefit from a wider range of improved digital services in terms of efficiency, quality and usability. In particular, businesses will benefit from the opportunity of developing new data-driven solutions. In

²¹I.e. (i) Directive 2006/123/EC of the European Parliament and of the Council of 12 December 2006 on services in the internal market; (ii) Directive (EU) 2016/2102 of the European Parliament and of the Council of 26 October 2016 on the accessibility of the websites and mobile applications of public sector bodies; (iii) National Legislation to transpose the above Directives; (iv) Regulation (EU) N°910/2014 on electronic identification and trust services for electronic transactions in the internal market (eIDAS Regulation) adopted on 23 July 2014; (v) Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation); (vi) Legislative Decree 07/03/2005 n° 82 (Digital Public Administration Code) and related modification.

addition, the national data platform will allow PA employees to benefit from streamlined and more efficient work processes. Finally, the investment is expected to generate savings for public finances, once again producing benefits for the country as a whole.

Timeline: The implementation period is estimated to be 48 months, up to December 2024.

Investment 1.3 Digital citizenship, enabling services and platforms.

Challenges: The e-Government Benchmark 2020 highlights that Italy has been making stable progress in recent years in the digitalisation of public services, and in this respect, it is now just below the EU average. At the same time, however, Italy is characterised by the lowest level in the EU in terms of penetration of digital public services. Indeed, only 25% of Italian citizens had online interactions with the public administrations, down from 28% in 2019 and significantly below the EU average of 60%. For instance, the Sistema Pubblico di Identità Digitale (SPID), namely the Italian digital solution for electronic identity, still requires support, as approximately just above 20% of the population has currently activated it.

The causes behind such a delay in the usage of digital public services can be grouped into three key families:

- The scarce quality and user-friendliness of digital public services at local level
- The limited availability of broadband connectivity across the territory, especially in rural areas and small municipalities
- The limited digital competencies of citizens

Indeed, the lack of digital skills is a significant obstacle for the socio-economic development of the country and for the recovery from the current crisis. According to the latest edition of the DESI index on human capital, Italy ranks 28th out of the 28 countries under consideration (27 Member States and the UK), losing two positions from the previous year.

Just 42% of the population aged between 16 and 74 possess basic digital competencies (significantly below the EU average of 58%), and just 22% has above-basic digital skills (once again, well below the 33% EU average). Similarly, Italy ranks poorly also in the DESI index on the use of internet and online activity (26th out of 28), with just 74% of the population making use of the internet at least once a week (against a EU average of 85%).

Objectives: This investment aims at the creation of a digital community, fostering the supply and demand of digital public services and encouraging a digital cultural shift.

First of all, the investment will improve and harmonise the supply of digital public services

towards all citizens through the support to: (i) the development of existing key enabling platforms and of new digital public services, (ii) the adoption of key enabling platforms by public administrations, and (iii) the creation - thanks to the functionalities offered by key enabling platforms - of more efficient, user-friendly and secure digital public services.

Moreover, the investment will aim at tackling the digital divide and strengthening citizens' digital competencies. Through the combination of a range of complementary actions - including the provision of trainings, the creation of digital hubs, the involvement of young volunteers as digital facilitators, etc. - the investment aims at reversing the country's downward trend, bringing it in line with or even above the average of relevant DESI indicators by 2025.

Finally, the investment aims at supporting a digital cultural shift through the creation of a cashless community, encouraging the adoption of new payment technologies between commercial operators and citizens. Through the provision of incentives to citizens and businesses aimed at reducing the use of cash and spreading digital based payments tools, the investment is part of a wider national strategy towards the creation of a cashless community with a complete digitalisation of transactions for all operators involved (citizens, businesses, public administration).

The expected impact is to support the reduction of tax evasion, especially in the form of omitted invoicing as requested by 2019 CSR Recommendation 1, and to normalise the use of digital means to carry out day-to-day transactions and operations. In this respect, it is to be noted that incentives are not foreseen for online electronic payments, in order to stimulate consumers to make purchases in small businesses undertakings (neighbourhood shops, bar, restaurants), supermarkets, large retailers, artisans and professionals, which were severely affected by the economic crisis due to COVID 19.

Implementation: The investment consists of the following key projects:

Improvement of the quality, efficiency, and usability of digital public services

The Department of Digital Transformation of the MID and the Agency for Digital Italy will define a detailed set of actions aimed at improving digital services for any selected Public Administration by following a standard model, a so-called "adjustment project", tailored to different kinds of public administrations, including municipalities, schools and museums. Public administrations and their providers will be encouraged to submit an investment proposal following the "adjustment project" for the improvement of their design and development phases through the adoption of standardised models for websites, services and platforms onboarding. These models will make services accessible, usable, compliant with PagoPA, SPID and CIE platforms, by using open data and source code that can also be reused by others. Any "adjustment project" proposal will have to adhere to specifications in terms of interoperability, use of design thinking, agile methodologies and results.

The Department of Digital Transformation and the Agency for Digital Italy will also be in charge of validating and monitoring funding.

Adjustment projects will be carried out by in-house and private providers and will cover the following public administrations:

- 8.043 Municipalities and 14 metropolitan cities,
- 8.618 schools of various orders and grades,
- approximately 500 public museums.

Improvement of accessibility of digital public services

A public sector information available in a transparent, effective and non-discriminatory manner is a source of potential growth of digitized public services: Italian citizens would benefit from broader access to public services through websites and mobile applications. Moreover, they would receive services and information that facilitate their daily lives and the enjoyment of their rights.

Public sector bodies have to gradually increase the level of their websites accessibility, adopting measures to raise awareness among stakeholders and promoting extensive training programs on accessibility.

The project aims to help public sector bodies to reach targets indicated in criteria, requirements and lines of action that can be taken from guidance documents issued at the national level.²²

In order to achieve the targets set by the project it will be necessary to perform the following tasks:

- Support local administrations in terms of training, expertise and possible budget transfer with the provisions of the European Directive 2016/2102
- Assess the accessibility and quality of digital public services, throw accessibility tests and monitor the quality of digital public services.
- Provide technical support for the accessibility of digital public services, developing reusable tools and accessible template and web kits
- Improve the skills of public employees on the subject of accessibility and IT tools developing training and awareness-raising events, communication and dissemination of the accessibility culture and digital services implemented.

The project will be managed by AgID.

²²Including in particular: (i) Three-year Plan for Information Technology in Public Administration 2020 - 2022 (AGID - July 2020); (ii) Guidelines on the accessibility of IT tools (AGID - January 2020); (iii) 4th National Action Plan for Open Government 2019 - 2021 (Department of Public Function - June 2019); (iv) National Strategy for Digital Competencies (MID - July 2020); (v) 2025 Strategy for technological innovation and digitalization of the country (MID - April 2020).

Widespread adoption of the PagoPA platform and of the IO app by public administrations

First of all, this line of action will entail the gradual adoption of the PagoPA platform by public administrations. Upon completion of the adoption process, public administrations will therefore be able to receive digital payments both directly and/or through dedicated intermediaries. The initiative is part of a wider effort to create a cashless community on the public administration side.

Similarly, public administrations will incrementally make their services available through the IO app, so to enable a single gateway to easily access public services through one's smartphone.

PagoPA SpA, the state-owned company which was created purposely to foster the adoption of digital payment systems throughout the country, will support the implementation of this line of action, under responsibility of the MID.

The project therefore aims to:

- promote and technologically evolve central digital infrastructures that facilitate dialogue with the digital components adopted by the Public Administrations;
- define integration processes to the enabling platforms envisaged by the three-year plan.
- integrate and provide client software components, libraries, SDKs (software development kits) to individual Public Administrations, which can be easily integrated with central infrastructures, significantly contributing to the adoption of enabling platforms.

Main benefits will be:

- Re-engineering of digital based processes and the consequent strong simplification of obligations, supervision and management;
- Optimization of service delivery processes, also thanks to the digital release of related documents (certificates, attestations, receipts, etc.);
- Automation of the issuing, notification and accounting of income and expenses processes;
- Economic savings within the Public Administrations resulting from cashless and freed resources and skills, to be allocated to higher value-added services;

The project guarantees the dissemination among all Public Administrations of digital payments through the PagoPA platform; the development of a new relationship between citizens and the Public Administration through the dissemination and implementation of the IO App, which aims to become an access point to all public services for citizens; the integration of downstream services of an electronic payment through the development of services based on the central point ("Centro Stella") of the payments.

The project is based on the awareness of the relevance of the payment market to public administrations, both in terms of the number of transactions (about 500 million) for a value of (about € 700 billion), and of the savings resulting from the adoption of a single digital facilitate and simplify collection services on the Public Administration side, the importance of spreading electronic payments to the detriment of cash, as well as the importance of encouraging the spread of a single access point to public administration services and a single interface to which the individual administrations can communicate and share data and APIs in a free and open way.

The distribution of clients (or front end tools) is a fundamental step to ensure a fast and economical integration, for all the platforms served, with a UX developed with modern technologies and approaches that achieves the dual objective of presenting the same functions and methods of delivery with respect to different channels and a simple and intuitive user experience.

As far as PagoPA is concerned, the main activities will consist of the following:

- Completion of the adoption of the PagoPA digital payments platform to simplify the citizen's interaction with the Public Administration in relation to the collection of taxes and duties.
- Continuous technological implementation of the PagoPA product in order to make it more effective and technologically more efficient.
- Expansion of the digital payments market and with the aim of a strong reduction in cash in transactions between citizens and public administrations.
- Promote the speed of payment and collection by PAs also in the perspective of contrasting tax evasion.
- Automatic reconciliation of receipts through the SIOPE + system and near real time updating of public accounting.

Concerning the IO App:

- Spreading the integration of services on the IO app by creating a single "digital counter" for the citizen to centralize the contact point between citizen and PA, avoiding the citizen having to look for the correct interlocutor
- Provide tools to facilitate the adoption of the IO app in the provision of services Significantly reduce the communication costs of administrative, tax and collection documents by eliminating printing costs and reducing notification costs
- Census of the services offered by each entity in order to activate the delivery through the single IO channel;
- Constant updating of references and contact details of each institution and service, to be displayed to the citizen for requests for further information and assistance;
- Monitoring of the use of digital services by citizens, in order to identify any problems and opportunities for improvement;
- Creation of a shared standard for the organization of services on digital channels

and their nomenclature, in order to facilitate the orientation of the citizen and the consistency of services throughout the territory.

Widespread adoption of SPID, CIE and ANPR by public administrations

Building trust in the online environment is essential for a successful transition to a digital society. The National Identity platforms SPID (Sistema Pubblico di Identità Digitale) and CIE (Carta d'Identità Elettronica) are at the core of the National Digital Strategy in Italy. These platforms help citizens to manage their digital identity for accessing online services and support the public administrations to manage access to their online digital services in a secure and cost-effective way, while developing new digital services that require secure access.

- The Public System of Digital Identity (Sistema Pubblico di Identità Digitale - SPID) is the digital solution for electronic identity, which already allows citizens to easily access various digital public services.
- The Electronic ID (Carta d'Identità Elettronica - CIE) is the national identification document and card-based, which combines both physical and digital security systems, allowing to securely guarantee one's identity and also to access a number of online digital public services.

SPID and CIE are compliant to eIDAS Regulation and notified to the EU. Therefore, SPID and CIE contribute to the EU framework for Digital Identity as requested by the Single Digital EU Market.

ANPR (National Register of the Resident Population) is an integrated system that allows municipalities to carry out registry services, consult or extract data, monitor activities and generate statistics. With ANPR, the administrations and service providers will be able to have a single, reliable source for citizens' data. An onboarding phase for any municipality is still ongoing, on track to be completed. ANPR, by aligning place name data, allows implementation of the National register of street numbers and urban streets (ANNCSU), which is necessary to complete the Land Registry reform. Amendments to Art. 62 of the Digital Administration Code envisaged that ANPR will contain, in addition to registry data, the national digital archive of the civil status registers and the data of the military service lists.

The integration of SPID and CIE within the PA has already started. At the end of December 2020, approximately 5.000 administrations have already integrated SPID and approximately 200 have integrated CIE, both central and local Administrations. In September 2019, the "Decreto Semplificazioni" was enacted. It requires that all the PAs integrate their Digital Services into SPID and CIE as the way to access digital services targeting citizens in Italy.

During 2020 the MID, in collaboration with AGiD and Istituto Poligrafico Zecca dello Stato, have conducted an integrated plan directed to all the Public Administrations to

accelerate the integration of SPID and CIE. The key components of the plan are:

- a national tender to assign economic resources to the local PAs to be used for integrating the central platforms
- an integrated communication plan targeting local PAs, via webinars, social, web
- support functions to help PAs during the integration period

The plan is still ongoing and funded under the “Fondo Innovazione” assigned to the MID. Thanks to this plan, 14% of the PAs will be integrated to SPID and CIE at the end of 2021. Further resources are needed to complete adoption by all the PAs, with special focus on the PAs with limited skills in IT and Digital.

ANPR status is encouraging. At the time of writing, about 89% of the municipalities and metropolitan cities already joined the program and integrated their system within the central systems.

We will progress and extend the plan already in place to reach the objective of 100% of PAs integrated to SPID and CIE.

To this purpose:

- we will extend the national tender to assign economic resources to the local PAs to be used for integrating the central platforms SPID and CIE.
- we will continue the integrated communication plan targeting local PAs, via webinars, social, web
- we will maintain the support functions to help PAs for integration

With regards to point 1, we will proceed and extend the plan by type of PA (central, local, hospitals, etc.), so that we can smoothen the integration process and optimise the economic effort for the integration.

Creation of “Presidi digitali”

The line of action will aim at supporting the creation of digital services access points (i.e. “Presidi digitali”) in those areas of the country that - due to their geographical location - are at risk of suffering from a lack of connectivity. In addition, it will include the mapping of isolated households and the identification of possible connectivity solutions for mountain lodges in the Alps and the Apennines.

Digital Notification Platform

The Digital Notifications Platform is regulated by the 2020 budget law and by the decree-law n. 162 of 2019, containing the extension of terms and other provisions, in which various measures have been envisaged to promote and enhance the computerization of the public administration. The diffusion of the digital administration continued with the decree-law n. 76/2020 containing urgent measures for simplification and digital innovation, that governs the platform for digital notifications of public administration documents

and details the methods of operation.

The functional analysis and the analysis of the requirements preparatory to the development of the Platform has been carried out during 2020.

The proposal aims to promote the digital notification platform in order to make the legal notification of acts, provisions, notices and communications of the public administration easier, more efficient, secure and cheaper, with savings for public spending and minors. charges for citizens.

Through the Digital Notifications Platform, public administrations will be able to make notifications with legal value of acts, measures, notices and communications to recipients (natural persons, legal persons, entities, associations and any other public or private entity, residents or having their registered office in Italy or abroad if they have a tax code). In essence, the paper registered letter is replaced by a digital communication, resulting in simplification for the administration and saving time for citizens, who will be able to have the deed also available on their device, in real time.

The objectives of the National Digital Notifications Platform are:

- Make the notification with legal value of deeds, provisions, notices and communications of the public administration easier, more efficient, secure and cheaper
- Reduction of out-of-pocket expenses (paper printing and shipping) certainty of the notification date in real time and consequent reduction of a large part of the dispute as well as of the relative management costs.
- Reduction of the complexity of notifications; Reduction of timing and legal certainty - the acts of the PA reach the recipient's attention in real time, immediately after uploading the document to the platform.
- Simplified and more efficient procedures: the act immediately begins to produce its effects by favouring the planning of administrative activities
- Greater environmental sustainability, resulting from less waste of resources (paper, toner, etc.)
- Reduction of the risk of non-delivery of a notification by an Entity
- Quick response times from the PA: an advantage, in particular, for companies that need to plan their activities and for citizens waiting to know the outcome of important practices
- Greater accessibility: the recipient can access the document at any place and time from their device, also favouring people with disabilities

Self-assessment and learning environment

The development of the self-assessment and learning environment ACCEDI for the citizens strongly contributes to bridge the digital literacy gap of the population. The project supports the improvement of citizens' basic and advanced digital skills in order to facilitate their participation in the economic and social life, and to increase their chances

to find a job. By offering digital skills' self-development tools for the citizens, sharing materials realised thanks to the different initiatives, ACCEDI will provide the needed tools to support the development of digital skills.

The project strengthens the usability and fruition of the results of the initiatives of Repubblica Digitale and of the National Coalition of Digital Skills and Jobs. Furthermore, the Operative Plan of the National Strategy for Digital Skills includes among its actions focused on the citizens, a specific project on ACCEDI. The realisation of self-assessment and learning environment ACCEDI is thus instrumental for the achievement of the goals envisioned by the National Strategy.

A preliminary step for the development of the self-assessment and learning environment ACCEDI has already started thanks to national funds. For the first semester of 2021 is planned the release of a first working prototype of the platform that will be developed according to this 1.5 investment plan.

In the future the self-assessment and learning environment ACCEDI could be interacting with the platform of the Digital Skills and Jobs Coalition of the European Commission, as requested by the European coalition itself. In order to provide this additional service, extra funds specific for this action may be provided by the Commission following a Call on CEF Telecom 2020 on European Platform for Digital Skills and Jobs, which will be confirmed in the following months. The activities related to this development are not included in the investment plan.

The development plan provides for the breakdown of activities on three main lines:

- Line 1: implementation of the platform and operational management,
- Line 2: organization and implementation of the contents of the "Self-assessment and learning environment ACCEDI"
- Line 3: promotion of the development of citizens' digital skills with the contents of ACCEDI (e.g. through webinars, meetings in the area, etc.) and from a community perspective

And on a progression according to the following phases:

- Phase 1 - Implementation and commissioning of the first version of the self-assessment and learning environment ACCEDI", without profiling and with coverage of two levels of DigComp framework, with all the features provided (including agenda of events, community forum, interaction tools with the National Coalition), activation of synergies with the CPIAs for use in training courses, and with other proposed projects such as the digital facilitation network and the Houses of innovation and digital culture
- Phase 2 - Extension of the "Self-assessment and learning environment ACCEDI" to all levels of DigComp mastery, with profiling and issuing of certificates
- Phase 3 - Extension of the "Self-assessment and learning environment ACCEDI"

with more paths with respect to the different targets and expansion with specific self-assessment kits and relative certification.

Network of digital facilitation services

The goal is to create or strengthen so-called ‘nodes’ of digital facilitation, namely public centres where digital facilitators support citizens to assess their digital needs and provide one-to-one dedicated support.

The project plan has a gradual approach linked to the definition of specific agreement for activity coordination, at regional level, that take into account the different starting situations of each context and therefore the different needs of support and project definition, on the basis of an operative model already consolidated that can be applied in several realities, as well as being an effective tool for sharing experiences and data on the service.

The digital facilitation services will cover the entire national territory and will be realised by the support and coordination of Regions. In particular, agreements will be stipulated for the digital facilitation services with every Region, binding them to cover homogeneously the territory of their competence.

Concerning the involved structures, the digital facilitation services are launched also strengthening pre-existent structures (i.e. libraries). This is why every action aimed at realising or strengthening the structures for the community planned in Mission 5 will ensure a faster and wider spread of the service.

The initiative of the digital facilitation services aims to achieve the objective of promoting the strengthening or the activation of nodes/hubs of digital facilitation located at public entities and third sector associations through regional coordination. This initiative, therefore, contributes to the realisation of a systemic action with a homogeneous development at national level that on the basis of the current best practices (regional projects such as “Punti Pane e Internet” in Emilia Romagna, “DigiPass” in Umbria and local projects in municipalities such as Roma, Cagliari), ensuring a widespread distribution of the service.

The development of the initiative is also focused on the empowerment of the projects, spaces and infrastructures already present on the territory (firstly in libraries and schools, secondary in juvenile and social centers). The services will be carried out also in the tax assistance centers, elderly centers, and could also occur dynamically on the territory in the field of assistance services or ISTAT census activity.

The investments will be related to the amount of population for each region that do not possess basic digital skills. The monitoring of the efficiency will be directly related to the reduction of this quota of the population in each single Region.

At local level the single initiatives will pursue multiple objectives:

- the development of citizens' digital skills, through education or strengthening of digital facilitation services in public hubs (i.e. townhalls, libraries, schools, etc.) and private structures (associations);
- the development of digital skills in a public administration (including schools) or in a third sector association in order to enable the evolution of the service according to the needs of the population;
- digital inclusion as integral part of an assistance service for disadvantaged categories.

The gradual progression of the development plan is linked to the definition of specific regional agreements for the coordination of activities. Considering the different starting points and, thus, the different support and management needs, the agreements are defined also on the basis of a consolidated working model, which could be implemented rapidly and is also an efficient hub for sharing experiences and data.

Digital Civilian Service

The project will focus on the development of civilian service projects targeted at the improvement of digital skills, including in particular:

- the development/improvement of citizens' digital skills, through digital facilitation services provided in public (e.g., in municipalities, libraries, schools, senior centers, etc.) and private (e.g., associations, third place) spaces, with particular attention to the elderly population;
- the development/improvement of digital skills in public administrations (including schools) or third sector entities;
- digital inclusion as part of assistance services for disadvantaged groups, such as the elderly.

The project will be based on the experience and the results obtained after the pilot phase launched in 2021.

The young volunteers, who will be selected and trained to carry out the digital civil service, will contribute with their support to the development of digital skills, the promotion of conscious and responsible use of new technologies, and the promotion of full enjoyment of active citizenship rights.

From an operational perspective, the activity of each volunteer, mainly consists of:

- first contact with users to identify the type of request and set up an appointment;
- one-to-one meeting for practical support;
- administration of a questionnaire for service monitoring.

The detailed project plan presented by each entity shall provide the completion of training activities and the inclusion of young volunteers in the service activities within two months. Thus, they will be able to begin from the third month the activities related to

the knowledge of the phenomenon of the digital divide, and, therefore the preparation and the administration of questionnaires, with at least quarterly internal meetings to evaluate service performance.

Houses of innovation and digital culture for citizens and youth

The project aims to create houses of innovation and digital culture for citizens and youth, experiential training places on emerging technologies, to speed up the overcoming of the digital cultural gap and the enhancement of advanced skills, especially in areas with high housing density, basic elements for making the potential growth produced by digital transformation effective. Main services offered by the Houses of innovation and digital culture for citizens and youth contribute to strengthening the digital skills of the citizens and youth in order to facilitate their participation in the economic and social life, and to increase their chances to find a job:

- Educational training with structured path for basic and advanced digital skills;
- Innovative and technological methodological testing, in connection with the development of intelligent cities in order to approach applied emerging technologies with free and gaming formats;
- Interest group meetings related to digital culture, facilitating the development of communities and territorial projects;
- Co-working spaces to allow citizens and young students to overcome the difficulties generated by the digital divide;
- Shaping the offered services in flexible formats adapting to the evolution of the users' needs and thus supporting adequately the national system of permanent learning;
- Paths of experiences' exchange and tutorship, acting as reference, support and motivation for the other municipalities, developing a strong synergy with local administrations, libraries, associations, thanks to a close collaboration between the different Houses of innovation and digital culture for citizens and youth;
- Use the Houses of innovation and digital culture for citizens and youth as hubs for digital transition providing co-working spaces available to youth providing supporting services such as:
 - educational lectures;
 - incubators for start-ups;
 - specialised and technical training paths on cybersecurity and STEM subjects;
 - orienteering and placement services on the digital transformation of traditional businesses;
 - consulting and support for young entrepreneurs and start-ups;
 - consulting for the digital transition of traditional enterprises.

The houses of innovation and digital culture for citizens and youth will cover the entire national territory and will be realised by the support and coordination of cities. The cities will be selected based on geographical criteria to ensure a complete coverage.

The implementation will be activated under responsibility of the Presidency of the Council of Ministers and the Minister of youth policies and sport.

Cashback

The Cashback initiative consists of rewarding consumers who make use of digital payments by giving them back a share of their purchases. In particular, it includes the following features:

- Minimum number of transactions: 50 per semester (10 transactions during the trial phase)
- Amount of cashback: 10% of the payment
- Transaction ceiling: €150 for each transaction; in other words, if the payment is above €150, the cashback is capped at €15.
- Total ceiling: €1,500 for each semester; in other words, if the total amount spent is above €1500, the cashback is capped at €150.
- Supercashback: €1,500 for each semester for first 100.000 participants in terms of number of transactions, disregarding the amounts spent. The cashback is directly credited on the account of the participants at the end of each semester (in February 2021 for the trial phase).

During the first day of the registration process (8 December 2020), there were 5 million registration requests, and traffic topped 8.000 operations per second. After a trial period between 8 and 31 December 2020, the cashback will last for 18 months, from 1 January 2021 to June 2022.

Tax receipts lottery

Transactions regulated with electronic payments entitle customers to participate in weekly, monthly and annual draws, with prizes of up to €5 million for consumers (and up to €1 million for merchants). The registration process is already under way.

Tax credit for fees paid by merchants

As from 1 July 2020, merchants with a turnover of less than €400.000 are entitled to a 30% tax credit on fees paid. The tax credit can be used on a monthly basis.

Communication plan of the cashless plan

The range of initiatives will be fostered by a dedicated communication plan, with the aim of raising the awareness of the different actions undertaken and also facilitating the understanding of the operational modalities for participation.

These lines of action are part of wider set of measures aimed at modernising the country's payment habits, including:

- Cash limits: As from 1 July 2020 to 31 December 2021, the use of cash is

not allowed for transactions above €2.000. This threshold will be further reduced to €1.000 starting 1 January 2022.

- Individuals' tax credits: As from 2020, tax credits related to certain expenses incurred by individuals are granted only if paid by electronic means.
- Basic bank accounts: Low-income citizens can activate a simplified bank account with no or low cost at a flat rate.
- Bank fees: In order to support the initiative, several players have voluntarily eliminated fees related to payments below certain amounts (€ 5 or 10 depending on the intermediary).

Application of Blockchain in the national digital transformation process

The project aims at the creation of a national blockchain infrastructure in order to provide both internal and citizen-oriented services, always paying attention to privacy and security. The infrastructure will allow all public administrations to exploit the technological opportunities offered by blockchain. The project stems from the need to develop technological independence and manage a national infrastructure to provide a constantly up-to-date catalogue of innovative services for all interested PAs.

The first phase of the project will focus on the definition of the governance model and on the set-up of the infrastructure, while the second phase will aim at the gradual release of services and their uptake by public administrations.

Stakeholders: The project will be managed by the Ministry of Defence, with the cooperation of the Ministry of University (Ministero dell'Università e della Ricerca, MUR), the Ministry of Economic Development (Ministero dello Sviluppo Economico, MISE), and the National Social Security Institute (Istituto Nazionale di Previdenza Sociale, INPS).

Impediments: Apart from the above-mentioned challenges that are hampering the uptake of digital public services, Italy's situation may also be attributable to the heterogeneous governance model. In order to improve it, the MID has launched a dedicated reorganisation project, funded by the Structural Reform Support Programme.

Moreover, the investment is largely aimed at those population segments with low digital skills and low education, so there is a risk of low engagement towards the initiatives. For this reason, implementation means envisage the creation and involvement of pilot groups in the definition and prototyping phase. The low level of digital skills among citizens, including especially the elderly, may also hamper the uptake of the cashback initiatives and have negative effects on the adoption of e-payments. In order to mitigate this risk, a dedicated communication and awareness-raising campaign will be implemented.

Certain activities are also based on the active involvement of regions and metropolitan cities. While some of these have already implemented successful initiatives in the field of digital competencies, there is a risk that those that currently do not have a consolidated

expertise in digital facilitation may not have the required skills to activate the action on the territory, resulting in a lack of homogeneity and effectiveness. For this reason, a central support and capacity building effort for the various entities involved is envisaged.

Target population: The improvement of enabling services and platforms will directly benefit public administrations, including local, regional and central ones. In addition, businesses - including especially start-ups and SMEs - will also benefit from the investment as they will be called upon for the provision of a number of digital services to the PA. Moreover, all activities towards the strengthening of digital citizenship and digital culture will be beneficial for all citizens, including in particular those segments of the population with lower digital competencies and currently more affected by the digital divide. At the same time, specific initiatives, such as dedicated training modules in the self-assessment and learning platform, will be aimed even at users that already have advanced digital competencies. The set of measures of the Cashless Plan are envisaged to target the entire population of both citizens and economic operators, as all consumers and businesses can benefit from the cashless community range of initiatives.

Timeline: The implementation period is estimated to be 66 months, up to the second half of 2026.

2) Modernisation of the public administration.

Investment 2.1: Capable PA: human capital recruitment

Challenges: The Italian public administration staff hiring is frozen due to the need to reduce its capacity, and for more than a decade the natural generational turnover has suffered a significant setback. As a result, 45% of Italian public employees are over 54 years old against the 22% from OECD countries (MID, 2020).

This led to a progressive impoverishment of the operational capabilities of the public sector which creates a gap both in terms of quantity, the number of staff, as well as quality, their skills. The current average length of the open competitions - which is about 18/24 months - poses great obstacles to an effective recruitment of civil servants in the Italian public administration. In fact, such an untimely recruitment process does not solve the competence gaps as soon as those arise creating a substantial challenge for the evolution of the PA.

Objectives: The objective is to foster the public sector recruitment capacity and hire staff with professional skills, relevant for the digitalisation of the PA and the effective implementation of the interventions foreseen under the RRF. The goal is to centralise the recruitment procedures by setting up both online and physical facilities, allowing for significant time and cost savings, thus addressing the labour market inefficiencies which

are due to the fragmentation of the recruitment procedures across the country.

Implementation: The stream of action carried out for this investment in human capital recruitment for the public administration is the following:

Centralisation and digitalisation of recruitment processes

- Bottom-up rethinking of models and procedural standards for the analysis of public administration current and expected skill needs (“skill-matrix”), the identification of personnel and training needs according to both the evolving working landscape and the needs related to the implementation of the Plan.
- Creation of the "National Portal for Recruitment" (in continuity with a similar initiative currently supported by the ESF under PON Governance 2014-2020) according to the EPSO model. It will enable to streamline and simplify public recruitment procedures, through vacancies assessment and coverage. The portal will have a unique interface for the public administration to centrally manage the recruitment processes; the citizen’s interface will ensure a single one-stop-shop access to all open competitions according to specific professional profiles with integrated geo-referencing system.
- The selection procedures by candidates through the “National Portal for recruitment” allows the creation of an "online candidate file" for personnel selection according to models already adopted by the European institutions (e.g. EPSO model). The implementation of the model requires the development of IT applications and their operation, the purchase of equipment and IT support to carry out open competitions in a territorially decentralised manner. In a second phase, the portal will also allow for the timely recognition of the needs of the PA and the mobility of employees.

Implementation of an extraordinary recruitment plan

- As a result of an in-depth analysis of needs implemented by all administrations with the support of the Department of Public Function (to be finalised by May 2021), a structured plan will be developed to hire 1.500 fixed-term (3-year contract) professionals with technical and/or highly specialised expertise (e.g. public procurement, Business Process Re-engineering (BPR), functional analysis, Application Lifecycle Management (ALM), customer experience, etc.) working for public administrations to support with the implementation of the interventions financed under the NRRP. Particular attention will be devoted to hiring staff with professional skills relevant for the goals of PA innovation, digitalisation and modernisation. The selection process will be centrally managed by the Department of Public Function. Selected candidates will be assigned to the administrations concerned, which will be responsible for the recruitment process, including remuneration aspects. At the end of the contractual period, an ad-hoc intervention for permanent recruitment will be foreseen, through a specific regulatory intervention, to value the expertise acquired

over the three years.

- Carry out centralised open competitions for recruiting new staff according to the hiring plan. Candidates' selection process will be carried out according to the EPSO model already adopted by European Institutions and will also aim at evaluating candidates' relational, motivational, aptitude and problem-solving skills (so-called "soft skills").
- Strengthen the network between PA, universities and businesses to support the hiring of qualified young people (with strong technical competencies) in public administrations.

Impediments The high number of individuals targeted entails the redefinition of the whole selection and recruitment process, also in consideration of possible future healthy emergencies (e.g. COVID-19 pandemic) that could result in gathering restrictions.

Target population: The creation of a centralised recruitment system will mainly benefit all individuals interested in going through the recruitment process and work for the Italian public administration. More specifically, that will target the population with specific technical background seeking for public sector job opportunities.

Timeline: The implementation period is estimated to be 66 Months, from January 2021 to June 2026.

Investment 2.2: Competent PA: skills empowerment

Challenges: The Italian public administration is severely affected by skills shortages, obsolete workforce competencies and digital illiteracy. The need of upskilling and reskilling and closing the competencies gap, is also included in the European Semester Country Specific Recommendations 2020 for Italy.

The need to recruit new professional figures (Investment 2.1 Capable PA: human capital recruitment) is accompanied by that of strengthening the skills of the staff already employed by the PA, returning to invest significantly in training. Due to the spending review, the expenditure for internal staff training suffered from heavy cuts during the first decade of the 2000s. This led to the impoverishment of civil servants' technical skills, and to the failure to match the skills with the new needs that arose from the changes in the management of public policies. According to the ISTAT, in 2017 training on digitalisation was delivered to just over 126,000 participants, equal to about 5% of the total. In 2018, ICT training involved only 7.3% of the employees of the local PA, with a decrease of 0.4% from 2015.

Finally, the argument for the definition of new organisational instruments and models of public work applies differently to the new needs that arose during the COVID-19 pandemic. Remote working played an important role as a "catalyst for innovation": in

addition to ensuring the continuity of administrative activity through remote work by the majority of public employees dispelled mistrust and clichés ("impossibility of performing work remotely"), it accelerated the digitalisation and strengthening of IT equipment and digital skills of employees and laid the foundations for a radical change in the public work model.

Objectives: The objective of the investment - which will be accompanied by structural regulatory interventions - is to empower the public administration staff with the knowledge and competencies - especially technical and digital - needed to perform their mission in the digital revolution currently in place. To this end, it is necessary to strengthen human capital by upskilling and reskilling staff currently in service.

This also entails the identification of new and more effective forms of valorisation of high-skilled personnel in service, with the aim of motivating and incentivising them and consequently improve the efficiency of administrations (for instance, by increasing retention).

In addition, the empowerment of civil servants' skills shall be based on high-quality training criteria for public employees, also through the establishment of a national system of certification and accreditation of training bodies.

Skills empowerment represents the other tenant of a comprehensive strategy to fill the competency gap of the public administration. Such an empowering approach has an enabling and synergic role with the digitalisation of processes and services.

It is worth noting that skills empowerment (e.g. digital) of civil servants will complement, but not overlap with, skill-strengthening initiatives foreseen under other missions. Indeed, the target populations of the latter are different (e.g. students, citizens, etc.) and do not include PA employees.

Finally, with the aim of promoting a competent PA, a new model for public work will be defined and implemented. This entails a results-based evaluation of performance and remuneration as well as the promotion of remote working.

Implementation:

Introduction of empowering mechanisms to strength managers' role and skills

- Systemic re-design of lifelong training - leveraging on the results of a personalised skills and competencies assessment - to ensure upskilling and reskilling of central PA executives on leadership, management, technical domains, digital skills and soft skills. This entails the introduction of mechanisms for strengthening the role and skills of public managers, with particular attention to the issue of women's access to management positions.
- Design, development and deployment of a software to support executives in their managerial role. The HR management application will enable executives to manage

resources, plan and coordinate activities of activities and fulfil regulatory obligations of public sector executives (the so-called "manager's dashboard"), also to oversight the correct functioning of remote working.

Training of civil servants

- Definition and set-up of a new service portfolio.
- For the identified services, carry out an assessment of competence needs (according to skill-matrix developed under *Investment 2.1 Capable PA: human capital recruitment*).
- Undertake a gap assessment of expected civil servant's skills needs based on currently employed workforce and expected turnover.
- Design and implementation of a training system (e.g. skills assessment, continuous training, etc.) for public employees (including public buyers) to introduce compulsory training modules in the Public Administration careers. The training must be specifically designed on the results of the employees' skills assessment. In addition, training will focus on: i) role-based competencies; ii) transversal competencies - also through the definition of basic digital skills - to leverage on for the upskilling in the field of digitisation.
- Training on the job for upskilling and reskilling targeting 232.000 central PA employees lacking relevant skills and competencies. It will contribute to the strengthening of the role, competencies and motivation of targeted civil servants, allowing for the valorisation of the acquired expertise and results achieved.
- Set-up of a quality certification system of training for public employees through the creation of a national accreditation system for training bodies.

Remote working and new forms of work organisation

The main actions foreseen for the investment are:

- Definition and implementation of a new "public work model" for all employees, with evaluation and compensation schemes based on "results" and not on "working time". This measure involves the rethinking of the performance measurement and evaluation systems - to be also linked to the citizen satisfaction - currently in use. The approach will leverage on both regulatory and contractual instruments.
- Provision of *ad-hoc* support to PAs (organisational, technological and tools investments) for the carrying out of remote working - expected to favour an increase in the individual productivity and a better reconciliation of life and work times - and the full implementation of the POLA²³. The support actions envisaged include:
 - interventions for the development of enablers for administrative capacity (e.g.

²³The Agile Work Organisational Plans (so-called "POLA" in Italian) identify the methods of implementing agile work by providing, for activities that can be carried out remotely, that at least 60% of public employees can make use of them, ensuring that they are not penalised in terms of work recognition and career progression.

- models, guidelines, operational tools, etc.);
- technical assistance in the preparation of the POLA and support for the re-organisation of the operating procedures for the provision of services to users according to remote working;
- wide spreading of collaboration and knowledge sharing platforms and applications for the effective implementation of remote working.

Impediments: The sheer numbers of training activities for the target population entail a complex implementation process in terms of organisation and infrastructure. Moreover, as far as the adoption of remote working and new work models is concerned, civil servants' resistance to change, deeply rooted mind-set and old routines are general behavioural impediments to the effective implementation of the new approaches. Instruments and tools designed to progressively change such behaviours are included in the plan to mitigate the risks.

Target population: The investment will target individuals at central public administration level according to skills requirement needs and training strategy. In order to make the investment effective at all PA levels, a two-fold approach will be adopted. Specifically, at a central level, actions will be carried out by focusing on the specific ecosystem (e.g. finance, health, etc.) while considering the entire sector. Instead, at a regional/local level, except for transversal competencies, activities will be implemented by following a "best practice" and benchmarking logic.

Specifically, the target population of the initiative to support remote working and introduce new forms of work organisation will be public administrations at all levels, ranging from small municipalities with less than 5.000 inhabitants to Central PAs serving the entire national population (i.e. micro, small, medium and big municipalities, provinces and autonomous provinces, regions, metropolitan cities).

Timeline: The implementation period is estimated to be 66 Months, from January 2021 to June 2026.

Investment 2.3: Simple and connected PA: simplify administrative procedures and digitise processes

Challenges: Administrative simplification has been on the Italian political agenda for more than thirty years. Yet, despite the numerous simplification interventions adopted in recent years, the results achieved have not proved to be up to the expectations and political commitments undertaken. In fact, simplification still seems today, especially in some sectors, an ambition that is difficult to implement, or a result of a challenging process posing new administrative burdens to users or greater regulatory complexity. The analysis is confirmed by international indicators that highlight the considerable costs for citizens and businesses of complying with administrative procedures (Source: Doing

Business Index, World Bank), the low confidence of citizens in the PA (Source: Eurobarometer), or the inadequate administrative compliance with transparency standards (Source: Corruption Perception Index, Transparency International, 2019).

The main issues hindering the implementation of the simplification policy in Italy are all too known. The excess, volatility and disorder of policy making; the current status of the public administration and the way in which responsibilities are shared between political and administrative bodies complicates the decision-making process by unnecessarily lengthening the time; making more complex organizational and institutional arrangements (see Parliamentary Commission for Simplification, Concluding Document of the fact-finding survey on legislative and administrative simplification, in Parliamentary Acts, XVII Legislature, Bulletin of Councils and Parliamentary Commissions, 31 March 2014).

On the operational level, however, the lack of effectiveness (if not the failure) of the simplification policies is mainly due to the absence of support and monitoring activities for the implementation of the measures adopted.

The challenges are mirrored in the European Commission country-specific Recommendations (CSR 20.5.2020 COM (2020) 512 final) where Italy is called to launch "an integrated strategy to strengthen administrative capacity" (recital 24). Also the European Investment Bank (EIB) during the hearing of 1 September 2020 on the Recovery Fund at the EU Budget and Policy Commissions of the Chamber and Senate, highlighted the need for a strengthening of the public administration and a streamlining of procedures through investments "in the human capital of the public administration and a review of spending procedures with a clear allocation of responsibilities between central government and local administrations" and the activation of "structures that operate discontinuously with respect to the past and endowed with adequate power and skills".

Objectives: The objective of the investment is to transform the Italian public administration into a simple, lean and connected organisation, capable of offering services designed - in a user-centric approach - on the real needs of citizens and businesses. The investment measures aim to create an "administration at the service of citizens and businesses", which reduces the time and costs of procedures, provides services according to new methods of service delivery and quality standards, and makes the most of the potential offered by digital technologies.

To this end, the investment foresees the systematic mapping of all administrative procedures affecting businesses and citizens, with priority for those necessary for the rapid implementation of the Recovery Plan projects. It also entails ad-hoc consultation of the interested categories. The aforementioned mapping is functional to the modification, on the regulatory level (if necessary, with a specific delegation law), of the digital re-engineering of the discipline of those procedures.

Implementation:

Map, simplify and re-engineer the procedures to facilitate economic activities, in line with

the implementation of the EU principles of liberalisation and digitalisation through:

- the creation of a "catalogue of procedures" under standardised and simplified regimes
- the elimination of unnecessary obligations and authorisations
- the definition of a system for monitoring the adoption of simplified procedures

Reduce time needed for carrying out complex procedures, through:

- the set-up of a multi-disciplinary expert's pool for supporting central, regional and local administrations in the management of complex procedures (e.g. infrastructures, public works, digital transition, etc.)
- implement an IT management system and operating units within central and regional administrations for publishing and monitoring advancement of complex procedures

Digitalise procedures for the construction and productive activities, contributing to the effective implementation of the "once only" principle, enabling access to databases, self-certification and ex post controls by:

- the digitalisation of both front and back office of these procedures for the construction and productive activities (e.g. One-Stop Shop for Productive Activities, so-called "SUAP",²⁴ Telematic Conference of Services, etc.)
- the digitalisation of the SUE (One-Stop Shop for Construction) services and their integration with the SUAP services
- the definition of technical specifications to ensure the interoperability of IT systems, within the framework of the new interoperability model of Italian PAs defined by the Three-Year Plan for IT in the Public Administration 2020-2022

To ensure a smooth implementation of these interventions, the following transversal activities will be carried out:

- *ex-post* verification, monitoring and measurement of procedures burdens and timings
- *ad-hoc* training of employees that will implement the digitised and simplified procedures institutional communication on the simplified procedures, also through the web and social media presence, both to inform citizens and businesses and to increase "Country reputation", according to the principles of "Country branding".

Impediments: Impediments are related to change management challenges. The goal is not only to move from paper-based documentation to electronic documentation but rather overcome resistance to change by leveraging on the transformational potential of emerging digital technologies.

²⁴The SUAP is an administrative simplification tool that aims to coordinate all the requirements needed for the creation of businesses, in order to streamline and simplify relations between the Italian PA and citizens.

Target population: The investment target will be public administrations at regional and central levels. In addition, the other indirect beneficiary of the investment can be private companies, including innovative start-ups and SMEs as well as citizens.

Timeline: The implementation period is estimated to be 66 Months, from January 2021 to June 2026.

Investment 2.4: Smart PA: establishment of Territorial Hubs for recruitment, training, co-working and remote working

Challenges: Currently, each single public administration must provide itself with adequate facilities for the implementation of the recruitment process and training activities as well as with equipped spaces for co-working and remote working. This results in cost inefficiency and thus in an increase of the public expenditure.

Objectives: The key objective is the set-up of 15 "Territorial Hubs" for the centralised implementation of recruitment, training, co-working and remote working. These hubs will be equipped with i) technological/organisational infrastructures necessary to open competitive exams, ii) co-working and remote working spaces, and iii) training and public service delivery centers. Overall, this will foster productivity, social inclusion and environmental sustainability.

Implementation:

Establishment of Territorial Hubs for recruitment, training and co-working and remote working, through:

- Identification of adequate spaces and facilities as well as planning of renovation
- Conduct of renovation work and technological adaptation for the actual implementation of the Hubs

In general, the buildings will be recovered from abandoned and confiscated properties from the mafia in agreement with the Italian Public Property Agency (so-called "Agenzia del Demanio") and with the National Agency for the management and use of the assets seized and confiscated to the organized crime (so-called "Agenzia nazionale per l'amministrazione e la destinazione dei beni sequestrati e confiscati alla criminalità organizzata"). More specifically, the Territorial Hubs will be made of:

- Technological/organisational infrastructures for open competitive exams;
- Training and public service delivery centers, which can be used, for instance, to organise meetings, co-design sessions and training for all staff of the public administration, both central and local, as well as citizens;
- Implementation of spaces equipped for co-working and smart working within the Territorial Hubs. This will contribute to reduce operating and facilities costs of

the Territorial Hubs when open competitions and training activities are not held and create places to socialize and knowledge-sharing between employees of different administrations.

Impediments: The effective usage of the Territorial Hubs physical spaces will be impacted by the uncertain evolution of the COVID-19 emergency.

Target population: The key target group will consist of all public administrations, including local, regional and central ones, that would benefit from the use of these Hubs.

Timeline: The implementation period is estimated to be 66 Months, from January 2021 to June 2026.

3) Organisational innovation of the Judicial System.

Reform 3.1: see Appendix A

Investment 3.1:

Challenges: The overall reform plan fits into a broader context of reorganisation of the justice system, with interventions aimed at acquiring additional human and capital resources and innovative organisational measures to systematically address the causes of inefficiency. The mere adoption of the above-mentioned reforms, in fact, cannot lead to the improvement of the justice system, as they are embedded in a system that is heavily burdened and compromised by the considerable backlog weighing on most judges. Therefore, even with the simplification of legal procedures, the excessive number of lawsuits yet to be judged would not allow the rapid disposal of such backlog. This problem is even more evident in the Supreme Court where this backlog, in the civil sector, is particularly significant.

Objectives: The goal of the investment is to support the reform action of the organisational module of the magistrate's work, enhancing the Office's tool for proceedings and facilitating the digitalisation of procedures. The provisional insertion of additional human resources would allow the management and disposal, in a defined period of time, of the backlog that currently weighs on the Ordinary courts, on the Courts of Appeal and on the Supreme Court of Cassation, thus reducing the overall workload assigned to individual magistrates and allowing the quick resolution of new proceedings. Therefore, the investment includes:

- the strengthening of the trial office, through an integrated collaboration between judge and qualified
- staff that would allow the former to focus on the most typical and pertinent issues;

- the disposal - until zeroing - of the considerable workload that weighs on the judicial offices, using temporary administrative staff with specific ad-hoc skills;
- the increase in digitalisation (recovery of non-digitised documents and support for the digitalisation of criminal proceedings);
- the reduction in the administration's response time to regulatory changes;
- the improvement of coordination functions of the management of the courts;
- the overcoming of functional disparities between ordinary courts.

Implementation: The investment entails the definition of need requirements and a hiring plan for supporting the modernisation of the Judicial system and the reduction of decision backlog which are currently slowing down the Italian Judicial system. More specifically:

- recruitment plan to hire staff in the "Process Office" to support the definition of pending proceedings for first and second instance courts for a period of three years (extendable for another three years).
- hiring plan for "non-permanent or honorary judges" in first instance civil courts suffering from the most significant backlogs. Their goal will be to support the judges in making the legal decision and in drafting the sentences. The contract will be for three years (extendable for another three years).
- hiring of full-time fixed term three years contracts for administrative staff (on top of the current staff and in addition to the hiring plan already underway) with specific skills (currently not covered by existing staff) to sustain the substantial (and extraordinary) workload effort of judicial offices. The hired staff will be allocated to specific mission units to strengthen judicial offices' administrative capacity and cope with the additional needs as a result of the strengthening of the "Process Office". The plan foresees the hiring of administrative and judicial staff as well as IT professionals and data entry operators. The resources will be distributed over the territories on the basis of existing work backlog thus contributing to reduce disparities between judicial offices across the country.
- targeted hiring of professional profiles to support the implementation of the reforms and extraordinary measures. This includes architects, engineers, surveyors, accountants, organization analysts, statisticians that will support the offices in essential organizational activities (accounting management, IT, statistical activities, technical building management needed to respond to the increased activities related to the RRF).

More specifically, the plan foresees the recruitment of temporary assistants to be allocated to the ordinary Tribunals and to the civil and criminal Courts of Appeal as well as the recruitment of honorary magistrates to be temporarily allocated to ordinary civil Tribunals. The goal of the recruitment will be to swiftly reduce the number of pending cases and introduce a structural change to the system. This temporary staff shall be placed in the Trial Office. This organisational model is inspired by previous experiences

that have yielded excellent results in terms of increasing efficiency in judicial activity and it will support judges throughout all stages of their work.

The clerks shall assist judges by carrying out all preparatory tasks necessary for the judicial function. In particular, they shall study the files, investigate the relevant jurisdictional and doctrinal background, and prepare the minutes of the decisions.

On the other hand, the honorary magistrates shall collect relevant legislative, jurisprudential and doctrinal documentation in order to study the issues submitted to the judge. More specifically, they shall prepare outlines for jurisdictional measures that have a simple and standardised nature. Furthermore, the administrative staff shall include resources with different skills (e.g. technical-scientific, legal-administrative, operational) and with different educational and professional backgrounds (e.g. university graduates, specialised diploma holders, non-specialised diploma holders), in order to offer the widest possible range of skills in the fields of:

- construction (engineers/architects and surveyors/experts, etc.);
- digitalisation (IT graduates and specialised IT graduates, etc.);
- procedural and legal reforms (graduates with a legal/administrative specialisation, etc.); and
- clearing the backlog (IT graduates, statisticians and management engineers/organisation analysts, data entry operators).

Finally, the implementation of specific digital competencies will be achieved through a specific training plan, that will leverage:

- about 50 trainers already available on the territory;
- decentralised offices spread across the entire national territory;
- use of an e-learning platform;
- collaboration with the “Scuola per la Pubblica Amministrazione”;
- collaboration with the “Scuola Superiore della Magistratura”.

Impediments: The investment may be hindered by delays and possible appeals during the completion of the recruitment procedures for administrative staff and honorary magistrates.

Stakeholder involvement: The investment involves all the judicial offices (i.e. Ordinary Courts, Courts of Appeal and Supreme Court of Cassation).

Target population: Citizens and businesses benefitting from a quicker timing in the resolution of civil proceedings pending before Ordinary Courts, Courts of Appeal and the Supreme Court.

Timeline: The investment begins in the second half of 2021 and ends in the second half of 2026.

4. Green and digital dimensions of the component

a) Green Transition:

The investments and reforms of this component, even if they do not directly contribute to the green transition (as it emerges from table 1 below), are in part conceived to reach, among the other objectives, efficiency and sustainability gains. For instance, the investments in digital assets (including data centres infrastructures) and in digitalization of public services will be done with a view to energy efficiency.

In particular, Investment 1.1 Digital infrastructures aims at building up a reliable, secure but also energy-efficient viable infrastructure to host the data and systems of the public administration in line with the CSR 2020 Recommendation 3 requesting “efficient production and use of energy” by “reinforcing digital infrastructure to ensure the provision of essential services”. Furthermore, it is also in line with the EU data strategy COMM (2020) 66 looking for reduction of the current environmental footprint of the ICT sector mainly connected to emissions due to data centres, cloud services and connectivity.

This objective is also in line with the guidelines of the European Commission expressed in the *Green Deal* Communication of 11 December 2019 where it was announced that, even at EU level, the Commission would evaluate “measures to improve energy efficiency and performance in terms of circular economy of the sector itself, from broadband networks to data centers and ICT devices”. Objective also reaffirmed in the Strategy *Shaping the digital future of Europe* of 19 February 2020 which highlights that the current environmental footprint of the ICT sector mainly connected to emissions due to data centres, cloud services and connectivity and emphasizes that “data centers and telecommunications will have to improve their energy efficiency, use the energy recovery of waste and use more sources of energy renewables. They can and must achieve climate neutrality by 2030.”

Furthermore, the digitalization of a number of public services and the elimination of paper-based processes by reducing the waste of resources (paper, toner, etc.) has a significant impact on sustainability. Furthermore, it is expected that the digitalisation of public services will reduce the need for physical interaction within public sector facilities and limit the need for mobility with a positive effect on CO2 emission reduction.

Finally, all reforms and investment are in line with the no significant harm principle, as defined in the Regulation 2020/852.

b) Digital Transition:

This component directly contributes to the digital transition through its reforms and in-

vestments. In particular, the following DESI areas are addressed: Digital Public Services; Human Capital/Digital Skills and Use of Internet Services by citizens.

Table 1 Green and Digital Tagging

	Green objectives		Digital objectives		Tagged RRF contribution	
Short title	Field of Intervention Green	Climate tag	Environmental tag	Field of Intervention Digital	Digital tag	Climate Digital
<i>Digitalisation of the public administration</i>						
<i>Investment 1.1: Digital infrastructures and cybersecurity</i>	055 ICT: Other types of ICT infrastructure (including large-scale computer resources/equipment, data centres, sensors and other wireless equipment)	0%	0%	055 ICT: Other types of ICT infrastructure (including large-scale computer resources/equipment, data centres, sensors and other wireless equipment)	100%	
<i>Investment 1.2: Data and interoperability</i>	011 Government ICT solutions, e-services, applications	0%	0%	011 Government ICT solutions, e-services, applications	100%	
<i>Investment 1.3: Digital citizenship, enabling services and platforms</i>	011 Government ICT solutions, e-services, applications	0%	0%	011 Government ICT solutions, e-services, applications	100%	
<i>Modernisation of the public administration</i>						
<i>Investment 2.1: Capable PA: human capital recruitment</i>	011 Government ICT solutions, e-services, applications	0%	0%	011 Government ICT solutions, e-services, applications	100%	
<i>Investment 2.2: Competent PA: skills empowerment</i>	012 IT services and applications for digital skills and digital inclusion	0%	0%	012 IT services and applications for digital skills and digital inclusion	100%	
<i>Investment 2.3: Simple and connected PA: simplify administrative procedures and digitalise processes</i>	011 Government ICT solutions, e-services, applications	0%	0%	011 Government ICT solutions, e-services, applications	100%	
<i>Investment 2.4: Smart PA: establishment of Territorial Hubs for recruitment, training, co-working and remote working</i>	012 IT services and applications for digital skills and digital inclusion	0%	0%	012 IT services and applications for digital skills and digital inclusion	100%	
<i>Organisational innovation of the Judicial System</i>						
<i>Investment 3.1: Human capital recruitment to strengthen the «Trial Offices» and to overcome disparities among the different court-houses</i>	n.a.	0%	0%	n.a.	0%	

5. Milestones, targets and timeline

[All milestones and targets are under review in line with the new budget]

Investment 1.1 Digital Transformation of the public administration: Digital infrastructures

An infrastructure of excellence, investments for the development of a highly reliable infrastructure on the national territory

- M1 Tendering procedure, Q4 2021
- M2 Development of a national infrastructure to provide cloud services to PAs, Q2 2022
- T1 The gradual hosting of identified data centers for migration in the infrastructure, so to enable the provision of the cloud services, 100% of target PAs by Q2 2025

Strengthening the technological infrastructure to support the jurisdiction

- M1 Project 1 - (DAG01) Digitization of procedures for the Pinto Law: Identification of digitalisation needs, Q4 2022
- T1 Project 1 - (DAG01) Digitization of procedures for the Pinto Law: Digitised files, 100% of target identified Q2 2026
- M2 Project 2 - (DOG14) Realization of the Single National Justice Data Centre: Identification of digitalisation needs, Q4 2022
- T2 Project 2 - (DOG14) Realization of the Single National Justice Data Centre: Realised data centres, 100% of target identified Q2 2026
- M3 Project 3 - (DOG15) Proprietary geographic connectivity network: Identification of digitalisation needs, Q4 2022
- T3 Project 3 - (DOG15) Proprietary geographic connectivity network: Nodes connected to the proprietary network, 100% of target identified Q2 2026
- M4 Project 4 - (DOG16) Perimeter and workstation security: Identification of perimeter and workstation security, Q4 2022
- T4 Project 4 - (DOG16) Perimeter and workstation security: Purchased workstations, 100% of target identified Q2 2026
- M5 Project 5 - (DOG27) digitalisation of archives: Identification of digitalisation needs, Q4 2022
- T5 Project 5 - (DOG27) digitalisation of archives: Digitised files, Q2 2026

Cloud First

- M1 Increase of cloud services in the public administration, Q4 2024
- T1 Adoption of new cloud services by the PA, 100% of pre-identified number of cloud services by Q4 2024

Cloud Enablement

- M1 Control Unit, Q1 2022
- T1 Assessment of migration plans of PAs, 100% of migration plans assessed by Q4 2024
- T2 Migration to cloud of PAs, 100% of identified migration plans by Q4 2025

Strengthening the National Security Perimeter for Cyber (PSNC) through interventions on technology, processes, governance and awareness-raising to increase cyber defences and country resilience

- T1 Support to the upgrade of security structures within selected public administrations and private companies, in line with the guidelines of the NIS authorities, 100% by Q4 2024
- T2 Creation of cybersecurity labs for sectors identified by the NIS Directive and the "legge sul Perimetro di Sicurezza Nazionale Cibernetica (DL 105/2019)", followed by their accreditation with the national Evaluation and Certification Centre (CVCN), 100% of identified labs by Q4 2024
- T3 Upgrade of selected Operators of Essential Services (OES) according guidelines set by NIS authorities, 100% by Q4 2024
- T4 Creation of Computer Emergency Response Teams (CERT) for each sector identified by the NIS Directive and for the different regions, ensuring their interconnection with the Italian Computer Security Incident Response Team (CSIRT), 100% of identified sectorial CERTs by Q4 2022 and 100% of selected regional CERTs by Q4 2024
- M1 Creation of a central control unit (Nucleo centrale ispettivo), Q4 2021

Investment 1.2 Digital Transformation of the public administration: Data and interoperability

Leverage information assets of the country

- M1 Mapping and promotion of public and private data assets, Q3 2022
- M2 Search engine for all available datasets, Q1 2023
- M3 Interoperability update of base registries, Q4 2023

Development of the interoperable national data platform and support to public administrations for the adoption of the interoperability model and integration of their APIs in the platform

- M1 Development of the platform and onboarding of databases of national interest, Q4 2024
- T1 Increase of the number of public administrations that provide their data through the API catalog, 100% by Q4 2024
- T2 Increase of the number of public administrations that make use of data through the API catalog, 100% by Q4 2024

Single Digital Gateway

- M1 Definition of implementation modalities of the once-only principle, Q2 2021
- T1 Accessibility analysis of involved PAs, 100% by Q3 2022
- T2 Quality monitoring of identified PAs procedures, 100% by Q4 2023

Investment 1.3 Digital Transformation of the public administration: Services and Platforms

Improvement of the quality, efficiency, and usability of digital public services

- M1 "Adjustment projects" (Progetti di adeguamento), Q1 2023
- T1 Adoption of standard model for websites, 100% of selected PAs adopting the standard model by Q4 2025

Improvement of accessibility of digital public services

- T1 Accessibility tests and quality monitoring, 100% of selected websites and apps monitored for accessibility by Q2 2024
- T2 Training, communication and dissemination of the accessibility culture, 100% of planned training outputs on accessibility of digital services implemented by Q2 2022
- T3 Development of reusable accessibility webkits for PAs, 100% of strategic PAs supported by Q2 2024
- T4 Meetings with strategic administration (i.e. regions and metropolitan cities) to advise and provide technical support on the implementation of AgID's guidelines on accessibility, 100% of strategic PAs supported by Q2 2024

Widespread adoption of the PagoPA platform and of the IO app by public administrations

- T1 Adoption of PagoPA, 100% of PAs out of those that have not adopted PagoPA yet by Q1 2026
- T2 Adoption of IO App, 100% of PAs out of those that have not adopted IO app yet by Q1 2026

Widespread adoption of SPID, CIE and ANPR by public administrations

- T1 Adoption of SPID, CIE, 100% of PAs by Q4 2024
- T2 Adoption of SPID by PA, 100% of PAs by Q1 2026
- T3 Uptake of eID (SPID + CIE) by citizens, 100% of eligible population by Q1 2026
- T4 Adoption of ANPR, 100% of eligible PAs by Q1 2026

Creation of "Presidi digitali"

- T1 Creation of "Presidi digitali" in areas suffering from a lack of connectivity, 100% of planned municipalities by Q1 2024

Digital Notification Platform

- T1 Adoption by public administrations of the platform for digital notices, 100% of identified PAs by Q1 2026

Self-assessment and learning environment

- M1 Creation of a self-assessment and learning environment for citizens and interventions for basic and advanced digital literacy, Q2 2022
- M2 Extension of the "Self-assessment and learning environment", Q1 2023
- M3 Extension of the "Self-assessment and learning environment" with more training courses, Q2 2024
- T1 Involvement of citizens, 100% of target population by Q2 2024
- T2 Development of learning modules, 100% of planned learning modules by 2024

Network of digital facilitation services

- T1 Activation of regional agreements, 100% by Q2 2023
- M1 Completion of projects, Q2 2024
- T2 Activation or strengthening of 'nodes', 100% of planned 'nodes' by Q2 2024

Digital Civilian Service

- M1 Completion of projects for the first year, Q2 2023
- M2 - Completion of projects for the second year, Q2 2024
- M3 Completion of projects for the third year, Q2 2025
- T1 Increase of volunteers, 100% of planned increase by Q2 2025
- T2 Participation of entities, 100% of pre-defined target entities by Q2 2025

Houses of innovation and digital culture for citizens and youth

- M1 Definition of general projects and terms and conditions of the agreements for pilot group, Q4 2021
- M2 Definition of general projects and terms and conditions of the agreements for second group, Q2 2023
- M3 Opening of Houses in the cities of the pilot group, Q4 2023
- M4 Opening of remaining Houses, Q4 2024
- T2 Involvement of citizens, 100% of planned citizen involvement by Q4 2024
- M5 Creation of public-private partnerships, Q4 2021
- M6 Trial and adjustment, Q4 2022
- M7 Consolidation and scale-up of initiatives, Q4 2023
- T3 Opening of Houses for the youth, 100% of planned Houses by Q4 2023
- T4 Provision of training paths, 100% of planned training paths by Q4 2023

Cashless Plan: Incentives

- T: at least 90% of foreseen incentives granted, Q4 2023
- M1: completion of the "cashback", Q2 2022
- M2: completion of the "tax receipts lottery" initiative, Q4 2023
- M3: completion of the "tax credit for fees paid by merchants" initiative, Q4 2023

Cashless Plan: Communication activities

- T: at least 90% of foreseen actions implemented, Q4 2023
- M1: communication plan, Q1 2021
- M2: completion of actions, Q4 2023

Investment 2.1 Capable PA: human capital recruitment

Centralisation and digitalisation of recruitment processes

- T: Reduction in costs and time for employee recruitment, - 15% by Q2 2022, - 25% by Q2 2026
- M1: Models and procedural standards for the analysis of needs and identified competences ("skill-matrix"), Q4 2022
- M2: Realisation of the "National Portal for Recruitment", Q2 2023

Implementation of an extraordinary recruitment plan

- T: Implementation of the Recruitment Plan, Q4 2022: 100%
- M1: Publication of the call for applications, Q1 2022
- M2: Selection procedures call for applications, Q4 2022

Investment 2.2 Competent PA: skills empowerment

Introduction of empowering mechanisms to strength managers' role and skills

- T1: Managers benefiting from skills development actions, Interim Q4 2022: 30%, Final Q2 2026: 100%
- T2: Central and regional PAs benefiting from an innovative management software supporting managerial functions ("manager dashboard"), Interim Q4 2023: 20%, Final Q2 2026: 50%
- M1: Introduction of new systems for competence assessment and carrying out of the assessment, Q1 2023
- M2: Training activities, Q2 2025

- M3: Implementation of a management software supporting managerial functions ("manager dashboard"), Q3 2023

Training of civil servants

- T: PA employees benefiting from upskilling and reskilling, Interim Q4 2023: 25%, Final Q2 2026: 75%
- M1: Training plan, Q2 2022
- M2: Training provision, Q2 2026
- M3: Implementation of a national system for certifying the quality of training, Q4 2025

Remote working and new forms of work organisation

- T1: PAs having implemented the Agile Work Organisational Plan (so-called "POLA") through measurable initiatives, Interim Q2 2023: 75%, Final Q2 2026: 95%
- T2: Managers and employees in remote working implementing activities suitable to be carried out remotely, Interim Q3 2023: 60%, Final Q2 2026: 75%
- M1: Redefinition and implementation of a new model of public work, Q4 2022
- M2: Provision of support to PAs for the enhancement of administrative capacity and technological investments, Q2 2026

Investment 2.3 Simple and connected PA: simplify administrative procedures and digitise processes

Mapping, simplification and re-engineering of procedures

- T1: Procedures mapped and standardised, Q2 2026: 100%
- T2: Re-engineered procedures and digital forms, Q2 2026: 100%
- M1: Preparation of a "catalogue of procedures" under standardised and simplified regimes, Q4 2023
- M2: Elimination of unnecessary obligations and authorisations, Q4 2023
- M3: Simplification of a set of critical procedures with stakeholders, Q4 2023

Speeding up of complex procedures

- T: Time reduction of complex procedures, Interim Q4 2023: 20%, Final Q2 2026: 30%
- M1: Set-up of a pool of multidisciplinary experts on specific topics, Q3 2021
- M2: Establishment of operating units within central and regional administrations for monitoring advancement of complex procedures, Q2 2022

Digitalisation of procedures for the construction and productive activities

- T: PAs fully managing procedures electronically, Q2 2026: 100%
- M1: Digitalisation of both front and back office for the construction and productive activities, Q2 2026
- M2: Definition of technical specifications to ensure the interoperability of IT systems, Q2 2026

Investment 2.4 Smart PA: establishment of Territorial Hubs for recruitment, training, co-working and remote working

Establishment of Territorial Hubs for recruitment, training, co-working and remote working

- T: Identified Territorial Hubs in operation, Interim Q4 2023: 40%, Final Q2 2026: 100%
- M1: Identification of spaces and planning of renovation, Q2 2022
- M2: Renovation work and technological adaptation carried out and implementation of the Hubs, Q2 2025

Investment 3.1 Human capital recruitment to strengthen the «Trial Office» and to overcome disparities among the different courthouses

Project 1 - (GAB01) Monitoring, Innovation, Task force, Organization, Research: a methodological and systematic approach for the recovery and resilience of justice (monitoring of the recovery progress of the backlog of judicial proceedings)

- M1. Reference legislation approval, Q2 2021

Project 2 - (DOG18) Human capital for administrative staff

- M2. Completion of recruitment procedures for administrative staff, Location assignments (1st quota) by Q2 2021, Location assignments (2nd quota) by Q4 2024
- T1. Entry into service/hiring, 30% Q4 2021, 30% Q2 2022, 40% Q4 2024

Project 3 - (DOG19) Trial Office (TO)

- M3. Completion of recruitment procedures of administrative staff, TO staff and TO judges Location assignments (1st quota) by Q2 2021, Location assignments (2nd quota) by Q4 2024
- T2. Entry into service/hiring, 1) 50% (staff) + 100% (MOA - Auxiliar Honorary Judges), Q4 2021, 2) 50% (staff) Q1 2024
- T3. Supporting magistrates, > 4,000 Q2 2022
- T4. Number of measures filed by judicial bodies (single and collegial, civil and criminal), Increase between 2% and 8% above annual average, Q4 2024, Q4 2026

6. Financing and costs

See Table 2 work in progress

A Appendix: Reform of Justice System

The main objective of the reform is to ensure the reasonable length of the process and it is accompanied by the investment in technology, in human resources, in the (*temporary*) staffing of the Offices of Proceedings (“*Ufficio del Processo*”) of the courts most burdened by arrears in the civil sector to accelerate the treatment of ongoing proceedings, in the organisation of the offices.

A specific intervention is provided for the disposal of tax litigation pending before the Court of Cassation. As documented in the last inauguration report of the judicial year, the tax section alone has a gradient, as of 2019, of 52,540 cases, while all the other ordinary civil sections together have a gradient of 51,583 proceedings (excluding immigration). In order to address this continuing criticality, it is expected that auxiliary honorary magistrates may be assigned, on an extraordinary basis, temporarily and contingently to the tributary sections of the Court, and for two cycles, in order to break down the endemic backlog weighed on these sections, negatively affecting the disposal performance of the entire Supreme Court.

In this context, strengthening the security and innovation of digital software and infrastructures is of primary importance. Combined with the completion of the digitalisation of the civil and criminal proceedings and the planned regulatory reforms, staff measures will ensure long-term performance up to European standards. The expectation of success of the measures described above is based on the high rate of disposal of business by the Italian magistrates (so called Clearance Rate), i.e. the constant increase in the percentage of definitions compared to annual occurrences (1,6 in 2019). This suggests that the absorption of the backlog through the extraordinary measures indicated will allow decision-making times in line with European standards.

The *reform projects* are aimed at the objectives of efficiency of justice, the protection of rights of action and defence, and the enhancement of the professionalism and independence of the judiciary.

Reform of the civil process

A draft law is pending in Parliament for the reform of the civil process aimed at simplifying and streamlining the process, both first-degree and appeal, through the reduction of rites and their simplification. Broadly speaking, the measure provides for:

- the introduction of a simplified civil rite: from three rites (court of peace, ordinary monocratic and monocratic summary) we move to a single rite;
- the reduction of the cases in which jurisdiction is conferred on the tribunal in collegiate composition;
- the review of the appeal judgment, with the provision that the institute of the judgment is the appeal; provided, moreover, that the time limit for the first hearing will not exceed 90 days;
- anticipation of the time limits for filing statements of clarification or modification of applications, exceptions and submissions with the aim of defining the decision making theme before the first appearance of the parties;
- the elimination of the hearing specifying the outcomes;
- the revision of the framework for alternative dispute resolution instruments with the exclusion of mandatory use of mediation in matters of health liability, financial, banking and insurance contracts. In the context of assisted negotiation, lawyers are given the opportunity to anticipate, where possible and with defined procedures, part of the investigative activity in order to facilitate the detection of the facts before the start of the trial, to allow the parties to better assess the fairness of judgment and to encourage transactive solutions. The examination of such activity in any subsequent judgment shall be returned to the judge’s assessment;
- a special mediation procedure is introduced with regard to the dissolution of communions of goods;
- the implementation of the telematic process, with the provision that, in proceedings before the justice of the peace, the tribunal and the Court of Appeal and Cassation, the filing of the documents and the acts of the party will take place exclusively by telematic means. Notifications may also be made electronically if the recipient holds a PEC address or a digital domicile;
- the definitive overcoming of the so-called ‘*Rito Fornero*’;
- the introduction, in the field of real estate expropriation of rules aimed at speeding up the course of the enforcement procedure and to contain the costs through the collaboration of the debtor, who may be authorised by the judge to sell directly the property foreclosed.

Regulatory intervention will necessarily have to be part of a broader context of overall re-organisation of the justice system. In addition, other measures are under consideration and are being developed for possible inclusion in a forthcoming decree law that contains the accompanying and functional measures for the realisation of the projects in the time horizon given by the European regulation establishing the Recovery and resilience fund.

The need to implement the reforms set out in draft delegation Law (*Senate Act no. 1662*) also comes out from the need to further strengthen the set-up already contained in the draft law pending in Parliament, ensuring that the overall objective of greater efficiency of civil justice is achieved. These are, in summary, the further measures being defined:

- in order to increase the use of alternative dispute resolution procedures and to facilitate the definition of disputes through judicial conciliation or out-of-court settlements, specific measures are being prepared, both implementing and simplifying the implementation of existing ones and introducing new ones;
- with regard to the civil process, further measures are being defined to improve the efficiency of the process with reference to the central issues of procedural foreclosures, re-establishing the temporal cadences for the definition of the decision-making theme, so that at the first hearing the positions of the parties are complete and the judge can assess the procedural choices functional to the speediest definition of the judgment;
- the operational entry into force of the system of the principle of clarity and summary of the acts of the parties and of the judge is also being developed;
- interventions are also being done on further rules to speed up and streamline appeal judgments;
- some amendments relating to arbitration judgment are being studied in order to give arbitrators the power to grant seizures and other protective measures if provided for in the arbitration agreement or other separate written act drawn up prior to the establishment of the arbitration judgment;
- finally, a number of measures are being drawn up in the field of justice expenditure, which introduce reward mechanisms where the parties, in specific cases, contribute to streamlining the decision-making phase in the Supreme Court, and on the digitisation of payments of the allowances referred to in Law No 89 of 24 March 2001 in order to speed up the winding-up proceedings.

Reform of the judicial system.

The reform of the judicial system, which is also pending in Parliament, does not only have effects on the legal profile, but also on the efficiency of the administration of justice. In fact, the rules governing the organisation of the activities of offices with a direct impact on the efficient management of the justice sector are primarily taken into account:

- the assignment to the executive of the office to verify that the distribution of the roles and workloads ensures the functional and efficient objectives of the office and ensures that all the magistrates of the office, sections and colleges are consistently fair;
- the specific provision that it is the responsibility of the manager (both of the office and of the individual section) to monitor the occurrence of delays by one or more magistrates of the office in order to ascertain the causes and to take any appropriate initiative to eliminate them, through the preparation of targeted disposal plans, to be verified in the practical operation every three months;
- the introduction of specific disciplinary offences in the event of non-compliance with the obligations set out in the preceding paragraph;
- the overall reorganisation of the Public Prosecutor's Offices, due to the need to require all the offices to have an organisational form based on criteria of efficiency and valorisation of the competences of individuals;

In relation to the rules of the judiciary which have effects of efficiency in the overall management of human resources, the following should be noted:

- the reduction of access to the career of a magistrate that allows graduates to participate directly in the competition, reducing the average age of access to the judiciary and making it attractive also for those particularly gifted young people who, instead, for long periods of time, embark on different careers;
- the reduction of the organic plant of the office of the maxillary of the Court of Cassation resulting from the restoration of the functions of supporting the *nomophilachia* of that office, so as to contain the number of magistrates removed from the ordinary exercise of jurisdiction;
- the extension also to magistrates who hold apical functions of the obligation to remain in the offices for at least four years, which is a timeframe necessary to allow adequate planning and organisation of the office they direct;
- preclude participation in the competition for the coverage of all senior posts (other than those of first President and Attorney General at the Court of Cassation) to magistrates who, by reason of their age, cannot guarantee their stay for at least four years which, as mentioned above, represent the timeframe necessary to allow adequate planning and organisation of the office they direct;
- reduce the number of passages of functions from judges to requirers;
- simplify the procedures for approving tables and plans for the organisation of offices;
- simplify the work of judicial councils.

Reform of the criminal process

The draft law pending in Parliament relates above all to the necessary realisation of the progressive digitisation of the criminal process: with rules relating to the electronic filing of documents and documents and a regulation of communications and notifications focused on the use of the PEC and also of technological solutions other than the PEC. A number of provisions are envisaged with the sole aim of eliminating the “dead time” of the criminal process, of drastically reducing cases where the proceedings lead to debate, of streamlining the discipline of a number of institutions with a prospect of acceleration and simplification. Special attention is paid to the appeal judgment, a real bottleneck of the criminal trial.

The principles underlying the reform action are summarised as follows:

The duration of the preliminary investigations is rescheduled according to the seriousness of the offences carried out. In order to make the maximum period of time more difficult to circumvent, a mechanism for judicial verification of the timeliness of the registration of criminal offences by the public prosecutor is introduced and an obligation is introduced for the public prosecutor to file the documents of the investigation at the end of the maximum period of time, with the additional obligation to file a request for dismissal or the prosecution within thirty days from the submission of the relevant request by the lawyer of the suspect or the offended person.

The guiding criterion of the decision of the Public Prosecutor and the Judge for the preliminary hearing is redefined, to make a request for the dismissal of the proceedings and the issue of the judgment not to proceed, replacing the parameter of the inadequacy of the elements acquired to support the accusation with that of the inability of the same to allow a reasonable forecast of acceptance of the accusation in the trial.

The rules on alternative rites are amended to encourage their adoption, except in cases where very serious offences are carried out.

With regard to the debated judgment, the reform contains a number of directives specifically geared to the objective of accelerating the procedure, including:

- the elimination of the need for the consent of the other procedural parties in order to revoke the admission of evidence to which the requesting party has renounced;
- the provision that the processing of technical advice and expert advice must be filed within a period prior to the hearing set for the examination of the consultant or expert;
- the obligation for the court to determine and communicate to the parties, at the beginning of the debate, the timing of the trial.

With regard to proceedings before the tribunal in monocratic composition, a “filter” hearing is introduced, always with a view to strong deflation, only in cases of direct litigation, in which the judge (other than the one before which, where appropriate, the judgment will have to be celebrated) assesses, on the basis of the documents in the prosecutor’s file, whether the debate is to be held or whether, on the contrary, a judgment of no place to proceed must be given.

The interventions related to the appeal judgment are numerous and significant:

The lawyer may appeal the judgment of first instance only if he has a specific mandate to appeal, issued after the delivery of the judgment, with the aim of avoiding a large number of appeals lodged in the interest of persons who have become irretrievable.

The possibility of bringing an appeal at the Registry of a judicial office other than that which issued the measure to be challenged shall be deleted, subject to the rules governing the electronic filing of the appeal.

The monocratic appellate judge is introduced, with jurisdiction to judge the judgments of first instance delivered by the monocratic judge, accompanying this innovation with adequate guarantees for the parties.

In order to ensure greater speed, deadlines for the maximum duration of the different phases and grades of the criminal proceedings are also introduced, hence the obligation for individual judges to take organisational measures to ensure that criminal proceedings are defined in accordance with the deadlines; failure to adopt such measures (and not non-compliance with deadlines), if attributable to inexcusable negligence, may constitute disciplinary liability; in the judgments of appeal against convictions, at the end of the period of time for the trial set in the reform, the procedural parties may request that the judgment of appeal against the judgment of conviction at first instance be dealt with. After the submission of the application, the process will have to be defined within six months. It will be up to the heads of the judicial offices and individual magistrates to ensure that these deadlines are met, by dictating the necessary organisational measures.

In short, the aim of the reform is to streamline and simplify the process and, without confusing the

fundamental rights of action and defence, speed up their conclusion in order to meet the dual need to avoid consuming prescriptions (in every state and degree) and, at the same time, that the processes have an unreasonable duration.

2 M1C2 - Digitalization, Innovation and Competitiveness of the Production System

1. Description of the component

Summary box

Policy area: Innovative technologies, digitalisation of the production system, internationalisation of Italian enterprises, ultra-fast connections, reduction of the digital divide

Objectives: the goals of this component are:

- a) Support the digital transition and the innovation of the production system through incentives to investments in cutting-edge and 4.0 technologies, research, development and innovation;
- b) Create ultra-fast optical fibre, 5G and satellite connections, for the modernization and completion of very high-capacity networks, connected to the white and gray areas and to strategic public facilities of the Country. Integration of satellite technologies to offer advanced services for the production sector and security;
- c) Promote the development of production chains, in particular innovative ones, as well as Made in Italy productions and increase the competitiveness of Italian companies on international markets, also using innovative financial instruments for this purpose.

Reforms and investments:

Investment 1: Transition 4.0: incentives for businesses, to facilitate the digital and green transition.

Investment 2: Innovation and technology of microprocessors: the project aims to support the high-tech sector of microelectronics, through a mix of tools for financial support for investments in machinery, equipment and production plants.

Investment 3: SMEs digitalization and Guarantee Fund : re-financing of guarantee fund to facilitate SME's access to credit and business liquidity (financed by ReactEU).

Investment 4: Investments for Ultra Broadband, 5G and Satellite connections:
 4a) Fast Internet connection (Ultra-broadband and 5G);
 4b) Space economy, development of a Constellation of Satellites and the National Institute of Earth Observation.

Investment 5: Supply chain industrial policies and internationalization: support industrial supply chains, in particular the most innovative ones, those of “made in Italy” and those that have been most affected by the effects of the pandemic.

Estimated costs:

EUR 25,750 million to be covered by RRF

M1C2 - Digitalization, Innovation and Competitiveness of the Production System

	Resources(euro/mln)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
Transition 4.0	3.10	15.70	18.80	-	18.80
Innovation and technology of microprocessors	-	0.75	0.75	-	0.75
SMEs digitalization and Guarantee Fund*	-	-	-	0.80	0.80
Ultra Broadband, 5G and Satellite connections	1.10	3.10	4.20	-	4.20
<i>- Fast Internet connection (Ultra-broadband and 5G)</i>	<i>1.10</i>	<i>2.20</i>	<i>3.30</i>	-	<i>3.30</i>
<i>- Development of a Constellation of Satellites and the National Institute of Earth Observation</i>	-	<i>0.90</i>	<i>0.90</i>	-	<i>0.90</i>
Supply chain's industrial policies and internationalisation*	-	2.00	2.00	-	2.00
TOTAL	4.20	21.55	25.75	0.80	26.55

Note: (b) includes FSC existing resources, to be devoted to specific measures.

* Includes lines of intervention with leverage effect.

2. Main challenges and objectives

a) Main challenges

The competitiveness of the national production system is inextricably linked to its capacity for technological innovation and therefore, for investment in R&D. Likewise, innovation today more than ever is based on the adoption of digital technologies that are creating a real revolution in production systems and processes, making them increasingly interconnected, automated and intelligent.

The challenge of the digital transition of the Italian industrial and entrepreneurial system, therefore, must be addressed with massive and structured efforts in order to overcome barriers and persistent delays, despite the achieved improvements in recent years. More than half of Italian companies are still characterised by a low level of investment in digital technologies and a limited digitalisation, which contributes to the loss of labour productivity growth.

Three main factors limit the enterprises' demand for digital services: economic constraints, technical difficulties (for example, restricted access to the connection network) and low levels of digital education and skills (for both workers and individual users). The Italian demographic makeup, the low coverage of broadband in some areas and the lack of incentives to adopt technologies contribute to these critical issues.

A second challenge concerns the widespread diffusion of optical fibre throughout the territory, by interventions both for the creation of ultra-fast networks and for the reduction of the digital divide in some areas of the Country and priority public realities. As a matter of fact, the Country ranks 17th out of 28 in the DESI Connectivity sub-index, showing a rather modest performance. In addition to the restrained connectivity offer, there is also a delay in the demand for ultra-fast fixed connection services from Italian users, which is partly explained by the Italian social and demographic makeup (lower incidence of the youngsters, low willingness to pay for faster connections and marked territorial development disparities) and partly the lack of appropriate incentives for the adoption of new technologies. Lastly, the implementation of the modern infrastructure of ultra-fast and 5G connections will also integrate with the development of satellite and Earth observation technologies. The integration of these technologies will allow a comprehensive and modern supply of services for the benefit of enterprises, institutions and citizens.

A third additional challenge concerns the competitiveness of the Italian production chains, their integration into global value chains and their internationalisation and export capacity. The fragmentation and small size of Italian companies (SMEs represent the 80% of the workforce) cause competitiveness problems, especially in sectors where scale economies and investment capacity are crucial. Furthermore, the economic impacts of the crisis have led to serious financial problems in many companies. Therefore, it is essential to envisage new financing systems and to facilitate SMEs access to funding, as well as to promote mergers. As for export, it has always had a strong role in the Italian economy: export value has grown steadily in the last 10 years, reaching 585 billion euros in 2019, 31.7% of the national GDP. Its fall in 2020 due to the Covid-19 pandemic has significantly contributed to weakening overall growth. Hence, it is timely to support the recovery also by stimulating export since it could play a pivotal role in the reconstruction of the entire economic system. To that scope, it is necessary to act on both the deficit of managerial culture in terms of internationalisation and on the delay in digitalisation. Such constraints often restrict SMEs from accessing, for instance, e-commerce and teleworking

tools and from exploiting the enormous growth potential resulting from the capacity to penetrate rapidly developing markets such as China and India.

b) Objectives The component intends to achieve the following goals:

1. Support the digital transition of the production system with incentives to private investments in technologically advanced capital goods (tangible and intangible) as well as in Research, Development and Innovation. In particular, this objective has two main focuses:
 - boost the ability to innovate of firms, especially SMEs, also fostering the process of integration into global value chains;
 - stimulate investments for the development and application of frontier technologies which are essential to the compete in the global markets (such as the Internet of Things, robotics, Artificial Intelligence, blockchain, cloud computing, edge computing, high-performance computing) maintaining a particular attention to cybersecurity aspects.
2. Increase investment in hi-tech sectors to support the competitiveness of strategic industrial sectors and safeguard skilled employment.
3. Complete the national optical fibre and 5G telecommunications network throughout the national territory and at priority public entities (schools, healthcare facilities, museums, archaeological sites, national parks, extra-urban communication routes), primarily to reduce the digital divide.
4. Develop satellite technologies aimed at strengthening Earth Observation systems for monitoring territories and extra-atmospheric space.
5. Strengthen Italian productions chains facilitating SMEs access to funding, through financial systems and tools such as a Guarantee Fund and a Fund of Funds.
6. Promote the internationalisation of enterprises, as an instrument of recovery and resilience of the productive system, given the traditional Italian orientation to export and the strategic role played by exporting enterprises.

The 6 goals are closely in line with the following Italian CSR (Country Specific Recommendations) 2019-2020:

- CSR3 2019 - Focus investment-related economic policy on research and innovation, and the quality of infrastructure, considering regional disparities. Improve the effectiveness of public administration, including by investing in the skills of public employees, by accelerating digitalisation, and by increasing the efficiency and quality of local public services. Address restrictions to competition, particularly in the retail sector and in business services, also through a new annual competition law
- CSR2 2020 - Provide adequate income replacement and access to social protection, notably for atypical workers. Mitigate the employment impact of the crisis, including through flexible working arrangements and active support to employment. Strengthen distance learning and skills, including digital ones
- CSR3 2020 - Ensure effective implementation of measures to provide liquidity to the

real economy, including to small and medium-sized enterprises, innovative firms and the self-employed, and avoid late payments. Front-load mature public investment projects and promote private investment to foster the economic recovery. Focus investment on the green and digital transition, in particular on clean and efficient production and use of energy, research and innovation, sustainable public transport, waste and water management as well as reinforced digital infrastructure to ensure the provision of essential services

3. Description of the reforms and investments of the component

Investment 1: Transition 4.0.

Challenges: Innovation, Research and Development are the basis for a competitive production system, an attractive business environment and a modern management of several socio-economic and environmental challenges. The current Covid-19 emergency has further highlighted the urgency to put at the centre of the Country priorities these issues, ensuring structural interventions beyond a temporary fix.

International benchmarking shows that in most OECD countries automatic tax instruments are the backbone of the support system for enterprises investment in R&D&I. With the 2017 “Industry 4.0 Plan”, consistent with this approach, Italy introduced a set of automatic fiscal measures to support R&D investments and technologically advanced capital goods purchase. The program has gradually been enriched and strengthened over the years through the extension of the beneficiaries (Enterprise 4.0 Plan) and the review and strengthening of the available measures for enterprises (Transition 4.0 Plan).

Since its inception, over one million companies have had access to at least one measure of the Plan, generating a positive impact on employment, despite extensive investments in 4.0 technologies (which are usually associated with adverse effects on hiring).

The 4.0 Plan has been an experience with positive outputs. Hence the PNRR will give it further impulse and continuity, through multi-year programming to offer stability and certainties to the enterprises. What is more, to increase the effectiveness of the fiscal measures of 4.0 Plan, targeted interventions will be introduced to effectively meet the investment needs of specific fields. For instance, the new challenges related to cybersecurity has become increasingly crucial for enterprises also due to pandemic-related restrictions and the consequent need to reorganise both distribution processes (e-commerce) and working method (teleworking). Thus, it is necessary to ensure investments in ICT infrastructure and services face current and future IT security threats.

Objectives: The new Transition 4.0 Plan, for the digitization of the Italian production system envisages a set of fiscal measures aimed at two main goals:

1. Increase enterprises investment in new technologically advanced capital goods (tangible 4.0 and intangible).
2. Increase private expenditure on Research, Development and Innovation.

Below is a description of the project's fiscal measures:

Tax credit for capital goods: fiscal benefit for investments in tangible 4.0 capital goods and intangible capital goods (both 4.0. and traditional ones). In comparison with the previous program, the intervention foresees increased tax concession rates and ceilings.

For tangible 4.0 capital goods, the following increases are foreseen:

- For expenses of less than 2,5 million euro: the new rate at 50% in 2021 and 40% in 2022.
- For expenses exceeding 2,5 million euro and up to 10 million euro: the new rate at 30% in 2021 and 20% in 2022.
- For expenses exceeding 10 million euro and up to 20 million euro, a new ceiling was introduced: a rate of 10% in 2021 and 2022.

Regarding intangible 4.0 capital goods, the following is foreseen:

- The rate increases from 15% to 20%.
- The increase of the ceiling on eligible expenses from 700.000 euro to 1 million euro.

Tax credits are also extended to traditional intangible goods, with 10% for investments made in 2021 and 6% for investments made in 2022.

Tax credit for R&D&I (fiscal benefit): Tax credit for R&D&I investments as well as for activities related to innovation 4.0, green economy and design. The new plan envisages the following increased tax concession rates and ceilings:

- R&D: the tax concession rate increases from 12% to 20% with a ceiling of 4 million euro (previously 3 million euro).
- Technological innovation: rate increases from 6% to 10% with a ceiling of 2 million (previously 1,5 million).
- Green and digital innovation: rate increases from 10% to 15% with a ceiling of 2 million (previously 1,5 million).
- Design and aesthetic conception: rate increase from 6% to 10% with a ceiling of 2 million (previously 1,5 million).

The expected *milestones* are:

- commitment of 100% of the resources allocated by 2024

A technical-scientific committee will be set-up for the assessment, monitoring and evaluation of measures implementation (by Q3 2021).

Targets for 2026:

- 1) Number of enterprises that purchase hi-tech capital goods: 60.000 per year, representing a +20% increase (baseline: 50.000 per year)
- 2) Number of enterprises that invest in R&D&I: 25.000 per year.

Implementation: The Ministry of Economic Development is responsible for the measures.

Target population: Firms investing in 4.0 and digital technologies and in R&D&I.

Timeline: 2021-2026 (see table 2 for details).

Investment 2: Innovation and technology of microprocessors.

Challenges: The hi-tech industrial supply chains are the most valuable component of every national industrial system, as they are a crucial source of R&D investments, skilled labour, and technological knowledge sharing and transfer that support other production compartments along with the whole territory. For example, one could consider the spillovers from different sectors, such as aerospace, advanced machinery, fine chemicals, and microelectronics, that benefit the entire industrial system. Italy performs well in these sectors, in terms of players and competencies of excellence, however its position is still weaker compared with its main trade partners. As a matter of fact, Italy ranks 15th among world major exporters of hi-tech products, with a market share of about 2%, much lower than the one of Germany, which amounts to almost 10%.

Therefore, it is crucial to undertake strategic investments that benefit the Italian hi-tech supply chains, supporting and concentrating the efforts in favour of those territories with a strong technological specialisation, hosting innovation ecosystems based on valuable partnerships between large companies, SMEs system, universities and R&D centres, investments in the south of Italy will be considered as priority.

Such challenge needs to be addressed through a European view, with the goal of making Italy a fundamental player in contributing to the EU positioning as a world leader in the development of cutting-edge technologies and in the most advanced and green manufacturing production.

Objectives: The Microprocessors innovation and technology project is a concessionary measure aimed at supporting industrial investments with high technological content and positive effects on employment and satellite activities so that it can have a strong impact on innovation, and on social and territorial cohesion. The measure, in particular, is characterised by a focus on the microelectronics industry as, among the hi-tech supply chains, it plays a highly strategic role on the national as well as European level.

As a matter of fact, microprocessors constitute the material basis for the development of most of the cutting-edge sectors and applications, such as artificial intelligence, au-

tomation, 5G, aerospace and defence system, electric mobility. Thus, microelectronics represents a fundamental compartment for the development and the competitiveness of the entire industrial system.

Moreover, at the global level, the sector is characterised by a strong concentration of players and territorial clusters with a very high technological innovation capacity. Italy contributes to the European semiconductors industry with technology hubs that stand out for their excellent industrial and research competences. Therefore, the goal of the project is to support the growth of this national supply chain and to underpin the development of the last technological frontiers, such as the one of microchips made of silicon carbide (SiC) which will play a fundamental role in the next revolution of the electric mobility.

The measure – which envisages calls for tenders or upon request scheme - offers financial support to investments in machinery, plants and production equipment with contributions equal to 40% of the eligible expenses. The allocated resources amount to a total of 750 mln euro (250 mln euro per year for a period of three years) that will then produce overall direct investments in the hi-tech supply chains of 1.875 mln euro, to which further investments, stemming from positive impacts on satellite activities, will be added.

The expected milestones are:

- 1) Activation of the one-stop shop (by Q2 2021)
- 2) Selection of the projects and start up of the investments (by Q4 2023)
- 3) Production of a report by the Managing Authority on the progress of the measure activities (Q2 and Q4 of every year from 2021 to 2026)

The target set for 2026 is constituted by the direct investments activated in the hi-tech supply chains equal to 1.875 mln euro.

Implementation: The Ministry of Economy and Finance, is responsible for the programme.

Target population: Hi-tech companies.

Timeline: 2021-2026 (see Table 2 for the details).

Investment 3: SMEs digitalization and Guarantee Fund

The estimated cost on REACT EU amounts to 0.8 billion euro

The liquidity crisis caused by the health emergency brings out, for large segments of the production system and regardless of the size of the company, the need to access sources of financing other than cash flow, compromised by the decline in turnover. The banking system and the support measures undertaken by the government have played a prominent role. For this reason, the PNRR - thanks to a synergy between several European programs - provides various tools for strengthening the production system, in particular tools to

promote access to credit and the liquidity of companies, such as the refinancing of the Guarantee Fund.

4) Investments for Ultra Broadband, 5G and Satellite Connections.

Investment 4a: Fast Internet connections (Ultra-broadband and 5G)

Challenges: The National strategy for the ultra-broadband, in line with the objectives of the Digital Agenda for Europe and the Communication from the European Commission COM (2016) 587, aims at reaching 85% of the population with services at a speed equal or superior to 100Mbit/s and the remaining 15% with services at a minimum of 30 Mbit/s by 2025.

The current infrastructure, at NGA ultra-broadband on FTTC or FWA networks, can guarantee speed equal at least to 30 Mbit/s in download and 15 Mbit/s in upload and therefore results inappropriate to grant the achievement of connectivity goals set for 2025. Therefore, it is necessary an intervention that allows for a breakthrough, from connectivity “over 30” to the connectivity “over 100” (speed of at least 100Mbit/s in download and 50 Mbit/s in upload) and able to deliver services up to 1 Gbit/s.

The implementation of the National strategy for the ultra-broadband started with an intervention plan reserved only to the areas of “market failure” (the so-called ‘white areas’), authorised by the European Commission Decision SA. 41647 (2016/N) of June 30, 2016.

To complete the coverage of white areas, there is a commitment to connecting the real estate units that still do not have access to ultra-broadband services (so-called ‘residual white areas’), as they are located in remote areas, hard to aggregate, and isolated from urban centres.

To complete the National strategy for the ultra-broadband, a second phase of the project will be started, in line with the European recommendations on the defined target for the gigabit society, carrying out infrastructural interventions focused on the connectivity of grey areas, in which only one operator is active and it is unlikely that another network will be installed.

The project has been approved by the Ultra-Broadband Committee, estimating a financial requirement of 5,3 billion euro to identify in the next European planning. The access to the fund of the National Recovery and Resilience Plan (PNRR) would ensure the realisation of the project, in its entirety and in short times.

Objectives: The proposal consists of a set of complementary measures aimed at extending the ultra-broadband coverage up to 1 Gbit/s to support the realisation of networks in strategic areas.

1. Piano Italia 1 Gbit/s. For larger dissemination of the new fibre networks on the national territory, thanks to the Recovery Fund resources about 30% of the 8,6mln residential units still in the digital divide with respect to the gigabit society will be reached. The remaining 70% of the necessary resources will be collected from other funding sources.
2. Completion of the School Plan (Piano Scuole). The goal is to provide all the Italian school facilities with connectivity services of broadband up to 1 Gbit/s in download, to support the connectivity needs for the delivery and fruition of the teaching system for students and teachers, in particular for the requirements that will emerge at the start of the academic year 2020-2021 (see mission 4 on education and research).
3. Health facilities plan. The goal of the project is to interconnect over 12.000 health facilities , healthcare personnel and patients, to strengthen the resilience and the capacity of the Healthcare System (see mission 6 on Healthcare). Particular emphasis is going to be provided for the development of the following services:
 - Telemedicine and remote assistance;
 - Medical records and electronic platforms for data collection and exchange between doctors and patients;
 - Empowerment platforms to raise the awareness as well as the health education of patients
4. Fibre plan for natural parks.
5. Fibre plan for museums and archeological sites. The goal of project is to provide all the museums and archeological sites on the Italian territory with a free wi-fi network, free-of-charge and widely distributed (see Component on Tourism and Culture). The costs will cover also the connectivity expenses of the museum facilities. Besides this infrastructural intervention, it is expected that support will be provided for the test of new technologies aimed at developing new multimedia content that could enrich the cultural offer of museums and archeological sites.
6. Spread of 5G network in public sports facilities.
7. Fibre for 5G along the extra-urban communication routes. Fibre optic backbones will be realised, by integrating existing backbones and installing new infrastructures on provincial roads, to favour the diffusion of 5G networks and services in support of road safety, mobility, logistics, and tourism in extra-urban areas. (see Mission 3 Component 1)

The targets set for 2026 aim at the connection to the network (with a speed of at least 100Mbits/s and up to 1 Gbit/s) of:

1. 2,5 mln residential units
2. 9.000 school facilities
3. No. 12.300 healthcare facilities
4. o. 100 natural parks
5. No. 200 museums and archeological sites
6. No. 1.000 sports centers

7. 30.000 km of extra-urban roads

Implementation: The Ministry of Economic Development (MISE) is responsible for the measures.

Target population: The national territory that is not reached by the ultra-broadband: school facilities, health facilities, natural parks, museums and archeological sites, sports facilities, extra-urban communication routes.

Timeline: 2021-2026 (see Table 2 for details).

Investment 4b: Development of a Constellation of Satellites and the National Institute of Earth Observation

Challenges: Space and Aerospace are two strategic sectors for the interest of the Country for all the services and applications that can be offered to national users and foreign markets, as well as for the large impulse to scientific research, technological progress and capabilities of development and production of the national industry.

In particular, a robust system of Earth Observation (Osservazione della Terra, OT) can provide accurate and timely measurements of physical, chemical, geological and biological parameters of the territory.

This information allows individuals and organisation to take more informed decisions, which promote the economy and guarantee public safety. Moreover, considering the aging of the national space infrastructure, the increasing crowding of the different orbital regimes with the related risk of in-orbit collisions, it is essential to ensure the security of the project in question and more generally of the entire national space infrastructure of interest (assets, data and services) from intentional and unintentional threats, developing a space-based SSA capability to safeguard and protect them. The national industry has shown competence and competitiveness at the global level in the development and realisation of products and services for the segment in orbit “upstream” (launch services, production and development of satellites, infrastructure, payload, sensors, habitation modules, robotics), the earth segment “midstream” (operations, security, terminals) and the supply chain of “downstream” services and applications.

Italy will support an industrial and supporting policy of new technological supply chains of the space sector that can set the priorities for the specific associated programmes, enhancing the acquired competencies from the national productive compartment and supporting the competitiveness on the international market. Such sector development, specifically of the Earth Observation (OT) and Space Situational Awareness (SSA) systems, is going to be of fundamental importance for supporting the realisation of new infrastructures, control and monitoring of existing infrastructures, prevention of the hydrogeological risk, maritime safety, emergencies management, precision agriculture, cultural heritage safe-

guard, safety and security of space and ground-based infrastructures of national interest.

To respond to the increasing request of satellite data of Earth Observation (OT) and of Space Situational Awareness (SSA) from Institutions and citizens as well as to the improvement of the capacity of environmental risk prevention, it is necessary to enhance the satellite capacity of monitoring with high temporal and spatial resolution of Italy, of Continental Europe and of the Mediterranean Basin.

Objectives: The goal of the investment consists in realising a new satellite constellation in low orbit, equipped with instrumentation (thermal and infrared, radar and hyper-spectral optics) adequate to observe, monitor and collect data in high resolution coming from the National and European territory and orbits of national and union interest. The availability of such data will allow for the development of methodologies of innovative computerised analysis (Artificial Intelligence, supercomputing) and calibrated on the specific needs of different strategic sectors, with a significant impact on the industrial and agricultural national supply chains, as well as on the civil and military fields. Furthermore, the large amount of data generated by the constellation will be an enabling factor for companies and startups specialised in geodata-analytics.

Data coming from the constellation will allow for the development of a multitude of services, among which:

- Marine-coastal monitoring for tracking and forecasting the wave motion, the geomorphological changes of the coast, the natural habitat, and the events that have an impact on the marine environment in general.
- The “Servizio Qualità dell’Aria” (Service for High-Quality of Air) to map and forecast the dispersion of pollutants, powders, ashes and other materials related to natural or anthropic events.
- Monitoring of ground movements due to earthquakes, volcanic eruptions, landslides and other natural episodes.
- Mapping of crops, forests, volcanic areas and the ground in general as well as its use and consumption degree.
- Monitoring and forecasting of the greenhouse gases levels and other essential climatic variables.
- Monitoring and forecasting the risk of floods and other events of hydro-geomorphological nature.
- Services for the identification of critical events such as floods, fires, earthquakes and volcanic eruption and mapping the relative damage caused.
- Services for the surveillance of terrestrial and maritime borders of the European Union.
- Services of surveillance, tracking, identification and characterisation of space objects resident in LEO (Low Earth Orbit), MEO (Medium Earth Orbit) and GEO (Geosynchronous Earth Orbit) orbits.
- Service for the protection of satellite spacecraft, infrastructure, and satellite mis-

sions from intentional and unintentional threats.

The project also involves the constitution of the National Institute of Earth Observation (Istituto Nazionale di Osservazione della Terra, INOT), which will manage and distribute the products and services resulting from the analysis of satellite data to the central and local State Administrations.

The expected milestones are:

- Approval of regulations aimed at the establishment of the INOT (by Q4 2021)
- Purchase of the supercomputing computer (by Q4 2022)

The targets set for 2026 are:

- n. of satellites built and placed in orbit: 30 (n. 24 OT and n. 6 SSA)
- n. of monitored variables: 8 (services identified for Public Administration)

Implementation: The Presidency of the Council of Ministers is responsible for the initiative. For the realisation of the satellite constellation, it is expected the involvement of an entirely Italian supply chain of SMEs supported by the competences of the Academies and Italian Research Centres.

Target population: The whole Italian territory (and of EU), Public institutions, private enterprises.

Timeline: 2021-2026 (see Table 2 for details).

Investment 5: Supply chain industrial policies and internationalisation

The project plans to support industrial supply chains, in particular those that have been most affected by the effects of the crisis and those most advanced from the point of view of innovation and environmental sustainability, in order to improve their positioning in European and global value chains and to reduce dependence on third countries.

Particular attention will be paid to companies (SMEs in particular) that promote “Made in Italy” products in the world. For this purpose, it will be used a “fund of funds”, through which the allocated resources are transferred to specialised operating funds for financial instruments, risks assumed and sectors of intervention. This contribution, together with EIB and EU instruments and participation in the capital and/or financing of financial intermediaries and partners, can represent the endowment that each individual fund would use to finance the initiatives of this project. Furthermore, it will be provided a set of interventions that stimulate the quality and specialisation in the aggregation processes of the supply chains in each sector, especially in those of national importance.

In this vein, integrations and interconnections between companies in the various stages of production processes will be encouraged, favouring also merger and capitalisation processes

with suitable tools.

[in progress ...]

Timeline: 2021-2026.

4. Green and digital dimensions of the component

a) Green Transition:

Work in progress...

b) Digital Transition:

Work in progress...

5. Milestones, targets and timeline

See Table 2 work in progress

6. Financing and costs

See Table 2 work in progress

Cost estimation methodology

Investment 1: Transition 4.0

The measures envisaged in the plan are largely in continuity with the past, albeit with changes that simplify and broaden their scope. As a precaution, the estimate takes into account the financial impact of similar measures in previous years.

In particular, for the Transition Plan 4.0 the value is obtained by estimating the tax advantage on a potential amount of investment assets in capital goods consistent with that of the previous version, integrated with the resource requirements attributable to management software (which can be facilitated starting from 2021).

For the 2020 R&D tax credit, have been taken into account the 2018 tax returns relating to the 2017 fiscal year.

The cost of the projects relating to this proposal was quantified on the basis of the quotations of similar services envisaged in the recent CONSIP SIAN tender.

Investment 4.A: Fast Internet connection (Ultra-broadband and 5G)

- 1) Italy 1 Gbit / s Plan. The cost base, linked to the infrastructure of the real estate unit, derives from the historical cost obtained on the basis of the previous financed interventions and is estimated at approximately 470 euros / real estate unit.
- 2) Completion of the School Plan. The cost base used (EUR 29,000 on average for each school) is the same as that used for phase 1 of the plan, for which the tender has already been launched.
- 3) Health facilities plan. The health centers obtained from the ISTAT database of the PA offices were mapped on an address basis, to evaluate the distance from the known fiber points. The locations for which the fiber is not in proximity are about 4,700 and it is at an average distance of 600mt. The cost of the CPE, of the transport and of the bandwidth, of the internet service and of the management and maintenance services was therefore estimated on the basis of the prices of the equipment available on the market and of the price lists of bandwidth and service offers.
- 4) Fiber for natural parks. An average cost was assumed for the equipment of the nodes / pylons in the park and an average of 20 nodes per park. The average cost of the node is estimated at around 37,500 euros.
- 5) Fiber for museums and archaeological sites. For the coverage of museums, an average cost was assumed to equip a single hall (approximately € 100,000 per hall), including the cost of connectivity. An average of 25 rooms per museum have been assumed. The cost of connectivity for the 200 locations (250,000 euros per site) has been added.
- 6) 5G networks in public sports facilities. An average cost per plant of approximately 120,000 euros was assumed.
- 7) 5G along extra-urban communication routes. The cost per km derived from the historical cost of manufacturing fiber backbones was used, to which was added the cost for the preparation of points for housing the 5G signal repeaters and boosters, equal to a total of 60 EUR/mt (i.e. 60 thousand EUR per km).

Investment 4.B: Development of a Constellation of Satellites and the National Institute of Earth Observation (INOT)

For the cost evaluation of the constellation, the estimate was made on the basis of the database of the Italian Space Agency, which identified by similarity the average costs of a multi-sensor constellation of this type and with the project performance. For the estimate of personnel costs, the reference are professionals of the same level currently operating at the Italian Space Agency. Market quotations were used to evaluate the purchase of the supercomputing computer.

For INOT, the estimate of personnel costs was carried out by referring to professional figures of the same level currently operating in research institutions.

3 M1C3 - Tourism and Culture

1. Description of the component

Summary box

Policy area: Tourism and culture

Objectives: With 55 sites included in the 2020 list of UNESCO World Heritage, cultural and creative sectors and tourism are key assets for Italy, in terms of their economic value and employment. Together they account for 12% of the National GDP, with the culture and tourism sectors generating respectively over 6% and up to 15% of total employment .

Culture and tourism also have significant positive social impacts on other policy areas, such as health, education, inclusion and urban regeneration. Participation in cultural activities, travel experiences and the encounter with foreign tourists offer the opportunity to appreciate the richness of cultural diversity, thus promoting equality and intercultural understanding, which is important in terms of social security.

Moreover, active cultural participation triggers innovative thinking, as suggested by the strong correlation observed in EU countries between top performers in terms of cultural practices and the ranking levels in the European Innovation Scoreboard. Access to cultural content fosters digitalisation and acquisition of digital competences, being prime fields of development and experimentation of emerging technologies, such as augmented and enriched reality, the Internet of Things and Artificial Intelligence.

Finally, culture and sustainable tourism can also favor the diffusion of more responsible environmental behavior and induce citizens to shift their consumption habits, thus favoring the emergence of the circular economy. A new and broader perspective on the value of investments in culture has been explicitly recognized by the “European Framework for Action on Cultural Heritage” (SWD (2018) 491) and the “New Agenda for Culture” (COM/2018/267 final) of the European Commission, which indicate the positive effects on health, innovation and social cohesion as key orientations of the EU’s future policy on culture.

Also the European Court of Auditors (*EU investments in cultural sites: a topic that deserves more focus and coordination, 2020*) has recently highlighted that not enough attention is paid to the sustainability of cultural sites in terms of investments.

The present Component, therefore, aims to improve the quality of life of citizens and tourists, to raise the levels of cultural, creative and touristic services, and to support the digital and green transitions and the socio-economic development of the Country. Its main objectives are:

- 1) To increase the attractiveness of strategic cultural sites, including a focus on the unique cultural heritage of Rome, making them accessible both digitally and physically, and maximising their contribution to the European Green Deal;
- 2) to foster culture-led-regeneration and sustainable tourism in remote and rural areas as well as in urban peripheries, including measures for the seismic security and restoration of the places of worship;
- 3) to upskill, reskill and prepare cultural and touristic operators for the future with a view to improving the quality of the tourist services.

Twin transition:

The proposed component provides an opportunity to promote jointly the green and digital transition. A series of investments, e.g. in slow tourism and in energy efficiency of the cultural sites, will reduce greenhouse gas emissions, while others, e.g. the capacity building of cultural operators in the green transition, will promote the circular economy. In parallel, many investments regard the digitalisation of cultural operators, sites and itineraries, to make them more accessible and promote creative and cultural industries.

Jobs and growth:

The investments related to the proposed component will create a significant number of jobs and contribute to growth both at local and national level. In 2016 the highest number of jobs connected to tourism in the EU was observed in Italy (4.2 million). In 2019, before the Covid pandemic, tourist expenditures in Italy reached EUR 44 billion.

