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Delivering on Europe's recovery through research and innovation



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DELIVERING ON EUROPE'S RECOVERY THROUGH RESEARCH AND INNOVATION

0 Introduction

Research and Innovation (R&I) are critical levers to ensure a sustainable and inclusive recovery, while boosting the resilience of our production sectors, the competitiveness of our economies and the transformation of our socio-economic systems.

On 27 May 2020, the Commission adopted a large-scale recovery package with a sizeable policy and funding boost to R&I. The proposal rests on two blocks. First, the “Next Generation EU” recovery instrument with fresh financing from the financial markets. Second, a reinforced long-term EU budget for 2021-2027. R&I is seen as critical to address the health crisis, the European Green Deal and the digital transformation of the economy. It is essential to boost emerging breakthrough and game changing innovation carried out by deep-tech start-ups and SMEs, as well as non-technological and social innovation. Consequently, Horizon Europe is proposed to be endowed with substantial additional funding of €13.5 billion (in 2018 constant prices).

Health, digital, socio-economic and climate-related research and innovation are critical for preparedness and for an effective and quick response to emergencies. The Covid-19 pandemic risks increasing inequality, exclusion discrimination¹ and global unemployment in the medium and long term². With Covid-19, existing stress in coal and carbon-intensive regions has aggravated. Therefore, particular attention

should be given to enhancing R&I in those advanced and sustainable technologies that help to mitigate the negative effects of the transition towards, and tackling climate and environmental-related challenges that is this generation's defining task. The European Green Deal calls for transforming the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use. It also aims to protect, conserve and enhance the EU's natural capital and protect the health and well-being of citizens from environment related risks and impacts. R&I can accelerate an inclusive and green global recovery that leaves no one behind.

Concerning health, the plan calls for a scale up of efforts in support of speeding up predictive, preventive measures, means to treat, support and cure, and ensuring that research findings are translated into public health policy measures and help health systems to recover rapidly. Regarding climate, it places an emphasis on promoting a recovery that is consistent with the European Green Deal and underlines that 25% of the EU budget will be spent on climate objectives.

Regarding the digital priority, the Recovery Plan underlines the necessity for the EU to develop and produce the technologies that will enable it to achieve the digital transformation according to its values, placing human beings at the centre, and avoid the risks and vulnerabilities of being entirely dependent on foreign solutions. These global challenges require international cooperation and global solutions.

The competitiveness of EU economy – its industry and the importance of breakthrough and

¹https://www.europarl.europa.eu/doceo/document/FE-MM-PR-653727_EN.pdf

²UN on Social impact of Covid-19, <https://www.un.org/development/desa/dspd/everyone-included-covid-19.html>

game-changing innovations by small and medium-sized enterprises, start-ups, and midcaps, are also priorities. The new Circular Economy Action Plan is a key tenet of the EU's strategy to 'build back' better after the pandemic and aims at using resources more efficiently. Likewise, cooperation between industry and small businesses with other ecosystem actors such as universities and research organisations shall be instrumental in this recovery.

2. Policy priorities: European Green Deal, Digital transformation, Health, Industrial Strategy and Sustainable investment
3. Global approach
4. Horizon Europe: delivering on the recovery

To achieve a sustainable recovery, investments need to go hand in hand with policies and reforms that stimulate business R&I. This is particularly critical in view of the changing dynamics of the innovation where issues related to complexity and concentration slow down productivity diffusion across firms, sectors and territories. R&I are critical to redress this challenge and ensure that measures are relevant for the socio-economic context of each place.

In the light of lessons learnt from the Covid-19 crisis, improving access to research infrastructures and openly sharing results are also indispensable, together with support for the availability of green and digital skills.

In the post Covid-19 reconstruction phase, R&I will be critical to make or break our future and support the green and digital orientation of the recovery. In line with the motto of the high level expert group on the economic and societal impact of R&I (ESIR): "Protect, Prepare and Transform Europe"³, creating greater resilience by design, not by disaster should be at the core of a coordinated European Covid-19 recovery response and, in particular at the core of a transformative R&I policy.

