



RECOVERY AND RESILIENCE SCOREBOARD

Next
Gen
EU

Thematic analysis

Research and Innovation

April 2022



This paper is part of a series of thematic analyses undertaken by the European Commission to illustrate the impact of the Recovery and Resilience Facility (RRF). The RRF is the European Union's largest ever funding instrument and is intended to support European economies and societies to recover from the Covid-19 pandemic and build resilience against future shocks. EU Member States commit to implement ambitious reforms and investments and receive funds from the RRF when they achieve these commitments.

Recovery and Resilience Scoreboard

Thematic analysis



Policy Overview

Research and innovation (R&I) are amongst the most powerful tools to boost the Union's economies and competitiveness at global scale, and instrumental in the green and digital transitions on the continent.

Strengthening and spreading R&I and improving the collaboration between private and public R&I in the Member States towards early market deployment of clean and innovative technology solutions is vital for reaching the ambitious targets set for the twin transitions and will provide an economic opportunity for the EU. The European Commission has identified several key technological areas where it will be important to develop or strengthen the R&I ecosystem and industrial capabilities to ensure future competitiveness and mitigate strategic dependencies and related risks¹.

Although the EU is still a global leader in research, its performance has stagnated since 2012, notably in terms of innovation, and other major players, from Asia in particular, are gradually growing and occupying a more prominent position on the global R&I and technological landscape. While R&I are the engine of long-term productivity growth, Europe continues to lag behind in turning the outcomes of its excellent research into disruptive innovation and fails to fully mobilise research and technological capacities, in particular in less developed regions. Technology diffusion efforts should be strengthened at all levels to promote technological uptake especially by SMEs. In a context of growing global competition and geopolitical instability, what is at stake is not only Europe's prosperity and economic competitiveness, but also its ability to autonomously source and provide crucial technologies and services that are safe and secure for industry, people and the environment.

The COVID-19 pandemic has demonstrated the importance of cross-border R&I cooperation to rapidly deliver solutions to the most demanding needs. It also highlighted the importance of addressing EU's strategic technological dependencies to strengthen its resilience. This can be done through promoting R&I cooperation in emerging technological fields, attracting best talents and confronting successfully brain drain, which is a major issue particularly in some Member States.

More is needed to revitalise the European Research Area (ERA). It was launched in 2000 in the context of the Lisbon strategy and has contributed to significant progress in areas such as research infrastructures, open science, international cooperation, gender balance in R&I, joint programming and the mobility of researchers. Despite this progress, more needs to be done and Europe is engaging in a renewed policy agenda to further revitalise the ERA. The 'Pact for research and innovation' proposed by the Commission and adopted by the Council in November 2021² reaffirmed the importance of coordination and joint action, under the framework of a new European Research Area, deepening existing priorities and initiatives, where possible through new and stronger approaches. Horizon Europe (with its budget of EUR 95.5 billion dedicated to R&I for 2021-27), as well as other EU funding programmes (notably cohesion funding through the European Regional Development Fund) are providing an essential contribution to the EU's effort to strengthen its R&I ecosystem and tackle major challenges ahead.

The Recovery and Resilience Facility (RRF) represents a unique opportunity to accelerate the development and transformation of the R&I system in Member States and boost the support to key technological areas. Building on the country-specific recommendations of 2019 and 2020 in the framework of the European Semester, in almost all Member States there will be an increased focus of investment-related economic policy on R&I. In addition to R&I investment, other recommendations invited Member States to remove the barriers hampering the optimal functioning of their innovation ecosystems, to enhance the effectiveness of R&I policies and of the overall innovative capacity of their economies, to support research institutions, R&I in the private sector and particularly in

¹ See SWD(2021)352 – *Strategic dependencies and capacities*.

² See [New Pact and governance structure for the European Research Area \(ERA\) - Consilium \(europa.eu\)](https://www.consilium.europa.eu/en/policies/new-pact-research-innovation/).

Recovery and Resilience Scoreboard

Thematic analysis



SMEs, access to finance for innovative companies, as well as a closer cooperation between science and business. Most of these recommendations have been addressed in the recovery and resilience plans (RRPs) approved so far. A significant amount of funds has been allocated to the corresponding reforms and investments in RRP, including to multi-country initiatives.

Research and innovation in the recovery and resilience plans

Overview of the plans

The overall expenditure for R&I in the RRP is significant. All approved RRP³ include measures related to research and innovation. This represents a total of **224 measures** (55 reforms and 169 investments) for a budget of around **EUR 44.4 billion⁴**. The R&I investments in the RRP represent typically between 4% and 13% of the RRF allocation of a country, with a few outliers below or above this range and an average of about 10%.