Social resilience: Culture and tourism are among the most affected sectors by the current crisis, although the dynamics vary across sub-sectors, with venue-based activities (e.g. tourism, museums, performing arts, live music, festivals, cinema) and the related supply chains being the hardest hit by the social distancing measures. According to initial estimates, during the first lockdown phase in the first half of 2020, the museums and cultural sites of Italy have lost around 80 million Euro, the cinema around 120 million Euro and music shows have suffered a reduction of revenues of 350 million Euro . The proposed component will include targeted interventions to improve the safe accessibility to cultural heritage sites and buildings, allowing wider participation to culture, thus promoting inclusion and socio-cultural regeneration of neglected areas and economic and social well-being. Remote and rural areas as well as urban peripheries will be affected by the investments of the component.

Reforms and investments:

Outcome 1: Cultural Heritage for next Generation

Investment 1.1: Strategic Investments Plan on cultural heritage sites, buildings and natural areas;

Investment 1.2: Digital Strategy and Platforms for Cultural Heritage;

Investment 1.3: Removal of physical and cognitive barriers in museums, libraries and archives to enable wider access and participation to culture.

Investment 1.4: Caput Mundi. Investments on artistic and cultural heritage of Rome.

Investment 1.5: Upgrade of a strategic production hub for the Cinema Industry (Cinecittà).

Outcome 2: Small tourist and cultural sites, rural areas and urban peripheries.

Investment 2.1: Attractiveness of Small Historic Towns;

Investment 2.2: Protection and enhancement of rural architecture;

Investment 2.3: Programs to enhance the identity of places, parks and historic gardens, participatory regeneration of urban peripheries;

Investment 2.4: Seismic safety in places of worship and FEC heritage restoration;

Outcome 3: Tourism and culture 4.0.

Investment 3.1: National Training Center for tourism operators;

Investment 3.2: Capacity building for culture operators to manage the digital and green transition;

Investment 3.3: Historical paths. Slow tourism;

Investment 3.3: Renewal and digitalisation of accommodation facilities and tourist services;

Estimated costs:

EUR 8,000 million to be covered by RRF

MIC3 - Tourism and culture

	Resources (euro/mdl)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
Cultural Heritage Next Generation	-	2.70	2.70	-	2.70
- <i>Strategic Investments Plan on cultural heritage sites, buildings and natural areas</i>	-	1.10	1.10	-	1.10
- <i>Digital Strategy and Platforms for Cultural Heritage</i>	-	0.50	0.50	-	0.50
- <i>Removal of physical and cognitive barriers in museums, libraries and archives to enable wider access and participation to culture</i>	-	0.30	0.30	-	0.30
- <i>Caput Mundi. Investments on artistic and cultural heritage of Rome</i>	-	0.50	0.50	-	0.50
- <i>Upgrade of a strategic production hub for the Cinema Industry (Cinecittà)</i>	-	0.30	0.30	-	0.30
Minor sites, rural areas and peripheries	-	2.40	2.40	-	2.40
- <i>Attractiveness of Small Historic Towns</i>	-	1.00	1.00	-	1.00
- <i>Protection and enhancement of rural architecture</i>	-	0.50	0.50	-	0.50
- <i>Programs to enhance the identity of places, parks and historic gardens, participatory regeneration of urban peripheries</i>	-	0.40	0.40	-	0.40
- <i>Seismic safety in places of worship and FEC heritage restoration</i>	-	0.50	0.50	-	0.50
Turism and Culture 4.0	0.30	2.60	2.90	-	2.90
- <i>Culture 4.0: National Training Center for tourism operators</i>	-	0.40	0.40	-	0.40
- <i>Capacity building for culture operators to manage the digital and green transition</i>	-	0.50	0.50	-	0.50
- <i>Historical paths. Slow tourism</i>	-	0.50	0.50	-	0.50
- <i>Renewal and digitalisation of accommodation facilities and tourist services*</i>	0.30	1.20	1.50	-	1.50
TOTAL	0.30	7.70	8.00	-	8.00

Note: (b) includes FSC existing resources, to be devoted to specific measures.

* Includes lines of intervention with leverage effect.

2. Main challenges and objectives

a) Main challenges

Cultural and tourism infrastructures need investments in order to facilitate post-COVID recovery

According to estimates of the World Tourism Organization, the international tourist arrivals in Europe have fallen by 58% between January and March 2020. In Italy, according to estimates of the National Institute of Statistics (ISTAT), in the 3-month period from March to May the pandemic has caused a reduction of 20% of the touristic presences foreseen over the entire year, and the second wave started in September will result in a more significant drop.

OECD ²⁵ recently recalled the need for a strong and responsive public support and the inclusion of culture and tourism sectors in National recovery strategies, in order to prevent that the combined effects of the crisis on distribution channels, the drop in public and private investments, and the sharp reduction of international and domestic tourist flows, affect both sectors over the long term. Moreover, OECD warns that the downsizing of cultural and creative sectors and tourism might induce a domino effect, with negative impacts on cities and regions in terms of “jobs and revenues, levels of innovation, citizen well-being and vibrancy and diversity of communities.”

The creative and cultural sector has been increasing in importance in Italy over the years, before being hit by the Covid pandemic. In 2018 there were 416.080 creative-driven companies in Italy²⁶, (i.e. using cultural content to increase their competitiveness) and 291.025 were part of the core cultural sector (creative and cultural industries, performing arts, historic and artistic patrimony). In 2017 the sector was estimated to have an overall value added of 95,8 Billion Euro. Over the last 3 years the demand for the use of cinema studios in Rome has, for example, increased by 200%, showing that the Cinecittà brand is strong, but the capacity to address this demand has been limited due to underinvestment in the past.

The crisis has hit life performances particularly hard, since meeting with audiences remains essential for the sustainability of the cultural and creative sectors and of tourism, and will be even more important for their recovery. Reconnecting with the public is the wish of any artist, musician, performer, tourist and cultural operator. Solutions to support the realisation of performances, shows and events open to the public and for accommodating tourists in safe conditions, i.e. more expensive and less profitable, will hence be required to support both sectors and to improve their economic and employment performance.

²⁵OECD, Culture shock: COVID-19 and the cultural and creative sectors, September 2020.

²⁶Report: “Io sono Cultura” Unioncamere, Fondazione Symbola.

In the public sector, Italy has a very vast and valuable cultural heritage that requires significant annual investments to be maintained, but can be an important pole of attraction for cultural activities and tourism. Numerous projects exist to revalue cultural and historic sites in the main metropolitan cities, including areas in the peripheries (e.g. the Biennale of Venice, the Old Port of Trieste, the European library for cultural information in Milan, the river area of Turin, the old forts of Genova, a new museum pole in Florence, the roman museums and archeological sites in Rome, a coastal park in Bari, an auditorium at the old Tobacco factory in Palermo). A special focus on the cultural heritage of the Capital city is needed, because the unique value and the specific attractiveness of such cultural heritage, especially in the view of the 2025 Jubilee which represents an important opportunity to develop a model of sustainable tourism.

There is also a need to invest to make Italian cultural sites more accessible to wider parts of the population and of tourists. According to the World Health Organization (WHO), 15% of the world's population (1 billion people) is estimated to live with some form of disability, and several obstacles still limit their access to cultural sites, with an impact on accessible tourism policies. Many exhibition facilities still have physical and sensory barriers: in Italy only half (53%) of the 4.908 museums, archaeological areas, monuments and eco-museums open to the public in 2018 were equipped with ramps, bathrooms and lifts for people with reduced mobility, and just over one in ten (12%) offered tactile paths and sensory information materials for visually impaired and blind persons. Due to the reduction in revenues, contributions and sponsorships generated by the pandemic, museums, libraries and archives are not able to afford the investments needed to remove these barriers in order to attract new audiences and tourists and thus rebuild their financial sustainability.

In terms of the touristic sector, the crisis can also offer opportunities. Before the crisis, Italy's tourist flows were characterised by high levels of concentration in the main historic cities (Rome, Florence and Venice) and in certain seasons. Compared to Spain, Italy has so far not managed to capture to the same level of off-season tourists from Northern Europe. There is now the opportunity to balance touristic flows by investing in rural and sustainable tourism. Italy has for example many small historic centres ("borghi") and places of worship, which can offer enriching and different types of touristic experiences. In addition, there are many citizens of Italian origin around the world, who could be interested in a kind of tourism connected to the discovery of their roots.

In order to attract more international tourists, also off-season, there is however a need to upgrade tourist accommodations. At present the quality and service levels of tourist accommodations across the country varies and is not always well captured by the number of stars or by quality certificates, which does not make it predictable. In some areas there has been underinvestment in tourist accommodations, which needs to be counteracted to increase Italy's attractiveness for tourists.

Fragmented digital infrastructures and shortage of skills limits the digital transition

Digital access to public information on cultural heritage is limited, thus reducing the opportunities for cultural and creative enterprises to use and reuse information for their products and services, and for the Education and research sector to raise the level of essential cultural services.

Many cultural institutions lag behind because of limits in their digital infrastructure. According to the National Institute of Statistics (ISTAT) in 2018 only 11.5% of the 460 state museums had a digital scientific catalog of their collections; only 20.8% had digitised their collections and only for 6.1% of them the catalogue was accessible online (43.7% had a dedicated website and 65.9% had a profile on the most important social media).

In addition to investments in digital infrastructures, cultural institutions need new skills: at present only 16% of Italian museums have staff dedicated to ICT and digital activities. This is a fundamental requirement, allowing them to reach out to local communities in times of social distancing and to offer services to cultural and creative enterprises (for example, by facilitating access to public information).

The pandemic has induced an acceleration in the use of digital tools by artists and cultural operators, which have made their content available online, but the provision of free and digitally mediated cultural content has so far not been supported by a sustainable revenue model.

The fast development of new digital technologies in the cinema sector, especially those related to virtual production, requires a strategic investment in the training of new professionals in this field, in order not to lose competitiveness compared to other countries.

The contribution of the cultural sector to the green transition and to the European Green Deal

Italy has a strong tradition in the restoration, conservation and adaptive reuse of built heritage, an approach which reduces the consumption of natural and energetic resources and land use, with substantial reduction of emissions. But there is a need to improve the energy efficiency of cultural heritage buildings and to update cultural heritage practices, in order to progress towards a more circular economy and contribute to the European Green Deal.

As mentioned above, after months of social distancing the increase of participation in life events will be crucial for the recovery and sustainability of the cultural sector. But cultural events, exhibitions, festivals, cultural reviews, musical events or fashion generate a significant environmental impact, in terms of greenhouse gas production and consumption of natural and energy resources. To promote a green approach throughout the supply chain of the cultural and creative sectors, it is therefore necessary to reduce the ecological footprint of cultural events and of specific activities and processes, such as those of conservation and restoration, minimising the production of greenhouse gases and the consumption of natural resources.

At the same time, cultural activities might contribute to the green transition as they can orient the behaviour of their suppliers (businesses and cultural and creative organisations), clients (public administrations and/or public and private cultural institutions) and their audiences. Cultural and creative sectors can contribute to climate action, combining design and sustainability for the strategic rethinking of more responsible lifestyles and behaviours towards nature and the environment, thus contributing to the New European Bauhaus launched by the European Commission under the Green Deal.

b) Objectives

1. Cultural Heritage Next Generation

- 1.1 Recover, develop and enhance, within a systemic logic, the widespread artistic and cultural heritage of Italy.
- 1.2 Develop the systems and skills necessary to create value in the digital environment and increase cultural demand through digital tools and services for growth of a market for cultural, educational and tourist services.
- 1.3 Remove physical and cognitive barriers to allow the weakest sections of the population to enjoy the cultural heritage widely.
- 1.4 Enhance Rome's archaeological and cultural heritage by reactivating virtuous tourist routes starting from "minor" places or monuments, not always involved in the large tourist flows that characterized the eternal city before the COVID-19 crisis.
- 1.5 Enhance the digitalization, energy efficiency and competitiveness of Cinecittà film studios, also in order to increase its attractiveness for major national, European and international productions.

2. Minor sites, rural areas and peripheries

- 2.1 Enhance the offer of accommodation and services to support touristic-cultural use, through the recovery and functional adaptation of buildings, structures typical of the agricultural and rural tradition, giving priority to interventions that pursue energy savings and the use of alternative energies.
- 2.2 Recover the rural building stock and preserve the characteristic features of historic rural landscapes to enhance the country's growth through the creation of jobs to increase the social cohesion and well-being of local communities, by reducing the ecological footprint of the conservation chain towards a circular economy model.
- 2.3 Increase and diversify the cultural offer through the promotion of innovative projects that value the role of cultural, institutional and social centers in areas not normally reached by this type of activity and cultural projects, such as peripheries; also enhance and upgrade parks and historic gardens.
- 2.4 Restore and recover the heritage of buildings of worship for conservation and prevention in relation to seismic risks.

3. Tourism and Culture 4.0

- 3.1 Create a national structure for the high level of training and training of tourist staff in order to promote higher vocational training.
- 3.2 Organize learning activities of operators in the cultural and creative sectors in the use of digital and new technologies in order to increase cultural participation and the demand for cultural products and services.
- 3.3 Recover historic railways to offer an opportunity to travel along historical lines to visit the suggestive places in Italy, and enhance walking paths to promote a segment of tourism able to relaunch territories in internal areas; whereby the ancient paths become tools of widespread knowledge of the history and heritage of Italy.
- 3.4 Redevelop accommodation facilities, in order to increase their quality and competitiveness through the restructuring and modernization of both basic structural components, environmental components, also aiming at innovation and digitalization of services.

c) National strategic context

The investments envisaged in the component are consistent, synergic and integrated with the priorities and actions included in the national strategies in the field of culture and tourism.

The protection and enhancement of cultural heritage for territorial attractiveness and social inclusion is at the heart of the mandate of the “Ministry for Cultural Heritage and Activities and for Tourism” (MiBACT), in line with the Constitutional objective of protection and conservation of cultural heritage for public enjoyment and use. MiBACT is engaged to unleash the potential of culture and cultural heritage as key factors for the attractiveness of territories, also in terms of competitiveness of the tourism sector, opportunity for human capital growth and social cohesion.

On this basis, the investments envisaged by the component “Culture and Tourism” are fully consistent with MiBACT’s investment plans (both ordinary and extraordinary programming) and in line with the priorities of i) strengthening great cultural attractions, ii) increasing the accessibility of places of culture and cultural participation, and iii) promoting cultural regeneration and sustainable tourism in marginal areas.

The proposed investments are hence well integrated with the strategic *National Reform Plan* and the *South 2030 Plan*. In particular, close complementarities exist with the *Strategic Grand Plan Cultural Heritage Projects* (Law 106/2014 and 2016 Stability Law), aimed at relaunching the competitiveness of the territories through interventions on assets and sites of exceptional cultural interest and national importance, with the *PON Culture and Development* (FESR 2014 -2020) and with the *Culture Operating Plan and Tourism* (FSC 2014-2020), aimed respectively at enhancing cultural venues owned by the State (for the PON) and by local authorities (for the FSC), according to the logic of territorial competences.

The territorial approach is also at the basis of the proposed interventions on historic

villages (“borghi”), focused on enhancing the interdependencies between tourism and culture, activating synergistic and integrated strategies oriented towards the sustainable development of the territories.

The enhancement of physical, sensory and cultural accessibility and cultural participation constitutes a strategic component of the policy for the use of cultural sites. The main reference for these interventions are the Guidelines for the preparation of the *Plan for the elimination of architectural barriers* (P.E.B.A) in museums, museum complexes, archaeological areas and parks, drawn up in 2018 by the Directorate-General for Museums of MiBACT.

The relaunch of tourism is pursued by investments closely related to the objectives of enhancing cultural heritage and strengthening the physical and cultural accessibility of places and territories. The interventions aim on one hand at implementing the *Strategic Tourism Plan* (PST) 2017-2022, engaging public institutions, operators and stakeholders in jointly improve the sector’s policies, and on the other hand are synergic with the measures adopted by the Government to contain the effects of the Covid-19 emergency.

The planned investments share with the PST their transversal and integrated approach - based on sustainability, innovation and accessibility/physical and cultural permeability - and implement some of its "specific objectives", such as: the "creation of a digital ecosystem of culture and tourism"; the provision of a tourist system of information and value-added services, adapted to local needs; the "qualification of the offer of major attractors and mature tourist destinations, with a view to sustainability"; the "tourism development of emerging destinations, such as cities of art and villages"; to "develop and qualify tourism businesses", strengthening the incentive system for digitalisation and defining a national classification system for both hotel and non-hotel accommodation facilities to meet the need to improve the quality of the accommodation offer and consequently increase the competitiveness of tourist destinations; to "increase the culture of hospitality and develop skills appropriate to the evolution of the market" through training courses along all segments of the training system; the implementation of "strategic projects for mobility for tourism purposes (e.g. national cycle routes, paths, tourist rail services, slow mobility)".

Finally, the investments in the **digital transformation of the culture, cultural heritage and tourism ecosystems** are:

- envisaged in the Strategy for technological innovation and digitalisation of the country 2025, which refers to the creation of new, efficient and simple digital services for the benefit of citizens and businesses, and the creation and support of services for the growth and development of innovation, primarily focused on the sectors of “Made in Italy” (manufacturing, tourism, food, fashion, design, social, digital humanities).
- consistent with the three-year plan for IT in the Public Administration 2020-2022,

including its various technological components and the National Museum System Platform, and with the implementation of specific plans and provisions of the MiBACT (Three-year plan for digitalisation and innovation of museums 2019; various MiBACT Decrees).

- synergic with the recent creation by MiBACT of the Central Institute for the digitalisation of cultural heritage (Digital Library), with the task of elaborating and supervising the implementation of the National Plan for the digitalisation of cultural heritage, currently being prepared.
- aligned with the Strategic Tourism Plan 2017-2022, which includes among its objectives the Digitalisation of the Italian tourism system, aimed at bridging the serious digital divide of national sector operators with respect to the main European counterparts.

3. Description of the reforms and investments of the component

1) Cultural Heritage for next Generation.

Investment 1.1: Text... .

Challenges: In recent years Italy has not invested sufficiently in cultural sector and cultural heritage due to the debt limitations of the public sector with particular reference to the municipal levels. The investment in upgrading cultural heritage sites constitutes a strategic choice for Italy's post Covid recovery. The Plan is aimed at strengthening the system of the great cultural infrastructures of the country, understood as poles of attraction, participation and cultural production; renovation of key heritage sites and buildings in urban centres and rural areas is an opportunity to make them more energy-efficient, less carbon-intensive over their full life-cycle and more sustainable, thus contributing to the European Green Deal²⁷. Renovation of key landmarks can also attract international and national tourism and foster urban regeneration, bringing social, environmental and economic benefits to local communities.

The intervention is fully synergistic with other plans and programs financed with EU and national funds (NOP Culture and Development-FESR 2014-2020, Operational Plan for Culture and Tourism-FSC 2014-2020, Major Cultural Heritage Projects referred to in art.7 of Legislative Decree 83/2014; NOP 21-27, in line with the policy objectives of the proposed EU Regulation and the preliminary strategic guidelines of the Partnership Agreement, will not include similar lines of action) as it is an integral part of a unitary strategy that the MiBACT pursues from different programming periods.

There are no overlaps with these programs, but rather appropriate complementarities,

²⁷COM(2020) 662 final

on the one hand, due to substantial differences in the characteristics of the interventions, although they are all part of the same general strategy, on the other, as other assets and other locations have been intentionally chosen with the aim of ensuring, in the complex of MIBACT programming, the maximum diffusion of the intervention to strengthen the great cultural and tourist-cultural centers.

Objectives: Investments on heritage sites and buildings and natural areas are expected to increase attractiveness for tourists and citizens, injecting a stimulus in the broader economy, including the commercial and construction sectors. As stated in the Commission’s Communication *A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives*²⁸, renovation must respect design, craftsmanship, heritage and public space conservation principles, thus contributing to people’s quality of life and to the sustainable development of our cities and rural areas, in line with the Davos Declaration “Towards a High-quality Baukultur in Europe”. Considering these references, the recovery of cultural heritage is intended at the service of recovery, resilience and greater social inclusion, and converges towards the two flagship initiatives *Power up and Renovate*, in line with the requests of the Commission which invites the MS to include these initiatives in their National Plans for Recovery and Resilience.

The objectives of the interventions are:

- to enhance the offer of cultural services by promoting wider access to culture and participation in cultural activities.
- to exploit the potential of cultural investments for tourism and sustainable development.
- to contribute to direct and indirect job creation and green and digital competences.
- to improve cohesion and social inclusion.
- to reduce the carbon footprint of the conservation chain and progress towards circular economy.
- to increase social resilience and lower the impact the crisis.

In particular, 11 interventions on cultural heritage sites, buildings and natural areas have been selected all over Italy, based on their strategic relevance. The interventions, with few exceptions, are located in the main Italian cities and all share the nature of complex projects where the recovery of cultural heritage assets is the basis of urban regeneration and / or environmental and landscape requalification processes.

The interventions include the Biennale in Venice, the Old Harbour in Trieste, the city Park River in Turin, the European Library of Information and Culture in Milan, the defensive system of the City of Genova, the River Po Park, some components of the Museum systems of Florence and Rome, various areas for “Recovery of Art” (Rome, Alessandria, Piacenza, Caserta, Camerino) as deposits in case of seismic events, a coastal

²⁸COM/2020/662 final

park in Bari, and an auditorium in the old Tobacco factory in Palermo. All sites have been selected for their potential in activating urban or rural regeneration processes.

The selection was made in synergy between MIBACT and Regions-Local Bodies and take based on criteria of complementarity with other national, regional and local programs as well as, in some cases, with the processes of transformation and urban development in progress, in order to ensure greater effectiveness investments of the PNRR, also in terms of ensuring the appropriate completion interventions. It should be noted that the investments concern only public assets / areas; for any operation that, after the investment, involve private components, the traditional public tender procedures will naturally be activated.

Implementation: A series of projects (i.e. the ones in Trieste, Turin, Milan, Genova, Florence and Bari) will be implemented by the municipalities, who will be in charge of finalising the project design, obtaining the required permits, awarding and supervising the works. The municipalities will sign agreements with other key stakeholders involved and organize joint working groups, in order to ensure the progress of the works in the envisaged timeframe.

The project in Venice will instead be implemented by the Foundation of the Biennale, the River Park Po (area that extends over 18 municipalities in Veneto and Emilia Romagna) by the public body responsible for safeguarding and enhancing the Park and the peripheral structures of MIBACT, the museums and archeological sites in Rome by the peripheral structures of MiBACT as well as the Bourbonic parks in Campania (with the exception of Ercolano, implemented by the “Fondazione Ville Vesuviane”), while the “Recovery Art” project will be followed by MiBACT and, for the areas located on ex-military site, by SoGIN (the “Società Gestione Impianti Nucleari”).

The projects are at different stages of development. Around 25% at present have a technical and economic feasibility study, 2 are at preliminary project design stage and one at executive design stage. The time required to finalise the executive project design for most projects is estimated to be around 12-16 months and develops progressively from the second half of 2021 to the end of 2022, while the award of works is expected to require in 3-6 months, allowing completion by mid/end 2026

Target population: Local residents, national and international tourists, cultural and creative enterprises.

Timeline: The timelines of the 11 interventions are very different. The time intervals within which the main implementation phases of the interventions are developed are set out below:

- completion of the design levels: from II semester 2021 to - II semester 2022
- Works and services contract award: from II semester 2022 to - II semester 2023
- completion of works and services: from I semester 2025 to - II semester 2026

Investment 1.2: Digital Strategy and Platforms for Cultural Heritage.

Challenges: Italian cultural sites and museums currently suffer from a digital divide, both in terms of digital infrastructures/systems, as well as in terms of the capacity of their staff. The challenge is to bridge this digital divide by improving the access to cultural resources and digital services, implementing a user-centered design of access points and building skills and competences.

Objectives: The objectives of the proposed investments are the following:

- to facilitate the growth of a complementary market of cultural services for small and medium-sized enterprises and innovative start-ups;
- to facilitate the transfer of R&D innovations into cultural heritage practice;
- to develop the potential of cultural databases and digital collections, both from an edutainment and scientific point of view;
- to ensure the long-term use and accessibility of digital archives and products of digitalisation of cultural heritage;
- to reduce inefficiencies and lower management costs through the rationalisation of information systems (cloud approach), the dematerialisation of paper archives and the digitalisation of deposits.

In particular, the investments will consist in:

Organising, integrating and increasing the digital heritage produced by State archives, libraries, museums and cultural venues;

Developing an infrastructure for the collection, preservation and wider access to these digital resources for citizens and operators, including for use and reuse by cultural and creative enterprises and innovative start-ups and educational purposes;

Creating a portal for the procedures for the protection of cultural heritage, in order to facilitate the delivery of digital services to citizens, enterprises and civil society.

Implementation: The MIBACT will overview and manage the implementation of the project through (i) its Central institute for the Digitalisation of the Cultural Heritage, (ii) its General Directorate for Organisation, (iii) the Central Archive of the State and (iv) the Regional Secretariats, which will manage relations with the Regions. A series of actions will be implemented by third parties (private entities, third sector) through contracts and partnership agreements as well as through tenders.

Costs are distributed as follows:

- National digitalization plan 5.0 mln;
- Digital infrastructure for Culture 90.1 mln;
- Digital Conservation Center 62.8 mln;

- Digital identity system of cultural heritage 17.0 mln;
- Service portals and procedures 10.0 mln;
- Digitization 200.0 mln;
- Complementary services (Service Network) 45.0 mln;
- Training and crowdsourcing 30.0 mln.

Target population: citizens, enterprises, cultural, economic and education operators, cultural and creative enterprises, public administrations.

Timeline: 4Q2021 Release for consultation of the National Plan for the digitization of cultural heritage; 4Q2022 Beginning of digital identity certification of cultural heritage; 4Q2023 Awarding of tenders for contributions to the development of innovative digital services for cultural heritage; 4Q2024 Full functionality of the digital infrastructure of culture; 4Q2025 Doubling of digital resources made available online; 2Q2026 consolidation of Network of complementary services for the digital use of cultural heritage.

Investment 1.3: Removal of physical and cognitive barriers in museums, libraries and archives to enable wider access and participation to culture.

Challenges: The removal of architectural, physical, cognitive and sense-perceptive barriers constitutes a criticality of Italian cultural sites. According to ISTAT in 2018 only 53% of State and non-State museums, monuments, archaeological areas and parks had improved their facilities removing physical barriers. Moreover only 12% of them had addressed perceptive, cultural and cognitive barriers, taking into account all difficulties, deficits and barriers that limit a true cultural experience.

Objectives: The proposed investments have the following objectives:

- to increase and diversify the cultural offer for different types of users, through the creation of innovative and transversal paths aimed at the widest use of Italian cultural sites;
- to guide museums operators in the development of Accessibility plans to remove physical and cognitive barriers in State museums, libraries and archives;
- to implement concrete solutions to remove physical and cognitive barriers in State museums, libraries and archives;
- to collect and provide information about the level of accessibility of State museums, libraries and archives. The availability of preliminary information to visit State cultural sites is, in fact, a critical factor to prepare the visit.

The investment consists in four components:

- drafting of a Strategic Plan for the elimination of sense-perceptive, cultural and cognitive architectural barriers (PEBA) in Italian cultural sites (about 2% of total investment);

- design and implementation of targeted interventions aimed at removing sensorial-perceptive, cultural and cognitive architectural barriers in museums, monumental complexes, archaeological areas and parks, state archives and libraries (about 85% of total investment);
- creation of an information system, aimed at presenting the cultural venues with a view to accessibility, including clear, certain and verified, effective and efficient information for a wide range of audiences, in Italian and EU languages (about 11% of total investment);
- capacity building scheme, training heritage professionals in the use and effective implementation of the measures undertaken (about 2% of total investment)

The investment is primarily focused on the state cultural sites (352 museums, monuments, archaeological areas and parks, 129 archives, 46 libraries) located in the whole country and, for a share equal to about 10% of resources, to regional, provincial, civic or private museums, managed by public entities or non-profit organizations.

Implementation: The intervention is implemented through a public notice issued by MiBACT and addressed to state cultural sites for the presentation of proposals; the identification of non-state institutions will be carried out through calls for tenders. Following the selection of the proposals, the resources will be assigned to sites of culture.

MiBACT will provide constant monitoring of the implementation and will be responsible for monitoring and reporting activities.

Target population: Resident population and tourists

Timeline:

- Identification of cultural sites object of intervention (following notice): Q4 2021
- Drafting of PEBA Q3 2022
- Works contract award: Q2 2023
- Completion of works and other activities: Q2 2026

Investment 1.4: Caput Mundi. Investments on artistic and cultural heritage of Rome.

Challenges: This action aims to define an innovative process of enhancement of the archaeological, cultural and tourist heritage of Rome in the perspective of the next Jubilee of 2025. The planned interventions include integrated cultural paths reaching the peripheral areas of the city, where there are relevant archeological sites along the main streets that came out of Rome, including tombs, catacombs, basilicas, villas and settlements arose. The project represents an international best practice of how the Roman historical, archaeological and cultural heritage could lead the process of requalification of the urban context and give opportunities for an economic development based on new tourist-cultural itineraries.

With the concerned action, a large number of artistic and archeologic sites are expected to be reopened to the public. The perspective of the 2025 Jubilee will ensure the completion of the projects well before the deadline, because the need to reopen the sites during the Jubilee year. The project includes a specific action for the training and of specialized staff to be employed in the management of the new restored sites. This is expected to increase significantly the cultural offer.

The main changes expected are:

- greater and diversified touristic offer through new cognitive paths and new cultural thematic within the city
- requalification of a relevant number of cultural sites which will be reopened to the public;
- processes of reviving Rome's tourism economy through the relevant increase in cultural supply
- creation of new jobs in the tourism sector.

Objectives: The main objectives are:

- significantly increase the number of cultural complexes restored and made usable;
- create valid and qualified tourist-cultural alternatives to the crowded central area;
- allow the training and entry into service of qualified personnel for the tourist management of the restored complexes.

Description of the investment:

In particular, this line of action includes the following investments:

- 1 - Roman Cultural Heritage for EU-Next Generation is aimed at regenerating the cultural and urban heritage, by restoring and re-functionalize a complex of high historical-architectural value of the city of Rome: a) the Aurelian Walls; b) The City of Arts Ex Mattatoio; c) The Park of Colle Oppio; d) the Museum of Roman Civilisation; e) Tevereever; f) The Capitol; g) the Imperial Forum; h) The Celius.
- 2 – I percorsi Giubilari 2025: dalla ‘Roma pagana alla Roma cristiana’. In view of the forthcoming Jubilee of 2025 ecological and cultural paths will be created with interventions of safety, anti-seismic consolidation, restoration of buildings, and their restitution to the public usage. The monuments will be included in Jubilee paths and in this way the most famous itineraries already existing in Rome will be better defined and enriched. The actions is extended to peripheral areas of the city, with the aim of making accessible sites that have not yet been permanently opened to the public.
- 3 – La città condivisa (“Shared City”) project we will act in contexts where participation in the cultural life of the city – understood as an indispensable condition

for a critical and informed citizenship, for social progress and human emancipation – is more difficult. It is intended to encourage the implementation of inclusion projects and increase various skills, involving local communities and public administrations. The multidisciplinary and creativity of young people are encouraged and their potential for innovation in the digital age is enhanced through cultural co-production and co-management of heritage. Some interventions will be useful to renovate public real estate intended for social and cultural services, educational purposes and/or restore public spaces, fountains, gardens and public parks today in degraded conditions. Thematic itineraries will be created to attract tourism in suburban historical and cultural paths. This investment includes interventions on the areas and buildings of large peripheral areas ranging from Via Salaria to Via Appia, including the places of Constantine on Flaminia and Casilina and the eastern outskirts of the city.

- 4 – Mitingodiverde. This action is based on three milestones: environment, integration and cohesion. It aims at restoring the citizens' sense of belonging to the city and at creating spaces for meeting, leisure and public green. Investments will therefore be made in the renovation of identity places, parks, fountains and historical gardens, supporting projects that foresee the active participation of the local communities. To this end, some emblematic places selected, threatened by decline, abandonment and reduction of the original perimeters. The popularity of these sites is linked with the historic city; in this framework the intervention on historical gardens and parks such as Villa Borghese and Villa Pamphili has particular importance, but also the recovery of fragments of gardens and green complexes that constitute a precious part of the city's heritage (Military Hospital of Celio or the slopes of Monte Mario to give an example), in addition to the green areas that go from Rome to the Lazio coast.
- 5 – Roma4.0. This intervention is aimed at offering citizens a new fruition experiences and to operators the ability to respond to an increasingly articulated and differentiated demand. It is part of the overall marketing and management strategy and is an indispensable tool for guiding, encouraging and increasing the attractiveness of Rome. The challenges to be addressed are, inter alia: bridging the digital divide in access to cultural resources and digital services; simplifying the relationship of Roma Capitale with citizens and businesses, providing online services related to the use of cultural heritage; increasing the use of digital technologies and in particular of augmented reality and virtual reality to enhance the large and small archaeological sites of the city; promoting the creation of a competitive market of complementary services in the cultural sector, for small and medium-sized enterprises and innovative start-ups.
- 6 – Amanotesa. The focus of the planned investments concerns: social inclusion, aggregation and intercultural dialogue to reduce the isolation and vulnerability of the weakest part of the Italian population; the cultural and social integration of people of all ages, ethnicity, gender and levels of education through museum,

librarian and cultural heritage; the elimination of architectural, sense-perceptive, cultural, cognitive and communication barriers in places of culture; the involvement of young operators of cultural and tourist heritage; the increase in institutional communication.

Implementation: The interventions involve the signing of a Programme Agreement between MIBACT, as responsible entity, the Municipality of Rome Capital City, the Ministry of Interior, the Diocese of Rome and the Ministro of Economy and Finance. For most of them the design is ongoing. All actions will be carried out in compliance with current rules on public procurement.

Timeline: Investments are multiple and diversified with differentiated timelines:

1. Roman Cultural Heritage for EU-Next Generation: by Q1 2026
2. I percorsi Giubilari 2025: dalla ‘Roma pagana alla Roma cristiana’: by Q1 2025
3. La città condivisa (“Shared City”): by Q2 2026
4. Mitingodiverde: by Q1 2026
5. Roma 4.0 Q4 2024
6. Amanotesa: by Q2 2026

Target population: - Resident population, tourists, experts and schools.

Total investment cost: 500 million euros

Investment 1.5: Upgrade of a strategic production hub for the Cinema Industry (Cinecittà).

Challenges: Current infrastructural and production capacity of the main Cinema production hub in Italy (Cinecittà Studios in Rome) do not meet the demand of large film productions. In 2018/2019, it was not possible to accommodate 70% of international demand due to the unavailability and inadequacy (in terms of technological innovation and size) of the studios: this resulted in an economic loss of approximately 25 million Euro. The absence of large Stages (over 2000 square meters) and already equipped Stages with the latest production technologies (virtual stage and underwater shooting stage, motion control) has pushed potential customers towards competing studios (e.g. Pinewood, Babelsberg, Nu Boyana).

Objectives: The investment aims at renewing the infrastructure and enlarging the area at disposal in order to attract European and other international film and television productions. By upgrading the film studios and improving the qualitative and quantitative level of the production offer, the investments aim to increase the attractiveness of Cinecittà for large national, European and international productions and to be able to compete with major international competitors. The project will increase stages availability by 80%, which is expected to lead to an increase of the turnover of about 90% and of

the employment in the related industries.

In particular, the investments include the following:

A1. The construction of new studios, recovery of existing studios, investments in new digital technologies and systems, services.

A2. The construction of 6 new high-tech theatres with annexes and services and related systems and roads on an area of 473,000 square meters;

B. Innovative technological infrastructural investments to enhance the production and training activities of the “Experimental Center of Cinematography” and an enhancement of the Cineteca heritage: new tools for audiovisual production, internationalisation of the National School of Cinema and cultural exchanges between the member countries of the European Union; creation of a photochemical laboratory for the preservation of the analogue collections of the National Film Archive and their robotic migration; conservation and safeguarding of the enormous historical and audiovisual artistic heritage of the National Film Archive and its migration to digital platforms.

C. Development and implementation of the national strategy for audiovisual training in 3 professional macro-areas: organisational/managerial; creative/artistic; technical workers (current professional skills required by this sector today come from non-EU countries).

Considering the energy-intensive capacity of the film and audiovisual industry, great attention will be dedicated to identifying eco-sustainable techniques and technologies for controlling the environmental impact in all phases of the production cycle, with specific reference to plant and technological solutions for the lighting, mobility, construction of film sets and audiovisual products. This includes the improvement of energy efficiency of Cinema production in Cinecittà, with new generation power plants, integrated with photovoltaic panels, in order to allow a significant energy saving, estimated at 70% of current needs.

Implementation: MIBACT – Direzione Generale Cinema e Audiovisivo (General Directorate for Cinema and Audiovisual) is responsible for the implementation of the project

With reference to components A1 and A2, the project will be implemented according to the canons of the building regulations and Legislative Decree 380/2001, that is, with a building permit issued by Comune di Roma (Municipality of Rome) for construction and according to the reference regulations for plants.

With reference to component B, the project will be implemented through an executive plan that organizes the implementation of the individual interventions into macro-activities:

Activity 1: design, planning and selection of technologies and layouts of the spaces for the virtual set, the photochemical laboratory and the robotic migration of the audiovisual

heritage;

Activity 2: design of intangible components for the creation of services related to the e-learning platform, the “CSC interactive” app and forms of valorisation of the CSC archive material;

Activity 3: planning of training initiatives that will be carried out both within the organization and in the educational offer that the CSC, thanks to these interventions, will be able to offer.

With reference to component C, the project includes the following implementation phases:

- analysis and monitoring of training needs, planning and scheduling of activities;
- first test on specific training targets and start of communication and dissemination activities throughout the national territory (this activity continues also in subsequent years);
- analysis of the results obtained with the first test and launch of a new experimentation on further targets;
- implementation of courses and training activities for the typologies of recipients identified (both with respect to the needs of the supply chain and with respect to that of professionals);
- completion of the actions and measurement of the results achieved.

Target population: Operators and enterprises in the cinema and audio-visual sector, professionals and students.

Timeline: Investments are multiple and diversified with differentiated timelines.

- Component A1: consists of 23 interventions. 12 interventions will be completed by 2024; 4 interventions by 2025; 7 interventions by 2026.
- Component A2: by 2026
- Component B: by 2024
- Component C: implementation of training activities from 2024 to 2026

2) Small tourist and cultural sites, rural areas and urban peripheries.

Investment 2.1: Attractiveness of Small Historic Towns

Challenges: In regular times Italy’s key touristic attractions in the main cities of art have suffered from over-tourism, worsening the quality of the touristic and cultural experience. In this respect the cultural heritage, history, art and traditions of many small Italian historic towns (“Borghi”) offers an enormous potential for sustainable tourism, helping to redistribute the economic benefits over the territory. These are often fragile contexts from a demographic and social point of view, characterised by high environmental risks, wors-

ened today by the effects of the Covid pandemic. The implementation of rehabilitation of public spaces, the restoration of the historical-architectural heritage, the activation of entrepreneurial and commercial initiatives, including new accommodation solutions such as widespread hospitality and hotel, can help revitalising the socio-economic fabric of these places, contrasting the depopulation and favouring the preservation of their remarkable cultural landscape and traditions.

The “Borghi” National Plan, divided into integrated local projects focused on tourism and culture, is part of the national policies for rebalancing territorial gaps, with particular reference to internal areas and is therefore consistent with multiple areas of national/regional programming towards which it develops suitable complementarities. In fact, with respect to the National Strategy for Internal Areas and the cohesion programs, also with reference to “Policy Objective 5” of programming period 2021-2027, the Borghi National Plan envisages sector-focused economic revitalization strategies (tourism, culture) and does not intervene on large-scale territorial areas but focuses the investment on small towns / villages. It should be noted that the MIBACT in the framework of policies on sustainable tourism, implemented in line with the Strategic Tourism Plan (STP) 2017-2022, has already launched a first edition of the "Bando Borghi" (Borghi Call), financed with national cohesion funds and addressed only to the less developed regions, which has collected a large number of proposals only partially financed due to the insufficient availability of resources.

Objectives:

The main objectives of the proposed project are to:

- orient tourism towards a more sustainable and widespread model, easing the anthropic pressure on major national destinations;
- create new opportunities for the economic development of fragile areas, affected by a hard to stop phenomenon of depopulation, also in light of new needs that have arisen as a result of the crisis generated by the pandemic;
- enhance accommodation facilities, services, small infrastructures and cultural activities to support the touristic-cultural use of the territories concerned;
- relaunch commercial, agri-food and craft activities, enhancing local products, knowledge and techniques.

The “Borghi” National Plan is a plan to support economic and social development in disadvantaged areas based on the tourist and cultural revival of small towns (villages).

Diversified actions are planned:

- Strengthening the offer of accommodation and services in support of tourist-cultural use, through the recovery of the historical heritage, favoring interventions that pursue energy saving and the use of alternative energy;
- the requalification of open public spaces through interventions for the elimination of architectural barriers, urban decor, etc.

- the creation of cycle and / or pedestrian paths for the interconnection and use of places of tourist-cultural interest;
- the creation and promotion of cultural and thematic itineraries, historical itineraries and guided tours;
- the creation of information and communication services for reception (info point, visitor center, etc.) also supporting the start-up of activities;
- the expansion of the cultural offer through the creation of cultural and artistic activities;
- the support of tourist, commercial, agri-food and artisan activities, enhancing local products, knowledge and techniques for the revival of local economies.

The Plan is expected to allocate:

- 850 mln euros for the recovery and requalification of the historical heritage and public spaces and for the construction of small service infrastructures: it is estimated to intervene on 283 Borghi, assuming an average contribution for each Borgo of about 3 mln euros.

- € 150 million for business support; assuming an average business contribution of 40,000 euros the support is estimated to reach around 3,750 enterprises.

Implementation: The definition and implementation of the Plan is based on the coordination and exchange between MiBACT, Regions, ANCI, Strategia Aree Interne (Internal Areas Strategy) which start from the early stages of the activities aimed primarily at sharing any preliminary choices, guided by complementary objectives with other programs, about the territorial areas targeted by the Plan as well as the public notice scheme that will be addressed to small municipalities as beneficiaries.

The selection of the Borghi in which to finance the tourism and cultural enhancement project will be made on the basis of a) appropriate territorial, economic and social criteria (statistical indicators) b) the ability of the project presented to impact on tourist attractiveness and to the increase the cultural participation of the resident population. In particular, the indicators will concern (preliminary indication): the consistency of the cultural and environmental heritage; the consistency of tourist and cultural use (tourist flows, museum visitors, etc.), the consistency of the tourist offer (hotels and other hotels, B & Bs, rooms and rental accommodation, etc.); the demographic trend of the municipality; the degree of cultural participation of the population; the consistency of cultural, creative and tourism enterprises (profit and non-profit) and related employees.

MIBACT is responsible for coordinating and managing the intervention; the resources will be assigned to public implementing bodies (municipality, peripheral structures of MIBACT, other public institutions) envisaged by the selected projects and to private subjects (companies, associations, etc.) selected through public tender procedures.

Target population: Public administration, firms, cultural and tourism operators.

Timeline: The intervention will be implemented according to the following phases.

2021: identification of the priority territorial areas (on the basis of statistical indicators); exchanges with regional and local administrations and other competent public and private institutions; publication by MiBACT of a call for proposals;

2022: evaluation of the proposals; signing of agreements / protocols with selected municipalities and signing of implementing regulations with beneficiaries;

2023: launch of public works; launch of a help desk for the collection of projects (by enterprises and non-profit organisations), evaluation and signing of agreements with private entities;

1st semester 2026: conclusion of activities.

As regards the implementation timelines, it is believed that the regulatory deadlines can be easily met as the complexities deriving from the concertation phases are offset by the characteristics of the projects, which are small and easy to implement.

Investment 2.2: Protection and enhancement of rural architecture.

Challenges: Traditionally, public investments in the cultural sector are aimed primarily at the restoration and enhancement of those assets that constitute the excellence of the national heritage which, however, is made up of a dense and continuous “fabric” of historical-architectural evidence whose deterioration and loss would inexorably compromise the integrity and identity of cultural landscapes. Many rural building structures, as well as agricultural assets, have suffered, over time, a progressive abandonment and degradation and tampering with the typological and construction characteristics and the surrounding open spaces. The proposed intervention is configured as an initiative that by territorial diffusion can generate important results in terms of safeguarding and / or restoring the landscape quality of the national territory, can significantly affect the environment by improving the energy efficiency of buildings and integrating, where possible and compatible, renewable sources. within an integrated recovery project, enhancing agro-forestry-pastoral crops of historical, characterized by low external energy inputs and by an excellent CO2 absorption capacity.

The cultural heritage present in rural and marginal areas is frequently characterized by a critical state of conservation that compromises its accessibility. The intervention gives back an underutilized heritage to the community and to public use, favouring the restoration of activities related to the agricultural world and the creation of services for the benefit of cultural and tourist use, such as small local museums connected to the rural world which play an important role in local communities and in particular in the education and training courses of the younger generations. Therefore, the intervention has effects in terms of competitiveness as it is connected to specific production areas

linked to the agricultural world; at the same time, the intervention is consistent with the tourism revitalization policy aimed at building alternative "destinations" that favor sustainable tourism models in inland areas and small towns.

The crisis following the spread of the Covid 19 epidemic has hit the economies of rural and marginal areas severely. The intervention constitutes an effective counter-cyclical measure since significantly activates the construction sector, skilled workers and a considerable number of professionals, generating employment both in the construction phase and in the perspective of continuity of maintenance actions.

Objectives: This proposal is aimed at giving impetus to a vast and systematic process of identification, conservation and enhancement of an articulated range of historical rural buildings and agricultural systems closely integrated with local development processes and directly supporting diversification actions on non-agricultural activities - and, among these, cultural and tourist activities - pursued by rural development policies.

The main objectives of the proposed project are to:

- Preserve the landscape values of historical rural landscapes through the protection and enhancement of the cultural heritage of immaterial material;
- Promote the continuity of local productions, specifically those that make use of traditional agricultural practices as they are crucial for the construction and maintenance of the landscapes associated with them;
- Promote the creation of activities linked to forms of sustainable tourist use and local traditions and culture.

In coordination with the Italian Ministry of Agricultural, Food and Forestry Policies, it is planned to support:

- through the definition of multi-year regional programs, the implementation of conservative rehabilitation and functional recovery interventions of agricultural settlements, buildings, artifacts or historic rural buildings, agricultural crops of historical interest and typical elements of architecture (also not subject to a restriction provision) and the rural landscape, ensuring the protection of the surrounding areas, the preservation of traditional types and methods of cultivation and encouraging the start-up and recovery of activities compatible with typical cultural traditions. Within the framework of the techniques adopted for the restoration and structural, functional and plant adaptation interventions, eco-compatible solutions and the use of alternative energy sources will be favoured;
- through the organization of existing data in the national and regional information systems, the updating and implementation of an information system dedicated to the types of rural architecture, interoperable with other systems;
- in the context of the National Register of Historic Rural Landscapes, established at the MiPAAF, the development and implementation of a section dedicated to rural architecture that can represent a place for collecting knowledge, for methodological

and technical-scientific study active participation of operators and citizens.

Assuming an average contribution of 150-180,000 euros/intervention, it is estimated that approximately 2,600-3,100 interventions will be carried out (UNESCO / FAO GIAHS sites / Rural landscapes recorded in the National Register / tourist-cultural itineraries and religious paths involved; buildings recovered for tourist functions; buildings recovered for cultural and social services; recovered buildings for farm activities; recovered agricultural crops of historical interest).

Implementation: The support for investments, which aim at the recovery and enhancement of the rural architectural heritage, owned or for various reasons held by both public and private entities, will privilege territorial areas of high landscape value (assets located in areas of landscape interest protected by law art.142 of Legislative Decree no. 42/2004 or of considerable public interest referred to in art.136 of the same Legislative Decree), the landscapes subject to recognition by UNESCO, FAO GIAHS and the landscapes registered in the National Register of Landscapes historical rural areas, established at the MiPAAF as well as the synergies with other candidate proposals for the PNRR such as the National Plan for villages, the Plan for slow tourism and other plans / projects of a territorial nature supported by the MiBACT programming, in particular those concerning tourist itineraries cultural and religious paths. In addition, area projects will be favoured that provide for aggregate applications that allow the redevelopment objectives of portions of the territory to be achieved more effectively.

Target population: Public and private entities who hold the ownership or use of assets (beneficiaries) for various reasons; operators in the sectors of tourism, crafts, agriculture, etc.; resident population, tourists (indirect recipients).

Timeline:

- By the first half of 2021: development of the consultation phase MiBACT, MiPAAF, Regions and Autonomous Provinces and the signing of an Agreement defining the phases and operating procedures of the intervention; definition of executive projects relating to centralized actions relating to the information system and the integration of functions relating to rural architecture within the National Register of Historic Rural Landscapes.
- By the second half of 2021: Start of the implementation phase of the centralized actions
- By the first half of 2022: Approval by MiBACT and MiPAAF of the regional intervention programs
- By the third quarter of 2022: Launch of the public tender procedure for the distribution of contributions to private entities and negotiation procedures for the selection of publicly owned interventions
- By the first quarter of 2023: Granting of grants to beneficiaries
- By the second half of 2023: Assumption of commitments and start of works
- By the first quarter of 2026: Conclusion of the intervention

Investment 2.3: Programs to enhance the identity of places, parks and historic gardens, participatory regeneration of urban peripheries.

Challenges: This sheet is about types of projects which, despite their diversity, focus on urban requalification and, therefore, on improving the quality of life of the population. It aims at the rehabilitation of the urban peripheries and, at the same time, the renewal of the concept of historic park and garden as center of “public beauty” for the population.

For peripheries, the action will support urban regeneration projects based on participatory culture in peripheral urban areas, with a focus on local communities, to create and enhance the offer of cultural and creative activities, in partnership with public and private stakeholders, civil society, foundations and / or cultural associations, universities, research centers, non-profit higher education institutes, enterprises and professionals.

With reference to historic parks and gardens, the programme will focus on the requalification of an important, though not exhaustive, part of the approximately 5000 sites present in Italy with an extensive action plan to acquire and spread knowledge about these areas and support their rehabilitation, ensuring their correct maintenance, management and public use.

Objectives:

For the urban peripheries:

- To increase and diversify the cultural offer through the promotion of innovative cultural projects that enhance the role of cultural, institutional and social leaders in areas not normally reached by this type of activity;
- to stimulate the participation of inhabitants of neighborhoods characterised by social and economic marginalisation and engage them in setting up and benefitting of innovative projects and cultural and creative activities;
- to improve cultural services and functions in the selected neighborhoods, through the opening, animation and use of cultural places (schools, libraries, community hubs) by their inhabitants;
- to create opportunities for the social and economic improvement of the selected neighborhoods, also by supporting innovative forms of cultural and creative enterprises in the neighborhood / urban communities, creating collaborative dynamics between residents, public institutions, local private entities, knowledge institutions, civil society organised, artists and creatives and / or other professionals.

For the historic park and garden:

- to equip and make public green spaces accessible, with impacts on urban attractiveness for residents and tourists and on improving environmental quality (e.g. air quality);
- to increase of the social and economic resilience and mitigation of the impact of the

crisis, as the intervention will involve companies from different sectors (construction, horticulture, etc.), skilled workers, professionals and multidisciplinary skills;

- to increase accessibility for all segments of the population to safe open-air resources for social life, with limited risks of spreading the COVID virus.
- to increase skills and competences for the management and maintenance of assets through the creation of training courses for the acquisition of specific and multidisciplinary qualifications.

The action aimed at the urban peripheries is implemented through a public notice addressed to the municipal administrations (provincial capital municipalities) in whose territories there are complex neighborhoods, in particular because cultural and educational reasons, identified through specific criteria and requirements, so that they present proposals for culturally based urban regeneration by local partnerships made up of public and private stakeholders mainly engaged in the cultural field and rooted in the local territories (university and school institutions, associations, foundations, organizations, committees).

The notice is aimed at supporting the creation and strengthening of the offer of cultural and creative activities with projects aimed at places of culture (museums, archives, archaeological areas also not open to the public), schools for the implementation of extra-didactic activities, libraries and cultural centers to finance projects aiming at making these structures hub for innovative cultural and creative activities. For these activities, it is also planned to carry out requalification interventions of public real estate already destined for social, cultural educational services and / or degraded and / or disused that are intended to be repurposed for socio-cultural activities for which it is possible to demonstrate the managerial sustainability of the initiative.

Only 2000 villas, parks and historic gardens under protection out of about 5000, are now regularly registered (and only 1/3 already recorded). A broad action plan is therefore necessary to improve the knowledge base and support the recovery of Italian historic parks and gardens, ensuring their proper maintenance, management and public use, also through restoration, requalification and enhancement. The intervention will start from censusing, cataloging and digitizing the assets, completing the ongoing census. Subsequently, the restoration, requalification and enhancement of about 95 historic parks and gardens (public and private) will be carried out. A training plan is also provided for operators in the sector where specialized and interdisciplinary skills are required.

Particular attention will be paid, because of their cultural and social relevance and importance (in terms of location and extension), to the Park and the Real Bosco di Capodimonte, the Park of the Royal Palace of Caserta and the areas of Villa Favorita in Herculaneum.

Implementation:

(i) Sites of Identity, peripheral urban Areas

The project approach is interdisciplinary and multilevel. It is implemented through the coordination of public and private administrations and institutions and in dialogue with the dense network of stakeholders in the area: public and private actors, organised social sector, foundations and / or associations cultural centres, Universities, research centres, non-profit advanced training institutes, businesses and professionals.

The initiative unfolds along the following main phases:

- 2021: Launch of the call by MiBACT (DG Contemporary Creativity) addressed to municipal administrations for the submission of preliminary projects prepared by local partnerships; evaluation and selection of proposals for financing;
- 1st semester 2022: Co-design of the initiatives supported by the call on the basis of an analysis of needs and resources (e.g. assets, skills, professionalism) and definition of the content of the "agreements" between the municipal administrations, local communities (public / private / third sector organisations); local offices of MiBACT (places of culture, research institutes, regional secretariats) will carry out accompanying and tutoring functions and, where appropriate, be partner of the initiatives. Signing of "agreements" between administrations and "active citizens"; implementation of initiatives and support for the creation of social, cultural and community enterprises that will ensure the sustainability of actions.
- 1st quarter of 2023: completion of planning and assignment of works and services;
- 2nd semester 2023: start of works, activities and services;
- 1st semester 2026: conclusion of activities.

(ii) Parks and historical Gardens

MiBACT (with the support of a technical-scientific coordination structure) will immediately select a first group of historic gardens and parks for interventions to be launched on 2021, while a second group of historical parks and gardens will be selected via a public call.

Phase 1 (to be completed by 2021):

- setting up the governance of the programme of interventions and technical-scientific coordination group (MiBACT, University, ANCI, sectorial organisations);
- identification of the first nucleus of historic state parks and gardens (5-7) - MiBACT decree for admission to financing and agreements with the beneficiary (MiBACT local structures);
- start of the census and recording of key data to be completed by 2023;
- Preparation of the training program and agreements with MUR, Regions, Schools;
- Publication of a public call for the selection of the second round of interventions of historical gardens-parks.

Phase 2 (2022-2026):

- evaluation of the applications received and admission decree for financing the selected interventions;

- Agreements with the beneficiaries;
- Tender procedures (by the implementing bodies) for the award of works;
- Realization of the works.

The management of both the projects will be supported by local authorities, for the action about urban peripheries, and by MiBACT and by local authorities, as well as by private stakeholders who will receive financing for the parks.

Target population: Local authorities, public institutions, non-profit private actors, resident population, tourists.

Timeline: 2026Q3

Investment 2.4: Seismic safety in places of worship and FEC heritage restoration.

Challenges: The intervention involves two components relating i)) the anti-seismic safety of places of worship and ii) the restoration of the FEC heritage under the responsibility of the Ministry of the Interior.

The earthquakes that have hit Italy in the last 25 years have highlighted the considerable fragility of historic buildings in the face of natural events. The lack in adequate preventive actions has resulted in considerable damage to cultural heritage over the years, as well as an enormous waste of economic resources for post-earthquake reconstruction interventions. It is therefore necessary to heal the still open wounds and to prepare a working methodology set for the verification of seismic vulnerability of the buildings that house our immense heritage and which are often themselves an integral part of it, avoiding interventions carried out in the emergency phase that often produce an aggravation the damage to the assets itself.

We now have an adequate technical-legal instrumentation that will allow us to act quickly on all cases widespread in Italy. It is therefore time to capitalize on the experience gained in this sector.

Objectives:

- Requalification of churches, towers / bell towers and, as a consequence, of the urban contexts gravitating around them through the improvement, including energy, of the structures targeted by the intervention;
- Restitution to the populations of monuments particularly representative of the local identity thanks to dynamics of re-appropriation in the communities involved, integration and involvement of the youth population through the relaunch of the sense of belonging to the community through awareness-raising and information actions on aspects related to civil well-being, protection environmental, cultural heritage.
- Triggering of processes to relaunch the economy, including local ones, thanks to the

support of highly specialized workers in the sector to unemployed youth populations, the increase in skills for the management and maintenance of assets, increase in the attractiveness of the territories for quality cultural tourism.

At the institutional level, MiBACT has adopted, in last few years, some initiatives aimed at defining and financing preventive anti-seismic interventions of architectural assets, however a large massive plan of anti-seismic preventive interventions has never been implemented that would definitively intervene on a wide category of assets to significantly reduce the seismic risk and avoid the enormous investment necessary for the restoration after the disaster, as well as the permanent loss of many of them, as unfortunately happens after every earthquake.

It is therefore considered necessary to propose an extraordinary anti-seismic prevention program on two particular typologies of monumental assets, churches and bell towers / towers that constitute the distinctive sign of entire communities that around these monuments have been recognized and strengthened in the key moments of their millenary history.

This program aims:

- on the one hand, to restore existing damage and to secure the cultural heritage (contents and containers)
- on the other hand, to put in place a plan in order to act preventively to prevent natural events, even of low intensity, from generating damage. relevant to cultural heritage.

It is believed to be able to intervene on a total of over 200 complexes (at least 150 churches and over 70 slender structures - towers and bell towers). The economic estimate of the request is based on the in-depth knowledge of the subject gained by the Administration in these difficult years. The planned monitoring action, which will be conducted in parallel, also implements the monitoring plan already in progress.

Implementation:

The program plans a differentiated timing, starting to carry out the interventions on the assets which, from an initial multifactorial screening, are emerging for seismic risk. At the same time, the vulnerability and risk filing plan, partly already started, and the implementation of the monitoring plan must be carried out. However, it is assumed that an important number of cultural complexes will be secured and adapted by implementing a typological strategy based on the nature of the asset on which the intervention will be carried out.

- Continuation of the filing on the conservation status of the Assets (during 2021)
- At the same time start of the interventions on the assets already mapped (2021-2025)
- Continuation of prevention and recovery interventions on assets progressively registered (2022-2026).

MiBACT and Ministry of Interior will be the beneficiaries and responsible for implementation. However, it will also be necessary to involve the other institutional and proprietary subjects (Regions, Local Bodies, Ecclesiastical Bodies) to set up management structures dedicated to the project to support the ministerial offices and cooperating with other implementing bodies.

Target population: Curies and other legally recognized ecclesiastical bodies, but also Regions, Local Authorities and, above all, Populations and tourists.

Timeline: 2026Q3

3) Tourism and culture 4.0.

Investment 3.1: National Training Center for tourism operators.

Challenges: In the coming years, the tourism sector will continue to change significantly due to the impact of technology, digitization and the need to revise consumption patterns reducing the carbon footprint of the sector. This will require not only the acquisition of new digital, green and social skills, but also of life-long education and continuous re-training and up-skilling of the workforce. Moreover, the pandemic has changed the perspective of tourism organizations, by demanding more flexibility. The tourism training project promotes quality professional training through the creation of a national structure for higher education and the training of personnel involved in tourism activities. The project will build on the results of the Blueprint for Sectorial Cooperation on Skills for Tourism .

The project aims to improve the institutional formative offer in the tourism sector through the review of the programs of formation and the definition of homogeneous professional profiles shared on the entire national territory (with particular reference to the definition of qualifications and certification of skills). By doing so it will be possible to increase and homogenize the quality of the tourist offer not only at company level, but on the articulation of the tourist ecosystem, favoring the creation of a system of high Italian *hôtellerie* (Hospitality Industry).

The added value of a high-level public training institution is that it does not target only those who come from tourist vocational training courses, but also professionals among the top management and those who already work in the sector. In this way it will be possible to accelerate the adaptation of skills and capabilities to the development of digital technologies, to increase the relational skills with customers and to offer the necessary tools to manage, with adequate organizational responses, the exogenous changes that can affect the sector.

The training programmes are defined by the MiBACT in consultation with the Regions

and other competent institutions (e.g. MiUR) in order to ensure homogeneity of the types and levels of training offered at the national level.

The provision of training for the tourism sector is aimed not only at people already involved in touristic activities, but also at the unemployed, non-working and inactive population in order to support and stabilise the growth of jobs in the sector.

The High Education School will be a permanent structure. Its purpose will be to promote systematic action to update the professional figures in the sector by supporting levels and quality of services in line with the increasingly high market needs. Therefore, at the end of the project the School will be integrated into the National Training System that will bear the related expenses.

Objectives:

- to create a national structure for higher education and training of personnel involved in tourism activities;
- to strengthen the training offerings for the tourism sector, both in relation to institutional training in schools and with higher education courses, and in relation to training workers in the sector, the unemployed and the not-working;
- to define training programs and contents (also in agreement with the Regions) shared and unified at the national level, establishing the minimum quality criteria of the training offerings;
- to contribute to the definition of recognized professional skills standards at the national level for the establishment of training actions aimed at workers in the sector and intended for the growth of professional and relational skills;
- to improve the quality of the services offered by the tourism sector;
- to reduce the percentage of operators with little or no specialist professional qualification, upskill the workforce and identify a path for the recognition and certification of professional competences needed to work in the tourism sector.

Implementation:

The proposal will be implemented according to the following phases:

(i) Setting up a higher education structure in the field of tourism.

- By Mid 2021: Identification of two premises for the education structure; design of training programs for students and managers in the tourism sector; start-up of planning and adaptation of spaces, technological infrastructures for the operation of the Training School and identification of non-teaching staff for the management of the Higher Education School; preparation and publication of a public notice for the adaptation of spaces and completion of the definition of training programs and identification of teaching staff;
- December 2021-July 2022: Execution of the work;

- July-September 2022 - Completion of the work, identification of the teaching staff and training staff and start-up of promotion and dissemination activities of the School's activities.
- November 2022: Beginning of the training activities.

(ii) National plan for training and professional updating in the tourism sector

- By Mid 2021: Institutional consultations with the Regions for the definition of the necessary professional skills and initiation of dialogue with the main stakeholders in the sector;
- June-September 2021: Preparation and publication of a public notice at the national level for the identification of the most suitable structures to provide the required training services. Preparation of a public notice addressed to companies in the sector and to the unemployed to be distributed at the territorial level according to the criteria shared with the Regions;
- December 2021: Identification of the bodies in charge of the training activities, according to the programs, procedures and criteria identified, and publication of the list of individuals in charge of providing training services;
- February 2022 until the completion of the intervention: Beginning of the training activities;
- March 2022: Completion of the consultation and sharing activities phase with the Regions. Preparation and approval of legislative and regulatory texts relating to the definition of competences and certification of the same homogenised and recognised at national level.
- September-December 2022: Adoption at regional and national level of shared rules and regulations.

Target population: staff employed in tourist accommodation and training, sector stakeholders, Regions, State Property Agency (for the possible identification and provision of suitable spaces for the establishment of the Higher Education School).

Timeline: 2026Q4.

Investment 3.2: Capacity building for culture operators to manage the digital and green transition.

Challenges:

The entire value chain of the cultural and creative sectors has been heavily affected by the pandemic. The sectors need new approaches to foster the resumption of cultural production and improve their sustainability. The strong push towards digitalisation induced led to a massive use of digital platforms as a way to offer cultural content. But unfortunately cultural operators lack the necessary skills and experience (and often even the

equipment) to make the best use of those opportunities and find a sustainable revenue model for their “innovative” cultural offer. Moreover, there is lack of capacity of make the best use of new technologies and data analysis (including through AI) for audience development purposes.

There is also need to improve the ecosystem in which the cultural and creative sectors operate, correcting the weaknesses of the cultural and creative sectors, characterised by a high fragmentation and “silos approaches”, small scale of the enterprises, by encouraging cross-sectoriality, networking and cooperation, learning lessons from European good practices, also by fostering the digital dimension throughout the entire value chain.

But the increase in cultural participation cannot be promoted to the detriment of the climate and the environment. Cultural events, exhibitions, festivals, cultural reviews, musical events or fashion generate a significant environmental impact, in terms of greenhouse gas production and consumption of natural and energy resources. At the same time culture can contribute to the green transition, by stimulating suppliers (businesses and cultural and creative organisations), clients (public administrations and / or public cultural institutions and private) and millions of users whose behaviour, suitably oriented, can contribute to sustainable growth and climate action, as highlighted by the New European Bauhaus initiative launched by the European Commission as part of the Green Deal.

Objectives:

The general objective of the investment is to support the recovery and relaunch of the cultural and creative sectors. The specific objectives of the actions are:

- A - Support the resumption of cultural activities by encouraging innovation and the use of digital technology throughout the value chain. The planned actions will support the capacity and action of cultural operators to implement innovative approaches, also via digital means, and grow their managerial and economic skills.

- B - Foster the green approach throughout the cultural and creative supply chain. The planned actions will encourage the green approach throughout the supply chain, by reducing the ecological footprint of cultural production and participation and promoting innovation and inclusive eco-design, in a circular economy key, to orient the public towards more responsible environmental behaviours.

Action A 1 - Interventions to improve the ecosystem in which the cultural and creative sectors operate by encouraging cooperation between cultural operators and organisations and facilitating their upskill and reskill.

The action will support (co-financing) existing networks and organisations, operating in the cultural and creative sectors (public and private), selected on the basis of their proved capacity with the aim of overcoming the extreme fragmentation of cultural and creative

sectors, which has constituted an element of fragility during the pandemic. The focus will be on improving the capacity of operators to promote innovation through digital training and business management, also by promoting the exchange of good practices and peer-learning.

Action A II - Support to the cultural and creative sectors for innovation and digital transition along the entire value chain (production, co-production, management, distribution and meeting with the public) towards new models of sustainability.

The action will support operators or organisations to implement activities that make use of new technologies and digital technology aimed at: Creation of new products for live and online circulation with particular attention to reaching to new audiences in deprived social contexts and internal areas; Ensuring an economic return to cultural offer while safeguarding intellectual property; Promote co-production, cross-border cooperation and international circulation, especially in the European Union; Culture-led regeneration processes, also through the enhancement of traditional skills in innovative contexts; Actions to diversify and improve the quality of the offer and better interact with the public.

Action B I - - Promote the reduction of the ecological footprint of cultural events

The action to reduce the ecological footprint of exhibitions, festivals, cultural events, musical events, and activities and processes such as those of conservation and restoration, minimising the production of greenhouse gases and the consumption of natural and energy resources. It will promote the inclusion of social and environmental criteria in public procurement policies in cultural events funded, promoted or organised by public bodies, orienting them towards environmental sustainability, thus steering the supply chain towards eco-innovation of products and services. It will build on the results of the LIFE GreenFEST project "Green Festivals and Events through Sustainable Tenders" which has developed Minimum Environmental Criteria for cultural events: exhibitions , festivals, cultural reviews, musical events).

Action B II - Promote innovation and inclusive eco-design, also in terms of circular economy and orient the public towards more responsible behaviour towards the environment and climate.

The action fosters the adoption of an ecological approach the creative/design sector, combined with the principles of Design for All, in order to ensure use and usability for all, regardless of age, capacity and / or social condition. The cultural and creative sectors will be encouraged to contribute to climate action, combining design and sustainability for the strategic rethinking of more responsible lifestyles and behaviours towards nature and the environment, thus contributing to the New European Bauhaus launched by European Commission under the Green Deal.

Implementation: The implementation will be supervised by the MiBACT and will involve the Ministry of Economic Development (MISE) as well as Regional and local

authorities, cultural hubs, cultural organisations and third sector entities.

Target population: Cultural and creative operators and organisations, cultural networks, creative hubs, cultural districts, Fablabs, creative spaces, third sector associations operating in the cultural field, museums, foundations training centers in the cultural and creative sector, schools and universities (for digital literacy and training programs), non-profit spaces, independent spaces, artist run spaces, etc.), artists and creatives.

Timeline:

The investment is organised along different lines of action:

Support the resumption of cultural activities by encouraging innovation and the use of digital technology throughout the value chain (Actions AI and AII)

- 4th quarter 2021: Call for the identification of organisations and networks to carry on training and peer-learning activities and support cultural and creative organisations in networking, cooperation and innovative actions at large scale;
- 1st quarter 2022: Call for support to innovative cultural projects;
- 2022-2023: Training and peer-learning activities and innovative actions;
- 2022-2025: Implementation of innovative cultural projects;
- 2022 – 2026: Monitoring and evaluation by MiBACT.

(ii) Foster the green approach throughout the cultural and creative supply chain. (Action BI and BII)

- 2nd quarter 2021 - Call for the acquisition of support services for the implementation of training activities, drafting of guidelines, coaching and exchange of good practices;
- 3rd quarter 2021 - Selection of the service providers;
- 2022-2026 Training and support activities.

Investment 3.3: Historical paths, slow tourism.

Challenges:

The project is in line with MiBACT's strategy on slow tourism, as outlined by the Strategic Tourism Plan, aimed at improving the attractiveness of remote areas and reducing anthropic pressure on "most visited" sites, balancing visitor flows, and opening up to the enhancement of new territories, in terms of sustainability and authenticity. In particular, the project will provide a new offer of Routes (*Cammini*) and will restore disused historic railway lines, or in the process to be dismissed, in areas of relevant cultural value, also restoring vintage old trains and museums explaining history of transportation and its role in the national development. The project will contribute to the European Year of Rails 2021 and is part of MiBACT's Recovery programme which saw 2019 as "Year of slow

tourism" and 2020 as "Year of tourist trains" and constitutes the element of union and correlation between all the topics the Ministry dealt with.

It will therefore be offered the opportunity to travel along historical railway lines through the most fascinating and evocative sites in Italy, building up a sustainable tourism also in minor destinations, to put people in closer contact with territories, focusing on authenticity, nature, natural parks, protected areas and historical and cultural places, all to be discovered and enhanced.

Objectives:

- To relaunch areas with a high natural and cultural value through the construction and / or restoration of infrastructures for sustainable tourism mobility (historic railways and routes), creating new opportunities for local economies induced by the expected increase in tourist flows and by new activities related to the management of the infrastructures and related services;
- To achieve a better distribution of tourist flows thanks to the organisation and promotion of alternative offers to the most popular destinations, allowing to stretch the tourist seasons and to diversify the offer;
- To reduce the environmental pressures by building a tourist offer inherently linked to forms of sustainable mobility, which might encourage the use of collective means of transport and promote the correct environmental behavior, respectful of places and natural resources.

A total of 16 historic railway lines, already precisely identified, will be restored for a total of 992 km, of which 10 in the center-south (725 km) and 6 in the center-north (267 km), in addition to the restoration of over 150 stations and at least 6 exhibition points.

Additional works will also be carried out - or completed - for 3 Paths ("Cammini") already on implementation phase by the Regions or local authorities under the direct coordination of MiBACT. In addition to the famous Via Francigena, entirely financed from North to South, a series of religious paths will be completed and the Appian Way path will come into operation (the delivery of the executive project is expected in the late spring of 2021). A further 1000 km of routes will be built as well as services that will improve the use.

Both projects will involve almost the entire national territory and most of the Regions, especially those in southern Italy.

The project is connected with the relaunch of the villages ("Borghi") and is included in a unitary strategy for a cultural relaunching of the country's marginal areas.

Implementation: The projects will be carried out, in continuity with those already underway, by the Regions and local authorities under the supervision of MiBACT.

The management of the two projects will be supported by the bodies in charge, by

FS Foundation with RFI in the case of historic railways and by the Regions and local authorities, with the support of the associations in the case of paths (“Cammini”).

Target population: National and international tourists, local population, A) FS Foundation; B) Local authorities, local MiBACT offices.

Timeline:

The project is divided into two main lines of action:

(i) Recovery of the historical railway lines and the connected FS historical heritage.

- 2nd quarter of 2021: MiBACT issues a decree for the admission to financing of the interventions; Agreement with Fondazione FS Italiane, that manages and enhances the historic rail heritage and Rete Ferroviaria Italiana (RFI), which manages the rail infrastructures in Italy;
- 4th quarter of 2021: start of the works;
- 2023: completion of works (except for lines in the Sardinia Region);
- 2025 completion of the works in the Sardinia Region.

(ii) Enhancement of the Routes and of the associated tangible and intangible heritage

- 1st half of 2021: Signing of Agreements (by integration of Agreements already in place) between MiBACT and the entities and institutions in charge of the identified Paths;
- 2nd semester of 2021: Agreements between MiBACT and individual beneficiaries;
- 1st half of 2022: completion of the projects design;
- 1st half of 2023: procurement procedure and awarding of works and services;
- 1st half of 2026: implementation and completion of interventions.

The entire project line will be concluded by 2026Q3.

Investment 3.4: Infrastructural improvement of tourist accommodations and tourist services.

Challenges:

The tourist accommodation facilities all over Italy have suffered strong losses due to the Covid pandemic. This has worsened their financial situation and made it harder for them to make the required investments in the quality and service levels, which would have been needed even before the crisis. The modernization and improvement of current standards of accommodation offer has the dual objective of increasing the competitive capacity of companies and promoting a tourism offer based on environmental sustainability, innovation and digitalization of services.

Objectives:

The redevelopment of tourist accommodations and the renewal and digitalization of the tourism ecosystem provide for the implementation of investments aimed to rising the standard of service (with an increase in the category level) in the key areas of environmental sustainability, digitalization, management innovation and renewal/diversification of the offer.

This line of action has a sectorial character in supporting the tourism industry that will be defined in the context of the usual State-Regions discussions to ensure maximum complementarity between national and regional intervention.

The intervention measures are intended for the entire system of tourist accommodations, and concern both hotels and extra-hotel facilities.

The measures also include support to increase the skills of employees in companies that have received funding and have made investments in more innovative sectors such as the digital space. These measures complement the investment and should therefore not be understood as training measures which are provided for in a different way. Investments will be encouraged through a combination of grants, low-interest loans and tax credits in line with EU State aid regulations.

Finally, the measures will take into account the "lessons learned" from the Covid-19 crisis in order to ensuring health security conditions in the current situation and identify ways of offering and managing services that may be more resilient to the occurrence of new potential crises in future. All future measures in the field of tourism and culture must include safety awareness.

The proposed investments have the following objectives:

- to redevelop accommodation facilities in order to raise their quality and competitiveness through the restructuring and modernization of basic structural components and improvement of environmental efficiency, also aiming at innovation and digitalization of services (e.g. optical fiber, online booking systems, automated check-in and check-out systems, online payment systems, digital marketing & communication etc);
- to raise the standards of hotel facilities to a higher level (4 stars and more) in order to attract new high-value tourism segments with a higher spending potential;
- to promote a new supply of touristic services capable of attracting segments of additional tourist demand and intercepting new trends (sports, sustainable, experiential tourism, etc.);
- to support and promote a "welcoming and safe" accommodation offer, calibrated on new needs and in compliance with the legislation on safety and physical distancing;
- to encourage virtuous behaviours and organizational, managerial and process innovations, including technical and structural aspects, aimed at reducing environmental impacts and improving eco-sustainable management (waste, energy consumption, water);

- to encourage the reduction of the fragmentation of the hospitality sector by supporting management innovations that imply ownership acquisitions or mergers, aimed at building hotel chains or merging several hotels, especially small and medium-sized hotels, under a single management;
- to promote innovative management models through the development of networks and other forms of aggregation between companies and operators in the sector, in order to overcome the weakness and fragmentation of the Italian business system and achieve European competitiveness standards;
- to increase the digitalization levels of companies operating in the tourism sector and to develop the digital and non-digital skills of operators in the tourism sector through access to qualified training.

Implementation: The implementation of the proposal under the coordination of the MiBACT foresees capital contributions in favour of the operators of accommodations.

Target population: Tourist accommodation enterprises; public entities at relevant institutional levels.

Timeline:

The project comprises the following phases:

- 1st semester 2021: Planning and signing of agreements with Regions and Municipalities and other stakeholders in order to define homogeneous elements throughout the national territory. Joint drafting and adoption of the necessary rules and regulations; sharing of the contents of the Public Notice. Creation of a Rotational Fund: definition and start of communication activities to inform everybody involved in advance to speed up the process.
- 2nd semester 2021: Definition of the regional allocation of resources; activation of a national one-stop-shop for the presentation of proposals.
- As of 1st quarter 2022 and until saturation of available resources: the collection of proposals begins. In compliance with the criteria for allocating available public investments throughout the country, the proposals will be evaluated using the FIFO system (First in, First out).
- The selection of beneficiaries will take place based on evaluation criteria set out in the joint call with the Regions and will take into account technical, economic and financial feasibility and innovation capabilities in terms of environmental and digital sustainability and maintained and/or created employment. Awards will be distributed taking into account the location of the most disadvantaged or remote areas.
- 1st half of 2026 – Completion of work.

4. Green and digital dimensions of the component

a) Green Transition:

Investments in cultural heritage will be consistent with the green principles. Regeneration of cities, territories and landscapes will be made in accordance with the principles of the circular economy, by reducing waste and attributing new values to natural resources, as well as supporting a fair and inclusive transition to a healthier, greener and fairer society and economy. However, such interventions do not contribute directly to the achievement of 37% target for the green transition.

The measures of this component cover different fields of intervention of Annex III to the Regulation with the following coefficients for the calculation of the support for climate change objectives and environmental support:

- Code 128. Protection, development and promotion of the public tourist heritage and tourist services.
- Code 129. Protection, development and promotion of cultural heritage and cultural services.
- Code 130. Protection, development and promotion of natural heritage and eco-tourism other than Natura 2000 sites.
- Code 88. Infrastructure for vocational education and training and adult learning.
- Code 108. Support for the development of digital skills
- Code 69. Other railways rebuilt or modernized.

b) Digital Transition:

The component does not contribute directly to the achievement of the mentioned 20% target foreseen for the digital transition, although it includes relevant interventions which promote the digital use of culture.

As a matter of fact, the project "Digital platforms and strategies for access to cultural heritage" has a coefficient of 100% for calculation to support the digital transition, referring to the digital field code "011 Government ICT solutions, e-services services, applications".

In addition, the action for the support of the cultural operators in the digital and green transition addresses the needs related to the development of digital skills, with regard to the training for the use of digital, digital literacy, community hub, creative labs, digital cultural use, creation of cultural ZFU.

See Table 1 work in progress

5. Milestones, targets and timeline

See Table 2 work in progress

6. Financing and costs

See Table 2 work in progress

In general, the Action is consistent with the 'Greener Europe' policy objective of the Cohesion Policy 2021/2027. The interventions financed by PNRR and those financed by the ESI Funds will be approached with a view of complementarity and/or integration. An ex-ante demarcation will be ensured to avoid the overlap of the programmes at national and regional level.

The tourism and culture sectors are crucial for the economy of the country. They represent a relevant induced economic for a large part of the country, especially for the regions where the local economy cannot count on the industry. To capitalize the potential of the sectors, the integration between different sources of financing has been promoted, in particular with the European Investment Funds regarding the intervention "Digital platforms and strategies for access to cultural heritage" and "Culture 4.0: Tourism training and initiatives for cultural diffusion in schools".

This approach is in line with the EU policy aiming at strengthening the level of digitalization of the cultural heritage and the use of advanced technologies. It is also in line with the Partnership Agreement 2021/27 of the Cohesion Policy, which includes, among the specific objectives for the ERDF, the Priority Objective 4 on strengthening the role of culture and sustainable tourism in economic development, social inclusion and social innovation also in terms of improving skills and opportunities through education.

The economic estimates of the costs related to tourism and culture interventions are based on the available feasibility studies. The standard prices more recently used in recent interventions in the same field have been considered. In several cases, executive projects with a detailed business plan on construction and management costs are available. In the digital field, innovative components have been addressed on the basis of the previous experience on the similar projects.

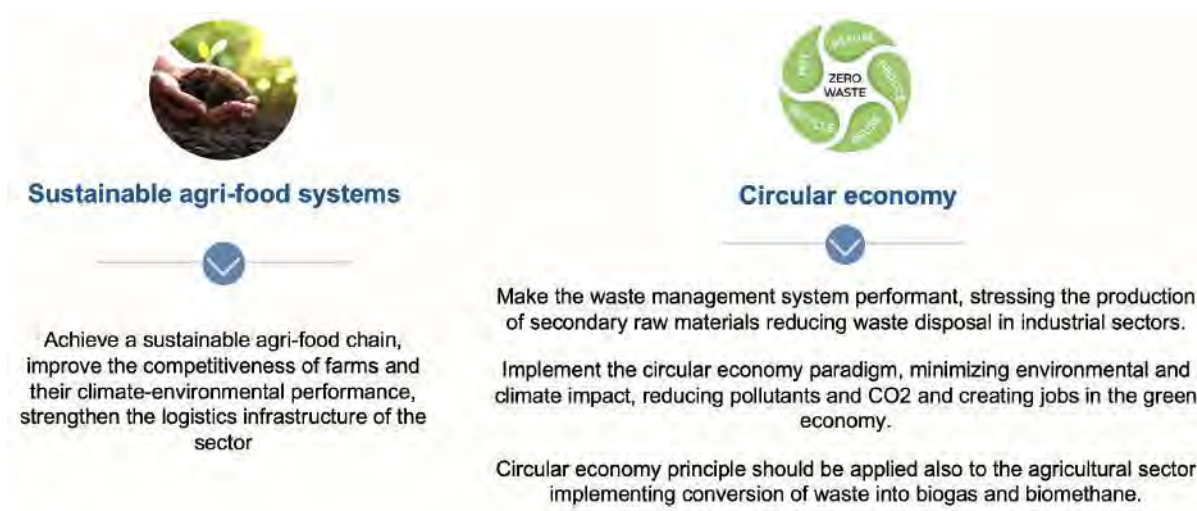


Mission 2 - Green revolution and ecological transition

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Mission's main objectives:



Mission's financing snapshot:

M2 - Green revolution and ecological transition

	Resources (euro/mld)				
	Existing (a)	New (b)	Total (c) = (a)+(b)	REACT-EU (d)	TOTAL NGEU (e) = (c) + (d)
M2C1- Sustainable agriculture and circular economy	-	5.90	5.90	1.10	7.00
M2C2 Renewable energy, hydrogen and local sustainable mobility	2.95	14.58	17.53	0.69	18.22
M2C3 - Energy upgrading and renovation of buildings	16.36	12.88	29.23	0.32	29.55
M2C4 - Protection of land and water resources	10.85	3.97	14.83	0.20	15.03
TOTAL	30.16	37.33	67.49	2.31	69.8

Note: (b) includes existing resources under national FSC, to be devoted to specific measures.

1 M2C1 - Sustainable agriculture and circular economy

1. Description of the component

Summary box

Policy area: European strategy "Farm to fork", infrastructures relating to the logistics of the agri-food sector, waste management, circular economy, environmental sustainability.

Objectives: The objectives of this component are:

- a) Achieve a sustainable agri-food chain, improve the competitiveness of farms and their climate-environmental performance, strengthen the logistics infrastructure of the sector.
- b) Make the waste management system performant, with emphasis on production of secondary raw materials to be used in different industrial sectors minimizing waste disposal.
- c) Implement the circular economy paradigm, minimizing environmental impact also regarding the global warming (reduction of pollutants and CO₂) and creating jobs linked to the green economy.

Circular economy principle should be applied also to agricultural sector implementing practice on conversion of waste into biogas and biomethane.

Reforms and investments:

Outcome 1: Sustainable agriculture.

Investment 1.1: Initiatives for sustainable agriculture

- a) Supply chain and district contracts for the agri-food, fishing and aquaculture, forestry, floriculture, and plant nursery sectors.
- b) Agri-solar Park.
- c) Logistics plan for the agri-food, fishing and aquaculture, forestry, floriculture and plant nursery sector sectors.

Outcome 2: Circular economy and enhancement of the integrated waste cycle.

Reform 2.1: National strategy for the circular economy: definition of specific legislation aimed at the ecological transition and implementation of the European action plan for the circular economy;

Investment 2.1: New plants and revamping of existing waste treatment plants.

Investment 2.2: Circular economy projects.

Investment 2.3: Ecological transition in the South of Italy (*projects to be defined*)

Estimated costs:

EUR 5.90b to be covered by RRF (7.0b total NGEU)

M2C1- Sustainable agriculture and circular economy

	Resources (euro/mld)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
1. Sustainable agriculture	-	2.50	2.50	-	2.50
2. Circular economy and enhancement of the integrated waste cycle	-	3.40	3.40	1.10	4.50
- <i>New recycling plants and modernisation of existing ones</i>	-	1.50	1.50	-	1.50
- <i>Circular Economy projects</i>	-	1.90	1.90	0.30	2.20
- <i>Ecologic transition in Southern Italy</i>	-	-	-	0.80	0.80
TOTAL	-	5.90	5.90	1.10	7.00

Note: (b) includes FSC existing resources, to be devoted to specific measures.

2. Main challenges and objectives

a) Main challenges

The Covid-19 pandemic has underlined the importance of a solid and resilient food system that works under all circumstances and which is able to ensure citizens have a sufficient supply of food at affordable prices. Furthermore, the transition to sustainable food systems also represents a huge economic opportunity, both for farmers, fishermen and producers in the aquaculture sector as well as for food processors and catering services. This transition will allow them to make sustainability their distinctive trait and to ensure the future of the Italian and EU food supply chain.

In connection with the agro-food issue, but not only, the need to reduce the production of waste has emerged, with attention to unsorted urban waste as well as to the development of effective models of separate collection. One of the main challenges is, in fact, to increase the "quality" of the waste produced also to close the circular economy cycle.

The "**Farm to Fork**" strategy, at the heart of the European Green Deal, comprehensively

addresses the challenges posed by achieving sustainable food systems, recognizing the inseparable links between healthy people, healthy societies and a healthy planet. Moving to a sustainable food system can bring environmental, health and social benefits, deliver economic benefits, and ensure that recovery from the crisis leads us on a sustainable path.

The strategy therefore constitutes a comprehensive approach to the value that citizens attribute to food sustainability. An opportunity to improve lifestyles, health and the environment. Creating a supportive food environment that facilitates the choice of healthy and sustainable diets will benefit consumers' health and quality of life and reduce health costs for society.

In line with the Action Plan for the circular economy (COM/2020/98), more emphasis will be placed on reducing waste production, reducing the quantities of unsorted municipal waste, and developing effective models of separate collection

The development of the **circular economy paradigm** is part of the provisions of the new Action Plan for the circular economy (COM/2020/98), one of the pillars of the Green Deal, approved on March 11th, 2020. The plan provides for a strategic framework, characterized by measures to ensure the design of sustainable products, the accountability of producers and consumers towards more sustainable choices, the increase of circularity in production processes (with particular reference to sectors that use more resources: electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and construction, food).

Italy in September 2020 has already implemented the directives of the "Circular Economy Package" with the recycling targets¹ or urban waste: at least 55% by 2025, at least 60% by 2030, at least 65% by 2035 and a restriction on their disposal in landfills of no more than 10% by 2035². In line with this reference framework, Italy's project proposals about circular economy aim to fill the structural gaps that hinder the development of the sector.³.

The main criticalities were identified in:

- plant deficiencies, for the treatment and valorisation of the organic fraction of waste;
- shortcomings of existing plants in relation to the need to reduce the production of new waste and consequent need for modernization of existing plants;

¹ Legislative Decree 3 September 2020, n. 116, on "*Implementation of directive (EU) 2018/851 amending directive 2008/98/EC on waste and implementation of directive (EU) 2018/852 amending directive 1994/62/EC on packaging and packaging waste*", published in the O.J. of 11 September 2020.

² Legislative Decree 3 September 2020, n. 121, on "*Implementation of Directive (EU) 2018/850, amending Directive 1999/31/EC on landfills of waste*", published in the O.J. of 14 September 2020.

³ All percentages are expressed in terms of "weight".

- inadequacy of separate collection systems, in relation to the new challenges to achieve recycling targets also through technological innovation;
- need to support local administrations (Regions, Municipalities) with governance at a central level that allows for strengthening local policies in the implementation of infrastructure for the creation of circular supply chains.

b) Objectives

The component is in line with the country-specific recommendations for Italy for 2020 (CSR-3), which suggest focusing investments on the green and digital transition, in particular on clean and efficient energy production and use, on research and innovation, on sustainable public transport, on the management of waste and water resources.

The objectives of the interventions of this component are different:

1. **Promote the green transition of the agri-food supply chains.** Italy, in line with the EU strategy (Farm to Fork), aims to reduce the environmental and climatic footprint of its food system and strengthen its resilience, guarantee the security of food supply in the face of climate change and loss of biodiversity, lead the global transition towards competitive sustainability from producer to consumer and exploit new opportunities. This means pursuing the following specific objectives:
 - ensuring that the food supply chain has a neutral or positive environmental impact, preserving and restoring the land, marine and freshwater resources on which the food system depends, helping to mitigate climate change and adapt to its effects, protect soils, soil, water, air, plant health and animal health and welfare and reverse biodiversity loss;
 - provide with security of food supply, nutrition and public health by ensuring that everyone has access to nutritious and sustainable food in sufficient quantities that meet high standards of safety and quality, plant and animal health, and that at the same time satisfy nutritional needs and food preferences;
 - preserve the economic affordability and sustainability of food while generating more equitable economic returns in the supply chain.
2. **Improve the management of urban solid waste and implement the circular economy paradigm.** This component aims to adopt new legislation defining the national strategy for the circular economy and regulating the organisation and operation of the waste/recycled material traceability system. This objective must also be achieved through targeted interventions on the territory which, on one hand, make it possible to solve critical situations in metropolitan areas in difficulty through the construction of new plants and, on the other, aim at the implementation of new projects with a high innovative content, allowing adequate collection and recovery of Waste Electrical and Electronic Equipment (WEEE), the closure

of the management cycle of the sewage sludge produced by wastewater treatment, as well as the creation of poles for waste produced by large users (ports , freight villages, health sector, etc.).

In particular, in the context of waste recovery and circular economy models, the production of environmentally sustainable biomethane will be increased - obtained from the organic fraction of the separate collection of urban solid waste, or from waste of plant and animal origin - and allocate it to transport, to cover the current share of fossil methane in transport equal to approximately 1 bcm (billion cube metres). This use can also make use of the existing methane gas infrastructure and the largest Italian fleet of methane vehicles in Europe (approximately 1 million vehicles). To this end, it is necessary to promote the increase of urban separate waste collection in harmony with national objectives, in order to allocate the organic fraction to new biomethane production plants, possibly built at local level (Regions, Provinces and Municipalities), to be used also in the fleets of vehicles for waste collection, providing for their gradual renewal in line with the provisions of the aforementioned Deployment of Alternative Fuels Infrastructure - DAFI directive. At the same time, there is a positive impact on the automotive industry and on the component industry for biogas plants.

The proposed interventions then have, more generally, the aim of contributing to the creation of new jobs linked to the green economy, stimulating local investments and their positive spill over effects on the local economy. In fact, the proposed investments represent an opportunity in terms of improving the knowledge and skills of workers and service providers as well as the potential creation of a pool of new employment and development of new qualified professions.

3. Description of the reforms and investments of the component

1) Sustainable agriculture.

The investment program consists of three main lines of intervention for the competitiveness, energy requalification and logistical capacity of the Italian agricultural sector.

Investment 1.1a: Supply chain and district contracts for the agri-food; fishing and aquaculture; forestry, floriculture, and plant nursery sectors.

Challenges:

Despite Italy's good performance in terms of quality and controls in the agri-food, forestry and fisheries and aquaculture supply chains, production methods remain to be reviewed in light of the new objectives of the Farm to fork⁴ strategy in terms of reducing production

⁴ Farm to Fork Strategy – for a fair, healthy and environmentally-friendly food system COM (2020) 381 final, 20.05.2020

inputs. The strategy plans to:

- reduce dependence on pesticides and antimicrobials, reduce excessive use of fertilizers, enhance organic farming, improve animal welfare and reverse the loss of biodiversity;
- ensure that agriculture, fisheries, aquaculture and the food value chain contribute adequately to climate objectives;
- ensure the sustainability of food production (including fish production), develop renewable energy production and improve energy efficiency in the agricultural and food sectors;
- ensure the security of food supply;
- reduce food losses and waste.

There is a lack of efficiency in the Italian production chains in the agricultural, forestry and fisheries and aquaculture sectors, for which the development of supply chain and district contracts can improve the sustainability of production processes, transformation, marketing and recycling and reuse of waste, also avoiding practices that are not sustainable at the environmental level, with evident repercussions also on the strengthening of the productivity and profitability of the sectors.

Objectives:

The proposed intervention aims to strengthen the instrument of supply chain and district contracts for the agri-food, forestry, fishing and aquaculture and horticultural sectors, through integrated investment programs throughout the country.

The supply chain and district contracts implement investment programs aimed at the green and circular transition of companies, at the growth of employment and the rate of innovation for these production sectors.

In particular, the creation and strengthening of supply chain and district contracts aim to achieve the following specific objectives:

- for the agri-food sector, to reduce the environmental impact of the food processing and retail trade sectors;
- for the fisheries and aquaculture sector, to promote the ecological sustainability of the product through incentives for "blue growth" as a system approach to the economy of the sea.
- for the forestry sector, to promote the efficient use of forest resources, enhancing business aggregation and associations, business agreements and networks;
- floriculture and plant nursery sectors, to increase the autochthonous and certified tree and forest production, to replace obsolete and inefficient greenhouses from an energy point of view and / or to make the related heating systems more efficient.

Implementation:

The managing Authority is the Ministry of Agricultural, Food and Forestry Policies, which is responsible for identifying priority strategic lines for the investment framework, defining the legal framework, selecting beneficiaries, as well as monitoring and reporting on interventions.

For each of the sectors affected by the initiative, the expected *milestones* are:

- a) Identification of intervention priorities (by Q2 2021)
- b) Publication of the call for the selection of investment programs (by Q4 2021)
- c) Approval of the final rankings of public calls for the granting of aid (by Q2 2023)

The *targets* set for 2026 are represented by the number of new supply chain contracts signed and are quantified in:

- n. 35 contracts for the agri-food sector
- n. 20 contracts for the fisheries and aquaculture sector
- n. 20 contracts for the forest sector
- n. 20 contracts for the floriculture and plant nursery sectors

It is estimated that by the third quarter of 2026 all investment projects, financed through the signed contracts, will be fully realized

Target population: Companies that directly contribute to the production, collection, transformation and marketing of products from the identified supply chains and companies that provide services and means of production.

Timeline: 2021-2026 (see Table 2 for details).

Investment 1.1b: Agri-solar Park.

Challenges:

From an analysis conducted on the National Data Bank of the Zootechnical Registry, a total of 201,782 zootechnical structures opened before 1990 are registered in the country. The use of asbestos was prohibited only in 1992 (with Law no. 257 of 27 March 1992 - *Rules relating to the cessation of the use of asbestos*), therefore until then the adoption of Eternit/asbestos for the construction of the roofs of agricultural and agro-industrial buildings was prevalent. Of all the structures built before 1990, around 69% are currently active, while the remaining 31% refer to companies that have ceased or merged into other activities.

The agricultural sector is also responsible for 10.3% of the EU's greenhouse gas emissions and 68% of the total agricultural area is used for livestock production⁵. In order to help reduce the environmental and climatic impact of animal production, the challenge that

⁵ Eurostat 2019 (UE-27).

this initiative wants to address is to develop the production of renewable energy while at the same time reclaiming the structures from asbestos (rural houses and warehouses are often ideal for placing solar panels).

The proposed interventions contribute to achieving the objectives set for 2030 by the Integrated National Plan for Energy and Climate (PNIEC) in terms of energy production from renewable sources in gross final consumption (30% share of the total).

Objectives:

The proposed intervention aims to modernize the roofs of buildings for productive use in the agricultural, livestock and agro-industrial sectors, thus increasing the sustainability, resilience, green transition and energy efficiency of the sector.

The project aims to incentivize the installation of solar energy panels, exploiting the useful surfaces of agricultural and agro-industrial production buildings. The specific goals are:

- improve insulation, thermal insulation and comfort of reared animals;
- remove the Eternit/asbestos present in the roofs of livestock facilities;
- install photovoltaic panels, creating a network of micro-power plants, spread throughout the territory, without soil consumption;
- improve the energy efficiency of buildings and support the transition towards self-consumption of energy from renewable sources;
- develop decentralized models of energy.

The project also makes it possible to improve the competitiveness of farms by reducing energy supply costs, which together represent more than 20% of farms' variable costs. In this way, the initiative allows agricultural businesses to be economically more resilient, while improving their climate and environmental performance.

Implementation:

The managing Authority is the Ministry of Agricultural, Food and Forestry Policies. For the implementation of the interventions, two widely tested and used procedures are currently under analysis (I.S.I. Call, Sabatini), in order to identify the most appropriate solution to the timing imposed by the RRF Regulation and more responsive to the needs of the sector.

For the purposes of implementation, the proposing Authority recommends the amendment of current legislation, providing for specific exceptions to the provisions relating to municipal urban planning (provided that the interventions do not lead to changes in cubature).

The expected **milestones** are:

- a) Preparation of the procedure for submitting applications (by Q3 2021)
- b) Start of the application procedure (by Q4 2021)

The **targets** set for 2026 are represented by:

- Surface covered with photovoltaic panels: 13,250 sq. m;
- Energy produced by the photovoltaic panels installed: 1,300 - 1,400 GWh (Gigawatt hour at full capacity);
- Increase of solar energy produced in Italy: + 5% compared to the baseline of 24,000 GWh⁶.

Target population: All the companies in the livestock sector that intend to modernize the roofs of the company production sheds.

Timeline: 2021-2026 (see Table 2 for details).

Investment 1.1c: Logistics plan for the agri-food, fishing and aquaculture, forestry, floriculture and plant nursery sectors.

Challenges:

Italy ranks eighteenth in the world ranking in terms of infrastructure competitiveness, defined by the "infrastructure" indicator of the *World Economic Forum 2019*⁷, highlighting an infrastructural gap - albeit improving - compared to the standards achieved by other developed economies. The proposed project intends to fill this gap in the country, focusing on the logistics of the agri-food, horticultural, fishing and aquaculture sectors, which are characterized by strong specificities throughout the supply chain.

Furthermore, the Logistics Plan aims to reduce the environmental impact of the transport system in the agri-food sector, by reducing traffic in the most congested areas and times, and to express the potential, in terms of exports, of Italian agri-food SMEs, improving accessibility to freight villages and hub services, the logistical capacity of wholesale markets and the traceability of products.

The improvement of sustainability (environmental, economic and social) is ensured through the reduction of emissions, the reduction of traffic in more congested areas and times, the reduction of waste and the reuse of by-products

These interventions are in line with the guidelines of the *Farm to Fork strategy*, with the general objective of "reducing the environmental and climatic footprint of the food system and strengthening its resilience, guaranteeing the security of food supply in the face of climate change and loss of biodiversity, lead the global transition towards competitive sustainability from producer to consumer and exploit new opportunities".

Objectives:

⁶ Fonte: GSE, Rapporto delle attività 2019

⁷ Fonte: *WEF The Global Competitiveness Report 2019*.

The plan for the logistics of the agricultural sector consists of contributions to companies and organizations that support investments aimed at achieving the following objectives:

- improve the storage capacity of cereals and agricultural raw materials, and accessibility to freight villages and hub services;
- strengthen the infrastructure of the food, floriculture and plant nursery markets;
- develop an integrated logistic system for fish industry supply chains;
- improve the logistical capacity of wholesale food markets, to ensure sustainable products at a low environmental and economic cost;
- increase rail freight transport and interconnections between ports, freight villages and logistic structures serving metropolitan areas;
- encourage a more equitable distribution of value along the supply chain to avoid food waste and promote social agriculture, through the application of emerging and innovative technologies in production processes, in precision agriculture and in product traceability.

Implementation:

The managing Authority is the Ministry of Agricultural, Food and Forestry Policies.

The expected **milestones** are:

- a) Identification of intervention priorities
- b) Preparation of the measure and levels of aid and publication of the “expressions of interest”
- c) Opening of the call
- d) Approval of the rankings and granting of aid

The **target** set for 2026 is equal to 60 interventions carried out, considering an average of three interventions per region.

Target population: Individual and associated companies (freight villages and wholesale market management companies), producer organizations, cooperatives and consortia, transport operators, port authorities, public administrations, local authorities.

Timeline: 2021-2026 (see Table 2 for details).

2) Circular economy and enhancement of the integrated waste cycle.

This line intervenes on the revamping of existing installations and the construction of new waste treatment plants for the enhancement and closure of the waste cycle, on the reconversion, through tender interventions, of industries such as chemistry towards the replacement of more polluting raw materials with recycled materials, and on the ecological transition of the South.

Reform 2.1: National strategy for the circular economy

Challenges: Despite the commitment and initiatives at EU and national level, the amount of waste generated is not decreasing. The annual production of waste from all economic activities in the EU amounts to 2.5 billion tonnes. To cancel the link between economic growth and the consequent increase in waste production, a considerable effort must be made along the entire value chain that includes production activities as well as private citizens⁸.

The implementation of sustainable products policy and its translation into specific legislation is essential to make progress in preventing waste generation. It is also necessary to build, further strengthen and better implement EU waste laws.

Furthermore, at the national level, the development of the circular economy varies considerably between regions, often leading to the initiation of EU infringement procedures and consequent fines⁹.

Objectives:

The reform aims at creating a national strategic framework to strengthen the coherence and effectiveness of circular economy policies, also in line with European provisions and in synergy with other national policies/strategies (National Strategy for Bioeconomy, Industrial Policies and Transition 4.0, Integrated National Plan for energy and climate, Cohesion policies implemented through the European Structural and Investment Funds).

The reform will pursue the reduction of the use of non-renewable raw materials, the decrease in the volume of waste, the reuse and recycling of waste, through the introduction of traceability systems of material flows, technological innovation, the diffusion of good practices and the adoption of tools to foster synergy between the public and private sectors and plan infrastructures to close the waste cycle.

The primary and secondary legislation will be modified for the recognition of the end of the waste qualification for numerous types of materials produced in the recycling chain and to speed up the authorization procedures for plants and their operation.

In particular, the Reform wants to act through two lines of intervention:

1. Define the national strategy for the circular economy:

- i. Establish, monitor and periodically update national objectives for the transition to an economic and environmental model based on the efficient use and management of resources and on the extension of the life of prod-

⁸ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - A new action plan for the circular economy - For a cleaner and more competitive Europe. Brussels, 11.3.2020

⁹ 2020 European Semester: Country Report - Italy

ucts and materials in all phases of the value chain (design, production, distribution, consumption and end of life management), in urban and industrial areas and throughout the territory.

- ii. Identify the strategy to improve the reduction of the use of non-renewable raw materials, the prevention of waste production, the reuse and recycling of waste, through the introduction of traceability systems for material flows, technological innovation, dissemination of good practices and the adoption of tools that can foster synergy between the public and private sectors.
- iii. Plan waste infrastructures.

The **milestones** and the **targets** are currently being defined.

2. Regulate the organization and functioning of the traceability system, simplifying and making administrative processes more timely and homogeneous:

- i. Regulate the organization and operation of the traceability system by allowing dialogue with the management systems of users, public and private, through specific interfaces, favouring administrative simplification, ensuring a preliminary period of experimentation and the sustainability of costs borne by the components of the system.
- ii. Promote the digitization of business systems.
- iii. Guarantee the traceability of material flows and their quality to the advantage of the development of circular supply chains and to counteract environmental dumping

The **milestones** and the **targets** are currently being defined.

Implementation:

The responsibility for the reporting and implementation of the Reform in question lies with the Ministry of the Environment and the Ministry of Economic Development.

The proposed Reform plans to address the following points:

- **Coordinate, promote, control and monitor the circular economy in Italy:** define and promote a National Strategy for the Circular Economy by defining the European Action Plan for the Circular Economy; draw up an annual report on the implementation at national level of the actions resulting from the strategy for the transition to the circular economy; strengthen and promote the activities of the Italian Platform for the Circular Economy (ICESP); create a national technical coordination and integrated control structure; set up a communication and promotion program for consumers and businesses, with particular attention to SMEs; define a strengthened control and surveillance system for safety, efficiency and sustainability in the circular economy sectors by fully systematising and integrating

existing structures and, where necessary, strengthen them, ensuring efficiency and simplification; implement regulatory reform and transposition programs based on the European Action Plan for the Circular Economy.

- **Sustainability of products and processes:** introduce regulatory measures to favour the reparability and durability of products; define regulations and/or mechanisms that encourage the sharing economy, collaboration, leasing/rental instead of purchase, forms of local reuse/recovery of resources, the development of integrated production-distribution-customer chains; implement the community legislation relating to the sustainability of categories of products with high environmental impact (AAE, vehicles, waste oils, packaging, plastic products, etc.).
- **Waste reduction and enhancement:** implement waste reduction objectives and adopt waste prevention measures including, for example, the implementation of the recently adopted obligations for extended producer responsibility schemes; adopt the harmonized model at EU level for separate waste collection and labelling to facilitate separate collection; implement the legislation relating to the "End of Waste" and by-products, integrated and intelligent implementation of other European regulations (REACH, SCIP, SUP, etc.) to strengthen sustainable production.
- **Make the production system more circular:** create a national technological hub and territorial competence centers for the circular economy to support the production system; create tools for the diagnosis of company resources (to be made in a mandatory perspective) and for the monitoring and traceability of companies in terms of circularity; define tools to promote eco-design in sectors with a high environmental impact; implement on an Italian scale the European strategic agenda for research and innovation in the circular economy (project H2020 - Cicerone) and strengthen Italian participation in European actions; develop other innovative market and/or financial tools for the circular economy (e.g. reward mechanisms, tax deductibility of leasing / rental costs for durable goods, VAT rate reductions, etc.), possibly integrated with the principles of energy efficiency and other sectors.
- **More circular urban, industrial and rural areas:** develop policy tools to make smarter services and industries for recycling and reuse, data science based and digital, starting new trials both at the scale of large cities and in rural areas; work for the revision of the rules on state aid for the environment and energy; develop policy tools for promotion actions for the integrated development of creative industries for well-being, health, and the green and digital transition, including improvements in circular and sustainable water management; develop policy tools to develop forms of circular industrial districts for the green conversion of traditional industrial sites into "zero emission" sites by implementing processes of industrial symbiosis also through the definition of specific rules.
- **Monitor and evaluate progress:** define a monitoring plan, indexes and national indicators for measuring progress towards the implementation of the Circular Economy, including the assessment of socio-economic and environmental impacts, also for the purpose of achieving climate neutrality objectives for the transition to the

circular economy and the implementation of the United Nations Sustainable Development Goals for 2030. The monitoring plan must include two independent assessment reports to verify the progress of the planned actions, including any critical issues that have emerged, and guide the updating of the strategy.

Target population: Whole national territory.

Timeline: The timing is currently being defined.

Investment 2.1: New plants and revamping of existing waste treatment plants

Challenges:

There is an extreme heterogeneity between regions in the North and South of the country as regards plant equipment for waste management. The location of the plants, mainly concentrated in the North, involves significant flows of waste from the Center-South to the North: the Center exports about 550,000 tons, corresponding to 38% of the quantities collected and the Peninsular South about 420,000 tons, or 30% of the waste collected.

The strengthening of the plant equipment is necessary not only to bridge the gap between the Central and Southern regions but also that existing between the same Northern regions and the lack of service in some large metropolitan areas of Central and Southern Italy and beyond (e.g. metropolitan areas of Roma Capitale, Naples, Bari, Reggio Calabria and Palermo): overall, about 1.3 million tons have been processed in plants in regions other than those of production and this quantity represents about 18% of organic waste from separate collection.

The management of organic waste and unsorted urban waste are the two main supply chains of intervention for achieving the objectives set out in the circular economy package directives by 2035.

The quantity of organic sorted waste collected in 2018 amounts to about 7 million tons – corresponding to 40% of sorted waste and 23% of total urban waste – of which about 3.7 million in the North, 1.4 million in the Center and in the Peninsular South, 0.3 in Sicily and 0.2 in Sardinia.

With regard to the management of unsorted urban waste and plants needed for the closure of the circular economy cycle, the emergency linked to national non self-sufficiency in the management of urban waste and special waste deriving from urban waste is known, including the management of waste resulting from the recycling of materials.

In addition to pursuing the circular economy and the recycling objectives deriving from European regulations, it is equally urgent to equip the Country with plants that allow the closure of the recovery cycle, with the aim of national and regional self-sufficiency.

The use of landfill as a waste cycle closure plant is the prevailing system in the central and southern regions, which makes it more difficult to achieve the target of landfill disposal, equal to a maximum of 10% by 2035, identified by Europe. In these regions, in fact, urban waste undergoes treatments in Mechanical Treatment (MT) and Mechanical Biological Treatment (MBT) plants, from which special waste originates, whose destination is mainly the landfill or transport of waste to the north.

Compared with the objectives of the circular economy (actual recycling equal to 65% of the total urban waste and use of landfill equal to 10% of the total urban waste) a further 25% of total urban waste, consisting mainly of non-recyclable residual urban waste, sorted waste from the selection of dry fractions (packaging waste, bulky waste, textile waste, WEEE) and from waste intercepted at the entrance to the organic fraction treatment plants, still remains to be managed.

Objectives:

The intervention involves investments for the enhancement and closure of the waste cycle. The focus will be on the upgrading of existing plants and the construction of new plants for the closure of the waste cycle with the production of secondary raw materials. The investments will also be aimed at strengthening separate waste collection with investments in new generation vehicles and implementing the logistics for waste fractions.