This paper focuses on the following **four areas**:

1. Accelerating Europe's recovery and transformation

³https://ec.europa.eu/info/sites/info/files/research_and_innovation/groups/esir/ec_rtd_esir-recovery-resilience-covid19.pdf

1 Accelerating Europe's recovery and transformation

A **partnership approach** between the EU and Member States is more critical than ever before to secure an impactful contribution of R&I policy to the European recovery from the Covid-19 crisis. Three components could be highlighted in this regard:

1. **A strong pipeline of R&I investments in support of Europe's recovery based on green and digital transformation.** The European Commission has proposed a *Recovery and Resilience Facility*⁴, drawing on 75% of the funds raised through *Next Generation EU*. In view of the Facility, Member States will submit *Recovery and Resilience Plans* with an investments pipeline over 4 years. This provides a unique opportunity for R&I investments in support of reforms that contribute to the green and digital transitions and raise the quality and efficiency of national systems, including conditions for increased private sector investments. The Commission will assess how the national Plans tackle bottlenecks identified through the Country Specific Recommendations of the European Semester, and how they contribute to achieving the twin transitions.

In this context, it is important to highlight some examples:

- developing *research and technology infrastructures* is essential to deliver on both the green and digital transitions, in line with the European Strategy Forum on Research Infrastructures (ESFRI) roadmap⁵;
- using *national data infrastructures compatible with the European Open Science Cloud (EOSC)*⁶. EOSC accelerates the production, circulation and uptake of knowledge by enabling European data spaces and seamless access to existing capacities to store, access, combine, analyse and process research data and preserve them. The creation of a European Health Data Space (EHDS) will promote health-data exchange and build the data and analytics capacity to ensure accelerated research for a quick and effective reaction of healthcare systems;
- supporting the *role of universities as essential actors of change* and contributors to the response to the pandemic and the European Green Deal, and digitalisation and with spin-offs that provide disruptive innovations;
- building on the *Erasmus+ European Universities Initiative* that is already acting as a test-bed for the acceleration of the structural, systemic and sustainable transformation of Europe's Universities. The initiative aims to boost skills and cooperation to position European universities as key actors contributing to sustainable social, economic and environmental development;
- training *highly skilled and resilient researchers*, able to anticipate and tackle upcoming challenges, to communicate scientific evidence to policy-makers and the public at large, to work across sectors

⁴https://ec.europa.eu/info/strategy/eu-budget/eu-long-term-budget/2021-2027_en

⁵ESFRI has established a European Roadmap for research infrastructures for the next 10-20 years, stimulates the implementation of these facilities,

and updates the roadmap as needed: <https://www.esfri.eu/esfri-roadmap>.

⁶Including Data Curation Centres at institutional and national levels and support to universities and research institutions that embrace all factors of Open Science.

(notably academia and industry) and disciplines, and to establish strong international partnerships. Promote in this context programmes, such as the Marie Skłodowska-Curie and the EU reference programme for researchers' training, including through the development of innovative doctoral programmes;

- promoting *R&I results and scientific knowledge*⁷ to provide new innovative solutions for recovery and transformation, including for industrial ecosystems. This should involve academia–industry joint research and mobility, incentivised research driven spinoffs and start-ups, mobilisation of knowledge transfer offices, a sound monitoring of R&I results for further deployment, and engaging with citizens to ensure that the new knowledge leads to sustainable innovative solutions that are deployed and matter to people;
- supporting the roll out of the *Horizon Europe research and innovation missions, partnerships* and EU-level initiatives that give a direction to investments in support of Europe's transformation, as well as help mobilise private investments towards these objectives.