For several Member States, **the Recovery and Resilience Facility can be instrumental in the development of their R&I system, shaping it in the years to come, with a real transformative impact, should the efforts be maintained over time.** For example, in several Eastern and Southern Member States, which are characterised by high RRF grants allocation and low R&D intensity,⁵ the R&I investments included in the RRP amount to over one year of (pre-Covid) public investments in R&I. Moreover, in some of those countries, these investments are accompanied by important R&I policy reforms.

The **R&I reforms** typically aim to:

- reduce **the fragmentation of the scientific research system** through the consolidation of scientific research institutions;
- **increase the attractiveness of research careers in public institutions** through changes to the recruitment, salary and career management policies (for key areas in particular), including with increased possibility for mobility and combining public research with private activity;
- **reduce the administrative burden** related to the access to public funding for R&I activities;
- support **knowledge and technology transfer** (between public research institutions and private companies) through the creation of appropriate entities (offices, agencies) and the removal of barriers to academia-business collaboration;
- **improve the coordination between the different levels of governance** of R&I and education policies, in order to respond to skills needs and enhance employability, especially for the young.

The RRP include both thematic and horizontal R&I investments, consisting in financial support for R&I activities and infrastructures, as well as the diffusion of innovation.

³ The recovery and resilience plans of the following 22 Member States have been approved by the Council so far (by March 2022): Austria, Belgium, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Ireland, Italy, Germany, Greece, Latvia, Lithuania, Luxembourg, Malta, Portugal, Romania, Slovakia, Slovenia, and Spain.

⁴ The figures in this thematic analysis are based on the pillar tagging methodology for the Recovery and Resilience Scoreboard and correspond to the measures allocated to the policy areas “R&D&I in green activities” (under the Green pillar), “digital-related measures in R&D&I” (under the Digital pillar) and “R&D&I” (under the Smart growth pillar) as primary or secondary policy areas.

⁵ R&D intensity is an indicator monitored by Eurostat and OECD. R&D is usually considered to have a narrower scope than R&I. For the definition of R&D, see the OECD Frascati Manual, Chapter 2 (<https://www.oecd.org/sti/frascati-manual-2015-9789264239012-en.htm>); on the distinction between R&D and innovation activities, see notably section 2.7 of the Frascati Manual.

Recovery and Resilience Scoreboard

Thematic analysis



The thematic R&I investments are targeted at a number of specific areas,⁶ for example:

- The **green transition** will be facilitated by R&I investments included in RRP's notably in the fields of:
 - **energy** (17% of total R&I expenditure; e.g., development of hydrogen solutions);
 - **environment** (6%; e.g., support for public and business R&I in the environmental field, research in innovative green technologies);
 - **transport/smart mobility** (4%; e.g., development of electro-mobility); and
 - **circular economy** (3%; e.g. development of re-use and recycling technologies).
- R&I investments in **digital technologies** account for approximately 15% of total R&I expenditure and include, for instance, development of advanced technologies (microprocessors, cloud, quantum computing, etc.), cybersecurity, 5G, as well as digital technologies of a more horizontal impact.
- Another important area of R&I investments is **health** (5% of total R&I expenditure). These investments include, for example, the development of alternative production processes for nuclear medicine for cancer treatment or the establishment of a centre for precision medicine.

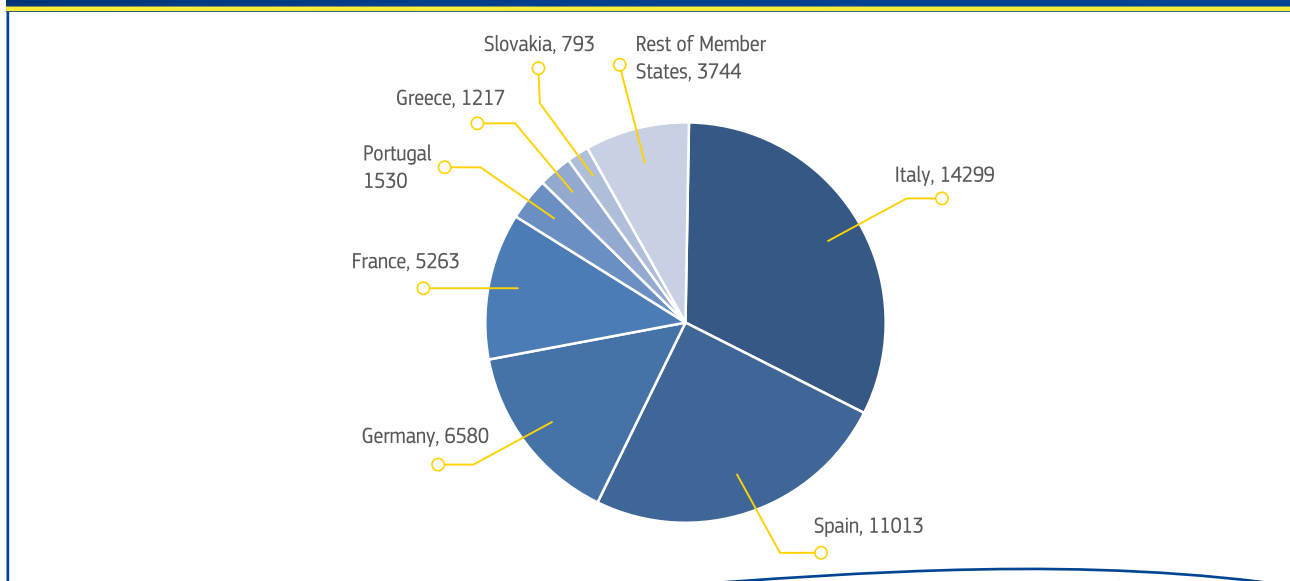
The horizontal R&I investments⁷ account for slightly more than one third of the total R&I investments.