The investment plan has two macro-objectives:

- 1) **Address particularly critical situations in the metropolitan cities of Roma Capitale, Napoli, Palermo, Bari and Reggio Calabria.**

The main objectives to be achieved are autonomy in the management of urban waste at the regional level:

- Reduction of waste production through strong communication activities and the promotion of collection and reuse centers for waste as well as of goods and materials that the owner has decided to discard. (*The project selection criterion is the guaranteed percentage reduction in waste production compared to the average of the last 5 years*).
- Adaptation of the plant equipment to close the urban waste cycle according to the principles of proximity while minimizing the shipment of waste deriving from treatment outside the region, even if destined for recovery. (*The project selection criterion is the guaranteed percentage reduction of waste deriving from the treatment of municipal waste destined outside the region*).
- Rapid increase of separate collection up to 55% of overall urban waste collected (targeting the goal of 65% by 2035), with subsequent maximization of preparation for reuse and recycling to achieve the objectives of Directive 2018/851 and that is to prepare for reuse and to recycle at

least 65% of collected urban waste by 2035. (*The project selection criterion is the achievement of the 70% separate collection targets - targeting the 82% target by 2035 - and the preparation for reuse and recycling of 55% of municipal waste from separate collection*).

- Progressive reduction in landfill disposal of residues from the treatment of unsorted municipal waste, maximizing material recovery and filling. The percentage of waste recovered with the production of materials and/or destined for filling with replacement of virgin resources must be at least 50% of the unsorted waste collected by 2025. (*The project selection criterion is the guaranteed percentage of unsorted municipal waste recovered after treatment*).
- Re-naturalization of areas heavily impacted by waste disposal through the adoption of innovative techniques for accelerating biological degradation processes and conversion of landfill biogas also to produce biomethane to be used in transport, further reducing flare disposal. (*The project selection criterion is the relevance of the re-naturalization intervention for environmental context and extension*).

The interventions that involve the construction of new recovery plants must preferentially be already hinged in the required authorization procedures, with exceptions to be assessed according to the social acceptability of the intervention, and the construction site must be demonstrated so that the objectives indicated above are achievable in the expected times. Projects must therefore be provided for these interventions with the level of detail, according to the type of interventions, which allows for the precise verification of the paths indicated above.

2) Implement highly innovative “flagship” projects throughout the national territory.

The main objectives to be achieved are:

- Collection and recovery of Waste Electrical and Electronic Equipment (WEEE) aimed at the pursuit of a collection of 70% of the weight of such waste placed on the market and the simultaneous recovery of 100% of the waste collected. (*The project selection criterion is the guaranteed percentage of WEEE collected, guaranteed percentage of WEEE collected and sent for recovery*).
- Closure of the management cycle of the purification sludge produced by the treatment of urban waste water according to the principles of proximity with innovative recovery techniques, with reference to nitrogen and phosphorus. Maximize the exploitation of outgoing flows by creating synergies with the treatment of other types of waste for which there is an unsatisfied demand for recovery. (*The project selection criterion is*

the minimization of the quantity of sludge destined outside the region to treatment and/or agronomic recovery platforms, compared to the quantities thus managed in 2020).

- Creation of treatment centers for the recovery of waste produced by large users (ports, airports, railway stations, hospitals, school buildings), such as packaging waste, kitchen and canteen waste, WEEE, bulky items, mattresses, road sweeping waste, hazardous municipal waste, waste from the health and veterinary sector. (*The project selection criterion is the innovativeness of the proposal with reference to the totality of the types of waste intercepted*).

Milestones and the **targets** are currently being defined.

Implementation:

For the implementation of the national strategy on the circular economy and, in particular, to support local authorities in the implementation of the planning objectives regarding the reduction of waste production and the effective construction of treatment, recovery and recycling plants, the Ministry of the Environment introduced the “National Program for waste management” (art. 198bis of Legislative Decree 152/06) implementing EU directives. The program, which must be approved within 18 months of the entry into force of the Directive (26.09.2020), defines the criteria and strategic lines to which the Regions (competent bodies in the field of waste management planning) must comply. The definition of the National Program began on November 12th, 2020 with the establishment of the institutional table. The consultation phase on the program outline (which must be subjected to Strategic Environmental Assessment) will see the involvement of all the main stakeholders to ensure maximum transparency of the process.

It should then be noted that both the Ministry of the Environment, with the creation of the General Directorate for the Circular Economy, and the Ministry of Economic Development, with the Circular Economy Division, have ad hoc structures for the management and monitoring of interventions

The implementation of the National strategy for the circular economy will be accompanied by a communication, education and information program aimed at strengthening citizens’ cognitive tools and guiding the architecture of choices towards sustainable models. The communication, education and information program will be developed by the Ministry of the Environment in collaboration with the Ministry of Economic Development, and with other departments interested in sectorial competence, and will see the involvement of the National Association of Italian Municipalities (ANCI), associations of category and NGOs with the aim of ensuring consistency in the actions implemented for the development of the circular economy in our country. Action will be taken on the reduction of waste production, on food waste and on information to citizens, starting from school age, relating to the construction of plants and infrastructures serving the circular supply

chains.

The communication schemes will also be developed with innovative tools such as those borrowed from behavioural sciences (*nudging*).

Target population: Regional administrations, Municipalities, citizenship.

Timeline:

The timing of the realization of the investments foresees a 2026 horizon, starting from available projects proposed by Metropolitan Cities, already present in the regional planning, verified by the Regulatory Authority for Energy, Networks and Environment (ARERA) for the tariff profiles and, in any case, verified for financial sustainability profiles, indicating any leverage effect for the share borne by private implementing bodies.

Investment 2.2: Circular economy projects

This group of interventions is financed through a Fund specifically intended to achieve the objectives of the circular economy with the aim of reducing the use of raw materials in industrial processes, gradually replacing them with materials produced from scraps, residues, waste.

The interventions must be consistent with the European Plan for the circular economy (Circular Economy Action Plan) with the aim of reducing the net production of waste and the landfilling of all process waste (under this purpose all the actions aimed at the valorisation of waste and the production of intermediate products to be allocated to the various production sectors by progressively reducing the supply of raw materials from abroad). Interventions will be financed on the Fund by activating, where possible in relation to the implementing body and the economic and financial sustainability of the intervention, financial instruments aimed at maximizing the leverage effect and the contribution of private capital and lenders such as the EIB.

Timing: An implementation period of 5 years is estimated (2021-2026).

The estimated cost on the RRF amounts to € 1.90 billion. An additional cost of € 0.30 billion is expected from REACT-EU. The total cost therefore amounts to € 2.20 billion.

a) Development of biomethane according to criteria promoting circular economy

Challenges:

In the Italian context, biomethane plays a strategic and central role for the purposes of decarbonization and circular economy, as it allows to maximize energy recovery from organic residues of agricultural, agro-industrial matrix and organic waste related to the agricultural process.

Agriculture is responsible for about 9% of the GHG emissions of the country Italy. The animal husbandry has an important part of this responsibility (CH₄, N₂O emissions). In this context, anaerobic digestion, a process underlying the production of biomethane, applied to livestock effluents is indicated as a solution to improve the situation (ISPRA, 2020) without reducing the size of the livestock.

In recent years, Italy stood out among European countries for having the largest number of active biogas plants. This result was facilitated by the economic support issued by the GSE to produce electricity, obtained from the combustion of the biogas produced.

In order to fulfil the requirements of the NECP 2030, especially for the achievement of the objectives on the share of biofuels among fuel mix, in the coming years, with the help of this project, the incentive process will be focused on supporting the production of biomethane, valid both for self-consumption uses in the place of production, and for injection into the existing network infrastructures. This last application generates an overall saving of greenhouse gases compared to the life cycle of fossil methane between 80 and 85%.

In addition to reducing CO₂ emissions deriving from the transport and consumption of fossil methane, this project will contribute to reducing CH₄ and ammonia emissions related to the storage and distribution of livestock effluents that are normally produced during the breeding and agriculture process.

Objectives:

This project mainly contributes to solving two issues of great interest for the Italian country: the green transition towards a circular economy with reduced CO₂ emissions and the creation of jobs in areas far from industrial centers or cities. A more detailed analysis of the benefits, that would be obtained by the implementation of the project, are as follow:

- *green transition*: reduction of GHG emissions as methane, nitrous oxide and ammonia from agriculture; increase in soil fertility through a recycling of bio-nutrients; valorisation of the by-products of the agro-industrial sector; encourage the conversion of diesel-fuelled mechanical vehicles to biomethane-fuelled vehicles, improving efficiency and emissions.
- *job creation*: the biogas supply chain is a short and highly integrated supply chain in the territory, allowing the mitigation of the economic and social impacts of the crisis even in rural areas. It has been estimated that the project could create around 90.000-100.000 hires¹⁰ in the period 2021-2026.

¹⁰based on publication “Gas for Climate Job creation by scaling up renewable gas in Europe; Navigant Netherlands BV, Reference No: 203997, Date: 18 November 2019” and using prudential and proportional criteria with respect to the impacts generated in 2012-2017 period, by the first biogas plants.

This Investment aims at the following 5 specific objectives:

1. Reconversion and efficiency improvement of existing agricultural biogas plants towards the total or partial production of biomethane to be allocated in the industrial heating and cooling sector and residential as well as in the tertiary sector and construction of structures for proper management input biomass and digestate (storage coverage, etc.).
2. Support to the construction of new facilities to produce biomethane, for the same uses.
3. Dissemination of agro-ecological practices in the biogas production phase (minimum soil working sites, innovative low-emission systems for the distribution of digestate) to improve the efficiency of nutrient use with a clear reduction in the use of synthetic fertilisers and an increase in organic matter in soils, as well as the creation of centralized treatment clusters for the valorisation of digestate and effluent with the production of organic fertilisers.
4. Replacement of obsolete and low-efficiency mechanical vehicles with methane/biomethane powered vehicles. This scrapping measure shall be integrated with the investments planned for conversion under the first objective 1 or extended to all the agricultural holdings concerned, contributing to the modernisation of the fleet of Italian farms while creating a greater diffusion and demand for methane-powered vehicles with a positive impact even in an industrial sector in which Italy is a world leader.
5. Promotion of investments for efficiency (use of heat in the farm and reduction of emissions) of existing small-scale plants for which it is not possible to access the conversion measures.

Implementation:

The development of biomethane generation is expressly provided for by the NECP, which provides an important contribution of it to achieve the set goal of renewables contribution in the transport sector. The NECP also provides for the possibility of imposing mandatory quotas of renewable methane also in sectors different from transport. The proposed project joins the existing financial support, for the promotion of biomethane in the transport sector (already present in the Italian system) and the possibility to convert existing plants in the agricultural sector which, due to the constraints on the materials that can be used, often encounter difficulties in using of the benefits provided by the authorities.

To achieve the first target (T1), this project provides a granting contribution -in compliance with the limits of grants and loans provided for in the European framework the investment required (40%)- for the partial or total conversion of an existing biogas plant (efficiency of biomass management infrastructures, upgrading system, network connection costs, purchase of agricultural machinery for use by the producer fuelled by biomethane) or for a new plant. In this case (T2), the incentive is added to the incentive forms already

available (Certificate of Consumption - CIC but of a lower value than that foreseen in the case of biomethane advanced by the Ministerial Decree of 2 March 2018). Depending on the technology and size of the plant, the average costs for the purchase of equipment (assembly, piping and civil works excluded) and the management of a plant can vary considerably. Therefore, especially in small plants, financial support is very often necessary.

For the purpose (T5) of replacing obsolete and low-efficiency diesel-fuelled vehicles with biomethane-fuelled ones, the strategy will involve both the self-consumption of biomethane producing farms and farms which want to scrap a diesel tractor. Estimates for the replacement of an agricultural tractor with a power of about 130 kW show a unit cost of 25-30% higher than a comparable diesel one: about 120 k€ each. These actions would be supported by a contribution equal to 40-50% (depending on the different conditions) to make the purchase advantageous compared to a similar diesel one. As a result of this project, a positive effect on the national mechanical industry, which is potentially the world leader in the production of bio-methane agricultural tractors, will be generated.

Milestones and targets

- T1: By Q2 2026, conversion of at least 70% of the 800 existing Biogas plants (for an overall number of 560 biomethane plants), characterized by electric power generation between 0.6-1MW; considering a possible increasing in production capacity in 50%
- T2: By Q2 2026, production of 0,7 bcm/y (billion cubic metres/year) of biomethane from new plants built by single or consortium farms
- T3: By Q2 2026, optimization of soil tillage and organic fertilization through the purchase of equipment for minimum tillage and for digestate distribution
- T4: By Q2 2026, creation of centralized poles for the enhancement of digestate
- T5: By Q2 2026, conversion process of the existing agricultural vehicle fleet, with the distribution of 250 mechanical vehicles powered by biomethane
- T6: By Q2 2026, efficiency interventions to recover the heat from biogas plant, characterized by sizes that do not allow conversion to biomethane

Target population: Municipalities, DSOs, biogas power producers and different industrial sectors. In particular, the project will to be focused on the transport and agricultural sectors and will enhance the industrial and agricultural sectors (such as the animal husbandry and dairy sector), both excellence of "Made in Italy".

Timeline: The implementation period is estimated to be 5 years (2021-2026).

b) Other circular economy projects

In progress ...(Projects to be defined)

Investment 2.3: Ecological transition in the South of Italy

In progress ...(Projects to be defined)

There are no costs related to the RRF. An amount of € 0.80 billion is expected from REACT-EU.

The intervention provides essential investments for the ecological transition of the southern marginal areas and in particular for the smaller islands, also in order to transform the latter into "100% green" territories as practical examples of ecological development models and real attractors green investments, as well as to support the development of the environmental economic zones located in Southern Italy.

4. Green and digital dimensions of the component

a) Green Transition:

b) Digital Transition:

Table 1. Green and digital impact

Short title	Green objectives				Digital objectives	Transition challenges	
	Climate	Environmental	Intervention field	DNSH		Green	Digital
	Tag	Tag					
Reform 1.1: Define the national strategy for the Circular Economy							
Reform 1.2: Regulate the organization and functioning of the traceability system, simplifying and making administrative processes more timely and homogeneous							
Investment 1: Supply chain and district contracts for the agri-food, fishing and aquaculture, forestry, floriculture and plant nursery sectors	40%	40%	047	yes	0	yes	no
Investment 2: Agri-solar Park	100%	40%	029	yes	0	yes	no
Investment 3: Logistics plan for the agri-food, fishing and aquaculture, forestry, floriculture and plant nursery sector sectors	40%	40%	026	yes	0	yes	no
Investment 4: New plants and revamping of existing waste treatment plants	40%	100%	042	to be defined	0	yes	no
Investment 5: Circular Economy Projects	100%	40%	032	to be defined	0	yes	no
Investment 6: Ecological transition in the South of Italy	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined

5. Milestones, targets and timeline

Project Name / Milestone	Milestone description / Deliverable	Quality indicators / Success criteria	Quantitative indicators / Targets			Financial resources (Budget / Actual / Variance)	Resource allocation	Dependencies / Risks / Issues	Timeline / Start / End / Duration	Responsible / Lead	Status / Progress
			Value	Unit	Year						
Milestone 1.1	Project initiation and approval	Project charter approved	100%	1	2023	€100,000	Project Manager	2023-01-01 to 2023-01-31	Project Manager	Completed	
Milestone 1.2	Requirements gathering and analysis	Requirements document approved	100%	2	2023	€200,000	Business Analyst	2023-02-01 to 2023-02-28	Business Analyst	In Progress	
Milestone 1.3	System architecture design	System architecture document approved	100%	3	2023	€300,000	System Architect	2023-03-01 to 2023-03-31	System Architect	Completed	
Milestone 1.4	Development and testing	Development and testing completed	100%	4	2023	€400,000	Development Team	2023-04-01 to 2023-04-30	Development Team	In Progress	
Milestone 1.5	Deployment and go-live	System deployed and live	100%	5	2023	€500,000	Operations Team	2023-05-01 to 2023-05-31	Operations Team	Completed	
Milestone 1.6	Post-project review and closure	Post-project review completed	100%	6	2023	€100,000	Project Manager	2023-06-01 to 2023-06-30	Project Manager	Completed	
Milestone 2.1	Phase 2 initiation	Phase 2 charter approved	100%	1	2024	€100,000	Project Manager	2024-01-01 to 2024-01-31	Project Manager	Completed	
Milestone 2.2	Phase 2 requirements	Phase 2 requirements document approved	100%	2	2024	€200,000	Business Analyst	2024-02-01 to 2024-02-28	Business Analyst	In Progress	
Milestone 2.3	Phase 2 architecture	Phase 2 architecture document approved	100%	3	2024	€300,000	System Architect	2024-03-01 to 2024-03-31	System Architect	Completed	
Milestone 2.4	Phase 2 development	Phase 2 development completed	100%	4	2024	€400,000	Development Team	2024-04-01 to 2024-04-30	Development Team	In Progress	
Milestone 2.5	Phase 2 testing	Phase 2 testing completed	100%	5	2024	€500,000	QA Team	2024-05-01 to 2024-05-31	QA Team	Completed	
Milestone 2.6	Phase 2 deployment	Phase 2 system deployed	100%	6	2024	€600,000	Operations Team	2024-06-01 to 2024-06-30	Operations Team	In Progress	
Milestone 2.7	Phase 2 review	Phase 2 review completed	100%	7	2024	€100,000	Project Manager	2024-07-01 to 2024-07-31	Project Manager	Completed	
Milestone 3.1	Phase 3 initiation	Phase 3 charter approved	100%	1	2025	€100,000	Project Manager	2025-01-01 to 2025-01-31	Project Manager	Completed	
Milestone 3.2	Phase 3 requirements	Phase 3 requirements document approved	100%	2	2025	€200,000	Business Analyst	2025-02-01 to 2025-02-28	Business Analyst	In Progress	
Milestone 3.3	Phase 3 architecture	Phase 3 architecture document approved	100%	3	2025	€300,000	System Architect	2025-03-01 to 2025-03-31	System Architect	Completed	
Milestone 3.4	Phase 3 development	Phase 3 development completed	100%	4	2025	€400,000	Development Team	2025-04-01 to 2025-04-30	Development Team	In Progress	
Milestone 3.5	Phase 3 testing	Phase 3 testing completed	100%	5	2025	€500,000	QA Team	2025-05-01 to 2025-05-31	QA Team	Completed	
Milestone 3.6	Phase 3 deployment	Phase 3 system deployed	100%	6	2025	€600,000	Operations Team	2025-06-01 to 2025-06-30	Operations Team	In Progress	
Milestone 3.7	Phase 3 review	Phase 3 review completed	100%	7	2025	€100,000	Project Manager	2025-07-01 to 2025-07-31	Project Manager	Completed	
Milestone 4.1	Phase 4 initiation	Phase 4 charter approved	100%	1	2026	€100,000	Project Manager	2026-01-01 to 2026-01-31	Project Manager	Completed	
Milestone 4.2	Phase 4 requirements	Phase 4 requirements document approved	100%	2	2026	€200,000	Business Analyst	2026-02-01 to 2026-02-28	Business Analyst	In Progress	
Milestone 4.3	Phase 4 architecture	Phase 4 architecture document approved	100%	3	2026	€300,000	System Architect	2026-03-01 to 2026-03-31	System Architect	Completed	
Milestone 4.4	Phase 4 development	Phase 4 development completed	100%	4	2026	€400,000	Development Team	2026-04-01 to 2026-04-30	Development Team	In Progress	
Milestone 4.5	Phase 4 testing	Phase 4 testing completed	100%	5	2026	€500,000	QA Team	2026-05-01 to 2026-05-31	QA Team	Completed	
Milestone 4.6	Phase 4 deployment	Phase 4 system deployed	100%	6	2026	€600,000	Operations Team	2026-06-01 to 2026-06-30	Operations Team	In Progress	
Milestone 4.7	Phase 4 review	Phase 4 review completed	100%	7	2026	€100,000	Project Manager	2026-07-01 to 2026-07-31	Project Manager	Completed	

6. Financing and costs

Component (name)	Investment/Reform (short description or cross-reference)	Relevant time period	Total estimated costs for which funding from the RRF is requested (m/€U.R)	If available: Total estimated cost by year (m/€U.R)							Funding from other sources (as requested by Art. 8 in the Regulation)			COFOG level 2 category / or type of revenue (if relevant, e.g. tax expenditure)	
				2020	2021	2022	2023	2024	2025	2026	From other EU programmes		From the national budget		Other sources (please specify)
				to be defined	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined			
Green enterprises and circular economy	Reform 1.1: Define the national strategy for the Circular Economy	2020-2021	0	0	0	0	0	0	0						
Green enterprises and circular economy	Reform 1.2: Regulate the organisation and functioning of the mobility system, simplifying and making administrative processes more timely and homogeneous	2020-2021	0	0	0	0	0	0	0						
Green enterprises and circular economy	Investment 1: Supply chain and direct contracts for the agri-food, fishing and aquaculture, forestry, horticulture and plant nursery sectors - Support for the Agri-food sector	2021-2026	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined						
Green enterprises and circular economy	Investment 1: Supply chain and direct contracts for the agri-food, fishing and aquaculture, forestry, horticulture and plant nursery sectors - Support for the Fishing sector	2021-2026	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined				Agriculture, forestry, fishing and hunting		
Green enterprises and circular economy	Investment 1: Supply chain and direct contracts for the agri-food, fishing and aquaculture, forestry, horticulture and plant nursery sectors - Support for the Forestry sector		to be defined	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined						
Green enterprises and circular economy	Investment 1: Supply chain and direct contracts for the agri-food, fishing and aquaculture, forestry, horticulture and plant nursery sectors - Support for the Horticulture and plant nursery sector	2020-2024	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined				Economic Affairs - Agriculture, forestry, fishing and hunting		
Green enterprises and circular economy	Investment 2: Agri-tour Park	2021-2026	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined		To be defined with the regional managing authorities under the European Structural Investment Funds	NSI Call (National program for the Insurance against Accidents at Work - INAIL)			
Green enterprises and circular economy	Investment 3: Logistics plan for the agri-food, fishing and aquaculture, forestry, horticulture and plant nursery sectors	2021-2026	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined	to be defined						
Green enterprises and circular economy	Investment 4: New plans and reversion of existing plans		1,500												
Green enterprises and circular economy	Investment 5: Circular Economy Projects	2021-2026	1,923	18	246	324	540	653	133	300	REACT-EU		04 3		
Green enterprises and circular economy	Investment 6: Ecological transition in the South of Italy		0							800	REACT-EU				

2 M2C2 - Renewable energy, hydrogen and local sustainable mobility

1. Description of the component

Summary box

Policy area: Energy policy, climate policy, sustainable local transportation, industrial policy

Objectives: The overall objective of this component is **to achieve the strategic goals established in The European Green Deal strategy (COM/2019/640 final) and in the Italian National Energy and Climate Plan in force**, leveraging reforms and investments in two main sectors (energy, transportation) which are responsible, when combined, of around the 50% of the total GHG emissions in Italy.

Reforms, duly transposing all EU Directives in the two domains, create the proper regulatory framework to pursue climate objectives while investments, stimulated by additional resources coming from the Recovery and Resilience Facility, provide a direct stimulus to the economy, by greening the industrial system and promoting new low carbon technologies go-to-market.

Twin transition: Altogether, the measures proposed in this component address priorities identified in the 2021 Annual Sustainable Growth Strategy (COM/2020/575 final), primarily to the:

a) Green transition by:

- accelerating the reduction of emission through **fast deployment of renewable energy and hydrogen** and
- **investing in sustainable mobility** through renewal of public transport fleet with zero- and low-emission vehicles, and investment in the development of mass transit systems.

b) Digital transition, with reference to more advanced and resilient energy infrastructures which generate a demand for digital technologies, their design, adoption and use.

Jobs and growth: All the actions foreseen in this component of the National Recovery and Resilience Plan are aimed at stimulating job creation and growth. The renewable energy and hydrogen component provides investments in research and development (R&D), in innovative low carbon technologies production plants and, last but not least, in new renewable energy generation innovative plants, with a significant contribution to reinforcing competitiveness of companies and labour skills and to maintaining technology leadership.

Reforms and investments:

Reform 1.1: Simplification of authorization procedures for renewable onshore and offshore plants and new legal framework to sustain the production from renewable sources and time and eligibility extension of the current support schemes.

Reform 1.2: New legislation providing a quota obligation system to use renewable gas for importers and producers of natural gas.

Reform 1.3: Smarter procedures for project evaluation in the local public transport systems sector with fixed installations and in the rapid mass transport sector.

Reform 1.4: Adoption of national programs on air pollution control (in accordance with Directive (EU) 2016/2284 and with the Climate Decree Legislative Decree no. 111/2019).

Outcome 1: Development and support for the supply chain of renewables

Investment 1.1: Renewable Energy Sources (RES);

- a) Support for the development of the authorization of projects such as floating and wind farms offshore, projects that are developed on PA sites (disposed in the last 3 years), or are low ground consumption or combined with storage technology;
- b) Support to the development of innovative integrated offshore renewable plants;
- c) Promotion of RES for collective and individual self-consumption.

Investment 1.2: Development of an Italian supply chain for renewable technologies production(PV cells and panels, and medium-large size wind turbines);

Investment 1.3: Projects at local level (Municipalities)

Investment 1.4: Reinforcement and digitalisation of power grid infrastructure

- a) Installation of thermal energy storage systems;
- b) Interventions for “smarter” electricity distribution networks (Smart Grid);
- c) Interventions to increase the resilience of the distribution network;
- d) Installation of integrated EV charging stations

Outcome 2: Promotion of clean hydrogen production and use.

Investment 2.1: Production of Hydrogen in brownfield sites.

Investment 2.2: Production of Electrolysers and Development of an Italian Hydrogen Supply Chain.

Investment 2.3: Hydrogen Use in Hard-to-abate industry.

Investment 2.4: Hydrogen Use in Heavy Goods Transport on Wheel.

Investment 2.5: Hydrogen Use in Railway Mobility.

Investment 2.6: Hydrogen Research & Development.

Investment 2.7: Hydrogen Combustion Technology Development for green power generation.

Outcome 3: Promote the use of alternative fuels and smart mobility

Investment 3.1: Investment in soft mobility (National cycle path Plan).

Investment 3.2: Green local public transport and Rapid Mass Transport:

- 3.2.1. Strengthening of the green transport industry, the related national supply chains and smart mobility
- 3.2.2. Renewal of the regional public transport bus fleet with clean fuels vehicles
- 3.2.3. Renewal of the regional public transport railway fleet with clean fuels trains
- 3.2.4. Renewal of the regional public transport naval fleet with clean fuels naval units
- 3.2.5. Digitalisation of local public transport
- 3.2.6. Development of Rapid Mass Transport systems
- 3.2.7. Sustainable mobility: *“Affrettati lentamente”*

Estimated costs:

EUR 17,530 million to be covered by RRF

M2C2 – Renewable energy, hydrogen and local sustainable mobility

	Resources (euro/mld)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
1. Production and distribution of renewable energy and support to the supply chain	-	7.98	7.98	0.69	8.66
- <i>Renewable Energy Sources (RES)</i>	-	4.00	4.00	-	4.00
- <i>Supply chain for RES technology production</i>	-	0.36	0.36	-	0.36
- <i>Reinforcement and digitalisation of power grid infrastructures</i>	-	2.72	2.72	0.18	2.90
- <i>Municipalities' projects in line with the National Energy and Climate Plan (NECP)</i>	-	0.90	0.90	0.51	1.41
2. Support to the hydrogen supply chain and transition towards green steel through DRI (direct reduced iron)	-	2.00	2.00	-	2.00
3. Sustainable local transport, cycling paths and rolling stock renewal	2.95	4.60	7.55	-	7.55
TOTAL	2.95	14.58	17.53	0.69	18.22

Note: (b) includes FSC existing resources, to be devoted to specific measures.

2. Main challenges and objectives

a) Main challenges

Between 2005 and 2018, greenhouse gases (GHG) emissions in Italy, in sectors not covered by the ETS legislation, have decreased by 18% and emissions per capita are at a level below the European average. The Integrated National Energy and Climate Plan (NECP) provides that greenhouse gas emissions are reduced by 43% for the ETS sectors compared to 2005, and by 33% for sectors not covered by the ETS regulation, by 2030. The new European Climate Law provides for an even more ambitious target of reducing emissions, which according to the recent Commission Communication should be at EU level of 55% to 2030 compared to 1990 levels. The new EU target will have to be translated into new national targets for Member States and the NECP will be revised accordingly.

The NECP in force foresees an increase of the share of energy produced from renewable sources to 30% of the gross final consumption to 2030 (against a objective of 32% foreseen by the European targets), and to 22% of the gross final consumption of energy in the transports. The plan also provides for an increase in electricity storage capacity (39 Gwh, of which 24 to be connected to the grid and 15 to be coupled to the distributed generation).

Thus, energy and climate goals, made more ambitious by the recent Commission's commitments, are going to require an extraordinary effort in terms of public and private

financial resources, policy makers' work to provide reinforced measures, simplification of authorisation processes, industry players commitment on R&D and implementation streams, fast tracking new technologies.

A comparable effort is expected in the transport sector, where decarbonisation is crucial in order to achieve these objectives effectively, given that transport is responsible for 30% of the total national greenhouse gas emissions. To consider that almost 95% of these emissions is due to road transport while 45% of the existing car fleet (and in particular 59% of the public vehicle fleet) is made up of vehicles with standards not exceeding Euro 3.

Also due to the persistence of other types of pollutant emissions from road vehicles, it is estimated that about 2 million inhabitants in Italy live in areas where the minimum European air quality standards are not respected.

In this regard, three infringement procedures are currently open with regard to the exceedance of the PM10 limit values in Italy between 2008 and 2012 in 19 zones and agglomerations and with regard to the exceedance of the limit values for nitrogen dioxide (NO₂) between 2012 and 2014 in 15 zones and agglomerations. Many of the exceedances covered by these infringement procedures, however, affect most of the areas located in the regions of the Po Basin.

In this context, the role of hydrogen deserves a specific focus. Its prominent role was set forth in July 2020 in the EU Hydrogen Strategy, projecting a growth from the current <2% in the energy mix to 13-14% by 2050, with an underlying electrolyser capacity of 500 GW. Member states are in the process of adopting the EU strategic direction: some of them (such as France, Germany, Portugal, Spain and the Netherlands) have already established 2030 or 2050 targets (even above the EU direction) and identified main use cases in the most relevant sectors, e.g. industry and transport.

In Italy, the NECP outlines the role of hydrogen in achieving sustainability targets and identifies the potential application of H₂ in a number of energy sectors: for example, the transport sector, with fuel cell trucks and trains (outlining a 1% penetration target in renewable fuels transport), and the management of electricity overgeneration, with H₂ storage applications (e.g. power-to-gas).

In this Recovery and Resilience Plan, consistently, a number of interventions have been planned to enact the EU Hydrogen strategy, taking into account the need for 1) creating a strong supply chain (production, storage, distribution) 2) building industrial capacity to produce hydrogen generation technology 3) fostering hydrogen use in large emitting industries and in heavy transport.

b) Objectives

In line with the European Flagship 'Power Up' (COM(2020) 575), the 'Energy Transition

and Sustainable Mobility' component identified a sub-action "Investments for NECP implementation" with the following objectives:

1. **Increase the share of energy produced by Renewable Energy Sources (RES)** and, more specifically:
 - a. to promote the strengthening of the supply chains for the production of innovative and highly efficient technologies in the renewable sector;
 - b. supporting the creation of a pipeline of new greenfield renewable projects with the outcome of the authorization procedures in a certain time;
 - c. promote the collective self-production of renewable electricity;
 - d. facilitate the transition from biogas for electrical use to biomethane for transport.
2. **Promote the production and use of hydrogen as an energy carrier of the future**, by nominating Italy as a state-of-the-art country both in the development of innovative technologies and related infrastructures, promoting the establishment of a sector chain.
3. **Ensure the resilience of the electricity grid** to encourage increased penetration of energy from renewable sources through:
 - a. the development of storage capacity and the dissemination of new technologies (e.g. smart grids);
 - b. the greater ability to resist adverse weather phenomena, avoiding prolonged interruptions of the electrical service.
4. **Promote the use of alternative fuels and smart mobility** by supporting the production chain of smart & green mobility and the renewal of fleets by replacing the most polluting vehicles with zero and low emissions vehicles.
5. **Encourage the reduction of the use of polluting modes of transport** through:
 - a. the transfer to the collective mobility system ("shift"), in particular by enhancing mass rapid transport systems in order to improve their transport quality and capacity;
 - b. a greater development of "gentle" mobility, thus reducing the use of individual journeys by road ("avoid").

Overall, actions in this component are aimed at achieving the following NECP's targets:

- For **energy-related** actions: additional installed capacity from renewable energy sources of 11,2-15 GW by 2025 resulting in CO₂ reduction of 2-3 Mton/year till 2025.
- For **sustainable mobility** actions: CO₂ reduction of almost 1 Mton/year till 2025 mainly attributed to developments in shared/public mobility and the gradual roll-out of vehicles characterised by reduced energy consumption and very low or zero CO₂ emissions, as well as the gradual and natural renewal of the vehicle fleet.

3. Description of the reforms and investments of the component

REFORMS.

Reform 1: Simplification of authorization procedures for renewable onshore and offshore plants and new legal framework to sustain the production from innovative renewable sources and time and eligibility extension of the current support schemes.

Challenges:

The national energy policy targets for 2030 set by the National Integrated Energy and Climate Plan ("NECP 2030") require the installation of new capacity from RES of about 40 GW, of which about 30 GW from photovoltaic systems. In this domain, among others, policies shall support the creation of a steady pipeline of new greenfield renewable projects through proper stimulus and with fast and certain authorisation procedures.

The main challenges to be tackled to this purpose can be identified in the following:

1. **Timing of the authorization process is not foreseeable and uneven on the national territory.** In order to encourage investments in new renewable capacity and to allow the decarbonisation of the generation under safe conditions, it is necessary to develop a homogeneous and rapid authorization framework that allows the development of projects at certain times.
2. **Limited private investment and fragmentation of renewable capacity in small plants.** Need to extend the mechanism of RES auctions planned to date to support the development of power generation plants from renewable sources in line with the ambitious objectives of the NECP on the development of renewable energy in Italy limiting land consumption for other uses.
3. **Absence of adequate remuneration mechanisms for the development of storage capacity, in the scenario of strong increase of generation from renewable sources.** In order to develop the development of such RES capacities and to ensure network stability, it is necessary to introduce new remuneration mechanisms that allow for a reasonable return on investments and increase the interest of investors (not network operators) towards capacity for accumulations and other systems useful for the stability of the network.
4. **Limited dissemination of the Public Private Partnership Instrument to support investment contributing to achieve the NECP in 2030.** In order to increase such investment, it is necessary to promote the dissemination of the Public Private Partnership in all sectors, including through the temporary use of a majority of public contributions to support such initiatives.

In this context, some critical issues arise:

- There are no guidelines for the authorisation of the construction and operation of installations for the production of electricity from renewable sources, of particular relevance, in the offshore sector. Given the peculiarities of the offshore sector and the growing interest of the market and the Italian and European legislator, it is suggested to consider the adoption of guidelines also for the offshore sector on the basis of what has been done for onshore installations in relation to the procedure referred to in Article 12 of Legislative Decree no. 387/2003
- Rationalisation and simplification of Environmental Impact Assessment procedures. This is already partly addressed by Article 50 of Legislative Decree no. 76 of 16 July 2020 (i.e. Decree of simplifications) and can find full application with the publication of the relevant implementing decrees, thus helping to create the conditions for obtaining permissions in time for compliance with the deadlines set out in the Recovery and Resilience Facility.

Objectives:

In order to overcome such barriers and to support for the creation of a pipeline of new renewable greenfield projects, this Reform action mainly pursues the following objectives:

- To approve changes in law for simplified authorization processes for photovoltaic and onshore and offshore wind farms
- To modify the current RES support mechanisms in order:
 - a. to extend the area of eligibility of current incentives, including new offshore installations and repowering of existing plants;
 - b. to extend the grants availability period.

Implementation:

The implementation process will involve the Ministry of Economic Development as process owner, together with the Ministry of Environment which, in cooperation, shall set the following new regulations:

1. The reform of RES supporting mechanism, also completing the transposition process of the RED II Directive;
2. The reform of authorisation processes, mainly related to environmental impact evaluation and related tasks.

According to the reform plan designed by the responsible authorities, the first proposal draft of the reform is due by the first quarter of 2021. Such draft will be submitted to a public consultation to, then, proceed to the approval, which is planned to happen by mid-year 2021.

The implementation process will proceed with the design of the auction procedures under the new regulation, targeting the successful completion of auctions awarding up to 6 GW

by the end of 2023.

Therefore, this Reform does not undermine recourse to competitive bidding processes for the award of investment and/or operating aid, in particular for large-scale projects.

In parallel, simplification measures are expected to generate small-medium scale RES plants growth which is expected to add from 10,5 to 15 GW of additional capacity. This activity is planned to be implemented in order to reach the following intermediate targets:

- 0,5-1 GW in 2022
- 1,1-2 GW in 2023
- 2,2-3 GW in 2024
- 3,2-4 GW in 2025
- 4,2-5 GW in 2026

To this purpose, Reform 1 package is linked to Investment 1, as described in the related paragraph.

Target population: The reform process will involve:

- on the public side, national and regional administrations
- on the private side, renewable power producers, renewable energy production project promoters, infrastructure project developers, related investors.

Timeline: The implementation period, as detailed by the above description, is estimated to be 6 year.

Reform 2: New legislation providing a quota obligation system to use renewable gas for importers and producers of natural gas.

Challenges:

Biomethane is strategic for decarbonisation and the circular economy, maximising energy recovery from organic agricultural and agro-industrial waste. In fact, agriculture is responsible for about 9% of Italy's GHG emissions and animal husbandry has an important part of this responsibility (in particular CH₄, N₂O emissions). Anaerobic digestion applied to manure is indicated as a solution to improve the situation (ISPRA, 2020) without reducing the stock of livestock.

The development of biomethane production from manure, complying with the Do-No-Significant-Harm principle, is particularly interesting in order to make agricultural activity more sustainable and at the same time to produce an advanced biofuel, valid for both point-to-point uses at the place of production and for networking, through existing network infrastructures. If channelled into the gas network, biomethane can contribute

to the achievement of the European targets by 2030, with an overall saving of greenhouse gases compared to the fossil methane life cycle between 80 and 85%.

Italy has a leadership in the production of biogas both in terms of volumes and production sustainability that seem to encourage further investment. The technical potential of biomethane that can be produced in Italy is considerable, with estimates varying according to the raw materials that can be used and the final use consistent with RED II, but still in billions of cubic metres.

The potential contribution of biomethane to the Country's economic growth is also significant. Being a resource obtainable from a plurality of productive processes and from various fields makes the development of a specialised supply chain possible, with positive repercussions on the economic system under the profile of the technological innovation in the manufacturing fields, agriculture and urban public services.

In addition to reducing CO₂ emissions from fossil fuel consumption, biomethane-related investments will help reduce emissions of CH₄ and ammonia related to the storage and distribution of manure through their use for anaerobic digestion and the equipment of covered storage facilities and "precise" systems of distribution of organic fertiliser (effluent as such or digestate), to reduce N₂O, CH₄ and nitrate emissions, through the development of agronomic techniques that allow for increased soil coverage, the reduction of nutrient intake through mineral fertilisers, as well as the increase in soil organic matter resulting from increased photosynthetic activity, carbon recycling and nutrients.

Objectives:

To this extent, the Reform contributes to achieving the Green transition objectives, also complying with the NECP by:

- replacing fossil fuels with biogas;
- reducing GHG emissions (in particular, methane and nitrous oxide) and ammonia from agriculture
- encouraging the use of renewable gas distributed through existing networks;
- encouraging the conversion of diesel-fuelled mechanical vehicles with biomethane-fuelled vehicles by improving efficiency and emissions.

As well, biomethane production policies and related investments contribute to reducing the use of natural resources per unit of product and increasing soil fertility minimising the use of chemical fertilisers, in line with the objectives outlined in the "Farm to Fork" strategy.

From an economic perspective, this measure contributes to employment creation in short and strongly integrated supply chains in different territories, allowing the mitigation of the economic and social impacts of the crisis also in rural areas.

As a reference, between 2012 and 2017, biogas plants-related investments reached 3.1 billion euro and generated around 100.000 AWU (estimate including direct, permanent and temporary employment, as well as indirect considering also the induced generated by the entire chain).

[Source: Statistical reports/ activities of the GSE 2013-2018, paragraph 11.2].

Implementation:

The Reform proposal provides for the promotion of an additional production of biomethane compared to biomethane used in transport, encouraged under the Ministerial Decree of 2 March 2018 (which is expected to be confirmed for a further period of time and whose incentive target of about 1 billion m³ remains confirmed).

Change in law for a simplified authorization process and modification of the current grants mechanism in order (i) to widen the eligibility perimeter and (i) to extend the grants availability period are foreseen.

Aid is to be granted within the limits and intensity of the aid provided for in the European framework for the necessary investment (40%) for the partial or total conversion of an existing biogas plant (efficiency of biomass management infrastructure + upgrading system + costs of connection to the network + purchase of agricultural machinery for the use of the producer powered by biomethane) or for a new plant, plus an incentive (in the form of a Certificate of Release for Consumption - CIC but of lower value than that provided in the case of biomethane advanced by the DM 2 March 2018) on the actual production of biomethane for a period of 10 years and the recognition of the Guarantee of Origin (GO) to the producer for the same period.

Cost assessment of projects submitted to the foreseen support plan will be carried out leveraging available benchmarks. Depending on the different technological processes used, the average costs for the purchase of equipment (fittings, piping and civil works excluded) and the management of a small-to-medium size upgrading system can vary considerably. Below is a summary of the average purchase and management costs for small-medium size upgrading plants, representative of the case of Italy:

- "The chain of biomethane: tools, mechanisms of operation and opportunities" (Assolombarda, Research no. 1 of 2020) reports data related to two sizes of capacity plant, suitable to represent the small-medium range of potential applications with a production of 1.10 million Nm³ of biomethane per year. For a plant with a capacity of 1 million Nm³/year, the estimated total investment costs (Capex) is about 1-1,5 million €/ per million m³ capacity. Increasing capacity to 10 million Nm³/year the Capex drops to about 0.5 - 0.75 million €/ per million m³ capacity. The investment cost of the anaerobic treatment section can double or triple in the case of sludge, while it reaches a value even quadruple for FORSU.

The input matrix (sewage sludge, FORSU, livestock waste or agricultural waste) plays an important role in this assessment (think of the methane content in biogas) although substantial differences are to be related more to the stage of anaerobic digestion than to the removal of carbon dioxide.

- Operating costs for a capacity of 1 million Nm³/year are estimated between 120,000 and 150,000 € and for a capacity of 10 million Nm³/year in the range between 800,000 and one million euro. They include the costs of ordinary, extraordinary maintenance, reagents and those of electricity, referring to an operation not less than 8000 hours per year.
- These references appear to be usable for the evaluations of this project, also in view of the fact that the proposal only provides for the use of input matrices represented by livestock waste and agricultural and agro-industrial waste; it is not planned to use sewage sludge.

Target population: Farmers, renewable power producers, heat operators and district heating system owners, installers, renewable energy production project promoters, infrastructure project developers, investors in agricultural activities.

Timeline: The implementation period is estimated to be X years.

Reform 3: Smarter procedures for project evaluation in the local public transport systems sector with fixed installations and in the rapid mass transport sector.

Challenges:

The amendment made by the Simplifications Decree - which, up to the 31st of December 2021, attributes to the Superior Council of Public Works the responsibility of expressing an opinion on both the technical-economic feasibility of the project in the local public transport systems and on the final design leads to a duplication of activities. leads to a duplication of activities. The examination of technical-economic feasibility of projects (including choosing alternatives, transport analyses, cost-benefit analyses, etc.) is also carried out by the General Directorate for Fixed Transport Systems and Local Public Transport for financing the interventions, according to procedures, put in place in agreement with the Cabinet Office and the Technical Mission Structure and shared by the MEF, which since 2018 are used for the allocation of resources for rapid mass transport in the Investment Fund (Notice n. 1 and n. 2 for the presentation of applications in the sector of rapid mass transport).

The duplication of activities concerning the evaluation of sectoral projects, causes inevitable assessment discrepancies by the various bodies involved and the consequent need for reiterated assessment of one body on the changes proposed by the other body and the other way round. This leads to lengthy procedures with consequent delays in the activation of the works, as already noted by some Local Authorities benefiting from state

resources in the sector.

Moreover, other types of procedures can be simplified. The Covid-19 pandemic has generated multiple impacts for the transport and infrastructure sector, especially for the transport supply chain and the realization of public work. In some cases, the pandemic has caused a slowdown of the work and a consequent crisis of the suppliers and economic operators.

In this context, it is necessary to support the entire supply chain by guaranteeing immediate adequate liquidity to beneficiaries to boost the sector by speeding up the procedure for payment of grants by using a digitalised system to verify the progressive execution of interventions eligible for funding.

Objectives:

The reform aims at making the procedures aforementioned more efficient by eliminating duplication of competences within the same Administration and accelerating the payment processes and timing of interventions in the public transport systems.

Implementation:

For what concern the duplication of responsibility for project evaluation in the local public transport systems. A dedicated regulation will provide concrete responsibility allocations and project approval roadmap in line with the objectives of the Simplification Decree.

For what concern the simplification of the payment procedure, the measure consists in preparing, for each of the interventions eligible for a grant, a data form that must be filled in by the Single Proceedings Manager and the Manager of the beneficiary body, for the progressive disbursement of the grant.

The form in question will show the details of the invoices relating to the progress of the work with an indication of the items in the Economic Framework to which they refer to. After entering the data in the digital system, the Directorate General proceeds directly with the contribution payment, without any further preliminary analysis.

A second-level check by the Ministry will take place at an intermediate and final stages of the intervention: only a defined sample of payments will be analyzed.

The reform in question will be supported by the implementation of an IT Platform. To this extent, the MIT's Directorate General of Local Public Transport has already started, as part of its activities, to revise the Platform of the Observatory on the Policies of Public Transport. According to this review, it is understood that it is possible to implement an additional IT package on the existing platform in order to have a dedicated service for managing the payment procedures. The adoption of such IT package to support the reform will result in significant time savings since the MIT will be allowed to check the accounting documentation concerning any ongoing projects well in advance the beneficiary

local administrations present a request for disbursement associated with a grant.

Target population: The procedure related to the evaluation of local public transport refers to local Administrations acting as promoters of projects involving local public transport system projects with fixed installations. Citizens will also benefit from quicker development time for transport infrastructure for rapid mass transport services.

The procedure related to the payments acceleration refers to institutional bodies (Regions, Municipalities), local public transport service companies or subsidiary companies of institutional bodies. Citizens will also benefit from quicker development time for transport infrastructure for rapid mass transport services.

Timeline: This reform will be part of a forthcoming regulatory measures.

Reform 4: Adoption of national programs on air pollution control (in accordance with Directive (EU) 2016/2284 and with the Climate Decree Legislative Decree no. 111/2019).

Challenges:

The EU legislation promotes a progressive reduction in the concentrations of atmospheric pollutants to protect the environment and the health of citizens from possible damage caused by certain substances, as well as ambitious goals in terms of reduction of the climate-altering emissions, with clear reduction targets in both areas.

Italy has aligned its relevant national legislation with the approval of

- the legislative decree 30 May 2018, n. 81, transposing the directive, 2016/2284 setting National Emission Ceilings (NEC) for air pollutants;
- the law 12 December 2019, n. 141, converting the legislative decree 14 October 2019, n. 111 (“Climate legislative decree”), containing urgent measures for compliance with the obligations established by Directive 2008/50, on ambient air quality and cleaner air for Europe.

The full application of such reforms will require the adoption of some implementing acts, both at national and regional level, in order to develop the specific regulatory framework that is needed to translate the objective of the legislation into concrete measures.

Objectives:

The reform aims at aligning national and regional legislation, and introducing relevant accompanying measures, for the reduction of the emissions of the air pollutants (in compliance with targets set by Directive 2016/2284 on national emission ceilings) as well as the ones of climate-altering emissions.

Implementation: The reform proposed by the Ministry of Environment (MATTM) provides 5 measures, as detailed below:

- Adoption of a National air pollution control Program pursuant to EU Directive 2016/2284;
- Adoption of a Climate Legislative Decree with 4 implementing decrees;
- Implementation of a Reform Program for the Regions of the Po river basin;
- Implementation of legislative and financial initiatives through other regional agreements;
- Implementation of a monitoring system to support the implementation of measures included in the PNIEC.

The reform will be implemented through specific monitoring indicators, as follows:

- Spared emissions of the target pollutants of directive 2016/2284 expressed in t / y;
- Reduction of 33% CO2 emissions by 2030 compared to the target in 2005 in non-ETS sectors expressed in Mt CO2 eq.

Target population: Citizens, regional and local authorities, transport operators.

Timeline: The implementation period is estimated to be 2 years.

1) Development and support for the supply chain of renewables.

Investment 1.1: Renewable Energy Sources (RES).

1.1.1 *Support for the development of the authorization of projects such as project pv floating and wind farms offshore, projects that are developed on PA sites (disposed in the last 3 years), or are low ground consumption or combined with storage technology*

Challenges:

The NECP set the renewable energy production target in 2030 to the 30% in gross final energy consumption (moving from the 18,3% in 2017) and assigned to renewable electricity the most challenging objective to cover the 55% of final electricity consumption (34,1% in 2017). To this purpose, the NECP provides the following considerations:

- The significant technically and economically feasible growth potential of photovoltaic installations and wind parks, thanks also to the reduction in costs associated therewith, points to a major development of these technologies, the production of which should triple and more than double, respectively, by 2030.
- In order to attain the targets on renewables identified for 2030, it will not only be necessary to stimulate new production, but also to preserve existing production and, if possible, actually increase it, by promoting the revamping and repowering of installations. In particular, the opportunity to promote investments in the revamping and repowering of existing wind power plants with more developed and efficient machines, by exploiting the excellent wind conditions at well-known sites that are already being used, will also help to limit the impact on soil consumption.

- A similar approach, based on a reduction in soil consumption, will be followed in order to guide the expansion of the significant growth capacity of photovoltaics that is projected for 2030, by promoting their installation primarily on buildings, roofs, car parks, service areas, etc. In order to attain the 2030 targets, it is nevertheless still vital to promote large ground-mounted photovoltaic installations, with priority being given, however, to unproductive areas that are not earmarked for other uses, such as areas not usable for agriculture. In this light, installations in former artificial areas (with reference to the National System for the Protection of the Environment (Italian initials SNPA) classification), preference should be given to contaminated sites, waste disposal sites and areas along the infrastructure system.

When considering mature technologies (e.g. onshore wind, grounded PV), a grid parity condition can be expected.

To explore renewable energy production from wind offshore and floating PV (likely to be far from grid parity) is identified by the NECP as an option, within the boundaries of environmental sensitivity and sea transport safety constraints.

Objectives:

In order to foster investments in renewable energy production, consistently with the considerations reported above, the investment action presented here foresees the following contribution to RES development:

- financial support through grants to support the development of floating PV and offshore wind projects, projects carried out on sites owned by the PA or with low land consumption or combined with storage technologies;
- financial support through loans (senior/junior loan and/or credit enhancement) for grid parity systems.

From a market perspective, different roles are assigned to grants and loans, respectively:

- Grants: they shall help mitigating merchant risk.
- Loans: they shall facilitate project bankability and/or financial sustainability with a specific focus on grid parity initiatives potentially at merchant and/or off-taker's risk

When preparing this measure, the assumption made is that a 4x leverage factor can be assigned to such instruments.

The overall target is to generate an increase of 4,5-5 GW of installed capacity in 2026 in order to support the 2025 NECP's target.

As reported by the milestones planning, it is foreseen to complete the allocation process of related financial resources by the first quarter of 2022, so complying with the EU Offshore Renewable Energy Strategy which provided that Member States shall be able to present

a pipeline of mature projects by the end of 2023.

Implementation:

This investment action will be implemented by the Ministry of Economic Development, which will assign grants support through call for tenders, while loans will be intermediated by an implementing body to be identified. Such procedures will be designed in a coherent manner with State-aid rules and submitted to EC's competition authorities before the implementation.

The implementation plan is coherent with the NECP's provisions, that is to accelerate renewable electricity plants authorisation and construction from 2021 onwards, in order to achieve the ambitious objectives of the Plan (to be revised according to the new climate actions of the Commission).

Depending on further considerations on technology maturity and market readiness, deployment actions for wave and tidal energy will be explored.

Target population: Renewable energy production project promoters, infrastructure project developers, related investors, renewable energy technology providers.

Timeline: The implementation period is estimated to be 5 years.

1.1.2 *Support to the development of innovative integrated offshore renewable plants construction.*

Challenges: According to the Italian Integrated National Energy and Climate Plan (NECP), Italy has set targets for the installation of 300MW and 900MW of offshore wind by 2025 and 2030, respectively.

To meet these targets, it is crucial to encourage both national and foreign financing institutions to invest in Italy strengthening national infrastructures while increasing the production of clean energy. In order to attract all types of investors some challenges need to be overcome.

The first challenge is the length of the authorization process. To ensure more attractive and efficient conditions to market players, Italy has to streamline and simplify the permitting process.

Another challenge is to overcome the lack of attractive financing schemes related to emerging technologies such as floating offshore wind. Supporting such technologies is, in fact, crucial for coastal countries with high levels of urbanization such as Italy to meet renewable energy production targets.

Objectives: In light of the Offshore Renewable Energy Strategy and the Strategy on Energy System Integration, through the initiatives described below, this Investment aims

at creating the pre-conditions to foster ambitious projects such as the realization of energy hubs combining energy production from different renewable sources.

The ambition is to realize integrated systems, first of their kind in Italy and in the Mediterranean Sea. The renewable energy would mostly come from offshore wind, either on fixed or floating foundations depending on water depths, and floating solar PV.

While the energy production is known to be intermittent in case of offshore wind and solar PV, the intermittency can be removed with the implementation of a dedicated system for energy storage. This investment aims at contributing to the decarbonization of the EU energy mix and supporting the transition to carbon neutrality of the European Union. Furthermore, it will contribute to the creation of a dedicated supply chain and it will create new highly technical skilled jobs.

All authorisation procedures (see also Reform 1) will comply with the EU environmental *acquis* (Environmental Impact Assessment, Habitats Directives) for individual projects and base their deployment on Maritime Spatial Planning (EU Directive 2014/89/EU).

Depending on technology maturity and market readiness of related components, investments can be made relying on recycled blades and batteries.

Implementation: In order to implement such projects, we might expect a public procedure focusing on innovative and sustainable technologies, system integration capacity and impact on Italian value chain. The implementation might involve Academic Research Centres while supporting the interaction with innovative start-ups.

In order to achieve these results, it is necessary for every wind farm to start with a wind measuring campaign. Since wind resource is of crucial importance in reducing the uncertainty in the predicted energy production of a wind initiative, this project will see the implementation of 4 measurement campaigns. They will be performed by floating lidar devices that will permit to measure the wind resource at multiple heights from near ground to above typical wind turbine hub heights. The wind monitoring campaigns will take not less than 12 months and will enable us to have accurate knowledge in terms of wind energy potential in the investigated areas.

Lidar fixed solutions can also be installed on existing offshore infrastructure, such as oil and gas platforms, located close to the investigated area. In this case additional costs of lidar floating solution will be avoided.

It is also crucial to strengthen the electrical infrastructure. Grid stability and appropriate capacity are key factors to consider. The implementation of intermittent renewable energies requires energy storage systems to balance the intermittency and capacity. Thus, the project will also see the upgrade and building of the required electrical infrastructure.

To support emerging offshore renewable technologies, 100Mw Floating PV plants will be engineered and installed in an area with a high irradiation in order to support and

integrate with Offshore wind turbines, therefore increasing total energy production.

The Floating PV technology targeted is able to resist significant wind streams and significant waves up to 4 meters due to its flexible structures. An expected reduction of more than 70,000t CO₂t per year is expected. This quantity is equivalent to removing from the road approximately 15,000 cars.

Target population: All local administrations are involved from the early phases to review the projects. The best onshore sites for the location of the activities are in the process of being selected in accordance with ongoing consultations with stakeholders involved safeguarding the marine flora and fauna.

Transmission system operators (TSO) are involved to review together storage capacity and grid stability. Avoiding intermittency in the injected power is a priority for the project.

Scouting of EU providers will be performed involving small and medium companies as well as start-ups for the supply of highly technological components.

For the Floating lidar campaigns subcontractors will be selected for the:

- Provision of a local marine facilities at the selected port
- Execution of local marine operations for commissioning
- Provision of suitable vessels
- Data management
- Service and maintenance as necessary, including vessel mobilisations
- Decommissioning including vessel mobilisations upon the end of the campaign

Floating PV will be engineered and installation performed relying on the EU value chain.

Fabrication of wind foundations will take place in national yards, thus creating new jobs but also widening the competences of existing yards.

For the procurement of smaller components, both for wind and solar, EU suppliers will also be considered. This approach will allow EU manufacturers and suppliers to have their references for a market in continuous expansion.

TSO will also contribute with their innovative solutions to overcome typical challenges with respect to grid connection. The involvement of national Transmission System Operator (TSO) will allow to establish a sound and robust collaboration that will result in a faster approach towards grid capacity evaluation and connection which will benefit future projects to come. All works required to upgrade the electrical infrastructure will likely involve EU contractors.

Timeline: The timeline foreseen for the investment is approximately 4 years.

1.1.3 Promotion of RES for collective and individual self-consumption.

Challenges: Italy has signed a plan characterized by very ambitious goals regarding the development of renewable energy for the next few years. In particular, among NECP targets, Italy has set that by 2030 the share of gross energy consumption covered by renewable sources will reach 30%, compared to a current figure of around 18%. Moreover, most likely, the 30% target will be further increased with a view to making the goal of total decarbonization by 2050 more feasible.

The achievement of these national objectives requires an important effort on many fronts, including: energy efficiency (to contain consumption and, consequently, also the increase in the effort on renewable sources), support for the penetration of renewable sources in the electricity sectors, thermal and transport, increase in RES production from small and medium power plants spread throughout the national territory. To this purpose, this project focuses on supporting the energy communities and the self-consumption process.

Following the publication of the Renewable Energy Directive (RED II), Italy has planned to design regulatory framework and incentive systems for the increase of small-power renewable generation plants (residential use).

Objectives: The project aims to increase the number of RES plants, supporting the following configuration, through incentives.

- Energy communities;
- Self-consumption.

Specifically, this project aims to ensure the necessary financial resources to be able to install a new capacity of 1500 MW through the configuration of energy communities and of 1000 MW through the Self-consumption configuration. For both the configurations, it is expected that these can have an annual producibility of 1200 MWh / MW.

Implementation: Based on the national context and on the objectives set in the NECP, in order to concretely increase the number of RES plants and achieve 2500 Mw of new power generation capacity:

- 1600 ML € of loans would be allocated to energy communities
- 600 ML € of grants would be for self-consumption

Concerning the energy communities, the loans would be integrated with the financing mechanism introduced by DL 162/2019, converted by law 8/2020, and implemented with Arera resolution no. 318/2020 / R / eel of 4 August 2020 and decree of the MiSE.

Both the mechanism will be based on the amount of energy produced that is self-consumed by the members of the community, albeit "traveling" on the public network. The incentive is equal to 110 € / MWh and is recognized for 20 years (estimated life of the plant) is repaid through a contribution to electricity bills (Asos component). During the pre-

liminary investigation for the preparation of the decree, this value is associated with a shared energy level equal to 60% of that produced.

The financing mechanism on which the loans will be integrated consists of a part linked to the non-payment of the costs of transport and distribution of electricity and a part linked to the power of the plant. Considering a 100 kW plant, the explicit support mechanism currently in force (decree of 4 July 2019) provides for a premium on self-consumed energy of 10 € / MWh (only if self-consumption is greater than 40% of the produced) and an incentive of approximately 60 € / MWh (calculated as the difference between the recognized tariff of 105 € / MWh and the current market price of electricity), both recognized for 20 years.

Target population: local, regional and national administration; municipalities, renewable power producers, PV local installers.

Timeline: The implementation period is estimated to be 6 years.

Investment 1.2: Development of an Italian supply chain for renewable technologies production (PV cells and panels, and medium-large size wind turbines).

Challenges:

Photovoltaic technology has always played the role of driving technology in the energy transition process. In the next decades, the solar PV capacity is expected to increase from 795 GW in 2020 to 2440 GW in 2030. By 2030, solar power in Europe will grow from today's 152 GW to 442 GW and in Italy from 21 GW to 52 GW (source: BloombergNEF).

Italy has a background of innovative technologies and efficiencies potentially higher than conventional ones. Therefore, it is appropriate to strengthen EU capabilities able to compete in a market considered strategic for the energy transition, supporting manufacturing capacity building in the country, allocating the related financial resources through transparent and non discriminatory procedures to EU players.

This initiative will provide a substantial social impact at national and European level because it will foster the European technology leadership in the next generation of PV modules and cells impacting on the whole PV value chain, expertise and know-how.

Thanks to its recognized role in the Mediterranean basin Italy may become a pivot in the PV market for the whole area, which accounts for an additional installed PV capacity from today's 18 GW to 80 GW in 2030 (source: BloombergNEF).

Since the market for photovoltaic cells and modules is dominated by Asian producers (mainly Chinese) for about 70% and Europe currently accounts for less than 5% of the production capacity of PV modules, the project will contribute to build a lasting Ital-

ian and European technological independence from extra-EU PV producers in order to overcome the energy transition challenges.

As for wind energy, Italy has been working to strengthen the commitment to decarbonization roadmap and in light of the milestones set by the Green New Deal, Wind Turbine Technology will be playing an important role. According to NECP wind energy is expected to grow around 80%, from the present installed 10GW to 18GW (1GW offshore). The global Italian demand is expected to be split in 5GW dedicated to repowering existing wind farms and the remaining 13 GW for new plants to be developed within 2030.

The project is in line with the green and digital transition and green economy required by the RRF and European Green Deal.

Thanks to its Strategic position in the Mediterranean area, Italy may play a pivotal role in the wind turbine market for the whole area.

The creation of a new European player in wind turbine technology for medium-high power aerogenerators, offers the opportunity to develop an additional supply chain, increasing industrial production within Europe.

Objectives:

This investment aims to achieve the green transition and restore Italy's growth potential. It allows the creation of new jobs in the aftermath of the COVID-19 crisis. It promotes sustainable growth based on the use of renewable energy in line with the objectives of the Next Generation EU and the Integrated National Energy and Climate Plan.

Furthermore, this investment aims to relaunch of EU supply chain in the wind turbine sector with creation of a new player, expected to rapidly expand rapidly a market segment not fully covered today, generating employment in the aftermath of the COVID-19 crisis and creating a new competence in the EU, with impact on Italy (developing R&D capabilities). In agreement with European Green Deal the project will contribute to reduce social and territorial inequality.

It will develop:

- new jobs created in the country, focussing on southern regions;
- fixed capital: in high-tech industrial infrastructures and digital automation, research and development and production of intellectual property and know-how;
- human capital: by new technical and specialist skills
- natural capital: contributing to the renewable resources increase as required by the NECP.

The main objectives are to:

- establish a EU champion of advanced and proprietary green PV technologies production;

- consolidate and create proprietary know-how and skills, by an R&D in strong synergy with external Research Centers and Suppliers;
- set-up the necessary supply-chain, by restoring a European chain in photovoltaic industry;
- contribute to the national objective of CO2 emissions reduction spelled out in the National Energy and Climate Plan.

To achieve it, the use of other EU instruments like Horizon Europe (e.g. European Partnership for Clean Energy Transition) can be considered.

These actions will contribute to the national objective, spelled out in the National Energy and Climate Plan, to reduce the national objective of CO2 emissions and supporting the green & digital transition.

Implementation:

The project will enhance the technological skills and high-tech industrial infrastructures and digital automation of an existing Italian start-up specialized in the production of PV cells and modules. The production will increase from the current 200 MW/year to at least 2 GW/year in 2025 by establishing the new production line, the processes and the supply-chain along with the necessary R&D, IP and channels to the market. By early 2026, the proprietary technology upgrade will increase the production to at least 3 GW/year. The major steps of implementation are the following:

- Design for permitting and request submission to the relevant Authorities,
- Permit obtainment,
- Design specifications and procurement contracts,
- Cell and Module line tools manufacturing by Suppliers and shipment,
- Cell and Module line facility and equipment installation,
- Cell and Module line start up and setting up,
- Module production ramp up to 2 GW/year,
- Technology upgrade implementation and production ramp up to 3GW/year.

As for the wind turbine supply chain, the implementation is foreseen to be articulated on the following main steps:

- Set up of IP & technology (consolidation of existing capabilities and acquisition of missing technologies)
- Set up of a manufacturing facility
- Set up of a local supply chain
- Prototype Manufacturing and assembly phase
- Commissioning and Testing of a pilot unit
- In parallel with know how improvement and development

Target population: Local, regional, national administrations, renewable energy produc-

tion project promoters, renewable power producers, IPPs, investors in renewable energy project, EPCs, Distributors.

Timeline: The implementation period is estimated to be 5 years (2021-2026).

Investment 1.3: Projects at local level (Municipalities)

Investment under definition

Investment 1.4: Reinforcement and digitalisation of power grid infrastructure.

1.4.1 Installation of thermal energy storage systems.

Challenges: The initiative supports the green energy transition, with a sustainable growth of renewable energy sources, allowing a larger reduction of renewable energy curtailment and a better balancing of its production in the national pool.

Reference is made to the Italian TSO's (Terna) Development Plan 2020 future increasing of installed RES capacity, leading to additional curtailment due to overgeneration.

Objectives: The investment anticipates the installation of thermal storage systems to decouple the thermal and electrical flows of "must-run" CCGT (Combined Cycle Gas Turbines) plants enabling time shifting of the electrical production, while ensuring safe and continuous energy supply to industrial complexes, especially those subject to major accident risk (Seveso's directive).

These actions will contribute to the national objective, spelled out in the National Energy and Climate Plan (NECP), to increase renewable quota in the Italian energy mix (55,4% at 2030) and reach a storage capacity of 3,0 GW at 2025, and are in line with EU's decarbonization strategy.

Implementation: Total amount of the investment (50 M€) to be fully funded by RRF on a non-repayable basis (100% grant on capital expenditure); otherwise, a suitable regulatory framework, providing for a support mechanism, should be developed to make the project sustainable.

Target population: Italian transmission system operator, renewable energy producers, installers, engineering companies, EPC contractors, small and medium enterprises.

Timeline: The implementation period is estimated to be 5 years.

1.4.2 Interventions to make electricity distribution networks smarter (Smart Grid).

Challenges: The growth of distributed RES generation foreseen by the NECP is going to require large investments to increase (especially) distributed generation hosting capacity. Although DSOs' investments are remunerated by tariffs, additional public contributions are able to accelerate projects implementation while minimising the impact of such effort on energy bills.

According to available analysis (Ministry of Economic Development and DSOs estimation), in the NECP's implementation timeline, the hosting capacity gap between DSOs funding potential through tariffs and foreseen system needs is around 8.000 MVA.

Objectives: The investment aims to increase the hosting capacity of distribution networks, in order to integrate the growing share of RES produced by distributed plants and to contribute to CO2 emissions reduction, complying with the NECP and EU strategies.

Consistently with the gap analysis mentioned above, the overall objective of this measure is to build around 230 new primary stations for an equivalent hosting capacity of 8.000 MVA.

RRF's resources are going to be committed to this purpose in order to minimise (if not completely avoid, any impact on energy bills by increasing tariffs).

Implementation: The Administration has gained considerable expertise in the implementation of the measure, thanks to previous experience in the management of the ERDF Fund. Therefore, the procedure tested and used - even recently - for similar initiatives on resources of the PON-IC, which provides for the selection of projects submitted on the basis of a technical-economic evaluation, can be replicated.

Based on state aid rules in force, the measures can only be implemented in the assisted regions (Apulia, Calabria, Sicily, Basilicata, Campania, Sardinia). The planned budget would be entirely expendable in these regions. However, the Directorate has already moved steps to open to such throughout the national territory.

The potential risks (however low and related only to cases in which it is necessary the authorization to the realization of lines) are manageable in the indicated times. An IT monitoring platform for similar operations financed from ERDF resources and more generally a bimonthly monitoring system is in place and can be replicated.

Target population: DSOs, local and regional administrations, Municipalities and other stakeholders.

Timeline: The implementation period is estimated to be 5 years (2021-2026).

1.4.3 *Interventions to increase the resilience of the distribution network.*

Challenges: Improving the resilience of the distribution network: in particular, increas-

ing the resilience of the system to extreme weather events. Although the investments of the concessionaires are remunerated in tariff, the need to support such investments with public contributions arises from the need to be able to count on the accelerating effect that only a public intervention can guarantee and that is fully justified in the face of the large investments provided for by the NECP on the network distribution for the achievement of the challenging objectives of the same NECP, both in terms of increasing the share of energy needs covered by energy from renewable sources and lower CO2 emissions. Non-repayable contribution of 100% of the investment made.

Objectives The investment aims to increase the resilience of the system to extreme weather events such as heat waves, ice sleeves, etc.

Implementation On the basis of the state aid rules in force, the measures can only be implemented in the assisted regions (Apulia, Calabria, Sicily, Basilicata, Campania, Sardinia). The planned budget would be entirely expendable in these regions, the Directorate has, however, already activated on this front so that such interventions are feasible throughout the national territory. The potential risks (however low and related only to cases in which it is necessary the authorization to the realization of lines) are manageable in the indicated times.

The bimonthly monitoring system currently used for other types of public support on the networks may be borrowed.

Target population: DSOs, local and regional administrations, Municipalities and other stakeholders.

Timeline: The implementation period is estimated to be 5 years (2021-2026).

1.4.4 Installation of integrated EV charging stations.

Challenges: The NECP gives the transport sector a central role in the decarbonization path to 2030. To achieve the European targets on decarbonisation, a fleet of around 6 million electric vehicles is expected by 2030 (of which 4 million fully electric and 2 million plug-in hybrids)

According to the data published by ACI, as of 31.12.2019 they are registered in the PRA 39,545,232. 46% of the fleet is petrol powered, 44% diesel, 9.9% has alternative power (it was 9.3% in 2018). Alternative fuel cars, 3,896,923, recorded a growth of 7.9% and are broken down as follows: 2,574,287 petrol-LPG (6.5% share), 965,340 petrol-methane (2.4% share), 22,383 battery electric (+ 0.1%), 316,209 petrol hybrid (0.8%), 18,359 diesel hybrid (0.1%), other 6,195. 5,606 units (about a quarter of the electric car fleet in Italy),

Based on this scenario, it is therefore essential to promote the development of a network of charging stations to support the projected increase in the need for electric mobility.

The lack of widespread distribution appears to be, for many studies conducted in Italy, the main cause of the lack of purchases of electric cars in Italy.

The employment impact, calculated from a statistical processing Input / output matrix based on networks, returns a value of approximately 6.6 hires for every million euros invested.

Objectives The work carried out in the MISTEG, for the purpose of revising the National Plan for the development of electric charging infrastructures (PNIRE), to the aim of identify, for each type, the objectives in terms of electric charging infrastructures necessary to reach the NECP targets, the following number of EV charging stations. Therefore, this project aims to support the construction of the following recharging points

- Number of charging stations on motorway: 222
- Number of charging stations on sub-urban areas: 1800
- Number of charging stations on urban center areas: 3537
- Number of charging stations connected to storage: 100

The targets were design assuming a slightly higher utilization factor for plants in extra-urban areas, and a progressive growth over time of the electric fleet in circulation in these areas.

Implementation General coordination will be carried out by the MiSE, with the support of the other Administrations with technical qualification functions (MIPAAF, MATTM, MEF). In the first months of 2021, the primary regulation and the implementing decree should be issued with notification to the EC. From the second half of 2021, resources will begin to be assigned and transferred according to a work progress logic.

The proposal approach provides for a contribution, in compliance with the limits and intensity of aid provided for in the European framework, on the cost of construction and in any case not exceeding 40% -80%. Details of the different financial contribution (% of the total cost), for the different configurations, are provided below

- Charging stations on motorway: 40 %
- Charging stations on sub-urban areas: 40 %
- Charging stations on urban center areas: 40 %
- Charging stations connected to storage: 80 %

The factor that most affects the economics is, on the other hand, linked to the level of use of the charging station and, therefore, indirectly to the intensity of traffic on the road on which it is installed.

Assuming a slightly higher utilization factor for installations in non-urban areas, and a progressive growth over time in line with the expected growth of the electricity fleet in circulation, it is possible to arrive at first estimates of the economic payback time of the investment, 'IRR and NPV. The aid intensity has been set at 40%, except for the case in

which there are accumulations, for which a higher aid intensity appears necessary.

Target population: Local, regional, national administration, Municipalities, renewable power producers, DSOs, EV charging station installers, infrastructure project developers, stakeholders of the electrical mobility

Timeline: The implementation period is estimated to be 6 years.

2) Promotion of clean hydrogen production and use.

Investment 2.1: Production of Hydrogen in brownfield sites.

Challenges: From an initial statistical survey of 2011, the total surface of the land dedicated to industrial areas in Italy was found to be 9.000 km², an area approximately equal to that of the Italian region of Umbria. Many of them are situated in strategic positions with untapped potential to contribute to build a more granular hydrogen network production & distribution to SMEs close by. The investment will provide the local use of H₂ in industry and SMEs, thus creating new Hydrogen Valleys with local production and utilisation.

Objectives: This investment has the objective of a new use of abandoned industrial areas to test unit hydrogen production from local RES in the industrial area and facility. The investment provides for a possible suitable re-use of industrial areas, avoiding further use of agriculture exploitation and becoming an engine for the revival of local economies, while providing a driving force for employment, economic growth and a widespread process of decarbonisation of the territories of the South Italy, enhancing production from renewable sources. The fallout in terms of employment can be quantified 25/50 units per system, according to capacity.

Implementation: - to be completed -

Target population: Hydrogen industrial players, research institutes, universities, SMEs, start-ups, municipalities and other stakeholders.

Timeline: The implementation period is estimated to be 5 years (2021-2026).

Investment 2.2: Production of Electrolysers and Development of an Italian Hydrogen Supply Chain.

Challenges: In Italy, already existing industrial entities having expertise in high technology adjacent sectors could speed-up the technology development and the set-up of an industrial electrolyser OEM for massive production of electrolysers. The project aims to create an industrial center for the production of electrolysers to meet the growing

demand in the coming years. The industrial pole must be able to produce electrolyzers of different sizes and types to meet the different needs of the market. At this stage the main types identified are: Alkaline, PEM, AEM. For the first two types, the objective is the reduction of final costs by leveraging economies of scale, for the AEM electrolyzers the involvement of research bodies (see projects H₂ R&D) is expected to increase yields and in particular on the length of the life cycle.

The Electrolyser market should scale up quickly as well: it is foreseen to grow by ~600 times in the next decade, from the current 70 MW of installed capacity to 40 GW declared by the European Union strategy. Italy has already some national capabilities in the production of electrolyzers, but the sector will require a significant scale up in the production output, in the development of end-to-end capabilities (from stack to electrolyser installation), and in the investments in R&D and pilot projects for large-size electrolyzers (i.e. electrolysis capacity greater than 10 MW)

To kick-start the development of a hydrogen market, the Government envisions the installation of about 5 GW of electrolysis capacity by 2030 to meet part of the above mentioned demand. National production of green hydrogen may be complemented with imports – which can be leveraged to position the country as a hub for hydrogen trading – or other forms of low carbon hydrogen, such as blue hydrogen.

Objectives: This investment aims to create of a national supply chain based on the potential user basin, economic impact in terms of employment and social growth, specialized jobs (technical, contribute to the decarbonisation of the economy), reduction of dependence on oil, reduction of energy imports, spillover of new specialized companies, projection on international markets, creation of turnkey service formulas for the the industrial sector.

The programme foresees two main delivery milestones where two different electrolyser sizes will be released. This choice goes into the direction of risk reduction and anticipates as much as possible the diffusion of systems to produce green hydrogen.

Implementation: To satisfy a hydrogen demand of about 2% by 2030 (corresponding to about 0.7 Mton / year), the most favorable conditions will need to be identified to ensure production feasibility and a low commodity cost.

Create an industrial plant for the production of electrolyzers to meet the growing demand in the coming years and create an Italian Supply Chain on H₂.

1. Set -up IP framework;
2. Set up a development programme based on a modular approach to satisfy a wide range of application;
3. Construction of dedicate manufacturing facilities dedicated to: feedstock management, assembling, prototype tests;
4. Manufacturing of the first prototype 1:1 scale with respect to commercial version

- for 1-5 MW scale;
5. Manufacturing of the first prototype 1:1 scale with respect to commercial version for > 10 MW scale;
 6. Execution of an experimental campaign on the prototype to verify its behaviours in different operating conditions and obtained the proper certifications.

Target population: Power system manufacturers, power engineering companies, producers of electrolyzers components, chemical industry, investors in electrolyzers, infrastructure project developers, local municipalities and other stakeholders.

Timeline: The implementation period is estimated to be 5 years (2021-2026).

Investment 2.3: Hydrogen use in “hard-to-abate” industry

Challenges: Hydrogen can help to decarbonize “hard-to-abate” sectors, characterized by a high intensity energy and lacking scalable electrification options. Two of them are the chemical products and oil refining sectors, in which hydrogen is already used as feedstock in the production of base chemicals, such as ammonia and methanol, and in a number of refining processes.

Hydrogen is mainly produced on-site in its “grey” form, i.e. from natural gas using Steam Methane Reformers (SMRs). This process is not emission free: emissions per kg of grey hydrogen produced are in the range of 7-9 kg CO₂ / kg H₂. To decarbonize it, a progressive switch to low carbon hydrogen would be a valid alternative. Current production is around 0.5 Mton H₂ /year (a penetration of about 1% on final uses), therefore representing one of the most promising sectors to start using low carbon hydrogen and developing the market.

In Europe, several projects have been launched in the past few years to experiment low carbon hydrogen in refineries and chemical plants, with strong momentum mainly driven by the willingness to contribute to national environmental targets, and to relevant funding provided by regulatory agencies for pilots and projects in low carbon hydrogen production. The dimension of the projects is still small compared to the total hydrogen need of an average plant, but many of them are expected to be in full operation by the end of the next year.

In Italy, refineries and chemical plants are mainly concentrated in central- northern Italy and on the islands, with wide variations not only in terms of plant dimensions and emissions, but also physical characteristics (e.g. proximity to sea, availability of sunlight, etc.). Therefore, the switch to low carbon hydrogen will need a careful plant-by-plant evaluation to assess its technical feasibility.

Objectives: In the primary steel industry, hydrogen represents the only zero carbon alternative in the production of Direct Reduced Iron (DRI), which can be progressively

used to avoid the high emissions' production of cast iron from blast furnaces. Currently, DRI technology uses natural gas as a preferential commodity: with the declining cost of hydrogen as compared to natural gas, steel making plants could start to consider hydrogen blending for DRI production.

In the industrial sector – in addition to chemical production, oil refining and primary steel production – hydrogen has the potential to be used also in industrial heating, particularly for processes requiring high temperature (>1000°C, e.g. in steel or cement industry, glass and paper plants), in which electrification may not be the most efficient or feasible alternative due to the necessary upgrade of the existing infrastructure.

Implementation: - to be completed -

Target population: Hydrogen industrial players, research institutes, universities, SMEs, start-ups, municipalities and other stakeholders.

Timeline: The implementation period is estimated to be 5 years (2021-2026).

Investment 2.4: Hydrogen Use in Heavy Goods Transport on Wheel.

Challenges: The long-haul truck segment is one of the heaviest-emitting sectors, accounting for 5-10% of overall transport. Currently, the regulatory landscape for the transport sector is evolving with concrete actions towards decarbonisation, setting new emission standards for Original Equipment Manufacturers (OEMs) in the next few years. In particular, new regulations for OEMs require emission reductions by 15% and 30% on new sales, by 2025 and 2030 respectively.

To comply with these new targets, OEMs are starting to invest in alternative powertrains, to progressive switch from diesel engines, currently the most used in heavy transport, to lower carbon fuels (hydrogen, biofuels, biomethane, etc.), electric powertrains or LNG. Not only cost competitiveness (i.e. Total Cost of Ownership - TCO) but also technical parameters (e.g. refuel time) drive customers' choice in this sector. For example, while the TCO of fuel cell trucks is currently not in competition versus other low carbon alternatives, its superior mileage and faster charging time compared to electric powertrain can pave the way for fast adoption of hydrogen based solutions. Moreover, the TCO of fuel cell trucks can become competitive with diesel trucks in the next decade, thanks to the declining cost of both vehicle and hydrogen price.

In Europe, the fuel cell truck market is starting to ramp up, with the first ten fuel cell long-haul trucks currently in full operation in Switzerland. Italy can follow a similar trajectory: it can be expected to witness a penetration of at least 2% of fuel cell long haul trucks by 2030, on a total national fleet of around 200,000 vehicles.

To sustain such market growth, a full scale-up of the fuel cell technology and investments

in relevant infrastructure should be undertaken. In particular, a dedicated grid with tens of refueling stations needs to be deployed, with priority given to strategic areas for heavy road transports (e.g. near inland terminals and on typical long-haul trucks' routes). For instance, the A22 Modena-Brennero or the West – East corridor (Turin – Trieste) highway could be a one of the possible starting points to install refueling stations and enable the fuel cell trucks' market growth. Further developments will take into account the update of DAFI Directive, foreseen within 2021.

The long-haul truck segment might experience a more significant penetration, and rise to 5-7% from the above mentioned 2% by 2030. This could be partially due to a more stringent target on overall emissions, likely to be approved in the context of the EU Green Deal. Moreover, the specific regulation on OEMs may require an additional effort in terms of climate impact (15% and 30% emission reduction on new sales by 2025 and 2030, respectively).

Objectives: This investment aims to create a hydrogen refuelling station network with up to 40 refuelling distributors suitable for trucks for a reduction of transport-related emission.

- *Reduction of emissions:* effect on climate and health;
- *Energy efficiency:* use of local energy from renewables;
- *National and regional economic cycles:* reduction of dependence on oil, reduction of energy imports, creation of economic value at local level;
- *Economic value:* connection with EU economy, tourism of the future tourism - flows to the Mediterranean;
- *Specialized jobs:* technical for asset management and maintenance;
- *Image:* Italy beacon for green technologies, tourism and eco-sustainable transport;
- *Replicability:* projects can be replicated throughout the country and abroad.

Implementation: - to be completed -

Target population: Local, regional, national administration, Municipalities, infrastructure project developers, investors in hydrogen technologies.

Timeline: The implementation period is estimated to be 5 years (2021-2026).

Investment 2.5: Hydrogen Use in Railway Mobility

Challenges: Another sector of interest for hydrogen is the railway sector, in particular the passenger railway transport: in Italy, approximately one third of the railways are dedicated to diesel trains, accounting for a small portion of national transport emissions. Fuel cell trains can become cost-competitive with diesel trains in the next decade, therefore being one of the most promising sectors in which to kick-start the development of a national hydrogen market.

In some European countries (e.g. in Germany), passenger hydrogen trains are already fully operative and regularly used by customers. In the UK and France, some proposals have been made to completely substitute diesel trains with hydrogen trains in hard-to-electrify routes by the next two decades.

In Italy, up to half of the non-electrified national routes could be converted to hydrogen by 2030: in some regions, diesel trains have a high average age and should be substituted in the next few years, making this the right moment to switch to hydrogen. Potential first regions in which start the deployment are those with a high number of diesel trains serving a large number of passengers, such as Sardinia, Sicily, Piedmont or regions where there is a common consensus on using hydrogen to start decarbonizing and improving local railways.

In terms of infrastructures, relevant synergies with the refueling stations for long haul trucks will need to be identified to boost utilization. Freight villages are an example of places in which hydrogen demand for both trucks and trains may need to be satisfied in the next decade.

Objectives: This investment aims to introduce hydrogen-powered trains into the national rail network. Hydrogen can replace diesel where track electrification is not economically feasible. Several trials and pilot projects worldwide have successfully shown the adaptability of the FCH technology to the rail sector across various applications ranging from regional passenger trains. In particular, about 40% of the national routes are not supported by electrification. As a result, the development of hydrogen trains is an economic opportunity to substitute the old locomotives.

Implementation: To develop a complete system for the production, storage and use of hydrogen for non-electrified railway mobility in which to carry out the first experimental projects, in view of the subsequent replacement of the diesel train fleet with hydrogen-powered trains. Construction of prototypes of hydrogen refueling stations complete with the infrastructure necessary for the service of the diesel train fleet with hydrogen-powered trains.

Target population: Local, regional, national administration, Municipalities, infrastructure project developers, investors in hydrogen technologies.

Timeline: The implementation period is estimated to be 5 years (2021-2026).

Investment 2.6: Hydrogen Research & Development

Challenges: The main challenges of this investment concern the technological demonstration in integrated and operational environments (Technology Readiness Level - TRL 8) of the various technological and system solutions developed. In particular, the implementation and demonstrate the different technologies for the production of hydrogen from

Renewable Energy Sources (RES), transport and distribution in mixture with natural gas (GN), or in pure form, in pipelines, up to use of hydrogen in the various application sectors, relating to energy, industry, sustainable mobility and transformation processes into synthetic products (gases / liquids).

The TRL increase will be achieved thanks to the integration and experimentation in a qualified and operational environment (Hydrogen demo Valley) of the various technologies belonging to the value of hydrogen. Hydrogen acts as the link to create the interaction between the RES and the energy system, overcoming the criticality of intermittence, ensuring use deferred over time. Electrolisers are the key element in transforming electricity into hydrogen.

Objectives:

The investment aims to improve knowledge of the implementation of the hydrogen vector in all phases: production, storage and distribution. Alongside the technologies, the reduction of costs through the growth of returns through experimentation in the main segments and the creation of prototypes aimed at verifying the industrialization phase of innovative processes. R&D is an important enabler and accelerator for the diffusion of hydrogen.

In particular, the R&D activities will have following specific objectives:

- Production of hydrogen from electrolysis through mature technologies to ensure adequate hydrogen production, by coupling the use of renewable energy produced on site with electricity of certified renewable origin from the grid;
- Production of hydrogen from different energy sources with emerging technologies and in the pre-commercial phase according to industrial needs;
- Production of 100% renewable synthetic methane from green hydrogen and CO₂ of biological origin, in order to favor the transport and distribution of renewable gases in the network (in perspective for seasonal geological accumulation) and towards users
- Identification of enabling technologies, development of business models and creation of professional figures that favor the development of the hydrogen economy;
- Innovate and digitize energy systems and networks to increase the interconnection between physical assets, people and information through pervasive IoT sensors, artificial intelligence and advanced control systems that allow to increase the resilience and reliability of infrastructures in new energy scenarios.

Implementation

A real hydrogen network will be developed with the aim of testing diverse technologies as well as operation strategies for supply and demand matching, as well as to provide R&D and engineering services for industrial players in need of to-scale validation of their products in a holistic environment.

A network of sensors will be introduced for the monitoring of the pipelines and, at a higher level, an all-encompassing system for data acquisition and analysis (HW and SW), both for integrated management of the Hydrogen Demo Valley and for categorising in view of possible replication in similar contexts.

Target population: hydrogen industrial players, research institutes, universities, SMEs, start-ups, municipalities and other stakeholders.

Timeline: The implementation period is estimated to be 5 years (2021-2026).

Investment 2.7: Hydrogen Combustion Technology Development for green power generation.

Challenges: In a system with an increasing share of variable electricity production from renewables, the high flexibility of gas turbine based power plants can effectively ensure grid stability and security of supply.

Objectives: The main objective of the investment is to make gas turbines an integral part of the future energy mix, meeting the incoming demand to extend the fuel flexibility of existing power generation infrastructure to incorporate green fuels, in particular Hydrogen.

The investment aims to improve the combustion technology for existing and new gas turbines to support, during and after Energy Transition, the green power generation. The vision is to meet GHG reduction targets, using as much as possible all the infrastructure already existing for Natural Gas, in line with circular economy principles.

Implementation: The strategy is to design retrofittable burners able to use Hydrogen, replacing NG, up to 70% corresponding to -40% CO₂ emissions reduction with respect to standard configuration operated with 100% of Natural Gas, and produce the prototype for each of the gas turbine sizes.

The Milestones of the investment are defined as real application and test of the technologies. These applications and tests will be done on field, on real Engine in Commercial running condition. In this case also the User (Electric Utilities) will be involved with positive effects on their business.

Target population: Gas turbine manufacturers, power engineering companies, other stakeholders.

Timeline: The implementation period is estimated to be 5 years (2021-2026).

3) Sustainable local transport, cycle paths and rolling stock renewal.

Investment 3.1: Investment in soft mobility (National Plan of Cycle Path)

Challenges: The number of cyclists in Italy is constantly increasing since 2013 (+ 41% to 2018) and brings an economic value of 7.6 billion euros per year, while the Cycle Internal Product is close to 12,000 million euros, representing a booster for the sector, implemented in synergy with the additional incentives for soft mobility undertaken by the other competent administrations (e.g. MATTM “mobility bonus”).

Besides being a sustainable urban transport solution, cycling plays a significant role for tourist mobility. With regard to cycle tourists, according to the analysis performed by Isnart-Unioncamere and Legambiente (2020), the total number of overnight staying of cycling tourists in 2019 was 54.7 millions. The majority of cycling tourists are foreigners (63%), while only 37% are Italians. The impact on the Italian economy in 2019 accounted for more than 4 million euros, corresponding to an average of 75 euros of expenditure per cyclo-tourist.

The estimates provided by Legambiente foresee a significant impact of the Covid-19 pandemic outbreak on the cycling sector: a 20% increase in the number of Italian cycling tourists is expected in 2020 compared to the previous year.

The mobility by bicycle will have a fundamental role in the immediate future and can have a driving effect on the cycle-travel sector with extraordinary potential in consideration of the Italian landscape and cultural context.

Objectives: The objective of the measure is to promote the use of zero emission vehicles for individual private transport and to encourage passenger intermodality involving the use of bicycles and public transport services. The realization of new cycle path will produce the following benefits:

- increase the potential attractiveness of daily journeys in urban areas with the use of bicycles, promoting the creation of interconnection nodes with other modes of transport (the so-called "last mile"), both within the city cycle network and in the connection between the sub-urban areas of large urban centers with the suburbs;
- improve the design quality of cycle paths, construction and maintenance of cycle networks, cycle and pedestrian routes, and urban and interurban infrastructures dedicated to soft mobility;
- enhance the playful and cultural aspects of the various areas crossed for tourist or recreational purposes (in the area of regional, national and European tourist cycle paths).

Implementation: The total cost of the measure is 737.3 million euros: 200.0 million euros for the realization of 1,000 km of urban and metropolitan cycle paths and 537.3 million for the realization of 1,626 km of tourist cycle paths.¹¹ At least the 50% of the

¹¹Additional resources for cycle routes deriving from national Funds (2014-2020 Infrastructure FSCs), addressed to the competent territorial bodies (Regions) with relative CIPE resolutions

resources will be allocated to the south regions.

The estimation of the cost for urban and metropolitan cycle paths was calculated as part of a technical-economic pre-feasibility analysis which assumes a unit cost of 200,000 euros per kilometer, with possible further increase of cost for metropolitan areas. The urban and metropolitan cycle paths will be developed in the 40 cities hosting major universities to be connected with railway or metro nodes. The main university centres will be identified on the basis of the number of students enrolled in the universities and the number of student travelers using the rail stations. The specific projects will be realised in compliance with the Decree of the Ministry of Infrastructure and Transport of 4 August 2017, n.397 and following amendments. The Decree among others establishes that, in case of municipalities with more than 100.000 inhabitants, the new cyclo paths must be part of the planned interventions of the relevant SUMP.

Moreover, the indication of adopting SUMPs is also in line with the decree 12.08.2020, n. 344, for the allocation of resources to local authorities (municipalities and metropolitan cities) for interventions on cycling. In particular, a reward for the bodies that had adopted, as of 30 April 2020, the SUMP in application of the decree of the Minister of infrastructures and transport 4 August 2017, n. 397 is provided.

The interventions will be implemented by the local authorities in compliance with the strategies defined in Law no. 2 of January 2018 and in line with the provisions of the Biciplans of Metropolitan Cities and Municipalities regarding the integrated planning of sustainable mobility. It has to be specified that the drafting of the National Cycling Plan in implementation of Law no. 2 of 2018 is nearing completion. At this purpose, the measure financed by the RRF will be integrated with the national resources already available.

The development of national priority tourist cycle routes involves internal green areas not subject to development deriving from mass tourism (e.g. Ciclovía Vento, along the Po river), and it is implemented through functional lots, with an extension of tens of kilometers. The new kilometers to be realized are cross-territories and they will be uniform in terms of design, sign and functionalities. Tourist cycle paths are listed in the table [M2C2-1](#) on page 65.

Table M2C2-1: Tourist cycle paths

No	National priority tourist cycle
1	Ciclovía Vento, da Venezia a Torino attraverso le Regioni di Veneto, Emilia-Romagna, Lombardia, Piemonte lungo le sponde del fiume Po (732km)
2	Ciclovía Sole, da Verona a Firenze attraverso le Regioni di Veneto, Lombardia, Emilia-Romagna e Toscana (392 km)
3	Ciclovía GRAB, Anello ciclabile all'interno della città di Roma lungo la via Appia e il fiume Tevere (44 km)
4	Ciclovía dell'Acquedotto pugliese, da Caposele a Santa Maria di Leuca attraverso le Regioni di Campania, Basilicata e Puglia, lungo l'infrastruttura storica del Canale Principe dell'Acquedotto pugliese (537 km)
5	Ciclovía Adriatica, da Venezia al Gargano attraverso le Regioni di Veneto, Emilia-Romagna, Marche, Abruzzo, Molise e Puglia lungo la costa affacciata sul Mar Adriatico (1109 km)
6	Ciclovía Tirrenica, dal confine Italia-Francia (Ventimiglia) a Roma attraverso le Regioni di Liguria, Toscana e Lazio lungo la costa del Mar Tirreno (560 km)
7	Ciclovía del Garda, un itinerario ciclabile ad anello lungo le sponde del lago di Garda attraverso le Regioni di Lombardia, Veneto e Trentino Alto Adige (140 km)
8	Ciclovía della Sardegna, itinerario ad anello attraverso l'intera isola della Sardegna e i centri di Cagliari, Oristano, Macomer, Sassari, Porto Torres, Olbia, Tortolì (1134 km)
9	Ciclovía della Magna Grecia, da Lagonegro a Pozzallo attraverso le Regioni di Basilicata, Calabria e Sicilia (1110 km)
10	Ciclovía Trieste-Lignano-Venezia, da Trieste a Lignano Sabbiadoro e Venezia attraverso le Regioni di Friuli Venezia Giulia e Veneto (150 km)

The aim of the measure is to have a reduction in air emissions. Considering that, for each kilometer traveled by bike instead of by car, the community is expected to save 97 euro cents for each kilometre of cycle path in terms of: health benefits, operating costs, travel time, noise, accidents, pollutants and GHG emissions from private vehicles (compared to the scenario in which the project is not implemented).

Target population: Regions, municipalities, provinces, metropolitan cities. The main beneficiaries are the citizens using bicycles for their daily trips in urban areas, as well as cyclo-tourists.

Timeline: The interventions will last 6 years, from 2021 to 2026. The cycle paths activation are progressive.

The interventions is coherent with the following timeline:

- realization of 1,000 km of urban and metropolitan cycle paths by 2022;
- realization of 1,626 km of tourist cycle paths by 2026.

Investment 3.2: Green local public transport and Rapid Mass Transport.

3.2.1 *Strengthening of the green transport industry, the related national supply chains and*

smart mobility.

The 2019 National Strategic Plan for Sustainable Mobility foresees the gradual replacement of busses for public transport with less polluting vehicles, particularly electric ones. Public transport in Italy currently accounts for only 14% of all motorised journeys, while 86% are made by car and motorbike. The LPT fleet in Italy has an average age of 10.5 years, is mainly Diesel Euro 2/5 and is characterized by a variable quality of service. The renewal of the LPT fleet implies an adequate production capacity, both in terms of its reconfiguration towards the development of innovative technologies and in terms of energy and environmental efficiency.

As part of the activities in support of the 2019 National Strategic Plan for Sustainable Mobility, the Ministry of Economic Development and the Ministry of Infrastructure and Transport commissioned Invitalia to carry out an analysis of the Italian bus production chain. This study revealed a varied landscape, in which, despite a few national bus manufacturers, there is a solid component supply chain. Currently the Italian bus production chain is made up of about 150 companies, most of which are small in size. The study also recommended strengthening the bus manufacturers' sector to cope with the technological transition that is required to meet the increasing demand for low and zero emissions busses.

The need of promoting the technological transition is also relevant for the hull construction sector, since the production of recreational crafts is not energy efficient and involves high carbon dioxide emissions.

Every year the public administration spends at least 150 billion on the purchase of goods and services and a relevant part of this is directed to investment in mobility. Through proper instruments, part of this spending could stimulate innovation and economic growth.

Objectives

The overall aim of the intervention is to promote the technological transformation - towards higher environmental and energy efficiency and smarter solutions - for the automotive, bus, nautical and maritime mobility supply chains.

A first action addresses specifically the bus sector. The intervention supports the investment in the bus production chain, in order to support the expansion of production capacity and the ecological transition to new feeding modes. The sum allocated can activate approximately 1 billion euros of investments for about 25-30 projects (this figure accounts also for the private business' investments).

A second action is intended to promote the purchase or construction of moulds prepared for the vacuum lamination of recreational craft units made of fibreglass infusion or prepregged fabrics, and for this purpose equipped with a perimeter flange.

A third action is aimed at stimulating innovation and industrial conversion towards new technologies for smart and sustainable mobility (electric / hybrid vehicles, digitalization, eco-design, etc.) of the small and medium enterprises active in the automotive, bus, nautical and maritime mobility supply chains. This, in order to lower the environmental impact of the sector and foster smart mobility.

Implementation

The cost of the measure is estimated to be 520 million euros: 300 million for the technological transformation of the busses supply chain; 20 million euros for the modernisation of recreational craft production facilities; and 200 million euros for Smarter Italy program to support innovation in the urban mobility supply chains.

The estimate of the intervention size for busses supply chain is estimated on the basis of the assessment carried out on the Italian companies that are active in the sector. Based on such analysis, the intervention shall allow the implementation of 25 to 30 industrial transformation projects through “Development contracts”.

Development contract acts as an instrument to support the bus production chain as it finances strategic and innovative large-scale production investment programmes. Development contracts are reserved to both individual and associated companies and involve a negotiating mechanism for financial incentives through non-repayable grants or interest rate subsidies and subsidised loans.

The total value of each investment programme financed by a Development Contracts has to be at least 20 million euros.

With regard to the administrative requirements, a directive issued by the Ministry of Economic Development (MiSE) is provided for the definition of the guidelines and implementation methods of the intervention, after which the companies submit a development plan, subject to an examination through a negotiation mechanism. The intervention can be implemented immediately and avail itself of a specific counter set up by MiSE. The examination requires 6 months; projects have an average duration of 36 months, to which must be added up another 12 months for reporting and final checks. The measure remains active until the counter’s resources are exhausted.

For what concerns the modernization of recreational craft production facilities, the use of infusion and fibreglass-resin processes results in a reduction in the overall weight of the hulls and consequently in fuel consumption. With a budget of 20 million, it is estimated that 200 moulds can be financed, for as many companies, through a tax credit from which the construction sites that build the hulls benefit.

The third action on the innovation and industrial conversion towards new technologies of the mobility supply chains will be supported under the Smarter Italy program, which is an innovation procurement program promoted by the Ministry of Economic Development

(MiSE), the Ministry of University and Research and the MID - Department for Digital Transformation of the Presidency of the Council of Ministers and implemented by the Agency for Digital Italy (AgID). Smarter Italy was established with the MiSE Decree of 31 January 2019, and it became operational with the agreement between MiSE and AgID for the implementation of intelligent public procurement.

As part of this action a new specific line of the Smarter Italy program will be activated by a Ministerial Decree of the MiSE. Under this line innovative green and smart mobility products and services will be procured via pre-competitive tender procedures or early adoption systems activated by Regions and municipalities. Through this system the public contractor buys either: a) the innovation process, including research and development services (research and development procurement and pre-commercial procurement) or b) the product of innovation created by others (public procurement of innovation).

The cost of the action is calculated assuming that 5 innovation contracts will be finalised per year over a period of 4 years. The average cost of an innovative contract is assumed to be 10 million of euros based on the experience stemming from the ongoing implementation of the Smarter Italy program.

Target population

The beneficiaries of the busses supply chain measure are EU companies that present an investment programme, through a proposing company, which promotes the initiative and the subjects that carry out research, development and innovation projects.

The beneficiaries of the modernization of recreational craft production facilities are EU shipyards that manufacture recreational craft units with NACE codes 3012 and 3011 and with a manufacturer code (MIC) in operation for at least 3 years.

The beneficiaries of Smarter Italy program for urban mobility are the local authorities (e.g. Regions, Municipalities) which will benefit from innovative mobility solutions offered by small and medium enterprises in the automotive, bus, nautical and maritime mobility supply chains.

Timeline

- The implementation of the busses supply chain measure will last 3 years (from 2021 to 2023);
- The implementation of the modernization of recreational craft production facilities will last 4 years, from 2021 to 2024;
- The implementation of Smarter Italy for smart and sustainable mobility will last 4 years, from 2022 to 2025.

3.2.2 *Renewal of the regional public transport bus fleet with clean fuels vehicles.*

Challenges

The Italian bus fleet for public transport presents an average age significantly above the EU counterparts: i.e. 10.5 years vs 7 years (CDP, ASSTRA, 2019. *Investire nel TPL*) and, thus, it is characterised by high fuel consumption and high operating and maintenance costs.

In particular, the Italian bus fleet for local public transport is composed of 42,000 vehicles out of which almost 90% are petrol, diesel and dual fuel vehicles and more than 40% are high emissions vehicles (i.e. Euro 0, Euro 1, Euro 2, Euro 3, Euro 4).

The high average age of the fleet represents a critical element for the public transport sector: firstly, it entails an increase in the operating and maintenance costs (e.g. the average maintenance costs of a new bus are 6 times lower than those of a 15 years old one), secondly, it reduces the quality of the service and travel comfort. Furthermore, a low-quality service does not encourage the shift from private cars to public transport, thus resulting in urban congestion and higher emissions from private vehicles (CDP, ASSTRA, 2019. *Investire nel TPL*).

The adoption of environmentally friendly vehicles will also require the availability of dedicated charging or refuelling infrastructures: this is the case of zero emissions vehicles like full electric or hydrogen powered vehicles. Another aspect to be considered is that electric vehicles, which currently represent the cleaner solution for road transport, are characterised by a limited travel range: i.e. about 170-200 km with a full charge. Therefore new investments in recharging and refilling infrastructure will be required to meet the objectives set by the European Directive 2014/94/EU on Alternative Fuels Infrastructure (DAFI) and by the EU Country Specific Recommendations 2019 (COM(2019) 512 final) and 2020 (COM(2020)512 final).

This action is fully aligned with the European Green Deal, which sets the objective to cut, by 2050, 90% of the transport-related emissions. Indeed, the achievement of such objectives implies among others the renewal of the public bus fleet and more specifically the adoption of alternative fuels vehicles and the related charging and refuelling infrastructure.

Objectives

The goal of this measure is to achieve a reduction of 66% in 2026 of GHG emissions from a fleet of 5,139 bus vehicles that will be substituted with low and zero emissions vehicles.

The operational objective of this measure is to accelerate the renewal of the bus fleet with buses powered through alternative and environmentally sustainable fuels (i.e. electricity, hydrogen and methane). This action can be implemented by purchasing new buses and the construction of an adequate charging infrastructure. Specific objectives are:

- enhancement of the quality and availability of public transport services and dis-

- courage the use of private vehicles;
- increase in user comfort and attractiveness of public road transport services;
- improvement of air quality, though the use of green fuels and innovative technologies in line with international agreements and regulatory provisions of the European Union;
- promotion the cohesion policy through the reduction of national gap as a result of the increase of bus equipment in Southern Italy.

Such objectives will be achieved through the renewal of about 12% of the overall bus fleet, corresponding to 5,139 vehicles that - if supported by the realisation of the dedicated infrastructure - would lead to the disposal of all Euro 0, Euro 1 and 96.5% of EURO 2 buses for local public transport by 2026.

Implementation

The implementation of the measure follows the national legislation as indicated National Strategic Plan for Sustainable Mobility (Piano Strategico Nazionale per la Mobilità Sostenibile - PSNMS). The plan covers the period between 2019-2033. Resources are assigned to local entities according to the provisions of the national legislative decree (Decree no. 1360 of April 2019). The list of beneficiaries local entities is defined through specific indicators aimed at measuring the environmental and socio-economic performance of the different municipalities/ regions: e.g. air pollution emissions and population.

The measure foresees the gradual renewal of buses for local public transport: 5,139 units by 2026. In detail, in the first two years of the intervention (2021-2023), the measure is mainly focused on CNG and LNG powered buses, rather than electric and hydrogen powered busses. Indeed, the use of methane as alternative fuel is faster to be implemented in the short-medium term due to the lack of adequate charging or refuelling infrastructure for electric or hydrogen vehicles. Resources allocated to electric and hydrogen-powered buses will significantly increase starting from 2024 compared to CNG and LNG powered buses.

Out of the total number of buses that will be renewed through the measure: 2,730 are GNC or GNL powered vehicles, 2,051 are electric powered vehicles and 358 are hydrogen powered vehicles.

The total investment cost for the measure accounts for 3,000 million euros, out of which 750 million euros for refill and recharge infrastructure and 2,250 million euros for purchasing new vehicles.

The investment cost for purchasing vehicles has been estimated by multiplying the average cost of buses - per type of fuel - and the number of buses to be acquired. The cost of a vehicle for local public transport depends on several factors, including: type, number of vehicles to be purchased with the same procedure, equipment and interior configuration.

Based on market benchmark¹², the total amount of the measure has been estimated considering the following average unit costs:

- GNC-GNL buses: 300,000 euro
- Electric buses: 550,000 euro
- Hydrogen buses: 850,000 euro

The 750 million euros for alternative fuels and recharge infrastructure are determined as the maximum cost recognized to beneficiary bodies. This sum is calculated according to the same parameters reported by the PSNMS, which establishes for an amount to be allocated to the construction of support infrastructures, up to 50% of the contribution for the first 3 years of each five-year period (art. 7 paragraphs 2 and 4 of the Prime Ministerial Decree of 17/04/2019). The intervention will therefore allow a complete implementation path for the green transition of road public transport, although, at the present stage, it is not possible to provide details about support infrastructures that will be implemented. The quantity and type of the support infrastructure will be defined according to the operational plans that will be proposed by the beneficiary bodies.

Target population: Resources are assigned to local entities according to the approach defined by the PSNMS. Thus, the new green buses will be operating in all such urban areas across the entire national territory. The beneficiaries are the local authorities, the public transport operators and the urban population.

Timeline: The implementation period will last 5 years, from 2022 to 2026 (cf. Table 3). In particular, in the first three years of the measure funding will be equally divided for the renewal of the bus fleet for public transport and for realisation of the charging infrastructure. In the last 2 years, funding will be entirely allocated to the renewal of the bus fleet.

3.2.3 *Renewal of the regional public transport railway fleet with clean fuels trains.*

Challenge

The Italian train fleet for regional local public transport is composed of 479 trains which present an average age of 29.28 years. The fleet includes 221 diesel trains and 258 electric trains.

Investments on the regional rail fleet are essential to improve comfort and reliability of suburban rail connections, which in turn can result in modal shift from private cars. Furthermore, older trains present higher operating and maintenance costs.

Investments made in Italy in recent years on local rail transport have produced positive effects with a growing share of citizens who gave up private cars because there was an

¹²CONSIP procurement, 2017

alternative to car journeys that, however, still dominate mobility in Italy (Pendolaria, 2019). Hence, a renewed train fleet will be effective in promoting modal shift from private cars thus favouring reduction on traffic congestion and related GHG emissions.

The need for a renewed train fleet for local public transport is fully aligned with the goals of the European Green Deal, which sets the objective to cut, by 2050, 90% of the transport-related emissions. Indeed, the achievement of such objectives is contributed by ensuring modal shift from private cars to trains powered by electricity or hydrogen.

Objective

The main goal of this action is to improve air quality and reduce GHG emissions from regional trains through the use of innovative technologies in line with international agreements and with the regulatory provisions of the European Union. The yearly savings from year 2026 onward in terms of GHG emissions will be in the range of 9.050 to 20.960 tonCO₂ depending on whether hydrogen is produced from fossil fuels or from renewable energy sources.

The general objective of this measure is to reduce the average age of the regional rolling stock fleet through the purchasing of electric powered train groups with semi-pilot and hydrogen powered trains. Specific objectives are:

- strengthen regional transport services by rail and discourage the use of private motor vehicles;
- improve the user comfort and increase attractiveness of regional rail transport services;
- promote the cohesion policy through the reduction of national gap as a result of the increase of rolling stock equipment in Southern Italy.

Such objectives will be achieved through the replacement of the most obsolete diesel trains with hydrogen trains, as well as the replacement of the oldest electric trains with new electric ones. As part of the intervention a total of 80 trains will be replaced resulting in a reduction of the fleet average age: from 29.28 years in 2020 to 27.72 years in 2026¹³.

Implementation

The total number of trains to be purchased as part of the intervention is 80 units by 2026, out of which 59 are electric powered trains and 21 are hydrogen powered trains. These amounts have been estimated on the basis of a market assessment. The share of hydrogen and electric powered trains may be modified depending on the rolling stock supply chain and local needs.

The total investment cost for the measure accounts for 1,000 million euros. In particular: 748 million euros for electric powered vehicles and 252 million euros for hydrogen powered

¹³The projection was made assuming no train would have been replaced in the no intervention scenario.

vehicles.