2. **Relentless support to research and innovation reforms by Member States.**

The European Commission will continue to support the design, implementation and evaluation of policy reforms that raise the quality and efficiency of national research and innovation systems. Alignment with education and training policies will be strengthened to provide the necessary and

essential skills base for R&I. All Member States, and relevant associated countries, will be able to benefit. This may include:

- a) *A reinforced dialogue with Member States* around policy challenges and opportunities for a recovery that sets the path for the green and digital transition⁸. The aim will be to accompany national reforms step-by-step. R&I are critical to step out of the recession in the short-run and ensure that human capital is not affected in the medium run. Countries which perform significantly below the EU average, e.g. on investments, science-business links or conditions for innovation need to urgently step up efforts to achieve higher quality in their science and innovation systems and stronger translation of knowledge into the business sector;
- b) *Promotion of synergies and coherent use* of all EU funding streams in support of R&I for the recovery and twin transitions across policy areas at EU, national and regional level. As an example of synergies between the various EU programmes, the new EU4Health and Horizon Europe would support the rapid deployment of innovations in Member States' health systems and in boosting industry investments (notably vaccines and therapeutics);
- c) *Europe's recovery would necessarily pay a specific focus to places lagging behind* and to those regions particularly hit by the crisis. Regional priorities as reflected in smart specialisation strategies include R&I objectives in areas such as climate, health, transport, agriculture and environment;

⁷https://ec.europa.eu/info/sites/info/files/research_and_innovation/strategy_on_research_and_innovation/documents/ec_rtd_valorisation_factsheet.pdf

⁸The Industrial R&D Investment Scoreboard will monitor industrial R&D investments specifically to capture R&D related to the European Green Deal: https://ec.europa.eu/info/news/2019-eu-industrial-rd-investment-scoreboard-report-2019-dec-18_en.



d) Use and deployment of the *Horizon Policy Support Facility*⁹.

3. **Integration of R&I policies and programmes to make Europe a transformational frontrunner.** The global recovery from Covid-19 is a pressing priority and it is also essential for Europe to move towards a more sustainable economic model, enabled by digital, health and clean technologies. Environmental, health and social sectors grow faster than the overall economy and this presents a very clear economic opportunity. The digital revolution is radically changing the way we live and work, and deliver public service. In line with these trends and the critical need to invest in a sustainable future, R&I support will have to be aligned with the EU Taxonomy on sustainable finance wherever relevant to ensure it respects the green oath to 'do no harm' and triggers crowding in and scaling-up of private finance.

These complex transformations require to move beyond strengthened coordination between national R&I funding and programmes towards greater ambition in co-creating the solutions between Member States, their regions (and countries associated to Horizon, when relevant) and the EU, with a view to further integrating national and regional R&I programmes. It also requires coordination of R&I agendas with other horizontal policy areas, related to the management of industrial transformation and the provision of the necessary skills, as well as with relevant thematic policies connected to the green and digital transitions, such as energy, transport, food systems and environment (circular economy, zero pollution, ecosystems and biodiversity). This should also be done in consultation with universities, research organisations, industry

and civil society, taking benefit of existing smart specialisation governance models.

In order to accelerate the recovery and transformation, Europe needs synergies between programmes to bring relevant EU R&I funding streams together.

⁹ <https://rio.rc.ec.europa.eu/policy-support-facility>

2 Policy links – European Green Deal, Digital Transformation, Industrial Strategy, Health and Sustainable Investment

R&I drive, enable and accelerate the shift towards green and digital transitions of our societies. R&I actions supporting the recovery should i) anticipate and prepare for subsequent socio-economic shocks of the crisis; ii) promote economic, social and territorial cohesion, and solidarity among Member States iii) focus on vulnerable groups/sectors/actors mostly hit by the crisis; iv) build long-term societal and ecosystem resilience and accelerate the greening of the economy; and v) focus on place-based solutions and build synergies with relevant programmes and promote international cooperation as relevant.

In this light it is critical that public investments are sustainable. Additional private investments for green R&I can be attracted through pilot schemes. Also, the crisis has shown the importance of open science and open access, in particular to follow the spread of the epidemic, and forecast its rapid evolution. The need for responsible R&I practices has been also demonstrated.

To address the recovery, six high-impact R&I areas are discussed as examples in this paper¹⁰: (1) investments in a clean and healthy planet; (2) digital transformation for a green, secure and inclusive recovery; (3) contributing to the resilience in ecosystems and societies; (4) greening through R&I; (5) health-related research and innovation; and (6) stocktaking of R&I capacity in Europe through the European Research Area.