They include a variety of cross-cutting R&I measures such as strengthening of innovation ecosystems (including through innovation clusters), upgrade of research infrastructures, grants for researchers, support for business innovation including start-ups and SMEs, facilitation of public-private R&I cooperation, and the support of existing or new regional clusters.

Several Member States also included investments to support Horizon Europe Partnerships and the funding of projects receiving a Seal of Excellence (i.e. projects which were judged to deserve funding under Horizon Europe but could not be financed due to budget limitations).

Total expenditure on R&I per Member State

In EUR millions



⁶ The relevant measures included in the specific areas mentioned below have been selected from the measures allocated to the policy areas mentioned in footnote 4.

⁷ I.e. those not limited to a specific thematic field. As per the previous footnote, horizontal R&I investments have been selected from the measures allocated to the policy areas mentioned in footnote 4.

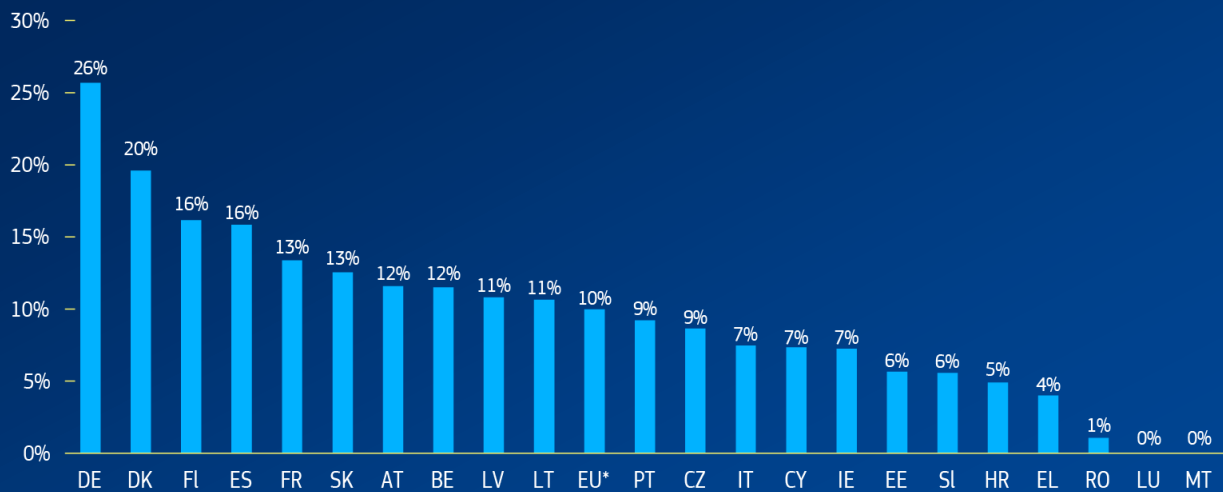
Recovery and Resilience Scoreboard

Thematic analysis



Share of expenditure on R&I

% of total allocation per Member State



EU*: For the 22 Member States, whose recovery and resilience plans have been approved so far.

Note: This chart shows estimated expenditure based on the pillar tagging methodology for the Recovery and Resilience Scoreboard and corresponds to the measures allocated to the policy areas "R&D&I in green activities", "Digital-related measures in R&D&I" and "R&D&I" as primary or secondary policy areas.

Good practices

Reforming the R&I system



Cyprus includes in its RRP an ambitious reform to develop a comprehensive national Research and Innovation Policy to support the R&I ecosystem and to enhance links between policy making and implementation. It will promote the efficient coordination of the R&I governance system and nurture innovation culture, with the aim to mobilise stakeholders. The reform consists in the adoption of a national Strategy for R&I, the related Action Plan and the revised Smart Specialisation Strategy including setting priorities to build competitive advantage by developing and matching R&I strengths to business needs. It will also consist in the establishment of a mechanism for policy impact monitoring and of the support of the Centres of Excellence in Cyprus, as well as in the development of a digital tool for the dynamic mapping of the R&I ecosystem (including policy measures, R&I performance, sector analytics, etc.).