The investment cost has been estimated by multiplying the unit cost of trains - per type of power - and the number of trains to be acquired. The following unit costs have been considered, based on available market information:

- Electric powered trains: 12.7 million euros;
- Hydrogen powered trains: 12.0 million euros.

Trains to be procured as part of this intervention are the ones used for regional services under public service contracts (PSC)¹⁴.

Target population: New rolling stocks are assigned to local entities and the vehicles will be operated by the service operators within the territory of the local entities identified. The main beneficiaries are the regional railway passengers.

Timeline: The purchasing plan is developed over a period of 6 years, from 2021 to 2026 (cf. Table 3).

3.2.4 *Renewal of the regional public transport naval fleet with clean fuels naval units.*

Challenge

In a country like Italy, maritime transport plays a relevant role as public transport service for mobility in the coastal areas.

The Italian public transport naval fleet is composed of 51 units with an average age of 34.3 years: only 5 naval units are less than 25 years of age and only 3 naval units are less than 15 years old.

The advanced age of the fleet represents a critical element for the public transport sector, especially from a sustainable point of view: it hampers the service quality, the comfort of travel and impacts severely in terms of GHG emissions. Furthermore, a low-quality service does not encourage the use of such public maritime services.

The National Reform Program, under Priority no. 5, promotes the implementation of sustainable investments. To this extent, the "sustainable" solutions to the issue of local mobility include the encouragement to use waterborne public transport that promote intermodal transport (ship-bike) and new-generation ships, powered by LNG (liquefied natural gas) or alternative fuels (methanol or hydrogen).

Moreover, the renewal of the naval fleet contributes to goals of the EU Regulation 2018/1999 which encourages measures to achieve low-emission mobility (including transport electrification).

¹⁴Therefore, this investment is not overlapping with the one proposed as part of M3C2.

Ministerial Decrees no. 52/2018 and no. 397/2019 allocate resources to the renewal of the public transport naval fleet but these are not deemed sufficient for the challenge identified.

Objective

The operational objective of the measure is to renew 25% of the total naval fleet for local public transport by purchasing low and zero emissions naval units (e.g. marine vehicles powered by LNG, electric or hydrogen). This action will allow for improving air quality and reducing emissions of climate change gasses. The yearly savings from year 2026 onward in terms of GHG emissions will be in the range of 45.300 ton of CO₂. Furthermore the measure will allow for savings of about 16.40 ton/year of SO_x.

The specific objectives are:

- improvement in social cohesion by ensuring territorial continuity via sustainable sea transport services;
- increase in the level of comfort of passengers;
- improvement in the user comfort and attractiveness of local maritime transport services;
- improvement of air quality and reduction of GHG emissions, through the use of alternative fuels;
- reduction of sea pollution;
- improvement of energy efficiency and security.

Such objectives will be achieved by purchasing new ro-ro pax and passengers-only ferries including high-speed naval units powered by hydrogen, LNG or electricity for the local and regional sea, lagoon (particularly the Venice lagoon), lake and river transport (cf. Legislative Decree no. 422 of 19.11.1997). Such units will be employed in transport services subject to public service obligations setting the following conditions: a) provision of an exclusive connection between municipalities within the same territory or region; b) continuous or periodical services with an undifferentiated offer to the public and pre-established itineraries according to Legislative Decree no. 422 of 19.11.1997; c) naval units pre-determined or approved by the competent authorities, pursuant to Article 16 of Legislative Decree no. 422 of 1997 d) contribution to the emission limits set by the EU Directive no. 2012/33 and by Regulation no. 2016/1628/EU.

The new naval units to be purchased must ensure:

- adoption of the criteria of the Energy Efficiency Design Index (EEDI) imposed by the IMO in order to reduce emissions (as a minimum) by 20% compared to the average emissions of a naval unit of the years 2000-2010;
- adoption of the latest automatic identification system (AIS) technology available on the market to locate other naval units in the vicinity;
- accessibility to people with reduced mobility;

- bicycle storage, except for vehicles destined for the Venice lagoon;
- suitable air conditioning on passengers' areas;
- availability of Wi-Fi in areas for passengers;
- luggage storages directly accessible to passengers with the possibility of securing them.

The measure will also strengthen the growth of the next-generation ship management market through the adoption of a tailored procurement plan for the purchasing of naval units.

Implementation

The total cost of the measure is 500 million euro: the purchase of 12 ro-ro and ro-ro pax ferries of about 30 million euros and the purchase of 10 high speed naval units (hydrofoil) of about 14 million euros.

The measure will be implemented by providing support to regional and local public transport companies through the adoption of a tailored procurement plan at central level for the purchasing of naval units.

In order to reach the the measure's objective, a "central direction cabin" will be set up at national level with the aim of monitoring the implementation of the plan: it will support, among other things, the establishing of procurement models (tenders), the subscription of contracts and the facilitation of economies of scale on a national basis.

Target population: New naval units are assigned to Regional authorities and the vessels will be operated by the service operators within the territory of the local entities identified. The main beneficiaries are the seaside population of densely populated regions.

Timeline: The implementation period will last 4 years, from 2022 to 2025 (cf. Table 3).

3.2.5 Digitalization of local public transport.

Challenge

The research and demonstration activities of recent years have amply demonstrated that the application of technologies can bring tangible and important benefits with considerably limited costs (for example, the benefit / cost ratio expected from cooperative services alone - C - ITS - is estimated at 3:1; the benefits deriving from the integrated use of innovative systems and services are much greater). Today's challenge consists in bringing benefits at a metropolitan scale, addressing the issues related to the expansion of the metropolitan area, starting from the dissemination of knowledge, by finding the necessary resources, not only financial ones - up to the provision of support in the creation of an efficient market (of components, systems and services) and an effective support framework.

Local public transport must accelerate its transformation by adopting new generation vehicles with electric traction and different charging systems according to use, connected to the infrastructure and equipped with operation control systems in order to guarantee road safety and the regularity of the service. In this scenario, it is necessary to boost a strong technological innovation.

The widespread use of ICT technologies for vehicles and roads is an essential component of the digital transition, as it also favors the development of new services for mobility in general, for both passengers and operators; finally, the availability of new data allows a new approach to the design, management and maintenance of urban networks.

Objective

The proposal aims at making public services safer, more versatile and connected through two specific actions:

- A. the implementation of a national enabling platform with C-ITS services in urban areas within the city of Turin, Rome and Naples;
- B. the creation of a living lab within the city of Milan that optimizes the most advanced solutions in terms of power trains for city buses, to adapt the infrastructure with C-ITS technologies as well as with 5G technologies in order to improve the safety of the vehicles and the service to end users.

The action A concerns:

- the design and implementation phases of the platform allowing the creation of a technical ecosystem for connected vehicles;
- the adaptation of local IT systems (monitoring, traffic management, information) also through the realization of new monitoring sensors, new cameras for monitoring and video analysis.

The action B, instead, concerns the implementation of pilot cutting-edge solutions both on public transport fleets and on urban infrastructure, favoring the development of new services for the citizen, the municipality and the public transport operator. In particular, this action includes:

- the purchase of 9 trolleybus and the installation of 6 charging infrastructures;
- the installation of digital infrastructure of 40.3 km of network through the implementation of smart systems and control traffic systems;
- the realization of infrastructure-vehicle communication system (I2V and I2X);
- the development of MaaS systems for the planning and use of services and traffic forecasting systems for travel planning.

Implementation

The total cost of the measure is 52,0 million euros: (A) 22,0 million euros for the imple-

mentation of a national enabling platform with C-ITS services and (B) 30,0 million euros for the creation of a “living lab”. The following section describes the implementation of each action.

Action A: C-ITS

The design of the platform will be carried following functional requirements and equipment specifications. The phase of design includes the tender procedure for the realisation, the supply and the commissioning and start-up in the three cities involved by 2021. The design and implementation phase will be followed by a testing phase by 2023.

Simultaneously, the mobility management systems of the three cities will be upgraded in terms of both extension and capacity to be integrated within the IT Platform. The full integration of the services will be completed by 2025.

The interventions will be customised on each city’s peculiarities and they will follow different roadmaps. Implementations will be subject to ex-ante / ex-post assessment, aimed at verifying the effects of C-ITS services in the urban area in the full-scale application, with particular reference to the effects in terms of sustainability of mobility. The impact assessment will be designed by following the best practices in the sector and adopting the indications of the pilot projects in progress in which the implementing bodies participate (e.g.: C-Roads Italy 2 and 3); consistently with the ex-ante / ex-post approach, the impact assessment will be initiated in the starting stages of the project and will last for its entire duration. The project is delivered in three phases:

- phase 1: verification and design of the platform and ex-ante assessment by 2021;
- phase 2: national platform in shared test and adaptation of local systems by 2023;
- phase 3: provision of C-ITS services, progressive extension of the areas covered by the short range services, traffic management systems, ex-post assessment by 2025.

Action B: - TPL 4.0

The interventions of the measure will be completed in 5 years by 2025. The project will be delivered according to the following steps:

- M12: renewal of 9 local public electric busses;
- M20: realisation of 6 charging infrastructures for the electric busses;
- M24: installation of 40.3 km of digital lanes infrastructure and of traffic control system;
- M30: development of advanced ADAS systems that make use of V2X communication;
- M36: development of the information and management system of smart grids; MaaS installation.

Target population: Metropolitan municipalities of Milan, Turin, Rome, Naples. The main beneficiary are passengers of urban mobility services.

Timeline: The intervention will last 5 years (cf. Table 3). In particular, Action A will last 5 years from 2021 to 2025, while Action B will last 3 years from 2021 to 2023.

3.2.6 *Development of Rapid Mass Transport systems (metro, streetcar, BRT).*

Challenge Sustainable Urban Mobility Plans (SUMPSs) promote sustainable mobility planning in urban areas: their aim is to ensure an adequate provision of sustainable and safe transport in cities. This is achieved through modal shift incentive policies, promotion of intermodality and the construction of new infrastructures.

In this context, measures to strengthen the rapid mass transportation system are fundamental for the implementation of an integrated transport system. The extension of rapid mass transport systems - which consist in networks of metropolitan railways, tramways, metro lines and BRT “Bus Rapid Transit” corridors - is of paramount importance to ensure the reduction of travel time for large passenger flows.

In 2016, Italy registered about 1,000 km of network equipped for rapid mass transport services in the city¹⁵ (Pendolaria, 2016) against 155,000 km of road network (European Road Network, 2020). Private cars are the most used vehicles in Italy: 36 million people over 18 years old have used their car at least once during 2019 while two out of three people have used it every day (ISTAT, 2020). Private cars share on total passenger trips (including walking) is more than 60%, while public transport is just about 10% (data for 2019, Isfort, 2020). This can lead to traffic congestion, especially in metropolitan areas.

Hence in case of congested urban areas, the implementation of rapid mass transport systems would allow for shifting mobility demand from private cars. The sustained speed that these transport systems can offer, often guaranteed by dedicated areas and / or lanes which ensures they are not affected by congestion, makes such systems extremely attractive to commuters and occasional passengers.

Objective

The goal of this measure is to shift about 10% of total demand of road passengers transport by car by 2026 in affected urban areas.

The operational objectives of this measure are: (i) the construction of new lines and extension of existing lines of rapid mass transport systems; (ii) the enhancement of existing rapid mass transport systems by upgrading the infrastructure, plant and equipment with the aim of increasing the offered capacity; (iii).the increase of vehicle fleets of rapid mass transport systems aimed at improving the offered capacity.

As part of this measure, 195 km of network equipped for rapid mass transport systems will be newly built. This account for:

¹⁵The city considered are Milan, Rome, Naples, Genoa, Turing and Catania

- the implementation of 57 km of tramway, including rolling stock;
- the implementation of 84 km of trolleybus, including vehicles;
- the implementation of 4 km of cableway, including cableway cars;
- the implementation of bus rapid transit systems of about 50km of lanes, including buses.

The measure contributes to the gradual decarbonisation of transport. The specific objectives are:

- modal shift of 10% of total demand of road passengers transport by car in the affected urban areas;
- reduction of GHG emissions.

Implementation

Table M2C2-2: **Tramways**

Municipality	Intervention	Type	Length (km)	Number of rolling stocks
Bergamo	Linea Tranviaria T2 della Valle Brembana, Bergamo - Villa D'Almè	TRAMWAY	10	11
Florence	Sistema tramviario di Firenze Linea 3 (II lotto) - Tratta Libertà - Bagno a Ripoli (3.2.1)	TRAMWAY	7	16
Genova	Sistema degli assi di forza per il TPL	TROLLEYBUS	45	145
Palermo	Sistema Tram Palermo - Fase II Tratte D, E2, F, G e parcheggi di interscambio	TRAMWAY	20	35
Rimini	2° stralcio "trasporto rapido costiero" (metro mare): tratta Rimini FS-Rimini Fiera	TROLLEYBUS	4	6
Rome	Funivia Battistini - Torrevecchia - Casalotti G.R.A. (Funivia Casalotti)	CABLEWAY	4	212
Rome	Tramvia Viale Palmiro Togliatti (Tramvia Togliatti)	TRAMWAY	8	20
Total			98	445

The total cost of the measure is 2,000 million euros; the interventions covered by this cost have been divided in the following two macro-groups:

1. realization of 98 km of network equipped for rapid mass transport systems, out of which 45 of tramway and 49 of trolleybus, 4 cableway and the purchasing of 82 tam groups, 151 trolleybuses and 212 cable cars for a total amount of 1,642 million euros. The operation will involve the cities of Genoa, Bergamo, Rimini, Florence, Rome and Palermo;

2. realization of 97 km of network equipped for rapid mass transport systems, out of which 12 km of tramway, 35 km of trolleybus and 50 km for bus rapid transport systems, including purchasing of buses, for a total amount of 358 million euros.

The interventions included in macro-group A have been identified through a call for expressions of interest. They are reported in the table [M2C2-2](#) at page 79.

The interventions to be included in macro-group B will be identified by launching a new call for expressions of interest which will be finalised by January 2021. The second EoI, according to the procedure already implemented for the first EoI with B.E.I, will consider the following criteria:

- The allocation of funding for interventions in the rapid mass transport sector is conditional on the drafting of the SUMP, as per Ministerial Decree 397/2017. Resources in fact, may be allocated exclusively to interventions included in these Plans or following a request for funding submitted by the competent local authority. Municipalities within a metropolitan city can access funding only in the presence of a SUMP for the urban area.
- The evaluation method for identifying projects to be funded as part of this measure is based on a standardized procedure that follows a specific in-depth and qualitative analysis. The analysis must assess the following indicators:
 - Technical-economic feasibility of the proposal with reference to the evaluation of the quality of the project, comparison of the unit cost of the infrastructure to the unit cost of similar transport systems, justification of the design choices and transport analysis;
 - Financial, managerial and administrative sustainability of the approval process and assessment of the project’s activations capability;
 - Effectiveness of the investment and economic-social profitability in terms of satisfaction of mobility demand, rebalancing between public and private transport, energy saving effects, environmental impact, accident reduction and socio-economic benefits.
- Each local authority, whose request has been positively evaluated, signs an agreement with the Ministry of Infrastructures and Transport, in charge of regulating the financing, to ensure the implementation of the intervention.
- In addition, the funding beneficiaries sign specific agreements with economic operators to ensure the implementation of the intervention.
- For the purposes of an activation consistent with the timing of the RRF, interventions concerning metropolitan systems are not included in this proposal as they require longer implementation times and, especially in Italian cities with many archaeologically sensitive areas, could be affected by slowdowns not predictable in the project phase.

Target population: The following local authorities can be beneficiaries of the financing:

- Metropolitan cities and capitals of metropolitan cities;
- Municipalities capital of the Region;
- Municipalities with over 100,000 inhabitants;
- Municipalities (individually or through agreements between local authorities, in accordance with art.30 of TUEL) with a population equal to or less than 100,000 (only where the interventions solve serious existing critical issues for mobility duly argued);
- Regions with rapid mass transport systems not delegated to Local Authorities.

The final beneficiaries of the intervention are the urban population of the affected areas.

Timeline: The implementation period of the interventions of macro-group A will last 6 years, from 2021 to 2026 (cf. Table 3). The interventions will be progressively activated. The interventions of macro-group B and the specific timeline will be defined after the results of the expression of interest planned by January.

3.2.7 Sustainable mobility “Affrettati Lentamente”.

Challenges:

In 2017, private cars have been the most used vehicles in Italy for each typology of Municipalities (e.g. metropolitans cities, suburbs of the metropolitan area, municipalities with a different range of inhabitants). Sustainable mobility choices are more frequent in the municipalities in the center of the subways areas, especially due to the greater incidence of people who travel on foot for study or work reasons (24.5%) or who exclusively use public transport (22.8%). The bike is used above all in municipalities with over 50,000 inhabitants (3.2%). (ISTAT, 2018).

As noted, sustainable mobility plays a key role from many points of view (economic, environmental, passenger comfort).

To this extent, it is necessary to increment the level of dedicated infrastructures and services including the creation of cycle paths, the development of shared mobility and info-mobility. These measures are fundamental both for sustaining the increasing demand and to promote a “soft” mobility.

The project proposal addresses the challenges and priorities identified in the country-specific recommendations. In particular, it addresses point 21 of the Council Recommendations on Italy’s National Reform Programme 2020, which states that meeting the challenges related to the environment and climate change, including sustainable urban mobility, is an opportunity to improve productivity and create jobs while avoiding unsustainable practices. The project proposal is also consistent with the European Commission’s Report on Italy - 2020 which identifies sustainable transport as one of the priorities on improving environmental sustainability.

Objective

The intervention objectives is to support the development of infrastructures and services for sustainable mobility as an alternative or integration of existing public transport services. The intervention includes actions for the promotion of sustainable mobility through the promotion of modal shift in passenger transport, including the creation of cycle paths, the development of shared mobility and info-mobility.

The project proposal stems from the need to give continuity and systematise the actions promoted by the Ministry of the Environment to favour the propensity for modal change and improve air quality in the urban environment, reduce polluting and climate-altering emissions. Through the implementation of the project, the aim is to develop alternative and / or supplementary sustainable mobility services and infrastructures to local public transport services.

Implementation

The estimated total cost of “Affrettati lentamente” intervention is 80 million euros, with a maximum funding for each municipality of 2 million euros for the implementation of one or more measures covered by the expression of interest for a total of 40 projects to be financed.

The estimate is based on similar measures carried out in previous years through specific Ministry of Environment (MATTM) funding programmes; it would allow the funding of at least 40 projects proposed by as many Municipalities with the consequent dissemination of the know-how and achievement of results on most of the national territory.

The interventions will be identified through a publication of an expression of interest within the Q4 2021 and subsequent selection of projects according to a series of criteria, including environmental effectiveness, identification of the beneficiary municipalities (they are responsible for the implementation and will implement the projects). The admission ranking will be defined by the Q2 2022. The start of the work is Q4 2022 and the conclusion of the intervention by Q2 2026.

Target population: 150 municipalities of 50,000 inhabitants with 40 projects to be financed.

Timeline: The measure will last 5 years (from 2021 with the start of administrative procedures to 2026).

4. Green and digital dimensions of the component

a) Green Transition:

b) Digital Transition:

See Table 1 work in progress

5. Milestones, targets and timeline

See Table 2 work in progress

Below are presented all Milestones (M) and Targets (T) related to each Reform and Investment of this component 'Energy Transition and Sustainable Mobility'.

Reform 1. Simplification of authorization procedures for renewable onshore and offshore plants and new legal framework to sustain the production from renewable sources and time and eligibility extension of the current grants for renewable plants

- M1: By Q1 2021, a first proposal draft of the reform in order (i) to widen the eligibility perimeter and (i) to extend the grants availability period
- M2: By Q2 2021, a first consultation update to consolidate the first proposal draft
- M3: By Q2 2021, the final approval enactment
- T1: By Q4 2023, additional 6 GW awarded in the auctions, considering a time and eligibility extension of the current grants for renewable plants (PV plants, wind farms, offshore and repowering)
- T2: By Q4 2026, increase of net cumulative 10,5-15 GW of installed capacity in order to reach the NECP target
- T3: By Q4 2026, achievement of 2-3 Mton/y of CO2 reduction

Reform 2. New legislation providing a quota obligation system to use renewable gas for importers and producers of natural gas

- M1: By Q1 2021, primary regulation and implementing decree issued with notification to the European Commission
- M2: By Q3 2021, obligation to release a quota of renewable gas to all producers and importers of fossil natural gas

Reform 3. Smarter procedures for project evaluation in the local public transport systems sector with fixed installations and in the rapid mass transport sector

Reform 4. Adoption of national programs on air pollution control (in accordance with Directive (EU) 2016/2284 and with the Climate Decree Legislative Decree no.111/2019)

Investment 1. Development and support for the supply chain of renewables

1.1 Renewable Energy Sources (RES)

1.1.1 Support for the development of the authorization of projects such as project pv floating and wind farms offshore, projects that are developed on PA sites (disposed in the last 3 years), or are low ground consumption or combined with storage technology

- M1: By Q1 2021, Design of rules for access to benefits and definition of the implementing process
- M2: By Q2 2021, Preparation of call for tenders
- M3: By Q3 2021, Publication of call for tenders
- M4: By Q1 2022, Allocation of grants/loans
- Mn. Milestones from M2 to M4 to be repeated from Q2 2022 with a similar timing
- T1: By Q4 2026, increase of net cumulative 4,5-5 GW of installed capacity in order to support the NECP target
- T2: By Q4 2026, contribution to the achievement of 2-3 Mton/y of CO2 reduction

1.1.2 Support to the development of innovative integrated offshore renewable plants

- M1: By Q2 2022, obtaining all the required permits for Lidar installation from the Authority
- T1: By Q2 2022, completion of a wind measurement campaign with n.1 Lidar floating installation in the northern coast of Adriatic Sea
- T2: By Q3 2022, completion of a wind measurement campaign with n.1 Lidar floating installation located in the southern and western coast of Sardinia region and northern coast of Adriatic
- T3: By Q3 2022, completion of a wind measurement campaign with n.1 Lidar fixed installation on oil&gas platform in the northern coast of Adriatic Sea
- T4: By Q3 2022, completion of a wind measurement campaign with n.1 Lidar floating installation in the southern coast of Adriatic Sea
- T5: By Q3 2024, installation of a PV floating plant in the northern coast of Adriatic Sea with a total power installed of 100MWe.

- M2: By Q3 2024, Authorizations for the construction of electrical infrastructures obtained (Autorizzazione Unica Dlgs 387/2003)
- T6: By Q3 2024, installation of electrical infrastructure related to offshore renewable plants at northern coast of Adriatic Sea and with the chance to enhance the local grid
- T7: By Q3 2024, installation of a northern coast of Adriatic Sea energy system storage with a total power of 50MW/MWh
- T8: By Q2 2025, installation of southern Sardinia electrical infrastructure related to offshore renewable plants and with the enhancement of the local grid
- T9: By Q3 2025, installation of southern Sardinia offshore wind floating system uses an innovative pendulum system to restore stability and to minimize motions and final weight of the foundation

1.1.3 Promotion of RES for collective and individual self-consumption

- M1: By Q1 2021, definition of the rules for access to benefits and definition of the organizational structure necessary for receiving the requests submitted to the GSE
- M2: By Q2 2021, publication of the methodologies and periods within submit the applications for the benefits
- M3: By Q4 2026, allocation and distribution of public funding to the winners of the tender
- T1: By Q4 2026, achievement of the 2500 MW of new power generation, and validation through the GAUDI platform

1.2 Development of an Italian supply chain for renewable technologies production (PV cells and panels, and medium-large size wind turbines)

- M1b: By Q3 2021, Contract signature with technological partner to obtain the license for on-shore AeroGenerator of medium-high power
- T1b: By Q4 2021, 70% of the documents, specifications and drawings needed to start the production are completed
- M1a: By Q2 2022, Design for permitting and request filed
- T2b: By Q2 2022, 80% attendance to Technology transfer/training lectures
- M2a: By Q3 2022, Permissions obtained by the relevant Authorities
- M2b: By Q4 2022, procurement and delivery of the main components for prototype nacelle (gear box, generator) available for front runner assembly step
- M3a: By Q4 2022; Design specifications for procurement contracts
- M3b: By Q4 2022, factory ready to manufacture new components according to the technical specification
- M4a: By Q1 2023; Procurement contracts with suppliers for the Cell and Module lines. Procurement Orders placed over the PO List
- T4b: By Q1 2023, first nacelle assembled and tested according to the specifications
- T3b: By Q2 2023, nacelle assembled and tested according to the specifications
- M4b: By Q4 2023, certification for commercial purpose obtained in order to declare engine class
- T5b: By Q4 2023, first wind turbine is installed and first commissioning is done
- M5a: By Q1 2024, the tools needed to be installed in the Cell and Module manufacturing line are manufactured and ready for shipment by the Suppliers
- T6b: By Q1 2024, the assembly station for prototype is improved and other 2 stations are installed
- M6a: By Q2 2024, installation of the Cell and Module facility manufacturing tools is completed
- T7b: By Q3 2024, a small pre-series batch of 4 turbines is assembled. The process for the 4 pre-series turbines is organized for all 4 turbines at once
- T8b: By Q4 2024, the assembly stations for pre-series are improved and other 3 stations are installed
- M7a: By Q3 2024, the Cell and Module line is started up and ready for process set up
- T1a: By Q2 2026, the Cell line and Module lines are running firstly at the pace of 2 and then 3 GW/year production

1.3 Projects at local Level (Municipalities)

1.4 Reinforcement and digitalisation of power grid infrastructure

1.4.1 Installation of thermal energy storage systems

- M1: By Q2 2021, preparation of all the technical documentation required to obtain the permission to build the plant

- M2: By Q3 2022, obtaining all the necessary authorisation to install the thermal storage
- M3: By Q4 2022, final approval of the economical feasibility of the investment associated with the project
- M4: By Q1 2023, start of the execution and installation phase of the storage plant
- T1: By Q4 2025, installation of three thermal storage systems on a selected areas

1.4.2 Interventions to make electricity distribution networks smarter (Smart Grid)

- T1: By Q4 2026, interventions on 8000 MVA electricity distribution networks to increase the integration of renewable energy
- T2: By Q4 2026, interventions on 230 electrical substations to make them smarter

1.4.3 Interventions to increase the resilience of the distribution network

- T1: By Q4, 2026, Improvement of the resilience of 4000 km of the distribution network to extreme weather events

1.4.4 Installation of integrated EV charging stations

- M1: By Q1 2021, definition of rules for access to benefits and organization for receiving applications
- M2: By Q3 2021, publication of a public notice, communicating the opening of the counter for the presentation of applications for benefits
- M3: By Q4 2022, identification of tender winners and dissemination of benefits
- M4: By Q4 2025, verification of the operational characteristics of the charging point
- T1: By Q4 2026, installation of n° 222 EV charging stations on motorway
- T2: By Q4 2026, installation of n°1800 charging stations on sub-urban areas
- T3: By Q4 2026, installation of n° 3537 charging stations on urban center areas
- T4: By Q4 2026, installation of n° 100 charging stations connected to storage

Investment 2. Promotion of clean hydrogen production and use

2.1 Production of Hydrogen in brownfield sites

- M1: By Q3 2021, completion of the feasibility study and business plan
- M2: By Q2 2022, obtaining all the required permits & authorizations from the Authority
- M3: By Q2 2023, procurement completed and construction activities launch
- T1: By Q2 2026, construction of 5 to 10 Hydrogen Valleys in abandoned industrial areas

2.2 Production of Electrolysers and Development of an Italian Hydrogen Supply Chain

- M1: By Q4 2021, completion of the feasibility study and business plan to set up a development programme based on a modular approach to satisfy a wide range of application
- M2: By Q4 2022, 1st step of procurement and 1st step of construction activities completed, such as: feedstock management, assembling, prototype tests
- M3: By Q4 2023, construction and procurement completed & commissioning started, starting the manufacturing of the first prototype 1:1 scale
- M4: By Q4 2024, execution of experimental campaign on the prototype to verify its behaviours in different operating conditions and obtained the proper certifications
- M5: By Q4 2025, industrial production
- T1: By Q4 2024, construction of 1 Gigafactory for the production of key components and material for electrolysers
- T2: By Q4 2025, target annual capacity of 1 GW of electrolysers

2.3 Hydrogen Use in hard-to-abate industry

- M1: By Q4 2022, Engineering, permitting and 1st step of the procurement are completed
- M2: By Q2 2023, all the procurement phases are completed and construction activities
- T1: By Q2 2026, realization of a first prototype in the industry "hard to abate" by testing the use of green hydrogen
- T2: By Q2 2026, CO2 emission reduction equal to 0.283t/tsteel

2.4 Hydrogen Use in Heavy Goods Transport on Wheel

- M1: By Q4 2021, completion of the feasibility study and business plan of the project
- M2: By Q4 2022, obtaining all the required permits and authorisations
- M3: By Q4 2022 Secure contracts for the procurement of materials and for the supply of hydrogen through tank trucks
- T1: By Q4 2026, installation of 40 Hydrogen refuelling stations suitable for trucks

2.5 Hydrogen Use in Railway Mobility

- M1: By Q4 2021, completion of the feasibility study and business plan
- M2: By Q1 2022, engineering, permitting and 1st step procurement completed
- M3: By Q3 2023, procurement completed and construction activities & commissioning started
- M4: By Q4 2024, construction & commissioning completed
- T1: By Q2 2026, construction of 7 hydrogen refueling stations with the infrastructure necessary for the service of the diesel train fleet with hydrogen-powered trains.
- T2: By Q2 2026, reduction of emissions equal to 550 tCO₂ / year

2.6 Hydrogen Research & Development

- T1: By Q2 2026, 4 Projects in 4 different research lines are developed: mobility, transport, industry, residential and building

2.7 Hydrogen Combustion Technology Development for green power generation

- M1: By Q3 2022, design of new Gas Turbine combustion system (Burner Design & Config. Setup) are completed
- M2: By Q4 2024, combustion systems tested on field, though specific procedures
- M3: By Q2 2026, test in full scale test facility: burner tested and validated in single burner, full scale, full pressure and full temperature test rig
- T1: By Q2 2026, Burners able to use hydrogen, replacing NG, up to 70%
- T2: By Q2 2026, 40% CO₂ emissions reduction with respect to standard configuration operated with 100% of Natural Gas

Investment 3. Sustainable local transport, cycle paths and rolling stock renewal

3.1 Investment in soft mobility (National Plan of Cycle Path)

- T1: By Q4 2022, realization of 1,000 km of urban and metropolitan cycle paths
- T2: By Q4 2026, realization of 1,626 km of tourist cycle paths

3.2 Green local public transport and Rapid Mass Transport

3.2.1 Strengthening of the green transport industry, the related national supply chains related and smart mobility

- M1: By Q1 2021: adoption of a MiSE directive to define the guidelines and implementation methods of the intervention for the busses supply chain measure;
- M2: By Q2 2021: adoption of a legislative scheme with MISE/MEF for the introduction of incentives for the recreational craft support measure
- T1: By Q2 2023: a number of 60 companies will receive incentives from the busses supply chain measure;
- T2: By Q2 2024: a number of 200 companies will receive incentives from the recreational craft support action;
- M3: By Q3 2022: Decree of MEF establishing a new line of Smarter Italy on sustainable and smart mobility;
- T3: By Q1 2025: 20 innovation tenders for smart and sustainable mobility are launched through the Smarter Italy program (1 procurement per year).
- or outboard engines for recreational craft with four-stroke outboard engines.

3.2.2 Renewal of the regional public transport bus fleet with clean fuels vehicles

- M1: By Q4 2021, conclusion of administrative procedures for the purchase
- T1: By Q4 2026, dismissal of 63 EURO 0 buses
- T2: By Q4 2026, dismissal of 250 EURO 1 buses
- T3: By Q4 2026, dismissal of 4,826 EURO 2 buses

3.2.3 Renewal of the regional public transport railway fleet with clean fuels trains

- M1: By Q4 2021, conclusion of administrative procedures for the purchase
- T1: By Q4 2026, renewal of 59 electric powered trains
- T2: By Q4 2026, purchasing of 21 hydrogen powered trains

3.2.4 Renewal of the regional public transport naval fleet with clean fuels naval units

- M1: By Q4 2024, conclusion of administrative procedures for the purchase
- T1: By Q2 2025, 22 ro-ro pax and passengers only dual-fuel or full-electric powered ferries purchased

3.2.5 Digitalization of local public transport

- T1: By Q4 2026, 3 large cities where new ecosystem for connected vehicles is developed
- T2: By Q4 2021, 9 renewal of local public electric buses
- T3: By Q3 2022, 6 realization of charging infrastructure
- T4: By Q4 2022, realization of 40.30 kilometers digital lanes infrastructure and of traffic control system
- M1: By Q4 2021, verification and design of the platform and ex-ante assessment
- M2: By Q4 2023, national platform in shared test and adaptation of local systems
- M3: By Q4 2025, provision of C-ITS services
- M4: By Q2 2023, development of advanced ADAS systems
- M5: By Q4 2023, development of the information and management system of smart grids and MaaS installation

3.2.6 Development of Rapid Mass Transport systems (metro, streetcar, BRT)

- T1: By Q4 2026, realization of 57 kilometers of lines realized (tramway)
- T2: By Q4 2026, realization of 84 kilometers of lines realized (trolleybus)
- T3: Q4 2026, realization of 4 kilometers of lines realized (cableway)
- T4: Q4 2026, realization of 50 kilometers of lines realized (bus rapid transit system lanes)
-

3.2.7 Sustainable mobility (“Affrettati Lentamente”)

- M1: By Q4 2021, publication of expression of interest
- M2: By Q2 2022, identification of beneficiaries

6. Financing and costs

See Table 2 work in progress

3 M2C3 - Energy upgrading and renovation of buildings

1. Description of the component

Summary box

Policy area: Energy efficiency, redevelopment and safety of public and private buildings, including residential construction, climate policy, social policy.

Objectives: The objectives of this component are:

a) *Green Transition:* the energy requalification of buildings can reduce energy consumption by X ktoe per year, increase efficiency energy by X% compared to a normal scenario and reduce the GHG emissions of X tCO₂ per year during the period 2021-2026, improving environmental and health performance.

b) *Jobs and growth:* efficiency improvements and redevelopment of buildings stimulate investment, create new jobs, promote the adoption of digital technologies, improve the resilience of the real estate portfolio support SMEs.

c) *Social resilience:* the interventions to improve the efficiency of buildings aim to renovate the existing building stock and alleviate the problems of energy poverty by reducing energy bills, while improving the affordability of housing and living conditions.

Reforms and investments:

Outcome 1: Energy efficiency program for public buildings.

Investment 1.1: School building security and energy upgrading plan;

Investment 1.2: School building replacement and energy upgrading plan;

Investment 1.3: Energy efficiency program for State-property buildings;

Investment 1.4: Program “Safe, green and social” for public housing;

Investment 1.5: Energy upgrading and renovation of public buildings in metropolitan areas;

Investment 1.5: Upgrading courthouses.

Outcome 2: Energy and seismic efficiency program for private and public residential buildings.

Investment 2.1: Time extension of the 110% superbonus to improve energy efficiency and buildings safety.

Estimated costs:

EUR 29,230 million to be covered by RRF

M2C3 - Energy upgrading and renovation of buildings

	Resources (euro/mln)				
	Existing (a)	New (b)	Total (c) = (a)+(b)	REACT-EU (d)	TOTAL NGEU (e) = (c) + (d)
1. Energy efficiency program for public buildings	6.10	4.62	10.72	0.32	11.04
- Program for the safety and energy upgrading of schools	5.87	0.50	6.37	0.05	6.42
- Energy efficiency program for State-property buildings	-	-	-	-	-
- Realization of new Schools by building replacement	-	0.80	0.80	-	0.80
- Program "Safe, green and social" for public housing	-	2.00	2.00	-	2.00
- Energy upgrading and renovation of public buildings in metropolitan areas	0.23	0.87	1.10	0.25	1.35
- Upgrading courthouses	-	0.45	0.45	0.02	0.47
2. Energy and seismic efficiency program for private and public residential buildings	10.26	8.26	18.51	-	18.51
TOTAL	16.36	12.88	29.23	0.32	29.55

Note: (b) includes FSC existing resources, to be devoted to specific measures.

2. Main challenges and objectives

a) Main challenges

The objective of the component is to give a strong impulse to the renewal of the public and private building heritage, first of all to significantly increase its energy efficiency, an action necessary to achieve the decarbonisation objectives of the economy set by the National Plan for Energy and Climate (PNIEC). Energy efficiency also allows significant savings, first of all, for the PA since a substantial part of the resources will be directed to the renovation of public buildings, schools, as well as residential buildings, starting with those with the worst energy efficiency. The efficiency measures will also make it possible

to intervene on the seismic safety of buildings in the areas at highest risk and to wire the buildings in synergy with the provisions of mission 1 on digitization.

A similar efficiency and safety measure is also envisaged for private buildings, through a robust and targeted incentive scheme. In this case, as well as for public buildings, Italy is characterized by an antiquated housing stock and with energy standards below the European average.

- **Climate changes.** Environmental sustainability and the fight against climate change are the central challenges of the European Union. The ambitious goal of achieving "climate neutrality" in EU countries by 2050 is also pursued through a strategy that aims to improve the energy efficiency of buildings, given that the building stock is the largest energy consumer in Europe (40% of consumption) and responsible for 36% of greenhouse gas emissions. Therefore, a process of redevelopment of existing buildings helps to achieve significant energy savings, especially in Italy where the real estate portfolio has structural characteristics that are examined and detailed below. In the broader appreciation of the potential of real estate efficiency, the same EU measures provide an exemplary role for public buildings, establishing in the Directive 2012/27/EU on energy efficiency that, from January 1st, 2014, the 3% of the total covered usable area of the heated and/or cooled buildings owned by the central government and occupied by it, must be renovated/upgraded every year to meet at least the minimum energy performance requirements.
- **Age of the building heritage.** In Italy, as highlighted in the National Plan for Energy and Climate, buildings for residential use amount to about 12 million with almost 32 million homes. More than 60% of this building stock is over 45 years old, that is, it is prior to Law 373/1976¹⁶, first law on energy saving¹⁷. This partly explains the high number of properties in the worst energy classes. In fact, 51% of residential buildings and 39% of non-residential buildings are characterized by poor energy performance, in energy class F and G (Energy Performance Certificate)¹⁸. It follows that the same buildings are unprepared to protect occupants from high temperatures and more frequent natural hazards, in changing climatic conditions, taking into account that about 37% of the total surface of non-residential buildings (schools, offices, shopping centers, hotels) is located in climatic zone E¹⁹ and in

¹⁶PNIEC - National Plan for Energy and Climate.

¹⁷Of these buildings, over 25% record annual consumption from a minimum of 160 kWh/m² year to over 220 kWh m² (PNIEC).

¹⁸Enea (2020) WEEE - Annual Energy Efficiency Report.

¹⁹Presidential Decree 412/1993 divides the Italian municipalities into 6 winter zones, based on degree days, on which the legislative, construction and energy requirements of the building and the operating methods of the systems depend. The Italian climatic zones share similar average temperatures during the various seasons. The climatic zones are therefore areas of the Italian territory that theoretically have the same climate, for which it is, therefore, possible to imagine the same or similar conditions. They have been defined so as to be able to establish the daily duration and the periods of ignition of

general almost 70% in temperate or cold areas.

- **Need for investment.** Italy intends to pursue a reduction in consumption by 2030 equal to 43% of primary energy and 39.7% of final energy compared to the PRIMES 2007 reference scenario²⁰. As regards the absolute level of energy consumption by 2030, Italy aims to reach a target of 125.1 Mtoe of primary energy and 103.8 Mtoe of final energy, starting from the estimated consumption in 2020. To this end, provides for a minimum final consumption reduction target of 0.8% per year in the period 2021-2030, calculated on the basis of the 2016-2018 three-year period. According to the PNIEC estimates, the achievement of the further national decarbonisation objectives, of a reduction in the non-ETS sectors equal to -33% compared to 2005 levels, require a significant commitment in terms of incremental investments.
- **High initial costs:** The investment required to significantly improve energy performance by carrying out a "deep renovation" of buildings (with an improvement of at least 60% in energy efficiency)²¹ often requires high upfront costs compared to gradual savings on long-term energy costs, so finding suitable financing solutions is challenging. The difficulty of finding internally the financial resources necessary to carry out energy efficiency interventions or even just to carry out the necessary planning activities (energy audit, business plan) preparatory to the implementation of the interventions themselves, is the first "block" to overcome.

b) Objectives

The component consists of two lines. The first concerns the implementation of a program to improve the efficiency and safety of the public building heritage, with reference to schools, public housing, municipalities and judicial citadels. The second provides for the introduction of a temporary incentive for energy redevelopment and anti-seismic adaptation of private real estate, through a tax deduction equal to 110% of the costs incurred for the interventions.

The component is in line with the country-specific recommendations for Italy for 2020 (CSR-3), which suggest concentrating investments and investment policies on energy efficiency. Italy is on track to reach its climate and energy targets for 2020, but further efforts are needed to reach the targets for 2030. Italy has decided to bring the share of renewable energy to 30% of final consumption gross national energy consumption in 2030 and to reduce energy consumption by 9.3 Mtoe/year until 2030²². The construction

the thermal systems (heating) in order to contain energy consumption. The climatic zones (also called climatic bands) are identified on the basis of the degree days and are six (from A to F);

²⁰The benchmarks may change with the PNIEC update.

²¹On the basis of primary energy savings, the European Observatory of the building stock has identified the following levels of renovation: light (less than 30%), medium (between 30% and 60%) and deep (over 60%). More generally, to be considered 'profound' a restructuring would have to generate efficiency in terms of both energy and greenhouse gas emissions.

²²The PNIEC identifies an indicative breakdown of the various sectoral contributions to the overall ob-

sector plays a central role in achieving these goals. While the share of SMEs adopting energy efficiency measures in 2017 is slightly higher in Italy than in the EU as a whole, the residential sector is responsible for over a third of total energy consumption. In fact, most of the 14.5 million Italian buildings were built before the adoption of the criteria for energy saving and the corresponding legislation, suggesting the opportunity of a widespread diffusion also of prevention interventions, in consideration of the exposure to the seismic risk of our country.

In light of these considerations, all the investments of the component aim to directly support the interventions in energy efficiency, thus taking into account the CSR-3 of 2020.

The component also supports the European flagship project "Renovate" (COM (2020) 575), improving the energy efficiency of public and private buildings and contributing to the doubling of the renovation rate and the promotion of deep renovations by 2025.

The investment objectives of this component are threefold.

Twin transition:

Green transition. The buildings are responsible for the X% of energy consumption in 2019. The set of interventions proposed has the potential to reduce energy consumption by X ktoe per year, increase the annual energy efficiency of X% compared to a normal scenario and reduce greenhouse gas emissions by X tCO₂ per year in the period 2021-2026. Thanks to the hoped-for acceleration of the interventions to improve the efficiency of existing buildings and deep renovation with the application of performing technologies, all the investments of the component contribute to the reduction of 26 MtCO₂eq of emissions in the civil sector by 2025 (PNIEC objective). Furthermore, this component reinforces the achievement of the envisaged objective of increasing energy efficiency on the building stock of the central public administration equal to at least 3% per year of the useful covered area (Article 5 of Directive 2012/27/EU). Finally, the initiatives intend to increase the national percentage of nZEB (Nearly Zero Energy Building - buildings whose energy consumption is almost zero)²³ compared to the stock of existing buildings,

jective of reducing energy consumption of 9.3 Mtoe/year, highlighting in the civil sector a reduction of 5.7 Mtoe in energy consumption by 2030, to which they contribute in particular 3.3 Mtoe reduction in the residential sector and 2.4 Mtoe in the tertiary sector. The industrial sector would achieve a reduction in consumption of approximately 1.0 Mtoe. While the transport sector, thanks to interventions to shift private passenger mobility towards collective mobility and/or smart mobility, road-to-rail freight transport and vehicle efficiency, manages to contribute to the gap between the two scenarios by 2030 for about 2.6 Mtoe. These parameters may undergo changes following updates of the PNIEC.

²³The definition of NZEB is contained in the European Directive 2010/31/EU on the energy performance of buildings (art.2): “*building with very high energy performance, determined in accordance with Annex I. The very low or almost zero energy requirement should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on site or nearby*”. The Directive was implemented with the Decree-Law of 4 June 2013 n. 63, converted with amendments

which in 2019 are less than 0.03% on a regional basis, while, less than 10% of the total nZEB are existing buildings that have been redeveloped to achieve this standard (mainly small single or two-family buildings and schools)²⁴.

Including X% of climate spending (see Table 1), this component contributes to the goal of dedicating at least 37% of spending to climate goals, while respecting a just and sustainable transition.

Further benefits are expected from the extension of the useful life of the properties, such as resilience to climate change and environmental disasters, by profoundly renovating housing and the building stock with a long-term perspective. Part of this component is also the replacement of heating systems, based on fossil fuels, which contribute to excessive air pollution, with cleaner alternatives powered by renewable energy.

The application of green public procurement through this component will increase the demand for more sustainable buildings and provide a stimulus for eco-innovation.

Jobs and Growth:

Work and growth. Creating jobs, stimulating local investments and their positive spillover effects on the local economy, promoting the adoption of digital technologies and the integration of renewable energies. In general, building efficiency processes have shown to have wide repercussions in environmental, economic and employment terms, due to the plurality and breadth of economic activities that they feed - specialized audit services, installation and maintenance, diagnosis and ICT, standard products high - thus contributing jointly to economic growth, as well as to the reduction of energy consumption and polluting emissions. A multiplier of the positive effects induced by efficiency actions, in terms of income production and employment, is the improvement of the knowledge and skills of workers and service providers as well as the potential creation of a pool of new employment and development of new qualified professions, both at higher level and at university and post-university level.

Social resilience:

By increasing the rate of deep energy renovation of existing buildings, including public buildings and national residential buildings, including social housing, it is possible to achieve substantial savings for the public budget. Furthermore, the reduction of energy bills mitigates the risks of energy poverty, particularly in the poorest performing buildings occupied by low-income and vulnerable families, while improving living conditions, enhancing thermal comfort, removing harmful substances. (e.g. asbestos, old lead

by Law 3 August 2013, n. 90 (in GU 03/08/2013, n. 181).

²⁴In Italy, the number of nZEB buildings in 2018 amounted to approximately 1,400 buildings, mostly of new construction (90%) and residential use (85%), as indicated by the nZEB Observatory - ENEA, Costanzo E., Basili R., Hugony F., Misceo M., Pallottelli R., Zanghirella F., Labia N., 2019. Observatory of nearly zero energy buildings (nZEB) in Italy 2016-2018.

pipes), improving facilities, ensuring that redeveloped housing units remain affordable for low-income families.

c) National strategic context

In general, in line with the national strategic objectives (PNIEC) and in the broader European regulatory and policy framework (Clean energy package) there is the potential to significantly reduce energy consumption in the building sector, through a huge program of interventions of redevelopment aimed at improving energy efficiency, capable of making a significant contribution to achieving climate neutrality by 2050.

3. Description of the reforms and investments of the component

1) Energy efficiency program for public buildings.

Investment 1.1: Structural rehabilitation of school buildings - School building security and energy upgrading plan

Challenges: The average age of the school structures clearly shows the need for a major requalification plan, in the awareness that the need to guarantee the quality of teaching also passes through the requalification and innovation of the learning environments, as also highlighted in the "2019 School Building Report" of the Agnelli Foundation. Starting from the data from the School Building Registry of the Ministry of Education, the Report deepened the analysis of 39,000 active buildings (about 150 million square meters), highlighting that school buildings in Italy have an average age of 52 years with strong regional heterogeneity, and that two out of three date back to more than 40 years ago. Considering that many of them are no longer adequate from the point of view of safety and sustainability and that most of them are still lacking also from the point of view of energy efficiency (only 38% of these buildings are equipped with double glazing, just 12% have external wall insulation and just over 25% are equipped with photovoltaic panels), the investment focuses mainly on the renovation, safety and energy requalification of these buildings, as well as the digitisation of learning environments through the internal wiring of schools.

Objectives: The goal is to create an energy efficiency program, seismic adaptation and safety of part of the school buildings, including digitization of the learning environments through the internal wiring of the schools, in such a way as to favor a progressive reduction of energy consumption and climate-altering emissions, an improvement in energy classes, an increase in the seismic safety of buildings and the digitization of learning environments. In addition, the program will promote participatory planning, involving the subjects who live in these places every day (teachers, students and the school community), the development of the territory and the enhancement of services to the community, the employment effects on companies in the sector.

The rate of renovation of the surface of the school buildings that is intended to be carried

out is equal to 20% of existing assets, thus reaching the share of 50% overall, considering the starting situation equal to 30% of buildings already efficient and safe. The proposed redevelopment plan is part of the reform of the school building reorganization, started with the establishment in 2012 in the budget of the Ministry of Education of the Single Fund for school building, and continued with the definition of three-year programs on the basis of annual plans drawn up by the regions. Up to now, investments of over 8 billion euros have been favored with the implementation of over 14,000 interventions.

The proposed redevelopment plan aims to renovate an area of X sqm of school buildings. The building renovations undertaken will result in a reduction in energy consumption (toe) of at least X%, passing from X toe to X toe, with an increase of X m³ surface area of schools with increased energy qualification by 2026.

The energy savings achieved will reduce annual greenhouse gas emissions by X tCO₂ and it will have significant positive social implications by improving learning conditions in schools.

Implementation: The program manager is the Ministry of Education, which is responsible for authorizing, monitoring and reporting on the interventions. The implementation of the interventions and works is the responsibility of the local authorities (Municipalities and Provinces) owners of public buildings used for school use which are also responsible for implementing the monitoring data on the information system. The Ministry of Education, in consideration of the investments in progress, has already defined a monitoring and reporting information system (GPU) on the model of those used for the reporting of European structural funds. In addition, the system also records the pre and post operam project indicators and is connected with the National Registry of the school buildings and with other national databases (eg BDU, BDAP). For the purposes of reporting and monitoring the works, on-site checks are also envisaged through the use of the school building task forces of the Agency for territorial cohesion.

Timeline: The implementation time is expected to start in 2021 and will last until 2026.

Investment 1.2: Construction of new schools through building replacement - School building replacement and energy upgrading plan

Challenges: The low energy performance, linked to the age of the school building heritage, where they cannot be adequately improved with a redevelopment of existing buildings (e.g.: buildings with a very high average age or in the case that the cost of demolition is demonstrated compared to that of the improvement), can be effectively addressed with a plan for the construction of new schools through a progressive building replacement, especially in areas at greatest seismic risk, to ensure that safe, comfortable and innovative environments are available, also in consideration of the need for support teaching based on new methodologies.

Objectives: The objectives of the program concern the progressive building replacement of a part of the old and not very innovative school patrimony; the construction of new modern, welcoming, innovative and sustainable structures from an environmental and energy point of view, in such a way as to favor the reduction of consumption and polluting emissions, the increase in the seismic safety of buildings and green areas and the digitization of learning environments through the internal wiring of schools; the participatory planning of learning environments, involving the subjects who live in these places every day (teachers, students and the school community), in such a way as to positively affect the teaching and learning of students; the development of the territory and the enhancement of services to the community;

The building replacement plan aims to intervene on n. x school buildings (x% compared to existing assets), equal to an area of x sqm.

The actions undertaken will lead to a reduction in energy consumption (toe) of at least xx%, passing from x toe to x toe, with an increase in energetically redeveloped surface equal to x m³ by 2026.

The energy savings achieved will reduce annual greenhouse gas emissions by x tCO₂ and it will have significant positive social implications by improving learning conditions in schools.

Implementation: The program manager is the Ministry of Education, within the terms and in the manner indicated in the previous section, relating to the implementation of the investment 1.1.

Timeline: The implementation time is expected to start in 2021 and will last until 2026-

Investment 1.3: "Safe, green and social" for public housing

Challenges: Home represents a fundamental element for consolidating and relaunching welfare measures, especially in a moment of extreme social exposure. To face the challenge of resilience towards seismic, environmental and social risk, a public housing program will be established aimed at creating, through redevelopment interventions, seismically safer homes and at the same time reducing their polluting emissions.

Objectives: The objective of the program is to support energy efficiency, seismic improvement and the reduction of management costs of the housing stock of national public housing. Overall, for energy efficiency it is estimated to intervene on approximately 10,200,000 m², representing 1/5 of the entire surface of the public residential building stock in Italy; for the seismic improvement it is estimated to intervene on about 1/5 of the value indicated above, about 2,000,000 m², starting from the assumption that almost half of the national territory falls into categories 1 and 2 of seismic classification, mostly areas with a low population density thus not including the large metropolitan areas,

where most of the public residential buildings are located.

The expected results aim to ease the transition of energy class from class G (buildings with the worst performance) to class E and the seismic improvement of the entire surface subject to intervention. A reduction in consumption of at least xx%, with a variation from x toe per year post investments.

The savings achieved through building renovation will reduce annual greenhouse gas emissions by x tCO₂ and will have significant positive social implications by improving housing conditions and promoting, where appropriate, the participation of residents of social housing units.

Implementation: The reference for coordinating the project is the Presidency of the Council of Ministers - Home Italy Department. The intervention priority will be given to the buildings with the worst performances (those with an EPC class F and lower).

The control room, set up at the Casa Italia Department, with the participation of the Ministries directly concerned (MEF and MIT) and the Regions, has general guidance and liaison tasks. The Casa Italia Department and the Regions ensure, on an operational level, monitoring during construction, to be carried out with an intense presence / reminder action on the territory and at the implementing bodies, aimed at identifying specific critical issues and promptly implementation of effective and practicable operational solutions.

During the operational phase, a control task force will be set up with the presence of ANAC, CdC, GdF, for the execution of anticipated control activities.

Timeline: The implementation time is expected to start in 2021 and last until 2025.

Investment 1.4: Energy efficiency and redevelopment of public buildings in metropolitan areas

- Projects being defined with ANCI, which concern the redevelopment of municipal-owned buildings for social uses. -

Investment 1.5: Improvement of judicial citadels

Challenges: To increase the resilience of the judicial system - linked to the issues of energy efficiency / anti-seismic consolidation of buildings - and fill the lack of functional spaces essential for making judicial activity efficient and effective, a program is proposed for the implementation and efficiency of the so-called "Judicial citadels". The interventions for the construction of the citadels have the objective of generating a concrete and visible improvement of the services provided to citizens, as well as strengthening the presence of the State and democratic institutions in urban contexts often burdened by

conditions of economic and social hardship.

Objectives: The program aims at redeveloping and enhance the real estate assets of the administration of justice in an ecological and digital manner. Among the primary objectives there is also the reduction of urban land consumption, combining into unitary buildings both the main functions and the services attached to each judicial office. Almost all the projects will insist on the existing heritage and therefore on maintenance, allowing the protection, enhancement and recovery of the historical heritage that often hosts the offices of the Administration, redeveloping the existing ones, rationalizing consumption and ensuring the economic, environmental and social sustainability of the interventions through the use of sustainable materials and renewable energy.

The milestones are the identification of the contracting parties and the relative stipulation of contracts. They measure the completion of all the preparatory phases for the operational start-up of the activities. As a time horizon, the achievement of this intermediate step is set at the fourth quarter 2023, due to the complexity of the interventions to be carried out. The specific target of the program is estimated in at least 40 buildings to be redeveloped, including the construction of the judicial citadels.

Implementation: The program manager is the Ministry of Justice. The implementation of the investment proposal envisages the following macro activities: signing of the memorandum of understanding between the various administrations involved in which objectives, responsibilities and roles are established; design of the work, which includes, in addition to a series of preliminary investigations (geological, structural), three levels of subsequent technical investigations (technical and economic feasibility project, final project and executive project), the final result of which is the drafting of the executive project; assignment of the execution of the work, in which the tender notice will be published for the assignment of the construction works of the citadel and has as its objective the selection of the person who will carry out the work, concluding with the signing of the contract; execution of the work, which is the construction phase of the judicial citadel and begins with the delivery of the works and ends with the issue of the certificate of completion of the works; the technical-administrative testing, in which a third party is responsible for certifying that the object of the contract, in terms of performance, objectives and technical-economic and qualitative characteristics, has been carried out and performed in compliance with the provisions and contractual agreements, and ends with the issue of the test certificate.

Timeline: The implementation time is expected to start in 2021 and will last until 2026.

2) Energy and seismic efficiency program for private and public residential buildings.

Investment 2.1: Extension of the superbonus to 110% for energy efficiency and building safety

Challenges: In order to face the challenge of the high initial costs of the renovation of buildings and the long payback periods, it is intended to extend the recently introduced 110% Superbonus measure (Article 119 of the Relaunch Decree)²⁵ to finance the energy and seismic requalification of residential buildings. The support will be provided in the form of a tax deduction, available for those who intend to carry out renovations / energy requalification of the building, such as those of thermal insulation of building envelopes, replacement of winter air conditioning systems and reduction of the seismic risk of buildings, as well as the installation of solar photovoltaic systems and infrastructures for charging electric vehicles. This tool is aimed at stimulating local economies and recreating lost jobs, both along the entire construction chain and in the production of goods and services for housing, as well as for the weakest categories most affected by the pandemic.

Objectives: The benefit is for expenses incurred for interventions carried out on common parts of buildings, on functionally independent real estate units and with one or more independent accesses from the outside, located inside multi-family buildings as well as on individual real estate units. The objective of the initiative is to extend the Superbonus measure, from the current 2021 until 2023, which finances energy redevelopment and seismic risk reduction works of national residential buildings at no cost, thanks to the operating mechanism of the subsidy, which raises the deduction rate for expenses incurred to 110%. The extension of the measure aims to triple the positive effect - in terms of annual energy savings generated by the energy requalification interventions - stimulated by the normal Ecobonus, shifting to deep redevelopment interventions. The eligibility of the interventions is conditioned by the improvement of at least two energy classes of the building or of the real estate units located inside multi-family buildings or, if this is not possible, the achievement of the highest energy class before and after the intervention, to be demonstrated through the certificate of energy performance (APE). Two categories of intervention are admitted to deductions of 110%: the "driving interventions" the achievement of the highest energy class, to be demonstrated through the energy performance certificate (APE), before and after the intervention. Two categories of intervention are admitted to deductions of 110%: the "driving interventions"²⁶ and the "driven interventions", the latter are admissible on condition that they are carried out jointly with at least one of the driving interventions. The objective is equal to 3 million square meters redeveloped per year, corresponding to approx 1% of the total area occupied by residential buildings.

Furthermore, the expected results aim to triple the annual savings generated by the

²⁵The measure was introduced in the "Relaunch" emergency package, formally converted into law on 18 July 2020, with the aim of contributing to the relaunch of the Italian economy in response to the COVID-19 crisis.

²⁶The driving interventions concern the building envelope, requiring an external insulating coating for an area of at least 25% of the building and the systems.

Ecobonus, quantified in 0.3 Mtoe of additional annual savings from new interventions, starting from a baseline of current level of energy savings generated by the Ecobonus equal to 0.1 Mtoe of additional annual savings from new interventions.

The milestone identified is the approval of the extension rule of the Superbonus measure for interventions carried out until 31 December 2023.

Implementation: The body in charge of the tool is the Ministry of Economic Development and tax bodies (Revenue Agency). The implementation procedures envisage a tax deduction of 110%, to be divided among the entitled parties in 5 annual installments of the same amount, within the limits of the capacity of the annual tax deriving from the tax return. In order to ease the generalized use of the measure, the facilitation mechanism provides for the possibility, instead of the direct use of the deduction, to opt for an advance contribution in the form of a discount from the suppliers of the goods or services or, alternatively, for the assignment of the credit corresponding to the deduction due.

In addition to the formalities ordinarily provided for tax deductions, for the purposes of using the incentive, the taxpayer must also acquire the approval of the documentation certifying the existence of the conditions that give the right to the tax deduction, including sworn certification technique relating to energy efficiency and seismic risk reduction interventions by qualified technicians and the attestation of the adequacy of the expenses incurred in relation to the subsidized interventions based on specific cost tables.

The mechanisms activated for some time for the Ecobonus, the Sismabonus and the Superbonus will be used for the monitoring and verification of the targets.

Target population: Condominiums, Individuals, outside the exercise of business activities, arts and professions, owners of the property object of the intervention, autonomous public housing institutes (IACP) or other institutions that meet the requirements of European legislation on "in house providing", undivided housing cooperatives, non-profit organizations and voluntary associations, amateur sports associations and clubs.

Timeline: The implementation time is expected to be in the fourth quarter of 2023 (December 31, 2023) (see Table 2 for details). Specifically, the measure applies to expenses incurred up to 30 June 2022 and up to 31 December 2022 for IACPs. It can be applied for a further six months in the cases of works carried out by condominiums and IACP when at least 60% of the works have been carried out before the expiry date of the measure. In order to give more time for more complex interventions, it is planned to extend the application of measure (i) for the IACP to 30 June 2023, extended by a further six months when at least 60% of the works have been carried out; and (ii) for condominiums up to 31 December 2022, regardless of the completion of at least 60% of the works.

4. Green and digital dimensions of the component

a) Green Transition:

Construction as a whole - housing, workplaces, schools or other public buildings - is the largest consumer of energy in the EU and a major contributor to carbon dioxide emissions. Overall, buildings in the EU are responsible for 40% of energy consumption and 36% of greenhouse gas emissions, mainly due to construction, use, renovation and demolition.

In Italy, as highlighted in the National Energy and Climate Plan, over 60% of the buildings for residential use were built prior to Law 373/1976, the first law on energy saving, and of these buildings, in addition to 25% recorded annual consumption from a minimum of 160 kWh/m² year to over 220 kWh/m². For national non-residential buildings - schools, offices, shopping centers, hotels, hospitals - the PNIEC reports the estimated average consumption for the different uses and climatic zones, highlighting, among other things, the most energy-intensive buildings, such as for example hospitals, with average electricity consumption of 303 kWh/m² and thermal consumption of 342 kWh/m².

Buildings, responsible for greenhouse gas emissions due to significant energy consumption, must therefore become more resilient as they are particularly vulnerable to the impacts of climate change. In line with EU guidelines, the achievement of ambitious emission reduction targets - up to climate neutrality by 2050 - significantly contributes to the construction of energy-efficient, sustainable buildings equipped with key enabling technologies (for example, advanced and sustainable building materials, digital interconnections). Building renovations improve energy performance and increase the use of renewable energy (for example, using solar photovoltaic systems, heat pumps),

Therefore, including the X% of climate expenditure (see Table 1 below), this component contributes significantly to the 37% target set by this regulation (proposal). The component also contributes to wider environmental objectives with an environmental expenditure equal to X% (see Table 1 below).

In addition, all investments foreseen in the component contribute to the green transition, taking into account the climate and environmental objectives defined in Regulation (EU) 2020/852 (Taxonomy Regulation) and the mitigation of climate change. The investments, in fact, concern the construction and renovation of energy and resource efficient buildings, with particular attention to environmental sustainability, as well as to technological innovation with a view to economic resilience.

b) Digital Transition:

- in progress ... -

See Table 1 work in progress

5. Milestones, targets and timeline

See Table 2 work in progress

6. Financing and costs

See Table 2 work in progress

Cost estimation method

Investment 1: Structural rehabilitation of school buildings - School building security and energy upgrading plan

Costs defined on the basis of national three-year programs and annual plans drawn up by the Regions. three-year programming of the Ministry of Education.

Investment 2: Construction of new schools through building replacement - School building replacement and energy upgrading plan

Costs defined on the basis of national three-year programs and annual plans drawn up by the Regions. three-year programming of the Ministry of Education.

Investment 3: "Safe, green and social" for public housing

For the housing stock of public residential buildings, the method of estimating costs for energy efficiency interventions took into account the implementation of a typical intervention that ensures a passage of energy class from class G to class E (e.g. : 1970s building , centralized system, light fixture, with more than 30 real estate units). Data provided by Federcasa and a medium-sized Aler were taken as a reference: the average costs of an energy efficiency intervention with a double class jump amounted to € 127 per sqm.

For seismic safety, on the other hand, reference was made to the average costs for interventions on the residential building heritage sustained during the 2009 earthquake emergency in L'Aquila and the White Paper for the reconstruction of the territories hit by the earthquake of 6 April 2009. In this document the costs of repairs on damaged buildings are compared with the costs that would be incurred on intact buildings; estimating an average cost on intact buildings of 350 € per sqm.

Investment 4: Energy efficiency and redevelopment of public buildings in metropolitan areas

[to be defined...]

Investment 5: Efficiency of judicial towns

[to be defined ...]

Investment 6: Extension of the super bonus to 110% for energy efficiency and building safety

The estimates were made taking into account the average costs for the energy and seismic upgrading of buildings recorded by the Ecobonus and Sismabonus incentive measures already in place for years, as well as the energy savings obtained from the application of the eco-bonus.

4 M2C4 - Protection of land and water resources

1. Description of the component

Summary box

Policy area: Protection of the territory and of the water resource, fight against hydrogeological instability, sustainable irrigation and reforestation

Objectives: The safety of the territory, intended as the availability of water resources, the elimination of soil and water pollution and the mitigation of hydrogeological risk, is a fundamental aspect for protecting the health of citizens and for attracting businesses, investors and tourism.

The objectives of this component are:

(i) Prevent and contrast the effects of climate change on hydrogeological instability phenomena and on the vulnerability of the territory in urban areas;

(ii) Guarantee the security of water supply for drinking, irrigation and industrial purposes and the reduction of water dispersions;

(iii) Ensure the sustainable management of water resources along the entire cycle and the improvement of the environmental quality of inland and maritime waters.

Twin transition: This component contributes significantly to the green transition by promoting a more efficient and sustainable use of water resources and by preventing actions against the risks associated with climate change. Great attention is also paid to the digitalisation of processes, with particular reference to the digital management of water resources and the efficiency of the networks, to be transformed into a “smart network”.

Jobs and growth: The fragility of the Italian territory and the stress on water resources in terms of both quantity and quality are critical issues that determine a structural economic weakness. The safety of the territory and the efficient and sustainable use of natural resources are therefore preparatory elements for the socio-economic development of the country.

The investments related to this component will contribute to creating and maintaining a significant number of jobs and to both local and national economic growth. The prevention of hydrogeological instabilities and an efficient integrated water service are necessary conditions for the health and quality of lives of citizens, for the establishment and maintenance of productive activities in the territories, and for the attraction of tourism. Furthermore, many of the proposed interventions, especially those of a structural nature, involve the opening of construction sites that generate jobs.

Social resilience: The measures envisaged by this Action will contribute to increase investments in the management of water resources in the South, in order to reduce the Water Service Divide of the South compared to the Center - North of the country. The internal areas of the country will be interested by investment priorities, in particular those related to the irrigation sector.

Reforms and investments:

Outcome 1: Prevent and combat the effects of climate change on hydrogeological instability phenomena and on the vulnerability of the territory in urban areas.

Reform 1.1: Simplification and acceleration of the procedures for implementing interventions against hydrogeological instability;

Investment 1.1: Structural and non-structural interventions for flood risk management and hydrogeological risk reduction (including innovation and digitization of territorial monitoring networks);

Investment 1.2: Urban Forestry;

Investment 1.3: Interventions for the resilience, the enhancement of the territory and the energy efficiency of the Municipalities;

Outcome 2: Guarantee the security of water supply for drinking, irrigation and industrial purposes and the reduction of water dispersion.

Reform 2.1: Simplification of legislation and strengthening of Governance for the implementation of investments in the water supply infrastructure;

Reform 2.2: Revision and strengthening of the governance model of reclamation consortia;

Investment 2.1: Investments in primary water infrastructures for the security of water supply1;

Investment 2.2: Investments in the resilience of the irrigation agro-system for a better management of water resources (including digitalization and technological innovation of distribution networks;

Outcome 3 Ensure the sustainable management of water resources along the entire cycle and the improvement of the environmental quality of inland and maritime waters;

Reform 3.1: Measures for the full implementation of the assignments for the Integrated Water Service;

Investment 3.1: Investments aimed at reducing losses in water distribution networks, including digitization and monitoring of networks;

Investment 3.2: Investments in sewerage and wastewater treatment;

Investment 3.3: Interventions in port areas to fill the deficit of facilities for the management of waste collected at sea.

Estimated costs:

EUR 14,830 million to be covered by RRF

M2C4 - Protection of land and water resources

	Resources (euro/mld)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
1. Measures to counter hydrogeological risks	3.36	0.25	3.61	-	3.61
2. Urban forestry	0.03	0.30	0.33	0.20	0.53
3. Sustainable forestry management and rural land maintenance (*)	-	-	-	-	-
4. Sustainable management of integrated water services	1.46	2.92	4.38	-	4.38
- Primary water infrastructure for the security of water supply	1.46	0.90	2.36	-	2.36
- Resilience of the irrigation agro-ecosystem	-	0.52	0.52	-	0.52
- Measures to reduce losses in water distribution networks, including their digitalization and monitoring	-	0.90	0.90	-	0.90
- Sewerage and wastewater treatment	-	0.60	0.60	-	0.60
5. Resilience, safety and energy efficiency of the municipalities	6.00	-	6.00	-	6.00
6. Port area facilities for the management of waste collected in the sea	-	0.50	0.50	-	0.50
TOTAL	10.85	3.97	14.83	0.20	15.03

Note: (b) includes FSC existing resources, to be devoted to specific measures.

2. Main challenges and objectives

a) Main challenges ²⁷

Significant negative impact of hydrogeological instability on the population and on the economic and productive fabric of Italy

- According to the data collected by the Higher Institute for Environmental Protection and Research (ISPRA) and reported in the Report on hydrogeological instability in Italy (2018 edition), 7,275 municipalities (91% of the total) are at risk from landslides and / or floods; 16.6% of the national territory is classified as more dangerous; 1.28 million inhabitants are at risk of landslides and over 6 million inhabitants at risk of floods. Only with reference to the landslide phenomenon, the main events (those that caused deaths, injuries, evacuees and damage to buildings, cultural heritage and infrastructures) are a few hundred a year and constantly increasing: 70 events in 2011, 85 in 2012 , 112 in 2013, 211 in 2014, 311 in 2015, 146

²⁷The data on the Integrated Water Service cited in this section come largely from the paper Acqua N.144: "Development of the South. Let's start from water" by REF Ricerche, February 2020.

in 2016, and 172 events in 2017.

- The costs for the restoration of damages and the reconstruction of the territories affected by emergency events are huge: in 2018 alone, with the Legislative Decree 119/2018 (tax decree) and the law 145/2018 (budget 2019), more than EUR were allocated 3.1 billion for the mitigation of hydrogeological risk in areas where disasters had occurred and a state of emergency had been declared.

Delays in the implementation of hydrogeological risk reduction projects

- The project selection procedure and the method of transferring financial resources is complex and lengthy, and the assignments by tender, often conducted by small local authorities, has led to delays in the time required to carry out the works. In addition, only a limited number of projects could be set up, and the establishment of planning funds has only partially overcome this problem.
- With the identification of the extraordinary commissioners for hydrogeological instability an improvement has begun in the overall spending capacity. However, since they have not been equipped with adequate technical support structures, to perform the contracting authority functions and sometimes their monitoring / approval functions, the Commissioners rely on local authorities, whose weakness constitutes a bottleneck in the procedures.

Fragmented and inefficient management of water resources, characterised by high losses

- Lack of strong public governance at the basin level to ensure integrated management of water resources - for civil, irrigation and industrial use - and lack of solid wholesale managers from a technical and financial point of view.
- Fragmentation of the managers in the Integrated Water Service (they are 290, more than 3 for the Optimal Territorial Area) and poor effectiveness and industrial capacity of the implementing subjects in the water sector in the South.
- Insufficient planning capacity of the reclamation Consortia, especially in the southern regions. Need to improve their governance to ease the implementation of investments to intercept the needs of the agricultural sector.
- High level of water resource losses: in distribution for civil uses the average loss is 41% (51% in the South) and it causes rationing in periods of drought. Even in irrigation use, the losses are very high and the margins for improving efficiency are significant. “Intelligent” extraordinary maintenance is therefore required, using digital tools and pressure regulation in order to efficiently reduce leaks.

Sewerage and purification not in line with European Directives, especially in the South

- 987 infringement procedures have been opened by the EU against Italy, most of which concern purification and water quality. They are concentrated in Sicily (255 cases), Calabria (190), Campania (104), as well as in Lombardy (147 cases).²⁸

²⁸Since May 2018, Italy has been ordered to pay 30 million euros for each six-month delay in bringing

- There are delays in spending the funds available for the Integrated Water Service (SII) in the South. The data from the Department for Cohesion Policies and the Agency for Territorial Cohesion show that funds and contributions (from the EU) are available for the Integrated Water Service - ESI - and national - FSC funds), but that the spending capacity is rather limited²⁹. Currently, around EUR 4 per capita per year vs. EUR 40 per capita per year nationwide.

Lack of digital, smart and organic management, of information and monitoring systems

- In order to improve the effectiveness and efficiency of investments in water infrastructures and in the protection of the territory against hydrogeological risk, it is necessary to have monitoring systems in the following fields: (i) monitoring of the territory, to favour the full integration of the information collected and data processing to support intervention decisions in critical areas; (ii) monitoring of water networks to detect malfunctions and reduce waste; (iii) monitoring of water infrastructures for the prediction of their useful life and the planning / verification of maintenance interventions.

b) Objectives

1) *Prevent and contrast the effects of climate change on hydrogeological instability phenomena and on the vulnerability of the territory of urban areas.*

- Mitigate the risks related to hydrogeological instability by combining structural and non-structural measures, in order to reduce the damage caused by the increasingly frequent extreme weather events, poor widespread forest management, as well as the lack of maintenance of forest hydraulics systems in mountain and hilly areas.
- Invest in the creation of territorial monitoring systems to have a valid database, aimed at a more effective planning of interventions and risk prevention.
- Increase the resilience of territories in urban areas through interventions aimed at reducing their vulnerability to the negative effects of climate change; through preventive and mitigation actions aimed at favoring the enhancement and sustainable development of the territory.

2) *Ensure the security of water supply for drinking, irrigation and industrial purposes and a reduction in water dispersion*

into compliance with the law the over 70 agglomerations with more than 15,000 equivalent inhabitants that lack adequate sewerage systems and purifiers.

²⁹For the 2007-2013 and 2014-2020 programming cycles, the total amount of public resources available is € 10.3 billion. Of these, about 83% should go to the territories of the South and the Islands, 12% to the North and 3% to Central Italy. The area of the South and the Islands is experiencing significant delays: the rate of completion of the interventions in July 2019 was "only" at 18%, for an amount of 760 million euros of expenditure, while 22% of the projects, corresponding to 1,464 million euros in loans, had not yet started.

- Improve the security of water supply by planning extraordinary maintenance, upgrading and completing water supply systems (dams, reservoirs, diversions and supply networks), including through monitoring and control systems to identifying the main vulnerabilities. Primary water infrastructures for civil, agricultural, industrial and environmental uses must be made efficient and resilient, with a view to adapting to climate change and ensure the overcoming of increasingly frequent water crises and of "emergency" policies.
- Increase the efficiency and resilience of the irrigation agro-ecosystem to extreme climatic events, such as instability and drought, by investing both in infrastructural interventions and in monitoring of usages (through the digitization and technological innovation of networks), for more sustainable management of water resources and a reduction of losses.

3) *Ensure the sustainable management of water resources along the entire cycle and the improvement of the environmental quality of inland and maritime waters.*

- Obtain a significant reduction in the dispersion of water in the distribution networks, also with the aid of new technologies, to favor the complete transformation of the water networks into a "smart network" and increase the resilience of systems to climate change.
- Achieve a higher quality of inland and maritime waters through investments in purification and wastewater treatment plants, which have beneficial effects on public health and the environment and allow for a reduction in infringements of EU directives;;
- Contribute to overcoming the water service divide between the South and the Center-North of the country, giving a concrete impetus to the begin an industrial management in areas of the country where the integrated service has not yet been entrusted to managers able to guarantee effective implementation of interventions.

c) National strategic context

The Action represents a clear and effective response to the priority challenges identified for Italy by the European Council where, in the communication COM (2020) 512 final of last May 20, the Council highlighted, among other things, that Italy is very vulnerable to extreme meteorological phenomena and hydrogeological catastrophes, and that infrastructural deficits in water management generate an environmental and health impact that entails considerable costs and loss of income for the Italian economy.

Overall, the Action is coherent with the priorities of the European Green Deal, in particular with the Climate Action and the European Biodiversity Strategy 2030. Through the national planning process, its coherence and complementarity with the policy objective "A greener Europe" of the cohesion policy 2021 - 2027 (specific objectives b.4 "promoting adaptation to climate change, risk prevention and resilience to disasters" and b.5 "Promoting sustainable water management").

The investments and reforms proposed in the Component are fully in line with the priorities established in the national investment strategies and plans, consistent with the European framework defined as a priority by the Flood Risk Directive (2007/60 / EC) and the main directives in the integrated water sector, such as the Water Framework Directive (2000/60 / EC), the Drinking Water Directive (1998/83 / EC) and the Urban Waste Water Treatment Directive (1991/271 / EC).

In particular, investments in water resources are defined in the "National plan of interventions in the water sector", divided into a "aqueducts" section, on the initiative of the Regulatory Authority for Energy, Networks and the Environment (ARERA), and in a section " invasi ", on the initiative of the Ministry of Infrastructure and Transport (Directorate General for Dams and Water and Electricity Infrastructures).

Investments in purification are defined in the "Plan for the collection and purification of waste water and overcoming EU infringement procedures" of the Ministry of the Environment and Protection of the Territory and the Sea (MATTM).

Furthermore, at the local level, we have the "Hydrographic District Plans" for the various uses of the resource (irrigation, industrial, civil, electricity) and the "Area Plans" for the Integrated Water Service, which define the priorities for intervention and investments in water, irrigation and purification infrastructures in the various hydrographic districts and territorial areas.

With specific reference to the issue of the integrated water service tariff, since 2012 the tariffs have been regulated by the Regulatory Authority for Energy, Networks and the Environment (ARERA) as a national regulator in line with the EU principles of cost coverage and "the polluter pays ". With Resolution 580 of 27 December 2019, ARERA approved the Method for the 2020-2023 tariffs, a regulatory scheme, which, in full consistency with the European regulatory framework, intends to bring those who are late towards national standards. It aims at increasing the efficiency of operating and management costs, as well as improving the awareness of citizens.³⁰

Finally, with respect to investments for the reduction of hydrogeological risk, we have the "National Plan for the mitigation of hydrogeological risk, the restoration and protection of the environmental resource" (so-called Proteggi-Italia), referred to in the DPCM of 20 February 2019. The Plan pursues the formation of a unitary framework of needs and is structured in different areas and intervention measures (emergency measures, prevention measures, maintenance and restoration measures, as well as simplification and governance strengthening measures).

³⁰In the context of water tariffs for agricultural use, there are regional regulations that quantify water uses for irrigation (based on the guidelines issued by MIPAAF with DM 31/07/2015), as well as a database (Webgis SIGRIAN) to quantify collective and individual water uses (and allow monitoring of illegal subtractions).

The measures of the Component are therefore defined within a broader and more general framework to ensure the complementarity of the various programs and a full synergy with other European and national funds. In this regard, the investments envisaged in the PNRR will be integrated and strengthened with:

- EAFRD resources (1 billion euro) for sustainable forest management, for forest hydraulics works in mountain and hilly areas with high hydrogeological and landslide risk and for the maintenance of rural areas;
- REACT-EU resources (200 million euros) for urban forestry interventions;
- Ordinary national resources, as provided in particular by the latest Budget Law, for interventions to combat hydrogeological instability (160 million euros) and for the resilience and enhancement of the territory in the municipalities (600 million).

3. Description of the reforms and investments of the component

1) Prevent and contrast the effects of climate change on hydrogeological instability phenomena and the vulnerability of the territory in urban areas.

Reform 1.1: Simplification and acceleration of the procedures for implementing interventions against hydrogeological instability.

Challenges: In its investigation relating to the 2016-2018 planning fund, the Court of Auditors highlighted the absence of an effective national policy to combat hydrogeological instability, of a preventive and non-emergency nature; the difficulty of administrative bodies to include the protection of the territory into their ordinary functions; the weakness of the implementing subjects and of the Extraordinary Commissioners / Presidents of the Region, who do not have dedicated technical structures. The Court of Auditors also underlined the procedural stickiness, the absence of adequate controls and a unitary system of databases.

Objectives:

- Simplification of project implementation and financing procedures.
- Strengthening the extraordinary Commissioners and strengthening the technical structures to support them in the design, procurement and supervision of projects.
- Strengthening the operational capacity of the district and provincial authorities.
- Systematization of information flows in order to eliminate redundancy in reporting between the various information systems of the State.

Some corrective actions have already been introduced by the so-called "Simplification Decree" (Law 11 September 2020, n. 120), which also provides that:

- the Extraordinary Commissioners for hydrogeological instability can avail themselves of technical assistance and operate in derogation from the Code of Public Contracts, always in compliance with the mandatory constraints deriving from be-

longing to the European Union;

- the maximum deadline for issuing opinions at the conference of services is thirty days.

Implementation: In order to speed up the whole process of planning, programming and implementing the interventions, other actions to reform the current legislation have been undertaken by the Ministry of the Environment. One of the most important is the revision of the Prime Ministerial Decree of 28 May 2015 (containing the criteria and methods for establishing the priorities for assigning resources to the interventions), whose aim is to simplify the preliminary procedure for projects, including:

- the involvement of the District Authorities right from the insertion of the interventions in the ReNDiS database (so as to instruct, for purposes of selection, only the interventions that have already obtained a positive opinion from the same Authority);
- the standardization of processes by establishing timelines for each phase;
- updating of the classification criteria on a technical-scientific basis, with the support of ISPRA;
- the inclusion of financial penalties in the event of a slowdown in spending by the Region.

Furthermore, a Decree Law is being defined by the competent Ministry of the Environment, which aims to further simplify the various processes, to insert innovative elements in terms of interoperability of IT reporting systems, to rationalize and systematize the regulatory framework of sector. The Decree provides for the strengthening of the operational capacity of Government Commissioners, also through the use of in-house State companies. Furthermore - to lay the foundations for a future, gradual return to ordinary management of resources - it is planned to strengthen the role of the Provinces, setting up a specialized office within them for the activities of contrasting hydrogeological instability, of which the Commissioner can also avail.

Finally, a strengthening of the control at central level is envisaged, with the establishment of a technical control room at the MATTM and the possibility of activating a National Task Force for specialized technical support for implementation.

Target population: Cities and urban and rural territories of the entire country, with particular reference to the areas characterized by greater risk and criticality.

Timeline: approval by Q1 2022.

Investment 1.1: Structural and non-structural interventions for flood risk management and hydrogeological risk reduction (including innovation and digitization of territorial monitoring networks

Challenges: The threats due to hydrogeological instability in Italy, exacerbated by the effect of climate change, compromise the safety of human life, the protection of productive activities, the protection of ecosystems and biodiversity, the protection of environmental and archaeological assets, agriculture and tourism. To reduce emergency interventions, increasingly necessary due to frequent disasters, it is necessary to intervene in a preventive way, through a broad and widespread program of structural and non-structural interventions.

Objectives:

- Securing built-up areas and hydrographic basins exposed to hydrogeological risk;
- Environmental remediation and mitigation of climate change effects;
- Greater level of control and management of flood risk;
- Increase of environmental and territorial knowledge and enhance specific survey activities, in order to implement a policy of prudent and sustainable management of the water resource and of the territory;
- Innovation and digitization of territorial monitoring systems, to favor the full integration of the information collected and the processing of data to support intervention decisions in critical areas of the territory.

In order to achieve the indicated objectives, it will be necessary to combine structural measures (such as those aimed at securing landslides or reducing the risk of flooding in metropolitan areas) with the additional non-structural measures envisaged by the water and flood risk management plans, focused on active maintenance of the territory, requalification, monitoring and prevention. Furthermore, in order to preserve and improve the state of water bodies and reduce land consumption, it will be necessary to increase the use of "nature-based" and "land-based" interventions, which allow for the integration of risk mitigation needs, with the protection and recovery of ecosystems and biodiversity.

These interventions benefit from complementary resources of 160 million euros in the Budget Law.

Furthermore, in addition to the measures described, with particular regard to the mitigation of risks in mountain, hilly and rural areas, EAFRD will finance (with 1 billion euro) sustainable forest management interventions, extraordinary maintenance and refurbishment of forestry hydraulics in mountainous and hilly areas with high hydrogeological and landslide risk, forest fire prevention and reconstruction of degraded forest areas, management and maintenance of rural areas.

Implementation:

The interventions may concern the entire national territory; structural measures will be selected by the MATTM starting from those inserted in the ReNDiS database on the basis of technical and objective criteria (such as people and goods at risk, the frequency of calamitous event to be addressed, the approved design level and the construction site),

considering the necessary compatibility with the timing of the Recovery Plan (dictated not only by the design maturity, but also by the type and size of the intervention).

As regards the methods of implementation, starting from Legislative Decree 91/2014, the interventions on the subject of hydrogeological instability are implemented by the Presidents of the Region as extraordinary Government Commissioners. However, even within the same regulatory framework, the regional administrations do not act in the same way: in many cases the Commissioners, lacking adequate technical support structures, delegate the implementation to the beneficiary Municipalities. This explains the need for reform no. 1.1 which aims, among other things, at strengthening the technical structures of the Commissioners.

Target population: Inhabitants of areas classified as at greatest risk, throughout the national territory.

Timeline:

- project selection by Q3 2021;
- completion of the design and assignment of the works by Q4 2023;
- completion of the works by Q3 2026.

Investment 1.2: Urban forestry

Challenges: Italian cities are increasingly exposed to problems related to air pollution, the impact of climate change and the loss of biodiversity, with evident negative effects on the well-being and health of citizens. This makes it important to implement measures aimed at environmental sustainability and the enhancement of the territory in the urban environment.

Objectives: In line with national and EU strategies, the project includes a series of large-scale actions aimed primarily at metropolitan cities, to improve the quality of life and well-being of citizens through the development of urban and peri-urban forests. The goal is to plant millions of trees, identifying the places and quantities according to the principle of using "the right tree in the right place". The Charter of the Ecoregions of Italy drawn up at the level of "34 ecoregions" will make it possible to select and assign to each metropolitan area the most suitable trees in terms of ecological, biogeographical and other different local needs. In this way, it will be possible to contribute to:

- preserve and enhance the widespread naturalness, biodiversity, and ecological processes linked to the full functionality of ecosystems;
- contribute to reducing air pollution in metropolitan areas, thus protecting human health;
- recover man-made landscapes by enhancing internal areas in direct ecological relationship with urbanized areas (ecological corridors, territorial ecological networks)

and enhancing the system of protected areas present in the immediate vicinity of metropolitan areas;

- curb soil consumption and restore useful soils.

The project also responds to social and economic needs. In many urban areas, especially in the South, green infrastructures could represent an important opportunity for employment development both in the field of plant production and in the management of green.

To supplement the resources of the PNRR, 200 million euros from REACT-EU will also be allocated to urban forestry interventions.

Implementation: The implementing bodies of the interventions will be the Municipalities, with a focus on Metropolitan Cities. The project is consistent with the experimental activity for urban reforestation launched pursuant to article 4 of the law of 12 December 2019, 141 (so-called national “climate law”). The implementation of the project can therefore be based on the scheme adopted pursuant to the aforementioned law, which envisages a planning phase managed by metropolitan cities; the presentation of detailed operational programs to the Committee for the development of public parks set up pursuant to article 3 of the law of 14 January 2013; the transfer of resources to metropolitan cities by the Ministry of the Environment for the implementation of interventions.

For the preliminary activities relating to the detailed operational programs, the Committee for the development of public green spaces makes use of the ISPRA and the National Network System for the protection of the environment, as per Law 132/2016.

Target population: Inhabitants of the Municipalities.

Timeline: - to be defined -

Investment 1.3: Interventions for the resilience, enhancement of the territory and energy efficiency of the municipalities

Challenges: Some of the most delicate challenges are concentrated in urban areas, where the majority of the population lives. Climate change and the observed increase in the frequency of extreme events make it increasingly urgent to address the geological-hydraulic criticalities in cities, such as floods, erosion and gravitational instability, and the consequent damage (consisting, among other things, in the deterioration of the building stock, damage to the underground service networks and interruptions to the road network).

Objectives: This investment aims to increase the resilience of the territories and promote their enhancement and sustainable development, through a varied set of interventions, of medium-small size, located in urban areas. The safety measures, aimed at reducing the vulnerability of the territory before the adverse of climate change effects and at limiting

damage, are accompanied by preventive and mitigation actions that intervene on the causes of climate change and promote the energy sustainability of the territory.

The planned interventions have, in particular, the following objectives:

- Prevention and mitigation of risks connected with hydrogeological risk and safety of the inhabited areas exposed to these risks;
- Road safety;
- Making buildings safe (through seismic improvement and adaptation interventions);
- Energy efficiency of buildings and public lighting systems.

Implementation: The interventions fall under current legislation and concern the urban areas of the entire national territory. The implementing bodies are the Municipalities. In particular, the resources are assigned to the Municipalities by decrees of the Ministry of the Interior, with the exception of the resources referred to in the budget law n. 145 of 2018, art. 1, paragraph 139, assigned to the Municipalities of their territory by the Regions with ordinary statute.

Target population: inhabitants of urban areas throughout the national territory.

Timeline: 2026Q2

2) Ensure the security of water supply for drinking, irrigation and industrial purposes and a reduction in water dispersion.

Reform 2.1: Simplification of legislation and strengthening of Governance for the implementation of investments in the field of water supply infrastructures.

Challenges: The articulated regulatory framework, the fragmented management of the water resource and of infrastructures connected to its supply have a negative impact on the capacity to plan and implement investments.

Objectives:

- More effective coordination of the legislation relating to the National Plan of interventions in the water sector;
- Provision of support and accompanying measures for implementing bodies not able to carry out investments relating to primary procurement within the foreseen time frame;

More specifically, this reform intends to act on the legislation that regulates the National Plan of interventions in the water sector (Law 205/2017, article 1, paragraph 516 and following), according to the following lines of action:

- making the National Plan the central public financing instrument for investments in the water sector by unifying the economic resources relating to water supply

infrastructures under the Plan;

- overcome the division between the “reservoirs” and the “aqueducts” section;
- involve ARERA to support the making of the entire Plan;
- simplify the training and updating procedures of the Plan;
- simplify the procedures for reporting and monitoring the investments financed;
- provide for central accompanying measures by MIT (directly or through a state company) for subjects that have lower capacity to plan and implement.

Implementation: The Ministry of Infrastructure and Transport will present a reform proposal relating to the water supply sector. The reform proposal will be shared with the institutional bodies involved (including MATTM and MIPAAF).

Furthermore, to promote the planning and implementation of interventions according to a systemic and organic logic and strengthen the Governance of the sector, the process of strengthening the district basin Authorities³¹, already started by the MATTM through a community project (We create PA - Line L6W1, funded under the PON Governance 2014-2020), will continue.

Target population: users of the water resource for different uses.

Timeline: approval of the regulatory provision by the first half of 2022 and finalization of the "internal" procedures for the implementation of the reform (methods to recognize needs, selection criteria, guidelines for the evaluation of investments) within the following year.

Reform 2.2: Revision and strengthening of the governance model for the reclamation consortia.

Challenges: On the national territory, some consortium structures have been commissioned, even for a long time. This has significantly limited their activity and planning capacity. In addition, the financial situation of the consortium bodies, in many cases precarious, due both to the various crises in the agricultural sector and to ineffective administrative functioning of the consortia themselves.

Overall, what has been described has penalized entire regional territories and their inhabitants, especially in the southern regions, resulting in a poor capacity for maintenance of the territory and innovation in the management of water for irrigation, as well as an inefficient use of economic resources destined to activities for the defense of the soil and the creation of reservoirs.

Objectives:

³¹In complementarity with the measures to strengthen the district authorities themselves envisaged in the context of reform no. 1.1, for a more effective contrast to hydrogeological risk.

- Promote the updating and strengthening of the governance model of the reclamation consortia, favoring the return to self-government of the commissioned consortia;
- Strengthen the planning capacity of the reclamation consortia, also through regional planning centers.

More specifically, the reform will concern the reorganization of the reclamation consortia through the revision of the criteria referred to in the State-Regions Agreement of 18 September 2008 (which include: the definition of the reclamation areas; the subjects and functions of the consortia; financial system of interventions and private participation; consultation and collaboration with local authorities and agricultural entrepreneurs; supervision and internal management control). In particular, it is envisaged the review of the procedures to allow for substitutive powers by the State and to reduce the time to decide the commissioning of entities, placing a time limit on the same entities, so as to guarantee the completion of all the actions necessary to return to the self-government of consortia in the shortest possible time.

Implementation: From a procedural point of view, MIPAAF will assess the strengths and weaknesses of the current governance system; consequently, in agreement with the Regions and Autonomous Provinces, it will elaborate a proposal to modify the criteria referred to in the aforementioned Agreement.

The established criteria must be incorporated into regional laws. To overcome the risk of non-transposition, all means of preventive consultation will be used. Based on the recognition of the existing regional regulations (Q4 2021), MIPAAF will present a reform proposal to the Regions (Q4 2022). Reward mechanisms linked to the effective implementation of the criteria within regional laws will also be included in the planning on national funds.

Target population: Reclamation consortia and inhabitants in rural areas of the country.

Timeline: The deadline for the approval of the Agreement is set for the end of 2023.

Investment 2.1: Investments in primary water infrastructure for the security of water supply.

Challenges: The increasingly frequent water crises due to ongoing climate change entail the need to make primary water infrastructures for civil, agricultural, industrial and environmental uses more efficient and resilient, so as to guarantee the security of water supply in all sectors and overcome the "emergency policy".

Objectives:

- Water supply security of important urban areas and / or large irrigated areas;
- Adjustment and maintenance of the safety of structural works;

- Greater resilience of infrastructures, also with a view to adapting to climate change;
- Recovery and increase of the useful transport capacity, with consequent economic repercussions, and improvement of the quality of the water resource.

In order to achieve the objectives indicated, investments financed will include measures for extraordinary maintenance and the upgrading and / or completion of the derivation, storage and primary supply infrastructures³².

The interventions will cover the entire national territory, with different purposes depending on the geographical area. In particular:

- the completion of large unfinished systems mainly in the south;
- extraordinary maintenance interventions aimed at static and seismic safety and greater efficiency in large irrigation systems or for multiple purposes, in the center-north;
- interventions on strategic infrastructures, which have also been operating for more than 60-80 years, and the related interconnections, to make them more resilient, throughout the territory.

Implementation: The program is in continuity with objectives and contents of the National Plan of interventions in the water sector (with particular reference to the “Invasi” section and to the interventions on large drinking water aqueducts in the “Aqueducts” section).

The competent central administration is the MIT Directorate General for "Dams and water infrastructures" which, for each work, signs an agreement with the implementing body to regulate the conditions and methods of intervention. For the “Aqueducts” section, ARERA works with MIT in the selection of investments. The implementing bodies will be the primary supply managers, the Reclamation Consortia, the Irrigation Bodies, and the managers of the integrated water service.

To ensure the completion of the projects within the time horizon of the RRF, interventions with defined and clear project profiles will be selected, proposed by subjects with proven spending capacity and without particular uncertainties in the authorization and possibly expropriation phases. In any case, constant monitoring will be carried out by MIT and ARERA and accompanying and replacement mechanisms will be put in place in the event of forecasts of non-compliance with the deadlines. It should also be noted that the procedure for selecting the interventions has already been launched by MIT, in September 2020, together with the preliminary activity relating to the National Plan of interventions in the water sector.

Target population: Users of the integrated water service, reclamation consortia, irrigation bodies.

³²The interventions on the distribution networks will be financed on the investment line no. 2.1.

Timeline: completion of the design suitable for the contract of works by 2022; awarding of works during 2023 and completion of works in mid-2026.

Investment 2.2: Investments in the resilience of the irrigation agrosystem for the better management of water resources (including digitalisation and technological innovation of distribution networks).

Challenges: The spectrum of continuous water crises, due to scarcity and the different distribution of the resource, has important effects on agricultural production, in particular where constant irrigation is a necessary practice and an essential condition for competitive agriculture. To increase the capacity to deal with emergency situations, it is essential to quantify the volumes used for irrigation purposes, to increase the efficiency in the irrigation of water and also to favor the use of non-conventional water to supplement the conventional ones.

Objectives:

- Improve water resource management and reduce losses;
- Encourage the measurement and monitoring of uses both in collective networks (through the installation of meters and remote control systems) and for private uses (through a monitoring system of private concessions);
- Prevent illegal uses of water in rural areas;
- Increase the resilience of the irrigation agro-ecosystem to extreme climatic events, drought events in particular.

In order to achieve the objectives indicated, infrastructural interventions on the networks and irrigation systems and on the related digitalisation and monitoring systems will be financed, consisting in the conversion of the irrigation system towards higher efficiency systems. Furthermore, purification monitoring systems will be implemented with the potential for irrigation reuse. Finally, the data system for collective uses (SIGRIAN) will be developed, to record and monitor the volumes used in self-supply and To prevent illicit uses of water (also thanks to the joint measurement of the volumes used on collective distribution networks).

Implementation: Irrigation and reclamation bodies will be responsible for the implementation of the interventions. The Ministry of Agricultural, Food and Forestry Policies will carry out the recognition and selection of the interventions in the initial phase of the launch of the Plan, using the National Database of investments for Irrigation and the Environment (DANIA). The latter will allow a selection based on objective criteria, being a tool that collects the interventions (implemented by the irrigation bodies, already financed or only planned), cataloging them through technical and financial-procedural information, also considering their territorial classification. Specifically, priority will be given to projects with a high construction capability and deemed to be of greater terri-

torial strategic importance by the regional authorities.

Target population: Agricultural production sector, population of rural areas made safe.

Timeline:

- project selection by Q3 2021;
- assignment of the works in phases and by Q3 2023;
- completion of the interventions by Q3 2026.

3) Ensure the sustainable management of water resources along the entire cycle and the improvement of the environmental quality of inland and maritime waters.

Reform 3.1: Measures for the full implementation of the assignments for the Integrated Water Service.

Challenges: In the South, the insufficient presence of industrial managers and the vast presence of management in economy traces a picture of the very fragmented and complex water sector: there are 1,069 managers, 995 of which are Municipalities that manage the service in economy (in particular, 381 in Calabria, 233 in Sicily, 178 in Campania, 134 in Molise). Previous experiences show that in the South an autochthonous evolution of the system is not viable, without a central intervention aimed at its resolution.

Objectives:

- Promote / strengthen the industrialization process of the sector (meaning supporting integrated operators, public or private, with the aim to achieve economies of scale and guaranteeing efficient management of investments and operations);
- Reduce the existing gap (water service divide) between the center-north and the South of the country, where there is a lack of industrial managers.

Implementation: In order to give concrete and specific impetus to the industrialization process of the sector, conditions to allocate of PNRR resources will be the establishment of Local Government Bodies and the successful entrusting of the integrated service to managers able to guarantee the efficient implementation of interventions.

The areas that currently do not meet the aforementioned criteria will have a deadline (Q2 2022) for adaptation to the national and European regulatory framework, so that they too can take advantage of PNRR funding. In particular, it is planned to reserve up to 30% of available funding for one year, in order to allow the lagging regions to align themselves.

In this regard, the MATTM, with the project Mettiamoci in Riga - Intervention Line 7, as part of the PON Governance 2014-2020, provides for the definition and signing of specific Memoranda of Understanding with Regions and Government Bodies in the area,

to give support, where delays are recorded, in the preparatory activities for the drafting of the Area Plans and the award of the integrated water service. To date, discussions are underway with the Regions of Sicily, Calabria, Molise and Campania to finalize the memoranda of understanding and start the support activity through a specific working group.

Target population: Users of the integrated water service.

Timeline:

- signing of the Memorandum of Understanding between the MATTM and the Regions concerned by Q2 2021;
- verification of the constitution of the ATOs and of the award of the SII by 2022Q2.

Investment 3.1: Investments aimed at reducing losses in water distribution networks, including digitization and monitoring of networks.

Challenges: The recovery of investments in the water sector that has been observed after the attribution to ARERA of the competences in the field of regulation and control of water services, still appears insufficient compared to the actual needs for modernization and development of Italian water infrastructure. The data acquired referring to 2016 show a replacement rate of the adduction and distribution networks equal to 0.39% (compared to an outdated infrastructure: about 35% of the pipelines are aged between 31 and 50 years). This is a low replacement rate, still far from the value of 2%, consistent with a technical 50 years life of such infrastructures. The value of the linear water losses (indicator calculated by comparing the total losses to the length of the network) is on average equal to 24 cubic meters / km / day, with an average value of the percentage water losses equal to 41%. The remote controlled district networks are equal to 21.8% of the total distribution networks. The data on service interruptions is strongly influenced by certain critical situations at local level (especially in the South and Islands).

Objectives:

- Obtain a reduction of losses in networks for drinking water;
- Increase the resilience of water systems to climate change;
- Strengthen the digitization of networks and transform them into a "smart networks", to promote an optimal management of water resources, reduce waste and limit inefficiencies.

In order to achieve the objectives indicated, the financed investments will concern the modernization and efficiency of the water distribution networks, favoring innovative projects that involve the use of new technologies. To this end, advanced control systems must be provide to allow monitoring of the main nodes as well as of sensitive points of the network, through the measurement and acquisition of flow rates, operating pressures

and water quality parameters.

An example of a “flagship” project of great economic, social and environmental value could be that relating to the restructuring of the water networks of the cities of Potenza and Matera in Basilicata. The managing body is the in-house company Acquedotto Lucano, which already has available a feasibility study and which could quickly prepare a technical-economic feasibility project to be tendered by the end of 2021. Current losses in the water distribution networks are very high (over 50%). Also the supply cost is very high as it concerns purified water raised a few hundred meters to an upper level. The manager’s difficult financial situation does not allow these investments to be activated exclusively on the tariff.

Implementation: As regards the aims and procedures, the proposed intervention is in continuity with the National Plan of interventions in the water sector (with particular reference to the interventions related to the drinking water distribution networks in the “Aqueducts” section).

The investments may concern the entire national territory and will be implemented by the Integrated Water Service Operators. The selection of projects will be carried out by the competent Ministries and by ARERA on the basis of a series of criteria, including: the existence of an integrated operator, in line with Italian and European legislation; the current level of losses and their expected reduction; the technical quality of the proposals, taking into account the existing level of digitization; the characteristics of the territory and the population; environmental impact; the ability of the operator, also from a digital point of view; the level of co-financing and coherence with general water planning tools.

Target population: Users of the integrated water service, reclamation consortia, irrigation bodies.

Timeline: selection of 70% of projects by 2021 and the remaining 30% by mid-2022; award of works by 2023 and completion by 2026.

Investment 3.2: Investments in sewerage and purification.

Challenges: The quality of the water resource has long been in a crisis, exacerbated in recent years by climatic variations, by the development of urban agglomerations with an increasingly intense consumption of land and by the presence of emerging pollutants, with consequent problems on the safeguard of water resources and of human health. The water systems present a high obsolescence; in particular, sewerage, urban drainage and purification systems, which are not always present, are frequently not adequate to European standards, with consequent burdensome infringement procedures. Since 2016, the establishment of a Single Commissioner has been planned to speed up the implementation of the collection works,

Objectives:

- Make the purification of wastewater discharged into marine and inland waters more effective, also by means of technological innovation;
- Where possible, transform purification plants into “green factories”, which allow energy and sludge recovery, and the reuse of purified wastewater for irrigation and industrial purposes;
- Contribute to overcoming EU infringement procedures in this area.

An example of a “flagship” intervention, relating to the purification plants, could be that in the province of Palermo on to the completion of the sewage networks and the construction of the new purification plants of Altavilla Milicia, Bolognetta and Partinico. In this case, the managing body would be the in-house company AMAP, who has the executive projects and has already started the design of tenders to quickly dispose of the definitive projects that allow the tender to be started by the end 2021. These agglomerations are all in infringement proceedings and the financial dimension of all interventions does not allow these investments to be activated exclusively on the tariff.

Another example of an intervention of great impact, in the context of the digitisation and control of the sewerage network, could be that relating to the management of rainwater in the city of Rome, where ACEA has already in the pipeline - based on the tariff system - an investment of 20 million euros to be launched by the end of 2021. A viable hypothesis may consist in increasing the project amount envisaged with the financial resources of the PNRR, allowing better management of rainwater in Rome, which currently creates numerous problems to citizens.

Implementation: The Ministry of the Environment and the Protection of the Territory and the Sea has the task to control and monitor the state of implementation of the interventions. The Integrated Water Service Managers will be entrusted with the implementation of the interventions. Their selection will be made by the Ministry of the Environment and the ARERA regulator, on criteria, such as: the existence of an integrated operator, in line with Italian and European legislation; the need to deal with an open infringement procedure; the expected improvement in the quality of receiving water bodies; the technical quality of the proposal; the characteristics of the territory and the population and possible synergies with other interventions; the ability of the operator; the level of co-financing; consistency with general water planning tools.

Target population: Users of the integrated water service.

Timeline: selection of 70% of projects by 2021 and the possibility of selecting the remaining 30% by mid-2022; award of works by the end of 2023 and completion by 2026.

Investment 3.3: Interventions in the port areas to fill the deficit of facilities

for the management of waste collected at sea.

Challenges: The lack of facilities for the management of waste collected at sea in the various port areas of the country leads to a worsening of the quality of maritime waters, causes considerable damage to the marine ecosystem in contrast with the principles of the circular economy.

The construction of new facilities and the modernization of existing ones therefore appear necessary, also in light of the provisions of Directive 883/2019 on port facilities for the collection of waste produced by ships, currently being implemented and, more generally, by the Directive framework on marine strategy 2008/56 / EC (Marine Strategy Framework Directive -MSFD) which constitutes the environmental pillar of the maritime policy of the EU (IMP) and of the "Blue Economy". Moreover, the intervention responds to the provisions of Directive 904/2019, also in the transposition phase.

Objectives:

- Improve the quality of maritime waters by reducing the pollution generated by plastic abandoned in the sea;
- To fill the deficit of facilities for the management of waste produced by ships and waste captured at sea, with particular attention to the recovery of fishing equipment, in the various port areas of the country;
- Contribute to the recovery of the marine ecosystem and the promotion of the circular economy.

In order to achieve the indicated objectives, it will be possible to carry out both construction interventions of new plants and interventions to adapt existing plants (intervention 1). Alongside the "structural" interventions, information and training actions will be organized for operators in the fishing sector and local communities, to raise awareness on the prevention of the phenomenon of abandonment of waste and its correct management (intervention 2).

Implementation:

The intervention is promoted by the Ministry of the Environment and the Protection of the Territory and the Sea. The other central administrations involved are the Ministry of Agricultural, Food and Forestry Policies and the Ministry of Infrastructure and Transport. The implementing bodies will be the Municipalities and / or Port Authorities depending on the type and size of the port, but the Port Authorities, the Maritime Authorities and any Marine Protected Areas will also be involved locally.

As regards the structural / plant projects, specific agreements will be stipulated between the Ministry of the Environment and the other Competent Authorities to identify the criteria for the realization of the projects.

Following the cognitive analysis carried out in the first year, the interventions - which

may concern the entire national territory - will be selected on the basis of the following priority criteria:

- absence or inadequacy of port facilities for waste collection;
- port size and / or port type;
- insistence of the port waste collection facility in protected marine areas of environmental value;
- presence of research, experimentation and development activities already planned or launched at the local level for the recovery of waste collected accidentally or voluntarily.

With reference to training and information measures, specific guidelines will be developed by the Ministry of the Environment, with the support of public research bodies.

Target population: the populations in the basin of the port areas of the country.

Timeline: For intervention 1 the cognitive activity will end with the definition of the already mentioned agreements between the Ministry of the Environment and the competent Authorities, while for intervention 2 the aforementioned guidelines will be drawn up (4Q2021). For the subsequent implementation of the plant interventions, an overall duration of 4 years is estimated, from design to final construction.

4. Green and digital dimensions of the component

a) Green Transition:

This Action envisages almost 55% of expenditure for the climate (see Table 1), thus contributing very significantly to the green transition by promoting a more efficient and sustainable use of water resources and prevention actions against the risks associated with climate change.

In particular, through investments 2.1, 2.2, 3.1, 3.2 and 3.3, the improvement of the environmental infrastructures for the management of water and waste and the reduction of pollution are pursued, protecting the health and well-being of citizens from environmental risks and impacts. The aim of investment 1.1 and investment 1.2, is to protect and restore biodiversity and natural ecosystems, to increase carbon absorption capacity, and to strengthen resilience in the face of climate change.

With reference to the climate and environmental objectives defined in the EU Regulation 2020/852 (Taxonomy Regulation), this Action provides a contribution in each of the following areas:

- Adaptation to climate change (through measures to reduce hydrogeological risk);
- Mitigation of climate change (through interventions for energy efficiency in munic-

- ipalities and urban forestry measures);
- Sustainable use and protection of water and marine resources (through measures relating to water supply infrastructures, the irrigation agrosystem and water distribution networks);
 - Pollution prevention and reduction (in particular, through investments in the “sewage and purification” sector aimed at reducing pollution of maritime and inland waters);
 - Protection and restoration of biodiversity and ecosystems (to which we contribute mainly through urban forestry interventions);
 - Transition towards a circular economy (in particular, through the investment aimed at filling the plant deficit of the port areas for the management of waste collected at sea).

b) Digital Transition:

Based on the codes provided for in the Recovery Fund Regulations, this Action does not directly contribute to the achievement of the aforementioned target, even if it provides for important measures to favor the "digital management" of the water resource and related networks, to be transformed into a "smart network ". In particular, the installation of software equipment and applications and hardware platforms for the implementation of remote control systems and the digitization of measuring instruments is envisaged.