The Horizon 2020 Green Deal call¹¹ (€1 billion) will mobilise R&I to foster a just and sustainable

societal transition and address the main priorities of the European Green Deal.

In order to address societal, economic and environmental challenges, it is necessary to strengthen links between the generation of new ideas, for example through the European Research Council, and their scale up through other EU funds, notably through the deployment of large-scale pilots and public authority led procurement of innovation. Many less developed and peripheral regions benefit from significant Cohesion Policy resources and offer the possibility to contribute to the European Green Deal through renewable production and important environmental services.

1. Investments in a clean and healthy planet

- Contributing to the European Green Deal by *re-orienting R&I investments to more sustainable activities*, including areas relevant for climate change mitigation (i.e. pollution, biodiversity loss, resources depletion);
- Supporting EU industry delivering on innovative technologies, for instance by increasing capacity for further decarbonisation to reach Europe's climate and sustainability targets;
- Contributing through R&I to green hydrogen production capacity in the EU and the efficiency of the hydrogen value chain from supply to utilisation (supporting the new Clean Hydrogen Alliance);
- Development of new sustainable bio-refineries and confirm the type and estimated potential. These bio-refineries should be designed and operated so as to have no negative impact on ecosystems or

¹⁰Without prejudice to Horizon Europe Strategic Plan discussions.

¹¹https://ec.europa.eu/info/research-and-innovation/strategy/european-green-deal/call_en



their services across Europe to support the transition to a climate neutral economy across EU regions;

- Accelerate the development of sustainable alternative transport fuels focusing on the supply and use of heavy duty vehicles, aviation and shipping advanced biofuels (especially those based on non-recyclable waste and residues);
- Innovative start-ups and SMEs, including spin-offs from universities and research organisations to develop novel energy technologies and business models (hybrid solar panels, new storage technologies, decentralised energy management, etc.);
- Support research and innovation to further improve and consolidate risk assessment and risk management of chemicals, including new and innovative testing and risk assessment methodologies, screening, monitoring and modelling, while linking knowledge on risk assessment and the development of new, safe-and-sustainable-by-design chemicals;
- Boost safe and sustainable-by-design innovation in Europe, focusing on the substitution of hazardous chemicals by safer alternatives and thus reducing risks to human health and the environment;
- Support the substitution of hazardous substances/chemicals of concern, e.g. through knowledge on, availability and market access of safer alternatives through the knowledge building, networks of experts and supply-chain cooperation;
- Support research on better sorting and decontamination of waste to ensure a safe and clean circular economy by removing dangerous chemicals;
- Zero pollution of oceans and waters, focusing on upstream prevention of pollution;
- Next generation of scientific instruments for a wide community of users to allow disruptive innovation and solutions in crucial areas for the European Green Deal (materials for batteries, lightweight materials, carbon removal, pesticides) and health (vaccines, therapies, testing, digital health, medical technologies, data-AI);
- Foster a strong European position in strategic value chains to contribute to technological sovereignty and translate research results and data into competitive solutions;
- Support cluster organisations to help their companies to invest in green production processes, and uptake green R&D results in collaboration with their technology centers. Cluster collaboration enables the pooling of companies with similar sustainability improvement potential and through their connection to green tech clusters they can deliver state of the art solutions;
- Promote the collaboration between Member States for the setting up of Important Project of Common European Interest ("IPCEI"), under the specific EU State aid rules; IPCEIs will fund disruptive and ambitious research and innovation initiatives, as well as the first industrial deployment of the technology.