The Croatian RRP proposes a reform aiming to increase the number of enterprises investing in and the size of investments in R&I. The reform will consist of an analysis of the existing R&D tax incentive scheme and amending and complementing the legal framework for R&D tax incentives to encourage the private sector to increase the intensity of its R&D investment, increase the number of beneficiaries of R&D tax incentives, simplify the procedures and reduce the administrative burdens, while improving transparency and accessibility.

Recovery and Resilience Scoreboard

Thematic analysis



 **The Portuguese RRP includes a reform consisting in revising the legal framework related to public R&I investments**, in order to facilitate the funding of public-private R&I partnerships, simplify the access to funding instruments for R&I activities and enhance the predictability and stability of funding by establishing a multi-annual programming framework for public R&I investment.

Strengthening the public science base and human resources for R&I

 **The Greek RRP includes an ambitious reform of the tertiary education system, aiming to enhance the research performance and market relevance of Greek universities.** It will develop and implement the “Strategy for Excellence in Universities and Innovation”, attracting distinguished researchers and strengthening the business-academia link. Specifically, it mainly consists of: a) Clusters of Research Excellence for business projects; b) Visiting Professorships for attracting in Greece distinguished academics from foreign universities; c) infrastructure of science and technology universities; d) financing industrial PhD programmes with companies.

 **Spain plans to update its Science, Technology and Innovation Law, in order to enhance the governance and coordination of the science, technology and innovation sector, create an attractive scientific career, and improve the knowledge transfer from research to applied products/services for the society.** The updated law will notably introduce a new scientific career for research staff, including university staff, which should improve transparency in the appointment of staff, flexibility, mobility and stability in the research career. This will be complemented by an investment aiming at supporting scientific careers with grants awarded through competitive calls.


Enhancing science-business linkages

 **The Danish RRP will provide funding to the public and private sectors to boost research and development, particularly in innovative green technologies.** The programme will be structured in at least four public-private partnerships, called “green partnerships”, bringing together research institutions, private businesses, public authorities and innovation actors to develop solutions to four mission-based challenges of reducing emissions in the transport, agriculture, food and waste sectors.

 **In order to preserve employment in private R&I, France will launch programmes aiming at strengthening collaboration between public research laboratories and private businesses.** These programmes will incentivise companies to hire young research graduates or have their existing researchers engage in doctoral or post-doctoral studies, so that they can build up their skills and improve their employability.

Supporting business innovation

 **The Lithuanian RRP contains an investment to foster the development of the start-up ecosystem by providing acceleration services for start-ups.** The Lithuanian Innovation Promotion Fund will be expanded to provide acceleration and venture capital investments for 32 start-ups in the capital region. In addition, several start-up accelerators will be established to support 80 start-ups, including 20 start-ups incubated by the newly established European Space Agency incubator and Space Hub.

 **The Spanish and Belgian RRP include ambitious investments to foster R&I activities across the hydrogen value chain** such as the financing of R&I projects, the development of new testing and demonstration facilities for companies (prototypes) and the increase of innovation capacity of companies through technology transfer activities. To support business cooperation, the measures will support the establishment or use of renewable


Recovery and Resilience Scoreboard


Thematic analysis



hydrogen clusters that will strengthen cooperation of businesses working on different areas across the entire value chain such as production, processing, transport, storage, and consumption.

Investment in R&I initiatives and multi-country projects

 **The Austrian RRP contains an investment into quantum computing, which includes funding the relevant research infrastructures and research collaborations.** The aim of the investment is to expand the knowledge base for the development of technologies for quantum sciences, especially hardware and software for quantum computing, simulation, and communication. The investment is also expected to strengthen cross-border cooperation in the area of quantum research and expand alignment with relevant European initiatives such as EuroHPC.

 **The German RRP will contribute to major multi-country initiatives aiming at developing and strengthening European innovation and industrial ecosystems in three key strategic technological areas: hydrogen, microelectronics, and cloud technologies.** These initiatives are planned to be implemented through Important Projects of Common European Interest (IPCEIs), which make it possible to bring together knowledge, expertise, financial resources and economic actors throughout the European Union. They will allow to support integrated R&I projects along the three concerned value chains.

Country overview

The figures provided in the Country Overview are based on the pillar tagging methodology for the Recovery and Resilience Scoreboard and correspond to the measures allocated to the policy area “R&D&I in green activities”, “Digital-related measures in R&D&I” and “R&D&I” as primary or secondary policy area. For all Member States, the listed relevant components are based on the Council Implementing Decision.