Table 1 - Green and Digital Impact

Short title	Green objectives				Digital objectives	Transition challenges	
	Climate	Environmental	Intervention field	DNSH	Tag	Green	Digital
	Tag	Tag					
<i>Objective 1</i>							
Investment 1.1 Interventi strutturali e non strutturali per la gestione del rischio alluvioni e la riduzione del rischio idrogeologico	100%	100%	35	Si			-
Investment 1.2 Forestazione urbana	40%	100%	50	Si			-
Investment 1.3 Interventi per la resilienza, la valorizzazione del territorio e l'efficientamento energetico dei Comuni - <i>nessa in sicurezza del territorio/dissato idrogeologico</i>	100%	100%	35	Si	-		-
Investment 1.3 Interventi per la resilienza, la valorizzazione del territorio e l'efficientamento energetico dei Comuni - <i>nessa in sicurezza ed efficientamento energetico degli edifici</i>	40%	40%	25	Si	-		-
Investment 1.3 Interventi per la resilienza, la valorizzazione del territorio e l'efficientamento energetico dei Comuni - <i>nessa in sicurezza delle strade</i>	0%	0%	62	Si	-		-
<i>Objective 2</i>							
Investment 2.1 Investimenti nelle infrastrutture idriche primarie per la sicurezza di approvvigionamento idrico	40%	100%	40	Si	-		-
Investment 2.2 Investimenti nella resilienza dell'agrosistema irriguo per la migliore gestione delle risorse idriche (compresa la digitalizzazione e l'innovazione tecnologica delle reti di distribuzione)	40%	100%	40	Si	-		-
<i>Objective 3</i>							
Investment 3.1 Investimenti finalizzati alla riduzione delle perdite nelle reti di distribuzione idrica, compresa la digitalizzazione e il monitoraggio delle reti	40%	100%	39-bis	Si	-		-
Investment 3.2 Investimenti nella fognatura e depurazione	40%	100%	41-bis	Si	-		-
Investment 3.3 Interventi nelle aree portuali per colmare il deficit di impianti per la gestione dei rifiuti raccolti a mare	40%	100%	44	Si	-		-

5. Milestones, targets and timeline

See Table 2

Reform 1.1 (procedures for implementing interventions against hydrogeological instability)

Milestone:

- Adoption of the decree by Q3 2021;
- Conversion of the decree law into law by Q1 2022;
- DPCM issue for the revision of the project selection criteria by 2022Q1.

Investment 1.1 (flood risk management and hydrogeological risk reduction)

Milestone:

- project selection by Q4 2021;
- completion of the design suitable for the contract of works by 2023Q3;
- awarding of works by Q4 2023;
- completion of the works by Q3 2026.

Target to 2026:

- Reduction of people at direct risk: to be defined
- Reduction of people at indirect risk: to be defined
- Reduction of people at risk of losing their home: to be defined
- Number of Municipalities subject to safety measures: to be defined

Investment 1.2 (urban forestry)

Milestone and Target: to be defined

Investment 1.3 (resilience, enhancement of the territory and energy efficiency of municipalities)

Milestone and Target: to be defined

Reform 2.1 (governance in the area of water supply infrastructure)

Milestone:

- Preparation of the regulatory provision and presentation to Parliament by 2021Q3;
- Approval of the regulatory provision by Q1 2022;
- Development of internal procedures for the implementation of the reform by 2022Q4.

Reform 2.2 (governance model of land reclamation consortia)

Milestone:

- Recognition of the current governance system by MIPAAF by Q4 2021;
- Reform proposal presented by MIPAAF to the Regions by Q4 2022;
- Approval of the new State-Regions Agreement by Q4 2023.

Investment 2.1 (security of water supply)

Milestone:

- selection of 80% of projects by Q2 2021, selection of the remaining 20% of projects by Q2 2022;
- completion of the design suitable for the contract of works by 2022Q4;
- awarding of works by 2023Q3;
- completion of the works by 2026Q2.

Target to 2026:

- Number of projects completed (interventions on reservoirs and/or supply systems): to be defined;
- Number of complex water systems for which security of supply is increased: to be defined.

Investment 2.2 (Resilience of the irrigation agrosystem)

Milestone:

- project selection by Q3 2021;
- financing of selected projects by Q3 2022;
- awarding of works by Q3 2023;
- completion of the works by Q3 2026.

Target to 2026:

- % Increase of withdrawal sources equipped with meters: from 24% current (baseline) to 41%;
- Area (expressed as a% of the total) that passes to a more efficient management of the irrigation resource as a result of the interventions: from the current 8% (baseline) to 12%.

Reform 3.1 (full implementation of the assignments in the Integrated Water Service)

Milestone:

- Signing of memoranda of understanding between the MATTM and the regions concerned by Q2 2021;
- Verification of the constitution of the ATOs and the assignment of the SII by Q2 2022.

Investment 3.1 (water distribution networks)

Milestone:

- selection of 70% of projects by Q3 2021, selection of the remaining 30% of projects by Q2 2022;
- completion of the design suitable for the contract of works by 2022Q4;
- awarding of works by Q3 2023;
- completion of the works by Q3 2026.

Target to 2026:

- Kilometres of district water network: baseline: 128,000 km; 2026 target:150,000 km;
- Reduction of percentage water losses: baseline 50%; 2026 target:to be defined

Investment 3.2 (sewerage and purification)

Milestone:

- selection of 70% of projects by Q3 2021, selection of the remaining 30% of projects by Q2 2022;
- completion of the suitable design for the works contract by Q2 2023;
- awarding of works by Q4 2023;
- completion of the works by Q3 2026.

Target to 2026:

- Reduction in the number of non-compliant equivalent inhabitants: baseline 3,572,574 equivalent inhabitants non-compliant; 2026 target:to be defined

Investment 3.3 (plant deficit in port areas for waste management)

Milestone:

- Conclusion of the information and investigation activities by Q4 2021;
- Award of works (for intervention 1, relating to the structural / plant part) by Q4 2023;

Target to 2026:

- Number of ports in which action is taken for plant adaptation: 150.

6. Financing and costs

This component will be coherent with the policy objective "*A greener Europe*" of the cohesion policy 2021 - 2027. The interventions financed by the PNRR and those financed by the structural funds will be linked by a complementary and/or integration relationship, and an ex ante demarcation will be foreseen to avoid planning overlaps.

See Table 2 work in progress



Mission 3: Infrastructures for a sustainable mobility

Contents

1	M3C1 - High speed railways and safe roads	3
2	M3C2 - Intermodality and integrated logistics	29

Mission's main objectives:



Mission's financing snapshot:

M3 - Infrastructures for a sustainable mobility

	Resources (euro/mld)				
	Existing (a)	New (b)	Total (c) = (a)+(b)	REACT-EU (d)	TOTAL NGEU (e) = (c) + (d)
M3C1 - High speed railways and safe roads 4.0	11.20	17.10	28.30	-	28.30
M3C2 Intermodal connections and integrated logistics	0.48	3.20	3.68	-	3.68
TOTAL	11.68	20.30	31.98	-	31.98

Note: (b) includes existing resources under national FSC, to be devoted to specific measures.

1 M3C1 - High speed railways and safe roads

Summary box

Policy area: National rail and road mobility

Objectives: The objectives of this component are: (i) the decarbonization and reduction of emissions through the shift of passengers and freight traffic from road to rail; (ii) the increased territorial connectivity and cohesion by reducing travel times; (iii) the digitalization of transport networks and improved security of bridges, viaducts and tunnels; (iv) the increased competitiveness of the productive systems in the South by improving railway links. These objectives are in line with the nationwide strategy on mobility of the Ministry of Infrastructure and Transport outlined in “#ItaliaVeloce”.

The component is focused on the rail network known as Integrated National Transport System of 1st level (SNIT), with a clear priority on the TEN-T network (core and comprehensive). The implementing entity is primarily the public national company “Rete Ferroviaria Italiana” (RFI), besides some works to be carried out by regional railways.

In the railway sector the interventions are focused on: (i) High-speed railway connections to the South for passengers and freight; (ii) High-speed lines in the North connecting to Europe; (iii) Diagonal connections; (iv) Introducing the European Rail Transport Management System (ERTMS); (v) Strengthening metropolitan nodes and key national links; (vi) Strengthening regional railway lines; (vii) Upgrading, electrification and resilience of railways in the South; (viii) Upgrading railway stations in the South; (ix) Renewal of the rolling stock.

In the road sector the focus will be on the digitalization and smart maintenance of numerous bridges, viaducts and tunnels on the A-24/A25 highways (crossing Italy from west to east) and on parts of the ANAS network.

This component is linked to the one on “Smart districts and integrated logistic inter-modality”, since it includes railway connections to ports and airports.

Twin transition: by supporting the transfer of passengers and freight from road to rail (RFI expects an increase of +10% passenger kilometres by rail in the long run and of +20% in freight), and investing in the digitalization of rail traffic and road maintenance to ensure safety and climate resilience, this component promotes both the green and the digital transition.

Jobs and growth: a more connected, safe and environmentally sustainable national rail and road transport network will boost the competitiveness of businesses, territories and cities, supporting the presence and growth of production sites and commercial activities. Overall, RFI has estimated that its investment programme up to 2026 could create on average an employment level of around 60,000 people per year.

Social resilience: re- the increase of capacity at key railway nodes in metropolitan areas will have positive spill-over effects on regional trains, making the city centres more accessible and improving the quality of life of commuters. Also, the railway investments establishing links with and/or within the South of Italy will reduce the railway infrastructure gap and travel times, improving social cohesion.

Reforms and investments:

Outcome 1: Transfer passengers and freight traffic from road to rail, increase rail speed/capacity/connectivity and improve service quality along key national and regional links, strengthen cross-border connections and EU railway interoperability

Reform 1.1: Simplify the approval process of the 5-yearly and annual updates of the *Contratto di Programma* between the MIT and RFI

Reform 1.2: Acceleration of the project authorization process

Investment 1.1: High-speed railway connections to the South for passengers and freight;

Investment 1.2: High-speed lines in the North connecting to Europe;

Investment 1.3: Diagonal connections;

Investment 1.4: Introducing the European Rail Transport Management System (ERTMS);

Investment 1.5: Strengthening metropolitan nodes and key national links;

Investment 1.6: Strengthening regional lines;

Investment 1.7: Upgrading, electrification and resilience of railways in the South;

Investment 1.8: Upgrading railway stations in the South;

Investment 1.9: Renewal rolling stock.

Outcome 2: Improve the safety and climate/seismic resilience of bridges, viaducts and tunnels

Reform 2.1: Implementation of the recent “D.L. Semplificazioni” (converted into Law n.120 dated 11 September 2020) by issuing a decree concerning the adoption of “Guidelines for the classification and management of risks, the evaluation of security and the monitoring of existing bridges”

Reform 2.2: Transfer the property of the bridges and viaducts from the lower level ranking roads to the higher ranking ones (highways and main national roads), in particular to ANAS

Investment 2.1: Implementation of a technological monitoring system to remotely control the bridges, viaducts and tunnels of the highways A24 and A25 and perform extraordinary maintenance investments into their resilience and safety

Investment 2.2: Implementation of a technological monitoring system to remotely control the bridges, viaducts and tunnels of the roads infrastructure of ANAS and plan extraordinary maintenance investments

Estimated costs:

Cost of EUR 28,300 million to be covered by RRF

M3C1 - High speed railways and safe roads 4.0

	Risorse (euro/mld)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
Railways works for the mobility and the fast connection in the country	11.20	15.50	26.70	-	26.70
- High-speed railway for passengers and freight, to increase the frequency and the capacity of existing railway connections	8.66	6.13	14.79	-	14.79
- European Rail Transport Management Systems (ERTMS) programs	0.27	2.7	2.97	-	2.97
- Strengthening metropolitan nodes, diagonal connections and key national links - Infrastructural and technological development and upgrading	2.27	0.7	2.97	-	2.97
- Renewal rolling stock and freight transport infrastructures	-	0.2	0.2	-	0.2
- Strengthening regional lines - Integration of High Speed railways with regional transport (interconnected railways), including some urban connections	-	2.67	2.67	-	2.67
- Upgrading, electrification and resilience of railways in the South	-	2.4	2.4	-	2.4
- Upgrading railway stations in the South	-	0.7	0.7	-	0.7
Improve the safety and climate/seismic resilience of bridges, viaducts and tunnels	-	1.60	1.60	-	1.60
- Implementation of a technological monitoring system to remotely control bridges, viaducts and tunnels of the highways A24 and A25 and perform extraordinary maintenance investments into their resilience and safety	-	1.15	1.15	-	1.15
- Implementation of a technological monitoring system to remotely control bridges, viaducts and tunnels of the roads infrastructure of ANAS and plan extraordinary maintenance investments	-	0.45	0.45	-	0.45
TOTAL	11.20	17.10	28.30	-	28.30

2. Main challenges and objectives

a) Main challenges

Current passenger traffic in Italy is heavily skewed towards roads

- At present passenger traffic in Italy is 90% on roads (860 billion passenger kilometres per year), while the railway represents only 6% of passengers (vs. 7.9% in Europe). The national transport sector is hence responsible for significant GHG emissions, with fossil fuels still representing the main source of energy.
- Most railway lines (72%) are electrified, while some diesel lines remain mainly at the regional level.

Freight volumes by road are concentrated in the North and at cross border links

- Freight volumes travel 51% on roads (1.05 billion tons in 2019) and 13% by rail (vs. 18.7% in Europe). Most of the freight volume (65%) is concentrated in Northern Italy (20% in Lombardy). As a result, in the North the traffic of heavy vehicles exceeds 30% of total vehicles in circulation, creating congestion and security problems.
- Road transport is especially relevant for Italy-EU imports (80% share) and exports (90% share), passing through the following key border links: Italy-France with 92% of freight volume on roads; Italy-Switzerland with 30% of freight on roads; Italy-Austria with 72% of freight on roads; and Italy-Slovenia with 94% of freight on roads.
- The total freight traffic crossing the Alps represents 223 million tons, whereby the situation of congestion is particularly critical along the Brenner cross border link, which handles 25% of the Italian trade through the Alps.
- In order to increase freight volumes by rail, an increase in the capacity of the network and nodes is necessary. Also the connectivity of railways to ports and airports needs to be increase. In the long run (by 2050) Italy aims to raise the share of freight traffic by rail up to 50% (for trips exceeding 300 km).

Limited railway connectivity to and within the South and in the Centre

- The high-speed network of Italy runs primarily from North to the South (along the Scandinavian-Mediterranean corridor), until Naples/Salerno.
- The population living south of Salerno is hence disconnected from the high-speed network. Overall in the South the capacity, reliability and frequency of the railway services is limited, resulting in long travel times.
- Also in the Centre of the country, West-East rail connections (e.g. from Rome to Pescara and from Orte to Falconara) are in need of upgrading, and the population living in the internal areas does not have access to a modern rail network.

Limited climate-resilience and poor status of maintenance of bridges, viaducts and tunnels along the road network

- There is insufficient knowledge of the status of the bridges, viaducts and tunnels along the national road network (of ANAS and/or of highway Concessionaires). In addition, the property and responsibility for the maintenance of the bridges and viaducts is not clearly allocated. An in-depth analysis and evaluation, the transfer of the responsibility for all bridges and viaducts to highway operators, and the setting up of maintenance guidelines and a maintenance plan are hence necessary to ensure the resilience of the infrastructure versus climate and seismic risks.
- The situation is particularly critical along the A24 and A25 highways (from Rome to Ancona and to Pescara), which include numerous bridges, viaducts and tunnels that are in danger, since they are located in a seismic area. These highways are

operated by a private concessionaire, but are amongst the most expensive ones in Italy. The required extraordinary maintenance works could hence not be financed through an increase of highway tariffs. Public financing is proposed given the public good nature of the proposed investments in security.

b) Objectives

The objectives of the component are:

- (i) the decarbonization and reduction of emissions through the passage of passengers and freight traffic from road to rail;
- (ii) the increased territorial connectivity and cohesion by reducing travel times (an objective of the national strategy is that 80% of the population should be at most 1 hour away from a high-speed connection);
- (iii) the digitalization of transport networks and improved security of bridges, viaducts and tunnels;
- (iv) the increased competitiveness of the productive systems in the South by improving traffic links.

In particular, in order to increase the attractiveness and competitiveness of the railway network, the focus of this component will be on:

- High-speed railway connections to the South for passengers and freight: three high-speed railway lines will be extended towards the South of Italy, i.e. the Naples-Bari (funded so far from ERDF), the Palermo-Catania and some functional lots of the Salerno-Reggio Calabria (the completion of which could be funded from national funds and ERDF). These lines will also increase the capacity to transport freight from the ports of the South.
- High-speed lines in the North connecting to Europe: the freight transport capacity of the Brescia-Verona-Padova line will be increased, in parallel to an increase of freight capacity of the Verona-Brenner link. In addition, the freight transport capacity from Genoa and its port through the Alps will be strengthened.
- Diagonal connections across Italy: investments are foreseen in the following three lines crossing Italy west to east: Orte-Falconara (focused on freight traffic, linked to the ports of Ravenna and Ancona); Rome-Pescara (mainly passenger traffic along the line, including commuters); and Salerno-Battipaglia-Taranto (focused on passenger traffic in internal areas of Basilicata and Puglia regions and on freight traffic from the port of Taranto).
- Introducing the European Rail Transport Management System (ERTMS) to ensure interoperability and security: the focus will be on the TEN-T network, starting with passenger traffic lines and then extending the ERTMS also to freight traffic lines.
- Strengthening metropolitan nodes and key national links: a nationwide investment programme of RFI will be dedicated to improve the capacity, reliability, safety and

service levels at 12 metropolitan nodes and along key railway links.

- Strengthening of regional railway lines: upgrading investments will also concern a series of regional railway lines (both transferred to RFI and/or owned by regional operators), including some “urban connections” used by numerous commuters.
 - Upgrading railway stations in the South of Italy by improving their accessibility.
- In the road sector the focus of the interventions proposed under the Recovery Fund will be exclusively on climate and seismic resilience and on the safety and security levels of critical infrastructures (bridges, viaducts and tunnels).

The investments foreseen in the railway and road sectors are in line with the 2020 and 2019 Country Specific Recommendations (CSR) for Italy. In particular, 2020 CSR mention the need to “front-load mature public investment projects and promote private investment to foster the economic recovery, focusing investments on the green and digital transition, including sustainable public transport”.

Also the 2019 CSR mention that “investment is needed to raise the quality and sustainability of the country’s infrastructure” and that “in the transport sector, Italy has not delivered on its infrastructure investment strategy (Connettere l’Italia)”, with the result that “the EU transport scoreboard shows that the quality of Italy’s infrastructure is below the EU average”.

Twin transition:

By supporting the shift of passengers and freight traffic from road to by rail and reducing road congestion, the component will reduce GHG emissions. In particular, RFI estimates that an increase of the share of passengers using the railway from 6% to 10% could result in annual CO₂ saving of 2.3 million tons by 2030.

In addition, the digitalization of railway services through the ERTMS and of bridges, viaducts and tunnels on the A-24/A25 highways and on the ANAS network will increase the safety levels of these transport modes, allowing to improve the planning of effective maintenance activities and reducing life cycle maintenance costs, while increasing the resilience of the network.

Jobs and Growth:

In an increasingly connected world with raising trade flows, a digitalized, green and efficient transport network is a necessary condition for economic growth. The investments in smarter, quicker and safer connectivity across Italy will hence improve the competitiveness and productivity of the connected territories.

People will spend less time traveling for work, including commuters. Tourist flows will be able to move more quickly across the country, discovering new areas of cultural interest and reducing the pressure on the main tourist centres.

Freight transport services will be more competitive, facilitating imports and exports of

goods, and attracting companies to locate their production sites and/or services close to efficient transport nodes. The increase of rail connectivity to ports in the North, Centre and South of the country will improve the competitiveness and environmental sustainability of the logistic corridors across Italy.

Social resilience:

The investments in national and regional railway networks and nodes in the South of Italy (including the accessibility of railway stations) will reduce the gap in terms of the existing railway infrastructure, reducing travel times and improving social cohesion. The increase of the capacity of key railway nodes in 12 metropolitan areas will have positive spill-over effects on regional trains, making the city centres more accessible and improving the quality of life of commuters. In addition, some investments will be directly targeted at regional/urban lines that are primarily used by commuters.

c) National strategic context

The component is fully aligned with the priorities of the national strategy for mobility, which are outlined in the document “#ItaliaVeloce”. The proposed investments and related reforms focus on the key links of the rail network of national and international interest, known as the Integrated National Transport System of 1st level (SNIT). A priority is given to the TEN-T network.

In the rail sector, the 1st level SNIT covers 8,800 km (around 50% of the national network) and 48 lines. The focus of the component is on the following TEN-T corridors:

- the Mediterranean Corridor crossing Northern Italy from West to East (Lyon-Turin-Milan-Verona-Venice-Trieste).
- the Rhine-Alpine Corridor from Genova to the Alps;
- the Scandinavian-Mediterranean corridor connecting Italy from North to South (Brenner-Trento-Florence-Rome-Naples-Bari-Messina-Palermo).

In terms of cross-border links, the ones included under the RFF are Italy-Switzerland (Genoa-Alps) and Italy-Austria (the Brenner). The Lyon-Turin line has not been included, since its completion is envisaged beyond 2026.

In terms of interoperability to favour the EU Single Market, priority will be given to the roll out the ERTMS along 3,400 km of the railway lines.

In terms of investments in regional railway lines, a distinction has to be made between lines that will be transferred to “Rete Ferroviaria Italiana” (RFI), and those that will remain regional, with regional companies as counterparts. In terms of operations, the services on these lines will be allocated following open, non-discriminatory and competitive procedures, as established by the access rules and monitored by the National Authority for Transport (“Autorità di Regolazione dei Trasporti” - ART).

Overall, railway investments in the South of Italy under the RRF are estimated to amount to around 45-50% of total investments. The decision on the use of additional ERDF funds for the railway sector in the South has to be taken, but will in any case be complementary to the RRF (e.g. to finance other regional railway lines).

In the road sector the focus proposed under the RRF is on the digitalization, safety and climate resilience of bridges, viaducts and tunnels in seismic areas. In particular, priority will be given to the A-24 and 25 highways in central Italy, which are considered to be in a critical status. In addition, a digitalization and maintenance plan will be launched also for bridges and viaducts in critical areas of the ANAS network.

Most of the investments proposed under the RRF are based on the Investment plans of the two key national public companies in the rail and road sectors, respectively “Rete Ferroviaria Italiana” (RFI) and the National Authority for Roads (ANAS). Both companies operate under “Contratti di Programma” with the Italian Ministry of Infrastructure and Transport (MIT), which are renewed at regular intervals. In order to accelerate the start of the investments, it is being considered that all works inserted in the Recovery Plan should be automatically included in the “Contratti di Programma” with RFI and ANAS, without the need for a separate approval process.

3. Description of the reforms and investments of the component

1) High speed/capacity railway network.

Reform 1.1: Acceleration of the approval process of the Planning Agreement (*Contratto di Programma*, CdP) between MIT and RFI

Challenges: The current long approval times of the CdP between MIT and RFI do not allow for adequate scheduling-planning-implementation of the interventions by RFI in set times.

Objectives: This reform provides for the acceleration of the five-year CdP approval procedure between MIT and RFI and subsequent annual updates, with the consequent speeding up of the implementation of the interventions.

Implementation: The MIT will propose a legislative amendment by 2021. A possible proposal provides that the competent Parliamentary Commissions express an opinion on the strategic guidelines of the CoP, prior to the opinion of the CIPE, and that the Court of Auditors (*Corte dei Conti* carries out, at the request of the Government or the competent Parliamentary Commissions, the concomitant control over the CoP (as recently introduced by the "DL Semplificazioni" 2020).

Target population: RFI and railway users.

Timeline: the legislative change for the acceleration of the approval procedures of the Planning Agreement between MIT and RFI will be presented by the end of 2021.

Reform 1.2: Acceleration of the project authorisation process.

Challenges: The uncertainties concerning the duration of the authorisation processes of projects, as well as the time required for the adaptation of the final project design to the prescriptions made by the various administrations, cause delays and cost increases.

Objectives: The MIT will propose a regulatory change, in order to allow to anticipate the geographic location of the works at the time of the “Progetto di fattibilità Tecnica Economica” (PFTE), instead of waiting for the definitive project design phase. The location will hence be included as a variation of the urban planning instruments, with a constraint linked to expropriation. The additional authorizations, which cannot be acquired on the PFTE, would be obtained in subsequent project design phases, without convening the “Conferenza dei Servizi”, as an exception to Law no. 241/1990.

The following positive effects are expected from the proposed regulatory change:

- all the observations of the various administrations will be collected at the stage of the PFTE, allowing to incorporate them, with savings in terms of time and resources, in the subsequent phases of the project design process;
- the land affected by the works will be reserved from the urban planning point of view, inhibiting building activities by third parties and allowing economic savings for future expropriations;
- the overall time for the authorization process of projects would be reduced from currently 11 months to 6 months.

Implementation: The MIT, in coordination with the Ministry of the Environment (MATTE) and the Ministry of Cultural Goods (MiBACT), will propose a legislative amendment of art. 13 of Law no. 120/2020 (Simplification Decree Law), and of related regulations included in the Code of Contracts, in the Environmental Code and in administrative procedures.

Target population: RFI and rail users.

Timeline: Legislative amendment to expedite permitting process will be proposed by mid 2021.

Investment 1.1: High-speed railway connections to the South for passengers and freight

Challenges: In order to ensure territorial cohesion and equity, there is a need to improve the connection of the inhabitants in the regions of the South to the high-speed railway network.

Objectives: The proposed investments in the High Speed Network (AVR) allow to develop the long-distance railway passenger and freight services in an effective manner, consistent with the structure of the Italian territory and with the connectivity needs of the southern regions. The proposed interventions will be integrated with the regional transport systems, which play a primary role in supporting the demand of local mobility, and also feed the system of High Speed connections at the national level.

In particular, the High-speed network interventions planned in the South will make it possible to reduce journey times and increase capacity, as illustrated below:

Naples-Bari: upon completion of the project the Naples-Bari section will be covered in 2 hours, instead of the current 3 hours 30 minutes; there will be an increase in capacity from 4 to 10 trains/hour on the sections with double tracks, and an adjustment of the performance to allow the transit of freight trains;

Palermo-Catania: upon completion of the entire project there will be a reduction in the journey time of 60 minutes on the Palermo-Catania section, and an increase in capacity from 4 to 10 trains/hour on the sections being doubled;

Salerno-Reggio Calabria: upon completion of the entire project, the journey time will be reduced by 60 minutes on the Rome-Reggio Calabria section, with a recovery of up to 40 minutes on the priority lots of the Salerno-Battipaglia-Paola section; in addition, there will be a performance upgrade to allow the transit of freight trains.

Implementation: the interventions are part of the current RFI Investment Programme in the Contratto di Programma, approved by the MIT. The Naples-Bari intervention proposed for funding by the RRF (a section of 90 km) is under construction, with completion of approximately 32 km foreseen in December 2023. The Palermo-Catania intervention proposed under the RRF (a section of approximately 150 km) is mainly in design phase, while the Bicocca-Catenanuova section (approximately 37 km) is planned for completion by December 2023. The priority lot of the Salerno-Reggio Calabria intervention (approximately 50 km) is in design phase with completion in December 2026.

RFI has demonstrated over the years a strong capacity to implement investments, starting from the planning phase, design, obtaining the necessary permits, launching calls for tenders, selecting and supervising contractors. Furthermore, it is expected that for the works included in the RRF, which still need to start the authorization process, further simplifying procedures will be activated through specific legislative procedures, in order to compress the time required for the authorization procedures foreseen in the planning process (Conferenza dei Servizi - environmental authorizations - cultural heritage superintendence authorizations, etc.).

Target population: users of the indicated railway lines.

Timeline: by 2026.

Investment 1.2: High-speed lines in the North connecting to Europe

Challenges: In order to increase the freight traffic by rail and to ensure the modal shift from road to rail in the cross-border trade, it is necessary to increase the capacity of railway connections in the North of Italy and with the rest of Europe.

Objectives: The proposed High Speed Network (AVR) interventions will allow to strengthen freight transport services by rail, according to an intermodal logic and by establishing connections with the system of existing ports and airports. In particular, the planned High-speed interventions allow the reduction of travel times and the increase of capacity, as indicated below:

Brescia-Verona-Vicenza-Padua: the proposed interventions refer to the Brescia-Verona section (of 47 km) and the Verona-Bivio Vicenza section (of 44 km). Upon completion of the entire project up to Padua, the journey time on the Milan-Venice section will fall by 10 minutes. The main benefits will be an increase in capacity and in the regularity of traffic due to a specialisation of the services (traditional vs. HS), a significant improvement in the regional transport system due to the higher capacity on the historic line, and a better accessibility of the new station at Vicenza Fiera;

Liguria-Alpi: the intervention will allow the transit of freight trains with as length up to 750 meters. Upon completion of the entire project, journey times will be reduced by 60 minutes on the Genoa-Milan section (compared with the current time required of 1h 30 minutes) and on the Genoa-Turin section (compared with the current time required of 1h 35 minutes). In addition, capacity will be increased from 10 to 24 trains/hour on the sections subject to quadrupling close to the node of Milan (Rho-Parabiago and Pavia-Milano-Rogoredo). The proposed intervention will allow the elimination of bottlenecks at the node, due to the separation of long-distance passenger and freight traffic flows from metropolitan-regional flows, and due to the increase in the transport offer and of the frequency of regional and metropolitan trains (from 10 to 12 trains/hour on the Voltri-Brignone link);

Verona-Brennero - adduction works: the section that will be built is the Trento bypass. It is part of the project which includes the quadrupling of the Fortezza-Verona line, the bypass of Bolzano and Rovereto city centers and the rationalization of flows from the north entering the node of Verona. Upon completion of the entire project there will be a significant increase in the capacity of trains in transit at the Brenner connection (target 400 trains/day).

Implementation: The implementing entity is RFI. The Brescia-Verona-Vicenza line is in the implementation phase with completion foreseen in June 2026 for the Brescia-Verona section, and in December 2026 for the Verona-Bivio Vicenza section. The Liguria-Alpi project is under construction for the Genoa Node and Third Giovi Crossing section (of 53

km), with completion foreseen in August 2025, and in December 2026 for the remaining sections. The Verona-Brenner adduction works (of 15 km), related to the Trento bypass, are in design phase with completion expected in December 2026.

Target population: users of the indicated railway lines.

Timeline: by 2026.

Investment 1.3: Diagonal connections

Challenges: In the center-south of the country there is the need to improve the connectivity to the High speed railway network through diagonal lines.

Objectives: the objective of the proposed interventions is to reduce the time required to travel by rail and to transport freight from the Adriatic and Ionian seas to the Tyrrhenian Sea, through an improvement of the speed, frequency and capacity of existing diagonal railway lines. In particular, the envisaged upgrading interventions are expected to allow a reduction in travel times and increases in capacity that can be summarized as follows:

Rome-Pescara: upon completion of the entire project there will be a time saving of 80 minutes on the Rome-Pescara stretch and an increase in capacity from 4 to 10 trains/hour on the doubled stretches (with the possibility to set up metropolitan services between Chieti and Pescara); in addition, the performance of the line will be adjusted to allow for the development of freight traffic;

Strengthening Orte-Falconara: upon completion of the entire project there will be a reduction in travel times of 15 minutes on the Rome-Ancona section and of 10 minutes on the Rome-Perugia section, an increase in capacity from 4 to 10 trains/hour on the sections subject to doubling of the tracks, and a performance adjustment to allow the transit of freight trains;

Taranto-Metaponto-Potenza-Battipaglia: upon completion of the entire project, journey times will be reduced by 30 minutes on the Naples-Taranto section (via Battipaglia) compared with the current time required of 4 hours, capacity will be increased from 4 to 10 trains per hour on the sections being upgraded, and the railway line will be adjusted to allow the passage of freight trains.

Implementation: The implementing entity is RFI. The selected interventions are in project design phase, with expected completion by end 2026: Rome-Pescara (about 32 km), the Orte-Falconara upgrading (about x km), and the priority lot of the Potenza-Metaponto section (around 35 km) of the Taranto-Metaponto-Potenza-Battipaglia line.

Target population: users of the indicated railway lines.

Timeline: by 2026.

Investment 1.4: Introducing the European Rail Transport Management System (ERTMS)

Challenges: At present the coverage of the ERTMS, which allows interoperability between European railway networks and an improvement of the performance of the railway systems in terms of safety, capacity and maintenance, is limited to a few railway sections.

Objectives:

- Upgrade of the existing safety and signalling systems to the European ERTMS standard;
- Guarantee of full interoperability with European railway networks;
- Increase and optimization of network capacity and performance;
- Higher efficiency of maintenance operations;
- Improvement of safety standards.

Implementation: RFI will proceed with the roll-out of ERTMS mainly in stand-alone mode, starting with the passenger transport sections, in order to allow freight operators time to adapt to the new standard. In particular, from 2022 to 2026 the ERTMS coverage is expected to be extended over 3,400 km of the RFI network. RFI has defined an accelerated plan for the extension of ERTMS, which envisages equipping the core trans-European railway network by 2030, anticipating the time objectives set by EU Regulation no. 1315/2013.

Target population: users of lines with ERTMS and related traffic catchment areas.

Timeline: by 2026.

Investment 1.5: Strengthening metropolitan nodes and key national links.

Challenges: Besides developing new railway sections (see investments 1.1-1.3 above), RFI also carries out a nationwide investment programme to upgrade its key railway nodes and national links. The railway nodes at 12 metropolitan cities require an increase of capacity to handle the connections between the national and the regional networks. In addition, existing key national railway links are also in need of upgrading, since they exhibit bottlenecks and low performance, due to reduced capacity and the interference between passenger and freight traffic.

Objectives: RFI envisages an investment programme regarding nodes and key links on the national territory with the following objectives:

- infrastructural development (doubling/quadrupling) and technological enhancement of key links of national interest, of connecting lines to the main freight terminals and of last mile connections to ports;

- adaptation of performance levels (module, gauge, axle weight) to allow the transit of higher freight volumes on the TEN-T corridors, on freight lines, and on the connecting lines with the main ports and intermodal terminals;
- mitigation of bottlenecks for the development of passenger and freight traffic, including punctual interventions to manage interferences between passenger and freight traffic flows;
- increases in capacity and reduction in journey times through the elimination of critical points;
- increases in the capacity of lines close to saturation;
- increase in the capacity of the suburban access lines to the nodes being doubled;
- renovation of stations.

As outlined in the national strategy in the document "Italia Veloce", the interventions on the nodes can be distinguished as follows:

- aim to enhance "metropolitan" or "suburban" connections, in order to guarantee capillary services with high frequencies, thereby supporting the demand for mobility expressed by large metropolitan cities (and also by medium-sized urban areas);
- focus on "fast regional" connections, capable to guarantee medium-range travel services, supporting the demand for mobility expressed by large diffuse urban areas, with competitive speed and comfort levels compared to the use of private cars;
- improve the accessibility and interchange between railway stations and other mobility systems.

The interventions foreseen on key national links concern the following geographic areas:

Liguria-Alps link (strengthening of connections with the swiss border passes, speeding up of the line Turin/Milan-Genoa, infrastructural and technological upgrading of the lines Genoa-Ventimiglia and Genoa-La Spezia);

Transversal link (infrastructural and technological upgrading of the line Turin-Venice);
Bologna-Venice-Trieste/Udine link (connections to the eastern border crossings);

Central and North Tyrrhenian link (infrastructural and technological upgrading of the Central Dorsale HS line and of access lines to the Tyrrhenian ports);

Adriatic-Ionian link (doubling of Termoli-Lesina line, upgrading and speeding up of Bologna-Lecce, infrastructural and technological upgrading Adriatic link);

Southern Tyrrhenian link (technological upgrading of the node of Naples);

Sicilian network: upgrading of Caltagirone-Gela line and electrification of Palermo-Trapani line;

Sardinian network (infrastructural and technological upgrading of Cagliari-Sassari/Olbia lines).

Implementation: The investment programme of RFI includes numerous works all over the country. RFI will closely follow the implementation of this national programme, including the phases of project design, works award and works supervision.

Target population: mainly users in the 12 metropolitan cities and users throughout the country affected by the upgrading of key links.

Timeline: by 2026.

Investment 1.6: Strengthening of regional lines.

Challenges: There is a need to upgrade regional railway infrastructures in various areas of the country. Regional railway lines can be distinguished as follows: interconnected lines with the national network (as described in Annex 1 of Ministerial Decree dated 5 August 2016) and non-interconnected lines. The fragmented management of the regional rail networks has caused connection problems with the main national network. The separate management of the national and regional lines has led to the adoption of different technological and operating systems; this has created overall safety problems of the railway network and a potential risk of accidents.

Objectives: The interventions foreseen on the regional lines have the following objectives:

To strengthen the interconnected regional railway lines, in order to reach the safety levels set by the National Agency for Railway Safety (ANSF);

To upgrade the non-interconnected regional rail transport system, which plays a primary role in supporting the demand for local and metropolitan mobility;

To support the connection of regional lines with the national high speed network.

As concerns the **interconnected regional lines**, which are expected to be transferred and managed by RFI, interventions are planned in the following regions:

Piedmont: upgrading and modernisation of the Torino Ceresse-Canavesana: improving the regularity of traffic flows;

Friuli Venezia Giulia: FUC railway: infrastructural and technological works on the Udine-Cividale line: improvement of the regularity of traffic flows;

Umbria:

- (i) Umbrian Central Railway (FCU): track renewal and replacement of the switches on the Perugia-Terni and Sansepolcro-Città Castello lines; improvement of safety standards for railway operations;
- (ii) FCU: Implementation of the ERTMS: improvement of traffic performance, optimisation of capacity and performance, improvement of safety standards; Campania

(EAV): Strengthening and modernisation of the Cancellone-Benevento line: improvement of safety standards for railway operations;

Puglia:

- (i) Bari-Bitritto line: infrastructural upgrading: compliance with technical/regulatory standards of the National Railway Infrastructure;
- (ii) Ferrovie del Sud Est (FSE): infrastructural upgrading of the Bari-Taranto line: the intervention will allow the adaptation to the performance standards of RFI and to the technical specifications of interoperability;
- (iii) FSE: Completion of SCMT/ERTMS equipment on the network: improvement of traffic performance, optimisation of capacity, improvement of safety standards;
- (iv) FSE: Realisation of intermodal Hubs and upgrading of 20 stations: the intervention aims at improving the accessibility of the stations and creating areas for exchanges rail-bus, rail-private car and rail-bike;

Calabria: Rosarno-S. Ferdinando line: upgrading of the equipment of the Rosarno and San Ferdinando lines for connection to Gioia Tauro.

As concerns the **non-interconnected regional railway lines**, some of which are connected to metropolitan lines, the following interventions are foreseen:

Lombardy: renewal of the rolling stock for the regional network;

Lazio: renewal of the rolling stock for the Roma Lido and Roma Viterbo lines;

Abruzzo: upgrading of safety standards for the Archi-Castel di Sangro section and renewal of the rolling stock on the regional network;

Campania: renewal of trains (underground lines, Linee Vesuviane, Linee Flegree, suburban line Naples-Piedimonte Matese) and technological development (Linee Vesuviane, Linee Flegree, EAV network);

Basilicata: upgrading of safety standards, renewal of equipment on several sections of the Appulo-Lucane railway lines;

Puglia: upgrading and modernisation works of the Ferrovie del Gargano and Ferrovie Appulo-Lucane;

Calabria: works to upgrade and modernise the regional railway lines of Cosenza-Catanzaro and Cosenza-San Giovanni in Fiore;

Sicily: upgrading of safety standards and renewal of the rolling stock on the Circumetnea line.

Implementation: In order to ensure the safety of the interconnected regional railway lines, regulatory provisions have identified RFI as the entity responsible for managing these lines and carrying out the technological interventions required to adapt these regional lines to the technological and safety standards of the national railway network.

So far, the FCU (Umbria) and the FSE Ferrovie del Sud Est (Puglia) have been transferred to RFI, while the other interconnected regional lines are still in the process of being

transferred from the Regions to RFI.

Pending the formal transfer of the above-mentioned interconnected lines to RFI, the interventions will be carried out through specific agreements between RFI, the Regions and the current infrastructure managers, with the exception of the interventions related to the Bari-Bitritto and Rosarno-San Ferdinando lines, which will be included in the MIT-RFI *Contratto di Programma*.

The upgrading of the non-interconnected regional lines and metropolitan lines will instead be the responsibility of the respective owners (Regions and/or Municipalities).

Target population: users of the lines indicated and their associated traffic areas.

Timeline: 2026

Investment 1.7: Upgrading, electrification and resilience of railways in the South.

Challenges: Several railway lines in the South of Italy are in need of upgrading and electrification, and present bottlenecks in their connection to the rest of the railway network and at key traffic nodes.

Objectives: Specific investments are foreseen to upgrade the railway network in various critical points in the South of Italy, to increase the competitiveness and connectivity of the intermodal logistic system (railways-airports-ports) and the connections with the major cities. In particular, investments are planned on the following lines:

- Molise region: Rome-Venafro-Campobasso-Termoli;
- Apulia region:
 - Upgrading of Bari – Lamasinata;
 - electrification Barletta – Canosa;
 - Pescara-Foggia.
- Calabria region: Upgrading Ionian Sibari-Catanzaro Lido-Reggio Calabria/Lamezia Terme
- Sicily:
 - Node of Catania
 - Ring road of Palermo
 - Upgrading Palermo - Agrigento - Porto Empedocle
 - Intermodality and accessibility to Trapani Birgi airport
 - Link to the port of Augusta
- Sardinia:
 - Olbia airport railway link
 - Track-doubling Decimomannu-Villamassargia

Implementation: RFI will implement the above investment plan, following the vari-

ous phases of project design, getting authorizations, tendering the works, awarding and supervising the works.

Target population: users of the upgraded railway lines.

Timeline: by 2026.

Investment 1.8: Upgrading railway stations in the South

Challenges: Numerous railway stations in the South present problems in terms of accessibility and integration with the territory. Investments are needed to upgrade the stations, improve the functionality of their buildings, the quality of the services provided to users and the energy efficiency levels.

Objectives: The proposed investment programme includes the following types of interventions:

Urban hubs and metropolitan lines (15 stations): interventions aim at the development, upgrading, accessibility and energy efficiency of individual stations and railway nodes, which act as mobility hubs (Messina, Villa S. Giovanni, Taranto, Salerno, Benevento, etc.) or metropolitan lines (e.g. the stations of the L2 metro line in Naples, etc.), which need to be upgraded/renovated in order to guarantee their centrality as a transport hub and service centres;

Enhancing the accessibility, attractiveness and energy efficiency of medium-large sized stations with high traffic volumes (30 stations): interventions related to stations of strategic importance from a transport and/or touristic point of view, described as Easy&Smart circuit stations (including Chieti (Abruzzo), Potenza Centrale and Potenza Superiore (Basilicata), Lamezia Terme, Cosenza, Sibari and Catanzaro Lido (Calabria), Sapri, Scafati, Nocera Superiore, Torre del Greco and Sarno (Campania), Termoli (Molise); Foggia, Polignano a Mare, San Severo and Barletta (Puglia), Macomer and Oristano (Sardinia), Palermo Notarbartolo, Acireale and Marsala (Sicily));

Functional requalification, improvement of accessibility and intermodality, and energy efficiency of small-medium sized stations (10 stations): all the interventions aim at improving the accessibility and attractiveness of the stations, as well as its energy efficiency and environmental sustainability.

Implementation: RFI will implement the above investment plan.

Target population: the users of the upgraded stations.

Timeline: by 2026.

Investment 1.9: Renewal of rolling stock.

Challenges: A part of the fleet of the rolling stock dedicated to freight transport is composed of old and polluting vehicles, which need to be substituted.

Objectives: The project foresees the renewal of obsolete freight wagons and locomotives, or their modernisation through revamping and retrofitting.

Implementation: The procedures to provide incentives for the replacement of the wagon fleet will be defined by the competent General Directorate for Railway transport of the Ministry of Infrastructure and Transport (MIT) and by the Rete Autostrade Mediterranee (RAM S.p.A. , an in-house company of the State, fully owned by the Ministry of Economy and Finance). For the renewal of a wagon, a contribution will be provided on the value of the new vehicle in exchange for the scrapping of an old vehicle, requiring proof of the freight traffic conducted with the old wagon. As part of the modernisation process, support will also be provided for the revamping and retrofitting of the existing rolling stock, introducing innovative and/or improved components.

Target population: rail freight operators.

Timeline: by 2026.

2) Safe roads.

Reform 2.1 Fulfilment of the recent D.L. Semplificazioni (Law Decree no. 76 of 16 July 2020, converted into Law no. 120 of 11 September 2020) concerning the adoption of the "Guidelines for the classification and management of risk, safety assessment and monitoring of existing bridges". **Reform 2.2:** Transfer the ownership of the works of art (bridges, viaducts) related to lower type roads to the owners of higher type roads (motorways and main suburban roads), in particular from the Municipalities, Provinces and Regions to the State.

Challenges: in the absence of a binding standard for bridge safety assessments and classification, each operator applies non-homogeneous and non-standard criteria to classify the risk level of the bridges. A further issue is the unclear ownership of some overpasses of road infrastructures.

Objectives: The reform foresees:

- the adoption of "Guidelines", which will allow the application of common standards and methodologies on the entire national road network;
- the transfer of the ownership of the bridges, viaducts and overpasses from the lower type roads to the higher type roads (motorways and main suburban roads): this will allow an increase in the overall safety of the road network, as the bridges,

viaducts and overpasses will be maintained by ANAS and/or the motorway concessionaires, who have better planning and maintenance capacities than the individual municipalities or provinces.

Implementation: the transfer of the ownership of the works of art will have to take place within six months of the entry into force of Law 120/20. It is expected to be completed in 2021, with a special "handover report" according to the rules of the Codice della Strada (Legislative Decree 285/1992) and its Regulations (Presidential Decree 495/92), which dictate provisions on the transfer of ownership between road-owning entities.

Target population: entire national territory.

Timeline: the transfer of ownership of bridges and overpasses from lower type roads to higher type roads will take place by 2021.

Investment 2.1: Provision of a technological monitoring system for remote control and investments into major safety interventions on main structures (bridges, viaducts and tunnels) on the A24-A25 motorways.

Challenges: The A24 and A25 highways are key road connections crossing the center of Italy from Rome to Pescara. The bridges, viaducts and tunnels on the A24 and A25 motorways present significant static criticalities - due not only to the seismicity of the area, but also due to their age and consequent deterioration - which require investments for adaptation and safety.

Objectives: Preparation and implementation of a dynamic monitoring system for remote controls on the structures (bridges, viaducts, overpasses and tunnels) of the A24-A25 highways, necessary to plan the interventions in a cost effective way and to improve the levels of maintenance; Implementation of an extraordinary plan for checking and putting into security the structures on the A24-A25 motorways: initially a survey of the state of maintenance of the structures will be conducted, and subsequently the required investments into safety measures will be implemented.

Implementation: The interventions will followed by the MIT. The motorway concessionaire of the "Strada dei Parchi" will have no gain from these interventions, which are required for safety, but will not be included in the economic and financial plan of the concession.

Target population: road users.

Timeline: - in-depth surveys on 50% of the viaducts by 2022; - first tendering of safety works by 2022; - completion of works by 2026.

Investment 2.2: Setting up of a technological monitoring system on the ANAS network for remote control of engineering works (bridges, viaducts, overpasses and tunnels) and implementation of interventions at the most critical points

Challenges: At present there is insufficient information, data and knowledge about the state of maintenance of bridges, viaducts, overpasses and tunnels on the road network. This prevents cost-effective planning of the maintenance works required to ensure safe connections between the country's main economic centres.

Objectives: The project envisages the application of an integrated census, classification and risk management system to 11,000 bridges and 1,600 tunnels of the ANAS national network. On this basis, the structures in the most critical conditions will be selected, on which technological monitoring will be applied and for which repair, safety or replacement works will be designed. A number of pilot projects will be developed, characterised by the use of innovative intervention techniques and materials.

The main goals of the proposed intervention are:

- the preparation and implementation of a dynamic monitoring system with remote controls, necessary to improve the planning of maintenance interventions and to identify the most vulnerable points, considering seismic and landslide risks and the useful life;
- the management of the safety of the road infrastructure in a structural way and through an iterative process (analysis of the network, inspections, management of the digitalised system, classification of priorities, implementation of the interventions), resulting in a better knowledge of the status of network with a consequent improvement in its safety.

Implementation: The interventions will be included in the Contract of ANAS with the MIT (*Contratto di Programma*), and will then be implemented by ANAS. The activities related to the census, data acquisition and data processing activities will feed into the national archive of public works (AINOP), set up at the MIT and that includes data from various administrations concerning the execution of public works. The survey campaigns will provide useful data and experiences, also for the monitoring and maintenance of bridges/viaducts/overpasses/gates of other road infrastructures.

Target population: road users throughout the country.

Timeline:

- Definition of the sample of bridges, viaducts, overpasses and tunnels to be monitored
- by the end of 2021
- Definition of the integrated digital platform for risk management and completion of the risk classification - by the end of 2023;
- Assessments of the most critical elements, installation of the technological monitor-

- ing systems, planning of the priority restoration/improvement/replacement/safety measures - by the end of 2024;
- Start-up of the integrated technological platform made available to the operators, implementation of some priority restoration/improvement/safety measures - by 2026.

4. Green and digital dimensions of the component

a) Green Transition:

The EU Regulation 2020/408 establishes, as a binding target, that at least 37% of the total budget of the PNRR must be allocated to the green transition.

This Action contributes significantly to the green transition, about 75% (see Table 1), by promoting a more efficient and sustainable use of transport and in particular of the railway mode.

In particular, investments 1.1, 1.2, 1.3 relating to the *High-speed railway network* and the intervention 1.5 *Strengthening metropolitan nodes and key national links* have a Green (climate) impact of 100%, while the remaining railway investments have a Green impact (climate) equal to 40%.

On the other hand, investments in the road sector have a green (climate) impact of 0%. With reference to the climate and environmental objectives defined in the EU Regulation 2020/852 (*Taxonomy Regulation*), this Action provides an important contribution to the prevention and reduction of pollution (in particular of atmospheric pollution, thanks to the important transfer of road traffic, both passengers and freight, to rail) and consequently on the mitigation of climate change.

b) Digital Transition:

The EU Regulation 2020/408 establishes, as a binding target, that at least 20% of the total PNRR allocation must be allocated to the digital transition. This Action contributes to the achievement of the aforementioned target, presenting a Digital impact of 16%.

In particular in the **railway sector**, only the investment 1.4 *Introducing the European Rail Transport Management System* (ERTMS) has a digital impact equal to 100%.

In the **road sector**, investment 2.1 *Implementation of a dynamic monitoring system to control remotely the bridges, viaducts and tunnels (A24-A25)* and investment 2.2 *Implementation of a dynamic monitoring system to control remotely the bridges, viaducts and tunnels (ANAS network)* both have a digital impact of 100%.

Table 1. Green and digital impact							
MISSIONE 3: "Sustainable mobility infrastructures" COMPONENT 1 - High speed/capacity railway network and safe road	Green objectives				Digital objectives	Transition challenges	
	Climate	Environmental	Intervention field	DNSH		Green	Digital
	Tag	Tag					
Investment 1.1: High-speed railway connections to the South for passengers and freight							
<i>High-speed railway network (Napoli - Bari)</i>	100%	40%	064	yes	0%		
<i>High-speed railway network (Palermo-Catania)</i>	100%	40%	064	yes	0%		
<i>High-speed railway network (Salerno-Reggio Calabria)</i>	100%	40%	064	yes	0%		
Investment 1.2: High-speed lines in the North connecting to Europe							
<i>High-speed railway network (Brescia-Verona-Padova)</i>	100%	40%	064	yes	0%		
<i>High-speed railway network (Liguria-Alpi)</i>	100%	40%	064	yes	0%		
<i>High-speed railway network (Verona-Brennero - opere di adduzione)</i>	100%	40%	065	yes	0%		
Investment 1.3: Diagonal connections							
<i>High-speed railway network (Roma-Pescara)</i>	100%	40%	068	yes	0%		
<i>High-speed railway network (Orte-Falconara)</i>	100%	40%	068	yes	0%		
<i>High-speed railway network (Taranto-Metaponto-Potenza-Battipaglia)</i>	100%	40%	068	yes	0%		
Investment 1.4: Introducing the European Rail Transport Management System (ERTMS)	40%	40%	071	yes	100%		
Investment 1.5: Strengthening metropolitan nodes and key national links							
<i>Technological development and infrastructural upgrading of key nodes</i>	100%	40%	068	yes	0%		
<i>Technological development and infrastructural upgrading of key links</i>	100%	40%	068	yes	0%		
Investment 1.6: Strengthening regional lines	40%	40%	069	yes	0%		
Investment 1.7: Upgrading, electrification and resilience of railways South	40%	40%	069	yes	0%		
Investment 1.8: Upgrading railway stations in the South	40%	40%	069	yes	0%		
Investment 1.9: Renewal rolling stock	40%	40%	072	yes	0%		
Investment 2.1: Implementation of a dynamic monitoring system to control remotely the bridges, viaducts and tunnels (A24-A25)	0%	0%	063	yes	100%		
Investment 2.2: Implementation of a dynamic monitoring system to control remotely the bridges, viaducts and tunnels (ANAS network)	0%	0%	063	yes	100%		

5. Milestones, targets and timeline

Related reform or investment		Milestone or target issue & number	Qualitative indicators (for milestones)	Quantitative indicators (for target)			Timeline for completion (indicate the quarter and the year)	Data source /Methodology	Responsibility for reporting and implementation	Description and clear definition of each milestone and target	Assessment risks	Verification mechanism	
				Unit of measure	Baseline	Goal							
Component 2 – High-speed capacity railway network and safe road													
Investment 1.1: High-speed railway connections to the South for passengers and freight	High-speed railway network (Napoli - Bari)	high speed/high capacity network km built		Km	0	69.5	4 Q 2023	Rete Ferroviaria Italiana	Ministry of Infrastructures and Transport	Conclusion of the process of award of works contracts (permissions, tenders, contracts) and implementation of 70 km of AV/AC network before 4 Q 2023.			
	High-speed railway network (Palermo-Catania)				0	#####	4 Q 2026						Additional 217 Km of AV/AC network is introduced before 4 Q 2026.
	High-speed railway network (Salerno-Briggio Calabria)												
Investment 1.2: High-speed lines in the North connecting to Europe	High-speed railway network (Brescia-Veneta-Vicenza)	high speed/high capacity network km built		Km	0	0.0	4 Q 2023	Rete Ferroviaria Italiana	Ministry of Infrastructures and Transport	Conclusion of the process of award of works contracts (permissions, tenders, contracts) and implementation of 180 km of AV/AC network before 4 Q 2026.	Effectiveness in the compliance with implementation timing / environmental permit release timing	Quarterly monitoring by the Ministry of Infrastructures and Transport	
	High-speed railway network (Liguria-Adige)				0	#####	4 Q 2026						
	High-speed railway network (Veneta-Brennero - opens in additional)												
Investment 1.3: Disposal connections	High-speed railway network (Roma-Pescara)	high speed/high capacity network km built		Km	0	0	4 Q 2023	Rete Ferroviaria Italiana	Ministry of Infrastructures and Transport	Conclusion of the process of award of works contracts (permissions, tenders, contracts) and implementation of 53 km of AV/AC network before 4 Q 2026.			
	High-speed railway network (Oliva-Falconara)												NOVA: non disponibile KPI realizzazione (DPI Infrastruttura)
	High-speed railway network (Tirreno-Magliano-Potenza-Romagnolo)				0	66.9	4 Q 2026						
Investment 1.4: Introducing the European Rail Transport Management System (ERTMS)		Km of network on which ERTMS is introduced		Km	0	800	4 Q 2023	Rete Ferroviaria Italiana	Ministry of Infrastructures and Transport	800 Km of network on which ERTMS is introduced before 4 Q 2023	Effectiveness in the compliance with implementation timing / foreign operators do not ensure the same level of upgrading in the train technological system	Quarterly monitoring by the Ministry of Infrastructures and Transport	
Investment 1.5: Strengthening metropolitan nodes and key national links	Technological development and infrastructural upgrading of key nodes	Progressive upgrading of nodes in the 12 metropolitan cities	realization of benchmarks for the development of passenger and freight traffic / technological upgrading of terminal sections / construction and upgrading of stations	Km	0	100	4 Q 2023	Rete Ferroviaria Italiana	Ministry of Infrastructures and Transport	100 Km of network upgraded before 4 Q 2023	Effectiveness in the compliance with implementation timing / environmental permit release timing	Quarterly monitoring by the Ministry of Infrastructures and Transport	
	Technological development and infrastructural upgrading of key links	Progressive upgrading of railway lines	performance adjustment / speed up lines and plants / doubling - quadrupling of congested lines	Km	0	500	4 Q 2026		Additional 400 Km of network upgraded before 4 Q 2026				
Investment 1.6: Strengthening regional lines		Upgrading of regional railways (management RFI)		Km	0	771	4 Q 2026	Rete Ferroviaria Italiana	Ministry of Infrastructures and Transport	Additional 771 Km of regional railways will be upgraded by RFI before 4 Q 2026	Effectiveness in the compliance with implementation timing / environmental permit release timing	Quarterly monitoring by the Ministry of Infrastructures and Transport	
		Upgrading of regional railways (management Regions, Municipalities, ...)		Km	n.a.	n.a.	4 Q 2026	Regioni Municipali...	Ministry of Infrastructures and Transport		Effectiveness in compliance with the implementation times / implementation times of projects by the Regions and Municipalities	Quarterly monitoring by the Ministry of Infrastructures and Transport	
Investment 1.7: Upgrading, electrification and resilience of railways South		Progressive upgrading of railway lines South		Km	0	YYY	4 Q 2026	Rete Ferroviaria Italiana	Ministry of Infrastructures and Transport			Quarterly monitoring by the Ministry of Infrastructures and Transport	
Investment 1.8: Upgrading railway stations in the South		Progressive upgrading railway stations in the South		n°	0	35	4 Q 2026	Rete Ferroviaria Italiana	Ministry of Infrastructures and Transport			Quarterly monitoring by the Ministry of Infrastructures and Transport	
Investment 1.9: Renewal rolling stock		Nr. of polluting vehicles substituted (rail)		n°	0	XXX	4 Q 2026	Ferrovie dello Stato	Ministry of Infrastructures and Transport	Nr. of polluting vehicles substituted (rail)		Semestral monitoring by the Ministry of Infrastructures and Transport	
Implementation of a dynamic monitoring system to control remotely the bridges, viaducts and tunnels (A24-A25)		Number of controlled viaducts, bridges and tunnels		n° viaducts	0	75	4 Q 2022	Highway Concessionaires	Ministry of Infrastructures and Transport	dynamic monitoring system in 75 viaducts before 4 Q 2022	In depth analysis of the needs / administrative permits release timing	Quarterly monitoring by the Ministry of Infrastructures and Transport	
					0	151	4 Q 2026						dynamic monitoring system in additional 76 viaducts before 4 Q 2026; maintenance work on the most critical bridges
					0	28	4 Q 2026						
Implementation of a dynamic monitoring system to control remotely the bridges, viaducts and tunnels (ANAS network)		Number of controlled viaducts, bridges and tunnels		n° viaducts	0	#####	4 Q 2026	ANAS - Highway Concessionaires	Ministry of Infrastructures and Transport	dynamic monitoring system in 12,000 viaducts before 4 Q 2026	In depth analysis of the needs / administrative permits release timing	Quarterly monitoring by the Ministry of Infrastructures and Transport	
					0	1,600							4 Q 2026

6. Financing and costs

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Component		Investment/Reform	Relevant time period	Total estimated costs for which funding from the RRF is requested (mn EUR)	If available: Total estimated cost by year (mn EUR)								Funding from other sources				COFOG level 2 category / or type of revenue
					2020	2021	2022	2023	2024	2025	2026	from other EU programmes specify the EU programmes and breakdown by programme if relevant	from the national budget	Other sources			
High speed/capacity railway network	Investment 1.1: High-speed railway connections to the South for passengers and freight	High-speed railway network (Napoli - Bari)	2020-2026	1,400	27	76	168	262	247	269	351	-	-	-	-	04.5.3	
		High-speed railway network (Palermo-Catania)	2020-2026	1,440	18	22	110	162	200	266	662	-	-	-	-	04.5.3	
		High-speed railway network (Salerno-Reggio Calabria)	2020-2026	1,800	-	20	146	399	365	304	566	-	-	-	-	04.5.3	
	Investment 1.2: High-speed lines in the North connecting to Europe	High-speed railway network (Brescia-Verona-Vicenza)	2020-2026	3,670	152	341	710	916	900	396	255	-	-	-	-	04.5.3	
		High-speed railway network (Liguria-Adri)	2020-2026	3,970	398	532	724	786	836	559	135	-	-	-	-	04.5.3	
		High-speed railway network (Verona-Brennero - opere di adduzione)	2020-2026	930	-	8	20	126	174	280	322	-	-	-	-	04.5.3	
	Investment 1.3: Diagonal connections	High-speed railway network (Roma-Pescara)	2020-2026	620	-	2	16	57	125	186	234	-	-	-	-	04.5.3	
		High-speed railway network (Orte-Falconara)	2020-2026	510	-	1	27	61	94	128	199	-	-	-	-	04.5.3	
		High-speed railway network (Taranto-Metaponto-Potenza-Battipaglia)	2020-2026	450	2	6	9	57	84	116	176	-	-	-	-	04.5.3	
	Investment 1.4: Introducing the European Rail Transport Management System (ERTMS)		2020-2026	2,970	-	78	271	425	563	705	928	-	-	-	-	04.5.3	
	Investment 1.5: Strengthening metropolitan nodes and key national links	Technological development and infrastructural upgrading of key nodes	2020-2026	2,970	48	145	224	350	436	500	467	-	-	-	-	04.5.3	
		Technological development and infrastructural upgrading of key links	2020-2026		48	98	112	125	132	134	151	-	-	-	-	04.5.3	
	Investment 1.6: Strengthening regional lines		2020-2026	2,670	n.a.								-	-	-	-	04.5.3
	Investment 1.7: Upgrading, electrification and resilience of railways South		2020-2026	2,400	n.a.								-	-	-	-	04.5.3
Investment 1.8: Upgrading railway stations in the South		2020-2026	700	n.a.								-	-	-	-	04.5.3	
Investment 1.9: Renewal rolling stock		2020-2026	200	-	40	40	40	40	40	40	-	-	-	-	04.5.3		
Safe road	Investment 2.1: Implementation of a dynamic monitoring system to control remotely the bridges, viaducts and tunnels (A24-A25)	2020-2026	1,150	n.a.								-	-	1,990	State source	04.5.1	
	Investment 2.2: Implementation of a dynamic monitoring system to control remotely the bridges, viaducts and tunnels (ANAS network)	2020-2026	450	-	25	50	100	100	150	75	-	-	-	-	04.5.1		

2 M3C2 - Intermodality and integrated logistics

Summary box

Policy area: Ports and Airports

Objectives: The objectives of this component are to: (i) strengthen the competitiveness of the Italian port system through an integrated development of intermodal infrastructures and last mile connections; (ii) ensure the environmental sustainability and energy efficiency of ports; (iii) digitalize the logistic supply chain and air traffic management systems; (iv) reduce emissions linked to the movement of goods.

Investments focused on improving seaside and digital accessibility, port capacity, energy efficiency, and intermodal connections, will be combined with reforms aimed at increasing strategic planning, a single Customs portal, an interoperable digital platform, and a review of the regulation regarding port concessions. The focus will be on ports that are part of the Integrated National Transport System (SNIT), with a priority on the TEN-T nodes. In addition, the component includes investments in the digitalization of airports to manage air traffic in an environmentally sustainable way. The above objectives are in line with the nationwide strategy on mobility outlined in “#ItaliaVeloce”.

The component champions the European Flagship ‘Recharge and refuel’ by promoting the electrification of docks at numerous ports (cold ironing project). By 2026, the proposed investments will ensure the electrification at 41 ports.

Twin transition: By supporting the electrification of quays, renewable energy sources and energy efficiency measures in port areas and the shift to rail transport, as well as the digitalization of port and airport traffic management systems, this component promotes both the green and the digital transition. Safety and climate resilience, this component promotes both the green and the digital transition.

Jobs and growth: By improving the competitiveness and productivity of Italian ports this component is expected to support an increase of passengers (56 million in 2019, including 12 million from cruise ships) and freight volumes (479 million tons in 2019), thereby creating jobs and contributing to growth at local and national levels. Jobs will be created not only in port areas but also inland along the logistic value chains.

Social resilience: re- The Covid pandemic has highlighted the importance of a resilient transport and logistic system, which continues functioning and transporting goods, medicines and food even during lockdown phases. The proposed investments in the capacity, productivity and environmental sustainability of key transport nodes (ports and airports) are hence important to support social resilience. The component also includes investments in numerous ports in Southern Italy (with a focus on Naples, Salerno, Cagliari, Manfredonia, Taranto, Brindisi, Palermo, Catania, Trapani, Messina, Milazzo, Villa San Giovanni and Reggio Calabria) thereby contributing to social cohesion.

Reforms and investments:

Outcome 1: Improve the strategic planning process of ports and the award of concessions in port areas.

Reform 1.1: Simplification of the procedures for the strategy planning process.

Reform 1.2: Regulation defining the competitive award of concessions in port areas.

Outcome 2: Improve seaside accessibility, increase capacity and establish last-mile intermodal connections of Italian ports.

Investment 2.1: *Seaside accessibility and resilience to climate change:* ports of Genoa, Vado Ligure, Marina di Carrara, Civitavecchia, Naples, Salerno, Brindisi, Taranto, Manfredonia, Palermo, Catania and Venezia.;

Investment 2.2: *Capacity increases:* ports of La Spezia, Venice, Trieste, Ravenna, Naples, Salerno, Cagliari, Brindisi and Trapani.;

Investment 2.3: *Last mile rail/road connections:* ports of Venice, Trieste, Civitavecchia, Ancona, Naples and Salerno;

Investment 2.4: *Increase in energy efficiency:* ports of Messina, Milazzo, Villa San Giovanni and Reggio Calabria.;

Outcome 3: Increase the digitalization of transport and logistic services, simplifying custom procedures.

Reform 3.1: Implementation of a Single Customs Window (“Sportello Unico Doganale”);

Reform 3.2: Establishment of a National Strategic Platform (UIRNET) for the network of ports, in order to introduce the digitalization of passenger and freight services;

Reform 3.3: Simplification of logistics procedures and document digitization, through the adoption of an electronic "*Convention relative au contrat de transport international de marchandises par route*" (CMR) to freight shipments;

Investment 3.1: The digitalization of the logistic chain;

Investment 3.2: The digitalization of air traffic management;

Outcome 4: Reduce GHG emissions by increasing electrification, energy efficiency and renewable energy use.

Reform 4.1: Simplify authorization procedures to provide electricity to piers ;

Investment 4.1: Electrification of piers (Cold ironing);

Investment 4.2: Green ports: renewable energy and energy efficiency interventions at ports.

Estimated costs:

Cost of EUR 3,680 million to be covered by RRF

M3C2 - Intermodal connections and integrated logistics

	Resources (euro/mld)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
Integrated project "Ports of Italy"	0.48	2.84	3.32	-	3.32
- Ports and intermodal connections to the great European and national communication routes and development of ports in southern Italy	0.48	1.62	2.10	-	2.10
- Green Ports and Cold ironing	-	1.22	1.22	-	1.22
Digital innovation of airport systems and of logistics systems	-	0.36	0.36	-	0.36
TOTAL	0.48	3.20	3.68	-	3.68

2. Main challenges and objectives

a) Main challenges

- The competitiveness of the Italian Port system: according to the Logistic Performance Index elaborated by the World Bank – which considers the time and costs of logistic systems, as well as the transparency, quality and reliability of the services offered – in 2019 Italy ranked 19th in the World, with the first three countries being Germany, Sweden and Belgium. Even if in terms of distance to market, Italian ports could be competitive for trade between Europe and the Far East, over recent years they have lost market shares, also towards other Mediterranean ports. The perception among the big shipping companies is that Italian ports do not offer a reliable logistic system, which leads them to prefer other ports, even if located further away. The higher travel costs to these ports are compensated by the lower handling costs and times, and by better railway connections to the production/consumption centres.
- Economies of scale of ports: with the traffic of mega-container ships growing, another element that large shipping companies consider when choosing among ports is their capacity in terms of access and logistics, and hence the possibility to benefit from economies of scale, in order to reduce the unit cost per ton of merchandise handled. Ports in Northern Europe have high levels of capacity and offer a broad set of logistic services (not distinguishing between gateway and transshipment as in the Mediterranean).
- The lack of an updated strategic plan: In line with the provisions of Legislative Decree no. 169 of August 2016 "Reorganization, rationalization and simplification of the discipline concerning Port Authorities pursuant to Law no. 84 of January 28th, 1994", 16 Port System Authorities were created . However, the strategic plans of many of these Port Authorities have not been updated, which has not allowed to reap the benefits that were expected from a more integrated and coordinated system, in which ports could specialize according to their comparative advantages.
- The need to develop port inter-modality and last mile connections: the freight traffic in Italy is typically over land (road or rail) and is not very integrated with sea traffic. Since the extreme points of the freight railway corridors (created with Regulation 913/2010) are typically ports, the resolution of the “last-mile” connections (by rail or road) is key to ensure the competitiveness of Italian ports. In some recent studies of the European Commission and in the Strategic National Plan of Ports and Logistics, the key bottlenecks that impede a quick connection of the national railway lines with the port infrastructures are mentioned: inadequate length and number of the railway tracks, excessive distance of the tracks from the piers and high costs of handling operations at ports.
- The need to upgrade the digital infrastructures and services at ports and airports:

the logistic inefficiencies of Italy have been estimated to have a cost of around EUR 70 billion per year , of which EUR 30 billion are linked to bureaucratic costs and digital delays. The development of digital systems is hence considered to be key to improve the efficiency of logistic operations and to allow an efficient management of the flow of information linked to the flow of goods. Over recent years Italian ports and logistic operators have established Port Community Systems (PCS), which manage the electronic flow of documents and commercial information related to port operations, facilitating the interaction between the various stakeholders (terminal and transport operators, and customs). Concerning airports, a higher level of digitalization could contribute to better traffic management, reducing the fuel consumption of airplanes and the related environmental impact.

- The environmental impact and sustainability of ports: it is necessary to reduce the environmental footprint and pollution caused by ports, which are often located close to city centres with a negative impact on air quality. This can be achieved by developing the electrification of the piers (“*cold ironing*”) and improving the energy efficiency of operations and increasing the renewable energy sources (“*Green ports*”).

The objectives of the component are to:

- (i) strengthen the competitiveness of the Italian port system through an integrated development of intermodal infrastructures and last mile connections;
- (ii) ensure the environmental sustainability and energy efficiency of ports;
- (iii) digitalize the logistic supply chain and air traffic management systems;
- (iv) reduce emissions linked to the movement of goods.

These objectives will be pursued by:

- supporting an interconnected port system with adequate economies of scale to develop trade flows, both between Europe and Far East and within Mediterranean;
- offering an effective, digital and reliable logistic system for transport to/from final destinations;
- realizing systemic interventions at ports, that include both seaside accessibility and last-mile land connections;
- considering ports not only as transit points, but as integrated local development nodes, both for local industries and value chains as well as for tourism.

The interventions will focus mainly on ports that are connected to the TEN-T corridors. The ports in the North of Italy are key strategic gateways for the oceanic trade flows of Italy and Europe, in particular with the Near and Far East. Ports in the Centre and South instead aim their activity at the inter-Mediterranean trade flows, facing a growing competition of the ports of North Africa. In particular, the accessibility and connectivity of ports in the Centre and South needs to be improved in order to stimulate local value chains. In this respect, the creation and development of Special Economic Zones in the South of Italy will provide incentives for the location of production and logistic centres

close to ports.

Twin transition:

The proposed investments in energy efficiency and renewable energy sources (Green ports) and electrification (cold ironing) of ports will result in a reduction of GHG emissions. In parallel, the digitalization of port and airport traffic flows and logistics will increase the productivity, predictability and efficiency of operations, hence reducing congestion and pollution levels.

Jobs and Growth:

In 2019 Italian ports have handled 479 million tons of freight (mainly liquid goods representing 38%, followed by containers 23%, Ro-Ro 22%, and solid goods 12%) and 56 million passengers. The value of the economic contribution of ports to the Italian GDP is estimated to be EUR 8.1 Billion. Italy is currently a market leader in short sea shipping, with a market share of 39% in the Mediterranean (246 million tons in 2019), and also for cruise ships passengers (12 million). The proposed investments aim at improving Italy's competitive position in the Mediterranean and hence increasing passenger and freight traffic levels, while ensuring that the envisaged growth is environmentally sustainable. The investments foreseen will have important spill over effects along the logistic value chains and are expected to safeguard local jobs and stimulate private investments (by terminal and logistic operators).

c) National strategic context

The component is well aligned with the priorities of the National strategy for ports, which are outlined in the document “#ItaliaVeloce”. In particular, the component is focused mainly on ports included in the Integrated National Transport System (SNIT).

Following the recent reorganization and rationalization of the Port Authorities (based on Legislative Decree 169/2016), the 1st level nodes of the SNIT cover 16 Port System Authorities, which in turn include 58 ports of significant international and national interest. In addition, the national port system also includes the category I seaports referred to in article 4 of Law 84/1994, that is ports for military defence and state security, and 217 minor ports of call dedicated mainly to pleasure boating, fishing and the transport of local passengers and tourists.

The strategy defined by “Italiaveloce” identifies the following priorities, with the objective to make ports increasingly more green, digital and resilient:

- The last mile connection (with railway where possible, otherwise road);
- The accessibility from the sea, allowing the access of larger sized ships;
- The selective increase of port land side capacity, especially for Ro-Ro and containers;
- The energy efficiency and environmental sustainability of the ports;
- The digitalization of port logistics and ICT;

- The development of industrial activities in ports;
- The development of waterfronts for cruise ships and touristic purposes.

The component proposed under the RRF follows the above priorities. The investments aiming at electrification, energy efficiency, and digitalization regard numerous ports (up to 41 in the case of cold ironing, of which 39 are part of the TEN-T network). Larger sized investments related to seaside accessibility, landside capacity increases and/or last mile connections concern 23 individual ports: 10 ports in the North/Center of the country (Savona, Genoa, La Spezia, Civitavecchia, Trieste, Venice, Piombino, Ravenna, Marina di Carra and Ancona) and 13 ports in the South (Naples, Salerno, Cagliari, Manfredonia, Brindisi, Taranto, Messina, Milazzo, Villa San Giovanni and Reggio Calabria, Catania, Palermo and Trapani).

As stated in the document “#ItaliaVeloce”, in the programming and planning process of transport infrastructure projects, quantitative assessment tools are used by the Ministry of Infrastructure and Transport to forecast mobility demand and estimate the level of infrastructure use, as well as the impact of changes in economic and territorial development with a view to integrated "transport-territory" planning. The proposed investments have been selected by the MIT, giving priority to those works which can be completed within the timeframe required by the RRF.

3. Description of the reforms and investments of the component

1) Improve the strategic planning process of ports and the mechanism for awarding concessions in port areas.

Reform 1.1: Simplification of the procedures for an update of the strategy planning process.

Challenges: The planning documents of many Port Authorities are outdated and do not take into account the reform of the Italian port system (implemented in 2016). Only a minority of the 16 Port Authorities have drafted the Document for Strategic Planning (DPSS). The delays in the development of the strategic plans do not allow to update the individual Port Master Plans (PRPs).

Objectives: A strategic and systemic vision of the Italian port system is needed, based on an update of the Documents for Strategic Planning (DPSS) and of the Port Regulatory Plans (PRP). The DPSS defines the development objectives of the Port System Authorities; it identifies the areas dedicated to port activities and retro-port functions, the areas of port-city interaction and the last mile road and rail interconnections, as well as the crossings of the urban center. In addition, the DPSS identifies the rules and procedures for the drafting of the individual port master plans.

Implementation: The Ministry of Infrastructure and Transport will formulate a proposal to simplify the norms concerning the port planning process, in order to allow ports

to adopt and adapt their plans quickly and without procedural uncertainties. In particular, the MIT will propose some changes to the current regulatory text aimed at: (i) simplifying the approval procedures of the DPSS and better defining its contents; (ii) streamlining the approval procedures of PRPs; (iii) providing for a clear hierarchy of planning acts, avoiding the coexistence of several plans insiting on the same perimeter; (iv) rationalizing the need for variants and technical functional adjustments of the plans.

Target population: the Port Authorities.

Timeline: regulatory change by 4Q 2021.

Reform 1.2: Implementation of a regulation defining the competitive award of concessions in port areas.

Challenges: There are delays in the implementation of the 1994 reform, which foresaw the issuing of a Regulation on concessions (article 18, paragraph 1 of Law no. 84/1994). This regulation is necessary to establish the criteria and conditions for the competitive tender of concessions in ports and to allow an efficient participation of the private sector in port activities.

Objectives: The aim of the regulation is to define the conditions concerning the length of the concession, the supervisory and control powers of the conceding authorities, the renewal procedures, the transfer of the facilities to the new concessionaire upon expiry of the concession, and the identification of the minimum fees that the concessionaires will be required to pay.

Implementation: The criteria for awarding concessions are to be defined by a specific decree of the Minister of Infrastructure and Transport (MIT), in agreement with the Minister of the Economy and Finance (MEF). To date, the MIT has issued a special circular dated 5 February 2018, which established specific technical and economic criteria to be used by the conceding entities to compare applications for the granting of the concessions. These criteria have been incorporated into the regulations for the use of the maritime domain by the Port System Authorities. The finalization of the regulation on concessions however requires further iterations between MIT and MEF.

Target population: companies in the maritime and intermodal freight sector.

Timeline: To be defined.

2) Improve seaside accessibility, capacity and last-mile intermodal connections of Italian ports.

Investment 2.1: Developing seaside accessibility and resilience of port infrastructures

to climate change.

Challenges: In recent years, the Italian port system has lost market shares, especially with respect to competitors in North Africa and the East Med, in part due to lower reliability and productivity, but also due to lower maritime accessibility.

Objectives: The objective of the proposed investments is to improve maritime accessibility through strengthening and consolidation works on dykes, docks, piers and quays, thereby allowing Italian ports to adapt to the increasing tonnage of ships.

A flagship project in this regard is the one related to the port of Genoa, where the construction of a new breakwater is planned, which will allow the access of larger new generation ships, the protection of the inner port areas and the raising of the safety levels of entry and internal maneuvers. The expected increase of scale of the ships handled will allow to activate private investments on the land side and a more intensive use of the existing and envisaged operating terminals. The handling and exit of the goods will be facilitated by the fact that the port of Genoa is connected by rail to the Liguria-Alpes line.

Interventions of a similar nature are planned in the following ports:

- Vado Ligure: first phase of new dam;
- Venice: works of restoration of sea banks;
- Marina di Carrara: new waterfront;
- Civitavecchia: quay extension and new access to the historical basin;
- Naples: extension and completion of the eastern dock - extension of the duca d'aosta dam to protect the new eastern container terminal;
- Salerno: Consolidation and functional adaptation of some piers and quays - extension of Molo Manfredi;
- Brindisi: Completion of the dock in the Capobianco area and realization of dredging reaching -12 m below the sea level;
- Taranto: new breakwater for the protection of the port - eastern and western section;
- Manfredonia: deep-sea pier;
- Catania: consolidation of the breakwater;
- Palermo: consolidation of the quays south of the Piave and S. Lucia piers and adjustment of the Vittorio Veneto quay - consolidation of the breakwater Acquasanta - completion of the outer breakwater of the Arenella harbour.

Investment 2.2: Selective increase in port capacity.

Challenges: Considering the increasing size of both passenger and container ships to reach economies of scale, it is necessary to adjust the capacity of some ports, both sea-side and land-side, in terms of terminals and freight handling facilities.

Objectives: The objective of the proposed intervestments is to increase port capacity, both through dredging works and the development of new piers and/or of new logistic platforms.

A flagship project in this case is the port of Trieste, which has made strategic agreements with important European operators that project the port in the international arena. In particular, the development of the logistic platform and related retroport connections is foreseen, as well as the extension of the common infrastructures to a new area (“Punto Franco Nuovo”). In addition, preparatory works are foreseen for the development of logistic and industrial activities in the Noghere area (integrated with the building of a new port terminal), the dredging of the service channel, the connection to the road system, as well as the functional modernization of the container terminal of Pier VII.

Interventions to increase overall port capacity are also planned in the following ports:

- La Spezia: realization and electrification of the new cruise ship pier;
- Venice: Montesyndial - new container terminal;
- Ravenna: deepening of the canals to -14,50 m and construction of a treatment plant for the excavated materials;
- Naples: enhancement and upgrading of the infrastructures for passenger traffic;
- Salerno: dredging of the commercial port and of the entry channel;
- Cagliari: Works for the realization of the quays of the new Ro-Ro terminal;
- Brindisi: reclamation of land and dredging of the middle harbour;
- Trapani: Dredging works at the outer port and at areas to the west.

Investment 2.3: Last Mile Rail/Road Connections.

Challenges: Many ports in Italy lack an adequate connection with the destination/origin areas of the goods, especially via rail. This makes Italian ports less competitive in the handling of freight and increases congestion and pollution levels in urban centers.

Objectives: The objective of the proposed investments is to complete a series of last mile rail and road connections included in the document #Italiaveloce. In particular, interventions are planned in the following ports:

- Trieste: extension of common infrastructures for the development of a new area (“Punto Franco Nuovo”);
- Venice: a new railway bridge over the Western channel, and railway and road works at the node of via della Chimica;
- Civitavecchia: a connecting bridge;
- Ancona: intervention on the northern waterfront with materials of seabed excavation;
- Naples: reorganization of the last mile railway connections and of the road network;
- Salerno: interventions at the “porta ovest”.

Investment 2.4: Energy efficiency.

Challenges: The intense traffic of passengers and freight in the Strait of Messina produces a high amount of emissions.

Objectives: The proposed energy efficiency project called “Green Strait” is in line with the Recharge and Refuel flagship area indicated by the European Commission. The project will involve the ports of the Authority of the Strait (Messina, Milazzo, Villa San Giovanni and Reggio Calabria). It will encourage the energy transition of maritime mobility in the Strait, by establishing a coastal LNG depot and providing for the electrification of the quays of the ports.

Implementation: The above mentioned projects 2.1 to 2.4 will be implemented by the Port System Authorities, each according to their own timetable. They are generally works with advanced design levels and with foreseen completion by 3Q2026. In the selection phase of the ports, the MIT required a series of process and result indicators for each port (see details in Table T2). The main milestones are the finalisation of the project design, the publication of the tender for works, the awarding of the works, and the finalisation of the works. Considering that the foreseen investments are numerous and subdivided in various lots, a common and accurate monitoring mechanism will have to be established in order to follow the progress.

Target population: users of 15 Port Authorities.

Timeline: by 3Q2026.

3) Increase the digitalisation of transport and logistic services, simplifying customs procedures.

Reform 3.1: Simplification of import/export operations through the effective implementation of the “Sportello unico doganale”(Customs one stop shop)

Challenges: One of the reasons for the loss of market share of the Italian port system is that it has higher average handling costs and longer handling times compared to other European ports.

Objectives: Creation of a special portal for the “Sportello Unico Doganale”, which will allow the interoperability with national databases and the coordination of the control activities by Customs.

Implementation: based on a proposal of the Ministry of the Economy and Finance (MEF), a Presidential Decree (DPR) was prepared, defining the methods and specifications for setting up the “Sportello Unico Doganale”. In order to finalise the process, the relevant opinion of the Council of State is awaited.

Target population: users and companies in the maritime and intermodal freight sector.

Timeline: realization of the “Sportello Unico Doganale” by 4Q 2021.

Reform 3.2: Coordination of the National Strategic Platform UIRNET with the network of ports in order to activate the Port Community Systems (PCS).

Challenges: The IT systems developed by the various port authorities are not interoperable, and therefore do not allow the exchange of information necessary for the efficient management of flow of goods.

Objectives: The proposed reform has the objective to make the PCS of the individual Port System Authorities compatible with each other and with the national strategic platform UIRNET. This will allow to increase the digitization of passenger and cargo movements.

Implementation: The project will be implemented under the guidance of a steering committee established at the Ministry of Infrastructure and Transport (MIT), with the participation of representatives of UIRNET, the Port System Authorities, and of the Freight Transport categories. This steering committee will elaborate an agreement between the parties, which will outline the implementation modalities of coordination between the individual IT systems.

Target population: users and companies in the maritime and intermodal freight sector.

Timeline: by 4Q 2023.

Reform 3.3: Simplification of logistics procedures and document digitization, through the adoption of an electronic "Convention relative au contrat de transport international de marchandises par route" (CMR) to freight shipments.

Challenges: The Logistics and Freight Transportation sector is undergoing a profound global transformation due to the boom in the online sales market, which grew at an average annual rate of 22% between 2015 and 2018. The global logistics market has Asia-Pacific as the main region, followed by North America and Europe. The Mediterranean is increasing its centrality in global maritime trade, with Italy having the potential to act as a logistics hub for ships to and from the EU.

The consignment note for international transport of goods, established in 1956 by the CMR Convention (Convention des Marchandises par Route), undersigned by 58 countries, is a document that regulates in a uniform way almost all international transports and certifies their regularity.

In 2008 an Additional Protocol to the CMR Convention was signed (entered into force on

5 June, 2011), which provided for the dematerialization of the consignment note through an electronic eCMR document, with the aim of improving the quality of the distribution chain, and reducing its environmental impact by eliminating the use of paper. To date, the Protocol has been adhered to by numerous countries (including Spain, France, the Netherlands and Switzerland).

Objectives: The digitization of transport documents is a key element of the EU strategy for the mobility of goods in all modes of transport, as demonstrated by the recent Regulations 2020/1056/EU, which aims to facilitate the exchange of electronic information, and 2020/1055/EU, which introduces the possibility of using eCMR in the context of checks on road cabotage operations.

The main advantages expected from the introduction of eCMR in Italy are: - Increased security and speed of information flows; - simplification of information flows between the actors of the logistics chain; - reduction of issuing costs; - less possibility of errors and discrepancies between the versions held by the sender, carrier and recipient of the goods; - greater transparency and ease of control, through the constant monitoring of operations and the possibility of access to information in real time.

It should also be remembered that, among the "Proposals for the simplification and competitiveness of Italian logistics chain" presented a year ago by the "Consiglio nazionale dell'economia e del lavoro" (CNEL) and resulting in three specific bills (still in Parliament), there is expressly the adoption of the eCMR, as a concrete application of the dematerialization of transport documents.

Implementation: the MIT will propose a legislative measure, along the lines of those already adopted for adherence to previous protocols. Besides the DG for road transport and intermodality of the MIT, the drafting of the law should also see the involvement of the Central Committee for the Road Hauliers. The concrete implementation of the eCMR entails the definition of an agreement between the Ministry of Transport, the control bodies and the associations of road haulage companies in order to establish the objectives of the project and its operating procedures.

Target population: companies operating in the Logistics and Goods Transport sector in Italy.

Timeline: within 24 months including a pilot project within 9 months.

Investment 3.1: Digitization of the logistics supply chain

Challenges: the efficient management and sharing of traffic data and commercial information are key elements for the productivity and competitiveness of ports and related logistic systems.

Objectives: Investments in the digitalization of the logistics supply chain aim at a sig-

nificant increase in the productivity and efficiency of processes. The planned investments will allow to achieve an increase in security and data protection and contribute to accelerate the digital transition of national productive systems, with the creation of new qualified jobs.

In particular, the following types of investment are envisaged:

- Creation of dialogue platforms with customers for the management/monitoring/-tracking and bidirectional exchange for individual shipments;
- Systems to plan, schedule and optimize loads through artificial intelligence systems;
- Systems for surveys, market analysis for activity planning and price quotations;
- Systems and equipment to review and modernize the business organization;
- Connections of logistic ports of call;
- Digitization of the documentation.

Implementation: the implementation of investments in the digitalization of logistics will be led by the Port Authorities, in coordination with the logistics operators.

Target population: port users and logistics operators.

Timeline: by 3Q2026.

Investment 3.2: Digital Innovation of airport systems

Challenges: Air traffic management at airports is key to ensure safe flying conditions and to mitigate the environmental impact of air traffic. The Single European Sky ATM Research (SESAR) program aims to reduce the environmental impacts of air travel by 10 percent.

Objectives: Digital innovation applied to the aviation industry enables improved aircraft sequencing, both in the en route airspace and for airport approaches, resulting in reduced aircraft fuel consumption.

In addition, digital innovation in the sector will allow the development of new tools that enable the digitization of aeronautical information and the implementation of unmanned aircraft platforms and services. "Secure information sharing" will for example allow the connection of different operational sites of flight assistance systems, ensuring coverage of cybersecurity requirements and connecting the Air Navigation Service Provider (ANSP) with other stakeholders.

The proposed investments will concern the following macro-activities:

- Development of an Unmanned Traffic Management (UTM) system;
- Digitization of Aeronautical Information: consolidation of APP (Approach Control Service) in ACC (Area Control Center), tower automation, AMAN (Arrival Manager);

- Secure Information Sharing;
- Cloud infrastructure;
- New maintenance model.

Implementation: ENAV will implement investments in the digitalization of airport services, in coordination with the selected airports of the TEN-T network.

Target population: airport users.

Timeline: by 3Q2026.

4) Reduce GHG emissions by increasing electrification, energy efficiency and renewable energy use.

Reform 4.1: Simplify the authorisation procedures to realise the cold ironing plants

Challenges: The current authorisation procedures for the construction of energy transport infrastructures require numerous steps and timeframes that risk slowing down the development of the energy supply project to the ports. Currently, the authorisation times required are about 2 years / 2.5 years, if the interventions are not subject to an environmental assessment, otherwise the time required could be significantly longer.

Objectives: Approval of simplified procedures for the construction of energy transport infrastructures aimed at supplying electricity from land to ships. At present, depending on the required voltage levels, there are two different authorisation procedures: (i) one for works included in the National Transmission Grid (for voltage higher than 132 kV), which are subject to a single authorisation by the Ministry of Economic Development (MISE) issued in agreement with the Ministry of Environment and Territory and Sea Protection (MATTM), after consultation with the Region or Regions concerned; (ii) another procedure for works falling within the User area (voltage level lower than 132 kV): in this case the authorisation process follows the rules included in the regional authorisation procedures. For Cold Ironing projects the two authorisation procedures need to be run in parallel.

Implementation: the MISE will make a proposal to streamline the authorisation process. In particular, it will be proposed to allow that the cold ironing projects are evaluated by the territorial offices of the MISE, which could, in a shorter timeframe than the central offices, study the projects and authorise them. In addition, the establishment of a single authorisation process will be proposed, in order to exploit possible synergies. Finally, it should be clarified that the cold ironing works should not be subject to an Environmental Impact Assessment (EIA), since port facilities are sites that have already been assessed in terms of environmental impacts and can be considered to be already "infrastructured".

Target population: users and companies of the 41 ports involved.

Timeline: to be defined.

Investment 4.1: Electrification of the docks (Cold ironing)

Challenges: Maritime transport has negative environmental impacts due to the use of low quality fuels, which cause negative externalities both during navigation and, above all, when ships are stationed in the port. During the mooring phase the engines not only cause a high level of pollution and noise within the port area (with emissions of CO₂, NO_x, PM 10, PM 2.5), but also in the broader surrounding area, including eventually the urban center. At present the number of electrified docks is limited in Italy compared to other EU countries. Those that exist do not provide electricity to cruise ships, ferries or container carriers, but mainly for ship repair terminals or cranes for handling goods.

Objectives: the project provides for the electrification of docks, in line with EU Directive 2014/94 (DAFI Directive), which establishes a common framework of measures for the implementation of alternative fuels infrastructures in the European Union in order to minimize dependence on oil and mitigate environmental impacts in the transport sector. The directive foresees the completion of coastal electricity supply by 31 December 2025, giving priority to ports of the core TEN-T network. Other ports will also be considered, unless there is no demand and/or the costs are disproportionate with respect to the benefits. The proposed investment, which is in line with the national decarbonisation objectives of Italy set out in the PNIEC in the area of energy efficiency in transport, would focus on 41 ports, 39 of which are part of the TEN-T network. It consists in the implementation of a connection and network on land for the supply of electricity to ships during the berthing phase, in order to minimize the use of auxiliary engines on board, significantly reducing emissions of CO₂, nitrogen oxides and particulate matter, as well as the noise impact.

Implementation: The implementing entities are the Port Authorities, which will have to coordinate the operators along the infrastructure value chain. Ports serving the cruise ship market will be given priority, considering their greater negative environmental impacts and the fact that many of them are already set up to connect to the power grid on shore. The second phase of the plan will include ports with ferry and container ship traffic.

Target population: users of the 41 selected ports.

Timeline: by 3Q2026.

Investment 4.2: Interventions for the environmental sustainability of ports (Green Ports)

Challenges: GHG emissions in ports (and other fossil fuel pollutants) come not only from ships, but also from the air conditioning in buildings and warehouses, service vehicles (both land and maritime), cranes, and the lighting in open spaces.

Objectives: The main objective of the project is to reduce CO2 emissions and improve air quality in port areas, through interventions that improve energy efficiency and promote the use of energy from renewable sources in ports. The projects will be selected from those that the Port System Authorities have indicated in their Documents for Energy and Environmental Planning (DEASP). In particular, the main categories of interventions envisaged are:

- energy efficiency, production of energy from renewable sources (wind power on land and on breakwaters, solar photovoltaic, solar thermal) and environmental monitoring of port areas;
- purchase of electric or low-emission vehicles for use in port areas;
- replacement of non-energy efficient equipment;
- creation of infrastructure for the use of electricity on the docks;
- environmental quality monitoring systems.

Implementation: The project will be developed in the ports of the 9 Port System Authorities located in central and northern Italy. The Port Authorities in the South are excluded as they already benefit from a similar project on cohesion funds (from the PON Infrastrutture e Reti of the MIT). Many AdSPs have already drawn up their Documents for Energy and Environmental Planning (DEASPs). The DEASPs include an accurate initial snapshot of the port system's emissions, through the so-called "Carbon Footprint", in order to be able to punctually monitor the results of the interventions carried out, and to measure their effectiveness in reducing CO2 emissions. Each DEASP contains a ranking, based on a cost-benefit analysis of the interventions that the individual AdSPs intend to carry out. On the basis of these documents, the Ministry for the Environment, Land and Sea (MATTM) will select the projects to be financed, to which resources will be allocated through the signing of specific MATTM-AdSP program agreements.

Target population: users of the 9 Port Authorities of the Centre-North and neighbouring populations.

Timeline: by 3Q2026.

4. Green and digital dimensions of the component

a) Green Transition:

The EU Regulation 2020/408 establishes, as a binding objective, that at least 37% of the total budget of the PNRR must be allocated to the green transition and the challenges that derive from it.

This Action includes about 36% of the costs for the climate (see Table 1).

b) Digital Transition:

The EU Regulation 2020/408 establishes, as a binding objective, that at least 20% of the total budget of the PNRR must be allocated to the digital transition and the challenges that derive from it.

This Action includes about 9% of the costs for the digital transition (see Table 1).

Table 1

MISSIONE 3: "Infrastrutture per una mobilità sostenibile" COMPONENT 2: Intermodalità e logistica integrata	Green objectives				Digital objectives	Transition challenges	
	Climate	Environmental	Intervention field	DNSH		Green	Digital
	Tag	Tag					
<i>Investment 2.1-2.4</i> <i>Investments in development and connection of port infrastructure</i>	40%	0%	080bis	Yes	0%		
<i>Investment 3.1</i> <i>Digitization of the logistic chain</i>	0%	0%	084	Yes	100%		
<i>Investment 3.2</i> <i>Innovation and digitalization of the air space</i>	0%	0%	084	Yes	100%		
<i>Investment 4.1</i> <i>Cold ironing of ports</i>	40%	40%	026	Yes	0%		
<i>Investment 4.2</i> <i>Green Ports</i>	40%	40%	026	Yes	0%		

5. Milestones, targets and timeline

see table 2 work in progress

6. Financing and costs

Component (name)	Investment/Reform (short description or cross-reference)	Relevant time period	Total estimated costs for which funding from the RRF is requested (mn EUR)	If available: Total estimated cost by year (mn/bn national currency/EUR)							Funding from other sources (as requested by Art. 8 in the Regulation)				COFOG level 2 category / or type of revenue (if relevant, e.g. tax expenditure)
				2020	2021	2022	2023	2024	2025	2026	from other EU programmes		from the national budget	Other sources (Private)	
				mm. nat. currency		specify the EU programmes and breakdown by programme if relevant (e.g. regional operational programme)									
Investment 2.1-2.4 Investments in development and connection of port infrastructure	Priority projects - Port of Genova	2020-2026	500	0	100	240	160					800		04 - Economic affairs 04.5 - Transport	
	Priority projects - Port of Trieste	2020-2026	385.5	0	63.27	55.93	87.59	91.35	68.83	18.53	8.64	Connecting Europe Facility		279.5	04 - Economic affairs 04.5 - Transport
	Works of Seaside accessibility at ports or works on Resilience to climate change, i.e. works on piers/dams (for details per port see tables below)	2020-2026	669	1.16	101.40	114.30	186.60	156.75	71.15	27.70			102		04 - Economic affairs 04.5 - Transport
	Capacity increase of the ports (for details per port see tables below)	2020-2026	464	4.15	53.90	132.17	93.30	57.55	55.85	30.00			192.455		04 - Economic affairs 04.5 - Transport
	Works of Last mile rail/road connections (for details per port see tables below)	2020-2026	70	0	7.94	19.41	19.08	15.67	8.00	0					04 - Economic affairs 04.5 - Transport
	Investment in energy efficiency	2020-2026	50		3	7	10	10	10	10				60	04 - Economic affairs 04.5 - Transport
Investment 3.1 Digitization of the logistic chain	Implementation of the process of digitalization of national logistics through investment projects, such as the creation of platforms for dialogue and discussion with customers for management/monitoring/tracking and bi-directional exchange for individual shipments	2020-2026	233			60	60	60	53						04 - Economic affairs 04.5 - Transport
Investment 3.2 Innovation and digitalization of the air space (for details per interventions see tables below)	The project includes 10 interventions related to digital innovation applied to the air transport sector, allowing an improvement in aircraft sequencing, both in en-route airspace and in approach to airports.	2020-2026	127		38	31	29	14	11	4					04 - Economic affairs 04.5 - Transport
Investment 4.1 Cold ironing of ports	Implementation of systems for the supply of shore-side electricity to ships during the mooring phase, so as to minimize the use of auxiliary engines on board for the self-production of the necessary electricity, thus reducing CO2 emissions	2020-2026	950		70	144	234	237	200	65					04 - Economic affairs 04.5 - Transport
Investment 4.2 Green Ports	Interventions to reduce GHG emissions in national ports not included in the Cohesion Fund Project "Infrastructure and Networks" carried on by Ministry of Transport.	2020-2026	270		25	25	80	70	60	10					04 - Economic affairs 04.5 - Transport

Component (name)	Investment/Reform (short description or cross-reference)	Relevant time period	Total estimated costs for which funding from the RRF is requested (mn EUR)	If available: Total estimated cost by year (mn/tn national currency/EUR)							Funding from other sources (as requested by Art. 8 in the Regulation)				COFOG level 2 category / or type of revenue (if relevant, e.g. tax expenditure)
				2020	2021	2022	2023	2024	2025	2026	from other EU programmes		from the national budget	Other sources (Private)	
											annual currency	Specify the EU programmes and breakdown by programme if relevant (e.g. regional operational programme)			
CIVITAVECCHIA	Infrastruttura per la Mobilità	Prolungamento Banchina 13 Il lotto (Il lotto OO.SS.)	26.60		11	20	5.5					42			
	Infrastruttura per la Mobilità	Pecce di collegam. con antemurale (Il lotto OO.SS.)	10.10			1	4	5.1							
	Infrastruttura per la Mobilità	Nuovo accesso al bacino storico (Il lotto OO.SS.)	43.20			3	25	15.2							
NAPOLI SALERNO	Infrastruttura per la Mobilità	PORTO DI NAPOLI Riassetto dei collegamenti ferroviari di ultimo miglio e della rete viaria portuale	20.00		2	5	5	5	3						
	Infrastruttura per la Mobilità	PORTO DI SALERNO Lavori di realizzazione del 2° lotto del 1° stralcio dell'intervento "porto 0vest" di Salerno - integrazione finanziamento	10.00		5	5									
	Infrastruttura per la Mobilità	PORTO DI NAPOLI Interventi di potenziamento e riqualificazione delle infrastrutture del porto di Napoli destinate al traffico passeggeri	26.00	3	8	7	8								
	Infrastruttura per la Mobilità	PORTO DI NAPOLI Ampliamento e completamento della darsena di Levante	20.00		1	5	7	7							
	Infrastruttura per la Mobilità	PORTO DI NAPOLI Prolungamento diga Duca D'Aosta a protezione del nuovo terminal container di Levante - Il stralcio completamento a 900m	150.00		2	20	20	50	50	8					
	Infrastruttura per la Mobilità	PORTO DI SALERNO Prolungamento del Molo Manfredi 200m	15.00			5	5	5							
	Infrastruttura per la Mobilità	PORTO DI SALERNO Dragaggio del Porto commerciale di Salerno e del canale di ingresso - fase 2	40.00			2	8	10	10	10					
	Infrastruttura per la Mobilità	PORTO DI SALERNO Consolidamento ed adeguamento funzionale di alcuni moli e banchine	40.00			2	8	10	10	10					
SALERNO TRAPANI	Infrastruttura per la Mobilità Intermodalità e logistica integrata	nessa in sicurezza e adeguamento normativo dell'asset portuale delle banchine e accessi ad dei moli Piave e S. Lucia ed adeguamento molo banchina Vittorio Veneto - riqualificazione nodo di rete TEN T	45.00	0.9	44.1					0	0				
	Infrastruttura per la Mobilità Intermodalità e logistica integrata	nessa in sicurezza e adeguamento normativo dell'asset portuale delle banchine e accessi - molo soprattutto Acquasanta - riqualificazione nodo di rete TEN T	12.00		10	2				0	0				
	Infrastruttura per la Mobilità Intermodalità e logistica integrata	nessa in sicurezza e adeguamento normativo dell'asset portuale delle banchine e accessi - molo fornice porto Arenella - riqualificazione nodo di rete TEN T	19.00	0.1	18	0.9									
	Infrastruttura per la Mobilità Intermodalità e logistica integrata	nessa in sicurezza e adeguamento normativo dell'asset portuale - dragaggio dell'Avanporto e delle aree a posante dello spongone Ronaglio - riqualificazione nodo di rete TEN T	60.00	0.6	18.1	19.8	19.8	1.7							
RAVENNA	Hub Portuale di Ravenna Fase II (3° e 4° stralcio)	L'intervento Hub Portuale di Ravenna Fase II (3° e 4° stralcio), la cui progettazione è stata recentemente ultimata a seguito dell'aggiornamento della caratterizzazione dei fondali, è consistita nel completamento del dragaggio del porto canale di Ravenna fino a -14,50 m di profondità come previsto dal Piano Regolatore Portuale vigente (3° stralcio), nel trattamento del refluo di dragaggio in un impianto di soil washing e nella collocazione del materiale in ex cave già individuali per il ripristino ambientale (4° stralcio). Il 3° e 4° stralcio del progetto Hub portuale di Ravenna Fase II sono strettamente connessi e saranno appaltati contestualmente, ma data la loro natura, con procedure distinte: appalto di lavori su progetto esecutivo già pronto per il 3° stralcio e concessione per la progettazione esecutiva, la realizzazione e gestione dell'impianto di trattamento su progetto di fattibilità tecnico economica, anch'esso già pronto, per il 4° stralcio.	2021-2027	101.00		38.45	20.85	20.85	20.85		0				

Component (name)	Investment/Reform (short description or cross-reference)	Relevant time period	Total estimated costs for which funding from the RRF is requested (m EUR)	If available: Total estimated cost by year (m/bn national currency/EUR)							Funding from other sources (as requested by Art. 8 in the Regulation)				COFOG level 2 category / or type of revenue (if relevant, e.g. tax expenditure)
											from other EU programmes		from the national budget	Other sources (Private)	
				2020	2021	2022	2023	2024	2025	2026	municipal currency	Specify the EU programmes and instruments by programme if relevant (e.g. regional operational programme)			
TARANTO	Infrastruttura per la Mobilità	NUOVA DIGA FORANEA DI PROTEZIONE DEL PORTO FUORI RADA DI TARANTO - TRATTO DI PONENTE	2020-2026	15.76	0.16	0.1	3.45	7.85	4.2		n.a.	n.a.	-		2
	Infrastruttura per la Mobilità	NUOVA DIGA FORANEA DI PROTEZIONE DEL PORTO FUORI RADA DI TARANTO - TRATTO DI LEVANTE	2022-2026	20.00			0.15	0.15	10	9.7	n.a.	n.a.			2
ORIENTE	Infrastruttura per la Mobilità	Noghere - Logistic/industrial area	2021-2024	60.00		36	9	9	6						
	Infrastruttura per la Mobilità	Noghere - New re-convertipurpose terminal	2021-2026	45.00		5.62	5.63	11.25	11.25	5.63	5.62			981	
	Infrastruttura per la Mobilità	New Free Port - Public service infrastructure, railway upgrade and integration	2021-2026	180.00		11.65	31.3	47.14	34.1	42.9	12.91	8.54 mrd	Connecting Europe Facility		
	Infrastruttura per la Mobilità	Port 7 - Upgrade of the container terminal	2021-2025	100.50		10	10	20.2	40	20.3				189.5	
VENEZIA	Infrastruttura per la Mobilità	Nuovo ponte ferroviario in canale Ovest Realizzazione di un ponte ferroviario di collegamento diretto tra la dorsale sud-ovest del Porto e la stazione di Venezia Marghera Scalo. Tale progetto consiste in: • eliminare la doppia manovra dei convogli ferroviari sulla Stazione di Mestre; • ottenere molteplici benefici in termini di capacità e sicurezza; • ridurre il numero di interferenze tra rete stradale e ferroviaria e di ridurre i tempi complessivi delle manovre ferroviarie che interessano la parte sud-ovest del porto, ove si genera il 40% del traffico complessivo del porto stesso.	2021 - 2023	8.00		0.6	3.7	3.7							
	Infrastruttura per la Mobilità	Opere di adeguamento ferroviario a stradale del nodo di via della Chimica L'opera prevede la modifica dell'attuale tracciato ferroviario del raccordo che si porporando lo stesso a tergo del compendio Magazzini Generali ed a lato di via della Meccanica nonché il raddoppio del raccordo esistente in prosecuzione dell'esistente in via dell'elettronica. Per quanto concerne la parte stradale, l'opera prevede la modifica degli attuali tracciati per mezzo di rotatorie, sottopassi e sovrappassi sia al fine di risolvere le interferenze strada - ferrovie sia al fine della separazione di flussi pesanti e leggeri.	2021 - 2024	12.00		0	5	6	0.57					0.00	
	Infrastruttura per la Mobilità	Montesquialdi - Nuovo terminal Container Il progetto prevede la realizzazione di un nuovo terminal container nell'area ex-Montesquialdi, bene demaniale gestito dall'ASPMAS. Il terminal di Montesquialdi, in grado di avere una capacità nominale di circa 1 milione di TEU, costituisce la parte di terra del progetto più ampio denominato "Pianificazione d'altura di Porto di Venezia e l'terminal container di Montesquialdi". Il layout progettato consentirà di amare modelli operativi innovativi in linea con i più moderni standard in uso nei terminal moderni.	2021 - 2026	32.60		10	33						151.8	0.00	
	Infrastruttura per la Mobilità	Opere di ripristino marginamenti casse di ormata B L'intervento è relativo alla realizzazione di opere di marginamento da realizzare ai bordi delle Casse di Colmata A, B e D-E, lungo il canale Malamocco - Marghera. Finalizzate al consolidamento e alla protezione dei bordi stessi, attualmente interessati da fenomeni erosivi, per il ripristino morfologico della superficie originale delle Casse di Colmata attraverso opere in pali e in scaglie emerse e sommerse. Ripristino marginamento ambientale sponda nord canale sud L'intervento di ripristino del marginamento ambientale in oggetto riguarderà un tratto di circa 160 m della Sponda Nord del Canale Industriale Sud di porto Marghera. Si ipotizza di realizzare la banchina con un diaframma continuo in c.a. di spessore 100 cm di lunghezza 20-25 m dalla quota -1 m l.m.s., con una travata di coconcreto in c.a. con alla quota di sommità.	2021 - 2025	27.50		0	7	13	7	1					0.00

	Component (name)	Investment/Reform (short description or cross-reference)	Relevant time period	Total estimated costs for which funding from the RRF is requested (mn EUR)	If available: Total estimated cost by year (mn/tn national currency/EUR)								Funding from other sources (as requested by Art. 8 in the Regulation)				COFOG level 2 category / or type of revenue (if relevant, e.g. tax expenditure)
													from other EU programmes		from the national budget	Other sources (Private)	
					2020	2021	2022	2023	2024	2025	2026	national currency	Specify the EU programmes and instruments by programme if relevant (e.g. regional operational programme)				
GENOVA	New Breakwater of Genoa Port	The scope of the project is clearly indicated in the table 2 at the point 'Related reform and investment'. The project envisages the demolition of the existing breakwater protecting Sampierdarena terminals and the construction of a new breakwater 6 km long, located further offshore on depth up to 50 m. The construction typology of the structure is made of reinforced concrete caissons based on rubblemound embankment. Design is in progress and the technical and economic feasibility is nearing completion.	2021-2026	500.00	0	100	240	160				800	5.034.702,49 (risorse AdSP)				
	Nuova diga di Vado Ligure Prima Fase	L'intervento è finalizzato ad aprire la zona di imboccatura del porto di Vado Ligure per consentire l'accesso in sicurezza delle navi portacommer dirette alla piattaforma multipurpose, nonché agevolare le manovre dei traghetti e delle navi dirette al terminal Fratta Ro-Ro sulla banchina principale e sulla banchina sud-est. Sarà realizzato attraverso lo spostamento del tramo terminale della diga esistente (390 m) con successiva ricollocazione dei casconi esistenti e la realizzazione di due casconi ex novo. La lunghezza della nuova diga sarà pari a circa 450 m e costituirà la prima fase della configurazione finale prevista a Piano Regolatore.	2021-2024	45.00		18	20	7		80.000.000,00 (di cui 45.000.000,00 richiesti a valere sul RRF)		35	1.088.571,43 (risorse AdSP)				
CATANIA	Lavori di consolidamento e ripristino della metà della diga forata, rafforzamento e potenziamento della testata del Porto di Catania	L'intervento riguarda il potenziamento della mantellata esistente esterna della diga-forata del Porto di Catania al fine di garantire la sicurezza della navigazione, le manovre e l'ormeggio delle navi nell'ambito dello specchio acque portuale.	2021-2024	70.00		1	20	30	19								
CAGLIARI	Infrastruttura per la Mobilità - Lavori di realizzazione dei banchinamenti del nuovo Terminal Ro-Ro presso l'avamposto est del Porto Canale	Il Piano Regolatore Portuale ha destinato l'avamposto est del Porto Canale alla movimentazione dei trafficanti Ro-Ro, con la realizzazione di un terminal specializzato. Il progetto prevede la realizzazione di sei attracchi, i relativi piazzali di manovra nelle aree retrostanti le banchine e nell'avamposto stesso per almeno sei. I 200 stalli, il dragaggio di tutti gli specchi acque antistanti l'avamposto (per le manovre di accosto e di ormeggio) sino a -11,00 m s.l.m.m. per complessivi circa 2 milioni di metri cubi di materiale, locali a servizio degli operatori portuali e degli utenti.	dal gennaio 2021 al settembre 2026 (collaudo lavori)	100.00	0,55	1,8	10	17,65	25	25	20						
BRINDISI MANDRAGONA	Infrastruttura per la Mobilità	Porto di Brindisi. Completamento del banchinamento in zona Capobianco e realizzazione dei dragaggi ad esso funzionali sino all'quota -12 m slm.	60 mesi	20.00		0,5	0,5	19									
	Infrastruttura per la Mobilità	Molo alti fondali: ristrutturazione e rifunzionizzazione del Bacino Alti Fondali.	48 mesi	80.00		0,5	0,5	39,5	39,5								
	Infrastruttura per la Mobilità	Porto di Brindisi. Completamento dell'infrastruttura portuale mediante banchinamento e realizzazione della retrostante colmata tra il pontile petrolchimico e Costa Morena Est	52 mesi	39.32		1	17.3169	21.00		39.325 mn EURO	ammisibile PON 2014-2020						
LA SPEZIA MARINA DI CARRARA	Transizione Verde	Construction and on shore power supply equipment of the new cruise pier in the first port basin of La Spezia - Realizzazione ed elettrificazione del nuovo Molo crociera nel 1° bacino portuale della Spezia	4th quarter 2023	30.00		15	15										
	Infrastruttura per la Mobilità	Functional and environmental improvement of the port-city interface (waterfront) of the port of Marina di Carrara (Lots 1, 2 and 4) - Intervento di miglioramento funzionale ed ambientale dell'interfaccia porto città (waterfront) del porto di Marina di Carrara (Lotti 1, 2 e 4)	1st quarter 2023	10.17		5	5			2.262.553	CEF TRANSPORT	35.264					
ADSP dello Stretto	Infrastruttura per la Mobilità	Progetto STRETTO GREEN - Incentivare la transizione energetica della mobilità marittima nell'Area dello Stretto: Deposito coesivo di LNG ad elettrificazione delle banchine dei porti dell'AdSP dello Stretto	2022/2026	50.00		3	7	10	10	10	10		€ 60.000.000 (Finanziamento privato PPP)				
ANCONA	Infrastruttura per la Mobilità	Intervento lungomare nord con i materiali di escavo dei fondali marini		10.00					5	5							



Mission 4 - Education and Research

Contents

1	M4C1 - Enhancement of skills and right to study	3
2	M4C2 - From research to business	34

Mission's main objectives:



Fill the education and skill gap and improve secondary and tertiary education

Develop the growth potential of human capital and the new skills to adapt to technological and environmental challenges, with specific attention to regional gaps. Facilitate access to higher education and encourage investment in tertiary education.