2. Digital transformation for a green, secure and inclusive recovery

- Develop ultra low power consumption and secure components: providing competitive home-sourced technology for use in multiple applications;

- Deliver the next generation of multi-sensing systems providing higher levels of intelligence in multiple applications and supporting clean and circular production in a wide range of sectors;
 - Strengthen software design and development in the EU, in an integrated manner with European electronics to enable the use of European components in a wide range of applications;
 - Support a world-leading European high-performance computing (HPC) ecosystem, (hardware and software), tools and architectures, HPC-powered simulations and applications in key areas for science, industry and policy-making;
 - Develop in Europe an advanced quantum computing infrastructure with its software and programming ecosystem, as well as a fully certified ultra-secure end-to-end quantum communication infrastructure (EuroQCI);
 - Develop EU technologies for (1) data sharing and re-use while respecting the legal framework relating to security and privacy, (2) big data analytics (processing, combining, modelling and analysing);
 - Develop ethical and trustworthy world-class Artificial Intelligence technology and the new generation of AI-Powered Robotics that both can be used in any context and sector such as Healthcare, Agriculture, Food, Environment, Mobility, Manufacturing;
 - Develop new solutions, methodologies and tools for cybersecurity certification and increased hardware, software and supply chain security in order to strengthen European sovereignty in digital technologies.
- 3. Contributing to the resilience in ecosystems and societies**
- Large-scale ecosystem restoration and regeneration of vulnerable ecosystems and habitats, (land/marine) including large-scale biodiversity-friendly afforestation and restoration of EU forests affected by climate change;
 - Smart specialisation is the cornerstone of R&I investments in European regions, with place-based innovation playing a key role to develop strong regional research and innovation ecosystems;
 - Reinforced rural-urban linkages for more inclusive, technology-driven and resilient regional development. Accelerating smart villages through support to rural communities to develop and scale up innovations is also essential to drive the digital and ecological transitions at the local level;
 - Preparing for and managing climate risks (heatwaves, forest fires, droughts, floods, diseases) through 100 demonstration projects across a number of European communities/regions/cities engaging people in their co-design and rollout;
 - Innovative start-ups and SMEs, including spin-offs from universities and research organisations: to develop novel technologies and business models for ecosystem remediation (green chemistry, environmental data analytics, etc.);
 - Develop a multimodal transport system to secure sustainable trade and supplies via urban freight transport and logistics; enable smarter operations and system-wide network efficiency and resilience;
 - Citizen-led and inclusive recovery: Citizens' Assembly on innovation for recovery; citizen science; open Responsible Research and



Innovation (RRI); creating a better future for EU youth; public sector innovation for more agile and citizen-friendly public policy outcomes; mobilising social innovation to speed up recovery through e.g. problem-solving hackathons; building democratic and governance resilience; citizen engagement for innovative societal and environmental solutions drawing on R&I results and knowledge; it will be important to harness the potential of the Erasmus Programme to engage with EU youth and benefit from the Programme's cooperation and stakeholder communities and channels; building resilient communities with social innovators, social economy; supporting behavioural change with regards to consumption and lifestyle choices to enact sustainable, climate-neutral growth;

- Entrepreneurial mind-sets and social values: building new educational modules in universities, skills, cooperation with industrial local value chains, new sustainable business models;
- Resilience and preparedness: modular manufacturing for resilient production; cultural heritage, creativity and sustainable tourism¹²; building democratic and governance resilience;
- Develop an integrated and sustainable rail system, based on a vision shared by the sector towards improved operational reliability, robustness and efficiency;
- Innovation supporting just transition in coal and carbon intensive regions focusing on advanced and sustainable technologies that help to mitigate the negative effects of the transition towards, and contribute to a climate-neutral and circular economy (incl.

geothermal carbon capture and utilisation, residual methane capture techniques, etc.); energy system transformation and alternative technologies; environmental restoration, reskilling measures for labour force;

- Involve 280+ universities under the Erasmus+ pilot European Universities initiative to design a dynamic and forward-looking recovery taking into account synergies between education, research and innovation.

4. Greening through R&I

- Animal health: eco-health with focus on surveillance and drivers and indicators in order to assess risks and prevent occurrence of emerging diseases;
- Enhancing resilience of the European food supply: identify main drivers of change, underlying mechanisms and severity of vulnerability and ways to reduce it. The role of local/regional agriculture and food innovation districts is essential in this context;
- Social innovation to generate new ideas/solutions in order to accelerate the shift towards climate-neutral and other environmentally restorative and sustainable practices, including transformation labs for the stakeholders to design new innovative processes; local green deals to empower community resilience and citizen's engagement through e.g. energy consumption competitions, reducing food waste, boosting green infrastructure, circularity and neighbourhood clean-up programmes;
- Innovative start-ups and SMEs to develop novel technologies (plastic alternatives, etc.);

¹²See for example JRC121263 on options for more sustainable and resilient tourism.