Austria

Allocation: EUR 401 million. Relevant component: 3.A, 3.D

The Austrian plan envisages the development of the overarching Research, Innovation and Technology Strategy 2030. Also, the plan includes a number of investments into research and innovation, notably to promote quantum sciences, to establish a centre for precision medicine on the campus of the Medical University of Vienna, and to fund digital research infrastructure projects of Austrian universities. Moreover, the plan provides funding for two IPCEIs, one on Microelectronics and Connectivity, to accelerate semiconductor development and production, and the other one on Hydrogen, to promote integrated projects along the hydrogen value chain, especially covering hydrogen production, storage and applications.

Belgium

Allocation: EUR 682 million. Relevant components: 1.2, 1.3, 2.3, 4.2, 5.2, 5.3

The Belgian plan contains a number of measures to strengthen research and innovation. It includes investments to provide an impetus to technological developments to support the energy transition, notably by developing an industrial value chain for hydrogen and establishing a series of large R&D facilities and equipment to develop research actions in the following areas: renewable and low carbon energy production; energy production, conversion and storage; CO₂ capture and valorisation; rational use of energy in buildings and in mobility; and electricity grid operation. The plan also provides for the development of nuclear medicine for cancer treatment. It also includes

Recovery and Resilience Scoreboard

Thematic analysis



measures to support research and innovation in the area of artificial intelligence (through developing the AI institute for human-centric use of AI in the areas of societal interests and in support of the twin green and digital transition) and circular economy (e.g. by financing circular projects on the substitution of hazardous chemicals and eco-design and by establishing innovation partnerships focused on the circularity of metals, batteries and minerals).

Croatia

Allocation: EUR 309 million. Relevant components: 1.1, 1.2, 3.1, 3.2

Reforms and investments in the Croatian plan targeting the research and innovation system seek to consolidate the public science base, revamp the institutional funding system of universities and public research organisations so as to incentivise high quality research, strengthen the attractiveness of research careers and improve the efficiency of R&I support programmes. Measures in the R&D component are also expected to foster skills development (e.g. by strengthening STEM and ICT skills) and attract and retain talent (e.g. by fostering researchers' mobility to and from international institutions and the industry, and establishing independent research careers for scientists). A modernised legal and financial framework should provide the conditions to focus research, development and innovation on results, leading to more competitive projects, stronger international cooperation, and an increased number of projects in academia-business cooperation. Increased investment in research infrastructure and organisational capacities of universities and scientific institutes is expected to allow for a higher quality of scientific research in Croatia.

Cyprus

Allocation: EUR 89 million. Relevant components: 2.1, 3.2, 3.3

The Cypriot plan incorporates the design of the national strategy for Research and Innovation and reforms of the overall R&I system, for the improvement of the governance of the R&I ecosystem. Through a balanced mix of reforms and investments, the plan foresees to strengthen the R&I potential of the country. The plan includes funding schemes to SMEs for R&I in green

transition. In addition, for improving the access to finance for young innovative firms, a State funded equity fund will be set up. Also, the plan encourages the use of dual technology to support innovation diffusion. It sets up an incentive structure for investments and human capital on R&I. For the support of structured cooperation between public research and businesses, a central knowledge transfer office will be established. The plan envisages the use of R&I in the primary sector (e.g. by establishing a system for monitoring and reducing greenhouse gas emissions in the agricultural sector) and it facilitates the use of R&I in services. Through the creation of a Regulatory Sandbox, it will enable FinTech, start-ups, and other innovative companies to expand their offering in new products or services, by regulators establishing a "testing ground" that would allow them to conduct live experiments in a controlled environment under their supervision.

Czechia

Allocation: EUR 609 million. Relevant components: 1.3, 1.4, 5.1, 5.2, 6.2

The Czech plan includes several investments and some reforms for research and innovation. It incorporates investments in facilitating access to finance for innovative SMEs, in strengthening research capabilities, in improving the public-private cooperation, in supporting R&I linked to digitalisation and promoting R&I in social sciences and humanities. Inter alia, it includes support for excellent research in medical sciences, such as cancer or infectious diseases research. For facilitating R&I in services, two regulatory sandboxes will be established. Moreover, through the establishment of the European Centre of Excellence in Artificial Intelligence for Citizens' Safety and Security, Czechia will invest in R&I to improve its citizens' protection. Additionally, the plan includes a number of funding schemes for research projects, for example for the development of 5G networks and services. Some of the funding will sponsor projects on the environmental field and green transition. Last but not least, the plan incorporates some reforms for supporting R&I, such as the creation of a National Coordination Group for Support for Industrial Research.