Strengthen the R&D system

Support foundational research and investment in human capital to stimulate and attract scientific talent. Promote a systemic use of the leverage of public and private investments in R&D. Support IPCEI and other international initiatives.



Reinforce Private-public collaboration and support innovation through technology transfer

Promote the systemic use of research results by the economic system. Incentivize companies to strengthen the synergies with the system of fundamental and applied research, to develop and introduce new technologies in the production system. Introduce innovation ecosystems based on a network of applied research institutes, inspired by the best international practices.

Mission's financing snapshot:

M4 - Education and Research						
	Resources (euro/mld)					
	Existing	New	Total	REACT-EU	TOTAL NGEU	
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)	
M4C1 Enhancement of skills and right to study	2.99	12.38	15.37	1.35	16.72	
M4C2 From research to business	1.38	9.91	11.29	0.48	11.77	
TOTAL	4.37	22.29	26.66	1.83	28.49	

Note: (b) includes existing resources under national FSC, to be devoted to specific measures.

1 M4C1 - Enhancement of skills and right to study

1. Description of the component

Summary box

Policy area: Promotion of the right to study and the fight against early school leaving, digitization of learning processes and tools, improvement of the quality of education and training through retraining, training and selection of teaching staff, closer interaction between skills development and the needs of the productive economy, institutions and culture, policies aimed at increasing the share of young high school and Universities graduates, widespread improvement of scientific and management skills, particularly in the field of digital technologies.

Objectives: The objectives of this component, developed with single proposed projects, are articulated on three axes:

(i) Access to education and reduction of territorial gaps in the level of education quality (code ACC). (ii) STEM skills and multilingualism (code DID). (iii) Research and vocational training reinforcement (code KNOW).

Reforms and investments:

Outcome 1: Access to education and reduction of territorial gaps

Investment 1.1: Student housing (code ACC);

Investment 1.2: Scholarships and exemption from school tuition fees (code ACC);

Investment 1.3: Nursery Schools and Early Childhood Education and Care (ECEC) services Plan (code ACC);

Investment 1.4: Upgrading kindergartens (3-6 years) and "spring" classes (from 2 years) (code ACC);

Investment 1.5: Extraordinary intervention aimed at the reduction of territorial gaps in I and II cycles of secondary school. To tackle school dropout (code ACC);

Investment 1.6: Full-time School Fund (code ACC);

Outcome 2: STEM skills and multilingualism

Reform 2.1: Tertiary advanced school (University-Indire) and compulsory training for school managers, teachers, administrative and technical staff (code DID);

Reform 2.2: Reform of teachers recruitment (code DID);

Reform 2.3: Reform to strengthen STEM and digital skills in all school cycles (code DID);

Investment 2.1: Integrated digital teaching and life-long learning of school staff (code DID);

Investment 2.2: STEM skills and multilingualism for teachers and students (code DID);

Investment 2.3: School 4.0: innovative schools, wiring, new classrooms and workshops (code DID);

Investment 2.4: Teaching and advanced university skills (code DID);

Outcome 3: Research and vocational training reinforcement

Reform 3.1: Reform of the tertiary vocational training system (ITS) (code KNOW);

Reform 3.2: Reform of Technical and Professional Institutes (code KNOW);

Reform 3.3: Reform of the "Orientation" system (code KNOW);

Reform 3.4: Reform of Ph.D. Programmes (code KNOW);

Reform 3.5: Enabling university degrees (code KNOW);

Reform 3.6: University degree groups (code KNOW);

Investment 3.1: Development of the tertiary vocational training system (ITS) (code KNOW);

Investment 3.2: Active orientation in school-university transition (code KNOW);

Investment 3.3: Universities and territories cooperation for vocational training (code KNOW);

Estimated costs:

EUR 15,370 million to be covered by RRF (16,720 total NGEU)

M4C1 - Enhancement of skills and right to study

	Resources (euro/mld)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
1. Access to education and reduction of territorial gaps	1.60	7.40	9.00	0.45	9.45
- <i>Student Housing</i>	-	1.00	1.00	-	1.00
- <i>Scholarships and exemption from school tuition fees</i>	-	0.90	0.90	0.45	1.35
- <i>Nursery schools and early childhood education and care</i>	1.50	2.00	3.60	-	3.60
- <i>Upgrading kindergartens (3-6 years)and spring classes (from 2 years)</i>	-	1.00	1.00	-	1.00
- <i>Extraordinary intervention aimed at the reduction of territorial gaps in I and II cycles of secondary school and tackle school dropout</i>	-	1.50	1.50	-	1.50
- <i>Full-time school fund</i>	-	1.00	1.00	-	1.00
2. STEM skills and multilingualism	1.39	2.73	4.12	0.90	5.02
- <i>Integrated digital teaching and life-long learning of school staff</i>	0.39	0.03	0.42	-	0.42
- <i>STEM skills and multilingualism for teachers and students</i>	-	1.10	1.10	-	1.10
- <i>School 4.0: innovative schools, wiring, new classrooms and workshops</i>	1.00	1.10	2.10	0.90	3.00
- <i>Teaching and advanced university skills</i>	-	0.50	0.50	-	0.50
3. Research and vocational training reinforcement	-	2.25	2.25	-	2.25
- <i>Development and reform of tertiary vocational training system (ITS)</i>	-	1.50	1.50	-	1.50
- <i>Active orientation in the school-university transition</i>	-	0.25	0.25	-	0.25
- <i>Cooperation between universities and territories on vocational training</i>	-	0.50	0.50	-	0.50
TOTAL	2.99	12.38	15.37	1.35	16.72

2. Main challenges and objectives

a) Main challenges

Improving and qualifying the performance of the school and university systems is an essential condition for fostering smart, inclusive and sustainable growth. Italy registers high school dropout rates with important territorial differences (18,80% in the South, compared to 11,70% in the Center North - ISTAT “Italian national statistical institute” 2018 data). This is the result of regional disparities in the quality of the educational

offer coupled with differences in the socio-economic context of students. Even in higher education, dropout rates, albeit slightly down in recent years, remain among the highest in Europe, especially for students that have a technical-vocational school backgrounds. The health crisis caused by Covid-19 has amplified regional and socio-economic gaps existing in Italy, impacting on the accessibility of distance learning, with the probable consequence of greater school drop-out.

Our national education and training systems suffer from structural regional and gender disparities in school results, significant gaps in digital competences of school staff and students, underfunded and understaffed tertiary education. These deficiencies hinder intelligent, inclusive and sustainable growth, prevent the development of human capital and its access and contribution to the productive system. It is necessary to develop advanced skills and an open and dynamic culture, necessary to fully take advantage of the opportunities provided by continuous changes and new challenges related to technological and environmental evolution at national and international level.

Knowledge-based and inclusive development models require the ability to respond, and often to anticipate, a rapidly evolving demand for skills as a result of technological change and emergencies, especially the climate and health ones. In facing these transitions, in particular the digital one, the Italian productive system suffers from a weak demand for skills as well as a scarce supply. The small size of Italian companies limits their ability to interact with universities; at the same time Universities lack flexibility to engage in partnerships with private enterprises to promote research and technological transfer. These conditions add difficulties to the development of an appropriate training system, contributes to the stagnation of productivity and does not increase the ability of enterprises to innovate and compete with the evolving context, characterized by rapid technical progress.

b) Objectives

Investment in human and social capital represent an essential condition for the future of the country. Italy will undertake a strategy that aims at fighting early school drop out in the various training stages, at strengthening the conditions of equity in the education accessibility and in the perception of incentives for educational growth among all categories of the population, according to age, gender, different conditions of ability and territory of residence, overcoming the conditioning stereotypes that weigh in particular on the educational choices of women.

The component is placed in a strategic perspective, distinguished by a systemic approach that covers the entire education and training chain, through a coherent and articulated set of measures that aim at building innovative and resilient education systems for the benefit of future generations.

The goals are linked to the 3 axes in which the component is divided, which show a close coherence with the initiatives of the Commission for the creation of a European

Education Area. In detail:

- Access to education and reduction of territorial gaps (code ACC), is an intervention that aims at extending the right to study to deserving young people, who are in economic and social difficult conditions, by providing them with access to allowances, housing and tax reliefs;
- STEM skills and multilingualism (code DID), aims at improving the quality of competences offered by the educational system, with particular reference to STEM, digital and environmental skills. This axe will allow to increase the attractiveness of different training places, from schools of different levels to universities, offering the development of skills and competences in line with the priorities shared by the European Commission in the document "*Achieving the European Education Area by 2025*". This approach will include a life-long learning program for the upskilling and reskilling of teachers and other school staff, an essential element to improve and innovate the Italian education system.
- Research and vocational training reinforcement ("For a knowledge-based society") (code KNOW), will enhance the role of universities as a driving force for the widespread of knowledge and organizational models to companies and institutions. It will also contribute to strengthening professional training and to relaunching the Vocational Training Institutes (ITS), which offer significantly employment prospects (80% of graduates find work within a year). This line of action includes measures to strengthen active orientation to students in the last two years of high school, in order to increase the number of students enrolled in tertiary education and facilitate the successful completion of study paths.

3. Description of the reforms and investments of the component

1) Access to education and reduction of territorial gaps.

Investment 1.1: Student housing.

Challenges: In Italy, the participation in higher education is not widespread; the percentage of young people who decide to undertake a university course and manage to finish it, is among the lowest in Europe (27,7% of the population 25-34 years, in 2018), with stronger criticalities in some southern regions. The reasons behind this phenomenon are linked both to the accessibility of education for certain social groups and to the degree of diversification of the offered training. Indeed, in Italy the workforce with tertiary education is among the lowest in Europe (19,3% of the population up to 64 years of age against the EU average of 32,3% in 2018). This investment is closely integrated with the "Scholarships and exemption from school fees" project.

Objectives: The measure aims at ensuring a widespread access to quality education regardless of the socio-economic background of students. It aims at adding between

50.000 and 100.000 of sleeping accommodations to the current 40.000, reducing Italy's gap with the EU average (where 18% of students are provided with sleeping accommodations, against the current 3% in Italy). This result will be achieved by covering part of the cost of the residential service for 3 years, at a price that will be negotiated with the property. Students will pay part of the rent, on average equal to a quarter of the cost, but with progression mechanisms based on the Equivalent Financial Situation Indicator (ISEE) of its family of origin.

The initiative is based on the use of leverage mechanisms which generate savings or, alternatively, the possibility of satisfying a higher demand for affordable housing with equal resources committed. It is possible to finance infrastructure interventions proposed by cities by redeveloping deteriorated and unused public buildings to allocate them to student housings. The new residences activated by this mechanism would also become a driving force for the tourist enhancement of urban areas, increasing the number and the quality of accommodation in times when university attendance is not foreseen.

Implementation: The program is managed by the Ministry of University and Research. The implementation of the intervention will be accompanied by a reform of the legislative framework related to university buildings, initially on an experimental basis carried out through Ministerial Decree.

Target population: Students.

Timeline: The measures will start in 2021 and will last until 2025.

Investment 1.2: Scholarships and exemption from school tuition fees (code ACC).

Challenges: In line with the Commission's initiatives to encourage the creation of a European education area, this measures, which is closely integrated with the "Student accommodation" project, responds to the same challenges to promote the increase of tertiary education.

Objectives: This project pursues the integration of contribution policies with policies to support education through:

- no-tax area extension to students coming from families with ISEEs indicator below 23,500 euro;
- scholarships increase to 700 euros;
- scholarships funding for a larger share of members.

Implementation: The program is managed by the Ministry of University and Research. The implementation of the intervention will be accompanied by a Ministerial Decree that will reform scholarships legislation and a Ministerial Decree for the implementation of the tax fee amendment.

Target population: Students.

Timeline: The intervention will start in 2022 and will last until 2024.

Costs: The estimated cost related to the RRF is equal to 0.90 billion euro. This intervention will also benefit from additional resources (0.45 billion euro) allocated in React-EU.

Investment 1.3: Nursery Schools and Early Childhood Education and Care (ECEC) services Plan.

Challenges: For years now, Italy's has shown one of the lowest total fertility rates in the EU (1.29 children per woman in Italy compared with 1.56 in the EU) and a continuous decline in births. The gap between births and deaths is increasing: for every 100 people who die, only 67 children are born (ten years ago, the same figure was 96). Significant territorial differences remain: the drop in the population is concentrated mainly in the South (- 6.3 per thousand inhabitants) and to a lesser extent in the Centre (-2.2 per thousand inhabitants). On the contrary, the population growth process continues in the North (+1.4 per thousand inhabitants). The latest projections on the Italian population estimate a decline from 60.3 million in 2020 to 51.4 million in 2100 (Eurostat, 2019). This process is also expected to be negatively affected by the COVID-19 emergency.

The specific recommendation for Italy (CSR) in 2019 noted that in 2017 only 28.6% of children under the age of three were placed in formal early childhood education facilities. To date, the availability of places in early childhood services is on average 25.5%, 7.5 percentage points lower than the European target of 33%. Moreover, this availability varies significantly at the territorial level: only 10% of children in Calabria attends a nursery school, compared to 47.1% in Valle d'Aosta.

Family care burdens have a significant negative impact on women's employment, especially in the case of mothers of 0-3 children. In order to look after their children, 11.1% of women who have had at least one child in their lives have never worked (the European average is 3.7%). In the South, this figure becomes one in five women. Reconciling work and family life is difficult for more than a third of those in employment (35.1%) who have care responsibilities for children, both men and women. 38.3% of employed mothers result to have made at least one change to their working conditions (e.g. reduced working hours), compared to 11.9% of employed fathers. This percentage rises to 44.9% for employed mothers of children between 0 and 2 years, while for fathers with children in the same age group it is just under 13%. The birth of children also leads to interruptions in women's employment, with the percentage varying according to the number of children (11% in the case of one child; 17% in the case of two children; 19% in the case of three or more children).

Objectives: The intervention is aimed at the construction of new structures and at the

requalification of existing ones for the provision of Early Childhood Education and Care (ECEC) services, so as to reach a national average supply level of at least 55% of nursery places (children aged 0-3), with the creation of about 415,000 new places by 2026.

The achievement of this objective would allow Italy, from the current supply of 25.5%, to exceed the European average (35.1%) and be in line with other Member States such as Spain (50.5%) and France (50%).¹

The objective is considered strategic in relation to the need to:

1. promote the birth rate in the country;
2. encourage female participation in the labour market, ensuring a better work-family balance;
3. invest in the well-being and education of children in their early years, whose socio-economic return is particularly significant.

Implementation: For the purposes of the overall implementation of the project, the available resources of the Fund for nursery schools and pre-school, established at the Ministry of the Interior by the 2020 Budget Law (Article 1, paragraph 59, Law No. 160/2019), will be increased to provide additional and specific funding for the conversion or construction of new early childhood services. This will be followed by the necessary acts to:

1. define the methods and procedures for submitting requests for grants, the allocation criteria and the methods of utilisation of resources, of monitoring, eligibility and evaluation criteria (Ministerial Decree and Public Notice);
2. establish a dedicated Steering Committee, composed of the following subjects: PCM - Department for Family Policies, Department for Regional Affairs and Autonomies, Ministry of the Interior, Ministry of Economy and Finance, Ministry of Education, Ministry of Infrastructure and Transport, as well as an element designated by the Unified Conference; this will be done by Decree of the Minister for Equal Opportunities and Family;
3. select the projects received from the Municipalities, which are the beneficiaries.

Following the publication of the ranking list of those admitted to funding, the beneficiaries will activate procedures to sign the agreements and start the conversion and construction works necessary to the creation of about 400,000 additional places in early childhood services, for the achievement of the average supply level of 55% of nursery places.

Target population: Children aged 0-3; women-mothers of children aged 0-3; potential mothers; families.

Timeline: The duration of the project is estimated in 5 years (till 2026).

¹ See the latest Istat report, available online: https://www.istat.it/it/files//2020/10/REPORT_ASILI-NIDO-2018-19.pdf.

Costs: The estimated cost related to the RRF is equal to 3,6 billion euro.

Investment 1.4: Upgrading kindergartens (3-6 years) and "spring" classes (from 2 years) (code ACC).

Challenges: The demand for childhood education and care - notably in yearly childhood - does not find adequate coverage in terms of quality and quantity, with severe territorial disparities. This slows down women return to their professional life and affects the birth rate decline.

The Enforcement of the 2015 school reform, which integrated education and training system from birth to six years, is aimed at improving the coverage and reducing regional differences. The 2020 budget law and the measures foreseen in mission 5 to be financed by the RRF, strengthen the financial support for families with children in the 0-3 age group who attend an early childhood education and care facilities, nonetheless, further efforts are needed to increase services and facilities quality for children in the 3-6 age group and as well attention to the experimentation of spring classes (from 2 years), a bridge that would help to cope with the inadequate offer for early childhood.

Objectives: The investment project is aimed at the construction, redevelopment and safety of preschools, guaranteeing the quality of teaching through the innovation of the learning environments, with particular strengthening to the experimental sections "spring" (24-36 months) and the constitution of centres for children, as per the legislative decree no. 65 of 2017, by overcoming the dichotomy between early childhood education services (0-3 years) and kindergarten (3-6 years), building a unitary educational path in compliance with the specific characteristics of the two segments. An estimated 33,300 children will benefit from the new kindergartens and 62,500 children will benefit from the upgrading of existing facilities, given the average capacity of 100 children.

Implementation: The program is managed by the Ministry of Education, in collaboration with local authorities and the Presidency of the Council - Family Department.

Target population: Children aged 2-6.

Timeline: The intervention will start in 2021 and will end in 2026.

Costs: The estimated cost related to the RRF is equal to 1 billion euro.

Investment 1.5: Extraordinary intervention aimed at the reduction of territorial gaps in I and II cycles of secondary school. Tackling school dropout (code ACC).

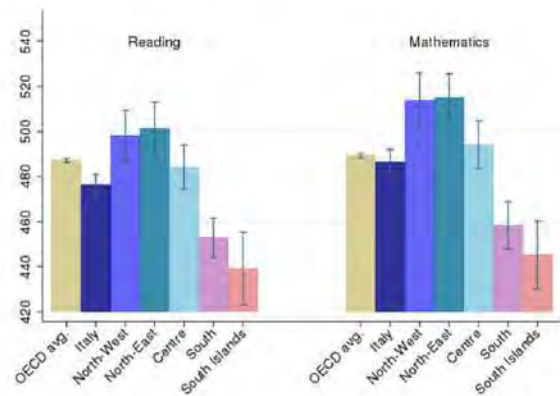
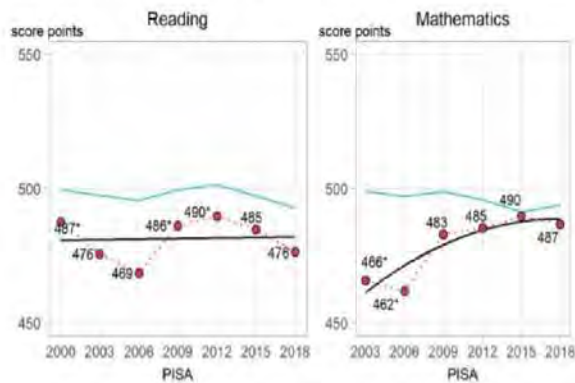
Challenges: National and international researches clearly and unequivocally show that the possession of good basic skills (understanding of the teaching language, mathematics

and English) is a very strong predictor of the educational success of young people. According to the Program for International Student Assessment (PISA), 15-year-old Italian students rank below the OECD average in reading, mathematics and science, with large territorial differences. In the North Italian student rank above the OECD average while in the South rank much lower. Similar evidence - as shown in Figure II 4.1 - occurs for Italian adults, for whom the International Assessment of Adult Skills Program (PIAAC) indicates a constant worsening of results compared to the OECD average.

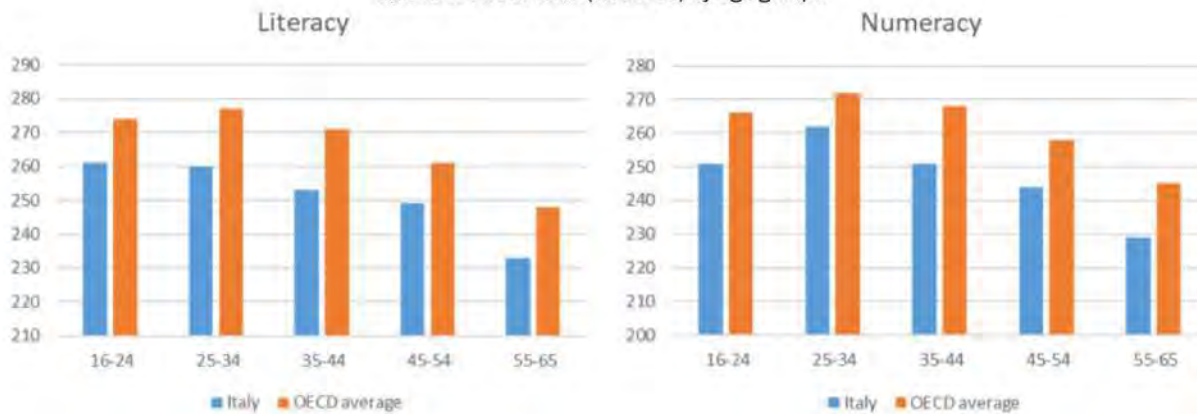
ITALY: BASIC KNOWLEDGE LEVELS IN SCHOOLCHILDREN AND ADULTS ARE WELL BELOW THE OECD AVERAGE

Results on school learning measured by OECD "PISA" tests show a gap for Italy..

... a gap that largely depends on the North-South divide in terms of educational results.



Results of PIAAC tests (2013-16) by age groups



Source: OCSE.

Although the National Guidelines for school curricula already set satisfactory targets to guarantee the achievement of these learning levels, there are still obstacles in reaching a sufficiently large share of students (potentially all students).

Another equally crucial challenge concerns the issue of early school leaving, a phenomenon that can be divided in two different cases: a) students who leave their studies prematurely already in the secondary school period and b) young people who are subject to early school leaving according to the European parameters of the ET2020 strategy (18-24 years).

a) In 2019, the Ministry of Education published the results of a survey on early school leaving according to which the average dropout rate in secondary school is around 3,8% (while it is 1,17% in the primary school). From the Ministry's (MIUR DGCASIS) survey, it is clear that where there are greater inequalities in income, a higher risk of poverty and material deprivation, the dropout rate is high. Likewise, "the inverse link between early school leaving and participation in work is evident, demonstrating the fact that low employment and social exclusion can also have negative impacts on the participation of children in education and training".

b) Early leavers from education and training, formerly referred to as early school leaver, refer to people aged 18 to 24 who have completed secondary education at the most and are not involved in further studies or training. The indicator "Early leaving from education and training" is expressed as the percentage of people aged between 18 and 24 who find themselves in this situation compared to the total population aged between 18 and 24 years; According to Eurostat, the dropout rate for Italy is 14,5%. (above the ET 2020 parameter which by 2020 should not have exceeded 10%)

Objectives: A plan is envisaged for the enhancement of basic skills which, starting from the analysis of students outcomes that shows large gaps within the Country, will be developed over 4 years with the goal of guaranteeing adequate basic skills for at least 1.000.000 students per year, also through the development of a single national portal for online training. Particular attention will be paid to schools that have experienced greater difficulties in terms of performance - thus customizing interventions on students need - where there will be a support intervention by the school manager with external tutors as well as, in the most critical cases, the availability of at least one additional staff unit per subject (Italian, Mathematics and English) and for a minimum of two years. In particular, mentoring and training actions (even remotely) are envisaged for at least 50% of teachers and the strengthening of the number of teachers (4) and experts (2) for at least 2000 schools. A pilot project to be carried out in the first semester of 2021 will be financed by the PON school funds already available.

In order to develop a strategy to structurally fight early school leaving and since the investment on basic skills is strongly linked with the need of prevention (basic skills gaps are among the main causes of early school leaving), the project also defines intervention and compensation measures. In this sense, the project includes an investment specif-

ically aimed at fighting early school leaving, promoting educational success and social inclusion, with specific programs and initiatives for mentoring, counselling and active and vocational guidance that prevent premature abandonment of studies already in the period of secondary school (about 120.000 students to be involved) and make it possible to reduce the phenomenon of early school leaving to the European parameters of the ET2020 strategy (age group 18-24, about 350.000 young people to be involved). In particular, for situation a) (age group 12-18), online mentoring will be aimed both at young people at risk and at those who have already dropped out, with a teacher / student ratio equal to 1:1 for interventions of support and recovery of learning for a total of 20 hours each (3h of mentoring and 17h of teaching). To this end, teachers from the class or school attended, or even from other schools, chosen by the children themselves, will be involved according to their willingness to take on the position. The additional commitment for teachers would be carried out beyond ordinary working hours, for a maximum of 6 hours per week, payable as additional teaching activities (with the option – depending on teachers' choices – of partial or total relief of contribution charges). As for situation b) (age group 18-24), the support activities consist of 10h of mentoring, or consulting interventions aimed at reintroducing the young person into the training circuit.

Finally, the project also aims at promoting social inclusion and ensuring Integrated Digital Education for students with disabilities or living in disadvantaged areas.

Implementation: The program is managed by the Ministry of Education; INVALSI, schools. Territorial Support Centers (Centri Territoriali di Supporto, CTS) will also be involved in the implementation of the measures for students with disabilities or living in disadvantaged areas.

The actions envisaged have a structural effect that goes beyond the time horizon of the RRF, since the reduction of the dispersion of training outcomes is achieved through the increase in the teaching and methodological skills of teachers. These skills will be consolidated within the teaching system, which will benefit permanently. The structural nature of the project is also measured by the reduction of territorial disparities in basic skills, with positive repercussions that would occur over time even at the highest levels of education

Target population: Schools, students, young people who have abandoned their studies.

Timeline: The intervention will start in 2021 and will last until 2024.

Costs: The estimated cost related to the RRF is equal to 1,5 billion euro.

Investment 1.6: Full-time School Fund.

Challenges: To be completed... .

Objectives: The "school time" will be increased to expand the training offer and to help reconcile the life and work times of families, and especially of women. This initiative is closely integrated with preschools strengthening (3-6 years) and "spring" sections (from 24 to 36 months).

To be completed...

Implementation: The program is managed by the Ministry of Education.

Target population: School students, professors, school staff and families.

Timeline: To be completed... .

Costs: The intervention is financed by RRF with 1 billion euros. Additional 300 million will be provided through PON projects.

2) STEM skills and multilingualism.

Reform 2.1: Tertiary advanced school (University - INDIRE) and compulsory training for school managers, teachers, administrative and technical staff (code DID).

Challenges: The continuous professional updating of school staff (managers, teachers and the administrative and technical staff) is crucial to ensure that the education of new generations proceeds in line with the challenges imposed by rapid changes. It is also essential for the efficiency of the overall school system. With regard to the multiple strategic and highly complex functions exercised by school managers in the context of school autonomy, they require periodic updating for the management of complex systems and emerging issues. On the other hand, teacher training constitutes the decisive lever for improving the national education and training system. Considering the rapid evolution of society, it is a priority to ensure pedagogical and didactic training which, together with in-depth disciplinary knowledge, allows to effectively address cultural and digital challenges and to provide high quality teaching. The professional condition of teachers records an inadequate enhancement of the training programs envisaged by the National Plan for Digital Schools and by the National Teacher Training Plan, a fragmentation of the training objectives and discontinuity of the training modules and, finally, low participation rate to continuous in-service training courses. Finally, the Administrative, Technical and Auxiliary Personnel (personale amministrativo, tecnico e ausiliario, ATA) suffer from the absence of a constant professional training consistent with technological progress and with regulatory changes. ATA in-service training is also characterized by an inadequate definition of the programs within the Three-year Plans of the Training offer pursuant to art. 1 paragraph 12 of Law 107/2015.

Objectives: The reform aims to build a quality life-long learning system for school staff in line with a continuous professional and career development through the establishment of a tertiary advanced school and the compulsory nature of in-service training for school

staff, linked with career progressions. Although in-service training is already mandatory under Law 107/2015, Article 1, paragraph 124, it has not been implemented as it did not provide for quantification (in terms of hours). The reform will establish the “Unità Formative” system as the subject of the specific legislative provision and of the next national collective labour agreement.

Implementation: The program is managed by the Ministry of Education. For the purpose of the reform, INDIRE - today a research body under public law, pursuant to article 19 of the decree-law of 6 July 2011, and in accordance with Article 2, paragraph 4 of the Statute, has the goal of “taking care of the in-service training of school staff, in close connection with the processes of technological innovation, through accompanying activities and professional retraining both in presence and in e-learning mode” - will perform new functions, which will require a remodulation of the three-year plan of activities referred to in Article 3 of the Statute.

Target population: School staff.

Timeline: The intervention will start in 2021; the promulgation of the law is expected in 2022; the full implementation of the reform will take place by 2025 with the finalization of the related investment project sub 8.

Costs: The estimated cost related to the RRF is equal to 0,034 billion euro.

Reform 2.2: Reform of teachers recruitment (code DID).

Challenges: The current system for new teachers’ recruitment needs a thorough review to ensure the required professionalism of school staff. The related reform will strengthen the impact of investments described above and will enable more qualified teachers to educate young people on how to face future job-related challenges. Moreover, the current selection system does not guarantee students adequate access to knowledge, relational and methodological-learning skills.

Objectives: The reform, structural in nature, aims at establishing a new system for the recruitment of teachers and has the strategic objective of improving the quality of our national education system. Particularly, in addition to the current public competition procedures, the measure foresees that aspiring teachers spend one year in further training and evaluation, and only after their successful completion the selection process will be completed. This innovative methodology will allow to recruit teachers on the basis of their level of knowledge as well as on the basis of the teaching methods acquired and their ability to relate to the educative community.

It is useful to remind that the current system already includes a sort of training and evaluation period, with methodological training on-line and educational internship, at the end of which the new teacher is merely "confirmed in the role" by the Evaluation Committee.

In this sense, the selection and recruitment phases coincide, where confirmation in the role is a pro forma procedure. The reform proposed aims instead to separate selection and recruitment. After passing the Exam Competition (selection phase), the candidate will enter the training system that will lead him, after carrying out an ad hoc course (with renewed characteristics of selectivity, also with regard to the vocational dimension to the profession) to the definitive recruitment. The methodological training path will be strengthened and at the end of the training course and only after the evaluation (by the evaluation committee at the level of the individual school institution) the candidate will be formally placed in the role.

Implementation: The program is managed by the Ministry of Education.

Target population: Teachers to be hired.

Timeline: The regulatory process will be launched in 2021; it is expected to publish the first public competition applying the innovative selection method in 2023, once the reformed law has been promulgated.

Costs: The estimated cost related to the RRF is equal to 0.

Reform 2.3: Reform to enhance teaching of STEM and digital skills in all school cycles (code DID).

Challenges: The ongoing social transformations and their repercussions on the economy require specific changes in training courses in order to structure a school capable of acting as a builder of attitudinal orientation (free from gender stereotypes), and as a key player in the national social context. According to the latest PISA report (2018) on school readiness of 15-year-old students, Italy shows significant gaps compared to the OECD average in scientific literacy (468 points vs. 491 on average), advanced critical reading skills (5% vs. 9% for all OECD countries) and financial literacy. Another gap regards gender: the average score of 15-year-old males in mathematics is equal to 494 points against 479 points for females (-16). In science, the gap is equal to 3 points (470 points for males vs. 466 for females). In relation to the future prospects of Italian top performers in science and mathematics, 26% of males and only 12,5% of females imagine themselves working in science or engineering at the age of 30, while the 10,7% of males and 22,7% of female students imagine a career in the health sector.

Italian companies demand for skilled workers is estimated in at least 469.000 people in the next 5 years. They will probably need to look at foreign markets to meet their demand for technicians and professionals in technological, scientific and economic fields. Current orientation practices are inadequate and ineffective as they are anchored to an obsolete vision of work. The system suffers an overall difficulty in creating enough technological and social innovation, and adequate training in the scientific field. The lack of STEM

and digital competences, for which Italy is among the European countries with the worst results, constitutes one of the main limits for the Country's development and for its recovery from the current crisis.

Objectives: The regulatory reform intervention consists in the integration, among curricular disciplines, of activities, methodologies and contents designed to develop and strengthen - with a full interdisciplinary approach - STEM, digital and innovation skills, for all school cycles, starting from kindergarten to secondary school. The reform aims at guaranteeing equal opportunities in terms of access to scientific, technological, engineering and mathematical careers.

Implementation: The program is managed by the Ministry of Education.

Target population: Male and female students.

Timeline: The intervention will start in 2021 and the legislative act is expected to be promulgated in 2022; the full implementation of the reform will take place with the finalization of the related investment project 11 described below.

Costs: The reform costs are equal to 0.

Investment 2.1: Integrated digital teaching and life-long learning of school staff (code DID).

Challenges: The continuous professional updating of the entire school staff (managers, teachers and the administrative and technical staff) is crucial to ensure that the training of new generations proceeds in line with the challenges imposed by rapid changes - not only technological - as well as for the efficiency of the overall school system. The challenges that the investment project wants to meet are therefore those already indicated in the related reform project sub 7 (Tertiary advanced school (University - INDIRE) and compulsory training for school managers, teachers, administrative and technical staff).

Objectives: The project envisages the creation of a system for the continuous professional development of all school staff with targeted training interventions for 300.000 recipients, based on a survey of their professional updating needs. In particular, training actions are envisaged for teachers, school managers, administrative and technical staff. The project is also aimed at implementing a digital system for the recording of experiences and training activities (professional portfolio) and creating of a balance of skills and training actions for improvement. All the 8.000 schools on the national territory will be involved in the project and will implement the training activities envisaged by the national planning. The digital system sofia.istruzione.it will allow the monitoring and national governance of the project.

Implementation: The program is managed by the Ministry of Education in collabora-

tion with schools.

Target population: School staff.

Timeline: The intervention will start in 2022 and will last until 2025.

Costs: The estimated cost related to the RRF is equal to 0,42 billion euro.

Investment 2.2: STEM skills and multilingualism for teachers and students (code DID).

Challenges: The challenges that the investment project takes up are those already indicated in the related reform project sub 2.3), with a focus on multilingualism, an equally strategic challenge for new generations to fully achieve a European citizenship, promoting intercultural contamination through the mobility of students and teachers. The National Institute for Documentation, Innovation and Educational Research (INDIRE) has allocated approximately 38 million euros for the in-service training of school staff and approximately 90 million euros for partnership projects between schools for students' mobility in the framework of the current Erasmus 2014-2020 program. This allocation covers only about 40% of the demand. On the other hand, the Erasmus+ Program represents an excellent investment in human capital with a relatively fast "return" for society. All the surveys and analysis in recent years show that those who participate in this project acquire skills that can be rapidly used in their careers. For example, an impact study conducted by the European Commission in 2019 shows that 80% of university students with international mobility experiences are able to get a job within 3 months of graduation. The same study reveals that 40% of students who did an Erasmus traineeship received a job offer from the host company, while 75% developed a strong spirit of self-employment and therefore the idea to start a business.

Objectives: The intervention consists in the integration, among curricular disciplines, of activities, methodologies and contents designed to develop and strengthen STEM, digital and innovation skills, in all school cycles, starting from kindergarten to secondary school, and with a full interdisciplinary approach. The intervention aims at guaranteeing equal opportunities and gender equality in terms methodological approach and STEM orientation activities. This initiative aims to encourage up-skilling and re-skilling processes in digital education and to the full integration of such methodologies in current school curricula:

- "Digitalisation and Innovation", for the development of computer science skills that are necessary for the school system and play an active role in the transition towards jobs of the future;
- STEM, for the development of training programs and a culture oriented to scientific disciplines (science, technology, engineering and mathematics) especially for female students in order to promote equal opportunities in sectors still characterized by

male over-representation.

Another objective is the activation of skills development/enhancement program, in cooperation with the business sector, in order to support teachers and schools in the training and research activities for improving the students' educational and employment success rate.

Furthermore, a national program for sustainable orientation is envisaged to bridge young people's expectations to socio-economic transformations, promoting equal opportunities in terms of access to scientific careers.

Finally, the project aims at strengthening multi language skills in students and teachers through a series of actions. Among these, a widening of consulting and information programs on Erasmus+ with the support of the Erasmus+ National Institute for Documentation, Innovation and Educational Research (INDIRE) and its ambassadors' network. In particular, the project is expected to pursue:

- activation of courses to increase language skills for students through curricular activities for kindergarten, extra-curricular activities for primary school and lower secondary school and a period of study abroad for students of the upper secondary school (through an initial grant of scholarships for the first year);
- the internationalisation of the Italian school system by investing in incoming mobility;
- language and methodological courses for teachers.

A digital system will be developed to monitor language skills at national level with the support of respective certifier entities.

Implementation: The program is managed by the Ministry of Education, in cooperation with the Department for Equal Opportunities of the Presidency of the Council of Ministers for the reinforcement of STEM and digital skills and the orientation activities for young women. In the implementation phase, schools will also be involved. As for the strengthening of multi language skills, the National agency INDIRE will be involved.

Target population: Schools, students and teachers.

Timeline: The intervention will start in 2022 and will last until 2025.

Costs: The estimated cost related to the RRF is equal to 1.1 billion euro.

Investment 2.3: School 4.0: innovative schools, wiring, new classrooms and workshops.

Challenges: Text... .

Objectives: The intervention aims at promoting and enhancing school digitalization, creating innovative learning environments, digital upgrading of school organization, in-

cluding wiring of school in order to improve connectivity, the supply of innovative and advanced tools in classrooms for digital teaching; in secondary schools, it is foreseen the activation of workshops for new professions connected with artificial intelligence, robotics and digitalization, also favouring the collaboration between public and private sectors. The intervention will be designed to reduce territorial gaps in the access to technologies by all school institution.

Implementation: Text... .

Target population: Text... .

Timeline: Text... .

Costs: The estimated cost related to the RRF is equal to 2.1 billion euro.

Investment 2.4: Teaching and advanced university skills (code DID).

Challenges: Emerging economic and social challenges for the future (primarily, environmental sustainability and digital diffusion) require adequate training courses consistent with the skills demanded by society and the labour market. In this perspective, Italian universities and the education system, in general, must be the driving force for the widespread adaptation of knowledge and organisational models to the continuous advancement of technology.

In line with the initiatives to contribute to the creation of a European education area and with the Action Plan for digital education (2021-2027), measures aimed at rethinking education and training for the digital age, at encouraging international openness and cooperation, and at promoting the dissemination of the culture of innovation, assume particular importance.

Objectives: The project aims at qualifying and innovate university (and doctoral) programs, through the levers of a) digitisation; b) “culture of innovation”; c) internationalisation, acting:

- on the promotion of open-access digital training courses of excellence, synergistic between universities and businesses;
- on strengthening the role of Superior Graduate Schools for high-merit and cutting-edge training in a new dimension of strong collaboration with universities and the business world, contributing to the dissemination of the culture of innovation;
- on the strengthening of scientific cooperation, on the circulation and attraction of talents, stably structuring training programs abroad, defining programs to support strategic partnerships to innovate the international dimension of the Italian university system, funding initiatives for the internationalisation of research.

Implementation: The program is managed by the Ministry of University and Research,

which will constitute a control room for the effective management of the sub-measures, enhancing the synergies.

Target population: Students, university.

Timeline: The intervention will start in 2021 and will last until 2026.

Costs: The estimated cost related to the RRF is equal to 0.50 billion euro.

3) Strengthening research and vocational training.

Reform 3.1: Reform of the tertiary vocational training system (ITS) (code KNOW).

Challenges: The Vocational Training Institutes, (*Istituti Tecnici Superiori - ITS*), structured as “Participatory Foundations”, create forms of integration between public and private resources (private companies constitute over 43,1% of the associate partners) and are very relevant in decentralised governance contexts, universities / scientific and technological research centres, local authorities, schools and training systems highly specialised technical and technological training. The ITS activate job-oriented tertiary courses to train technicians who manage highly complex systems and processes, mostly digitised, paying particular attention to the integration between design, technologies and organisation, in six articulated areas: Energy efficiency; Sustainable mobility; New technologies of life; New technologies for the Made in Italy (Business services, Agri-food system, Home system, Mechanical system, Fashion system); Innovative technologies for cultural heritage and related activities; Information and communication technologies. The ITS are distinguished from other educational channels as they are mainly focused on employment opportunities, being able to guarantee to the 83% of their graduates a job one year after graduation (92% of cases compatible with the followed curriculum) linked to the real demand of the labour market (ITS national monitoring, Indire 2020). They represent a different training model capable to intercept the real need for new competences required by the production system. They offer teachers with direct experience in the labour market (70%), internships (43%), hours of theory carried out in business and research laboratories (25,5%). With educational modalities (locations and timing) designed according to the technological areas. ITS graduates particularly appreciate these courses, even though data on ITS enrolments (7.831 enrolled in courses launched in 2019, Indire) show that the goal of structuring a reliable channel of vocationally oriented tertiary education, competitive with the University, remains to be achieved. Often despite high demand from the labour market, the “technical training” option appears to be a second choice. Alongside this critical element, there is one more factor: to date, 11% of ITS seem to need improvement actions; some of them fail to provide educational paths continuously, thus giving families an image of an unstructured training channel. ITS have always obtained a negative result in the 2015-2020 monitoring and given their location and structural difficulties, they are more exposed to the social and economic impact of the crisis.

Objectives: The reform is intended to strengthen the tertiary vocational training system by extending the organisational and teaching model to other training contexts (supporting the training offer, introducing rewards and widening the paths for the development of enabling technological skills - Enterprise 4.0). It will also put Vocational Training Institutes in the legal system of job-oriented Tertiary Education and rebalance the quality of the connection with the entrepreneurs' network in the regions.

Implementation: The program is managed by the Ministry of Education.

Target population: Vocational Training Institutes (ITS), students.

Timeline: The process will start in 2021; the Promulgation of the rule is expected in 2022. The implementation is linked to the investment project 15.

Costs: The estimated cost related to the RRF is equal to 0.

Reform 3.2: Reform of Technical and Professional Institutes (code KNOW).

Challenges: The current system of Technical and Professional Institutes offers training programmed which are now obsolete with the needs of the labour market, as well as disconnected from the territories. As a consequence, the social and economic impact of the crisis is deepened by an insufficiently prepared human capital unable to face the challenges of the labour market and to contribute to the Country's development and innovation.

Objectives: The reform project of the Technical and Professional Institutes aims to invest in human capital in a targeted and specific approach tailored to the geographical, economic and social conditions of the territory, with direct short- and long-term benefits on the country's growth potential, as well as the promotion of new entrepreneurial settlements, to foster employment and development. The reform aims at orienting Technical and Professional institutes towards the innovation output of the National Industry 4.0 plan as well as the profound digital innovation in place in all sectors of the labour market. The high quality of the offered curriculum will encourage the graduates' employability thanks to the adoption and harmonisation of training programmes according to the needs of each territory and the labour market.

Implementation: The program is managed by the Ministry of Education.

Target population: Technical and Professional Institutes.

Timeline: The process will start in 2021; the Promulgation of the rule is expected in 2022. Full implementation is expected in 2025 through accompanying actions.

Costs: The estimated cost related to the RRF is equal to 0.

Reform 3.3: Reform “Orientamento” (code KNOW).

Challenges: According to UNICEF’s October 2019 report, based on ISTAT data, in Italy of young adults in the 15-29 years age class, 2,116,000 are NEET (*Not in Education, Employment, or Training*), equal to a share of 23.4% of young people present on the territory (in Sicily the share is as high as 38.6%, in Calabria 36.2% and in Campania with 35.9%). Among the more than 2 million NEET, 38% are aged 20 to 24 years².

In this context, “Orientation” is not only just a tool for managing the transition between school, higher education and labour market but also a lasting value in the life of each person, ensuring development and support in decision-making processes to promote active employment, economic growth and social inclusion.

Objectives: The regulation will introduce orientation modules - not less than 30 hours per year - in upper secondary schools (for students in the IV and V years) in order to promote increased levels of education. It will also create a digital orientation platform, related to the tertiary educational offer of Universities and Vocational Training Institutes (ITS), easily accessible by young students. The proposal favours the growth potential by targeting the most fragile front of the young population, subject to the risk of dispersion and unemployment in the future, preventing the NEET phenomenon. The proposal also promotes growth potential by investing in the creation and development of human capital in line with the actual demands of the labour market.

The proposal goes in the direction of supporting other investments in a strategic approach (to fight early school leaving and gender gap in STEM disciplines, to strengthen ITS, ecc..).

Implementation: The program is managed by the Ministry of Education.

Target population: Students in the iv and v year of upper secondary schools.

Timeline: The process will start in 2021; the Promulgation of the rule is expected in 2022.

Costs: The estimated cost related to the RRF is equal to 0.

Reform 3.4: Reform of university degree groups (code KNOW).

Challenges: Society and economic trends show that the current disciplinary classifications are obsolete and that in various scientific fields the prevailing organisational models of universities and institutions is inadequate. The growing complexity requires constant assessment between different disciplines, and the new educational paradigms should en-

² In details: 49% of them have obtained a secondary school diploma, while 40% have completed a lower cycle of education while 11% hold a university degree.

hance more advanced, transversal and multidisciplinary skills.

Objectives: The reform foresees the removal of constraints in the definition of credits to be assigned to the different disciplinary areas, in order to allow the construction of teaching systems that strengthen multidisciplinary skills, on digital technologies and environmental field, as well as on soft-skills. The reform will also be extended to job-oriented degree classes.

Implementation: The program is managed by the Ministry of University and Research.

Target population: University professors, researchers and students.

Timeline: The reform will be implemented through D.M. to be adopted in 2021, for the application of updated teaching regulations starting from the academic year 22/23.

Costs: The estimated cost related to the RRF is equal to 0.

Reform 3.5: Reform of Ph.D. Programmes (code KNOW).

Challenges: An economy and a society built on knowledge imply an enhancement of the role of the Ph.D. programme, that must provide an adequate training to undertake a university career or high-level activities in firms or public institutions. Ph.D. graduates need to contaminate the ruling class of the Country, in the private and in the public sector, stepping out of the boundaries of the academic world, promoting knowledge and expertise spill-over which are usually built in the university environment, contributing to the capabilities of the productive system to innovate and compete.

Objectives: The reform will update the regulation on Ph.D. programmes, simplifying the procedures for the involvement of companies, research centres, national and international, in Ph.D. programmes. The proposed reform has clear integrations with all the investments related to Ph.D. programmes in the target domain “Education and research”.

Implementation: The program is managed by the Ministry of University and Research.

Target population: University professors, researchers and students.

Timeline: The reform will be presented with the Ministerial Decree, which is currently under preparation, and ultimate in 2021, becoming effective for the cycles that will start in 2022.

Investment 3.1: Development of the tertiary vocational training system (ITS) (code KNOW).

Challenges: The proposed project allows full implementation of the xiv) reform to strengthen the education offer of Vocational Training Institutes, inspired by models es-

tablished in other European countries. By working in networks with companies, universities/scientific and technological research centres and local authorities, the education and training system will reduce Italy's significant backlog in non-academic tertiary training, as will reduce the mismatch between the demand and the supply of work that is at the root of much youth unemployment.

Objectives: The project intends to increase the educational offer of Vocational Training Institutes, enhancing their supplies and logistics needed and increasing the participation of the enterprises in the educational processes. In particular, the project aims at significantly increasing the number of ITS and at strengthening laboratory structures (introducing innovative technologies 4.0); it will also invest in enriching teachers' competences. The goal is to increase the number of enrolled students in ITS (+100% min-currently there are 15.000) and consequently the number of graduates (currently 8000 per year). Furthermore, it is foreseen to activate a national digital platform that allows students to know the job offers for those who obtain a professional qualification. The proposal helps to reduce the skills mismatch, by offering training opportunities with high standards and adapted to the promotion of the competitiveness of the country's economy in relation to the innovations of Enterprise 4.0 and the twin transitions. The implementation of new training courses and the dissemination of innovative training model would also enhance a fully specialized training chain linked to the Energy 4.0 and Environment 4.0 areas and therefore functional to the adaptation of 4.0 skills to strategic development sectors.

Implementation: The program is managed by the Ministry of Education with Vocational Training Institutes for its fulfilling.

Target population: Vocational Training Institutes (ITS), young people, students.

Timeline: The intervention will start in 2021 and will last until 2025.

Costs: The estimated cost related to the RRF is equal to 1.5 billion euro.

Investment 3.2: Active orientation in school-university transition (code KNOW).

Challenges: In line with reform 3.3, it is appropriate to implement actions of active orientation to connect youngsters with the academic world, also through the reinforcement of specific teachings, to increase the awareness as well as the motivation to grasp economic and social opportunities of higher education.

Objectives: The project aims at elevating the transition from secondary school to university and, at the same time, tackling university dropouts in the following years, contributing to laying the foundations to reach the strategic goal of increasing the number of university graduates. The measure contributes to the qualification of the education system through a rise in the success indicators (school attendance, improvement of learning

levels, number of students admitted to the following academic year, etc.).

Implementation: The program is managed by the Ministry of University and Research.

Target population: Students.

Timeline: The intervention will start in 2021 and will last until 2026.

Costs: The estimated cost related to the RRF is equal to 0,25 billion euro

Investment 3.3: Universities and territories cooperation for vocational training (code KNOW).

Challenges: Reduce the skill mismatch, favouring the alignment between the supply of taught skills and the skills demanded by enterprises: according to the JRC, Italy is among the countries that risk the most to face future imbalances between demand and supply of advanced digital skills; according to the Confindustria forecasts, the ICT, chemical and mechanical sectors are those in which new jobs will be created in the coming years.

Increase graduates with STEM skills: according to Eurostat data, compared to the EU average, Italy reports a lower percentage of graduates in science and engineering - 12,2 % compared to 15,5 % - whereas ICT graduates account for only 1 % of the total number of graduates, compared with 3,6 % at EU level). To this end, it is crucial to break down the barriers that currently limit the percentage of women enrolled and to complete training in technical and scientific disciplines.

Objectives: The project aims to implement a vocational training program, which foresees the construction of partnerships on a regional basis with universities' contributions and local branches of professional associations. Increasing the supply of job-oriented degrees is crucial. The gap between our country and the European average is determined by the percentage of the population with tertiary qualifications compared to the total population aged 25-34.

Each region will be able to manage different job-oriented degrees in different classes, according to the specialisation of the local enterprises. Cooperation on a regional basis may include the participation of Vocational Training Institutes and the creation of educational programs in synergy with exchange mechanisms and integrated training courses.

Implementation: The program is managed by the Ministry of University and Research.

Target population: University.

Timeline: The intervention will start in 2021 and will last until 2026.

Costs: The estimated cost related to the RRF is equal to 0,5 billion euro.

Investment 3.4: Enabling university degrees - Reform (code KNOW).

Challenges: Few young people, having completed their schooling, decide and have the opportunity to continue investing in themselves, pursuing a university degree. In addition to accessibility conditions (see investments 1.1 and 1.2), the barriers are also linked to attractiveness: the perception of the usefulness of acquiring a university degree in terms of better job opportunities and more active participation in social and cultural spheres it is also influenced by the complexity of the process of entering the labour market, making the investment fruitful.

Objectives: The reform foresees the simplification of the procedure to activating the exercise of professions, harmonising the final degree examination e national examination, thereby simplifying and speeding up access to the labour market for graduates.

Implementation: The program is managed by the Ministry of University and Research.

Target population: University.

Timeline: The intervention, already applied to some professions, will be completed by 2021 through a legislative provision and extended to interested graduates starting from 2022.

Costs: The estimated cost related to the RRF is equal to 0

4. Green and digital dimensions of the component

a) Green Transition:

The Commission Regulation (proposal) No 408/2020 that establishes the Recovery and Resilience Plan sets a binding goal on each Plan, which has to include a minimum of 37% of expenditure related to climate.

The investments in the educational offer of transversal skills, in particular in the environment and sustainable development domain, represent the condition to support the transition process of the economy and the society towards the goal of climate neutrality. The planning of the three pillars on which the component is built shows clear coherence with this goal, above all in the areas concerning teaching enhancement and vocational training reinforcement.

b) Digital Transition:

The component is built on the awareness that the digital transformation keeps on accelerating through the development of emerging technologies, with the consequent challenges that result from it: disinformation and marginalisation of the most vulnerable groups, because of the strong gap in the technological integration for education purposes, in the provision of infrastructures and in the availability of digital skills registered on the

territory and in the society.

From this perspective, the planning on which the component is structured is focused on the promotion of digital transformation skills development: digital literacy, strengthening of competences, and tools and methods of education are topics that go through and characterise the component.

Table 1

Work in progress

Table 2

Work in progress

6b. Method of estimating costs

1.1) Student housing.

The value of the investments is based on an estimation of the average annual cost per assigned sleeping accommodation being equal to 4.000 euro (which corresponds to $\frac{3}{4}$ of the average annual fee, of 5.500 euro per year, thus assuming that the remaining $\frac{1}{4}$ is borne by students).

1.2) Scholarships and exemption from school tuition fees.

The costs of the first sub-measure are estimated thanks to the distribution of students by the Equivalent Financial Situation Indicator (ISEE) of the family of origin. Extending the no-tax area to 23,500 euro of ISEE and providing a progressive contribution up to 30,000 euro of ISEE, creates an annual cost, caused by the non-payment of the tuition fees to universities, of 195 mln euro even after considering the average increase of students stimulated by this measure, in the first three years. The estimated costs, for a period of three years, is equal to 585mln euro.

The costs of the second and third sub-measures are estimated on the basis of the percentage of regular students who are awarded a scholarship, as well as the average amount of the scholarship. In order to reach the average European level of regular students who are awarded a scholarship (equal to 20%) and to take the average amount of scholarships to 4,000 euro per year (with an increase of 700 euro), it is calculated an annual cost of 252 mln euro, which amount to 756 mln euro in three years.

1.3) Nursery Schools and Early Childhood Education and Care (ECEC) services Plan.

The estimated cost is 3.6 billion Euro.

1.4) Upgrading kindergartens (3-6 years) and “Spring” classes (from 2 years).

The estimated costs of 1 billion Euro start from the following assumption:

- average cost for a new building: 1,5 mln
- average cost for a reconversion/upgrading of an existing facility: 0,5 mln
- average number of children in a school: 100

Using 50% of resources for new facilities (tot. 333) and the other 50% for upgrading (tot. 625), the total number of interventions achievable is 958, with an impact on 95,800 children.

1.5) Extraordinary intervention aimed at the reduction of territorial gaps in lower and upper secondary schools (A). Fight against school dropout (B).

The intervention costs are estimated in the following way:

- Video production, platform for education management and online tutoring: €10,000,000.00
- Online tutor: €2,000,000.00
- 4 additional teachers (on average) for about 2,000 schools (average cost €30,000.00); total annual €240,000,000
- 2 experts for 2,000 schools (average cost €10,000.00); total annual = €40,000,000.00

In addition to these costs, there are others which are specific to the intervention (B), estimated in the following way:

- Equipment and Licences for 6,000 schools: €4,000 per school = €24,000;
- For the target a) additional teaching hours €35 (gross cost State €46.45) + Additional hours functional to teaching €17.5 (State gross cost €23.23) x 120,000 students x 20h of intervention (tutoring learning recovery and learning recovery) of which:
 - 120,000 students x 3h x 23.23 = €8,362,800
 - 120,000 students x 20h x 46.45 = €94,758,000
 - Total for one year = €103,120,800
 - Total for two years = €206,241,600
- For the target b) additional hours functional to teaching €17.5 (State gross cost €23.23). 350,000 youngsters x 10h of intervention (tutoring) x €23.23 = €81,305,000;
- 3,500 post-diploma courses for a maximum of 100 youngsters each (x 200 cad.) €70,000,000;

Training intervention for the teaching personnel €1,000,000 Total for 2 years €141,000,000

- Intervention for accessibility (Sign Language, Braille, subtitling): €500,000;
- Operating expenses Territorial Support Centers (Centri Territoriali di Supporto, CTS), with a number of 3 seconded operators (i.e. 6 in partial exemption);

35,000 x 3 = 105,000 euro per year for each CTS

Annual expenses for 106 CTS = 11,130,000

1.6) Full-time School Fund

The estimated cost is 1 billion Euro

2.1) (Reform) Tertiary advanced school (University – INDIRE) and compulsory training for school managers, teachers, administrative and technical staff.

The estimated costs of the tertiary advanced school have been calculated by considering 100 university professors at the average cost of €50,000. giving a total of €5,000,000 per year for a period of 5 years.

The operating expenses including the offices, fees, utilities, personnel costs of Boards, President, General Manager, and 15 administrative employees amount to €1,000,000 per year.

The first year, besides the €6,000,000 of the necessary costs for the operations, also €4,000,000 for the furniture startup, €2,000,000 for the preparation of educational workshops, and €2,500,000 for other technological equipment (distance learning platforms, computer equipment, etc.).

2.1) Integrated digital teaching and life-long learning of school staff.

The estimated total cost is equal to €420 mln, of which 10 mln are intended for the training of school managers, 290 mln for the training of teachers, 127 mln for the training of the administrative and technical staff (Personale Tecnico, Amministrativo e Ausiliario, ATA), and 3 mln for the platform of the professional portfolio and open badges management. These costs, which will allow for the training of 1.000.000 people among school managers, teachers, and administrative staff, are going to be managed by the Central Administration through calls for tenders at public evidence and School-Centers (Scuole Polo) for training, as well as individual scholastic institutions.

2.2) (Reform) Teachers recruitment.

The cost is equal to 0.

2.3) (Reform) STEM and digital skills in all school cycles.

Reform at 0 cost.

2.2) STEM skills and multilingualism for teachers and students.

The estimated total costs include the following costs concerning the STEM domain:

- €40,000,000 for teachers training;
- activation costs of experimental projects on 61,100 classes (€91,650,000);
- costs related to the update of teaching equipment on 309,000 classes (€463,500,000), to the implementation of the digital platform supporting the training of teachers and teaching activities (€8,850,000);
- costs related to promotion and orientation actions intended for upper secondary schools which are oriented towards the STEM domain as well as towards university education and tertiary vocational training, for both students and families (96,000,000).

The reasonings that underlie the costs are mainly linked to:

- the number of classes of lower and upper-secondary school (about 370 thousand)
- the cost of training 100,000 teachers considering 60 hours annually on average (integrated online and in presence) of groups of 30 teachers, with the involvement of universities (€8,000 for 5,000 courses = €40,000,000)
- the budget assigned for the implementation of the compulsory STEM and information technology projects in each class (about €1,800 per project on average)
- the budget assigned for the implementation of projects related to the orientation for the development of STEM and information technology skills in each school, with particular emphasis on the equal opportunity guarantee (about 11,000 euro for each of the 8,000 schools on average).

In terms of the multilingualism scope, it should be noted that the National Institute for Documentation, Innovation and Educational Research (INDIRE) has allocated on the Erasmus 2014-2020 programme a total of 38mln euro for the training in service of the school staff and about 90mln euro for partnership projects between schools with students mobility. This has allowed satisfying about 40% of the request. In addition to the budget necessary to cover 100% of the request, also the budget for curricular and extra-curricular courses for students needs to be considered.

2.3) School 4.0: innovative schools, wiring, new classrooms and workshops.

To be defined.

2.4) Teaching and advanced university skills.

The volume of the total investments of the sub-measures, of which the project is made, is based on the following estimates:

- cost of Ph.D. scholarship equal to €150,000;
- cost of the analytical project for the continuous digital training, the activation of 5 teaching-learning centres and 4 Digital Education Hubs, based on previous or analogous experiences;
- analytical project of enhancement of superior graduate schools equal to 25 mln per year;
- analytical project for 10 initiatives of transnational education 10 mln/initiative = 100 mln;
- analytical project for the support to strategic partnerships to innovate the international dimension of the Italian university system and a programme to support Italian universities that are part of the European University Alliances recognised by the EU: 5 mln/year;
- analytical project for the internationalisation of research, in collaboration with the Conference of Italian Universities Rectors (CRUI) as well as other European institutions: 16 mln/year.

3.1) (*Reform*) of the tertiary vocational training system (ITS) (code KNOW).

The reform costs are equal to 0.

3.1) Development of the tertiary vocational training system (ITS) (code KNOW).

The total estimated cost is composed as follows (to review according to new budget):

- xxx€ to increase the number of enrollments (+ 100% min) and graduates
- xxx€ for instrumental equipment
- xxx€ for the fund for rewarding and monitoring
- xxx€ for training, network management and cross-border mobility

The reasonings that underlie the costs are mainly linked to:

- The current number of Vocational Training Institutes ITS (104), with 3.536 graduates in 2018;
- Confindustria's 2020 analysis, based on Istat and Unioncamere data, estimates that almost 13.000 technicians are required by enterprises graduate from Vocational Training Institutes (ITS);
- Current costs. The standard cost of a Vocational Training Institute (ITS) course is 330,000 euro. The average class of a Vocational Training Institute is formed of 22 students. The average cost of a graduate is therefore around 15,000 euro;
- For the estimate of the costs for infrastructural equipment, it is possible to see the funding already provided by the MISE for the current year aimed at improving the infrastructural equipment of the tertiary vocational training system. The MISE has awarded 15 million euro with an estimate of the minimum cost for each ITS of 400,000 euros (Law no. 160 of 27 December 2019, Article 1, paragraph 412);
- The current Rewarding Fund (Fondo per la premialità) and the relative monitoring (provided by article 1, comma 875, of Law n. 27 of December 2006, n. 296) has at its disposal about 13 mln euro per year to be delivered on the basis of national monitoring actions, and to be increased coherently with the assumed rise of students. In addition, the cost for the implementation of the national monitoring of the Vocational Training Institutes (ITS) (agreement of State-Regions Conference – Conferenza Unificata - of August 5, 2014, and applied for the first time in 2015, with the Agreement in State-Regions Conference n. 133 of December 17, 2015, the appropriate changes have been adopted to the monitoring system as an effect of the indications included in article 1, comma 45, of Law n. 107 of July 13, 2015) for the evaluation of the achieved results and the consequent assignment of the reward need to be considered;
- In the 104 Vocational Training Institute (ITS) there are currently 104 directors, about 200 course coordinators, and 7,000 teachers; the increase in the number of coordinators and teachers will be in line with the expected increase in the number of students. The directors and coordinators of the courses are expected to have 25 hours of training per year equal to the minimum level of training required (for a module in teacher training) to ensure the diffusion of the service innovation and uniformity. The cost of one hour of training is estimated at 60 euros per hour. For teachers, training modules of 9 hours a year are planned. The cost of one hour of training remains unchanged at 60 euros per hour;
- For each of the 104 Vocational Training Institute Foundations, there is a part-time “network animator”;
- It is assumed to offer cross-border mobility for one month to 10% of the total number of students; 6-day mobility is also provided for course directors and coordinators (daily cost €160).

3.2) (Reform) of Technical and Professional Institute (code KNOW).

The reform costs are equal to 0.

3.3) (Reform) of "Orientamento scolastico" (code KNOW).

The reform costs are equal to 0.

3.2) Active orientation in school-university transition (code KNOW).

The value of the investments is estimated by assuming that the courses will be held in presence to groups of 20 students on average. Each course would have a duration of 30 hours, with an hourly cost of €100. Furthermore, specific projects are foreseen to lead female students (250.000) to STEM disciplines with seminars and short meetings (about 4-5 hours).

3.3) Cooperation between Universities and territories on vocational training (code KNOW).

The value of the investments is calculated assuming an annual cost per student of €2,000 based on the analysis of previous trials of job-oriented degrees held in universities in recent years.

3.4) (Reform) of Ph.D. Programmes (code KNOW).

The reform costs are equal to 0.

3.5) (Reform) enabling university degrees (code KNOW).

The reform costs are equal to 0.

3.6) (Reform) University degree groups (code KNOW).

The reform costs are equal to 0.

2 M4C2 - From research to business

Summary box

Policy area: Promotion and strengthening of basic and applied research, research plans and infrastructures for strategic challenges, technology transfer.

Objectives: The objectives of this component, developed with individual proposed projects, are articulated on two axes:

- a) Strengthening the R&D chain and support IPCEI initiatives ("Research is the future") (code RES), raising the growth potential of the economic system, through a systemic use of the leverage of investments in R&D, taking into account the territorial differences and the type and dimensions of enterprises. The expected repercussion is an increase in the volume of public and private investment in research and innovation and the improvement of the resilience and economic and environmental sustainability of the R&D development processes.
- b) Technology transfer and supporting innovation ("For widespread innovation") (code INN), encouraging - with public and private investments - the systemic use of research and innovation results by the economic system. The expected results consist in a more effective level of collaboration between the public scientific base and the business world and in the development of researchers' skills - especially in the field of digital technologies, environmental transition and management models.

Reforms and investments:

Outcome 1: Strengthening Research and Development and IPCEI initiatives.

Reform 1.1: Implementation of R&D support measures;

Investment 1.1: Partnerships extended to universities, research centres, companies and funding of basic research projects;

Investment 1.2: Funding projects presented by young researchers (code RES);

Investment 1.3: Agreements for Innovation (code RES);

Investment 1.4: Initiatives based on the IPCEI model. Partnerships in research and innovation (code RES);

Investment 1.5: New Research Projects of Significant National Interest (code RES);

Investment 1.6: Fund for the National Research Programme (NRP) (code RES);

Investment 1.7: Fund for research infrastructures and buildings (code RES).

Outcome 2: Transfer of technology and support for innovation.

Investment 2.1: Strengthening research structures and supporting the creation of "national R&D leaders" on some Key Enabling Technologies (code INN);

Investment 2.2: Strengthening and sectorial/territorial extension of technology transfer centers by industry segments (code INN);

Investment 2.3: Establishing and strengthening of "innovation ecosystems", building "territorial samples of R&D" (code INN);

Investment 2.4: Introduction of innovative doctorates that respond to the needs of innovation and promote hiring of researchers by companies.

Estimated costs:

EUR 11,290 million to be covered by RRF (of which 1,380 million are referred to ongoing projects).

	Resources (euro/mld)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
1. Strengthening R&D, and IPCEI initiatives	1.38	5.91	7.29	-	7.29
- Partnerships extended to universities, research centres, enterprises and funding of research projects	-	1.61	1.61	-	1.61
- Funding projects presented by young researchers	-	0.60	0.60	-	0.60
- Agreements for Innovation	-	0.70	0.70	-	0.70
- Initiatives based on the IPCEI model. Partnerships in research and innovation	-	1.00	1.00	-	1.00
- Fund for the National Research Programme (NRP)	0.45	0.40	0.85	-	0.85
- New Research Projects of Significant National Interest	0.35	0.60	0.95	-	0.95
- Fund for research infrastructures and buildings	0.58	1.00	1.58	-	1.58
2. Transfer of technology and support to innovation	-	4.00	4.00	0.48	4.48
- Establishing and strengthening "innovation ecosystems", building "territorial samples of R&D"	-	1.30	1.30	-	1.30
- Strengthening research structures and supporting the creation of "national R&D leaders" on some Key Enabling Technologies (Agritech, Fintech, IA, Hydrogen, Biomedics)	-	1.60	1.60	-	1.60
- Strengthening and sectorial/territorial extension of technology transfer centers by industry segments	-	0.50	0.50	-	0.50
- Innovative doctorates that respond to the needs of enterprises and promoting hiring of researchers by companies	-	0.60	0.60	-	0.60
- Doctorates and researchers on green and innovation technologies	-	-	-	0.48	0.48
TOTAL	1.38	9.91	11.29	0.48	11.77

2. Main challenges and objectives

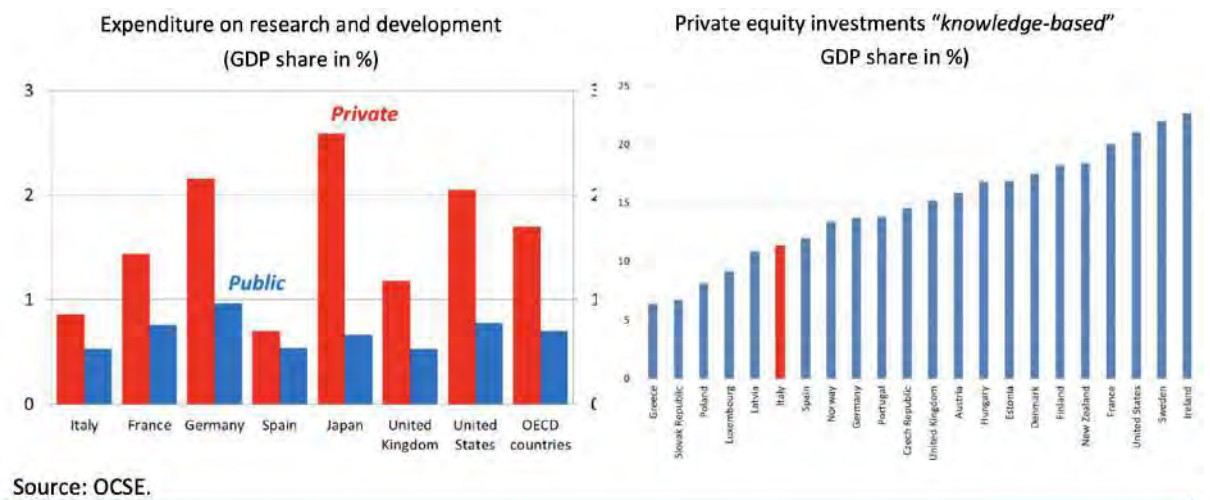
a) Main challenges

Italy needs to strengthen the conditions to develop a knowledge – based economy, competitive and resilient. The country will act on the basis of a systemic approach that foresees the increase of investment in R&D. This component responds to the main challenges highlighted below:

- Low level of R&D spending. Italy registers a low intensity of R&D expenditure

compared to GDP (in 2018 equal to 1.4%) much lower than the OECD average (2.4%), in both public and private sector. Public R&D spending has declined since 2013 and reached 0.5% of GDP in 2018, the second lowest level among the EU-15 countries. The level of private R&D spending, although increased in recent years, remains significantly below the EU average (1.41%). The increase of public and private investment in R&D is a crucial condition to recover the gaps in productivity levels.

ITALY SPENDS TOO LITTLE ON R&D AND "KNOWLEDGE BASED" CAPITAL



- Availability of human capital. An important barrier to the development and competitiveness of the Italian economic system is the limited availability of competences: the number of public and private researchers is lower than the average in other advanced countries (the number of researchers per active person employed by companies is only half of the EU average: 2.3% versus 4.3% in 2017). Italy must stop the consistent and lasting loss of scientific and technical national talents, that move abroad to more attractive European and international systems, bringing along the result of investments in higher education made in their country of origin.
- Reduced demand for innovation. In Italy, the reduced demand for innovation and for highly qualified human capital is mainly due to: the prevalent specialization of the productive system in traditional sectors; the typically small or medium size of Italian enterprises, resulting in a greater propensity to contain costs; a limited innovation culture. The use and enhancement of the scientific and technological base available is therefore limited: the volume of research developed in the public R&D system and financed by private companies (as a percentage of GDP) remains distant from the EU average. In 2019 only 2% of Italian publications were public / private co-publications compared to 4% in the EU.
- Integration of research results into the production system. The scarce qualification of skills and the limited resources available to the structures responsible for

technology transfer prevent the successful collaboration between academies and industries. This is another element that limits the potential to use and enhance the scientific and technological base available. Moreover, Italy suffers the absence of a comprehensive network of centres dedicated to technology transfer and a systematic connection of such centres with the frayed production system.

b) Objectives

The component aims at substantially resolving the 2019 and 2020 country-specific recommendations for Italy, which suggest to strengthen and give continuity to R&D policies, through the support of public and private investment, the diffusion of innovative technologies, the strengthening of skills, thus supporting and promoting the transition towards a knowledge-based economy.

The component intends to promote the fundamental levers of research and innovation to develop the country's economic growth potential and shape a more resilient and sustainable development path. The lines of actions foreseen aim at contaminating and enriching the business environment with the results of R&D activities (carried out by public and private research centres, in an integrated way), at facilitating the application of technologies, in particular by SMEs, and at connecting companies to strategic value chains at European and international level.

Italy can count on competitive advantages based on a widespread and consolidated presence of industrial realities and research of excellence on cutting-edge technologies, especially in the areas of robotics and automation, health, materials, design, construction, energy and agro-industry.

However, the propensity to invest in R&D is still limited, and this holds back the competitiveness of the business system and the ability to transform the scientific basis into economic value (so-called "European paradox"). This is particularly evident for some types of enterprises (SMEs) and in some areas of the country.

The approach developed in this component is based on a limited number of priorities, well interlinked projects and the development of skills in line with the needs expressed by different sectors of the economy. This approach should: i) guarantees coherence and critical mass to the interventions, ii) gives continuity to support policies, iii) avoids dispersion of resources and fragmentation of priorities.

The component involves the entire supply chain process, and aims at filling the geographical gaps attributable to the weakness of the business context in the South and its low demand for innovation. The objectives are connected to 2 main axes in which the component is divided:

- funding programs (joint public - private) for basic and applied research projects, (code RES), periodically defined under a unitary governance, with the aim to raise

- the level of competitiveness of companies and of public and private research centres;
- strengthening technology transfer mechanisms (code INN), encouraging a systemic use of R&D and innovation results, acting jointly on the demand and on the supply side (in the sense of a greater qualification of the structures), and developing adequate and new skills, especially in the field of digital technologies, environmental transition and management models.

3. Description of the reforms and investments of the component

1) Strengthening Research and Development and IPCEI initiatives.

Reform 1.1: Implementation of R&D support measures.

Challenges: One of the main challenges concerns the governance mechanisms to support of R&D investment and make its policies effective. It must generate a significant impact on the productive and research fabric, ensure coherence and critical mass to interventions and avoiding dispersion and fragmentation of priorities.

Objectives: The systemic approach to support R&D activities will be strengthened with a model based on a few horizontal missions, with aggregated and integrated interventions to support the entire supply chain (technological poles and research infrastructures, scientific and technological skills, companies). This approach will overcome the actual logic of mere redistribution of resources and will ensure continuity in the financing of initiatives. This action will be accompanied by the simplification of process related to the management of funds devoted to public-private research activities. The Ministry of Universities and Research will also introduce new operating models that will be defined on the basis of good practices in other countries (e.g., Fraunhofer Institute in Germany).

Implementation: The Ministry for Universities and Research and the Ministry of Economic Development will be responsible for this reform. An Interministerial control room will be established with an Interministerial decree that will set the simplified disciplines for the management joint R&D activities.

Target population: Universities, research centres, businesses.

Timeline: The intervention will be completed in 2021.

Investment 1.1: Partnerships extended to universities, research centers, companies and funding of basic research projects.

Challenges: The new development models require an ever-closer interaction between the world of research and the world of production, and innovations must serve as an opportunity for the development and not as a cause of decline of our companies. Such challenges

requires the evolution of research strategies, the increase of research competitiveness, and the contribution of research to social and economic well-being.

Objectives: This line of action, which is closely integrated with the initiatives to support the research supply chain, aims at financing 10 major research and innovation programs carried out by widespread networks of public and private subjects. Such actions will contribute to strengthen national technology chains and promote their participation in European and global strategic value chains. The program will promote the aggregation of small and medium-sized enterprises around large private players and public research centres; it will encourage collaborative and complementary research activities. R&D projects also involve investments by universities in new positions of fixed-term researchers: they will increase their skills while implementing the research activities envisaged by the projects.

In addition, the National Research Plan (NRP) will contribute to strengthen the national country system in the European and global dimension.

Implementation: The program is managed by the Ministry of University and Research. The measure is closely integrated with the reform indicated in point ii) Implementation of R&D support measures. The programme is closely integrated with the NRP: once the missions are defined, working groups will be set up to define, for each mission, a roadmap of objectives.

Target population: Universities, research centres, enterprises, researchers.

Timeline: The intervention will start in 2021 and will last until 2026.

Investment 1.2: Funding projects presented by young researchers(code RES).

Challenges: Filling the gap in advanced skills is one of the essential conditions to recover the scarce productivity of the Italian economy: in this perspective contribution of ideas and energy of young researchers becomes crucial.

Objectives: The project - strongly inspired by the European ERC starting grant, in the Excellent Science pillar of the Horizon Europe program –finances research activities managed independently for 5 years by young researchers, who will immediately gain a first experience of research responsibility. It also includes a program of short mobility for research or teaching activities in other locations in Italy or abroad.

Implementation: The program is managed the Ministry of University and Research. The measure is closely integrated with the reform indicated in point ii) Implementation of R&D support measures.

Target population: Researchers.

Timeline: The intervention will start in 2021 and will last until 2026.

Investment 1.3: Agreements for Innovation (code RES).

Challenges: Italy lacks integration of financial instruments to support investment along the entire research and development chain; it also needs to simplify the procedures to make financial instruments accessible to companies and to invest in capacity building of enterprises in the use of financial resources.

Objectives: The intervention will support the implementation of research and development projects and the introduction of high-profile innovative solutions, through the collaboration of technology transfer centres, research and knowledge widespread bodies, in line with the Transition Plan 4.0 and with the National Smart Specialization Strategy (SNSI). The facilities, intended for companies of any size, are aimed at supporting the creation of new products, processes or services and at the significantly improvement of existing ones, through the development of innovative technologies. This intervention strengthens the diffusion of digital technologies in the productive system.

Implementation: The program is managed by the Ministry of Economic Development. The intervention is based on a negotiated evaluation procedure and resumes some successful schemes already adopted by the Ministry of Economic Affairs in previous actions. It is closely integrated with the reform indicated in point ii) Implementation of R&D support measures.

Target population: Research centres, enterprises.

Timeline: The intervention will start in 2021 and will last until 2026.

Investment 1.4: Initiatives based on the IPCEI model. Partnerships in research and innovation code RES).

Challenges: The relaunch and recovery, when they have characteristics of economic resilience and sustainability, are linked to the need to position the country on the strategic European value chains, safeguard the knowledge, raise the level of investments and services for research and development of new technologies, contaminate the productive system with the results of R&D activities by facilitating the application of technologies by SMEs.

Objectives: The project has a twofold objective. First: to support and strengthen the strategic value chains in Italy, in close synergy with the European strategic planning and agendas. The IPCEIs bring together knowledge, skills, financial resources and economic actors from across the Union, to overcome serious systemic or market failures and respond to social challenges that cannot be met otherwise, in the areas that cover the

digital and green dimensions, showing clear integrations and synergies with the PNRR missions "Digitalization, innovation, competitiveness" and "Green revolution and ecological transition".

It aims at supporting research, development and innovation projects identified with specific calls, in collaboration with EU counterparts. This also promotes the participation of Italian firms in research and innovation partnerships (European Partnerships) within the framework of the Horizon Europe program.

Implementation: The program is managed by the Ministry of Economic Development. The measure is closely integrated with the reform indicated in point ii) Implementation of R&D support measures – Reform.

Target population: Research centres, enterprises.

Timeline: The intervention will start in 2021 and will last until 2026.

Investment 1.5: New Research Projects of Significant National Interest (code RES).

Challenges: The national research system lacks interactions between universities and research bodies and this limits the Italian participation in initiatives under the European Union's Framework Programme for Research and Innovation.

Objectives: A new lever of Research Projects of Significant National Interest to fund three-year projects that, due to their complexity and nature, require the collaboration of research units belonging to universities and research organizations. These projects - which intend to promote curiosity-driven research activities, both fundamental and oriented - are selected on the basis of the quality of the scientific profile of those responsible, as well as the originality, methodological adequacy, impact and feasibility of the research project.

This type of activity stimulates the development of initiatives promoted by researchers, towards frontier research, and a stronger interaction between universities and research institutions. This should encourage the participation in initiatives under the European Union's Framework Programme for Research and Innovation.

Implementation: The program is managed by the Ministry of University and Research.

Target population: Universities; Public Research Centres; researchers.

Timeline: The new call issued in autumn 2020 provides for the activation of a single funding procedure with annual opening windows for the submission of research projects for the years 2021 and 2022.

Investment 1.6: Fund for the National Research Programme (NRP) (code RES).

Challenges: Italy faces the need to strengthen interactions between universities and research bodies and encourage participation in initiatives under the European Union's Framework Programme for Research and Innovation.

Objectives: The Fund will support scientific research measures set out in the National Programme for Research (NRP) 2021- 2027 in such a way as to ensure the implementation of the strategic lines in the field of scientific research in coherence with the EU Framework Programme for Research and Innovation. The Fund will finance collaborative projects between public research centres, companies and other institutions, which are coherent with the approach introduced by the new Horizon Europe Research Framework Programme

Implementation: The program is managed by the Ministry of University and Research.

Target population: Universities, Public research institutions.

Timeline: The implementation passes through competitive calls, according to the scheme of European research and innovation projects, or in response to call for proposals setting out the objectives of the projects to be financed, within the framework of the various measures identified.

Investment 1.7: Fund for construction and research infrastructure (code RES).

Challenges: The evolution of economic systems towards knowledge-based development paradigms involves the strengthening of research infrastructures, by favouring their integration into the productive and research tissue.

Objectives: The Fund is aimed at building research infrastructures in public research institutions or strengthening the existing ones. The Fund will be activated in synergy with measures related to "innovation ecosystems" and national thematic networks (see measure "national R&D leaders"), strengthening them through the provision of research infrastructures. The fund will promote the lever of private investment, thanks to mechanisms that will strengthen the profitability of research infrastructures, especially in the strategic areas of technological innovation.

Implementation: The program is managed by the Ministry of University and Research. Implementation phase foresees a strict integration with the programme devoted to the creation and enhancement of "innovation ecosystems".

Target population: Research infrastructures.

Timeline: to be developed

2) Transfer of technology and support for innovation.

Investment 2.1: Strengthening research structures and supporting the creation of "national R&D leaders" on some Key Enabling Technologies (code INN).

Challenges: Italy needs to strengthen research infrastructures, spread an entrepreneurial culture, promote programs at universities and research centres that encourage the creation and development of research spin-offs. Integrating the use of advanced technologies (e.g. robotics and automation) and emerging technologies - such as artificial intelligence, high-performance computing, cyber security - into production processes is an essential condition to strengthen the competitiveness of companies and increase employment opportunities. These technologies can find application in areas where social challenges are growing (digital transition, health, climate change) and are integrated, in a matrix approach, with the missions that inform the strategic system.

Objectives: The measure aims at financing the creation of at least seven research centres on as many strategic issues. The investment will also be directed to strengthening the hardware and software infrastructure at the disposal of highly qualified personnel. These centres - which will arise from the collaboration between universities, research institutes and companies - will have a national scope with a technological and/or thematic declination, consistent with the priorities of the European agenda and the contents of the PNRR. In this first phase the following centres have been identified:

- National Centre for Artificial Intelligence for research, innovation and technology transfer of excellence at national and international level. The Institute includes a High-Performance Computing Infrastructure (HPC) focused on edge computing and embedded AI aspects, a priority for the Italian production system.
- National Centre for High Technology Environment and Energy. Development of technologies for environmental management and renewable energy.
- National Centre of High Technology quantum computing. HPC Centre of Excellence for Advanced Simulation and Big Data, aimed at developing a new generation of numerical applications.
- National High Technology Centre for Hydrogen Technology development supporting the energy transition to hydrogen.
- National High Technology Centre for Biopharma for the development of research and applications in the world of Bio engineering and pharmaceuticals, linking intersectoral technologies and multidisciplinary experiences.
- National Agri-Tech Centre, to encourage innovation and development of the Italian agri-food sector to which universities and research centres will contribute, as well as other state structures to promote private investment in research. The Agri-Tech Hub will be based in Naples and will include several cutting-edge laboratories and infrastructures dedicated to research and experimentation of technologies in the agri-food sector.

- National Fintech Centre, to foster innovation and development of the financial and economic market in a digital key, which will be based in Milan. In addition to the Bank of Italy, which will operate through the FinTech channel and as a coordination and direction centre for various activities, universities, research centres and large financial industry operators will contribute to the hub.

The measure will reinforce synergies with the Horizon Europe research program.

Implementation: The program is managed by the Ministry of the University of Research and the Ministry of Economic Development. The measure will be accompanied by a reform jointly implemented, to define the governance and management of the centres. The measure is closely integrated with the reform indicated in point ii) Implementation of R&D support measures – Reform and with the programme dedicated to the creation and enhancement of "innovation ecosystems".

Target population: Universities, research centres and companies.

Timeline: The intervention will start in 2021 and will last until 2026.

Investment 2.2: Strengthening and sectorial/territorial extension of technology transfer centres by industry segments (code INN).

Challenges: The range of technological skills present in private and public research structures is very broad in Italy; however, the degree of collaboration between companies and the research system is limited, and it is mainly a prerogative of medium-large companies. In this perspective, especially for SMEs, it becomes necessary to rationalize and strengthen the system of specialized centres and structures, and to simplify access and exploitation of skills and technologies.

Objectives: The measure foresees a process of reorganization and rationalization of different centres (Competence Centres, Digital Innovation Hubs, Digital Innovation Points) carried out to offer advanced technological services to companies. In detail, investments will be allocated to the following types of structures:

- Competence Centre: on the basis of the national specializations emerging from the National Intelligent Specialization Strategy, it is planned to activate 10 to 15 centres (indicatively on green technologies, “precision agriculture”, technologies for sustainable construction, sectoral applications of artificial intelligence, etc.). The aim is to strengthen the system of competence centres – in the framework of the Transition 4.0 strategy (see Mission 2) - also through the aggregation of existing research, transfer and innovation centres. The centres will be in charge of providing companies with advanced technological services (e.g. test before investing) and innovative services, on the model of the European Digital Innovation Hubs.
- DIH network, Pid and more: the aim is to create a first level connection between

the business system/supply chain and the skills and supply system, through the stimulus and the self-assessment of businesses on their level of digital intensity.

- Local / territorial innovation hubs: technology transfer centres in the cities undergoing 5G trials, namely Turin, Rome, Catania, Cagliari, Genoa, Milan, Prato, Modena, L'Aquila, Bari and Matera. New centres - besides those already financed - could be created on projects presented by municipalities also with the aim to regenerate abandoned industrial areas, or prevent depopulation of "inner areas".

Implementation: The program is managed by the Ministry of Economic Development. The measure is closely integrated with the reform indicated in point ii) Implementation of R&D support measures - Reform

Target population: Technology transfer structures.

Timeline: The intervention will start in 2021 and will last until 2026.

Investment 2.3: Establishing and strengthening of "innovation ecosystems", building "territorial leaders of R&D" (code INN).

Challenges: Innovation must be conceived as a real ecosystem that must include advanced training and laboratories, created in partnership with private companies. They must be able to exploit and enhance the skills of researchers, otherwise attracted by appealing employment opportunities abroad. The scarce presence of business incubators in Italy limits the transition of innovation from the research field to that of enterprises. Italy needs to strengthen the training mechanism, through collaboration with the productive world, widening the opportunities to develop initiatives promoted by dynamic young people. The challenge is therefore to be able to count on locations, the ecosystems of innovation, where these components coexist, influence and stimulate each other, fuelling the circulation of ideas, energies and resources to the benefit of research development and its positive effects on business environment and on the society.

Objectives: The project, which is inspired by some successful experiences (such as, the university campus of the Federico II University in San Giovanni a Teduccio), is centred on public research bodies.

Innovation ecosystems are physical places of contamination between universities, research institutions, companies and local institutions; their activities are related to higher education, applied research, innovation, on specific technological areas, defined on the basis of the specialization of the territory.

The innovation ecosystems will have a regional or multiregional dimension and their scope will be defined on the basis of:

- 1. Scientific excellence of universities and institutions.

- 2. Specialization of the Region, that will host the initiatives.
- 3. Involvement of large companies as well as SMEs.
- 4. Availability of local institutions to support the initiatives.
- 5. National and international relations with other centres of scientific excellence, which will become available for collaboration.

Planned activities, to be carried out, are related to:

- Training activities
 - Academy in collaboration with companies: training courses built ad hoc for the training needs of companies, in order to bridge the mismatch of skills. The training courses will be characterized by a large flexibility in the definition of: content of training (free from the scientific-disciplinary sectors), teachers (coming from academia or the business world), approach in teaching (innovative teaching, support of digital systems, groupwork, etc.), criteria and method to select students (tests, entry, interviews, etc.), duration of training courses, integration into the companies.
 - Industrial doctorates, with the involvement of companies, aimed at conducting research activities functional to their innovation challenges.
- Applied research activity. Innovation ecosystems will host research infrastructures that can be used by companies and research groups in a stable and continuous way (also hosting operational units of companies) as well as open-labs or joint laboratories with companies. The infrastructure will also support the transfer of research activities to the market, i.e. initiatives to create new spin-offs and innovative start-ups.
- Support to new start-ups, through the incubation of research spin-offs and the contribution of venture capital operators.
- Involvement of communities as well as local institutions, to strengthen the engagement of citizens on issues related to innovation, the sustainability of social and economic development and the importance of skills and scientific culture.

Implementation: The program is managed by the Ministry of University and Research. The measure is closely integrated with the reform indicated in point ii) Implementation of R&D support measures. Implementation phase foresees a strict integration with the “Fund for construction and research infrastructure” as well as with the project “Strengthening of research structures and creation of "national R&D leaders" on some Key Enabling Technologies " and other measures of the Plan devoted to the creation of innovation ecosystems (see Missions 5 and 6).

Target population: Universities, research centres, enterprises.

Timeline: The intervention will start in 2021 and will last until 2026.

Investment 2.4: Introduction of innovative doctorates that respond to the needs of innovation by enterprises and promote hiring of researchers by companies (code INN).

Challenges: The current difficulties, exacerbated by the pandemic, call for a reconfiguration of the higher education and research systems of the Country. This perspective includes interventions aimed at increasing the opportunities to access most advanced skills, share basic transversal ones (related to digital technologies and environmental transition), promote active interaction with the productive world.

Objectives: This line of action aims at enhancing high-profile skills, especially in the KET's areas, through:

- the establishment of dedicated PhD programs, with the contribution and involvement of companies, also encouraging the creation of research spin-offs.
- incentives for companies to hire junior precarious researchers.

The establishment of PhD programs dedicated to industry activities and the tertiary sector is envisaged, with three cycles of 5,000 places per year. Private companies, SMEs in particular, will contribute and be actively involved through the establishment of cooperation networks. The program will be supported by a series of measures to streamline procedures: start of the courses, cooperation with companies in the management of the courses, with the involvement of research bodies.

This line of actions will also build a mechanism to cut the tax wedge for the recruitments of researchers with at least three-year experience in non-permanent positions in the university (e.g. PhD, scholarships, grants, RTDA). This measure will benefit workers and employers, and will be proportional to the length of experience gained in the academic world, with up to 10 points of reduction of the wedge per year of academic career. In the three years, the measure may concern up to 20,000 workers.

Implementation: The program is managed by the Ministry of University and Research. The measure foresees the creation of an hub aimed at supporting the technology transfer from the research field to the real economy and the economic enhancement of researches produced by doctorates, in order to allow some of the PhD researchers to become entrepreneurs or, alternatively, to enhance their research activity in favour of new start-ups created by third parties. The measure is closely integrated with the reform indicated in point ii) "Implementation of R&D support measures", and with the doctoral reform proposed in the second component of the mission statement.

Target population: Researchers.

Timeline: The intervention will start in 2021 and will last until 2026.

4. Green and digital dimensions of the component

a) Green Transition:

The Regulation (proposal) COM (2020) 408, which establishing the Plan for Recovery and Resilience, sets a binding target for each Plan, which must include at least 37% of climate spending.

R&D Investments represent an essential lever in the transition process of the economy towards development paradigms oriented towards environmental sustainability, contributing significantly both to the improvement of the company's performance and to the introduction of useful solutions to reduce environmental impacts in society consumption habits.

In this perspective, there are many projects placed within the three axes in which the component is articulated. In fact, the strengthening of the R&D chain involves themes (innovative materials, energy, construction) that have a strong environmental impact. Similarly, investments in structures that enhance technology transfer mechanisms intercept certain areas (hydrogen, energy, environment) that contribute significantly to the green transition. Finally, investments in strengthening skills and supporting public demand (mobility, recycling of waste) are oriented towards issues that are broadly matched to green issues.

b) Digital Transition:

The digital transition - and the resulting impact on the field of work, business and education - takes on a necessary central role in the component, as this transition must be accompanied, encouraged and supported by massive investments in research and innovation. Such investments are a necessary condition for creating skills and shaping processes that steer the economic and social system towards a digital future, facilitating the implementation of technology in business processes, without relegating it to the role of a commodity (you buy, you assemble, you use) but holding together the processes, organisation and technologies.

The essential leverage of digital can be considered, however, only if the radical change of business strategies will be accompanied by massive investment in skills. In such a perspective the investment of the component shows a close integration with the contents of the component. In detail, the link can be traced in all three axes in which it is articulated if we consider that the digital transition:

- is one of the priorities for R&D support,
- represents an architrave of the technology transfer strengthening mechanisms: DIH, skills centre, Key Enabling Technologies on which they are based all the national sample of R&D, litem directs training paths and the public demand for innovation.

6a. Financing and costs

Table 3. Estimated cost of the plan															
Component	Investment/Reform	Relevant time period	Total estimated costs for which funding from the RRF is requested (mn EUR)	If available: Total estimated cost by year (mn EUR)							Funding from other sources				COFOG level 2 category / or type of revenue
				2020	2021	2022	2023	2024	2025	2026	from other EU programmes		from the national budget	Other sources	
											mn. bn nat. currency	specify the EU programmes and breakdown by programme if relevant			
From research to business	Strengthen the R&D chain and support IPCEI initiatives ("Research is the future")														
From research to business	Partnerships extended to universities, research centers, enterprises and funding for research projects	Q1, 2021 - Q4, 2025	1610 mln			350.00	450.00	550.00	260.00				The measure will be built to be synergistic with the Horizon Europe research program and with the research missions identified in the program itself.		
From research to business	Implementation of R&D support measures - Reform	Q4, 2021	0												
From research to business	Funding for young researchers	Q1, 2021 - Q3, 2026	600 mln			120.00	120.00	120.00	120.00	120.00			The measure is strategic to strengthen the role of research groups run by young people in the international arena. The measure is strongly inspired by ERC calls, in the Excellent Science pillar of the Horizon Europe program.		
From research to business	Agreements for Innovation	Q1, 2021 - Q2, 2026	700 mln			100.00	100.00	200.00	200.00	100.00					
From research to business	Initiatives based on the IPCEI model. Partnerships in research and innovation - Horizon Europe	Q1, 2021 - Q1, 2026	1000 mln			100.00	250.00	250.00	250.00	150.00					
From research to business	New Research Projects of Significant National Interest		950 mln												
From research to business	Fund for the National Research Programme (NRP)		850 mln												
From research to business	Fund for construction and research infrastructure		1380 mln												
From research to business	Technology transfer and supporting innovation ("For widespread innovation")														
From research to business	Strengthening of research structures and creation of "national R&D leaders" on some Key Enabling Technologies	Q1, 2021 - Q4, 2026	1600 mln			80.00	490.00	490.00	210.00	210.00	210.00		The measure will be built to be synergistic with the Horizon Europe research program and with the research missions identified in the program itself.		
From research to business	Strengthening and sectorial/ territorial extension of technology transfer centers by industry segments	Q1, 2021 - Q4, 2025	500 mln			50.00	100.00	100.00	50.00						
From research to business	Creation and strengthening of "innovation ecosystems", building "territorial leaders of R&D"	Q1, 2021 - Q4, 2026	1300 mln			100.00	200.00	350.00	350.00	200.00	100.00		The first discussions are underway with the counterparts of Spain, Portugal and France Ministries to ensure the synergy of this measure with similar initiatives in mentioned countries and ensure that innovation ecosystem nodes become a supranational relations network.		
From research to business	Innovative doctorates for private companies and introduction of researchers into enterprises	Q1, 2021 - Q4, 2026	600 mln			50.00	100.00	100.00	200.00	100.00	50.00		Initial discussions are underway with the equivalent departments of Spain, Portugal and France to ensure the synergy of this measure with similar initiatives in those countries and thus encourage intra-European mobility of researchers from the private sector.		

6b. Method of estimating costs

i) Supporting Partnership between universities, research centres, enterprises and funding for joint research projects - Investment (code RES).

In the last five years the industrial research expenditure generated by the support policies was equal to 1 billion euro. It was noted that this resulted in a significant demand for quality research which has not been financed; the project proposals which did not have access to the aid were at least five times those financed. Therefore, it is estimated that 5 billion research spending is of a quality that can be generated through partnerships between private and public entities. The research budget is calculated on an average leverage funding estimate to 0.35.

ii) Implementation of R&D support measures - Reform (code RES).

Reform that does not entail costs

iii) Funding for young researchers - Investment (code RES)

The costs, with three-year projects, were estimated assuming an average size of 750,000€. Short mobility periods have an estimated average unit cost of 10,000 euros.

iv) Agreements for Innovation - Investment (code RES).

Projection on historical data relating to Innovation Agreements, assuming an average investment per beneficiary of 13.1 million euros. [to recover additional supporting items...]

v) Initiatives based on the IPCEI model. Partnerships in research and innovation – Horizon Europe – Investment (code RES).

The estimation of target values is based on assumptions derived from the current mode of operation of IPCEI projects activated in Italy (Microelectronics 1, Batteries 1, Batteries 2). The average investment is 150 million euros per company. [to recover additional supporting items...]

vi) New Research Projects of Significant National Interest (PRINs financed with FIRST fund increase, DL relaunch art. 238) - Investment (code RES).

[to recover additional supporting items...]

vii) Fund for the National Research Programme (NRP) - Investment (code RES).

The average investment is 8.5 million euros per project. [to recover additional supporting items...]

viii) Fund for construction and research infrastructure - Investment (code RES).

The average investment is 50 million euros per intervention. [to recover additional supporting items...]

ix) Strengthening of research structures and creation of "national R&D leaders" on some Key Enabling Technologies – Investment (code INN).

Costs defined on the basis of a detailed analysis of management costs and the experience of similar centers. [to recover additional supporting items...]

x) Strengthening and sectorial/ territorial extension of technology transfer centres by industry segments – Investment (code INN).

The estimated target values are based on assumptions derived from the current methods of financing and implementing innovation clusters as set forth in the August 13, 2020 directive from the Minister of Economic Development. [to recover additional supporting items...]

xi) Creation and strengthening of "innovation ecosystems", building "territorial leaders of R&D" - Investment (code INN).


The budget forecast is based on an average estimation of 40 million of the single intervention, applied to the 20 planned interventions. The single intervention requires an investment under construction for the redevelopment of existing sites equal to 10 mln (taking in account an average size of 10000 square meters and a unit cost of redevelopment of 1000€/m²); an investment for the construction of research laboratories which includes both the acquisition of installations and equipment and specialised personnel in the first three years, equal, on average, to 20mln, and a margin of 10 million for the start-up and management of activities in partnership with private parties (large companies, SMEs, start-ups, spin-

offs), which provide for their co-financing. It should be noted that this assessment applies to interventions that will be installed in sites where there are already existing structures that need to be adapted to host the intervention. These sites are already being identified.

xii) Innovative doctorates for private companies and introduction of researchers into private companies - Investment (code INN).

The estimate is based on:

- the cost of a PhD fellowship of approximately €60,000 and foreseeing companies co-financing at 50%.
- number of junior precarious researchers who leave their academic careers after an average experience of 5 years. It is assumed that for every year of experience gained researchers can enjoy tax relief for 1000 euros once hired, spread over the first 2 years of work, which determines a cost of 50 mln euros. Activating this measure for 3 years has a cost of 150 mln.

A hand holding a red baton on a track, symbolizing a relay or passing on a mission.

Mission 5 - Inclusion and Cohesion

Contents

1	M5C1 - Employment Policies	3
2	M5C2 - Social infrastructures, families, communities and third sector	36
3	M5C3 - Special intervention for territorial cohesion	58

Mission's main objectives:



Mission's financing snapshot:

M5 - Inclusion and cohesion					
	Resources (euro/mld)				
	Existing (a)	New (b)	Total (c) = (a)+(b)	REACT-EU (d)	TOTAL NGEU (e) = (c) + (d)
M5C1 Employment policies	0.80	5.85	6.65	5.97	12.62
M5C2 Social infrastructures, families, communities and third sector	3.30	7.15	10.45	0.38	10.83
M5C3 Special intervention for territorial cohesion	-	4.18	4.18	-	4.18
TOTAL	4.10	17.18	21.28	6.35	27.62

Note: (b) includes existing resources under national FSC, to be devoted to specific measures..

1 M5C1 - Employment Policies

Summary box

Policy area: Inclusion and cohesion

Objectives:

The first component, “*Employment Policies*”, aims to promote labour market transformation with adequate instruments to facilitate employment transitions, improve workers’ employability and skills, and achieve decent work for all (women, young people and adults). According to the Country-Specific Recommendation (CSR) No 2 for Italy (COM (2020) 512 final), these interventions aim to “*mitigate the employment impact of the crisis, including through flexible working arrangements and active support to employment. Strengthen distance learning and skills, including digital ones*”.

Specifically, the component promotes the following specific objectives:

- Supporting employment levels, in particular with regard to the outsiders groups (young people, women, adults without secondary education qualification, long-term unemployed) by defining and improving ALMPs measures, aimed to foster the acquisition of skills and their matching with labour market needs.
- Facing the mismatch between the skills of workers and the companies’ needs in order to ensure access to quality training throughout the country, by strengthening cooperation between the various competent national and regional institutions and defining uniform standards for vocational training and competence certification system.
- Improving the employability of young people and the acquisition of competences through the apprenticeship in dual system.
- Promoting the empowerment of women, through direct support for the creation of women’s enterprises.
- Enhancing the “Universal Civilian Service” initiative for young people aged between 18 and 28 years old, in order to promote their acquisition of key competences (soft skills and digital skills).

In order to achieve these objectives, the component is composed of two main lines of intervention and five specific initiatives.

1. Line of intervention: “Active Labour Market Policies (ALMPs) and employment support”

1) Strengthening Active Labour Market Policies (ALMPs): Supporting unemployed

workers and workers in transition by improving the Public Employment Service network and establishing the “National Programme for the Guaranteed Employability of Workers” (*Programma Nazionale “Garanzia Occupabilità dei Lavoratori - GOL*)

2) National Strategic Plan for New Skills: Promoting upskilling and reskilling pathways, a) by strengthening the interaction between skills and the needs of the economy, institutions and society and pushing them up to international standards; b) by developing green and digital skills linked to technological development and transition processes; increasing; c) increasing the professional skills of the active population, also through lifelong learning pathways, and improving the employability of unemployed workers and those at risk of unemployment, including those furthest from the labour market.

3) Support women’s entrepreneurship: Raising the level of women’s participation in the labour market, by leveraging their creative and innovative potential, and supporting services to promote women’s self-employment and entrepreneurship.

4) Apprenticeship in dual system: Strengthening the dual system, in order to boost the matching of education and training system with the labour market, and the acquisition of new skills by young people and adults without a secondary education qualifications.

2. Line of intervention: “Universal Civilian Service”

5) Universal Civilian Service: Promoting the personal and professional development of young people, aged between 18 and 28 years old, and their acquisition of basic and soft skills through the “Universal Civilian Service” initiative.

Reforms and investments:

a) Reforms:

Reform 1: “National Programme for the Guaranteed Employability of Workers”. Establishing a new measure (Guaranteed Employability of Workers - GOL) as a national programme for taking charge, providing specific services (assessment, skills assessments, definition of training needs, etc.) and personalised vocational training for employability;

Reform 2: “Definition of an essential level of vocational training”: Setting common standards for vocational training and strengthening the VET system in Italy, by promoting a territorial network of education, training and work services also through Public-Private Partnership (PPP).

b) Investment:

- Investment 1: “Strengthening Active Labour Market Policies (ALMPs)”: Improving the capacity building of the Public Employment Services (PES) e their integration with the vocational education and training system, also through the network of private operators. In particular, the procedures for taking charge of the unemployed will be redefined, through innovative ALMPs able to promote personalised upskilling and reskilling pathways and job coaching.
- Investment 2: “National Strategic Plan for New Skills”: Facing the relevant mismatch between the skills acquired by workers and the companies’ needs, particularly in order to boost the current green and digital transition and support CVET policies (2.1 “New Skills Fund; 2.2 “Provision of training programmes, managed and coordinated by universities, for reskilling and upskilling purposes”; 2.3 “Implementation of a permanent system for the development of adult competences in a lifelong learning context using the 129 Provincial Centres for Adult Education and Training (Centri Provinciali per l’Istruzione degli Adulti - CPIAs).
- Investment 3: “Support women’s entrepreneurship”: Defining, identifying and/or adapting support instruments for the creation and development of enterprises with predominant or total female participation, including innovative start-ups, and the consolidation of existing ones.
- Investment 4: “Apprenticeship in dual system”: Strengthening the apprenticeship in dual system, in order to ensure more effective matching between learning (including training-on-the-job) and work, as well as the acquisition of technical and soft skills by young people and adults without secondary education qualification.
- Investment 5. “Universal Civilian Service”: Strengthening of the Universal Civilian Service, as a tool supporting youth employability levels and ensuring a direct impact on the communities in terms of social cohesion.

This component promotes new skills and the entry of outsiders (young people, women and long-term unemployed) into the labour market. These measures are strengthened by the introduction of specific incentives and labour costs reductions, funded by the Budget Law, for employers hiring young people, women, especially in the South.

Estimated costs:

Cost of EUR 12,620 million; 6,65 of which are requested under RRF

M5C1-Employment policies

	Resources (euro/mld)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
Employment Policies	0.40	5.60	6.00	1.50	7.50
- Active Labour Market Policies (ALMPs) and employment support	0.40	2.60	3.00	0.50	3.50
- Support to women entrepreneurship	-	0.40	0.40	-	0.40
- Dual system Apprenticeship	-	0.60	0.60	-	0.60
- National Strategic Plan for New Skills	-	2.00	2.00	1.00	3.00
Favourable tax regime to support employment in southern Italy and create new jobs for women and young people **	-	-	-	4.47	4.47
Universal civilian service	0.40	0.25	0.65	-	0.65
TOTAL	0.80	5.85	6.65	5.97	12.62

2. Main challenges and objectives

a) Main challenges

Gaps of Active Labour Market Policies (ALMPs)

The European Commission's communication "*European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience*"¹ stresses that employment public services (PES) can play an important role in steering people towards greater and better retraining, also by increasing the relevance of education and training systems. At the same time, the Active Labour Market Policies (ALMPs) system in Italy underlines many issues, as reported by the *European institutions in the Country Specific Recommendation (COM (2020)511 final of 26.02.2020)*:²

- The need for strengthening the capacity building of the Public Employment Services (PES);
- Poor coordination between the level of ALMPs and social services;
- Lack of coordination between the central and local systems.