- Transformation of road transport to zero-emission mobility through a world-class European research and innovation and industrial system, ensuring that Europe remains world leader in innovation, production and services in relation to road transport;
- Accelerate the development and prepare the deployment of low-carbon and clean solution in the shipping sector, reduce its environmental impact (on biodiversity, noise, pollution and waste management), improve its system efficiency, enhancing digital and EU satellite-navigation solutions and contribute to the competitiveness of the European waterborne sector;
- Accelerate the reduction of all aviation impacts and emissions (CO2 and non-CO2, including manufacturing and end-of-life, noise), developing aircraft technologies for deep decarbonisation transformation, and maintaining European aero-industry's global leadership position;
- Digital transformation of the steel industry to decarbonise faster the sector and develop programmes to improve workforce skills;
- Foster public and private industrial R&I investments through mapping synergies of funding from Digital Europe, Innovation Fund, InvestEU, CEF, Erasmus and Horizon Europe;
- Support R&I in chemical recycling of plastics and invest in deployment of advanced, energy efficient recycling technology that produces high quality secondary materials;
- Accelerate the development and/or enlarge the scope of research and technology infrastructures to better understand and characterise environmental impacts in Europe; ensure the availability of relevant research data as part of the European Open

Science Cloud (EOSC) and build an ambitious and shared vision to support industry scale-up and technology diffusion at EU level.

5. Health-related research & innovation

- Health post-Covid-19: socio-economic impacts of outbreak response, mental health; impact of sex and gender differences in health and disease; consequences of reallocation of health care resources from chronic diseases, in particular cancer;
- Digital and Infrastructure: focus on prediction and prevention, patient stratification and development of national health data infrastructures as part of the European Open Science Cloud (EOSC), AI for health (pandemic preparedness and quality in healthcare delivery);
- Strengthening the European Health Research Infrastructures including TRANSVAC, to accelerate substantially vaccine development;
- Covid-19 and other pandemics data preparedness: support the development of national portals for related clinical data;
- Develop a safe system approach in transport: find new solutions to avoid 25.000 deaths on European roads per year as well as avoid large scale incidents in rail, shipping and aviation;
- Innovative start-ups and SMEs to develop scalable health innovations (wearable diagnostics, AI applications, etc.);
- Foster the uptake and deployment of research results and innovation by building synergies of funding of Horizon Europe with EU4Health, Digital Europe and InvestEU but also to support the development and modernisation of health systems.



6. Stocktaking of R&I capacity in Europe through the European Research Area

- Need to support structural, systemic and sustainable transformation of Europe's Universities to increase their resilience and preparedness with focus on recovery (shift to digital education); the European Research Area will work together with the European Education Area to support an EU Knowledge Area/Strategy;
- Support Member States' public research institutions to equip themselves for carrying out excellent open science, e.g. in relation to human resources and IT hardware;
- Create national open science funds to support the transition to open access publishing models and develop national policies and infrastructures for research data;
- Excellence hubs to build directional collaborative research capacity with focus on R&I for digital technologies, European Green Deal, and health research;
- Disruptive innovation from academic sector to accelerate economic recovery – incl. spin-offs from universities and public research organisations, via a dedicated mechanism through the European Innovation Council accelerator; EU Technology Transfer actions¹³;
- Promote uptake and use of research-based solutions. An intellectual property framework that is fit for purpose should enable fair and transparent access to IP generated by the R&I framework programmes.