Recovery and Resilience Scoreboard

Thematic analysis



Denmark

Allocation: EUR 304 million. Relevant components: 1, 2, 6, 7

The Danish plan contains various measures that support research and innovation, mainly focusing on green transition in order to tackle the challenges of meeting Denmark's targets to reduce greenhouse gas emissions by 70% by 2030 and to reach climate neutrality by 2050. The planned research programme will support the so-called "green partnerships", where, by joining forces, public and private actors will be able to obtain funding for investments in innovative research and development solutions in four thematic fields: carbon capture and storage; green fuels; environment-friendly agriculture and food production; circular economy focusing on reuse and reduction of plastic and textile waste. The measures also aim to provide the public and private sectors with financial and tax incentives to boost research and development, particularly in innovative green technologies.

Significant funds are allocated also to support the green transition of the Danish agriculture sector through the research and development of new solutions and climate technologies to reduce greenhouse gas emission and the establishment of an organic innovation center to conduct research within organic agriculture and food.

Estonia

Allocation: EUR 55 million. Relevant components: 1, 2, 4

The plan will support research and innovation efforts enabling the green transition of enterprises. This notably includes the funding of projects on the modernisation of the business models in manufacturing companies and investments in the deployment of resource-efficient green technologies. In complement to these two measures, a financial instrument, the 'Green Fund', should provide funding for companies and sectors whose products, services or processes are related to research-intensive green technologies. The plan also includes a pilot project on renewable energy storage. Moreover, a measure will allow to support research and development activities carried out by SMEs in the context of their digital transformation.

Finland

Allocation: EUR 337 million. Relevant components: 1, 2, 3

The Finnish plan has a strong focus on innovative capacity of start-ups and SMEs, research infrastructure as well as contribution of innovators to the twin transition. Funding packages for companies are encouraging the creation of new sectors, products, businesses and operating models and they aim at promoting green transition and investing in research and innovation infrastructure supporting sustainable growth and digitalisation. The plan contributes to digital transition through measures in applied research and deployment of new technologies in microelectronics, 6G, artificial intelligence and quantum computing and cybersecurity. It also contributes to the green transition by promoting investment in renewable energy technologies and infrastructure, climate change mitigation and a low-carbon and circular economy, focussing on research and innovation, technology transfer and cooperation between research, business and local government. Finland will also support research activities related to hydrogen through the Important Project of Common European Interests (IPCEI) for hydrogen.

France

Allocation: EUR 5 263 million. Relevant components: 4, 6, 9

About 13% of the French recovery and resilience plan will support research and innovation. This notably includes a set of investments in R&I projects in strategic technological areas (mainly under the 'Programme d'Investissements d'Avenir') such as green and digital technologies. Some of these investments will be implemented through multi-country initiatives (in hydrogen, cloud technologies and microelectronics in particular). They are complemented by measures aiming at preserving R&I employment and improving cooperation between public and private research through the promotion of mutually beneficial exchange programmes. France also introduced in its RRP a wide-ranging reform, the multi-annual programming law on research (2021-2030), aimed at gradually enhancing public R&I funding, strengthening the attractiveness of research careers and fostering public/private linkages.

Recovery and Resilience Scoreboard

Thematic analysis



The plan also includes a contribution to the increase of the funding of the National Research Agency in order to expand its project funding capacity, as well as support to innovation in the fields of teaching and education.

Germany

Allocation: EUR 6 580 million. Relevant components: 1.1, 1.2, 1.3, 2.1, 2.2, 5.1

A large part (about 26%) of the allocation to German recovery and resilience plan will support research and innovation. The corresponding numerous measures of the plan mainly address green and digital technologies. They notably include the participation in innovative multi-country initiatives on hydrogen, microelectronics and cloud technologies.

As far as green technologies are concerned, other measures with a dedicated research focus include, for instance, funding for the development of electromobility (including through application-based R&I projects), setting up a technology and innovation centre for hydrogen, and project-based research on climate change. Research and development are also supported by new low carbon integrated energy systems for urban neighborhoods and by developing and implementing greenhouse gas neutral production services.

Moreover, the plan will allow to fund R&I projects addressing the digital transformation of the automotive sector, as well as R&I activities led by the Digitalisation and Technology Research Centre of the Bundeswehr (dtec.bw) on strategic technological areas (such as cybersecurity), with the objective to contribute to strengthen German and European digital and technological sovereignty. As part of the implementation of the German data strategy, support will also be provided to research in data science and other R&I activities aiming at enabling a better re-use, sharing and management of data, including research data.