Therefore, it is necessary to increase investments in innovative active policies and lifelong

¹ Communication from the Commission to the European Parliament, the Council, the European Economic And Social Committee and the Committee of the Regions. *European Skills Agenda for sustainable competitiveness, social fairness and resilience* (COM/2020/274 final)

² Communication from the Commission to the European Parliament, the European Council, the Council, the European Central Bank and the Eurogroup 2020 European Semester: *Assessment of progress on structural reforms, prevention and correction of macroeconomic imbalances, and results of in-depth reviews under Regulation (EU) No 1176/2011* (COM/2020/150 final)

learning systems, in order to promote new employment opportunities, develop new knowledge and skills related to strategic sectors (i.e. green and digital), as well as enhancing competences acquired in the formal, informal and non-formal context.

It is also necessary to meet the professional needs determined by the green and digital transitions, aiming to progressively reduce the gap between existing skills and the skills needs of businesses. Moreover, ALMPs must be able to facilitate employment transitions, both with reference to sectors in crisis and in terms of new opportunities generated by digital and green within the same sector.

As highlighted in the European Commission's Communication of 30 June 2020 "*European Skills Agenda for sustainable competitiveness, social fairness and resilience*",³ the COVID-19 pandemic has accelerated the digital transition: smart working and distance learning have become a reality for millions of people in Europe and at the same time has highlighted significant skills gaps.

Gap in participation in training activities

According to the latest available *Adult Education Survey* (2016-17),⁴ Italy ranks 20th position in the adult participation rate in formal or informal training activities. More recent data based on the *Labour Force Survey*⁵ indicate 8.7% of employed persons participating in training activities compared to 13.8% for the EU15 average.

The *OECD-PIAAC international survey (Programme for the International Assessment of Adult Competencies, 2nd round 2013)*⁶ highlights that in Italy the low skilled citizens in literacy are almost 11 million (28% of the adult population between 16 and 65 years, compared to an OECD average of 15,5%).

As underlined by recent literature (INAPP – *National Institution for Public Policy Analysis, Focus PIAAC- Programme for the International Assessment of Adult Competencies 2018*),⁷ "people with low levels of competence are not distributed evenly throughout Italy. The South and North-West of the Country are the regions with the highest percentages: alone they have more than 60% of Italian low-skilled".

In particular, a study carried out by OECD in 2017,⁸ stressed as our Country has to face ten skill challenges, gathered in 4 pillars of intervention: a) developing relevant skills, b)

³ Communication from the Commission to the European Parliament, the Council, the European Economic And Social Committee and the Committee of the Regions, op.cit.

⁴ Eurostat, *Adult Education Survey* (2016-2017).

⁵ Istat, *Labour Force Survey*: <https://www.istat.it/en/archivio/127804>

⁶ OECD Skills Survey, PIAAC: <https://www.oecd.org/skills/piaac/>

⁷ INAPP, PIAAC Data: <https://www.inapp.org/piaac/risultati-e-dati>

⁸ OECD (2018), *OECD Skills Strategy Diagnostic Report: Italy 2017*, OECD Skills Studies, OECD Publishing, Paris, <https://doi.org/10.1787/9789264298644-en>.

activating skills supply, c) making effective use of skills; d) strengthening skills systems. These issues are related to policy interventions, recommended by the OECD, that are fundamental to reduce the gap, measured by a set of indicators, and to achieve the average EU level.

There is therefore a need to realign the needs of enterprises and the skills of workers, at least partially recovering the gap with the European average. It should be noted that the incidence of participation in training activities is double among managers (68.1%) compared to unskilled staff (31.5%), so it is on the lower qualifications that a priority for intervention should be focused.

Needs for disruptive skills

The disruptive change of the ongoing technological revolution (growing connectivity between people, technologies, sectors and lifestyles) requires people new skills in terms of adaptability, flexibility, resilience and creativity. At the same time, the OECD points out that the main challenge is not only to ensure that citizens can develop skills in line with the technological changes taking place. In order to be competitive and ready for a changing labour market, it is also necessary to acquire those skills of global and intercultural analysis and understanding of problems, so that no one is left behind.

According to the Digital Economy and Society Index (DESI),⁹ Italy ranks 25th out of the 28 EU Member States in 2020, highlighting a significant gap in terms of Human Capital. In 2019 Italy dropped two places and now ranks last in the EU on the Human Capital.

Compared to the other European Countries, Italy records very low levels of basic and advanced digital skills. Only 42% of people aged between 16-74 years old have at least basic digital skills (58% at EU level), while the number of ICT specialists and ICT graduates is below the EU average (2,8% versus 3,9% in Europe). The number of ICT graduates is also the lowest in the EU (only 1%), despite many different interventions promoted in recent years (National Plan for Digital Schools, National Plan “Enterprises 4.0”; strengthening post-secondary technical education and vocational training institute (“*Istituti Tecnici Superiori*” - ITS, “Transition 4.0”, National Strategy “Italy 2025).

Therefore, it is necessary to increase efforts in the promotion of digital skills, boosting innovative lifelong learning systems, in order to improve the competitiveness and productivity of businesses and the efficiency of the country’s system.

Gender employment and inequality gap in the labour market

The 2019 specific recommendations for Italy (CSR) note that the gender gap in employment levels remains one of the highest in the EU and the employment rate of women, although slightly increasing, is far below the EU average (53.1% compared to 67.4% in 2018). With the Covid emergency, the employment rate of women in the second quarter

⁹ European Commission (2020), Digital Economy and Society Index (DESI) 2020.

of 2020 fell to 48.5% bringing the inactivity rate of women (15-64 years) to 46.5%.¹⁰

The challenge for the country is therefore to encourage women's participation in the labour market, which has a strong positive impact on the economy, especially in the face of a shrinking workforce and skills shortages, as underlined by the European Commission in its 2020-2025 Gender Equality Strategy. In addition, according to the International Labour Organisation (ILO), the recent international economic crisis has had a serious impact on the weakest groups in the labour market, including women.

Gender equality conditions have worsened considerably, with a consequent increase in discrimination in the workplace. This situation is confirmed by the fact that, in the first half of 2020, the employment rate of women fell below 49% due to the halt in production activities caused by the Covid-19 pandemic, which severely affected the sectors with the greatest presence of women, such as commerce, hospitality and tourism, care services, entertainment and culture. In fact, the country still has employment sectors that are strongly characterised by gender, with industry and construction predominantly male and the services sector highly feminised (around 50% of employed women work in services), particularly in health, education, hospitality and catering, as well as in the arts and culture.

Moreover, according to ISTAT,¹¹ there is a progressive deterioration of the quality of women's work in Italy. Less access to top positions, more part-time jobs and discontinuous careers are the factors that, together with a different age structure, determine gender differentials in labour income. The share of female employees who, irrespective of their job title, reports coordinating the work of other people is 18.4% in 2018, a share that has increased slightly since 2017 and also since 2008. The gap with men is 5.4 percentage points. Women in part-time employment are now a third (32.8% in the average of the first three quarters of 2019) compared to 8.7% of men. The incidence of part-time workers is higher among younger women (35.1% up to 34 years of age) and increases as the level of education decreases (42.6% up to middle school graduates and 22.5% among university graduates). Part-time work has not grown as a tool for reconciling work and family life, but in its involuntary component, which has exceeded 60% of the total, increasingly becoming a tool used for flexibility on the side of businesses rather than on the side of people and their needs for reconciling work and family life.

Supporting female entrepreneurship

Women's participation in business life is still low. Only 22% of businesses are run by women, which, according to international observers such as the OECD and the European

¹⁰Quarterly note on employment trends Q2 2020 - ISTAT

¹¹Measures in support of women's participation in the labour market and for the reconciliation of life and work needs AA.C. 522, 615, 1320, 1345, 1675, 1732, 1925 Hearing of the National Institute of Statistics Ms Linda Laura Sabbadini Director of the Central Directorate for Studies and Thematic Enhancement in the area of Social and Demographic Statistics.

Commission, is a limiting factor for the growth of our economy.

The recent IV Report on female entrepreneurship by UNIONCAMERE¹² shows that women's enterprises (about 1.3 million) account for about $\frac{1}{4}$ of the total, with a strong presence of sole proprietorships (63% compared to 48% of the total). The female entrepreneurship segment is showing interesting signs of dynamism, in particular with a high rate of increase in new enterprises, especially in the services sector, contrasted, however, by the persistence of elements of weakness in relation to investments in innovation and technology, internationalisation and access to financing and forms of venture capital.

The Report also shows how female entrepreneurial initiatives have suffered more than male ones during the lockdown period, with a reduction in registrations (-42% compared to -35% for male ones), despite the fact that in the previous period they had grown faster than male ones. There has been a slowdown in the process of women's empowerment initiated through female entrepreneurship, one of the strategic sectors for the country's development and the full participation of women in the labour market and in positions of responsibility. It is therefore strategic and urgent, with the objective of recovering the national GDP, to activate measures that restore and expand the number of working women, also through incentives and interventions to support women's entrepreneurship.

Opportunity gap for young people

Promoting youth employment is one of the main challenges at European and national level. Despite the positive trend in the last three-year period 2017-2019, the Covid19 pandemic wave has again worsened the national trend, bringing it back below 40% as during the economic recession. In this regard, the *European Commission's recommendations for Italy (COM (2020) 512 final* of 20.05.2020) highlight the need to promote an effective "integration into the labour market of inactive and NEETs".

The opportunity gap for young people is represented by the constant growth of NEET, which achieves particularly negative results in Italy, making our country the worst in Europe for this indicator. For what concerns the age group 15-34 years, indeed, the NEET are 3 million 189 thousand, of which 53.8% are concentrated in Southern Italy.

The data on the NEET measure precisely the growing social unrest of the new generations: long-term absence from the labour market or the education system significantly increases the difficulties of reintegration, as well as the risk of social exclusion and poverty in the medium to long term.

At the same time, the NEET indicator actually includes different target groups to be considered:

- Young people who are more vulnerable and at risk of social exclusion (i.e. the long-term unemployed or the discouraged);

¹²Unioncamere, IV Report on Female Entrepreneurship, 2020.

- Young people that voluntarily choose to leave the labour market (i.e. those inactive for family reasons)
- Young people that are only temporarily in this situation, because they are waiting to complete informal or non-formal training pathways.

At the same time, there is a clear need to further promote the participation of young people in the political, social and cultural life of the country. According to the data of the *European Intergenerational Fairness Index*,¹³ Italy is the country with the highest level of "generational gap" among the Member States. This gap has a direct impact not only in the delay of the new generations in reaching their economic independence, but also in the difficulty of participation as "active citizens" in their own communities. In addition, the precariousness of employment fosters an increase in mistrust towards political and social institutions, which are perceived as distant and uninterested in the problems of young people.

According to the European initiative "*Youth Employment Support: a Bridge to Jobs for Next Generation*",¹⁴ there is thus a clear need to relaunch and further strengthen investments devoted to young people, in order to both promote their employment and acquisition of skills, as well as to boost their social and economic integration in the European and national community.

b) Objectives

The package of investments, by which this component "Employment Policies" is composed, aims at pursuing the following objectives:

1) Strengthening ALMPs, in order to support unemployed workers and workers in transition by improving the PES network and establishing the "National Programme for the Guaranteed Employability of Workers (GOL)". The interventions of this component aim to tackle the following priorities identified by the European Commission in the Country Reports for Italy:

- Recommendations 2019 (COM (2019)512 final del 05.06.2019)¹⁵ – n.2 "*Ensure that active labour market and social policies are effectively integrated and reach out notably to young people and vulnerable groups*"
- Post-Covid Recommendations (COM (2020)512 final del 20.05.2020) n. 2 – "*Mitigate the employment impact of the crisis, including through flexible working arrangements and active support to employment. Strengthen distance learning and*

¹³Intergenerational Foundation, Intergenerational Fairness Index: <https://www.if.org.uk/>.

¹⁴European Commission (2020), [Commission proposal for a Council Recommendation on a Bridge to Jobs. Reinforcing the Youth Guarantee.](#)

¹⁵European Commission, Recommendation for a Council Recommendation on the 2019 National Reform Programme of Italy and delivering a Council opinion on the 2019 Stability Programme of Italy, (COM/2019/512 final), pag. 12.

skills, including digital ones” .

Referring to the strengthening of the operation of the PES, the National Reform Programme identifies the following intervention areas - in addition to the increase in the number of staff and the consequent adaptation of the operational centres:

- the need to invest in staff training;
- the need to operate with a high level of integration between labour and social services;
- the need to invest in external communication of the services offered and in the supporting information systems.

Another area highlighted by the National Reform Programme is the strengthening of the linkage between education and training systems and the labour market, improving their quality and fostering the transition of young people to the world of work.

2) Adopting a National Strategic Plan for New Skills, aimed at supporting upskilling and reskilling processes and promoting occupational transitions, through the development and growth of workers' skills, including young people and adults. In particular, the Country-Specific Recommendations for Italy 2020 in paragraph 19 highlights the need to improve e-learning and e-skills, with regard to working-age adults and distance learning. It is also stressed that investment in skills is crucial to promote a smart and inclusive recovery and to foster a green and digital transition. All national and local actors will be involved in the promotion of these Interventions - Provincial Centres for Adult Education (CPIA in Italian),¹⁶ Higher Technical Institutes (ITS – *Istituti Tecnici Superiori*¹⁷), universities, training providers, interprofessional funds.

3) Promoting women empowerment in the labour market, according to the European Commission's 2019 and 2020 CSRs and to the implementation process of the EC 2020-2025 Gender Equality Strategy, published in March 2020. In particular, the objective of this component is to increase investments aimed at promoting women participation in the labour market and equal work opportunities in response to the 2019 CSR. Which requires Italy to reduce both the gender employment gap and gender inequality in the Workplace (e.g gender pay gap). All these actions have been envisioned to encourage greater female

¹⁶According to the Italian Law, the CPIA (Provincial Centre for Adult Education) have this task, representing a public body devoted to contributing in the implementation of the priority actions and strategies of the local networks for life-long learning (under art.4, clause 55 of the Law 92/2012). Since their establishment, the CPIAs have represented a structured and widespread point of reference for the coordination and implementation of reception, guidance and support actions addressed to adults, with a particular focus on disadvantaged targets, including the migrant population.

¹⁷The Higher Technical Institutes are Italy's initial experiment of vocational tertiary education provision in line with a system established and consolidated for some years, also in other European countries. The higher technical institutes are top-class centres highly specialised in technology, in connection with the production industry. They were set up in 2010 to train skilled technicians in strategic areas for Italy's economic development and competitiveness

participation in the workforce and, as required by the 2020-2025 European Strategy for Gender Equality, empower women in the labour market, increasing their opportunities to become investors and entrepreneurs.

4) Strengthening the dual system, in order to boost the matching of education and training systems with the labour market and the acquisition of new skills by young people. Through the apprenticeship in dual system and the training-on-the-job approach, the aim is to foster training pathways that meet the companies' needs in terms of skills.

According to the UnionCamere-ANPAL Report , in 2019 31% of Italian companies faced relevant problems in finding high-skilled workers for 1.2 planned contracts. This skills mismatch affects not only those job vacancies where degree are required, especially STEM (science, technology, engineering, mathematics), but also those where a HEIs qualification is not required. As highlighted by the UnionCamere-ANPAL report, among the most difficult professions to find are blacksmiths, welders, workers specialised in the installation and maintenance of electrical equipment, ICT specialists. The rate of difficulty in finding jobs for these professions range between 48% and 58%.

In order to tackle this challenge, many reforms have been implemented over last years to introduce the dual system in Italy: work-related learning (Alternanza Scuola-Lavoro), simulated training enterprises (Impresa Formativa Simulata - IFS), vocational apprenticeship (Apprendistato professionalizzante), Higher Technical Institutes (Istituti Tecnici Superiori - ITS). At the same time, the low levels of participation and the fragmentation of the dual system offer require for more investments at national and regional levels.

5) Promoting the personal and professional development of young people, aged between 18 and 28 years old, and their acquisition of basic and soft skills through the “Universal Civilian Service” initiative. The intervention has a relevant social impact, considering that young people carry out projects that are useful to local communities, and therefore indirectly this also ensures economic benefits (in terms of social care services, education, social promotion, etc.). For what concerns the direct impact on employment, an INAPP sampling analysis in 2017 highlights the effects of the "Civilian Service measure" in terms of youth employment: 33.5% of NEET participants are employed (at six months after the end of the service), while 52% of volunteer participants are employed (at 12 months after the end of the service).

3. Description of the reforms and investments of the component

1) Reforms.

Reform 1: “National Programme for the Guaranteed Employability of Workers” (*linked to Investment 1 Strengthening Labour Market Policies*”).

Challenges: Several reforms have taken place in recent years in the ALMPs system,

starting with the *Job Act*¹⁸ and the establishment of a “citizens“ basic income (“*Reddito di Cittadinanza*”).¹⁹

Technological progress and globalisation have profoundly changed production activities and the labour market. Countering skills obsolescence is one of the major challenges of our time, in economies that are constantly evolving and require continuous training and updating. The need to adapt the skills possessed by workers, jobseekers, but also students who will soon enter the labour market, has been evident for some time. The Covid-19 emergency has strongly brought this need to the forefront, capturing the attention not only of institutions but also of the workers themselves and, more generally, of the current and future workforce, who is called upon to re-examine their employment situation with new eyes, in search of methods of adaptation and acquisition of skills capable of taking their professionalism beyond the crisis.

The new GOL Programme starts from the experience of these years, trying to overcome the excessive heterogeneity of the local services, with an approach based on the definition of essential levels of services, proximity of actions and network integration.

The reform is fully consistent with the National Reform Programme under the European Semester.

According to the Priority 2 "Labour Market School and Skills", the plan highlights a lack of skills and the mismatch between qualifications and business needs among the causes of Italy's low productivity. It is thus essential to promote a more efficient active labour market system by strengthening the PES and promoting training courses for the development of new skills in line with the challenges of the labour market (soft skills, digital skills, etc.)

Objectives: In agreement with the regions, the Government aims at adopting a National Programme for the Guaranteed Employability of Workers (GOL) in order to take charge and provide specific services and personalised professional planning.

The GOL programme aims to assist unemployed workers and workers in transition by activating the network of employment services and providing a variety of active labour policy tools. The criticalities observed in the recent reform processes have to be overcome by investing in specific essential levels of services that guarantee uniformity of treatment throughout the national territory.

In addition, the National Programme GOL will strengthen the Public Employment Services (PES), so that they can systematically carry out skills forecasting analysis, build personalised training plans and thus provide guidance and job coaching through an active engagement of public and private stakeholders.

¹⁸Legislative Decree n. 81/2015.

¹⁹Legislative Decree n. 4/2019.

The Programme will be adopted by inter-ministerial decree, following agreement at the State-Regions Conference.

Implementation: Starting with the review of the job-integration voucher (*assegno di ricollocazione*), already funded by the 2021 Budget Law, the National Programme GOL will provide specific active labour policy services, in the context of the Personalised Service Agreement, drawn up between the unemployed and the public employment service (PES), in order to achieve the job placement objective. A range of upskilling and reskilling services will be also enhanced, in order to promote the acquisition of professional qualifications, higher technical diplomas and degrees through credit recognition.

In addition, the 2021 Budget Law²⁰ states that part of the resources of the newly established “Fund for the implementation of ALMPs measures related to those eligible by the European Commission under the React-EU Programme” (“*Fondo per l’attuazione di misure relative alle politiche attive rientranti tra quelle ammissibili dalla Commissione Europea nell’ambito del programma React-EU*”) can be used for the establishment of the National Programme GOL.

While the procedures for calculating eligible expenditure, reimbursement and results, as well as the linkage with private operators are defined at national level, the Programme GOL will be managed in close cooperation with the Regions. The identification of personalised services related to the Programme and well as their definition according to the specific recipient, is entrusted to a specific ministerial decree.

As part of the establishment of the National Programme GOL, it is also envisaged that the job-integration voucher, consisting of an amount to be used with bodies that provide personalised service of job guidance and taking charge, will be one again be granted to recipients of NASPI (New Employment Social Insurance Benefit)²¹ or DI-SCOLL²² for more than 4 months.

Implementing Bodies: Ministry of Labour and Social Policies (MPLS) and ANPAL (National Agency for Active Labour Market Policies).

Target population: Target population is as follow:

- Recipients of income support instruments for the unemployed (New Employment Social Insurance Benefit - NASPI);
- Recipients of basic income (“Reddito di Cittadinanza”);
- Outgoing workers benefiting from extraordinary or derogation wage supplementa-

²⁰Article 1, c. 325, Law n. 178/2020

²¹NASPI is a cash benefit granted, on request, in the event of involuntary redundancy or expiry of a fixed-term employment contract, to employed workers, which includes apprentices, cooperative members, artistic staff and fixed-term workers of public administrative bodies.

²²DIS-COLL is a cash benefit awarded on request in the event of involuntary redundancy to workers with an atypical employment contract registered with the separate pension scheme.

tion instruments (CGIS).

Timeline: 3 years (2021-2023)

Reform 2: “Definition of an essential level of vocational training” (*linked to Investment 2 “National Strategic Plan for New Skills”*).

Challenges: Revision of the governance of the vocational training system in Italy, by means of agreements at the different levels of government and between the different competent state administrations, in order to guarantee access to quality training at national level, as well as defining uniform standards and strengthening the competence certification system.

Objectives: The strengthening of ALMPs (Reform 1 and Investment 1) will be accompanied by a national structural reform aimed to revise and reorganise the training of workers, both employed and unemployed. The VET system in Italy will be enhanced by promoting a territorial network of education, training and employment services (also through PPPs), as well as by developing an inclusive lifelong learning system and innovative upskilling and reskilling pathways.

In coordination with the Regions, the aim of the Plan is to define essential levels of training activities that must be activated, in particular for the most vulnerable. For instance, standards can be set for the training of recipients of income support instrument for the unemployed (NASPI, DIS-COLL) or recipients of basic income (“*Reddito di Cittadinanza*”) and long-term unemployed, as well as for taking charge of outgoing workers who benefit from extraordinary or exceptional wage supplementation instruments (CIGS that is the Italian acronym for extraordinary redundancy fund, fund for cessation of activities, derogation treatments in areas of complex crisis).

Implementation: The National Strategic Plan for New Skills will provide for the definition of an essential level of vocational training, linked to specific needs to be identified with respect to the different target groups. Activities should be guaranteed within a certain period of time (e.g. within six months from the access to the benefit), follow certain quality standards, be certifiable, and be carefully monitored on the basis of result indicators (e.g. percentage of training participants finding employment within a certain period of time). Pilot projects can also be envisaged, to be subjected to rigorous impact assessment in order to identify good practices that can be translated into national guidelines. Essential levels of training could be an essential element of the reform of social safety nets.

1st Semester 2021 - In the first half of 2021, the Government aims to adopt, in agreement with the Regions and subject to the approval of a constitutive regulation, a National Plan for New Skills that will improve the employability of workers in the face of changes in

the market and the evolution of professional needs. The Plan will be adopted by an inter-ministerial decree, after agreement at the State-Regions Conference. In the same period, the Regions will be asked to launch regional plans.

2nd Semester 2021 - In the second half of 2021, administrative procedures will be defined and training programmes will be launched.

3rd Semester 2021-2026 - Training will be provided until 2026, involving - in additional terms compared to what happens today - about 15% of unemployed workers (more than 350,000 workers) and an even higher number of employed people in different ways (new skills fund, training by universities, interprofessional funds, etc.).

Implementing Bodies: Ministry of Labour and Social Policies (MLPS)

Target population: Different targets can be defined according to the level of skills already possessed and the employment status: employed in companies undergoing restructuring (e.g. CIGO, CIGS, solidarity), employed in transition, unemployed, recipients of basic income. Targets will be set on the basis of the types of beneficiaries:

1. Recipients of basic income (“Reddito di Cittadinanza”);
2. NASPI recipients;
3. Long-term unemployed people (>24 months), but not recipients of income support;
4. Workers in transition (CIGS recipients for termination, complex crisis areas, national strategic enterprises);
5. Workers receiving notice of dismissal (to be disciplined) at the end of the layoffs block;
6. Working poor (low-skilled/low-income/atypical workers).

Timeline: 6 years (2021-2026)

2) Investments.

Investment 1: “Strengthening Active Labour Market Policies (ALMPs)” (*linked to Reform 1 “National Programme for the Guaranteed Employability of Workers”*).

Challenges: There is a clear need for such training measures to support employment transition to be structured and governed by the competent institutions and to be accompanied by an adequate and strengthened system of employment services, which is also ‘competent’ and operates in synergy with local services, especially those on the social side, for an integrated and multidimensional care of individuals and families, where deemed necessary. Hence the need to include within the same investment project a line of action dedicated to strengthening the Public Employment Services (PES), working on their capacity to provide quality services and on their ability to communicate and publicise the range of services available and thus to be “appealing” to all workers and

not only to disadvantaged categories. Effective results can be achieved only by working synergistically in these areas of intervention in terms of strengthening the potential for growth, job creation (including through self-employment) and the social and economic resilience of the country system.

Objectives: The investment project also will strengthen the PES, by implementing interventions to adapt the skills of students, workers and job seekers to the skills needs being renewed due to the emergence of the "green" and "digital" themes and due to the profoundly changed post-Covid-19 reference context. An intervention of this relevance necessarily has lasting impacts at country level.

The contents of this project start from already existing interventions concerning the strengthening of the PES (e.g. the *Plan for strengthening services and active labour policy measures*,²³ co-financed by the NOP Systems for Active Employment Policies) and skills matching with businesses' needs (e.g. all the fragmentation of specialised training and guidance interventions co-financed by the various ESF OPs). At the same time, they focus on the employment transition to the new green and digital challenges.

Implementation: Three years: 2021-2022-2023, reserving the following two years for the administrative management tasks necessary to ensure compliance with the deadlines of Article 14 of the RRF Regulation.²⁴

The implementation phase envisages the design and implementation (also in distance learning) of training interventions to update the skills of the operators, starting from a needs analysis and the implementation of interviews with key figures of the employment services supply system (e.g. on the topics of service standards, of supply and consultation of the Unified Information System, on the skills plan to align the existing skills with the needs of the enterprises, on the services of identification, validation and certification of the skills of the National System). Furthermore, it is also envisaged the design and implementation of contents and communication channels of the services offered.

Implementing Bodies: Ministry of Labour and Social Policies + ANPAL (National Agency for Active Labour Market Policies)

Other stakeholders: Ministry of Education, Ministry of University and Research, Regions and Autonomous Provinces, responsible for PES and competent in training, social territorial ambits. The project also envisages the involvement of the Joint Interprofessional Funds (*Fondi Paritetici Interprofessionali*),²⁵ which are not public law bodies but play a strategic and important role in the provision of continuous training geared to employment

²³ ANPAL, [Piano di rafforzamento dei Servizi e delle misure di politica attiva](#).

²⁴ European Commission, "*Proposal for a Regulation of the European Parliament and of the Council Establishing a Recovery and Resilience Facility*" (COM/2020/408 final).

²⁵ Law n. 388/2000: The Joint Interprofessional Funds are set up as inter-sectoral associations through agreements between the social partners and are authorized to operate by the Ministry of Labour.

transition.

According to the National Reform Programme, it is believed that the investment project can be supported by: cyclical support for employment; the promotion of decentralised bargaining within the framework of an overall reorganisation of bargaining levels; the enhancement of lifelong learning; and the strengthening of the system of prevention and protection of health and safety in the workplace.

Target population: The project is aimed to complete the path of strengthening the PES and to promote interventions to match the skills of students, workers and job seekers to the businesses' needs, due to the emergence of the "green" and "digital" challenges and due to the new post-Covid-19 context. The expected result is to reach at least 500,000 workers per year.

Target population is as follow:

1. Recipients of income support instrument for the unemployed (New Employment Social Insurance Benefit-NASPI ; DI-SCOLL) for at least 4 months;
2. Recipients of basic income (“Reddito di Cittadinanza”);
3. Long-term unemployed;
4. Outgoing workers benefiting from extraordinary or derogation wage supplementation instruments (CIGS, redundancy fund for cessation of activity, derogation treatments in complex crisis areas);
5. Workers receiving notice of dismissal (to be disciplined) at the end of the layoffs block.

Timeline: 3 years (2021-2023).

Investment 2: “National Strategic Plan for New Skills” (*linked to Reform 2 “Definition of an essential level of vocational training”*) .

Challenges:

- Stimulating public-private cooperation in CVET and training supporting the employers in the investment on upskilling and reskilling of the workforce, guaranteeing relevant increase of the employee participation to learning activities;
- Strengthening the territorial network of education, training, work and social inclusion services, promoting agreements between Provincial Centres for Adult Education (CPIAs), employment services and municipalities to allow reception, taking charge and possible guidance actions in favour of the adult population
- Transforming the 129 CPIAs into hubs of a lifelong learning system throughout the country with reference to basic training for the most fragile and vulnerable adults (e.g. beneficiaries of basic income), as well as for the elderly population. This intervention is also relevant to guarantee them full digital citizenship (e.g.

by facilitating access to public digital services – SPID, Italian acronym for public digital identity system, online social security and tax services, etc. – and private ones – online bank accounts, online shopping, etc.);

- Strengthening universities as a central players in the creation of high-level training pathways for reskilling and upskilling in various subject areas, in collaboration with businesses and administrations, business and workers’ associations and professional bodies, for workers with a diploma or degree, supplementing existing training pathways with short, modular training pathways tailored to meet training needs, especially through digital systems.

Objectives: The Plan, coordinated by the Ministry of Labour and Social Policies, together with the Ministry of Education and the Ministry of University and Research, in collaboration with ANPAL and after agreement in the State-Regions Conference, aims to support employment transitions and the development of new skills for young people and adults. In order to pursue this objective, the National Strategic Plan for New Skills will promote the following interventions:

2.1. “New Skills Fund”:

Once the training needs for the specific company, sector or territory have been identified, the New Skills Fund encourages professional updating by charging the cost of the hours spent in training to the Fund’s resources. Training costs (teachers and classrooms) are borne by the companies, also through the use of interprofessional funds.

The Fund can also be activated for companies using the “*Cassa integrazione*” (payroll subsidies): in order to face restructuring or structural crises, the training activities promoted are crucial to promote workforce relocation processes or help the transition to new employment.

2.2. “Provision of training programmes, managed and coordinated by universities, for reskilling and upskilling”

Creation of training programmes for workers with a diploma or degree, managed and coordinated by universities, involving companies and integrating existing training paths with short, modular, and hoc calibrated training paths (Microcredentials). In this regard, the intervention will be promoted in close cooperation with the “Innovation Ecosystem” initiative, foreseen in the Mission 4 of the NRRP. The creation of sharing hubs between universities, research centres, businesses and local institutions will allow to provide training programmes, coordinated by Universities, that meet businesses’ needs and the smart specialisation of the local communities.

2.3 “Implementation of a permanent system for the development of adult competences in a lifelong learning context using the 129 CPIAs”:

- Definition of an integrated system for lifelong learning;

- Involvement in training activities of recipients of basic income (*“Reddito di Cittadinanza”*) with low skills. In particular, it should be noted that in the 18-64 age group of the recipients who apply to the social services of the municipalities, about 20% do not have a secondary school diploma and a further 50% have no more than a secondary school diploma;
- Improved offer of ordinary courses aimed at reaching a diploma;
- Provision of short training courses (*Microcredentials*)²⁶;
- Recognition, promotion and certification of basic and advanced skills;
- Retraining for work also with reference to smart working;
- Learning distance implementation through the enhancement of digital teaching tools and methodologies;
- Support and training/information of the elderly population in accessing public (SPID, on-line social security and tax services, etc.) and private (on-line bank accounts, on-line shopping, etc.) digital services.

The main aim is to allow the CPIAs to become the hubs of a system of lifelong learning in the territory with reference to basic and advanced training and digital citizenship. Moreover, the aim is to ensure a system of adult education also with a view to vocational retraining. According to the European indications for lifelong learning²⁷, the CPIAs will also be strengthened to foster the integration of the most vulnerable.

Implementation:

2.1 “New Skills Fund”:

The New Skills Fund was established by Article 88 of Decree-Law No. 34/2020 to boost the training of workers. Based on trade union agreements and the rescheduling of working time, it can be used by companies affected by production reorganisation processes or to foster redeployment of redundant workers. The Fund supports the wage costs, including social security and insurance charges, relating to the hours not worked during the training courses.

Given that the implementation process has already started and taking into account the timeframe for the approval of the NRNP, it is believed that the Fund can be considered immediately operational.

Implementing body: ANPAL (National Agency for Active Labour Market Policies), which has already issued the first public notice for 2020 projects.

²⁶According to the EU New Skills Agenda, “*Micro-credentials can be defined as documented statements that acknowledge a person’s learning outcomes, which are related to small volumes of learning and that for the user are made visible in a certificate, badge, or endorsement (issued in a digital or paper format).*”

²⁷Council of the European Union, *Council Recommendation on Upskilling Pathways: New Opportunities for Adults*, 19 December 2019

2.2 “Provision of training programmes, managed and coordinated by universities, for reskilling and upskilling purposes”

Creation of training programmes for workers with a diploma or degree, managed and coordinated by universities, involving companies and integrating existing training paths with short, modular, ad hoc calibrated training paths to be reconciled with training needs, delivered mainly through digital systems. The implementation phase envisages the following steps:

2022:

- Definition of administrative procedures in agreement with the Ministry of Labour and the Ministry of Education for the involvement of universities and companies;

2023:

- Providing training paths for employees and companies

{Implementing body:} Ministry of University and Research (MUR) and Universities

Other stakeholders: Innovation ecosystem - research centres, businesses (large firms, SMEs, networks of companies), local institutions, civil society representatives (third sector organisations, associations, etc.).

2.3 “Implementation of a permanent system for the development of adult competences in a lifelong learning context using the 129 CPIAs”:

Creation of a permanent system for the development and requalification of teachers’ and citizens’ competences in a lifelong learning context using the 129 CPIAs that will be strengthened by means of cabling interventions in the school premises, purchase of updated professional laboratories and provision of training allowances for hardware purchase costs, connection costs, transport costs. The implementation phase includes the following steps:

2021

- Alignment of Adult Vocational Education (IDA – *Istruzione degli Adulti*) to the decree 62/2017, with revision of Vocational Didactic Units (*Unità di Apprendimento - UDA*);
- Implementation of the decree 16 January 2013, n. 13 in the CPIA context;
- Training of teachers of UDA courses (II level) with regard to digital and professional skills for distance learning (*Formazione a Distanza - FAD*) and to adapt the UDA to the needs of companies in the sector and on a given territory;
- Strengthening of the role of the "Didactic Units" of the CPIAs; an "upper secondary" will assume the role of network leader for the management of the training actions. Each network will be able to present a project which must include the following actions: a. Analysis of the sectors present in the area of competence and

identification of the training needs; b. Development of "short courses"; c. Purchase of sector laboratories or updating of the equipment d. Specific training of teachers in charge of the "short course";

- Guaranteed coverage of the necessary expenses (Staffing of level II adult courses at 70% frontal lessons and 30% project hours).

2022

- Pro-educational training of adults on digital skills;
- Short training courses;
- Validation and certification of skills developed;
- Establishment of a training allowance for adults.

2023

- Provision of school premises for Level II courses equipped with wiring, classrooms dedicated to the discipline, up-to-date professional laboratories;
- Provision of adult education;
- Establishment of paid study leave for employed adults;
- Establishment and/or enhancement of incentives for employers to train low-skilled employees.

2024

- Implementation of the system and provision of training courses to adults on basic and advanced skills, professional requalification;
- Provision of training to the elderly population in accessing public (SPID, on-line social security and tax services, etc.) and private (on-line bank accounts, on-line shopping, etc.) digital services.

Implementing Bodies: Ministry of Education

Other stakeholders: 129 CPIAs

Target population:

2.1 “New Skills Funds”:

- Workforce of the companies and businesses involved.

2.2 “Provision of training programmes, managed and coordinated by universities, for reskilling and upskilling purposes”

- Employees and companies.

2.3 “Implementation of a permanent system for the development of adult competences in a lifelong learning context using the 129 CPIAs”

- Adults with low skills.

Timeline:

2.1 “New Skills Fund”:

- 6 years (2021-2026)

2.2) “Provision of training programmes, managed and coordinated by universities, for reskilling and upskilling purposes”:

- 5 years (2022-2026)

2.3) Implementation of a permanent system for the development of adult competences in a lifelong learning context using the 129 CPIAs:

- 4 years (2021-2024)

Investment 3: “Creation of women’s enterprises”.

The investment, amounting to EUR 400 million, aims at defining, identifying and/or adapting support instruments for the creation and development of enterprises with predominant or total female participation, including innovative start-ups, and the consolidation of existing ones.

Challenges:

Low level of female participation in the labour market. The gender gap in employment levels in Italy remains one of the highest in the EU and the employment rate of women, although slightly increasing, is far below the EU average (53.1% compared to 67.4% in 2018; in the first half of 2020, the employment rate of women fell below 50%). Inactivity is more prevalent among women, just as the phenomenon of undeclared work particularly affects the most vulnerable groups such as migrants, women and children. The level of participation in the labour market and the employment rate of women is also symptomatic of the low capacity to employ and make the most of the human capital in Italy, since - although young women have higher levels of education than their male peers - there are large differentials, to their disadvantage, in employment rates upon leaving school. The gap is widened in the less developed areas of the country.

Low participation of women in business life. Only 22% of companies are run by women, which, according to international observers such as the OECD and the European Commission, is a limiting factor for the growth of our economy. In addition, women experience more interruptions in employment, more precariousness and irregularity. One of the objectives of the European Gender Equality Strategy 2020-2025 is to empower women in the labour market by increasing their chances of establishing themselves as investors and entrepreneurs. EU cohesion policy supports female entrepreneurship, the (re)integration of women into the labour market and gender equality in specific, traditionally male-

dominated sectors.

Low propensity of women to invest in innovation and technology, internationalisation and access to financing and forms of venture capital. The female entrepreneurship segment shows interesting signs of dynamism, in particular with a high rate of increase in new businesses, especially in the services sector (Unioncamere, IV Report on Female Entrepreneurship, 2020). However, this is contrasted by the persistence of elements of weakness concerning investments in innovation and technology, internationalisation and access to financing and forms of venture capital. The above-mentioned Unioncamere report also shows how female entrepreneurial initiatives have suffered more than male ones in the lockdown period, with a reduction in registrations (-42% compared to -35% for men), despite the fact that in the previous period they had grown faster than male ones.

Objectives:

The project, in its twofold nature of reform and investment, aims to raise the levels of participation of women in the labour market by leveraging their creative and innovative potential. In particular, the project - through an integrated strategy of financial investments and support services - aims at:

- supporting female entrepreneurship, by systematising and redesigning the current supporting tools with respect to a vision that is more attuned to the needs of women, especially qualified young women, and more attentive to innovation and the key roles that women can play in the company;
- supporting the implementation of innovative business projects for women-owned or predominantly women-owned enterprises already established and operating (digitisation of production lines, switch to green energy, etc.);
- supporting the start-up of women's entrepreneurial activities through the definition of an offer that is able to respond in a personalised way to women's needs (mentoring, technical-managerial support, measures for work-life balance, etc.);
- creating - through targeted communication actions - a favourable and emulative cultural climate for women's entrepreneurship, particularly in schools and universities.

In relation to the support of innovative skills and business creation areas, the challenges of the green and digital transition will be emphasized with particular attention to the segment of women's micro and small enterprises, including individual enterprises.

Implementation:

Implementation of the legislative basis (2021 Budget Law) for the creation and execution of the Fund in support of female entrepreneurship and development of new support instruments (Quarter I 2021).

From the IV quarter of 2021 until 2026, the Fund's operations will be supported by:

- provision of facilities (e.g. non-repayable fund, zero interest rate, financial facilities) for the creation, consolidation and innovation of enterprises by women, including participation in the risk capital of enterprises;
- provision of accompanying measures (mentoring, technical-managerial support, work-life balance measures, etc.);
- design and promotion of multimedia communication campaigns and events, in order to create a favourable and emulative cultural climate for the enhancement of female entrepreneurship, in particular, among the student population of schools and universities;
- in itinere and ex post monitoring and evaluation, in order to verify the efficiency and effectiveness of the tools and accompanying measures, with a view to introducing possible corrections to the measure in the medium term. From 2022 onwards: 2 half-yearly monitoring reports per year and 1 annual evaluation report for 5 year plus a final evaluation report. The monitoring and evaluation reports may also be included in the Annual Report to Parliament that the Minister of Economic Development is required to submit pursuant to the 2021 Budget Law (Article 17, paragraph 6).

Implementing Bodies: Ministry of Economic Development (MISE) and Department for Equal Opportunities

Target population: Women of any age residing throughout the country who intend to start a small or micro-enterprise, start up.

Timeline: 6 years (2021 - 2026)

Investment 4: “Apprenticeship in dual system”

Challenges:

Low rates of attainment of secondary and tertiary education. The share of 25-64-year-olds with at least upper secondary education is 62.2% in 2019, much lower than the EU average of 78.7% and some countries including Germany (86.6%), France (80.4%) and the United Kingdom (81.1%). As far as tertiary education is concerned, only two out of 10 people in Italy (about 19.6%) have tertiary education, against the European share of about one third, i.e. 33.2%.

High levels of early school leavers. The share of 18-24-year-olds in Italy who have at most a lower secondary qualification and are already out of the education and training system is 13.5% (561,000 young people), which is higher than the European benchmark set at 10%; among early school leavers, only one in three (35.4%) is employed in Italy, compared to the European average of almost one in two (46.6%). The employment rate at territorial level is heterogeneous, with a value of 22.7% in the South against 49.5% in

the North and 46.9% in the Centre.

Difficulties in generational turnover and much higher percentages of youth unemployment and NEETs than the European average. ISTAT data highlight that the percentage of young people aged 15-29 not in employment or training is 22.2% (2 million young people). The share of NEETs is the highest among EU countries, about 10 points higher than the EU average (12.5%).

Objectives:

The project intends to strengthen the dual system, in order to make the education and training systems more synergic with the labour market, as well as boosting the employability of young people through the acquisition of new competences, with the on-the-job learning approach. This intervention also ensure the development of training courses that meet the companies' needs, thus reducing the mismatch between the skills required in the labour market and those provided by education and training system in order to get out of the crisis and engage in the recovery.

In particular, the specific objectives of the intervention are:

- Qualification and modernisation of education and training system, in order to improve the access of young people into the labour market, through the enhancement, consolidation and dissemination of work-related learning, as well as the dialogue with enterprises at national and local level.
- Measures to strengthen the dual system by increasing the financial allocation, in order to enhance the training offer, with particular focus on marginalised areas.
- Implementation of a "strengthened" and "participated" governance, also through the support of specific bodies that are already operational, such as the Apprenticeship Technical Body, which coordinates the key stakeholders, including the economic and social partners, operating in the field of training, with specific reference to apprenticeship training.
- Increase the share of NEETs aged 18 to 24 with a secondary school qualification, by promoting their training through the apprenticeship in dual system and improving their employability.
- Increase the share of graduates and young people with tertiary education qualifications (*Higher Technical Institutes - ITS*).
- Enhance the adult participation in upskilling and reskilling pathways

Implementation: The action is fully consistent with the National Strategic Plan for New Skills (see Investment 2).

The distribution of resources to the Regions for the strengthening of the dual system will take place on the basis of the number of students enrolled in VET courses. The monitoring process will be provided by INAPP, according to the data provided by the Regions and Autonomous Provinces.

Implementing Bodies: Ministry of Labour and Social Policies (MPLS)

Target population: Increase the number of young people participating in formal education and vocational education and training through the apprenticeship in dual system. The main target group is young people, but it is also envisaged to promote specific apprenticeship training for adults without secondary education qualification. The project is also intended to finance cooperation in territorial networks between training institutions and businesses, extending to the entire country the initiative expected under Axis 1 Bis of the NOP YEI for regions in 'transition'.

Timeline: 3 years (2021-2023)

Investment 5: "Universal Civilian Service".

The investment, amounting to EUR 650 million, aims to promote the personal and professional development of young people, aged between 18 and 28 years old, and their acquisition of basic and soft skills through the "Universal Civil Service" initiative.

Challenges: The National Reform Programme makes explicit reference to the Civil Service within priority area 2 "Labour market, school and skills" and, in particular, in the section "School system and enhancement of training". The document, in fact, highlights the importance of promoting "non-formal civil service training/education" .

Therefore, the Universal Civil Service investment promotes a training process for young people aged between 18 and 28, aimed at the acquisition of key and basic skills, on which Italian students and adults perform among the worst in the EU (as highlighted in the 2019 Recommendations). At the same time, the Universal Civil Service is also an indirect measure of active support to youth employment.

The project also has an impact on the communities, which are the target of the actions carried out by the youth participants in the Civil Service. The areas that benefit most from this initiative are those highlighted as priorities by the European Commission: poverty or social exclusion, accessibility to social services, home/community care, early-school leaving and educational poverty, prevention of natural risks, gender diversity, green and digital transition. For what concerns the digital and green transitions, the project also promotes the participation of young people on environmental and digital issues, through specific and cross-cutting actions devoted to these two areas (a special project is also promoted in collaboration with the Ministry for Innovation, Technology and Digitisation). Given the role of young people as agents of change, efforts will be made to better target their training so that they can contribute to sustainable and innovative transition processes through their daily actions.

Moreover, the projects are implemented by local civil service organisations, in order to further promote the personal growth and citizenship of the young participants, as well

as to acquire the democratic value necessary to be part of the European and national community. This non-formal educational process makes young people aware of their rights and duties towards the community, improving their relationship with institutions and steering them to tackle the emerging challenges of the 21st century.

The Universal Civil Service projects therefore have a positive impact for young people and local actors, as they provide a service to the community and promote citizenship values. The recent experience of the Covid-19 emergency has further increased the relevance of this measure. Indeed, faced a minor financial investment compared to other types of policies, it ensures highly significant results also in terms of social and territorial cohesion.

As illustrated above, the Universal Civil Service's measure has a widespread and significant impact in many areas of interventions. Moreover, it is relevant to underline how all of them are fully in line with the main objectives of the United Nations 2030 Agenda for Sustainable Development, which have inspired the three-year planning of Universal Civic Service.

Objectives:

In summary, the general objective of the project is to strengthen the Universal Civil Service, stabilising the number of voluntary workers and raising the quality of the programmes and projects in which young people are involved. More young people and better projects means more effective interventions in favour of communities and local inhabitants.

The specific objectives are the following:

- Increasing the number of young people involved in non-formal learning through the Universal Civil Service, in order to improve their knowledge and skills and to be geared more closely to the development of their professional life;
- Raising awareness among young people of the importance of active citizenship as a tool for inclusion and social cohesion;
- Promoting interventions with a high social impact on the territories, with particular attention to the green and digital transition. As previously highlighted, the green and digital impact of these projects can be both direct - with reference to the thematic areas of intervention - and indirect - with regard to their effectiveness on communities;
- Fostering projects related to local communities, in order to make the Country more resilient and mitigate the economic and social impact of the crisis. Most of the projects are aimed at the most vulnerable categories and most exposed to the effects of the emergency.

Furthermore, these projects are often carried out in complex urban areas (suburbs, inland areas, ecc), at risk of social marginalization and far from institutions and cultural centres. The intervention, therefore, aims at revitalizing these communities, through a direct

investment in young people.

Implementation:

The Department for Youth Policies and Universal Civil Service is responsible for the implementation of this intervention. At the same time, it will be useful to foster greater collaboration with the various Ministries that have specific competences in youth policies (i.e. education; environment, cultural heritage; digital transformation or civil protection).

The project has a three-year duration but is developed on an annual basis. The selection of a standard number of volunteer operators is envisaged for each of the years considered. This objective is achieved by providing for the publication of a Notice in the first half of each year, addressed to civil service organisations. They will present intervention programs in which young volunteers will be involved. In the second semester, the programs will be evaluated, approved and partially funded. Finally, the call for the selection of volunteer operators will be published.

Therefore, the project provides for a six-monthly monitoring of the progress and can become operational immediately, as soon as the resources to be allocated are established.

During each year, the results of the intervention will be analysed in order to highlight any critical issues and study possible solutions aimed at reducing them. At the same time, the exchange of good practices at national and local level will also be promoted, with the aim of putting them into the system for the following year.

The quantitative monitoring system of the measure will be based on the following objectively measurable indicators:

- Number of civil service organisation involved in the planning;
- Number of places for volunteers foreseen in the projects presented by the civil service organisations;
- Number of programs and projects carried out;
- Number of facilities financed;
- Number of young people selected as volunteers;
- Number of young people involved;
- Number of municipalities affected by civil service projects.

As well as quantitative monitoring, it will be also possible to promote a qualitative monitoring,

- Quality of the programs and projects carried out;
- Skills acquired by volunteers;
- Effectiveness of interventions in the territories with reference to the activities promoted;
- Level of satisfaction of the volunteers.

Implementing Bodies: Department for Youth Policies and Universal Civil Service

Target population:

As the main target, it is expected to involve a number of young volunteers annually equal to 120,000 units (and a total number of about 175,000 volunteers over the three year period), and, at the same time, to improve the quality of programs and projects presented by the organisations.

Therefore, it is necessary to:

- Raise the standards of the design;
- Approve annually the Universal Civil Service’s Programming Plan;
- evaluate and approve annually programs and projects of civil service organizations, in order to ensure a sufficient number of places available to young people;
- Issue selection notices;
- Establish contracts to young people
- Monitor the progress of programs and projects;
- Liaise with voluntary organizations and operators.

These activities will be carried out for each of the years covered by the proposal.

Timeline: 3 years (2021-2023).

4. Green and digital dimensions of the component

a) Green Transition:

The (proposed regulation COM(2020) 408 establishing a Recovery and Resilience Facility sets a binding target of at least 37% of the plan’s total allocation to contribute to the green transition or to the challenges resulting from it²⁸.

The reform and investment projects related to this component aim to meet the need for “green expertise”, by reducing the gap between existing skills and the companies’ needs, and promoting employment transitions towards the "core green" sectors (production of green products and services) and “go-green” (conversion of processes, reduction of environmental impact, specialization of functions).

Also creating the condition for the development of female entrepreneurship is a drivers

²⁸Communication COM(2020)575 on the Annual Sustainable Growth Strategy 2021 sets out a climate target of 37% for each national Recovery and Resilience Plan, to follow the commitment of the European Council of July 2020. This is reflected in the 7th compromise proposal put forward by the German Presidency on the proposal for a Regulation COM(2020)408 as a Council negotiating mandate.

for investments in environmental sustainability. The recent IV Report on Female Entrepreneurship by Unioncamere shows that female enterprises in Italy are quite green. Women's businesses are more environmentally aware, driven above all by ethics and social responsibility: the proportion of young women's businesses that invest in green, driven by an awareness of the risks associated with climate change, is higher than that of young men's entrepreneurs (31% vs. 26%).

These reform and investment areas are absolutely consistent with the investment priorities provided for by the 2021-2027 Partnership Agreement. Indeed, ESF+ also supports training and professional qualification to meet the skill needs in sectors with a high green impact. According to the *National Strategy for the integration of the long-term unemployed into the labor market*²⁹, this component supports the reform of labour market, through specific ESF + interventions aimed at:

- Identification of needs
- Professional retraining
- Strengthening and networking of information systems and the ERDF to improve the technological equipment.

Moreover, the component's reforms and investments are fully consistent with the *National Energy and Climate Plan (PNIEC)*³⁰. As well as providing a vision of the actions promoted in the field of Energy and Climate, the Plan highlights potential impacts on employment, education and skills, making use of the information system on professions, employment and professional needs, set up by INAPP on behalf of the Ministry of Labour and Social Policies. This information system allows to draw up short-term recruitment forecasts and to identify professional needs, medium-term employment forecasts and to anticipate professional needs over five years.

There is also a relevant connection between the objectives promoted under this component and the SDGs 8 "*Decent Work and Economic Growth*" of the UN 2020 Agenda for Sustainable Development, with specific relevance to the targets 8.3, 8.5, 8.6, 8b. In addition, the component is also consistent with the European Green Deal and the National Strategy for Sustainable Development (SNSvS)³¹, adopted in Italy. Although the component does not have a direct connection with the territorial plans involved in the Just Transition Fund (JTM), two specific interventions (Investment 3 "Support women's entrepreneurship" and Investment 5 "Universal Civilian Service") do provide for possible areas of application under points d), e), f), g), h,) of Article 4 of the Proposal for the Regulation establishing the Fund (COM (2020) 22 final)..

²⁹Op.cit

³⁰Op.cit.

³¹Ministry of Environment and Protection of Natural Resources and the Sea, [Strategia Nazionale per lo Sviluppo Sostenibile, 2017](#).

b) Digital Transition:

The Regulation COM(2020) 408 establishing a Recovery and Resilience Facility sets a binding target of at least 20% of the plan's total allocation to contribute to the digital transition or to the challenges resulting from it³².

As highlighted by the already mentioned DESI database, the actions included in this component aim precisely at reducing the existing gap between the current and forecast skills needs of enterprises and existing skills, by investing more in the acquisition of STEM, technological and digital skills, according to the indications of the recent 2019 INAPP study, co-financed by ANPAL through the resources of the National Operational Programme (NOP) on Systems for Active Employment Policies.

Moreover, as highlighted by the European Commission's recent Communication of 30 June 2020 "*European Skills Agenda for sustainable competitiveness, social fairness and resilience*"³³, the Covid-19 pandemic has further accelerated the digital transition process: smart working and distance learning have become a reality for millions of people in Europe and, at the same time, has highlighted significant skills gaps.

Therefore, it is necessary to promote a package of transversal interventions aimed, on the one hand, at curbing the potential negative impacts on employment and, on the other, at boosting investments in new technologies and digital transition. In particular, the acquisition of digital skills (hard and soft) by the new generations is one of the main priorities of the Universal Civil Service, as also highlighted by the "*Digital Civil Service*" initiative, set up by the Minister for Technological Innovation and Digitalisation - in agreement with the Minister of Education, Universities and Research. The proposal promotes the development of digital skills and the digitalisation of enterprises, with particular reference to the SMEs, which have more difficulty in grasping and sustaining the challenges of the digital transition.

Table 1 - *work in progress*

³²Communication COM(2020)575 on the Annual Sustainable Growth Strategy 2021 proposes setting a 20% digital target for each national Recovery and Resilience Plan. This was endorsed by the European Council of 1-2 October. See Article 15(3)(c1) which sets out the 20% digital target, based on a methodology for digital tagging set out in Annex III.

³³Op.cit

5. Milestones, targets and timeline

Table 2 - *work in progress*

a) Reforms.

Reform 1: “National Programme for the Guaranteed Employability of Workers” [*linked to Investment 1 Strengthening Labour Market Policies*]

Milestones: By Q4 2021, establishment of a National Programme for Guaranteed Employability of Workers (GOL)

Targets: By the date Q4 2023, number of workers involved in the GOL

Reform 2: “Definition of an essential level of vocational training” [*linked to Investment 2 “National Strategic Plan for New Skills”*]

Milestones: By Q4 2021, establishment of National Plan for New Skills

Targets By Q42026, increased the number of workers involved for each target of beneficiaries:

- a) Recipients of basic income (“Reddito di Cittadinanza”)
- b) NASPI recipients
- c) Long-term unemployed people (>24 months) but not recipients of income support;
- d) Workers in transition (CIGS recipients for termination, complex crisis areas, national strategic enterprises);
- e) Workers receiving notice of dismissal (to be disciplined), at the end of the layoffs bloc;
- f) Working poor (low-skilled/low-income/atypical workers).

b) Investments

Investment 1: “Strengthening Active Labour Market Policies” [*linked to Reform 1 “National Programme for the Guaranteed Employability of Workers”*]

Milestones: By Q4 2021, establishment of a National Programme for Guaranteed Employability of Workers (GOL)

Targets: Increased the number of PES involved in the Strengthening Plan over the three-year 2021-2023 period

Investment 2: “National Strategic Plan for New Skills”: [*linked to Reform 2 “Definition of an essential level of vocational training”*]

Milestones: By Q4 2021, establishment of National Plan for New Skills

Targets: Increased the number of workers involved in the training activities over the 2021-2026 period

Investment 3. “Support women’s entrepreneurship”:

Milestones: By Q1 2021, issuance of the decrees implementing of the Fund in support of women’s businesses referred to the 2021 Budget Law

Targets:

- Increased the number of women’s enterprises supported since the start of the intervention, by Q4 2026 (intermediate target: Q4 2023)
- Accompanied measures - number of vouchers issued, by Q4 2026 (intermediate target: Q4 2023)
- Implementation of communication and education actions (mentoring, monitoring and evaluation, impact analysis, culture, professions and schools, dissemination and training, by Q4 2026 (intermediate target: Q4 2023)
- Number of monitoring and evaluation reports by Q4 2026 (intermediate target: Q4 2023)

Investment 4. “Apprenticeship in dual system”:

Milestones:

- tbd

Targets: Increase the number of people (young people and adults without secondary education qualification) obtaining a qualification through apprenticeship in dual system by 300,000 over the three year 2021-2023 period (intermediate target: 100.000 each year).

Investment 5. “Universal Civil Service”:

Milestones: By 2021 publication of the civil service notice with increase of places

Targets: Increase the number of volunteers by at least 120,000 over the three-year 2021-2023 period.

6. Financing and costs

Table 2 - *work in progress*

2 M5C2 - Social infrastructures, families, communities and third sector

Summary box

Policy area: Inclusion and cohesion

Objectives:

Estimated costs:

Cost of EUR 10,830 million; 10,450 of which are requested under RRF

M5C2 - Social infrastructures, families, communities and third sector

	Resources (euro/mld)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
Socio-assistential services, disabilities and marginality	-	3.45	3.45	0.38	3.83
- <i>Social infrastructures in municipalities and involvement of the third sector</i>	-	2.50	2.50	0.10	2.60
- <i>Autonomy patterns for people with disabilities</i>	-	0.50	0.50	-	0.50
- <i>Temporary housing and Postal stations</i>	-	0.45	0.45	0.28	0.73
Urban regeneration and social housing	3.30	3.00	6.30	-	6.30
- <i>Urban regeneration</i>	2.80	0.70	3.50	-	3.50
- <i>Social housing</i>	0.50	2.30	2.80	-	2.80
Sport and peripheries	-	0.70	0.70	-	0.70
TOTAL	3.30	7.15	10.45	0.38	10.83

Note: (b) includes FSC existing resources, to be devoted to specific measures.

2. Main challenges and objectives

This component provides a national strategy for the active inclusion of vulnerable population groups, whose situation worsened as a result of the COVID-19 epidemiological emergency. This plan has been envisioned through a series of actions: the strengthening of integrated social services, the adoption of innovative models for social housing, the development of resilience capacity for most vulnerable groups, also through the spread of sports culture.

a) Main challenges

As highlighted in the *Country Specific Recommendations 2019*, in Italy “Income inequality and risk of poverty are high, with wide regional and territorial disparities. In 2017, 28.9% of the population was at risk of poverty or social exclusion, above both the pre-crisis levels and well above the 2017 EU average (22.4%). Children, especially those with a migrant background, are particularly affected.”³⁴ Other groups facing a high risk of living in poverty are temporary workers, self-employed and people with a migrant background.

Furthermore, inequality has intensified in the past ten years. The gap between the rich and the poor has widened, as well as the percentage of people living in extreme poverty. In fact, lower-income groups have not benefited from the slow economic recovery of recent years. Nationally, the proportion of families living in extreme poverty has nearly doubled, up to 6.9% (2017), with the worst figures (10.3%) being recorded in southern Italy.

The impact of social transfers for reducing poverty and inequalities is one of the lowest in the EU. The anti-poverty scheme introduced in 2018 has been recently replaced by a new major scheme (citizenship income) with an active inclusion approach, subject to certain conditions. However, these reforms may prove difficult to implement, creating a considerable burden for the public administration, namely on employment and social services, whose access and adequacy remain problematic.

In this context, the main challenges of the Component are described below.

In Europe, as well as in Italy, the number of people with disabilities is constantly growing due to the population aging. Indeed, relevant studies confirm that, at global level, there is a positive correlation between aging and disability, especially in the poorest countries where individuals are more exposed to health risks due to chronic diseases, accidents and other pathologies.

The European Structural and Investment Funds (ESI Funds) are the EU’s main financial instruments to support economic and social cohesion. They promote social inclusion of the most vulnerable population groups, including people with disabilities.

The EU and its Member States are committed to improving the socio-economic conditions of people with disabilities, building on the Charter of Fundamental Rights of the European Union and the Treaty on the Functioning of the European Union.

With the final Communication COM (2010) 636, the European Commission presented the European Disability Strategy 2010-2020: a renewed commitment to a barrier-free Europe. This Strategy includes a framework of measures envisaged to implement the United Nations Convention on the Rights of Persons with Disabilities at European level.

The goal of the Strategy is to create "a barrier-free Europe for all". Several areas for action have been identified, such as:

³⁴EC COM/2019/512.

- full inclusion of people with disabilities in all levels of society
- promotion of accessibility
- participation in society on an equal basis with others in all areas of daily life
- higher employment rates for people with disabilities
- more inclusive education
- improved medical care and high-quality, sustainable social protection systems.

On November 30th 2017, the European Parliament adopted a Resolution on the Implementation of the European Disability Strategy, in which it expressed "its concerns that, in spite of improvements, persons with disabilities are still at high risk of unemployment and that less than 30 % have completed tertiary education or equivalent, compared to around 40 % for persons without disabilities; calls, therefore, on the Member States and the Commission to pay special attention to the difficulties young persons with disabilities and/or SEN encounter during their transition from secondary and university education and/or vocational training to employment".³⁵

On 20 November 2020, the EC presented an evaluation report of the 2010-2020 Strategy. This 10-year evaluation highlights that, although there is room for improvement, the Strategy had a positive impact on the inclusion of issues related to disability within EU legislation and policies. Positive examples of its impact are the adoption of the *European Accessibility Act*, the *Web Accessibility Directive* and the legislation on the rights of passengers.

Despite the efforts of the European Union and its Member States, people with disabilities nevertheless continue to face challenges, such as high rates of unemployment and poverty.

Starting from the results of this evaluation and considering the provisions of the UN 2030 Agenda for sustainable development based on the principle that no one is left behind, the European Union is preparing the European Agenda on the Rights of Persons with Disabilities 2021-2030. This new Strategy will be publicly available in the following months and will address, among others, emerging issues such as the impact of the Covid-19 pandemic on persons with disabilities.

Over the next decade, according to this Agenda, an equal, high-quality and barrier-free access to education, full economic and political inclusion and the abolition of all physical barriers to access buildings and transport must be guaranteed to all people with disabilities, together with an improvement in the collection of statistical data relating to disability.

- Social services do not have adequate resources and their availability in remote and rural areas is a major problem that can foster depopulation. Therefore, *strengthening social services* is essential for the success of the minimum income system and

³⁵European Parliament resolution of 30 November 2017 on implementation of the European Disability Strategy (2017/2127(INI))

for all disadvantaged people. However, in the absence of additional resources, the implementation of the new system risks putting an excessive burden on social services, which must now reach a greater number of beneficiaries. Other vulnerable groups who depend on social services but are not necessarily among the beneficiaries of the minimum income, such as the elderly or people with disabilities, may be particularly affected.

- More *home and community-based care and long-term care* is key to provide support to people with disabilities and other disadvantaged groups, as well as family support measures through the improvement of social transfers.
- In the field of social policies, *sport sector holds a big role in promoting social inclusion and integration*. In fact, in many disadvantaged areas, sports can represent a good and healthy alternative to marginalisation for vulnerable and young people, by improving health and mental conditions and providing for an educational and training role. Sport promotion is particularly important in more deprived and marginalised areas, characterised by a high presence of disadvantaged families and a lack of sport facilities.

The Covid-19 pandemic crisis has profoundly affected the sports sector, highlighting the urgency to recognise the role of sports for social inclusion. To this end, it is essential to promote investments in sports facilities, raising the number of available structures where to ensure social inclusion activities. These investments should be concentrated in the most vulnerable areas, such as for example urban peripheries, that have highest levels of disadvantaged people.

One of the most relevant dimensions of vulnerability is related to **availability of affordable housing**. The Covid-19 pandemic has worsened an already dramatic situation: according to the Nomisma Institute³⁶, 1 million and 475 thousand low-income Italian families suffer from housing problems and 783,000 are in conditions of acute distress while 692,000 in serious distress. Moreover, the 2020 lockdown has lowered living conditions of Italian families, so much that one in four families had difficulties paying rent, and over 40% expect to be unable to pay it in the next 12 months.

Faced with such a serious situation, the public housing system plays a fundamental role in terms of responses to housing problems. Today, the rent-related component alone accounts for over 64.5% of household spending (412 euros the average cost incurred for the payment of the rent).

Based on these data, in the event of a reduction in average rent to 200 euros, housing deprivation outside the ERP would go from the current million families to about 363,000 households. If a further reduction of 110 euros in rents were applied, 288,000 families would remain in a situation of hardship but a total of 712,000 would emerge from it.

³⁶“Dimensione del disagio abitativo pre e post emergenza Covid-19. Numeri e riflessioni per una politica di settore”, commissioned by Federcasa to Nomisma Institute, 2020.

Given that the average fee practiced in Italy for ERP is 110 euro, this phenomenon can be addressed with the public housing system.

Marginalization and social degradation are spread in the Italian territory, with a major concentration on urban and metropolitan areas, and impact on the territorial gap between Northern/Central and Southern Italy. The challenge is reducing marginalization and social degradation by investing in urban regeneration in order to increase citizens' quality of life and to contrast the social and economic gap between the North and the South of Italy.

b) Objectives

Main objectives of the Component are described below:

- **Strengthening the role of local social services as a tool of resilience** by aiming at the definition of personalized models for taking care and improvement of the quality of life of persons with disabilities, also through the enhancement of social infrastructures involving the third sector.
- **Improving the protection system and the inclusion actions in favour of people in conditions of extreme marginalization** (e.g. homeless people) and housing deprivation through a wider offer of temporary accommodation assistance facilities and services, personalized paths towards autonomy and personal resilience.
- **Recognising the role of sports in social inclusion and integration**, by realising integrated projects that can impact not only targeted people, but also local communities. In fact, sports facilities are considered attraction poles of the territories (urban areas, peripheries) and their renovation is connected to local regeneration processes, in terms of urban valorisation and resilience.
- Integrating national policies and investments to ensure a multiple approach that concerns both the **availability of a more affordable public and private houses and urban and territorial regeneration**.

c) National Context

In the context of priority no. 3: social policies, support for families and fight against poverty of the 2020 **National Reform Program**, the Italian government is committed to adopting an organic discipline ('Code') on disability, aimed at redesigning the social, work, educational inclusion and protection schemes of people with disabilities, while, at the same time, providing a more efficient processes of benefit disbursement.

The "code" will guide general disability policies towards an independent path, in accordance with the approach of the United Nations Convention on the Rights of Persons with Disabilities.

With **Law decree n. 4 of 28.01.2019**, the Italian Government has established the **citizens' income**, a labour policy to guarantee the right to work and contrast poverty,

inequality and social exclusion, while promoting the right to information, education, training and culture with specific policies aimed at offering economic help and social inclusion for vulnerable groups.

Moreover, with the Directorial Decree of the Ministry of Labour and Social Policies n. 669 of 28.12.2018, Government has defined policies directed to people with disabilities. This Decree, in fact, adopts Guidelines for Regions to allow them to present proposals for adhering to the experimentation phase of this intervention model to guarantee **independent life and social inclusion of people with disabilities**.

Concerning national policies related to sports, this Component is coherent with the € 10 million **Fund for sports and peripheries**³⁷, managed by the Italian Presidency of the Council of Ministers - Office of Sports. Moreover, in 2019 the Operational Plan funded by the National Development and Cohesion Fund has been approved, with a resource allocation of € 40 million.

In order to allocate Fund resources, the Office of Sports organises selection procedures for the following types of projects:

- a. realization and regeneration of sports facilities for competitive sports, concentrated on disadvantaged areas and urban peripheries;
- b. diffusion of sports equipment in order to reduce existing social and economic imbalances;
- c. completion of existing sports facilities for professional sports at national and international level.

In this context, investments included in this Component, have an important role in producing a positive impact for local communities, with special attention to the most marginalized areas.

The *2020 National Reform Programme* has focused national housing policies on: a) answering the needs of poorer households, by making both private and public housing available; b) allocating resources to support people who need to rent houses or have innocent arrears; c) renovating real estate assets and updating registries.

The same path has been followed by the *National Programme "Qualità dell'abitare"*³⁸, aimed at promoting integrated projects within five different lines of intervention: (i) requalification, reorganization and increase of real estate assets assigned to social housing; (ii) regeneration of urban and socioeconomic context; (iii) improvement of urban areas accessibility and security as well as for local services and infrastructures; (iv) regeneration

³⁷The Fund was established by art. 15, c. 1, of law decree 25 November 2015, n. 185, converted with modifications in law n. 9 of 22 January 2016, n. 9.

³⁸The National Plan has been established by art. 1 c. 437 of the Italian Law n. 160 of 27/12/2019 "Bilancio di previsione dello Stato per l'anno finanziario 2020 e bilancio pluriennale per il triennio 2020-2022 (Legge di bilancio 2020 - Manovra 2020)"

of areas and spaces, with a specific focus on more fragile living conditions, improving environmental quality and climate change resilience; (v) identification and application of innovative models and instruments of social inclusion and welfare in cities. The National Programme is managed by the Italian Ministry for Infrastructures and Transports and foresees an allocation of 853,81 million EUR directed to Regions, Metropolitan cities and municipalities.

In addition, the *Fondo Investimenti per l’Abitare (FIA)* has been established. This is a real estate investment fund focused on the increase of affordable housing, economic sustainability and integration with local public policies. The FIA was subscribed by the Italian Ministry for Infrastructures and Transports (€ 140 million), by Cassa Depositi e Prestiti (CDP) (€ 1 billion) and by insurance companies, banks and pension funds (€ 900 million) for a total equity commitment of more than € 2 billion. The FIA underwrites units of funds (target funds), managed by other asset management companies (SGRs), dedicated to affordable housing projects. This investment format has allowed the underwriting of 29 real estate funds, managed by 9 Italian SGRs.

As described above, a multiple approach operating at different levels (private and public houses, investments on houses and/or investments on urban environment, etc.) has been adopted, aiming at social inclusion with a specific focus on affordable housing availability. The Component is coherent with the national approach and can contribute to a wider intervention on this objective.

3. Description of the reforms and investments of the component

The Component describes investments related to vulnerability and social inclusion and does not include reforms. Investments have been organised in three main topics, which represent specific challenges for Italy:

1. Social services, disability and social marginalization;
2. Urban regeneration and social housing;
3. Sport and peripheries.

1) Social services, disability and social marginalization.

Investment 1: Social infrastructures in municipalities and involvement of third sector.

(details to be defined)

Investment 2: Autonomy patterns for people with disabilities (to be updated).

Challenges: Addressing the need for a coherent and comprehensive national plan aimed at improving social cohesion and inclusion and inter-generational solidarity. Tackling social inequalities and ensuring decent living conditions by empowering vulnerable and

people with disabilities by providing economic support, social care services and social inclusion initiatives.

Objectives: The aim of the project is to accelerate the process of deinstitutionalization by providing community and home-based social and health services in order to improve the autonomy of people with disabilities. The project, in fact, is focused on improving their autonomy by removing barriers in accessing housing and job opportunities, also considering new possibilities offered by information technology. Increasing home-based care services for people with disabilities and aligning social services to new standards of home care is fundamental to support families and facilitate home staying.

This project is coherent with the pathway marked by the Ministry of Labour and Social policies with the approval of guidelines for improving autonomy and social inclusion of people with disabilities and with the realization of “Progetti di vita indipendente” and “Progetti per il dopo di noi (L. 112/2016)”, funded by the *Fondo nazionale per la non autosufficienza* and the *Fondo per l’assistenza alle persone con disabilità grave prive di sostegno familiare*.

Implementation: The project will be implemented by municipalities (responsible for social services), single or in association, coordinated by the Ministry of Labour and Social Policies and in collaboration with Regions, in order to improve the capacity and the effectiveness of personalised social care services, focused on specific needs of disabled and vulnerable people and their families. Thus, investments will be focused on increasing home care services and supporting people with disabilities to allow them to reach a higher quality of life by renovating home spaces based on their specific needs, developing domestic solutions and finding new areas by earmarking real estate properties confiscated to criminal organisations. To ensure the economic independence of disabled and vulnerable people and the reduction of barriers in accessing the job markets through smart-working solutions, the project will provide them with ICT devices and support to develop digital skills.

Services offered to people with disabilities consist in three lines of activities:

- definition and launch of customised projects to support people with disabilities;
- renovation and adaptation of home spaces, with new technology solutions and remote assistance;
- development of digital competences to allow people with disabilities to tele-work.

Total cost of the project amounts to 330 Meuro in order to implement 600 projects (each consisting of 1 or 2 apartments for about 5-10 people in total) in all Italian social districts.

Stakeholder involvement: Social security institutions, public housing entities, social assistants, home care providers and educators, local governments and authorities

Target population: Direct beneficiaries are people with disabilities and their families.

Timeline: The implementation period is estimated to be from 2021 to 2026.

Investment 3: Housing First and Post Stations (to be updated).

Challenges: Italy counts an important number of people living in conditions of extreme marginalisation. One of the main problems concerns homeless people (mainly single people and sometimes families) who do not have the chance to access public and social houses and, consequently, do not have the possibility to become independent. Beyond the need to find a home, these people should have the opportunity to receive social assistance and health services.

Objectives: The aim of the project is to help homeless people access a temporary accommodation, in apartments for small groups or families, and refer to a structure for these communities, which offers comprehensive services aimed at promoting autonomy and social integration.

Implementation: Financial resources will be allocated to the municipalities (responsible for social services), single or in association (social districts), that will invest in helping homeless people and families to have temporary accommodation and other essential services.

Concerning *Housing first*, municipalities will make flats available for single individuals, small groups or families up to 24 months. In fact, municipalities will provide people with temporary accommodations, preferably houses and flats, that are already State property through a program of buildings' refurbishment and renovation. In addition to this, customised projects will be activated for each single person/family in order to implement personal growth development programmes and to help them achieve a higher degree of autonomy.

Moreover, in larger urban areas and metropolitan cities a *Post Station System* will be implemented, i.e. a service and inclusion centre for homeless people. Such centres will offer, besides a limited night reception, important amenities such as health services, catering, post distribution, cultural mediation, counselling, job orientation, legal consulting, goods distribution among others. Voluntary Associations, specialized in social services, will be involved in the Post Stations activities, collaborating with public administrations and contributing with their experience and competences. In order to reach a wider social inclusion, the project will involve actions focused on job placement, with the support of employment centres. These actions will consider job agreements foreseen in the context of citizens' minimum income and will offer the opportunity to participate to job experiences or internships.

The allocated resources for the implementation of the plan amount to:

- 177,5 €/mln for Housing first, in order to implement 250 projects for homeless

- people (each consisting of 2-4 apartments for about 10-15 people in total);
- 245 €/mln to develop 250 projects of post stations.

Stakeholder involvement: Third sector organizations and/or private bodies operating within the social policies sector.

Target population: Homeless people with no chances to access public and social houses and to find a job, families or people in poverty and extremely marginalised.

Timeline: The implementation period is estimated to be from 2021 to 2026.

2) Urban regeneration and social housing.

Investment 4: Investments in projects of urban regeneration, aimed at reducing situations of marginalization and social degradation

Challenges: Marginalization and social degradation are spread in the Italian territory, with a major concentration on urban and metropolitan areas, and impact on the territorial gap between Northern/Central and Southern Italy. These phenomena can be measured by using the ISTAT indicator “Index of social and material vulnerability”, aimed at measuring the vulnerability degree of a territory, taking into consideration social and housing conditions of its citizens. Reducing them by investing in urban regeneration is essential both for increasing citizens’ quality of life, with special reference to those living in marginalized and deprived areas, and for reducing social and economic gap between the North and the South of Italy.

Objectives: The project is aimed at providing municipalities with grants for investments in urban regeneration, in order to reduce situations of marginalization and social degradation as well as to improve the quality of urban decorum as well as of social and environmental context, in full respect of the “do not harm principle”.

Implementation: This initiative has been launched through article 42 of Budget Law n. 160/2019 which, for each of the years from 2021 to 2034, provided for the assignment to municipalities of grants for investments in urban regeneration projects, for up to 150 million euros for the year 2021, 250 million euros for the year 2022, 550 million euros for each of the years 2023 and 2024 and 700 million euros for each of the years 2025 to 2034.

Secondary implementing measures are in the course of being enacted by a Decree of the President of the Council of Ministries, that establishes criteria and rules for projects’ selection. This Decree, for which a political agreement has already been reached, sets the following framework:

1. municipalities can submit their projects in order to apply for grants, respecting defined criteria and rules;

2. the Minister of Internal Affairs, together with the Minister for Economy and Finance and the Minister of Infrastructures and Transports, will identify the amount of grant for each project. If the total amount of required grants exceeds the amount of available resources, a selection will be realized by giving priority to projects submitted by municipalities with a higher index of social and material vulnerability³⁹.

Projects can be submitted in two different deadlines: in 2021 for the experimental phase related to period 2021-2023 and by June 2023 for the period 2024-2026. Moreover, they can be concentrated on three main areas:

1. reuse and restructuring of public areas and existing public buildings for public scopes and interest, including demolition of illegal buildings;
2. improvement of the quality of urban decorum as well as of social and environmental context, including restructuring of public buildings, with the aim of developing social, cultural and education services as well as promoting cultural and sport activities;
3. sustainable mobility.

As described above, projects' areas are oriented to reuse and restructuring of existing buildings, without foreseeing new constructions and fully respecting the "do not harm principle".

Stakeholder involvement: State-Regions conference

Target population: Direct beneficiaries are municipalities. Indirect beneficiaries are citizens living in municipalities beneficiaries of the grants.

Timeline: The implementation period is estimated to be from 2021 to 2026.

Investment 5: National Plan "Qualità dell'abitare".

Challenges: In the "Council Recommendation on Italy's 2020 National Reform Program and delivering a Council opinion on Italy's 2020 stability program "(COM (2020) 512 final of 20.05.2020), point (9) of the introduction indicates that "It is likely that the socio-economic consequences of the COVID-19 pandemic are unevenly distributed across regions and the Italian territories ...". In this perspective, the National Innovation Programme for Quality of Life is also promoted with the aim of "contributing to the reduction of housing problems with particular reference to the peripheries and to encourage the exchange between the different regional realities ". Furthermore, the Plan adopts a sustainability and densification approach, according to the "no land consumption" concept and according to principles and guidelines adopted by the European Union,

³⁹The Index of social and material vulnerability is an ISTAT indicator, aimed at measuring the vulnerability degree of a territory, taking into consideration social and housing conditions of its citizens.

concerning the urban model of the smart, inclusive and sustainable city (Smart City).

Objectives: The aim of the project is to contribute to the reduction of housing and settlement difficulties, with particular reference to existing public heritage, and the regeneration of urban areas which are particularly degraded and lacking in services, mainly focusing on green innovation and sustainability. Mainly, the Plan aims to:

- redevelop, reorganize and increase the assets intended for social housing;
- re-functionalize areas, spaces and public and private properties also through the regeneration of the urban and socio-economic fabric;
- improve the accessibility and safety of urban areas and the provision of services and urban-local infrastructures;
- regenerate areas and spaces already built, increasing environmental quality and improving climate resilience to climate change also by means of operations with impacts on urban densification;
- identify and use innovative management and inclusion models and tools, social and urban welfare, as well as participatory processes.

Implementation: According to the article 1, paragraph 438 letter a) Law n. 160/2019 and to article 3, paragraph 1 Decree on “Procedures for submitting proposals, evaluation criteria and methods of disbursement of funding for the implementation of the national innovative program for the quality of living”, Regions, metropolitan cities and cities can submit applications for funding. Each of them can present up to a maximum of three funding requests. The application phase is divided into two phases:

- Phase 1: a preliminary overall proposal will be sent indicating the strategy as a whole and the set of interventions aimed at achieving the prescribed purposes. Funding requests are formulated by filling in a specific online application scheme containing the significant data for the assessment of proposals. The High Commission for evaluation and assignment of the ranking of the proposals eligible for funding is established. By decree of the Ministry of Infrastructure and Transport, within sixty (60) days from the completion of the scrutiny of the High Commission, the Program is approved with the identification of the proposals eligible for funding. The proposals which are considered having a high strategic impact on the national territory, defined as “Pilot”, are admitted to financing.
- Phase 2: a final overall proposal, together with a specific online form (filled in PIN-QuA2 form), will be transmitted by no later than two hundred and forty (240) days from the publication of the above-mentioned decree. The documentation transmitted is examined by the High Commission within ninety (90) days and if the evaluation is positive expresses its authorization to finance to the Ministry. With decree of the Ministry of Infrastructure and Transport within sixty (60) days from the authorisation to finance, the list of proposals definitively admitted to funding is approved. The signing of the Convention or Program Agreement for the implementation of the proposals definitively accepted for funding will take place within

sixty (60) days from the approval of the ranking.

Impediments

The allocation of funds is developed according to the time frame defined by the D.I. n. 365 of 16 September 2020 and in accordance with current legislation, so as to avoid delays or disputes in the assignment. However, since the public entities subject to funding are directly responsible for the implementation of the interventions, compliance with the deadlines (starting from the assignment of the works to the control and tracking of the assignment times and the correct implementation of the procedures) could give rise to critical issues. The Program also provides for the participation of private entities that could be potential elements of additional risk.

Target population: Citizenship.

Timeline: The implementation period is estimated to be from 2021 to 2026

Investment 6: Increase the availability of Social Housing.

Challenges: Access to *affordable and adequate housing* remains a real challenge for Italy. In fact, real estate market values penalize underprivileged and low-income people, increasing inequality and social exclusion. Moreover, concerning young people and, more specifically, university students, many *obstacles persist in the achievement of university education* because of the lack of affordable housing solutions.

Consequently, the Italian Government aims to launch a new program focused on the *enhancement of affordable housing* in Italy in its different forms (student accommodations and temporary residences, apartments for rent, senior housing) and the improvement of the living conditions of low-income households and vulnerable people affected by the global Covid-19 pandemic, providing affordable and good-quality social housing, in order to tackle one of the most relevant factors behind social vulnerability in the Italian context. At the same time, a focus on young people will stimulate both the creation of new families and an increase in birth rate.

Objectives: The aim of the project is to **support vulnerable people and low-income households** and **provide affordable, secure and good-quality housing** by increasing the availability of Social Housing. Investments in social housing would be particularly beneficial for college students, underprivileged people and low-income households affected by the global Covid-19 pandemic, especially in the Southern regions of Italy. The estimated final target is to build 5000 new affordable housing units (for people who cannot access the free market but have not the right to public housing) and 4400 beds in student accommodation. In addition to direct investments, the project will improve the financial capacity of local government through new local investment platforms, enabling them to directly invest in social and public housing, as well as in the promotion of urban

regeneration and in the provision of services and meeting spaces for the neighbourhood.

Implementation: From an operational point of view, the mechanism that will be used is based on a system of real estate investment funds. A real estate **Fund of Funds** will invest in real estate target funds which will develop affordable housing projects. The system allows the raising of different kinds of financial resources at various levels (equity, debt, grants). RRF resources made available to the affordable housing project will be used for Fund of Funds' shares undersigned by the beneficiary Ministry. Therefore, the project will be managed by the Ministry for Infrastructures and Transports (MIT) and Cassa Depositi e Prestiti S.p.A. through its subsidiary CDP Immobiliare Sgr (CDPI SGR). This is aimed at increasing the financial capacity of local government to redevelop and increase the supply of Social Housing through the creation of **local investment platforms** able to attract additional financial resources of private social housing on the basis of the same model adopted by *Fondo Investimenti per l'Abitare* (FIA), the real estate investment fund launched by CDPI SGR.

Thus, the project will be mainly focused on establishing local platforms which could (i) ease the access to financial resources, (ii) facilitate request and approval of procedures, (iii) accelerate disbursements based on reporting about project's progress, (iv) improve monitoring, audit and assistance procedures.

CDPI SGR will directly manage the construction of 2,500 affordable housing units and 1,500 beds in student accommodation. In order to monitor the implementation phases, CDPI SGR will receive quarterly reports from the target funds and collect all data related to the activities of construction sites.

RRF resources will be combined with third-party resources (target of mobilising 0,5 bn Eur additional) raised both at Fund of Funds level and at target funds level (multiple effect not considered).

Impediments: Risk of delay (currently unpredictable) due to any technical or connected with town-planning criticalities linked to the construction sites.

Target population: Vulnerable people, including students, and low-income households.

Timeline: The implementation period is estimated to last from 2021 to 2026

3) Sport and peripheries.

Investment 7: Sport and Peripheries.

Challenges: Covid-19 pandemic has deeply impacted on sport events and competitions as well as on non-competitive sports. In fact, the whole sector is suffering from economic losses. Local communities, especially those most deprived, might lose urban spaces (both

public and private ones) where people can play sport and develop social relations, with the risk of an increase of social exclusion.

In conclusion, sport can be considered as a strategic tool against poor living conditions such as the lack of job security and the ghettoisation of certain suburbs and deprived areas, also taking into account that participation in sport is positively related to self-esteem, self-regulation skills, and social inclusion.

Objectives: The project is aimed at regenerating urban areas focusing on sport facilities, in order to promote social inclusion and integration, especially in the most deprived areas of Italy. Sport and culture play an important social role for inclusion, cohesion and well-being and are a strong tool for participation and social integration. The creation of sports facilities and the regeneration and requalification of sports structures and urban parks can enhance the socialization of young people and tackle social marginalization.

In this context the national multi-year plan of interventions “Sport e Periferie” (Sport and Suburbs) which started in 2015 and still ongoing can be placed within the reform and investment strategy conceived by the Italian Government more than five years ago.⁴⁰

In order to avoid misunderstandings from now on we will talk about “Sport and Periferie” when referring to the national multi-year fund, and about “SeP” when referring to the new present project.

The 2018 budget law ⁴¹ adopted “Sport and Periferie” as a structural Fund, allowing the expenditure of € 10 million per year, starting from 2018, to be assigned to the Office for Sport at the Presidency of the Council of Ministers. There was an urgent need to develop social and cultural policies in order to achieve common goals: to reduce marginalization and social degradation, as well as to improve the quality and redevelopment of the social fabric, also through the promotion of sports activities.

All the measures and interventions of this fund have been designed, implemented and delivered using methodological tools to assess its sustainability. The selection of the projects is actually based on a predefined set of scoring criteria. The evaluation of the applications is carried out by a special Commission which is in charge of delivering the final ranking of the subjects admitted to the funding. Since 2015, more than 350 projects have been selected and more than 100 have been completed.⁴²

In accordance and continuity with the current reform and investment activities initiated by the Italian Government, the SeP project intends to improve living conditions for the most vulnerable communities, including migrants and marginalized areas in an inclusive

⁴⁰Fund established by article 15, of the [decree law 25 November 2015, n. 18](#) converted by [law 22 January 2016, n. 9](#)

⁴¹[Law n. 205, 27 December 2017](#)

⁴²For example in 2019 were admitted to financing 245 projects for an amount 72 mln €

and conflict-sensitive manner by enhancing access to sport, aiming at the inclusion of youth to prevent marginalisation and deviation to crime and organised crime.

By activating urban requalification mechanisms and renewing sport facilities, it is possible to improve culture and territorial regeneration, with positive impacts on economic and social conditions of urban/local communities and on territorial resilience. In general, the main objectives of the project are:

- i. defining a socio-economic regeneration process, in terms of valorisation of urban relations, social inclusion and better links between open and closed spaces with a special attention to spaces for sport activities (Milestones 1, 2 and 3 and Targets 1 and 2);
- ii. enforcing territorial resilience by focusing on the reuse of already existing buildings and urban spaces (Milestones 1, 2 and 3 and Targets 1 and 2);
- iii. reducing socio-economic impact of the Covid-19 pandemic (Milestones 1, 2 and 3 and Targets 1 and 2);
- iv. promoting national and European policies on green and digital transition (project implementation of awarded proposal in line with the guiding principle of with the European Union Action Plan for the circular economy (EU's Taxonomy Regulation) – eco-design approach - the management of a construction project in a sustainable way - use of circular building materials - energy efficient buildings - safeguarding green open spaces, areas for social aggregation and interaction, active and passive sport areas, and cultural spaces – etc.) (Milestones 1, 2 and 3 and Targets 1 and 2).

Implementation: project implementation is structured in three phases:

- *Phase 1:* This phase includes all the necessary preliminary analysis and actions in order to better prepare the public procurement, such as the baseline identification and analysis; the creation of dedicated tools; the identification of project partners (e.g. sport federations, other associations and entities with competences in sport) and experts (these partner(s) will play a critical role in supporting and contributing to the implementation of the project activities) and their engagement; the setting-up of facilities aimed at supporting the beneficiaries in developing their sustainable projects.

At the end of the phase 1, a public administrative procedure will be implemented for the selection of territorial projects (call for proposal).

- *Phase 2:* starting phase and implementation of the selected projects. For most expensive projects, it will be possible to use the project financing instrument, and each project can receive from 80% to 100% of the total cost of the project, requiring a possible private contribution.
- *Phase 3:* monitoring and verification of the projects' implementation level and promotion of best practice.

The requested EU contribution for SeP project amounts at 700mln EUR. In the following figure the implementation project plan is reported.

Concerning the call for proposals, the eligibility criteria will be differentiated in mandatory and additional requirements:

Mandatory requirements:

Eligible activities must be in line with the “Sport e Salute” – SeP strategy and the European Union Action Plan for the circular economy (EU’s Taxonomy Regulation) of the concerned sector.

The SeP project takes advantage from reliable and profitable know-how of “Sport e Periferie” Fund (national ongoing investment program) for the development of criteria and indicators.

In this view, the computation of the composite vulnerability index (material and social vulnerability by the Italian National Institute of Statistics ISTAT) and environmental sustainability, in terms of energy efficiency through the use of appropriate technology and the use of renewable sources/environmentally friendly materials (criteria currently included in the call for proposal of Sport e Periferie” Fund (national ongoing investment program) will be taken into account and eventually improved.

Proposals need to include an analysis of relevant gender and inclusion issues and incorporate relevant activities in their strategy.

Additional requirements:

While all applications meeting the above mandatory requirement will be considered, applications will receive additional points if the proposals meet the additional requirements, not yet individuated (these criteria will be selected during the phase 1).

Proposals may come from Local Authorities (Regions, Provinces, Cities, ect) sport associations, schools (schools have to make accessible its sport infrastructures to all citizens during school time), no profit organizations as well as oratories provided with sport infrastructure.

Eligible costs are those required for carrying out the project activities and are incurred by the applicants and their partners.

Costs should:

- Comply with the principles of sound financial management, in particular value for money and cost effectiveness, in accordance with the Italian public procurement Code (Decreto legislativo 18 aprile 2016, n. 50. and Public contracts in the EU – rules;
- reflect market prices;

- be recorded in the applicants' accounts, be identifiable and verifiable and be backed up by original supporting documents.

Target population: Municipalities, sport federations, other associations and entities with competences in sport are direct beneficiaries of the financial contributions.

The citizens are the purpose of this project proposal, especially young and disadvantaged people living in deprived areas.

The combination of sport and young people is a perfect tool of values and is one of the most effective glue for social and territorial cohesion especially in the rural areas. Sport is an instrument of citizenship, of construction of public space and of exploration of living spaces but it is also a bridge between citizens, especially young people, and places.

Sport is recognized as a universal language that elevates the human being to a condition of equality. Sport is an instrument of dialogue made up of practices rather than words and for this reason it is a privileged form of communication to young people. Not surprisingly, in the 2030 Agenda which includes the Sustainability Goals, sport is counted as one of the main means for peace. Sport is able to remove the barriers of disability, is a tool of women's emancipation and social justice.

Timeline: The implementation period is estimated to be from 2021 to 2026.

4. Green and digital dimensions of the component

a) Green Transition:

Investments included in the Component, such as “**Sport e peripheries**”, “**Piano Nazionale dell’Abitare**” and “**Fondo Investimenti per l’Abitare**”, which are aimed at improving social inclusion and reducing vulnerable people marginalisation, promote urban regeneration and renovation of buildings taking into consideration green aspects concerning renovation of green areas in cities or increasing existing buildings’ energy efficiency, etc.. Other investments included in the Component do not have specific impacts on green transition, but they ensure the full respect of the “do no significant harm” principle.

In this context, the Component is coherent with policy objectives of the new structural funds programming period and with the **Partnership Agreement 2021-2027**, whose draft has been shared with European Commission for a first evaluation. The Component, in fact, can contribute to two specific objectives of Policy 2 “Greener Europe”, namely promotion of energy efficiency measures and transition to circular economy.

Investments included in this Component are also in line with provisions of the **Integrated National and Climate Plan** and, more specifically, with the dimension “Energy effi-

ciency”. The Plan, in fact, clarifies that the significant potential for efficiency in the building sector may be better exploited through measures such as the energy renovation of buildings and neighbourhoods, together with the structural renovation, earthquake proofing, systems upgrading and refurbishment, also in line with the strategy on energy renovation of the building stock by 2050. The above-mentioned projects are aimed at promoting social inclusion by solving housing availability problems for vulnerable people, also taking into consideration buildings’ energy performance, as well as renovating urban areas paying attention to the balance between built and green areas.

Moreover, the Component can contribute to the Goals of the UN **Agenda 2030 for Sustainable development**, such as n. 11.3 “*By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries*” and n. 11.7 “*By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities*”, ensuring its compliance with the EU Green Deal and the National Strategy for Sustainable Development as well.

b) Digital Transition:

The (proposed) Regulation COM(2020) 408 establishing a Recovery and Resilience Facility sets a binding target of at least 20% of the plan’s total allocation to contribute to the digital transition or to the challenges resulting from it.

The Component is coherent with the EU and national policies in the field of digital transition, with reference to the investment “**Autonomy patterns for people with disabilities**” aimed at improving autonomy of people with disabilities, promoting community and home-based social and health services by removing barriers in accessing housing and job opportunities, also considering new possibilities offered by information technology and domotics.

The Component is therefore in line with the **Communication “Shaping Europe’s digital future”**, that describes EC key objectives for next 5 years and, more specifically, with the objective “Technology that works for people: Development, deployment and uptake of technology that makes a real difference to people’s daily lives. A strong and competitive economy that masters and shapes technology in a way that respects European values”.

Moreover, as highlighted by the EC Communication of 30th June 2020 “**European Skills Agenda for sustainable competitiveness, social fairness and resilience**”, Covid-19 pandemic has accelerated the process to digital transition: teleworking and distance learning spread among millions of people in whole Europe and relevant digital gaps have emerged. In this context, training and upskilling activities on digital competences are essential for people with disabilities and, more generally, vulnerable ones.

Table 1 - *work in progress*

5. Milestones, targets and timeline

(i) Social infrastructures in municipalities and involvement of third sector

Tbd

(ii) Autonomy patterns for people with disabilities (to be updated on the basis of the increased budget)

Milestones:

- establishment of a task force between the Ministry of Labor and Social Policies and the Regions in order to prepare the operational plan of interventions at the territorial level – by March 2021
- publication of (non-competitive) procurement procedures for social territorial areas – by June 2021
- definition of projects in the territorial social areas – by March 2022

Targets

- 600 number of territorial social areas involved in the procedures
- 600 number of activated projects (1 or 2 apartments per project)
- 4,200 people with disabilities involved

(iii) Housing First and Post Stations (to be updated on the basis of the increased budget)

Milestones

- establishment of a task force between the Ministry of Labor and Social Policies and the Regions in order to prepare the operational plan of interventions at the territorial level – by March 2021
- publication of (non-competitive) procurement procedures intended social territorial areas – by June 2021
- definition of projects in the territorial social areas – by March 2022

Targets

- 250 territorial-social areas involved in the procedures
- 250 housing-first projects activated (2-4 apartments per project)
- 3,400 subjects taken care of (families and individuals in temporary housing difficulties, homeless)
- 250 Post Stations built
- 25,000 homeless involved

(iv) Investments in projects of urban regeneration, aimed at reducing situations of marginalization and social degradation (to be updated on the basis of the increased budget and the related line of intervention)

Milestones

- Submission of requests by municipalities in 2021-2023 - by 90 days from the Decree publication
- Awarding of public works - by 750 days
- Submission of requests by municipalities in 2024-2026 - by June 2023
- Awarding of public works - by October 2024

Targets

- 120 approved projects for the period 2021-2023

- 240 approved projects for the period 2024-2026

(v) **National Plan “Qualità dell’abitare”** (to be updated on the basis of the decreased budget)

Milestones

- Intervention planning (by March 2021)

Targets

- Renovation actions and proposals to regenerate degraded and service-deficient urban areas
- 30% of total eligible organizations involved
- 75% of the total number of Regions and Autonomous Provinces involved
- High-performance pilot projects for the regeneration of particularly degraded and service-deficient urban areas
- 50% of the total number of Regions and Autonomous Provinces involved

(vi) **Increase the availability of Social Housing**

Milestones

- Fund’s establishment - by December 2021
- First 3 Investments establishment - by December 2022

Targets

4,000 accommodation facilities (2,500 affordable apartments and 1,500 beds in student accommodations)

(vii) **Sport and Peripheries**

Milestones

- setting-up of a technical working group for developing and implementing the project activities, also including monitoring and evaluation of projects awarded - by the end of the year from the start of the projects
- setting-up of a Technical Committee for the selection of projects (only for the selection of projects) – by the end of 2021
- definition of the call for tenders – by the end of 2021

Targets

- percentage of the projects awarded fully implemented:
 - realization of 20% of all the awarded regeneration interventions measured at the end of the first semester of the second year (end of the 1st semester of the 1st year of PHASE 2).
 - realization of 30% of all the awarded regeneration interventions measured at the end of the second semester of the second year (end of the 2nd semester of the 1st year of PHASE 2).
 - realization of 40% of all the awarded regeneration interventions measured at the end of the first semester of the third year (end of the 1st semester of the 2nd year of PHASE 2).
 - realization of 50% of all the awarded regeneration interventions measured at the end of the second semester of the second year (end of the 2nd semester of the 2nd year of PHASE 2);
 - realization of 65% of all the awarded regeneration interventions measured at the end of the first semester of the fifth year (end of the 1st semester of the 4th year of PHASE 2).

- realization of 70% of all the awarded regeneration interventions measured at the end of the second semester of the fifth year (end of the 2nd semester of the 4th year of PHASE 2)
- involvement of at least 20% of the National Sports Federations, measured at the end of the 3rd year (end of the 2nd year of PHASE 2).

Table 2 - *work in progress*

6. Financing and costs

Table 2 - *work in progress*

3 M5C3 - Special intervention for territorial cohesion

Summary box

Policy area: Territorial cohesion

Objectives:

This component aims at reducing the gaps between the different areas of the Country. In order to tackle the fragmented regional development and social inequalities, a common vision focused on territorial interdependence and cohesion is needed.

Specifically, this component aims at tackling marginalization issues characterized by different types of gaps:

- a) “Demographic and services divide”, directly linked to the divide between inner/rural, mountain, peripheral areas and urban areas, in order to ensure the same levels of essential services and the relaunch of specific productive vocations;
- b) “Investment divide”, related to areas affected by seismic events, in particular the 2009 and 2016 earthquakes, so to guarantee a safe and sustainable reconstruction and to boost the social, economic recovery of these territories;
- c) “Divide on skill development”, in a open innovation perspective involving businesses, research centres and public authorities;
- d) “Social and economic divide in the Southern regions”, where the economic crisis is affecting a weaker production chain, a more fragmented labour market and a less inclusive community.

In order to achieve these objectives, the component has four intervention areas:

- (i) Plan for resilience of internal areas, through the strengthening of the National Strategy for Inner Areas (NSIA). The purpose of this Plan is to promote an integrated development of the Country, to avoid the depopulation of those areas not directly connected to the primary road network;
- (ii) Intervention in the earthquake areas, with the aim to improve the energy and seismic standards of private and public buildings, by strengthening the renewable energy sources, and to support local economic and productive activities, by enhancing environmental and agro-food assets, tourism and cultural heritage;
- (iii) Projects for the development of the South, including support for precision agriculture, investments for tackling education poverty, investments for the redevelopment of hubs for higher education and reskilling/upskilling paths, multidisciplinary research and business creation, as well as the enhancement of assets confiscated from the organised crime.

Reforms and investments:

Reform 1: Structural strengthening of the National Strategy for Inner Areas (NSIA) and regulatory reforms to improve accessibility to essential public services, remove regulatory constraints that inhibit adequate access to basic services by the citizens of inner areas, as mapped in the NSIA and support the launch of the health and education reform.

Investment 1: National Strategy for Inner Areas: a) Development of the local economy and new entrepreneurship; b) Enhancement of community social services and infrastructures.

Investment 2: Earthquake Area Plan.

Investment 3: Creation of Innovation Ecosystems in Southern Italy.

Investment 4. Enhancement of assets confiscated from the organised crime

Estimated costs:

EUR 4,180 million requested under RRF

M5C3 - Special intervention for territorial cohesion

	Resources (euro/mld)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
National strategy for inner areas	-	1.50	1.50	-	1.50
Earthquake Area Plan	-	1.78	1.78	-	1.78
Innovation ecosystem for Southern Italy	-	0.60	0.60	-	0.60
Valorization of assets confiscated from criminal organizations	-	0.30	0.30	-	0.30
TOTAL	-	4.18	4.18	-	4.18

Note: (b) includes FSC existing resources, to be devoted to specific measures.

2. Main challenges and objectives

a) Main challenges

Curbing the marginalisation of large areas of the Country

The 2020 Country Report of the European Commission highlights that in recent decades, territorial inequalities have increased in Italy. The territorial disparities do not only concern Southern Italy versus Northern Italy, but also the so called “inner areas”, the suburbs versus the city centres, the smaller towns versus the medium-sized cities, the

de-industrialised countryside versus the former industrial sites. Due to the Covid-19 crisis, these inequalities have worsened, making the need for urgent intervention more evident (The current situation calls for targeted policy responses – Country Specific Recommendations, pt. 9).

However, the phenomenon of marginalisation affecting ever larger areas of the country has causes prior to the epidemic crisis. The progressive reduction of investments in the South has also weakened the North, because of economic integration between the two areas. According to the overall scenario provided by the *Sistema dei Conti Pubblici Territoriali*, at the Territorial Cohesion Agency (ACT, 2009), the total capital expenditure of the PA in Southern Italy in 2018 has more than halved compared to 2008 trend (from 21 to 10.3 billion) (2030 South Plan – II. Resources. A commitment for the 2020-2030 decade).

In this regard, the National Recovery and Resilience Plan (NRRP) becomes an opportunity to both tackle the effects of Covid-19 crisis, and change the macro-economic trends of the Country and, more specifically, of marginalised areas.

Moreover, the European Commission stresses that it will be important to anticipate ongoing investment projects and to promote private investments, in order to foster economic and social recovery, also through NRRP investments.

Green transition investments will also be particularly relevant to boost the recovery and increase future resilience.

Addressing challenges of environments and climate changes, such as hydrogeological risks, sustainable urban mobility, energy efficiency, circular economy and industrial transformation, is an opportunity to improve productivity, while avoiding unsustainable practices. At the same time, investing in this kind of services can support the creation of new jobs and sustain the post-crisis effort.

Therefore, curbing the marginalisation of large areas of the Country can be summarised in the following gaps:

Worsening of the level of security in the territory - Since Inner Areas are characterised by hydrogeological and seismic risks, enhancing their security is strictly linked to enforce repopulation of these areas. For example, ensuring a well-maintained road network even means both curbing hydrogeological risk for Inner Areas and connecting hydrogeological areas in case of rescue interventions to the city centres and their services; moreover it makes more accessible these Areas.

Reduction of the essential service supply to people - Due to the reduction of public investment triggered by austerity during the economic crisis in 2008, the indicators measuring access to essential services in the South and marginalised areas, with particular reference to education, health and social assistance (2020 Svimez Report - The territorial distribution of public expenditure and access to services), diverged from the national average levels.

As an example, the per capita expenditure of the municipalities for socio-education services, addressed to children aged 0-2, is EUR 1,468 in the Central regions, EUR 1,255 in the North-East and then falls to just EUR 277 in the Southern regions.

Lack of economic development and joblessness - Negative demographic trends, the poor conditions of the labour market, the lack of quality services, all weaken the growth prospects of these areas, leading to the depopulation of the South and of rural areas.

Missing valorisation under sustainable perspective - The South, Inner Areas and islands are among the areas more affected by climate change and by the process of social and territorial marginalisation related to the current development model. It is essential to promote actions aimed at achieving a fair ecological transition. It is also crucial to boost best practices in the field of circular economy. For example, promoting, particularly in the Southern regions, the reusing assets confiscated to organised crime. As the extraordinary maintenance operations and rehabilitation of existing infrastructures avoid consumption of new land.

b) Objectives Coherently with the challenge of reducing socio-economic and geographical marginalization in large areas of the Country, the proposed package of reforms and investments intervenes on infrastructures, services, on new job opportunities and knowledge, considering also the crosscutting role that sustainability and technological innovation play.

The component with reforms and investments aims at reactivating the enabling conditions for reversing the negative trends (depopulation, collapse of public investment, lack of productivity gains, worsening attractiveness of these areas, etc.) that affect the development potential of these areas.

Strengthening of security and recovery of territories

- Contribute to the hydro-geological rehabilitation of the territory, first and foremost in inner areas and more marginalised areas;
- Provide infrastructures capable of increasing accessibility and safety in these areas;
- Supporting the restart process for places that have been affected by seismic events.

Revival of essential public services

- Rebalancing the supply of essential services in favour of the most vulnerable members of the population and in particular marginalised areas. The main areas of intervention include education, health and mobility;
- Relaunching the attractiveness of the territories in order to improve life conditions of people living in these areas and positively affecting the demographic dynamics of the target places.

Reactivation of economic development

- Favouring job opportunities especially for the human capital that is potentially best suited to trigger development phenomena (from brain drain to brain gain; from the loss of mature activities to generational changeover);
- Developing contexts capable of building cutting-edge skills, by setting up a system of training and production within the territory;
- Promoting technology as an enabling element for productivity growth and as a trigger for the unexpressed potential of the South.

Investments for sustainability in marginalized areas

- Enhance investments and economic activities, respecting territories and their specificities, using in a sustainable way the natural, landscape and cultural characteristics;
- Promoting the dissemination of experiences in line with the European paradigm of the circular economy and more in general of the reusing best practice;
- Recovering infrastructure in use or disused, avoiding extra soil erosion.

The mentioned objectives are closely correlated (e.g.: the repopulation of places encourages their maintenance; the maintenance of places increases their attractiveness which fosters population settlement; the presence of a minimum number of people makes services and commercial activities sustainable, etc.). The selection of projects in this component has taken into account initiatives capable of favouring the achievement of these objectives and capable of generating directly and indirectly relevant positive impacts.

The investments and reforms of this component are related to the existing European and National programmes (NRP, NSIA, 2030 South Plan, National Strategy for Green Community, National Strategy for confiscated assets rehabilitation through Cohesion Policy, 2030 National Integrated Energy and Climate Plan, 2021-2027 Partnership Agreement, Green Deal, etc.). These coordinated policies design an overall strategy that contributes to the macro-objective of reducing development gaps and tackling marginalisation.

Contributing to the implementation of the above-mentioned National and European plans also ensures compliance with the Commission's recommendations, including CSR and Country Report recommendations.

3. Description of the reforms and investments of the component

1) Strengthening the National Strategy for Inner Areas.

Reform 1: NSIA - Structural strengthening of the National Strategy for Inner Areas and regulatory reforms to improve accessibility to essential public services.

The reform aims at strengthening the National Strategy for Inner Areas (areas far from essential services: education, health, accessibility) by changing some regulation constraints

that currently limit access to basic services (transportation, education and health) for inhabitants of these Inner Areas.

The estimated budget is EUR [200] million, including also initiatives aimed to kick-start the implementation of the reform.

Challenges: The National Strategy for Inner Areas is also aimed to increase the attractiveness of Inner Areas, in order to boost their population, the maintenance of the territory and the enhancement of these cultural and natural heritage.

In addition, the increase of the attractiveness of these areas may ensure more job opportunities for young people and support the fight against the abandonment of the territory.

Objectives: The reform aims at changing and updating the existing legislation, in order to strengthen the territorial network of essential care services for residents of Inner Areas. In particular, the areas covered by this reform are: Health, Education and Transport.

Implementation: The implementation of the reform envisages a technical and political dialogue with the public authorities, so to start the technical preliminary investigation on the necessary regulation changes, as well as to identify the related budget coverage. This process ends with the approval and the subsequent implementation of the regulatory changes.

More in detail, the reform can be summarised on the basis of the following essential services:

- Definition of the “*School Package*”, in coordination with the Ministry of Education:
 - a) increasing the number of School Heads located in the Inner Areas, also by the way of derogation from the current limits n. pupils/school heads;
 - b) promoting the presence of teachers in the Inner Areas;
 - c) training of teachers teaching classes with pupils of different ages groups;
 - d) strengthening the presence of secondary schools;
- Definition of a “*Health Package*”, in coordination with the Ministry of Health:
 - a) strengthening territorial health networks, with a particular attention to the organisation of birthing services;
 - b) increasing socio-health services at home;
 - c) increasing specialist services and networks of laboratories and consultants in the territories;
 - d) interventions in favour of telemedicine;
- Definition of the “*Mobility Package*”: adapting regional transportation planning to the needs of the Inner Areas. In this regard, it will be relevant to ensure that the Regions take into account the needs of the Inner Areas when defining the service contract with the LPT (Local Public Transport) authority.