¹³https://ec.europa.eu/info/research-and-innovation/law-and-regulations/technology-transfer_en

3 Global Approach

The Recovery Plan recalls that the Covid-19 crisis “*makes a strong and urgent case for strengthened multilateralism*” and that global challenges “*require international cooperation and common solutions. [...] The world must avoid a global ‘great game’ to come out first and on top, to the detriment of others.*” It goes on to identify thematic priorities (Health, European Green Deal, Digital Single Market, Innovation), but also geographical priorities, in particular Africa, including the Southern Mediterranean, the Western Balkans and the Eastern Neighbourhood.

In the UN’s Addis Ababa Action Agenda, science, technology and innovation (STI) is recognised as a means to achieve Sustainable Development Goals (SDGs). Under this framework, the active use of STI should be promoted as an important part of a sustainable recovery from the Covid-19 crisis. The distinctive localised (place-based) and inclusive approach applied by Member States and EU regions for the strategic use of their research and innovation resources in the context of cohesion policy (the Smart Specialisation concept) is now recognized in the UN Guidebook on STI for SDGs Roadmaps¹⁴ and can be used as reference in the context of the EU’s R&I International Cooperation.

The increases in the budgets for Horizon Europe and the External Instrument¹⁵ (NDICI) are presented together. The NDICI increase of €10 billion (100% increase) will be fully devoted to the External Guarantee Instrument, 60% of which must be committed by the end of 2022. This offers increased potential for synergies, including through blending of grants and

equity/debt. Against the background of these actions, pursuing association to Horizon Europe with strong performing STI partners will amplify our chances to tackle common challenges.

In the light of the Recovery Package, thematic priorities should be more strongly integrated into the policy coordination with associated and other third countries and international organisations to maximise the impact from alignment. The geographical focus needs to be more strongly reflected as well. Natural resources underpin national economies, provide crucial raw materials for everyday life and are necessary to almost every sector of the global economy. The new Circular Economy Action Plan advocates for a worldwide transition to a circular economy and decoupling economic growth from resource use. Moving from linear, highly resource depleting systems with high impacts on natural capital, towards circular systems, that use resources more efficiently and sustainably, is at the heart of the plan. This is a key contribution to the SDGs. R&I cooperation with our international partners at global, regional and bilateral levels will be a crucial enabler for the circular economy transition. Continued support to knowledge providers in the field of natural resources, such as the International Resource Panel and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, will also be important to this end.

Mission Innovation is a relevant global initiative to accelerate clean energy innovation through sustained public investment coupled with business leadership. The EU’s work on rare diseases is also an excellent example of aligning Member State interests at EU level and globally to ensure the rapid delivery of research results to the citizens. This initiative feeds into the bigger international effort through the International Rare Diseases Research Consortium. .

There also appears to be a need for continued close cooperation with Africa in the area of R&I,

¹⁴<https://s3platform.jrc.ec.europa.eu/-/smart-specialisation-and-sdgs?inheritRedirect=true&redirect=%2Fsustainable-development-goals>

¹⁵https://ec.europa.eu/international-partnerships/documents/eu-budget-future-neighbourhood-development-and-international-cooperation-instrument_en



tapping the potential for increased synergies between Horizon Europe and the Neighbourhood, Development and International Cooperation Instrument (NDICI), including by involving private finance for green technology in cooperation with the reinforced External Action Guarantee.

The exploitation of opportunities for convergence of thematic priorities with existing multilateral policy/programming platforms, international organisations and key partner countries and regions, notably to deliver the external dimension of the Green Deal, resilience to Health threats and the Digital Transition is to be considered in this context.

4 Horizon Europe – delivering on the recovery

The Covid-19 outbreak has been the latest example of the unprecedented challenges and transformations that affect our planet and our people. In their Policy Brief [“Protect, prepare, and transform Europe: Recovery and resilience post Covid-19”](#), the ESIR high-level experts provide advice on the transformative research and innovation policy needed. R&I policy must be designed to enhance the lives and livelihoods of people and enable resilience across European and global communities so as to prepare for future shocks and “build back better”.