Greece

Allocation: EUR 1 217 million. Relevant components: 3.2, 4.5, 4.7

The plan includes a combination of investment and reform R&I projects. The plan envisages the development of the “Strategy for Excellence in Universities and Innovation”, by improving the research performance of universities, including through attracting distinguished researchers and strengthening the business-academia link. It also plans for the strengthening of the research capacity in important scientific and technological areas, through the creation, expansion and upgrade of infrastructures of research centres. The plan also includes a large amount of funding schemes to financially support R&I activities. Through RRF lending, it provides for funding towards SMEs for R&I. It also plans several grant schemes for research projects, including on basic and applied research. Further, the plan introduces funding synergies to Horizon projects with a “Seal of Excellence”, for financing top innovative SMEs, in fields such as environment and energy. Related to that, support will be provided to projects that are evaluated with a very high score in the “excellence” criterion in smart specialisation sectors. For supporting the visibility of “start-ups” of Greece, the plan foresees the increase of extroversion of the R&I ecosystem, through the government accreditation as “start-ups” and their registration in a digital portal. Moreover, the plan includes the development of a “next generation” information system with the state-of-the-art technologies, such as artificial intelligence, which would enhance institutions’ decision-making in real time and would contribute to border control, fight against crime and terrorism, cybersecurity, critical infrastructure protection and resilience, search and rescue and disaster resilience.

Ireland

Allocation: EUR 72 million. Relevant components: C1

The Irish plan includes two large grant schemes for supporting R&I, towards an effective green transition and digital transformation. The grant schemes will promote R&I projects covering a range of priorities in climate, healthcare, digital and agriculture sectors, using a challenge-based funding model devised by Science Foundation Ireland.

Recovery and Resilience Scoreboard

Thematic analysis



Italy

Allocation: EUR 14 299 million. Relevant components: M1C2, M2C1, M2C2, M4C1, M4C2, M6C2

The Italian plan includes a very large financial envelop for the support of Research and Innovation. It is composed of many funding schemes for research projects, and several projects that develop synergies with other EU tools, or initiatives, especially in industrial R&I. Furthermore, the plan focuses on improving the skills of human resources involved in R&I activities. For example, the plan foresees the extension in number and career opportunities of PhDs fellowships. Moreover, the plan envisages establishing and strengthening of "innovation ecosystems for sustainability", by building "territorial leaders of R&I". Through the plan, there will also be funding for the construction of an integrated system of research and innovation infrastructures. Moreover, the plan will also fund research projects of significant national interest. It will also fund projects by young researchers. In addition, it will incentivize SMEs in investing in R&I, for example, through tax credits and grants schemes for industrial research projects. The plan also includes a measure to supplement a fund on Important Projects of Common European Interests (IPCEI). On the reform side, the plan will contribute to move to a more systemic support to R&I activities. It includes measures to increase the mobility of researchers and managers between universities, research infrastructures and companies, reforms to simplify the management of research funds and projects to reform the career path of researchers, increasing their focus on research activities.

Latvia

Allocation: EUR 198 million. Relevant components: 4, 5, 6

The Latvian plan includes a reform of the higher education institutions (HEIs) to achieve improvements in the quality of higher education and the universities' research output. The plan also aims to improve innovation governance through an ecosystem approach and full-cycle support for innovation clusters. The investments are planned for increasing the highly-skilled human resources in R&D, for the development of innovation clusters that would develop R&D capacity in enterprises, promote cooperation of all

representatives and increase the share of innovative enterprises in the economy. The plan also provides for creating the necessary framework for Latvia's participation in the network of European of Digital Innovation Hubs and in Genome of Europe project. It is also planned to foster the innovation culture and increase the innovation output within public administration.

Lithuania

Allocation: EUR 237 million. Relevant components: 1, 5

The plan envisages the consolidation of institutions responsible for innovation promotion into a single Innovation agency to make research and innovation policies more coherent and efficient. Measures will also support joint business-science missions focused on R&D activities. The plan envisages systematic promotion of R&D in higher education institutions, notably by creating the Science policy implementing agency under the Lithuanian Government. Moreover, the plan includes a measure to provide acceleration services and venture capital investments for start-ups. Another investment is aimed at encouraging science and business to participate in Horizon Europe and other international funding programmes.

Luxembourg

Allocation: no targeted R&I allocation but some relevant measures in component 3A

The Luxembourg plan includes a component aiming at creating a new technological ecosystem in Luxembourg in the field of quantum communication technology, with the intention to create jobs and attract scientific experts. The objective is to support innovation in this area with the purpose of developing ultra-secure communication technologies and integrating the national infrastructure into the EuroQCI project. It includes a reform complemented by an investment of EUR 10 million in the development and deployment of research infrastructure to gain knowledge and experience in the field of quantum communication technology.

Recovery and Resilience Scoreboard

Thematic analysis



Malta

Allocation: no targeted R&I allocation but a reform in component 3

The plan envisages the adoption and implementation of Malta's Smart Specialisation Strategy 2021-2027, the key initiatives of which include the promotion of inter-agency collaboration in support of enterprises and inter-agency coordination in order to raise awareness on R&I funding schemes, as well as the simplification of procedures related to application for funding and provision of guidance to potential beneficiaries in a more targeted and effective manner. This reform is also aimed to encourage public-private cooperation to transform research results into market-ready solutions. The reform complements the efforts in R&I undertaken through the Union's cohesion policy funds.