The financial requirements for the start of the reform have been estimated according to the characteristics and investments related to "School", "Health" and "Mobility", as identified in the Area Strategies approved by the Inner Areas Technical Committee and promoted during the 2014-2020 National Strategy. In particular, this financial need,

standardised according to resident population (per capita), is estimated at: 57 euros per inhabitant - School package; 66 euros per inhabitant - Health package, 126 euros per inhabitant - Mobility package.

Given these unit costs, the implementation of the reforms, aimed at least 5% of the population of the Inner Areas, has a total cost of about EUR [200] million.

The main stakeholders involved in the implementation are the Ministry for the South and Territorial Cohesion, the Ministry of Education, the Ministry of Health, the Ministry for Infrastructure and Transport, the Regions and the 72 identified Inner Areas, the Inner Areas Technical Committee.

Target population: Inhabitants in the target areas of intervention.

Timeline: A timeframe of 2 years is foreseen for regulatory change and 4 years for supporting the start of the reform.

Investment 1: National Strategy for Inner Areas -. [linked to reform 1]

Both investment and reform proposals are aimed at making structural national policy related to the Inner Areas.

About three fifths of the Italian territory is classified as an inner area. They are located across Italy from North to South and present similar characteristics: a) great natural and cultural heritage; b) distance from urban and service centres; c) significant opportunities of development by combining innovation with tradition.

In order to revitalize and enhance the inner areas, it is necessary to support investments that increase their attractiveness, while reversing their declining trends (infrastructural, demographic and economic).

The investment proposal consists of the following intervention areas:

1. Strengthening the existing economic activities and development of new entrepreneurship, including the agricultural sector;
2. Community services and infrastructures to tackle the issues of limited access to basic services (services for elderly, service for young people at risk of exclusion, social care services), also through the dialogue with the local communities

Challenges: Despite the relevant investment made with both ESIF and national funds, the Italian Inner Areas face the following issues:

1. Difficulties in strengthening the existing economic activities and development of new entrepreneurship, to be tackled through specific measures for job creation, especially for young people, in order to boost their return to these areas;
2. Lack of community services, to be tackled by identifying organisational and innova-

tive solutions that allow to adequately respond to the daily problems of people living in such particular contexts, in order to contrast the deterioration of the quality of life in these areas;

Objectives: The NSIA aims at both adapting the quality and quantity of education, health and mobility services (citizenship), and promoting initiatives that enhance the natural and cultural heritage of these areas, also focusing on local production chains (market).

These investments also are aimed to achieve the following impacts, that are foreseen to be correlated among each other:

- Promoting the economic and social recovery of the areas;
- Creating new job opportunities, particularly for young people;
- Increasing the deployment of community services and social infrastructure to improve the quality of life;
- Supporting the generation turnover in agriculture and the expansion of existing farms run by young people;
- Tackling the depopulation in the areas mapped by NSIA;
- Encouraging the development of sustainable local markets;
- Improving the maintenance of the territory, through the support and active role of its inhabitants;
- Enhancing the level of knowledge of the local authorities' assets and the capacity of implementing bodies to assess risks, according to standardised procedures consistent with the current regulations, as well as carrying out the consequent mitigation measures.

Implementation: This proposal is based on the following two interventions:

(i) Development of the local economy and new entrepreneurship

The intervention aims to extend two specific measures - already implemented in Italy - to all Inner Areas:

- “*Resto al Sud*” measure, to be extended to the Centre-North Inner Areas (excluding those in earthquake-affected areas already covered by this measure).
- “Young entrepreneurs in agriculture” measure.⁴³

The above measures will be implemented through “one-stop” procedures.

The endowment was estimated on the basis of the applications submitted and accepted for financing under the two measures “*Resto al Sud*” and “Youth Entrepreneurs in agriculture”, taking into account the population of the relevant municipalities in the eligible age, and assuming higher application/admission rates in the Centre-Northern Italy than

⁴³D.Lgs n.185/2000 - Titolo I, Capo III, including following changes.

in the Southern Italy.

(ii) Enhancement of community social services and infrastructures

The intervention aims at tackling the issues of social exclusion and marginalisation, by intensifying the provision of services (to the elderly, young people at risk, social welfare services, etc.).

The implementation envisages the following steps: a) the identification of statistical indicators aimed at measuring specific intervention needs; b) the promotion of dialogue with the local community, in particular through technical-institutional meetings with their representatives, in order to select specific criteria in the definition of services and allocation and resources; c) the preparation of the implementation tool; d) the activation of the measure.

The financial requirement has been estimated on the basis of the investments mapped in the Area Strategies, already approved by the Inner Areas Technical Committee and elaborated during the 2014-2020 National Strategy's pilot initiative.

2) Earthquake area plan.

Investment 2: This Plan is intended for all the areas of Central Italy that have been affected by numerous seismic events in the last 15 years, which have seriously influenced their liveability, with consequences in terms of human losses, conspicuous damage to public and private buildings⁴⁴ and long-lasting effects on urban and socio-economic life.

The Plan, envisioned by the Office of the Extraordinary Commissioner for the 2016 earthquakes in agreement with the Department "Casa Italia", is divided into the following two wide-ranging areas of intervention:

1. Measures aimed at rebuilding areas affected by earthquakes and involved in reconstruction programs;
2. Measures specifically directed at the seismic zones of the 2009 and 2016 earthquakes.

The aim is to ensure a safe, sustainable and connected reconstruction in order to start the process of social, economic and environmental recovery for these territories. This is particularly needed to introduce elements of innovation and improve the quality of life by

⁴⁴See <https://opendataricostruzione.gssi.it/home>: the portal is a project of the Gran Sasso Science Institute, created in collaboration with the Municipality of L'Aquila, the University of L'Aquila, the special offices for the reconstruction of L'Aquila and the seismic zones (Usra and Usrc) and with the contribution of Openpolis and Actionaid Italia International Onlus which brings together all the data, statistics and information on the reconstruction of L'Aquila and the municipalities of the seismic zone damaged by the earthquake of 6 April 2009.

creating the conditions for staying, living, moving, working, specialising, doing business, visiting and learning about these territories.

The first Line of Action involves the Private reconstruction of buildings for economic activities, securing public and school infrastructures, energy efficiency, urban design and sustainable communities, with the following interventions:

- A. Energy efficiency and seismic improvement of private and productive buildings
- B. Public buildings, urban design and cities that are less energy-intensive, more connected and inclusive

The second Line of Action involves Know-how and action: support to skills and training (skills strategy) and to the qualification of productive vocations, also with reference to institutional development contracts, with the following intervention:

- C. Know-how and action. Integrated centres for local skill development, university research centres and promotion of an eco-sustainable economic identity, also in light of institutional development contracts

The third and final Line of Action involves Support to skills and training (skills strategy) and to the circular economy, creative industries and tourism divided in the following interventions:

- D. Terreconomy - Circular economy of territorial resources
- E. Apennines and Knowledge: Culture, Creativity and Tourism

Challenges:

Objectives:

Implementation:

Target population:

Timeline: .

3) Innovation Ecosystem in Southern Italy.

Investment 3: Investment Creation of Innovation Ecosystems in Southern Italy.

The objective of the project, which is closely linked to the action promoted by the Ministry of Education (MUR) for the setting up and strengthening of innovation hubs at national level, is to invest EUR 600 million for the creation of Innovation Ecosystems in Southern Italy. Indeed, these ecosystems provide for the creation of material infrastructures or the regeneration of abandoned ones, aimed at attracting new innovative businesses and

promoting the development of highly-qualified human capital.

Challenges:

- Contributing to the digital transition and socio-economic development in the Southern Italy
- Revitalising productivity and competitiveness through the support for research, innovation and technology dissemination, as well as investing in people's skills.
- Strengthening collaboration models between businesses, institutions, research organisations and civil society, in accordance with the open innovation approach and the involvement of all the stakeholders (also known as “quadruple helix structure”)
- Sustainable development of society, through the identification of new tools and approaches aimed at boosting the green and digital transition.
- Environmental recovery, urban regeneration, and socio-economic revitalization of degraded urban areas.

Objectives: The project aims to promote the social and environmental regeneration of degraded urban areas, through the creation of 8 Innovation Hubs to host higher education, reskilling/upskilling paths, multidisciplinary research and creation of businesses

The regeneration of these areas involves a broad collaboration between universities, research centres, businesses, public administrations, and third sector organisations, by valorizing the role of all the players involved.

Implementation: This initiative, proposed by the Minister for the South and Territorial Cohesion, provides for a total of EUR 480 million of investments for the creation of 8 Innovation Ecosystems in the South (EUR 60 million each, estimated by taking into account similar measures enacted in the past).

These interventions will be implemented over the period 2021-2026 in close collaboration with the MUR and the Southern Regions where the hubs are located.

The initiative consists of an initial planning phase, coordinated by an Inter-institutional table (MUR, Ministry for the Southern Italy and Territorial Cohesion, Regions, etc.) which will have to set up a memorandum of understanding to share the general aims of the two support measures (this one and that of the MUR) and the procedural path to implement them.

During this phase the sites will be selected through expressions of interest and also the tender procedures will be launched. The executive planning is expected to be finalised in the third quarter of 2021. The identification of these sites will take into account, on the one hand, the absence of constraints that could slow down the execution planning and, on the other hand, the stakeholders' capacity to steer the strategic development of the Ecosystem.

The second phase consists of the requalification and infrastructural upgrading of the

identified sites and will start within the first quarter of 2023 and end in the third quarter of 2026.

The action will be supported by actions under the responsibility of the MUR aimed at: a) human capital upskilling and reskilling, b) attraction and business incubation, c) collaborative research between research bodies (universities and research centres), enterprises and institutions and d) implementation of open innovation initiatives with the involvement of the local community.

Target population: Businesses, academic community, public authorities and civil society in the target areas.

Timeline: The project is scheduled to start in 2021, with a duration of 6 years. The end of the project is foreseen for the second quarter of 2026.

4) Valorisation of assets confiscated from the organised crime.

Investment 4: Enhancement of assets confiscated from the organised crime

The investment, amounting to EUR 300 million, aims at implementing the National Strategy for Confiscated Assets Rehabilitation, by promoting the reuse for social, economic, employment and institutional purposes assets confiscated from organised crime, and located in the 8 Southern regions.

Challenges: Reducing the social and economic impact of the crisis through the rehabilitation of the assets confiscated from organised crime, in order to boost economic, social and territorial cohesion, restore growth potential, and foster the creation of new jobs.

Strengthening and improvement of public services for citizens.

Objectives: The project promotes the economic, social and civil development of areas affected by organised crime, pursuing actions of confiscated assets rehabilitation, according to the Objective 2 of the National Strategy for Confiscated Assets Rehabilitation through Cohesion Policy, approved by the CIPE with resolution 53/18.

Through this rehabilitation to the community and a more effective and efficient use of the confiscated assets for economic, social and institutional purposes, the project creates the conditions for a transparent market economy, without conditioning, while ensuring greater wealth and employment opportunities in the regions of Southern Italy, in compliance with legality and social justice.

Specifically, the confiscated assets rehabilitation aims to:

- social/housing inclusion of people living in conditions of exclusion (people at risk of poverty, homeless people, victims of violence, elderly people, people with limited

- autonomy, Roma, etc.) through the creation of facilities, social/health residences, day centres, co-housing or flat sharing;
- integration through the regeneration of public spaces, in order to improve services to citizens (community social services, such as nursery schools, leisure centres, socio-educational services for early childhood, toy libraries and day centres for minors, socio-educational communities, gyms, labs);
 - socio-cultural gathering spaces for young people, managed by voluntary associations or networks (mini-libraries, spaces for music groups, community or neighbourhood gathering places, etc.);
 - support for new job opportunities for young people and people at risk of exclusion, while at the same time producing goods and services of public interest through the creation of spaces for creativity, innovation and social entrepreneurship (hubs);
 - Legality and territorial security sites (barracks, police/carabinieri stations, civil protection, etc.), in order to promote a more transparent and legal economy and foster the replacement of buildings for which the public administration pays rent;
 - facilities for hosting, mediation and integration, by supporting migrants in the territory and steering them to the competent services (health facilities, employment centres, etc.).

Implementation: The initiative, proposed by the Minister for the South and Territorial Cohesion, promotes total [investments of €140 million for 280 interventions] to enhance the value of public real estate (buildings and land), to be selected in agreement with the regions and with the involvement of the beneficiary entities.

There are an average of 35 actions planned for each of the eight regions (Abruzzo, Basilicata, Calabria, Campania, Molise, Apulia, Sardinia and Sicily), aimed at ensuring the assets reuse for social, economic, employment and institutional purposes, as well as promoting a more transparent and legal economy.

For the purposes of carrying out the aforementioned interventions, 8 agreements are expected to be signed in the first half of 2021 between the "Confiscated Assets" Agency, the Territorial Cohesion Agency, the Department for Cohesion Policy and the Southern Regions, aimed at the publication of tenders or notices addressed to Local Authorities and/or Third Sector Organisations for the confiscated assets rehabilitation, according to the Objective 2 of the aforementioned National Strategy.

By the end of 2021/first quarter 2022, interventions will be selected for each of the 8 Regions, as a result of the regional calls.

Once the selected projects have been approved, the Beneficiary Bodies will activate the procurement procedures, in order to allow the awarding and delivery of construction sites and the start of the works by the last quarter of 2023. The following three-year period (2024-2026) will be dedicated to building renovation infrastructural activities and the projects will be completed no later than the fourth quarter of 2026.

The implementation phase will be carried out through two specific actions aimed to support local authorities in their project planning and sustainability. Therefore, this action makes highly skilled human resources available to local authorities involved in processes of identifying the future use of confiscated assets, as well as in the selection of organisations responsible for the management process. The technical resources thus support the administrations for a limited period without replacing them in responsibilities, identifying ways of confiscated assets rehabilitation with the involvement of private organisations at local and national level.

Target population: About 35 local authorities (municipalities, provinces, metropolitan cities) and/or third sector organisations for each of the 8 Southern Regions. Local citizenship and specific categories of recipients who will benefit from the property.

Timeline: The project will start in 2021, with a duration of 6 years. The conclusion of the interventions is expected by the second quarter of 2026.

4. Green and digital dimensions of the component

a) Green Transition:

Investments aimed at rehabilitating civil and industrial buildings (e.g. areas subject to past earthquakes), by using technologies to reduce environmental impact. The component, through investments of Earthquake Area Plan, aims to improve the skills needed to support eco-sustainable investments for qualifying the productive vocations of the territory, whilst promoting innovation and fostering employment and economic growth. The regeneration of existing buildings will improve the area's resilience thanks to the drastic reduction of the impact of natural disasters and the increase in the production of clean energy..

b) Digital Transition:

These projects promote the digital transition of the component mainly through the following drivers:

- investments in high-tech infrastructures for the provision of services throughout the agri-food chain, encouraging the digitalisation of production processes at sectoral level (e.g. precision agriculture using sensors to gather agronomic data);
- investments in new entrepreneurship and generational turnover processes, also by encouraging digital innovation adoption for SMEs;
- investment in advanced training centres to promote skills adapted to local production vocations, including the application of new technologies.


Table 1 - *work in progress*

5. Milestones, targets and timeline

Table 2 - *work in progress*

6. Financing and costs

Table 2 - *work in progress*



Mission 6 - Healthcare

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-

Mission's main objectives:

To increase effectiveness, efficiency and resilience of the Italian healthcare system



Mission's financing snapshot:

	Resources (euro/mln)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
M6C1 Proximity networks, facilities and telemedicine for territorial healthcare assistance	-	7.50	7.50	0.40	7.90
M6C2 Innovation, research and digitalization of national healthcare service	5.28	5.23	10.51	1.31	11.82
TOTAL	5.28	12.37	18.01	1.71	19.72

Note: (b) includes existing resources under national FSC, to be devoted to specific measures.

1 M6C1 - Proximity networks, facilities and telemedicine for territorial healthcare assistance

1. Description of the component

Summary box

Policy area: Fostering economic and social cohesion in the EU and supporting green and digital transition

Objectives: The component aims to boost and align the Italian National Health Service with the communities needs for local care and assistance, also in light of the pandemic emergency, ultimately achieving higher levels of welfare for the citizens, regardless of where they live and their socio-economic conditions.

Reform: Proximity networks, facilities and telemedicine for territorial healthcare assistance: systemic and multilayer reform aimed at providing an effective equality in the access to medical services and overcome a sector-based approach to the concept of health, also considering environmental and climatic health determinants and their changes, in synergy with the economic and social development of the country.

Investment: Projects aim to enhance territorial healthcare assistance enhancing the role of the patient, integrating care services in a "one health" (holistic) approach focusing on strengthening local healthcare services: investments foreseen include the construction and modernization, both from a technological and an organizational side, of the Italian National Health Service (NHS). All investments are linked to the reform mentioned above.

Estimated costs:

EUR 7,500 million to be covered by RRF

M6C1- Proximity networks, facilities and telemedicine for territorial healthcare assistance

	Risorse (euro/mla)				
	Existing (a)	New (b)	Total (c) = (a)+(b)	REACT-EU (d)	TOTAL NGEU (e) = (c) + (d)
1. Proximity networks, facilities and telemedicine for territorial healthcare assistance	-	7.00	7.00	-	7.00
- <i>Community Health House to improve territorial health assistance</i>	-	4.00	4.00	-	4.00
- <i>Homecare as first point of assistance for citizens</i>	-	1.00	1.00	-	1.00
- <i>Strengthening of intermediate healthcare and its facilities</i>	-	2.00	2.00	-	2.00
2. Health, environment, and climate	-	0.50	0.50	0.40	0.90
- <i>Ecologic approach to Public health</i>	-	0.50	0.50	0.40	0.90
TOTAL	-	7.50	7.50	0.40	7.90

2. Main challenges and objectives

a) Main challenges

The Covid-19 pandemic has made clear the universal value of health and its true nature as fundamental public good. The **Italian National Health Service** (NHS) continues to be recognized throughout the world as one of the most efficient systems that, in guaranteeing health as a fundamental right, manages to achieve good results (higher life expectancy at birth and lower mortality values compared to OECD countries averages) and, at the same time, manages to limit health expenditure (3,649 US\$ per capita in 2019, versus 4,223 US\$ OECD countries average). These achievements are the result of a widely offered healthcare, especially through hospitals, high professional competence of health operators and valuable scientific and research outputs, provided by Scientific Hospitalization and Care Institutes “IRCCS” as well as by other NHS entities, such as, for example, University hospitals. During the pandemic emergency, universal health care systems have shown a better resilience capacity that has allowed countries to face the pandemic in a timely manner. The Italian have contributed to shape good practices, that have helped also other countries in facing the emergency.

Nonetheless, the Italian NHS has come to the test of Covid-19 showing elements of relative weakness compared to the main European partners, and the persistence of significant disparities between the Italian regions, which need to be addressed. The Covid-19 emergency has therefore strengthened the need to intervene and to renew some key elements of the Italian NHS, also in consideration of structural (i.e. demographic) and current (i.e. epidemiological) trends. In fact, considering the ongoing increase of the elderly population, the Italian NHS will face an increasing demand for health and more complex needs,

which require an effective response in terms of integrated services provided through the territorial assistance network.

Critical issues emerged can be summarized as follows: (i) an excessive gap between health levels provided by the Italian regions, especially in terms of prevention and territorial assistance and - within these Regions -, the inequality between urban areas and internal areas; (ii) a poor capacity in integrating hospital services, local health services and social services; (iii) a delay in the implementation of local health care services and prevention services, also with significant disparities among Regions, especially in relation to hospital-territory integration; (iv) a poor synergy in the definition of prevention and response strategies of the health service with respect to environmental and climate risks, according to the so-called “One-Health” approach.

In addition, the Covid-19 emergency has highlighted the crucial importance of having technological/digital solutions for public health, strong digital skills and adequate processes for care services. Digital health in the post-emergency phase shall provide an important contribution in the management of public care and assistance processes, e.g. in outpatient services, and in facilitating the communication between healthcare professionals and patients. An important acceleration of investments in digitization of the Italian NHS is therefore necessary, especially in the fields of: telemedicine, management of basic medicine activities, outpatient visits, pre-triage, pre-screening, monitoring of patients treated from home, tele-consultation and digital collaboration between hospitals and healthcare companies for the management of information or between emergency departments, intensive care and infectious diseases and local assistance; patient relationship management capable of informing citizens, especially the fragile categories, detecting their health conditions, communicating with them and managing the territorial and hospital emergency networks. To this end, developing and deploying innovative technologies such as Artificial intelligence, Internet of medicine and big data applications is crucial.

In line with this context, the component contributes to responding to two main challenges:

1. Enhancement of health assistance and territorial healthcare network

- **WHAT:** Fragmentation and disparities of territorial healthcare across the regional systems lead to inhomogeneity in the provision of the so-called “essential levels of assistance” (LEAs), ultimately compromising quality and appropriateness of care services provided. Strengthening and reorganizing primary care, also by leveraging the experience of the pandemic, implies the need to overcome the fragmentation of healthcare responses through the effort to ensure continuity of care, multiprofessional and multidisciplinary approaches, integrated hospital-home pathways, improved clinical governance of care pathways and socio-health integration.
- **WHY:** The analysis of data and information on local healthcare assistance in Italy highlights a very uneven picture between Regions and some widespread structural weaknesses:

- lack of provision of integrated home care services, compared to other OECD countries guaranteeing accessibility to home care (4% elderly patients compared to the OECD average of 6%);
 - lack of homogeneity in terms of mortality among geographical areas (e.g. average death rate - deaths per 1,000 individuals per year - in Italy of 10.5, from P.A. Bolzano 8.3 to Liguria 14.3. The figure is obviously affected by the different demographic distribution of the elderly population among the regions);
 - territorial inequalities in terms of years in good health and quality of life especially in older age (average life expectancy 83 years, from Campania equal to 81.4 to Trento equal to 84);
 - lack of integration between hospital and healthcare territorial services and between health and social services.
- **RECOMMENDATION:** The challenge is also highlighted in the country-specific recommendations and aligns with the European objective to ensure economic, social and territorial cohesion related to - and valid beyond - the Covid-19 emergency (Art. 4(1) of the proposal for a Regulation COM (2020) 408 final). In order to pursue this aim, the component intends to: i) support the economic policy linked to investments in research and innovation and the quality of infrastructures, taking into account regional disparities; ii) improve the efficiency of public administration, in particular by investing in skills of public servants, accelerating digitalization and increasing the efficiency and quality of local public health services (Recommendation no. 3 of COM (2019) 512 final). The proposal also concerns the area of “Health and Prevention”, in line with the Sustainable Development Goals (SDGs), in particular Goal No. 3, of the 2030 Agenda and the public health measures provided for by the Treaties, in particular art. 168.

2. Health, environment, and climate: national reform plan and investments in public health for resilience and sustainable recovery

- **WHAT:** The need of preserving citizens’ health against environmental and climatic pollutants, as well as contrasting the impact of environmental changes, prompts to adopt the "One-Health" approach, which embraces both national health and environment and climate prevention systems. This strategy is innovative and fits into the institutional structure of the Italian NHS. It is also consistent with the development outlined for the Italian NHS with the aim to achieve international organizations’ targets. Implementing the holistic “One Health” approach allows for a stronger leadership in the healthcare sector promoting healthier, safer, and more accessible facilities.
- **WHY:** Data and information available show an urgent need to address the current fragmentation of interventions meant to guarantee a cohesive approach across the Healthcare, Environment and Climate sectors. Italy has faced many environmental crises and climatic emergencies over the years, often resulting in health emergen-

cies, highlighting critical serious issues in prevention actions. The socio-sanitary relevance of environmental determinants is exemplified by data on air pollution that place Italy among the most critical European areas (about 30 thousand deaths per year due to fine particulate matter, which represent 7% of all deaths - excluding accidents). It is widely recognized the role of environmental determinants as risk factors for pathologies that represent the majority of morbidity and mortality in European countries (tumors, metabolic syndrome, neurological and reproductive pathologies) and for rarer but of absolute importance pathologies such as congenital anomalies (5-6% of children in the first year of life in Italy). The poor capacity, dynamism and resilience of the Italian NHS in the proactive assessment of the impacts of environmental exposures and climate change on health - in a country located in the Mediterranean area that is among the most fragile with respect to climate change, seismic risks and hydro-geological instability - is related to a limited interdisciplinary and intersectoral culture - from governance, to management, to public health professionals, to risk assessment.

- **RECOMMENDATION:** A new institutional and systemic strategy and organization, functional to manage the health-environment-climate matter, is necessary to ensure the compliance of the Country towards international organizations' targets, and in particular: a) the Global Action Plan for the Prevention and Control of NCDs 2013-2020 by the WHO; b) the Sustainable Development Goals of the UN 2030 Agenda; c) the indications of the Sixth Ministerial Conference on Environment and Health of the Ministers of the WHO European Region in Ostrava in June 2017, aimed at ensuring "better health, a healthier environment and sustainable choices". At the same time, in line with the European recommendation on the Italian reform program [20.5.2020 COM (2020) 512 final] and with the other relaunch and resilience guidelines [including EU Public Health Policy - PE 652.027 - July 2020, Brussels, 27.5.2020 COM (2020) 456], it is necessary for the Country to strengthen the resilience of healthcare and environmental policies and institutions, enhancing their human, cultural and instrumental capital, guaranteeing the effectiveness of health promotion in synergy with other reform programs (first of all, the green and digital transition), taking into account the potential impacts of post-Covid-19 growth on the environment and health, also in light of the ongoing climate change.

b) Objectives

In light of the above-mentioned challenges, this component aims to enhance health assistance and territorial health network, improving the quality and sustainability of home care, community-based care and long-term care aiming to ensure better assistance levels throughout the whole country. To this end, the component also aims at addressing the fragmentation and lack of homogeneity of healthcare services offered in the different Italian regions, in line with the 2019 and 2020 EC country-specific recommendations and the strategic objectives set at national level. Finally, this component aims at applying

holistic approaches in planning and managing social and health services and environment, climate and health prevention. More specifically:

- consolidate the role of the local healthcare District¹ in planning of actions, of primary and secondary prevention in the health and social field, as well as in rehabilitation through the preparation and governance of treatment paths;
- consolidate the role of the community, through the identification of a facility, the so-called “Community Health House”, making it a local reference point for social and health matters for individuals. This place shall guarantee care of chronic patients, which is one of the greatest challenges for health and social systems in an ageing population;
- implement processes for assessing the needs of the population by level of complexity through the strengthening of socio-health single access points (“punti unici di accesso” - PUA) and multidimensional assessment units (“unità di valutazione multidimensionale” - UVMD);
- enhance home care, especially for vulnerable and disabled people, through the development of remote monitoring techniques and home automation;
- enhance the health workers’ professional skills, also in the domain of new technologies;
- ensure the proactivity of healthcare services in the field of public hygiene as a means to guarantee the health of the population, by strengthening the planning, monitoring and coordination of interventions, as well as ensuring adequate technological supply;
- design and implement at national level a strategic investment plan aimed at creating a national system for the prevention of health with respect to environmental and climatic determinants according to the holistic "One-Health" approach;
- increase the provision of essential levels of assistance (“Livelli Essenziali di Assistenza”, LEA) by improving the results of the core and non-core indicators contained in the New Guarantee System (“Nuovo Sistema di Garanzia”) of the Italian Ministry of Health.

c) National strategic context

The component-related set of investments falls within the Italian national strategic context in the healthcare sector and within the budgetary policy objectives for 2021-2023, which take into account the National Recovery and Resilience Plan in line with Eu-

¹ In Italy, the *Azienda Sanitaria Locale* (ASL) is the local health authority that has to plan and organize the health and medical assistance for the population that lives in its territorial area, supplying diagnosis and treatments by public and/or private providers. The ASLs are divided in *Distretti* (“Health” or “Social Health” Districts) that plan the territorial medical assistance, coordinating the general practitioners’ activities with the other health structures on their territory, and supplying some health services (mental health, drug addiction, service for people with disabilities and others). These Districts thus play a key role in establishing the range of services to be provided and in guiding the different players involved in disease prevention, health promotion, social and disability services.

ropean programming. These investments are also part of the Italian national strategic health plan which is going to be defined by the Italian Ministry of Health, in collaboration with other Italian public administrations. Furthermore, the component is consistent with the Italian national energy and climate plan, pursuant to Regulation (EU) 2018/1999, as well as with the territorial plans for a transition under the Just Transition Fund, with partnership agreements and operational programs based on EU funds, as well as with the contents of the White Paper on artificial intelligence - an European approach to excellence and trust from the European Commission (dated 19/02/2020). The program, with an interdisciplinary value, also has a role in contributing to achieve the objectives set out in the European Green Deal.

Furthermore, in May 2020, the Italian Government approved the Decree no. 34 (the so-called “Decreto Rilancio”, or “Relaunch Decree”), which introduced urgent measures to support families and businesses to recover from the economic consequences of the Covid-19 emergency, while confirming the effort to guarantee everyone’s health and safety.

Concerning the overall economic feasibility of the component, it should be specified that investments-related costs estimated for the purpose of this document only refer to the quota for which the funding through RRF is requested. These lines of action are part of a wider national health programming and could receive additional financial support by both the national budget and other European programs (e.g. ReactEU). For instance, personnel costs and other non-quantified expenditures will be included in the definition of the structural national health budget.

3. Description of the reforms and investments of the component

1) Reform projects

Reform 1.1: Definition of organisational and technological standard for Territorial healthcare assistance and its facilities and Define a new institutional structure of Health-Environment-Climate prevention (under Health “Reform Proximity networks, facilities and telemedicine for territorial healthcare assistance”).

Challenges and Objectives: The reform, as a preparatory element for the interventions of the Component, intends to:

- Establish a new model of territorial healthcare assistance, which has to be close to citizens’ needs, granting the population with effective equity of access to healthcare and social services, through the definition of homogeneous qualitative and quantitative standards, the strengthening of the network of district services, as well as through the consolidation of the hospital and the emergency network integrated within it.

The reform pursues the redefinition of services to guarantee that healthcare territorial services could be increasingly close to the needs of people (including those who

live in rural or disadvantaged areas), capable of enhancing the peculiarities of the various communities (territorial, professional and scientific).

Through this reform and its related investments, the Italian NHS gives continuity and further enhances the actions and programs aimed at strengthening the coordination between the national and regional level able to ensure uniform “Essential levels of assistance” (LEA) throughout the national territory, contrasting regional variability and high mobility rates between the northern and southern regions. The Ministerial Decree 70/2015, which governs the reorganization of the hospital network, has launched a gradual modernization of the hospital system by improving the governance of the NHS in terms of the quality of assistance and the organization of health services, through the definition of qualitative, structural, technological and quantitative standards relating to hospital care and the emergency network.

In addition to contributing to the achievement of these objectives, the Reform will also make it possible to strengthen the territorial network and ensure greater proximity to the citizen, to better distribute care activities while avoiding overloading the hospital network. Ensuring greater integration between hospital and local facilities is indeed a crucial element to provide a better access to care and a uniform level of provision of the “Essential Levels of Assistance” (LEA) at national level.

Actions:

- definition of a new organizational model of Territorial healthcare assistance network, through the definition of a regulatory which identifies structural, technological and organizational standards;
- enhancement of health know-how through the professional skills updating of health staff, with respect to digital education and dissemination of organizational reform;
- Define a new institutional structure of Health-Environment-Climate prevention, according to the “One-Health” approach, in order to promote human health keeping in due consideration environmental and climatic health determinants and their changes, in synergy with economic and social development of the Country.

The reform is intended to define a new strategy as well as a new institutional and systemic organization, in synergy with economic development, necessary to allow the Country to meet international organizations’ targets; this will allow to promote interventions to ensure healthy, safe and accessible environments. In fact, changes in cultural, structural and technical-scientific at the level of governance and support of “territorial” medicine are needed, including aspects of regulation, research, control, consultancy and training. This to ensure: i) the enhancement of resources (infrastructural, structural, instrumental, human) essential to increase effectiveness of prevention, surveillance and response to health-environment-climate emergencies in the Country through science-based solutions; ii) the updating of actions for the prevention and response to communicable and non-communicable diseases according to WHO, international and European guidelines; iii) health promotion in synergy with environmental protection, intersectionality and inclusion of social and

economic dimensions to support sustainable development uniformly throughout the Country.

Implementation: This reform will be implemented through the following key activities: This reform will be implemented through the following key activities:

- establishment of a National Health-Environment-Climate Prevention System (SNPS) with a dedicated regulatory framework;
- creation of new specific health professional categories;
- proposal for revision of sector regulations and environmental legislation.

The reform also plans to improve the relationship between Healthcare and Scientific Research, as detailed in the Component Innovation, research and digitalization of national healthcare.

Target population: Text... .

Timeline: Text... .

2) Investment Projects

Investment 1.1: Community Health House to improve territorial health assistance.

Challenges: Chronic diseases in 2019 affected almost 40% of the Italian population - i.e. 24 million people - of which 12.5 million have multi-chronicity, for a healthcare expenditure of nearly 67 billion euro. The, amount of chronically ill patients is also in progressive growth, with an impact on the future need to commit health, economic and social resources. Furthermore, according to data of the Italian National Institute of Statistics (Istat), there are 3.1 million people with disabilities in the Country, i.e. 5.2% of the Italian population. Of these, almost 1.5 million are over 75 years old (i.e. more than 20% of the population in that age group). In addition, Italy has the highest share of elder population compared to the EU average - approximately 23.2% of the population is over 65 years old and 3.6% over the age of 80 (Istat) - and life expectancy at birth is among the highest in the world², which results into an overall old and ageing population and a long-term pressure on the NHS to be addressed.

The presence, in this context, of uncoordinated health and social assistance interventions in the territory, the slow increase of local healthcare facilities across the regions and/or the slow increase of the services offered in non-hospital facilities, are a cause of organizational

² Statistics may differ depending on the organisation or institute collecting and analysing them. According to OECD, Italy ranks fourth, with an overall expectancy at birth of 83.4 years (OECD (2020), Life expectancy at birth (indicator). doi: 10.1787/27e0fc9d-en - accessed on 26 November 2020).

inefficiency and hampers the quality of the service provided and perceived by the citizens. This issue has been particularly highlighted by the Covid-19 emergency, and it is now clear that there is the need for geographically widespread facilities, in order to avoid excessive use of hospital care, especially for non-urgent treatments that cannot be postponed.

Objectives: The Community Health House is an organizational solution that has the function of primary care hub and follows a model of delivery and use of services by promoting the proximity of the facilities to the local community, being able to filter access to acute care facilities and to coordinate and integrate all care services for chronic patients already present in the area (e.g. a slight malaise or a small accident, the need for various tests such as non-communicable diseases, difficulty in managing a family situation and the need to find someone who takes care of the person, etc).

In particular, it is important to underline that it acts as a citizen's "single point of access" to health services and that, therefore, it develops and manages a single health database for each citizen, aiming at guaranteeing equal treatment in care and access to such facilities for all residents in the Country.

In the Community Health House, citizens can:

- consult a general practitioner and a nurse throughout the day;
- consult a health professional who welcomes citizen's requests, guides the citizen to services and takes care of activating proper health paths;
- solve adequately most of citizen's problems in a single location;
- manage chronic diseases through shared and supervised care pathways.

More specifically, the investment's objective is the following:

- **activation of 2,575 Community Health Houses** - in order to ensure equity of access, territorial proximity and quality of care to people regardless of age and their clinical picture (chronically ill patients, non-self-sufficient people needing long-term care, people with disability, mental distress, poverty), through the activation, development and aggregation of primary care services, and implementing assistance delivery centers (energy efficient) for a multi-professional response.

The investment aims at integrating social and health care services for a global care of the person in the Community Health Houses in order to improve care service of chronically ill patients and the most vulnerable population categories, such as people with disabilities. More extensive and inclusive home and community-based care and long-term care is key to provide support to people with disabilities and other disadvantaged groups, as also mentioned in the 2019 country-specific recommendations.

Implementation: The Italian Ministry of Health will be responsible for the planning, execution, management and monitoring of the component as a whole. In relation to the actions that present a concurrence of competences of other public administrations

(e.g. Regions), coordinated and negotiated governance tools will be applied, such as the Institutional Development Contract (Contratto Istituzionale di Sviluppo) with the Italian Ministry of Health as the responsible and implementing Authority and the participation of regional Administrations together with the other entities concerned. This approach will be able to save time and simplify procedures - including authorization procedures - where accompanied by the activation of service conferences (“conferenze di servizi”).

Stakeholder involvement: Italian Ministry of Health and other Italian Ministries, Italian National Agency for Regional Health Services (Agenas), Italian National Institute of Health (Istituto Superiore di Sanità, ISS), Italian Regions, local health units (Aziende Sanitarie Locali - ASL).

Target population: This investment targets the entire population.

Timeline: For details, please refer to Paragraph 5 and Paragraph 6.

Investment 1.2: Homecare as first point of assistance for citizens.

Challenges: As mentioned in the 2019 country-specific recommendations, more home and community-based care and long-term care are crucial in providing support to people with disabilities and other disadvantaged groups. Strengthening home care is one of the main challenges of the Italian NHS. Indeed, as provided for in the Decree of the President of the Council of Ministers of 12 January 2017 and in 2016 National Chronicity Plan (Piano Nazionale della Cronicità, 2016), home must be the preferred care setting when health, housing and family conditions permit. As of today, integrated home care is mainly provided to people aged over 65 (83.7% of cases). With the Relaunch Decree n. 34, dated 19 May 2020, Italy has already intended to strengthen integrated home care, aiming to increase the current 4% of patients aged over 65 to be assisted from home up to 6.7%. This goal takes into consideration the OECD average value (6%) and some particularly virtuous examples in Europe, such as Sweden, at 10.9%, Germany, at 9.5% and Spain, at 7.1%. In addition, the aim is to mend the fragmentation and the lack of homogeneity of home services offered throughout the Country.

Objectives: The goal is to enhance the home healthcare offer by engaging 282,425 people. The investment aims to strengthen the resilience and the ability of the Italian NHS to manage processes related to integrated home care, going beyond the objectives set in the above-mentioned Relaunch.

To achieve this objective the investment is composed by following lines:

- implementation of 575 Coordination centers for homecare;
- provision of technologic devices to home care professionals;
- provision of telemedicine technologies to vulnerable patients, cared for home;
- enhance digital and technological solutions of the local healthcare unit (ASL) in

order to connect data and clinical information.

The Decree n. 34/2020, in line with the recommendations of the Council on PNR 2020 and with the 2019 country-specific recommendations, in the context of strengthening the NHS in relation to the Covid-19 emergency, provided for an increase in the staff necessary to ensure the provision of essential levels of assistance, especially in the area of the homecare. The adoption of advanced ICT tools and the development of an artificial intelligence model aim at streamlining the communication systems between the various parties involved, thus allowing simplification of existing information flows and providing a contribution to operators in the provision of care and assistance and to decision makers in the governance and planning of services. In particular, the investment aims to promote continued and continuous home care of the patient throughout the Country, implementing the services provided for all “vulnerable individuals”, pursuant to art. 1, paragraph 4, of the Decree n. 34/2020, with particular attention to the various aspects related to chronicity.

Thus, the intervention intends to strengthen this type of care and shall reorganize and re-engineer processes also through the development of innovative digital solutions to address artificial intelligence and telemedicine. The ability of connecting the patient’s residence with the healthcare environment can generate direct benefits for the patients and their families, who will be able to interact with healthcare professionals directly from their own homes, obtaining precise and targeted indications on care, thus contributing to the constant monitoring of their health.

Implementation: The Italian Ministry of Health will be responsible for the planning, execution, management and monitoring of the component as a whole. In relation to the actions that present a concurrence of competences of other public administrations (e.g. Regions), coordinated and negotiated governance tools will be applied, such as the Institutional Development Contract (Contratto Istituzionale di Sviluppo) with the Italian Ministry of Health as the responsible and implementing Authority and the participation of regional Administrations together with the other entities concerned. This approach will be able to save time and simplify procedures - including authorization procedures - where accompanied by the activation of service conferences (“conferenze di servizi”).

Stakeholder involvement: Italian Ministry of Health and other Italian Ministries, Italian National Agency for Regional Health Services (Agenas), Italian National Institute of Health (Istituto Superiore di Sanità, ISS), Italian Regions, local health units (Aziende Sanitarie Locali - ASL), businesses.

Target population: This investment mainly targets the over-65 aged population segment, i.e. around 14 million people in the Country.

Timeline: For details, please refer to Paragraph 5 and Paragraph 6.

Investment 1.3: Strengthening of Intermediate healthcare and its facilities (Community hospital).

Challenges: The adverse effect of the lack of complete implementation and fragmentation of local health services, along with the consequent integration between territorial and hospital services, is one of the main challenges that the Italian NHS currently faces. In particular, the difficulties of citizens in finding answers to their health needs locally generate important inefficiencies every year with repercussions also on safety and quality of services provided. The not sufficient level of territorial healthcare facilities negatively impacts the quality perceived by citizens of the NHS, and it can generate stress and a sense of abandonment, especially in most vulnerable individuals and people living in disadvantaged areas.

Objectives: The general objective of the investment is to ensure the creation of 753 Community hospital. These facilities have a crucial function between patients, home and hospitalization. This intervention shall take place in the context of the general improvement of the primary care system in order to personalize local assistance, avoiding, if possible, the psychological distress of a hospitalization, especially for the most vulnerable individuals.

This temporary hospitalization is intended to reduce hospitalization for people with acute or chronic diseases, as it would be dedicated to people who need continuous nursing and medical assistance. Patients may come from home or other residential facilities, from the emergency room or discharged from acute care hospitals.

Furthermore, this will foster the pertinence of hospital services by providing an alternative to improper access to the emergency room, especially for those who need health surveillance, but with already defined diagnosis. Finally, this will facilitate discharge by providing the family and local services with the time necessary to adapt the home environments to the needs that may have emerged, safeguarding the social costs and the income capacity of families.

Implementation: The Italian Ministry of Health will be responsible for the planning, execution, management and monitoring of the component as a whole. In relation to the actions that present a concurrence of competences of other public administrations (e.g. Regions), coordinated and negotiated governance tools will be applied, such as the Institutional Development Contract (Contratto Istituzionale di Sviluppo) with the Italian Ministry of Health as the responsible and implementing Authority and the participation of regional Administrations together with the other entities concerned. This approach will be able to save time and simplify procedures - including authorization procedures - where accompanied by the activation of service conferences (“conferenze di servizi”).

Stakeholder involvement: Italian Ministry of Health and other Italian Ministries, Italian National Agency for Regional Health Services (Agenas), Italian National Institute of Health (Istituto Superiore di Sanità, ISS), Italian Regions, local health units (Aziende

Sanitarie Locali - ASL).

Target population: Entire population.

Timeline: For details, please refer to Paragraph 5 and Paragraph 6.

Investment 2.1: Health, environment, and climate: national reform plan and investments in public health for resilience and sustainable recovery.

Challenges: During the Italian Presidency of 2017 G7-Health, the impacts of climate and environmental factors on health have been set as the health priority of this century. In Italy, the balance and the sustainability of the economic development of many sectors with respect to the environment and to health has been critical, as highlighted by recent data: many areas of the Country suffered a significant contamination, such as to require remediation interventions. In 58 of these contaminated areas, inhabited by about 6 million people (10% of the national population), the extent of the contamination required the rise of these areas to sites of national interest; out of these 58 National interest sites, 45 has shown a 9% increase in malignant tumors in the younger population and a mortality rate greater by 4-5% compared to those who live in no-risk areas, with an expected scenario of greater criticality in the future. Environmental crises with health impacts are exacerbated in contexts of severe and widespread earthquake, hydro-geological and climatic fragility extended to the entire National territory. As recently analysed in the WHO-UNCCC Climate and Health Country Profile, Italy shows large inefficiencies in policies and institutional actions at central and local level aiming at prevention and promotion of health.

Objectives: Boosting ability, effectiveness, resilience and impartiality of the Country in facing current and future health impacts, associated with environmental and climate risks, in a “One-Health” vision, through the implementation/adaptation of about 190 (> 50%) reference structures of the national network of the national health-environment-climate prevention system.

One-Health is a collaborative, multidisciplinary, intersectoral and coordinated approach to address potential or occurred risks that come from the interaction between the environment-pollution-human ecosystems.

Implementation: The Italian Ministry of Health will be responsible for the planning, execution, management and monitoring of the component as a whole. In relation to the actions that present a concurrence of competences of other public administrations (e.g. Regions), coordinated and negotiated governance tools will be applied, such as the Institutional Development Contract (Contratto Istituzionale di Sviluppo) with the Italian Ministry of Health as the responsible and implementing Authority and the participation of regional Administrations together with the other entities concerned. This approach

will be able to save time and simplify procedures - including authorisation procedures - where accompanied by the activation of service conferences (“conferenze di servizi”).

Stakeholder involvement: Italian Ministry of Health and other Italian Ministries, Italian National Agency for Regional Health Services (Agenas), Italian National Institute of Health (Istituto Superiore di Sanità, ISS), Italian Regions, local health units (Aziende Sanitarie Locali - ASL).

Target population: Entire population.

Timeline: For details, please refer to Paragraph 5 and Paragraph 6.

4. Green and digital dimensions of the component

a) Green Transition:

The component generally contributes to the development of the **green transition** by:

- improving of technological efficiency by enhancing all forms of innovation and optimization of production processes;
- providing a more efficient care service, which reduces the needs for travels to hospitals - which is cause to pollution generated by transport means - in favour of a local and home-driven approach;
- supporting energy efficiency renovation of the infrastructures and equipment;
- supporting risk prevention models and the management of both climate and non-climate related natural risks or risks linked to human activities, such as pandemic crisis.

b) Digital Transition:

The Project generally contributes to the development of the **digital transition** by:

- strengthening of digital capabilities and implementing of advanced technologies in hospitals, consistent with the Integrated National Plan for Energy and Climate;
- fostering a deep technological evolution of communication and data transmission systems from territorial units to hospital or territorial competent structures with large benefits on the appropriateness of the health services provided;
- strengthening the digitization of care by promoting the diffusion of care devices in connection with each other, especially for professionals and disadvantaged people in the field of telemedicine;
- redefining operational methodologies within the Italian NHS using digital technologies and robotics strategic elements, ensuring monitoring and remote assistance, integrating research activities with care activities.

Specifically, the investments address the following elements:

- Home as the place of first care:** it sustains the development of the digital transition by involving investments in the implementation of artificial intelligence systems that, through big data and machine learning, will provide support to operators, decision makers and will enable patients to receive the necessary treatments in a timely manner. With respect to the green transition, the project will allow to keep patients at home, limiting their transfers of those of their families. In addition, transfers of caregivers will also be limited to cases of necessity. Better home care optimizes the consumption of drugs and disposable medical devices, through increasingly personalized and flexible plans.

TABLE 1 - Green and digital impact					
	Digital		Green		
	Intervention Field Tag	%	Intervention Field Tag	Climate %	Environmental %
M6C1: Investment 1: Enhancement of health assistance and territorial healthcare network,					
<i>1.1 - Community Health House to improve territorial health assistance</i>	na	0%	na	0%	0%
<i>1.2 - Homecare as first point of assistance for citizens</i>	<i>013 e-Health services and applications (including e-Care, Internet of Things for physical activity and ambient assisted</i>	100%	na	0%	0%
<i>1.3 - Strengthening of intermediate healthcare and its facilities ("Community hospital")</i>	na	0%	na	0%	0%
M6C1: Investment 2: Health, environment and Climate					
<i>2.1 - Health, environment and climate: development of an ecological public health model</i>	na	0%	na	0%	0%

5. Milestones, targets and timeline

1) REFORM

Reform 1: Definition of organizational and technological standard for Territorial healthcare assistance and its facilities” and “Definition of a new institutional structure of Health-Environment-Climate prevention” (under Health “Reform Proximity networks, facilities and telemedicine for territorial healthcare assistance”):

- definition of a new organizational model of the local network through the identification of structural standards, technological and organizational;
- development of human capital through the professional development of direct digital education of health personnel and disclosure of organizational reform.

Define a new institutional structure of Health-Environment-Climate prevention:

- establishment of the National Prevention System Health-Environment-Climate (SNPS) and related regional articulations;
- establishment of new health professionals specifically dedicated to health-environment - climate issues and the definition of the relevant curriculum;
- proposed revision of industry standards and environmental legislation, including the Decree. April 3, 2006, n. 152 for alignment with the new management system.

2) INVESTMENT

Investment 1.1: Community Health House to improve territorial health assistance:

- survey and identification of the existing Community Houses to be restored, converted and built from scratch by Q1 2022;
- implementation of the interventions and activation of 2.575 Community Houses by Q2 2026.

Investment 1.2: Home-care as first point of assistance for citizens:

- designing of 1 digital model ADI following an analysis of national and international best practices on the application of Artificial Intelligence by Q2 2022;
- development of the digital model of ADI by Q4 2023;
- implementation of 575 infrastructures related to ADI by Q2 2024;
- model implementation identified for ADI's Health workers by Q2 2026;
- supply of telemedicine for ADI patients for ADI by Q2 2026.

Investment 1.3: Strengthening of Intermediate healthcare and its facilities (“Community hospital”):

- recognition and identification of existing structures to be restored, to be converted and to be realized ex novo by Q1 2022;
- realization and / or adaptation of structures as community hospitals by Q2 2026.

Investment 2.1: Health, environment, and climate: national reform plan and investments in public health for resilience and sustainable recovery:

- establishment / strengthening of centers of excellence at National level;
- creation / strengthening of local structures of SNPS-SNPA networks and of eventual other public research institutions by Q4 2022;
- establishment / strengthening of regional and local hubs with specific skills and responsibilities in health-environment-climate by Q4 2025;
- digitisation of the SNPA and SNPS networks, including the digitisation of networks of environmental and health monitoring data at the local level by Q4 2025;
- set up of a School of Specialization in Health-Environment and Climate at the Departments of Medicine prior agreement with Italian Ministry of University and Research by Q4 2025;
- establishment of the center for training and update in Health-Environment / Climate; distance learning courses by Q4 2025;
- three-year national and multidisciplinary research calls in health-environment-climate by Q4 2025;
- strengthening of regional health facilities, hospitals, IRCSS and other research organizations, for the development of integrated interventions in health promotion, active surveillance and health care and participative communication systems of the communities by Q2 2026.

6. Financing and costs

Estimated cost of the plan													
Component name	Investment/ Reform	Relevant time period	Total estimated costs for which funding from the RRF is requested	If available: Total estimated cost by year (mn/bn national currency/EUR)						Funding from other sources (as requested by Art. 8 in the Regulation)			COFOG level 2 category / or type of revenue (if relevant, e.g. tax expenditure)
				2021	2022	2023	2024	2025	2026	from other EU	from	Othe	
COMPONENT 1: Proximity networks, facilities and telemedicine for territorial healthcare assistance													
Investment 1 - Enhancement of health assistance and territorial healthcare network													
Investment 1.2 - Homecare as first point of assistance for citizens	a2	2021-2023	34,455,500 €	477,300 €	10,416,200 €	23,562,000 €							
	b1	2022-2024	211,600,000 €		52,900,000 €	105,800,000 €	52,900,000 €						
	b2	2024-2026	189,094,500 €			75,637,800 €	75,637,800 €	37,818,900 €					
	b3	2024-2026	564,850,000 €			225,940,000 €	225,940,000 €	112,970,000 €					
Investment 1.1 - Community Health House to improve territorial health assistance	2	2023-2026	4,000,000,000 €	1,660,480 €	415,120 €	1,199,377,320 €	1,199,377,320 €	1,199,377,320 €	399,792,440 €				
Investment 1.3 - Strengthening of Intermediate healthcare and its facilities ("Community hospital")	a2	2023-2026	2,000,000,000 €	628,000 €	157,000 €	599,764,500 €	599,764,500 €	599,764,500 €	199,921,500 €				
Investment 2 - Health, environment and Climate													
Investment 2.1 - Health, environment and climate: development of an ecological public health model	a1	2021-2025	450,498,950 €	41,586,274 €	115,688,359 €	138,481,496 €	113,156,548 €	41,586,274 €					
	b1	2021-2026	49,501,050 €	9,900,210 €	12,400,315 €	12,400,315 €	7,400,105 €	4,950,105 €	2,450,000 €				
Total		2021-2026	7,500,000,000 €	54,252,264 €	191,976,994 €	2,079,385,631 €	2,274,176,273 €	2,147,255,999 €	752,952,840 €				

2 M6C2 - Innovation, research and digitalisation of national healthcare service

1. Description of the component

Summary box

Policy area: (i) promote the economic, social and territorial cohesion of the Union; (ii) strengthen economic and social resilience; (iii) mitigate the social and economic impact of the crisis; (iv) support the digital transition.

Objectives: The component aims to ensure the necessary enabling and transversal conditions to ensure greater resilience of the healthcare service through: (i) the promotion and strengthening of the scientific research sector, giving priority to the creation of clinical-transnational networks of excellence and being oriented towards prevention; (ii) the strengthening of health information systems and digital tools at all levels of the national health care service; the enhancement of human resources, through the modernisation of training tools and contents and the development of professional skills; (iii) the development of a significant structural improvement in the safety of hospital structures and alignment with the current anti-seismic standards; (iv) replace obsolete healthcare technologies in hospitals, reaching higher standards of efficiency and effectiveness in the clinical path.

Reforms: Reorganize the network of Scientific Hospitalization and Care Institutes (IRCCS) to improve NHS quality and excellence: concerning an update of the national regulations by introducing the necessary rules to review the legal regime of the IRCCS and the research policies related to the Ministry of Health; to support research and strengthen the responsiveness of the NHS to health emergencies, the epidemiological transition and the health needs related to the demographic framework, as well as guaranteeing clear paths that regulate the relations between the national healthcare service and the University, in order to guarantee a greater integration in compliance with the competences of the Ministry of Education, University and Research, the Ministry of Health, Regions and Bodies of the NHS;

Investments: The planned investments concern the development, strengthening and modernization, both in technological, structural and infra-structural terms, of the national healthcare service and the Research sector. All investments are linked to the reform mentioned above;

Estimated costs:

EUR 10,510 million to be covered by RRF, of which 5,230 million in new projects

M6C2 - Innovation, research and digitalization of national healthcare service

	Risorse (euro/mld)				
	Existing	New	Total	REACT-EU	TOTAL NGEU
	(a)	(b)	(c) = (a)+(b)	(d)	(e) = (c) + (d)
Technological and digital update	5.28	4.73	10.01	-	10.01
- <i>Digital update of the hospital technology park</i>	1.41	2.00	3.41	-	3.41
- <i>Hospitals</i>	3.30	2.30	5.60	-	5.60
- <i>Strengthening of the technological infrastructure and of the tools for data collection, data processing, data analysis and simulation at central level</i>	0.57	0.43	1.00	-	1.00
Scientific research, technological transfer and training	-	0.50	0.50	1.31	1.81
- <i>Strengthening and enhancement of the NHS biomedical research</i>	-	0.20	0.20	-	0.20
- <i>Health innovation ecosystem</i>	-	0.10	0.10	-	0.10
- <i>Development of technical, digital and managerial skills of professionals in the healthcare system</i>	-	0.20	0.20	1.31	1.51
TOTAL	5.28	5.23	10.51	1.31	11.82

2. Main challenges and objectives

a) Main challenges

The component “Innovation, research and digitalization of the national healthcare” stems out from the need to intervene in the process of transformation and renewal of the current Italian national health service, promoting the creation of a modern and digitally-oriented offer, able to enhance the quality of care and the response to the health needs of citizens.

The Covid-19 emergency has highlighted some structural weakness of the Italian healthcare system. The response of the healthcare system to the development of the pandemic has been hampered by deficiencies in the supply of adequate medical and health devices, the availability of staff, the provision of infrastructure and of technological and digital equipment.

The Italian Government focused its effort on overcoming the short-term COVID-19 emergency and, together with this, on ensuring a responsive health and care system, able to respond to the needs of the evolving society and overcome the challenges that prevent it from serving the population's needs most effectively and efficiently. To this aim, the national strategies and agenda are perfectly aligned with the priorities set by the EU in terms of digitalisation - in particular concerning the services provided by the public administration and the specific needs of the healthcare system - which require particular attention in ensuring that adequate supply of services is provided through efficient means. Leveraging the innovation and digitalisation of the health and care system - in particular in response to the challenges of the ageing population - and investing in enhancing the training and availability of health workers and medical infrastructure is indeed of primary importance.^{3,4}

On the other hand, the Italian research sector need more funding in order to ensure more coordination and up-to-date improvement of the healthcare service offering. Biomedical research is particularly affected compared to other international practices. The development of transnational clinical networks of excellence would enable the sharing of the geographically-dispersed competences, creation of synergies and, ultimately ensure efficiency and effectiveness in developing the biomedical products supporting the health and care of the population.

Research is an essential item, as it ensures the improvement of the care of the sick, in addition to the development and evaluation of organisational-management methods to increase the efficiency of the NHS. The lessons learned during the Covid-19 emergency show that a new and suitable way to meet needs and contingencies must be identified to establish lasting, transparent and mutually profitable relations between Public action and the action of Private Operators. All this falls within the scope of a sector that has to be considered absolutely “strategic” and where the lead of the central administration is essential. The main challenge in this area concerns the ability to define a new sectoral planning policy approach to combine public interventions in relation to healthcare with the needs and potential of the supply chain as a whole, as well as support the private initiatives in a logic of sustainable and lasting partnerships. It is essential for the Country to equip itself with national research and innovation programs, containing development guidelines to direct the growth of the national ecosystem, and that these are supported by a strategic, unitary and integrated medium-long term vision.

The modernisation and digitisation process is one of the most relevant challenges of the National Health System and, for this reason it requires the continuous update of the

³ OECD (2019) *State of Health in the EU - Italy Country Health Profile 2019*. European Commission (2019) *Joint Report on Health Care and Long-Term Care Systems & Fiscal Sustainability*, Institutional Paper 105, June 2019 ISSN 2443-8014 (online); see also: *Country Document - 2019 update for Italy*.

⁴ European Commission Recommendation for a Council recommendation on the 2020 National Reform Programme of Italy COM(2020) 512 final.

clinical and assistance skills of health and social-health personnel, balancing the need for highly specialized skills with the need for a high level of integration between operators in the general system of health services. In particular, in line with the need to upgrade and modernise the territorial network as well as the hospital one, it will be essential to focus on training of key figures such as the General Practitioner and the top hospital roles of the Health Authorities (general directors, chief medical officers, administrative director, districts director, head of departments, as well as the board of auditors and the supervisory body), in order to acquire the necessary managerial skills and competencies to face current and future health challenges in an integrated, sustainable, innovative, flexible and result-oriented perspective.

In addition to the development of technical-managerial skills, the scope of the training, will also be aimed at equipping healthcare professionals with knowledge and tools to ensure maximum safety for the patient along the clinical care path. In fact, as shown by a recent study published by the ECDC - European Center for Disease Prevention and Control - it emerges that Italy ranks among the last Countries in Europe for prevalence of healthcare-related infections (Ica).

For this reason, specific training interventions are provided to train health personnel in order to improve the management of hospital infections, reducing the high number of cases that occur annually. The challenges of the component also include the objective of modernising healthcare companies from a structural point of view, in order to ensure the highest standards of anti-seismic safety. The intervention is particularly important, also in light of Italy being one of the Countries with the greatest seismic risk due to its particular geographical position. The consequences of an earthquake also depend on the characteristics of resistance of buildings to the actions of a seismic shock. The more vulnerable a building is (by type, inadequate design, poor quality of materials and construction methods, poor maintenance), the greater the consequences. Interventions are therefore planned to make health facilities increasingly safe places and in line with the most recent anti-seismic standards.

Within the context mentioned above, the component contributes to responding to the following challenges:

- overcoming issues related to the limited resources allocated to research in the health sector and digital health;
- addressing the low level of interrelation between **research & AMP**;
- developing a stronger link between research centers and businesses, in an open innovation perspective;
- making healthcare facilities safer and in line with the current anti-seismic safety standards;
- overcoming the critical issues related to the limited and uneven dissemination of the electronic health record;
- resolving the issue related to of equipment ageing / low use of health technologies

in hospitals;

- overcoming the limited spread of telemedicine tools and activities;
- aligning training plans consistently with the health sector needs.

1. Technological and digital update

- **WHAT:** Digital update of the hospital technology park, both in terms of high-tech equipment (CT, Resonances) to replace the old ones, as well as interventions aimed at the digitalization of health facilities (both at the level of clinical assistance processes - operating theaters, diagnostics, ... - and at the level of technological infrastructure and IT assets). (ii) Strengthening, update and expansion of the Electronic Health Record at regional level and strengthening at the central level of the technological infrastructure and tools for data collection, processing, analysis and simulation (Ministry of Health), to support the development of advanced tools analysis of complex phenomena and scenario prediction; (iii) development of a significant structural improvement in the safety of hospital structures and alignment with the most modern anti-seismic standards.
- **WHY:** The national context relating to the digitalization of healthcare, as a transversal and central element to support the development of health care not only in hospitals but also in the local facilities, shows indeed critical numbers. Only 1.2% of public health expenditure is destined for digital 4.0 technologies. In absolute terms, spending on digital health in Italy settles at €22 per capita - compared to €70 in Denmark, the most virtuous country in Europe - and it has a growth rate of only 7% (in 2019); the DESI Index (Digital economy and society index) places Italy at the 25th place in Europe in 2020.

Italy needs interventions aimed at technological enhancement and innovation. It is necessary to invest more in technological and digital tools, streamlining processes and activities, but also intervening on the relationship between health care workers and patients and on the use of available data. ICT technologies and the availability of Big Data analysis tools allow to collect, trace and process an enormous amount of data relating to the entire health ecosystem, paving the way to targeted health policies, thanks to complex tools of analysis, simulation and prediction. ICT technologies also allow the personalization of care and increase patient engagement. This is why it is essential to promote the digitalization and interoperability of health data and the enhancement of health information systems to support both clinical activities and the governance of the health system. The diffusion of the Electronic Health Record (EHR) across the country is a key step to address this challenge.

Having digital solutions capable of integrating care and assistance processes (outpatient and community medicine), as well as supporting proximity and communication with patients, becomes a fundamental competitive factor for the health sector in the post-emergency phase, in particular to be able to support the process of strengthening and homogenising local services throughout the national territory. Moreover, it is a priority to address the need of updating the technological equipment used in

hospitals, in terms of the provision of large health equipment dedicated to diagnosis and treatment, and in terms of assets, tools and digital technologies to support the collection and analysis of information and data throughout the hospital care process. The technological equipment is indeed old and inefficient compared to other countries. The actions addressing these challenges shall take into account the differences across the territory and aim to reach homogeneous levels of technological supplies across the Country.

At the governance level, the management of the ongoing crisis has made the need to be able to process large amounts of health and non-health data in real time even more clear. In this sense, it is of strategic importance for the Ministry of Health, to strengthen the development of information flows and related technological infrastructure in order to support the development of forecasting models for health care monitoring and planning of activities. This will not only allow to strengthen and make governance increasingly effective but also to have powerful calculation tools capable of identifying and anticipating phenomena that could “threaten” the sustainability of the NHS in the medium-long term.

Italy also needs interventions aimed at developing structural improvements. Among public buildings, hospitals play a strategic role in the event of a disaster, as they have a fundamental rescue function for the population, ensuring the effective continuation of the first emergency medical interventions launched in the field. The hospital, one of the most exposed and sensitive sites as it is crowded with thousands of people with very different reactive abilities, is therefore required not only to withstand the impact force of the earthquake without excessive damage, but also to continue to offer sufficient levels of health care.

- **RECOMMENDATION:** The component is developed in accordance with the Council Recommendations of 9 July 2019 (2019 / C 301/12) on the 2019 National Reform Program of Italy and, in particular, with recommendation no. 3 concerning investments in the quality of infrastructures, also in order to bridge regional disparities and improve the efficiency of Public Administration by investing specifically in the acceleration of digitalization processes. In line with point no. 1 of the Council Recommendations of 20 May 2020 (COM (2020) 512 final) on Italy’s 2020 National Reform Program, which foresees – in 2020 and 2021 – the adoption of measures aimed at “... strengthening the resilience and capacity of the health system with regard to health workers, essential medical products and infrastructures ...”, the component also focuses on infrastructure investments in the hospital sector in order to provide an adequate response to the critical issues identified in the Country Report related to Italy 2020 of 26 February 2020 (SWD (2020) 511 final).

2. Scientific research and technological transfer

- **WHAT:** (1) Enhancement and strengthening of the NHS biomedical research to make the sector more competitive at the international level, together with strengthening the NHS response capacities to health emergencies and epidemiological transi-

tion and healthcare needs linked to the demographic framework. (2) Development of an innovative health ecosystem for the creation of clinical-transnational networks of excellence capable of pooling existing skills in the Country and implementing synergic public-private interventions for innovation, development and qualified employment.

- **WHY:** The Life Sciences sector is one of the most dynamic in our Country, yet, without an investment policy in research and innovation it will gradually decline. 53% of the total investments of pharmaceutical companies in Italy are focused on R&D. Investments in the sector, equal to 1.6 billion euros in 2019 (up 4% annually since 2015) represent 4.3% of sector investments at European level and 10% of total investments in research and development of our Country. The incidence of R&D investments on added value reaches 17%, a value significantly higher than the one recorded by medium-high technology sectors (8%), the manufacturing sector (4%) and the total economy (1%). Nonetheless, R&D spending in Italy is equal to only 1.4% of GDP, a value below the EU-28 average (2%) and the average for OECD countries (2.4%). The innovation brought by the results of research in the Life Sciences must be supported as it has a potential revolutionary effect on all aspects of the daily life of human beings and represents a determining factor in the definition of scientific progress. Indeed, it is facing a change paradigm, increasingly linked to a logic of personalized medicine and the development of new generation therapies with the possibility of proposing better prevention activities, better diagnoses, more targeted therapies and reduced side effects. Indeed, the R&D activities of Life Sciences companies not only take the form of therapies that have positive effects for safeguarding the health of citizens and improving the living conditions of patients, but also constitute a strategic investment for the national economy. In this context, it is necessary to build an organized system and a coordinated network of Technology Transfer in the Life Sciences sector in Italy, built and managed by a public-private partnership, which captures the specificities of the health technology sector in the country and which contributes to the enhancement of research and the role played by the NHS in research. It is a question of networking existing realities, sharing common tools and platforms, as well as patient economic-financial investments that correspond to the technological, ethical and regulatory complexity of the sector.
- **RECOMMENDATION:** the update and strengthening of research and development within the NHS is a strategic item which can allow the NHS to provide an adequate response to the needs of citizens and ensure a point of reference for the industrial system for health innovation. In particular, the strengthening of the biomedical research system in Italy - through the strengthening of the response capacity of the centers of excellence in the sector of rare diseases - can foster the economic development of the Country by improving its competitive capacity based on the interaction between research and companies able to guarantee continuous and effective technology transfers.

3. Technical digital and managerial upskilling of NHS professionals

- **WHAT:** Ensuring a structured and sustainable training activity for healthcare professionals in order to face current and future challenges. Strengthen the training activity through the involvement of General Practitioners (GPs), increasing the scholarships for the specific training course in general medicine and the enhancement of technical and managerial skills for the top roles of health structures and for the remaining hospital staff.
- **WHY:** Scientific progress and technological innovation require that healthcare professionals are constantly updated and trained. According to Legislative Decree 502 of 30 December 1992, which established the obligation of continuous training for health professionals, such training should be “aimed at adapting professional knowledge throughout the entire professional life and improving skills and the clinical, technical and managerial skills of health workers, with the aim of guaranteeing the effectiveness, adequacy, safety and efficiency of the assistance provided by the National Health Service”. Furthermore, the pandemic crisis has also highlighted the difficulty of hospitals to hire adequately trained staff, especially with reference to digital and innovative issues.
- **RECOMMENDATION:** Point 16 of the Recommendation of the European Council of 20 May 2020 recommends to remove any obstacles to training, hiring and retention of health professionals and - together with this - to improve the coordination and governance of the NHS institutions, in order to foster coordination and collaborations.

b) Objectives

The overall aim is to increase the effectiveness and efficiency of the health and care system, taking into account challenges such as the ageing of the population and the limited investment in health infrastructure made in the past, which hinder the quality and efficiency of the Italian healthcare system. To reach this broader objective, this Component aims to enhance the innovation and digitalization in health facilities and support the research and the training of health professionals.

The digitalization of healthcare systems is a key part of the European Commission’s strategy to empower citizens and build a healthier society. Data is now recognised as a key enabler for the digital transformation in healthcare. In this framework, the European Commission (EC) set the priorities to digitally transform the health and care system into a Digital Single Market and to put EU citizens at the centre of the healthcare system. It emphasised that citizens’ need to be able to access and share their data anywhere in the EU, the promotion of research, disease prevention and personalised healthcare, and the importance of digital tools for person-centred care. In particular, the EC Communication on Digital Transformation of Health and Care in the Digital Single Market (COM(2018) 233 final) identifies three priorities:

- Citizens' secure access to their health data, also across borders - enabling citizens to access their health data across the EU.
- Personalised medicine through shared European data infrastructure - allowing researchers and other professionals to pool resources (data, expertise, computing processing and storage capacities) across the EU.
- Citizen empowerment with digital tools for user feedback and person-centred care - using digital tools to empower people to look after their health, stimulate prevention and enable feedback and interaction between users and healthcare providers.

In line with these priorities, the promotion of electronic health records based on a common European exchange format is also one of the objectives recently set by the EC in the strategy "Shaping Europe's Digital Future" (February 2020). Indeed, the adoption of electronic health records could also generate efficiencies, contributing to the attainment of fiscal sustainability goals for health and long-term care systems.

Therefore, the specific objectives of this component - to be achieved by July 2026 - are the following:

- Ensure the supply of updated health equipment technologies, replacing the existing ones, and promote the digitalization of health facilities in order to guarantee a prompt and adequate response to any epidemic or pandemic events. According to this, it is foreseen to purchase 2,648 new medical devices and improve the digitalisation of 177 *DEA - Dipartimenti Emergenziali Assistenziali* 1st level.
- Strengthen and expand the National Health Information System in terms of evolution and modernization of the infrastructure/systems for creation, collection and analysis of health and non-health data, increasing the number of types of digital documents digitized in the Electronic Health Record. This will entail strengthening and further developing the Electronic Health Record at a regional level to promote, according to European standards, document digitization, harmonization and data extraction, facilitate information sharing, and strengthening the IT systems security for consultation, enhance regional capacity for data collection, analysis and interoperability.
- Strengthen the Ministry of Health's IT infrastructure used for the collection, processing, validation and analysis of health data, as well as the implementation of new health information flows and the integration of existing flows.
- Support advanced innovation in the management of health data through AI, Big Data and Machine Learning and integrate information from administrative flows with clinical data collected to implement personalized and precision paths.
- Ensure a secure accessibility of health data in compliance with privacy legislation.
- Strengthening of forecasting, simulation and business intelligence tools and high-level skills within the Ministry of Health, in order to support the definition of planning and prevention policies.
- Address and overcome a specific gap between research and industry that could

hinder the attractiveness of the product/technology for investors and demonstrate the mitigation of risk for a potential investor / industry or licensee, if a patent exists.

- Develop, through the funding of research programs/projects focusing on specific pathologies of high biomedical complexity, targeted therapies capable of providing concrete answers to the health needs of citizens affected by rare diseases and rare tumours and strengthen the response capacity of the centers of excellence in Italy.
- Ensure a structured and sustainable continuous training for healthcare professionals to face current and future challenges, promote the development of adequate managerial skills for personnel with responsibility for coordination and governance of the NHS entities and dedicate moments of specific training for healthcare professionals in terms of safety of care pathways, in order to reduce cases of hospital infections among patients.

c) National strategic context

This component is in line with the national health strategies. Indeed, the set of investments falls within the national strategic context in the healthcare sector and within the budgetary policy objectives for 2021-2023 which take into account the National Recovery and Resilience Plan in line with European programming. These investments are part of the national strategic health plan which is going to be defined by the Italian Ministry of Health, in collaboration with other public administrations. Finally, the component is coherent with the national plan for energy and climate and its updates as well as with the contents of the European Commission “White Paper on artificial intelligence - a European approach to excellence and trust” (19/02/2020) and Italian Strategic Plan for AI (“Strategia nazionale per l’intelligenza artificiale”, 2020) recently published by Ministry of Economic Development highlighting great opportunities and use cases for AI in the healthcare sector. This component - which is characterized by an interdisciplinary value - has also the objective of guiding the policies set to achieve the objectives included in the European Green Deal, as an outcome of proximity assistance or digital access to health data by citizens and its exploitation for diagnosis and assistance.

In particular, the digitization initiatives envisaged by this component are part of the general framework of modernization of the PA-citizen relations envisaged by the Italian Digital Agenda (AGID), which embeds the indications of the European Digital Agenda for Europe - DAE - 2010) and sets - among its main objectives - the establishment of the electronic health record (FSE) intended as a single digital document of the patient’s socio-health data. Similarly, the priorities for the interventions related to digitalization in healthcare were outlined in the Digital Growth Strategy 2014-2020 (March 3, 2015) and then reaffirmed in the Pact for Digital health referred to in the State Regions Agreement of July 7. 2016, identifying in the Electronic Health Record (FSE) the tool through which citizens can trace and consult the entire history of their health care life, sharing it with health professionals to ensure a more effective and efficient service.

The component also includes an important intervention to enhance scientific research as an integral part of the activities of the National Health Service (NHS) as it is a fundamental item to ensure an effective, efficient and high quality health care to all citizens, responding to the real needs of assistance and care across the Country. The tools of this policy can be found in the National Health Research Program (PNRS) (pursuant to Article 12 bis, paragraph 3, Legislative Decree 229/1999) which defines, on a three-year basis, the corresponding research strategies and the allocation of resources, ensuring synergies between public and private research, as well as between national research and European and extra-European research, aggregating and enhancing in a single vision efforts and resources already present in the NHS and in the academic and scientific world, avoiding duplication and overlapping of activities. The lack of digital skills in all different areas (for which Italy - among all the European countries - shows more gaps), is one of the main issues limiting the social and economic development of the Country and its recovery from the current period of crisis. This shows why primary importance should be given to the issue of digital skills, and why it represents another important objective of the component in line with the needs of the Country. Indeed, the “Digital Republic” initiative was included in the Italian 2025 Strategy of the Italian Minister for Technological Innovation and Digitisation, presented on 17 December 2019, based on the overarching consideration that the digital transformation of the Country cannot ignore the contextual growth and diffusion of digital culture.

Concerning the overall economic feasibility of the component, it should be specified that investments-related costs estimated for the purpose of this document only refer to the quota for which the funding through RRF is requested. These lines of action are part of the wider national health programming, and could receive additional financial support by both the national budget and other European programs (e.g. ReactEU). For instance, personnel costs and other non-quantified expenditures will be included in the definition of the structural national health budget.

3. Description of the reforms and investments of the component

1) First project / project area name.

Reform 1.1: Reorganize the network of IRCCS to improve NHS quality and excellence -under Health Reform “Proximity networks, facilities and telemedicine for territorial healthcare assistance”.

Objectives: Regarding this Component, the reform aims to reorganize the *Scientific Institute for Research, Hospitalisation and Healthcare* (IRCCS) network to improve NHS excellence, revamping the relationship between Health and Research, revisiting the legal regime of the IRCCS and the research policies pertaining to the Ministry of Health. It will indeed support research and strengthen the NHS responsiveness to health emergencies, epidemiological transition and health needs related to the demographic framework. The

reform also aims at enforcing collaboration and technological transfer between research and life sciences industry.

Actions:

- reform of the IRCCS introduced by a specific regulatory / administrative act for the reorganization of the Institutes; identification of new financing methods.
- Strengthening of the collaboration between Ministry and Regions in order to align the objectives of the general direction and the objectives of the scientific direction, also assigning to them greater powers for intervention in relation to defining the legal structure and necessary funding.
- definition of a clear framework of actions and common governance tools to maintain consistency in policy guidelines.
- comparison with the trade unions in order to evaluate pros and cons of the new legislation and identify areas for improvement.
- overcoming the current regime of incompatibility of the Scientific Director (which entails the absolute impossibility of carrying out professional activities, even if in the interest of the Institute, including teaching activities and research activities themselves).
- development of research-industry partnership models.

Among the activities, the reform will also intervene in the area of Proximity networks, facilities and telemedicine for territorial healthcare assistance and in the definition of a new model of territorial healthcare assistance and a new institutional structure of Health-Environment-Climate prevention, as further detailed in the component “Proximity networks, facilities and telemedicine for territorial healthcare assistance”

Investment 1.1: Digital update of hospitals’ technological equipment.

Challenges: Italy needs interventions aimed at enhancing and innovating the technological and digital assets currently in use in hospitals, in order to guarantee a better response to the population health needs and improve each entity governance capacity also thanks to a digital and interoperable care path focused on the exchange of data and information. In addition, it is important that health professionals and patients trust digital health technologies, and that no one is excluded, especially given the growing role that technology will play in the future of healthcare.

Data published by the Ministry of Health show significant obsolescence and gap in the digital infrastructure and equipment availability to ensure that the health services are effectively provided nationwide.

- about 24% of CT (computed tomography) scans are over 10 years old;
- about 27% of NMRs (nuclear magnetic resonance) are over 10 years old;

- about 31% of angiographers are over 10 years old;
- about 74% of mammograms are over 10 years old;
- about 50% of pulmonary ventilators are over 10 years old.

In France, Denmark and Sweden, between 60 and 70% of the equipment is up to 5 years old, while in Italy the most recent equipment (considering those up to 5 years old, i.e. the most performing and hi-tech ones), is increasingly less. As underlined by the Ministry of Health, obsolescence compromises quality of performance, efficiency of use, avoid potential digital use and interaction, and it has a negative effect on healthcare service sustainability, which has to face high maintenance costs and increased inefficiencies (e.g. waiting time). The technological equipment inadequacy brings the Italian NHS to a challenge, which engages the Government in the constant search for a delicate balance between guaranteeing high quality healthcare based on innovation, the need to rationalize spending, while respecting the basic principle of fairness by guaranteeing equal patient access to treatment innovation over the whole territory.

Objectives: The improvement of the digitalization of healthcare facilities contributes to enhancing staff productivity, facilitating hospital operations, improving the process quality, ensuring patient safety and high-quality service delivery, by integrating cutting-edge technologies such as medical devices, smart information systems, facility control and automatic conveyor systems, location-based services, sensors and digital communication tools into health processes. The digital update will make it possible to replace healthcare equipment with the most technologically advanced versions, bringing benefits also at the level of clinical assistance processes - operating theatres, diagnostics, etc. As a next step, leaders across the health system will need to agree how innovation is funded, decide which technologies are most effective, and establish a robust IT infrastructure able to provide safe, secure and equitable access to both the technology and the data generated. Technological evolution will also equip companies and professionals with advanced analysis tools, able to collect data in real time, transform it into information and interpret it in order to carry out simulations. The investment aims to purchase and test 2,648 pieces of equipment to replace obsolete and out of order technologies (over 5 years old) and improve the digitalisation of 177 health facilities (including *DEA I livello - Dipartimenti Emergenziali Assistenziali I livello*).

More specifically, following an analysis of the technological equipment currently present at the DEA - Emergency and Acceptance Departments - of 1st and 2nd level and at the Emergency Department - the project aims to identify the need for equipment in replacement of obsolete or out-of-use technologies (over 5 years old): 305 CT with 128 slices, 167 NMR at 1.5 T, 83 Linear Accelerators, 863 Fixed X-ray Systems, 154 Angiography, 75 Gamma cameras, 44 Gamma cameras / CT scans, 295 Mammography, 662 Ultrasound).

In addition, the project foresees the improvement of digitalisation of 177 1st level DEA structures, which will be part of the digital system implementation process. Through the adoption of innovative and technologically advanced solutions and the upgrade of the

digital assets of public health facilities, it will be possible to improve the efficiency of care levels and adapt structures and organisational models to the best international safety standards, also through the implementation of digitalisation processes of care pathways.

For the purposes of estimating the needs, a premise is necessary in terms of configuration of the hospital system of the Italian NHS. The organisation of hospitals in Italy, in fact, is currently regulated by Ministerial Decree 70/2015 and is based on hierarchical levels of complexity of the hospital structures that provide services in continuous and day-cycle hospitalisation for acute cases, through a network model organised on context specificities. Hospitals have three levels of increasing complexity:

- basic hospital unit, with a catchment area between 80,000 and 150,000 inhabitants, which are structures with an Emergency Room with the presence of a limited number of specialties with a wide territorial diffusion: Internal Medicine, General Surgery, Orthopedics, Anaesthesia and support services in active guard network and / or in a 24-hour (h.24) ready availability regime of Radiology, Laboratory, Blood Bank. They must also be equipped with “Intensive Short Observation” beds;
- level I hospitals, with a catchment area between 150,000 and 300,000 inhabitants, which are structures with a 1st level DEA, equipped with the following specialties: Internal Medicine, General Surgery, Anaesthesia and Intensive Care, Orthopedics and Traumatology, Obstetrics and Gynecology (if required by number of births / year), Pediatrics, Cardiology with Cardiological Intensive Care Unit (UTIC), Neurology, Psychiatry, Oncology, Ophthalmology, Otorhinolaryngology, Urology, with an active and / or on-call medical service or in network for pathologies that foresee it. The Radiology Services, at least with Computed Axial Tomography (CT) and Ultrasound, Laboratory and Immunotransfusion Service must be present or available on the network h. 24. For complex pathologies, (such as trauma, cardiovascular ones, stroke), forms of consultation, image transfer and agreed protocols for patient transfer to level II Centers must be provided. The level I hospital must also be equipped with beds for “Short Intensive Observation” and beds for Sub-intensive Therapy (including multidisciplinary ones);
- level II hospitals, with a catchment area between 600,000 and 1,200,000 inhabitants, are structures equipped with 2nd level DEA. These aids are institutionally referable to hospitals, university hospitals, some Scientific Institute for Research, Hospitalization and Healthcare (IRCCS) and large-scale facilities of the Local Health Authority (ASL).

The evaluation of the digitalisation of hospitals, therefore, is based on the hypothesis of digitizing all the structures of the first level DEA (177), which are characterised by a high level of diffusion, a medium-high level of complexity and a homogeneous distribution on the national territory. The assessment of the current digitizing level, preliminary to the implementation of the intervention, will allow to refine this evaluation more precisely, according to the real needs of each Region.

Implementation: The Ministry of Health will be responsible for the planning, execution, management and monitoring of the intervention as a whole. For actions and interventions that require the involvement of individual regional entities, coordinated and negotiated governance tools will be applied, such as, for example, the Institutional Development Contract (Contratto Istituzionale di Sviluppo) with the Ministry of Health being the responsible and implementing Authority and the regional Administrations and other bodies concerned being the participating actors. This approach will ensure time-saving and simplification of procedures - including authorisation procedures - where accompanied by the activation of service conferences (“*Conferenze di Servizi*”).

Target population: Regions, local health units (Aziende Sanitarie Locali - ASL) and hospitals, which through digital and technologically advanced tools will be able to better govern the healthcare supply chain with benefits in terms of efficiency and effectiveness, and citizens, who will benefit from a prompt and quality response to healthcare needs.

Stakeholder involvement: Ministry of Health of Italy, Regions, local health units (Aziende Sanitarie Locali - ASL), hospitals and suppliers.

Timeline: For details, please refer to Paragraph 5 and Paragraph 6..

Investment 1.2: Towards a new safe and sustainable hospital.

Challenges: The entry into force of the Ordinance of the President of the Council of Ministers no. 3274 of 20 March 2003, “First elements regarding general criteria for the seismic classification of the national territory and technical regulations for construction in seismic areas” has revolutionised the pre-existing regulatory framework. In fact, the whole national territory is classified for seismic purposes and, according to this, structures must be designed and built in compliance with standards. The new item introduced by Ordinance n.3274/2003, is the obligation to carry out seismic vulnerability checks for buildings of strategic interest, therefore including health facilities and strategic works. Among public buildings, hospitals play a strategic role in the event of a disaster, as they have a fundamental rescue function for the population, ensuring the effective continuation of the first emergency medical interventions launched in the field. The hospital, one of the most exposed and sensitive sites as it is crowded with thousands of people with very different reactive abilities, is therefore required not only to withstand the impact force of the earthquake without excessive damage, but also to continue to offer sufficient levels of health care. This means that particular attention must be paid not only to load-bearing elements, but also to non-structural and plant elements, as well as to the distribution of functions and flows, to ensure that the environmental units and the equipment necessary for the management of maxi emergencies.

In light of what just said, the main challenge consists in completing interventions aimed at adapting hospital structures to the current anti-seismic regulations.

Objectives: The project aim is to outline a path for structural improvement in the field of hospital facilities safety, which plays a crucial role in emergency situations. More specifically, the aim is to align them to the anti-seismic regulations. To this end, the Ministry of Health identified in 2020 an overall need for 675 interventions distributed proportionally among the Regions according to the share of access to the National Health Fund. For the initiation of procedures and work sites in relation to the interventions identified, the development of a specific Action Plan is expected. The amount was divided considering the number of projects to be activated per single region. The breakdown over the years was made considering the distribution over time of the types of projects, and in particular: preliminary projects in 2021, feasibility studies concentrated in the period 2022 - 2023, the technical-economic feasibility projects in 2024, the final projects in 2025, executive projects in 2026, interventions without planning and seismic vulnerability checks in the period 2021-2026.

Implementation: The Ministry of Health will be responsible for the planning, execution, management and monitoring of the intervention as a whole. For actions and interventions that require the involvement of individual regional entities, coordinated and negotiated governance tools will be applied, such as, for example, the Institutional Development Contract (*Contratto Istituzionale di Sviluppo*) with the Ministry of Health being the responsible and implementing Authority and the regional Administrations and other bodies concerned being the participating actors. This approach will ensure time-saving and simplification of procedures - including authorization procedures - where accompanied by the activation of service conferences (“conferenze di servizi”).

In particular, the above-mentioned objectives shall be achieved through the development of an Action Plan for the initiation of procedures and work sites for anti-seismic interventions and the completion of 675 seismic adaptation and improvement interventions in hospitals. The project will allow for a significant structural improvement in the safety of hospital structures, improvement of the crucial and strategic role that structures play in emergency situations and alignment with the most modern anti-seismic regulations.

Target population: Regions, health facilities and workers of the health sector who will be able to carry out their duties in a safer way, improving the timeliness and quality of interventions; the patients, who will be able to benefit from safer health facilities.

Stakeholder involvement: Ministry of Health of Italy, Regions, local health units (Aziende Sanitarie Locali - ASL).

Timeline: For details, please refer to Paragraph 5 and Paragraph 6.

Investment 1.3: Strengthening of the technological infrastructure and of the tools for data collection, data processing, data analysis and simulation at central level.

Challenges: The health system in the EU is facing systemic development due to the evolution of the way the technological innovations enable healthcare services to be delivered to patients. A significant boost towards this aim is enabled by the effective exchange and use of data: the EHR (Electronic Health Record) is a key tool unlocking the potential of data analysis in the healthcare sector. However, the level of use and diffusion of the EHR among health professionals and citizens is highly heterogeneous at regional level. The monitoring carried out by the Agency for Digital Italy (AgID) shows a substantial deviation between the activation and actual use of the EHR by citizens. Indeed, with regards to citizens, in 10 out of 20 regions there is an activation level lower than 50%, and one slightly higher than 1% in 6 regions, while the use of the EHR is over 50% for only 4 regions. Also critical is the situation related to the activation and use of the EHR by doctors, which results in a level of activation similar to that of citizens (in 9 regions there is a rate of <50%) and a satisfactory level of use only for 3 regions

Objectives: The investment aims at strengthening the technological infrastructure of the Ministry of Health responsible for the collection, processing, validation and analysis of health data, as well as the implementation of new health information flows and the integration of existing flows. Create a national platform for the management of health registers and surveillance systems and develop a national platform for telemedicine solutions. This investment, therefore, aims at strengthening, evolving and expanding the Electronic Health Record – EHR - at regional level, as well as strengthening the technological infrastructure and the tools for data collection, processing, analysis and simulation at central level (Ministry of Health), to support the development of advanced analysis tools of complex phenomena and scenario prediction.

The EHR allows patients to have access to all their health documents and allows operators to increase the quality and timeliness of the care decisions to be taken. It is necessary that the EHR is adopted uniformly on the national territory and that it is improved in security, with the aim of making it complete from the point of view of information and usable for both citizens and operators.

The EHR, if managed and used in a complete and correct way, also favours the governance of regional and national health systems based on “real world” clinical data. The use and dissemination of the EHR is therefore essential for the digital transformation of health. It also allows the interoperability of health data which is one of the national and European objectives, the subject of specific interventions and projects on which Italy is also working within the eHealth network.

Implementation: The Ministry of Health will be responsible for the planning, execution, management and monitoring of the intervention as a whole. For actions and interventions that require the involvement of individual regional entities, coordinated and negotiated governance tools will be applied, such as, for example, the Institutional Development Contract (*Contratto Istituzionale di Sviluppo*) with the Ministry of Health being the responsible and implementing Authority and the regional Administrations and other

bodies concerned being the participating actors. This approach will ensure time-saving and simplification of procedures - including authorisation procedures - where accompanied by the activation of service conferences (“conferenze di servizi”).

In particular, the following macro-actions are envisaged:

- definition of operational plans of the regions to strengthen the EHR and of the health data exchange infrastructures;
- complete implementation of EHR services throughout the national territory;
- development of Regional Telemedicine Platforms in an open data prospective assistance services and customer services for the correct usability of the service by the citizens;
- conception and design of a powerful and complex tool for simulation and prediction of medium-long term scenarios of the NHS;
- design and deployment of new health information flows, gradually between the different regions;
- Strengthening the technological and application infrastructure of the Ministry of Health.

Target population: Regions, and healthcare workers who, through an improved EHR, will be able to take advantage of a set of data and information useful for the governance of activities in terms of planning and monitoring; citizens, who will be able to access information related to their care cycle in an innovative, secure and transparent way.

Stakeholder involvement: Ministry of Health and other Ministries, National Agency for Regional Health Services (Agenas), Italian National Institute of Health (Istituto Superiore di Sanità, ISS), Regions, healthcare workers, software companies.

Timeline: For details, please refer to Paragraph 5 and Paragraph 6.

Investment 2.1: Strengthening and enhancement of the NHS biomedical research.

Challenges: The biomedical research system in Italy is underfunded, which makes it difficult to compete with other institutions internationally. This has a negative impact on the Country’s competitive capacity, considering that economic development is based on the interaction between research and businesses. The life sciences sector is one of the most dynamic in our country, but without an investment policy in research and innovation it is destined to gradually decline. In fact, today we record:

- a reduction in Research Funds for biomedical and health research;
- a lack of risk capital and specific skills to support technology transfer processes.

Adaptation and strengthening of research and development capacity within the NHS is envisaged to allow the NHS to provide adequate responses to the needs of citizens and

ensure a point of reference for the industrial system for health innovation. The research networks of the Scientific Institute for Research, Hospitalisation and Healthcare (IRCCS) can play a fundamental role in the cohesion of the Italian socio-economic ecosystem. Indeed, they represent an essential critical mass for clinical trials and research in rare diseases; they are places of election for the Health Technology Assessment policies of the NHS; thanks to digital technologies, they provide second opinions and remote assistance services, limiting inter-regional mobility and promoting the social inclusion of people with disabilities. In general, this will strengthen the national Health System. The project will develop in coherence and collaboration with the research ecosystem programs proposed by the Ministry of University and Research (MUR) and technology transfer programs proposed by the Ministry of Economic Development (MISE), also through joint initiatives.

Objectives: The project is aimed at carrying out two types of interventions:

Financing of PoC (Proof of Concept) projects, for a total of 100 million, which will help reduce the gap between research results and industrial application, support the development of technologies with a low degree of technological maturity, as well as fostering the transfer of technology towards the industry. In particular, this line of action aims to:

- build / improve a prototype and prepare for commercialisation;
- verify the commercial feasibility or carry out scale-up tests;
- show risks mitigation for a potential investor / industry or licensee, if a patent exists;
- address and overcome a specific gap identified by the industry and which hinders its attractiveness for investors;

The detailed investment program will be the result of discussions and contributions from relevant stakeholders in the sector.

Funding of research programs / projects in the field of rare diseases and rare cancers. These pathologies, of high biomedical complexity and often multi-organ expression, require the convergence of high clinical competence and advanced diagnostic and research activities and require technologies of excellence and the coordination of collaborative networks at national and European level. In order to strengthen the responsiveness of the centers of excellence in Italy, a research program with dedicated funding for a total of 100 million is expected to be launched in order to develop targeted therapies capable of providing concrete answers to the health needs of citizens suffering from rare diseases.

Implementation: The Ministry of Health will be responsible for the planning, execution, management and monitoring of the intervention as a whole. For actions and interventions that require the involvement of individual regional entities, coordinated and negotiated governance tools will be applied, such as, for example, the Institutional Development Contract (Contratto Istituzionale di Sviluppo) with the Ministry of Health being the responsible and implementing Authority and the regional Administrations and other bodies concerned being the participating actors. This approach will ensure time-saving

and simplification of procedures - including authorisation procedures - where accompanied by the activation of service conferences (“conferenze di servizi”).

The project is based on the assignment of vouchers for PoC projects - Proof of Concept and on the allocation of funding for research programs aimed at rare diseases and rare cancers.

Target population: Regions, University, Businesses and Scientific Institute for Research, Hospitalisation and Healthcare (IRCCS).

Stakeholder involvement: Ministry of Health and other Ministries, Scientific Institute for Research, Hospitalisation and Healthcare (IRCCS), universities and research centers and businesses.

Timeline: For details, please refer to Paragraph 5 and Paragraph 6.

Investment 2.2: Health innovation ecosystem.

Challenges: This investment addresses the following challenges:

- the need for innovative actions for the health research and innovation system in Italy, including in the sectoral planning policy approach;
- enhance the specificity and complexity of innovation in the life sciences in relation to intellectual property issues, the expansion of research times, regulatory complexity and ethical implications;
- the need to identify a new and suitable way to establish lasting, transparent and mutually profitable relations between the action of public and private organisations, within the perimeter of a strategic sector where the direction of the central public administration is crucial;

Objectives: The intervention aims to develop an ecosystem for innovation in the “Health” Area as identified by the National Research Program (PNR) and the National Intelligent Specialisation Strategy (SNSI).

In particular, the project aims to create an Innovative health ecosystem through the creation of clinical-transnational networks of excellence capable of pooling the skills which exist in the Country and creating public-private interventions that work in synergy to innovate, develop and create qualified employment.

Two macro - actions are envisaged, one relating to the creation of a network of technology transfer centers and the other relating to the strengthening and qualitative and quantitative development of the Lifescience Hubs by geographical area (North - Center - South).

The innovative element in the approach adopted lies in the structured “lead” function

of the Ministry in defining the intervention priorities on which to focus action. The project will develop in coherence and collaboration with the research ecosystem programs proposed by the Ministry of University and Research (MUR) and technology transfer programs proposed by the Ministry of Economic Development (MISE), also through joint initiatives.

Implementation: The Ministry of Health will be responsible for the planning, execution, management and monitoring of the intervention as a whole. For actions and interventions that require the involvement of individual regional entities, coordinated and negotiated governance tools will be applied, such as, for example, the Institutional Development Contract (Contratto Istituzionale di Sviluppo) with the Ministry of Health being the responsible and implementing Authority and the regional Administrations and other bodies concerned being the participating actors. This approach will ensure time-saving and simplification of procedures - including authorization procedures - where accompanied by the activation of service conferences (“conferenze di servizi”).

The intervention will be implemented through the creation of a coordinated network of centers for technology transfer and the definition of structured sharing paths for the scouting of research lines and their development in a perspective of industrialization and innovation of the health ecosystem.

The intervention also aims to achieve a qualitative and quantitative strengthening and development projects of the Life Sciences Hubs by geographical area (North - Center - South), in order to strengthen and develop the national network of specialized innovative infrastructures - Life Sciences HUB.

Target population: Entire NHS and business, including SMEs.

Stakeholder involvement: Ministry of Health and other Ministries, Scientific Institute for Research, Hospitalization and Healthcare (IRCCS), universities and public and private research centres, SMEs.

Timeline: For details, please refer to Paragraph 5 and Paragraph 6.

Investment 2.3: Development of technical-professional, digital and managerial skills of professionals in healthcare system.

Challenges: Scientific progress and technological innovation require health professionals to be constantly updated and trained. According to Legislative decree 502 of 30 December 1992, which established the obligation of continuous education for health professionals, this training should be “aimed at adapting professional knowledge throughout the entire professional life and improving skills and the clinical, technical and managerial skills of health workers, with the aim of guaranteeing the effectiveness, appropriateness, safety and efficiency of the assistance provided by the National Health Service”. In addition,

the pandemic crisis has also highlighted the difficulty of hospitals to recruit adequately trained staff, especially with reference to digital and innovative issues.

Objectives: This investment aims to increase scholarships for the specific course in general medicine, guaranteeing the completion of 3 three-year training cycles; launch a training plan on safety in terms of hospital infections for all NHS medical and non-medical management profiles, nursing and technical staff; activate a training path for personnel with top roles within NHS Bodies in order to allow them to acquire the necessary managerial skills and abilities to face current and future health challenges in an integrated, sustainable, innovative, flexible and result-oriented perspective.

Implementation: The Ministry of Health will be responsible for the planning, execution, management and monitoring of the intervention as a whole. For actions and interventions that require the involvement of individual regional entities, coordinated and negotiated governance tools will be applied, such as, for example, the Institutional Development Contract (Contratto Istituzionale di Sviluppo) with the Ministry of Health being the responsible and implementing Authority and the regional Administrations and other bodies concerned being the participating actors. This approach will ensure time-saving and simplification of procedures - including authorisation procedures - where accompanied by the activation of service conferences (“conferenze di servizi”).

Target population: Healthcare workers.

Stakeholder involvement: Ministry of Health and other Ministries, universities.

Timeline: For details, please refer to Paragraph 5 and Paragraph 6.

4. Green and digital dimensions of the component

a) Green Transition:

The component generally contributes to the development of the green transition with the:

Investment 1.1: Digital update of hospitals’ technological equipment

According to the Integrated National Plan for Energy and Climate, and to Regulation (UE) 2018/1999, the aim of the investment is to improve the technological efficiency focusing on all kinds of innovation and improvement of the production process. Facilities and properties renovation will meet innovative requirements in terms of energy efficiency and low environmental impact.

Investment 1.2: Towards a new safe and sustainable hospital

This investment is in line with the field of intervention 038 as it foresees to carry out structural interventions in hospital facilities in compliance with the anti-seismic regulations.

Investment 1.3: Strengthening, evolution and expansion of the Electronic Health Record (EHR) at regional level and strengthening of the technological infrastructure and of the tools for data collection, processing, analysis and simulation at central level.

In line with the European Green Deal, the investment will finance the green transition, in terms of energy and resources, with particular attention to environmental sustainability, efficiency, as well as technological innovation with a view to economic resilience. The spread of the EHR will allow the reduction of paper printing health documents by favouring access to health data in a completely digital way according to European standards.

b) Digital Transition:

The component contributes to the development of the digital transition by:

- strengthening digital capabilities and using advanced technologies in hospitals, in line with the Integrated National Plan for Energy and Climate;
- a deep technological evolution of the communication and data transmission systems from the territorial units to the hospital or territorial structures of competence with a positive impact on the quality of the health services provided;
- strengthening the digitalisation of assistance by promoting the widespread dissemination of connected assistance devices, especially for professionals and disadvantaged individuals in the field of telemedicine;
- redefinition of operating methodologies within the NHS through the use of digital technologies, ensuring remote monitoring and assistance and integrating research activities with assistance activities;
- development of Scientific Institute for Research, Hospitalization and Healthcare (IRCCS) networks based on virtual functional links between homogeneous centers of reference for genomic analysis and, in general, for all geomics sciences.

Investment 1.1: Digital update of hospitals' technological equipment.

The investment contributes to the creation of an infrastructure for the collection of data useful to be analyzed through artificial intelligence and machine learning processes. In this sense, it contributes to the strengthening of digital investments in the country, making the information infrastructure interconnectable and easily accessible.

Investment 1.3: Strengthening, evolution and expansion of the Electronic Health Record (EHR) at regional level and strengthening of the technological infrastructure and of the tools for data collection, processing, analysis and simulation at central level.

The presence of data in the EHR will also make it possible to create an “ecosystem of digital services” which contributes to the dematerialisation and physical disintermediation of several processes (exemption request, etc.).

TABLE 1: Green and digital impact

	Digital		Green		
	Tag	%	Tag	Climate	Environmental
				%	%
M6C2: Investment 1: Technological and digital update					
1.1 - Digital update of hospitals' technological equipment	093 Health equipment	100%	093 Health equipment	0%	0%
1.2 - Towards a new safe and sustainable hospital	na	0%	038 Risk prevention and management of non-climate related natural risks (i.e. earthquakes) and risks linked to human activities (e.g. technological accidents), including awareness raising, civil protection and disaster management systems, infrastructures and ecosystem based approaches	0%	100%
1.3 - Strengthening of the technological infrastructure and of the tools for data collection, data processing, data analysis and simulation at	095 Digitalisation in health care	100%	092 Health infrastructure	0%	0%
M6C2: Investment 2: Scientific research and technological transfer					
2.1 - Strengthening and enhancement of the NHS biomedical research	na	0%	na	0%	0%
2.2 - Innovative ecosystem of Health	na	0%	na	0%	0%
M6C2: Investment 3: Technical, digital and managerial upskilling of NHS professionals					
3.1 - Development of technical-professional, digital and managerial skills of professionals in healthcare system	na	0%	na	0%	0%

5. Milestones, targets and timeline

1) REFORMS.

Reform 1: Reorganise the network of IRCCS to improve NHS quality and excellence (under Health Reform “Proximity networks, facilities and telemedicine for territorial healthcare assistance”):

The reform implementation steps are listed below:

- strengthening collaboration between the Ministry of Health and the Regions: arrangements at least 13 (60%) of the regions;
- criteria and conditions to be defined for private IRCCS legal form;
- legal framework for public and private IRCCS – in order to define funding structure (Criteria and assumptions to define different requirements);
- criteria and models for the drafting of agreements for general management responsibilities / and scientific / research direction;
- status of NHS research personnel and scientific director - phase of confrontation with the unions to evaluate the pros and cons of the new legislation and to improvement of the legislation itself (defining criteria and preconditions);
- status of the National Health Service and scientific director of research staff (defining criteria and preconditions);
- criteria for the recognition and for the revocation status of IRCCS - complete the set of indicators needed for the detection of scientific and charitable activities of the Institutes (indicator set);
- definition Code of Conduct;
- technology transfer and relationships with businesses - industry research partnership models (definition of criteria and preconditions);
- definition of scientific cooperation policies, rationalization of the individual research institutes, collaboration with scientific and industrial partners;
- criteria for the assessment of the impact of research - systematic fund of research impact assessment activities funded (Evaluation Model);
- financing arrangements, budget is assigned by the Ministry of Research.

2) INVESTMENT.

Investment 1.1: Digital update of hospitals’ technological equipment:

- drafting of a report on the need assessment of large equipment, by Q2 2021;
- development of the Action Plan, by Q2 2021;
- definition of the tender procedure by Q2 2022;
- 2,648 large sanitary equipment Purchased and tested to replace obsolete or out of use technologies, by Q4 2023;
- 177 digitized medical facilities (DEA - Emergency and Admission Departments - Level I) by Q4 2023;

Investment 1.2: Towards a new safe and sustainable hospital:

- development of an action Plan by Q4 2021;
- 675 interventions to adapt to the anti-seismic legislation completed by Q4 2026.

Investment 1.3: Strengthening of the technological infrastructure and of the tools for data collection, data processing, data analysis and simulation at central level:

- strengthening and evolution of regional platforms for processing and archiving data from CDA2, by Q4 2026;
- support to the supplier entities in the production of data in CDA2 format, by Q4 2026;
- development of Regional Telemedicine Platforms (Phase 1) completed in 5 Regions by Q4 2022;
- development of Regional Telemedicine Platforms (Phase 2) completed in 7 Regions by Q4 2023;
- development of Regional Telemedicine Platforms (Phase 3) completed in 9 Regions by Q4 2024;
- implementation and testing in 2 pilot Regions of 4 new Flows at regional level (Phase 1) by Q4 2021;
- implementation of 4 new Information Flows at regional level (Phase 2): Implementation and testing in 10 Regions, by Q4 2022;
- implementation of 4 new Information Flows at regional level (Phase 3): Implementation and testing in 9 Regions, by Q4 2023;
- strengthening of the technological and application infrastructures of the Ministry of Health by Q4 2022, completing platform and portal Open Data;
- strengthening of the technological and application infrastructures of the Ministry of Health by Q4

- 2023, completing evolutionary maintenance interventions;
- strengthening of the technological and application infrastructures of the Ministry of Health by Q4 2026, completing Data Analytics Platform;
- construction of a powerful and complex tool for simulating and forecasting medium/long- term scenarios of the SSN (Model Phase 1) by Q4 2023 – Model plan;
- construction of a powerful and complex tool for simulating and forecasting medium/long- term scenarios of the SSN (Tool Phase 1) by Q4 2023 – Model design;
- construction of a powerful and complex tool for simulating and forecasting medium/long- term scenarios of the SSN (Model Phase 2) by Q4 2026 – Model implementation, validation and end;
- construction of a powerful and complex tool for simulating and forecasting medium/long- term scenarios of the SSN (Model Phase 3) by Q4 2026 – design implementation and Model maintenance;
- construction of a powerful and complex tool for simulating and forecasting medium/long- term scenarios of the NHS - Completion of the National Health Prevention Hub by Q4 2026

Investment 2.1: Strengthening and enhancement of the NHS biomedical research:

- definition of a two-year selective procedure for the assignment of vouchers for PoC (Proof of Concept) projects, by Q4 2021;
- definition of a two-year selective procedure for the assignment of vouchers for PoC (Proof of Concept) projects, by Q4 2023;
- assignment of vouchers for PoC (Proof of Concept) projects, for a total value of 50 million, by Q4 2025;
- assignment of vouchers for PoC (Proof of Concept) projects, for a total value of 50 million, by Q4 2025;
- definition of a public procedure for the assignment of research programs / projects about rare diseases and rare cancers by Q4 2021;
- definition of a public procedure for the assignment of research programs / projects about rare diseases and rare cancers by Q4 2023;
- assignment of funding for research programs / projects about rare diseases and rare cancers, for a total value of 50 million, by Q4 2025;
- assignment of funding for research programs / projects about rare diseases and rare cancers, for a total value of 50 million, by Q4 2025.

Investment 2.2: Health innovation ecosystem:

- Action Plan development for the creation of a coordinated network of technology transfer centers by Q4 2023;
- public tender procedure based on Action Plan development for the creation of a coordinated network of technology transfer centers by Q4 2023;
- implementation of 3 actions for technology transfer centers by Q4 2026;
- Action Plan elaboration for the strengthening and development of the Lifescience Hubs by Q4 2023;
- public tender procedure based on Action Plan elaboration for the strengthening and development of the Lifescience Hubs by Q4 2023;
- 3 projects by geographical area (North - Center - South) for the strengthening and development of the Lifescience Hubs by Q4 2026.

Investment 2.3: Development of technical-professional, digital and managerial skills of professionals in healthcare system:

- increase the scholarships for the specific training course in general medicine, guaranteeing the completion of three three-year training cycles, by Q2 2026;
- begin an extraordinary training plan for hospital healthcare personnel of the NHS based on hospital infections, by Q4 2026;
- implementation of 3 actions for technology transfer centers by Q4 2026;
- enable a training path for the top roles of the NHS bodies and its macro-organizational structures for the acquisition of the necessary managerial skills and capabilities to meet current and future healthcare challenges in an integrated perspective, sustainable, innovative, flexible and results-oriented, by Q4 2026.

6. Financing and costs

Estimated cost of the plan													
Component name	Investment/ Reform	Relevant time period	Total estimated costs for which RRF is requested *	If available: Total estimated cost by year (m/ bn national currency/EUR)						Funding from other sources (as requested by Art. 8 in the Regulation)			COFOG level 2 category / or type of revenue (if relevant)
				2021	2022	2023	2024	2025	2026	from other EU programmes	from the national	Other sources	
NEW ID													
Investment 1 - Technological and digital update													
	Investment 1.1 - Digital update of hospitals' technological equipment	2021-2023	2,000,000,000 €	100,486,625 €	842,393,750 €	1,057,119,625 €	- €	- €	- €				
	Investment 1.2 - Towards a new safe and sustainable hospital	2021-2026	2,300,000,000 €	215,576,560 €	552,809,146 €	552,809,148 €	499,650,615 €	228,820,814 €	250,333,717 €				
	Investment 1.3 - Strengthening of the technological Infrastructure and of the tools for data collection, data processing, data analysis and simulation at central level	2021-2026	430,000,000 €	54,294,594 €	90,866,981 €	105,903,166 €	76,981,384 €	45,123,124 €	56,850,750 €				
Investment 2 - Scientific research and training													
	Investment 2.1 - Strengthening and enhancement of the NHS biomedical research	2021-2026	200,000,000 €	- €	- €	100,000,000 €	- €	- €	100,000,000 €				
	Investment 2.2 - Innovative ecosystem of Health	2021-2026	100,000,000 €	11,050,000 €	17,600,000 €	17,850,000 €	17,900,000 €	17,925,000 €	17,675,000 €				
	Investment 2.3 - Development of technical-professional, digital and managerial skills of professionals in healthcare system	2021-2026	200,000,000 €	10,442,700 €	40,488,700 €	52,931,200 €	42,488,500 €	32,045,800 €	21,603,100 €				
	Tot	2021-2026	5,230,000,000 €	391,850,479 €	1,544,158,577 €	1,886,613,139 €	637,020,499 €	323,914,738 €	446,442,568 €				

Note: All milestones and targets are relative to the *new funds* - i.e. those 5,320 millions that will add to the funding that was already planned to be devoted to the objectives of this component in the current legislative framework.