Based on current proposal, the €13.5 billion additional resources for R&I foreseen in the recovery instrument¹⁶ will be committed (2021-2024) in the areas considered as being a priority for the recovery: Cluster 1 – Health; Cluster 4 – Digital, Industry and Space; Cluster 5 – Climate, Energy and Mobility; the European Innovation Council (EIC); reforming and enhancing the European R&I system¹⁷. The Commission, and DG R&I in particular, will need to ensure that this funding contributes to the recovery in the European Union (and beyond). Horizon Europe should focus on what is necessary for a sustainable recovery, whilst ensuring a human, placed based, and democratic response to the challenges.

In line with the priorities of the recovery package, there is a need to reconsider the R&I agenda by using the Strategic Planning process to build in a greater degree of directionality, balanced support to all Technology and Market Readiness levels (T&MRLs), more demonstration projects with a strategic view, strengthening better synergies with programmes that are demonstrating and deploying results going beyond R&I, and more

leverage from private operators and Member States. The Strategic Plan and Work Programmes must reflect these new imperatives, which will be strengthened by our commitment to the EIC, European Partnerships and missions.

One challenge identified in the Recovery package is a lack of investment available to private companies, notably deep-tech start-ups and SMEs. The European Innovation Council is in an excellent position to address this issue. It is designed to support high risks – those projects which are not “bankable” for investors and beyond the risk level of EU financial instruments. These are precisely the companies that could create the new jobs and lead the way in the future on sustainability and digitalisation. It is highly agile, allowing fast support to innovative projects and companies, and has a record of identifying the best start-ups and SMEs from anywhere in Europe. Its calls so far have been massively oversubscribed. Since October 2019, the EIC pilot Accelerator has attracted close to 10,000 start-ups and SMEs requesting €26 billion of support, of which just 200 have been selected for funding with the €760 million budget available), showing the scope for a rapid increase in funding.

EIT will contribute to foster the transition towards a more sustainable, energy-efficient society. In particular, through its Knowledge and Innovation Communities (KICs), the EIT tackles different themes and innovation-driven activities that supports the creation and strengthening of sustainable innovation ecosystems and help build innovation capacities at EU level to tackle key global challenges, including those linked to the digital and green transitions.

European Partnerships under Horizon Europe can be key elements in Europe’s recovery. They leverage investments by other actors (Member States, Associated Countries and the private sectors) to maximise the impact of

¹⁶Article 3 (b) Proposal for a Council Regulation establishing a EU Recovery Instrument to support the recovery in the aftermath of the COVID-19 pandemic - COM(2020) 441.

¹⁷The EU budget powering the recovery plan for Europe” - COM(2020) 442.



public investments. Several relate to strategic industrial eco-systems and are working to implement projects at high TRL or demonstration projects, which can assist the recovery in the short term and they are concentrated in the clusters that will be funded under the recovery package. Many of them are designed to accelerate transitions towards climate neutral and circular industries¹⁸, society and economy, or providing solutions for the sustainable management of resources (e.g. water, soil), and preserving biodiversity. The Strategic R&I Agendas (STRIA) set out by each partnership will be the opportunity to embed the recovery priorities into their work.

Missions are an effective instrument for Covid-19 recovery as they bring together all relevant policies and instruments as well as actions at the Member State level. They are designed to maximise the possibilities for deployment of solutions and engage with stakeholders and Member States. Missions will provide directionality for R&I investments and to investments by regions and Member States.

We also need to ensure that the Horizon Europe Strategic Plan and Work Programmes fully reflect the priorities of the recovery package, building in a greater degree of directionality, balanced support to all Technology and Market Readiness levels, demonstration projects and better synergies with other cohesion and external instruments.

This includes deployment of the new and strengthened instruments that are available in Horizon Europe – the EIC, partnerships and missions and ensuring that the STRIA of each partnership fully reflects the recovery priorities.

¹⁸E.g. energy intensive and process industries.

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This paper presents the contribution of research and innovation (R&I) to the recovery.

It highlights four critical areas:

- 1. Accelerating Europe's recovery and transformation**
- 2. Policy links – European Green Deal, Digital Transformation, Industrial Strategy, Health and Sustainable Investment**
- 3. Global approach**
- 4. Horizon Europe: delivering on the recovery**

Research and Innovation policy