Portugal

Allocation: EUR 1 530 million. Relevant components: 5, 10, 12

The plan aims to increase the level of research and innovation, notably through fostering the links between business and science, promoting the transfer of R&I results to the business sector, and supporting the implementation of ambitious and comprehensive research and innovation agendas addressing major socio-economic and environmental challenges. The implementation of the reforms, in particular those designed to promote R&I and innovative business investment, aims to increase the weight of high value-added products in the economy and strengthen the network of interface institutions, to support knowledge and technology transfer. Major investments are foreseen for the implementation of the Mobilising Agendas or Green Agendas to develop new goods and services in relevant strategic areas. Also, the plan aims to strengthen the blue economy innovation ecosystem.

Romania

Allocation: EUR 314 million. Relevant component: 9

The Romanian plan enhances the country's innovation capacities by streamlining the governance of the R&I system at the national level, strengthening science-industry linkages, and improving the quality of

research output. For instance, it rewards cooperation across research institutes, which currently do not often have enough critical mass. It encourages the simplification of national legislation related to contracting, financing, monitoring and evaluation of R&I projects, and explicitly targets the formation of public-private research partnerships. Finally, the plan aims at attracting internationally reputed researchers with financial and career incentives, and at enhancing the integration of Romania's R&I system into the European Research Area (ERA) and Horizon Europe through the establishment of specialised competence centres and mentoring programmes.

Slovakia

Allocation: EUR 793 million. Relevant components: 8, 9, 17

About 12% of the allocation to the recovery and resilience plan of Slovakia will be dedicated to R&I, with a comprehensive package of reforms and investments. The plan aims to address the problem of fragmented and low R&D spending and to strengthen the innovation potential of the country.

Reforms are notably envisaged to improve the performance of Slovak universities through changes to their governance and management, as well as through their consolidation. The approach to public R&I funding should also be revised and strengthened, in particular through the enhanced R&I governance structure and better coordination, improved cooperation between business and academia, and international cooperation. Investments are planned to stabilise human capital as well – to attract and retain excellent researchers and support excellent science. Support will also be provided to R&I projects addressing the decarbonisation and digital transformation of the economy. Moreover, the plan features investments in supercomputing infrastructures and in the development of advanced technologies, including through participation in multi-country initiatives.

Slovenia

Allocation: EUR 138 million. Relevant components: 3, 6, 8, 9, 11

Mutually-reinforcing reforms and investments in research and innovation, productivity of companies,

Recovery and Resilience Scoreboard

Thematic analysis



and education will contribute to higher productivity and advancing the twin transition in Slovenia. A number of measures included in the plan will help to improve the business environment and boost investment in innovation while also ensuring the digital and green transitions. Investments in research and innovation are focusing on the low carbon economy, circular economy and sustainable food systems in the green pillar, and also support research and innovation focusing on digitalisation. Substantial support will be directed to research and development activities of research organisations and enterprises, including for setting up demonstration projects. The envisaged funding instruments for researcher mobility schemes will support human resources for R&I, with a view to reversing the brain drain and attracting/retaining top talents in the country. The plan also supports investment in improved coordination between research institutes and companies and among researchers.

Spain

Allocation: EUR 11 013 million. Relevant components: 3, 6, 7, 8, 9, 10, 12, 13, 15, 16, 17

With about 16% of the RRF allocation and more than 30 measures and sub-measures comprising a mix of reforms and investments, research and innovation features prominently in the recovery and resilience plan of Spain. The plan also includes a component fully dedicated to 'Science, technology and innovation'.

The proposed measures should enable Spanish firms and researchers to participate more actively in a stronger pan-European research system (notably by supporting their participation in Horizon 2020 and Horizon Europe, pan-European research infrastructures and multi-country projects for health purposes, such as Genome of Europe). The impulse given to research and innovation should also underpin and accelerate the modernisation of production processes.

Spain will reform the Law on Science, Technology and Innovation to enhance the governance of the sector, develop new scientific career, and foster knowledge transfer. Public-private partnerships will be supported, notably in innovation projects with a high technology readiness level ('TRL') to translate research into innovation. Investments will also target major R&D&I infrastructures, including data and computing Infrastructures, to upgrade them to international standards. Moreover, Spain plans to modernise the

university system by establishing minimum qualitative standards for research and to improve the employability of graduates and relevance of training to new market needs driven by innovation.

In addition to the above, specific measures will focus on support to R&I in the following key priority areas: green transition, health, automotive and aerospace.