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NEXT GENERATION EU? RESEARCH & INNOVATION IN CENTRAL AND EASTERN EUROPEAN RECOVERY PLANS

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National Recovery and Resilience Plans (RRPs) represent an opportunity for EU member states to initiate and fast-track major economy-wide reforms. Green research & innovation is central to achieving key European objectives, including accelerating the economic recovery from the COVID-19 pandemic and meeting increased climate ambition.

This briefing uses E3G and Wuppertal Institute's *Green Recovery Tracker*¹ data to analyse the research & innovation components of Central and Eastern European RRP. It finds that many Central and Eastern European member states are going in the right direction by allocating substantial amounts of spending to research & innovation (ranging from 6 to 23% of overall funding²). However, a much smaller share of this funding is currently specifically geared towards green research & innovation.

There is a clear opportunity to strengthen green research & innovation measures as further details are defined and the RRP are implemented. The European Commission should work with member states to ensure that a greater share of research & innovation funding goes to areas that would also support the green transition.

¹ The Green Recovery Tracker is a joint project by the Wuppertal Institute and E3G, conducted in collaboration with national experts. <https://www.greenrecoverytracker.org/>

² At the time of writing, Poland, Slovakia, Slovenia, Lithuania, and Romania have submitted final Recovery and Resilience Plans to the European Commission. Analysis for Bulgaria, Estonia and Czechia is based on draft plans.



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A closer look at the R&I landscape in Central and Eastern Europe

Research and Innovation (R&I) performance varies across the EU-27 member states. The ‘**innovation gap**’, or the difference in R&I performance between EU-13³ (group of predominantly Central and Eastern European member states that joined the EU since 2004) and EU-15 member states (predominantly Western European countries that joined the EU before 2004) has dominated the debate on R&I performance across the EU.

The innovation gap is reflected in the European Commission’s *European Innovation Scoreboard*, which classifies EU member states into innovation performance groups based on a composite indicator, aggregating measures of public and private investment, research and skills development, innovation partnerships and business environment.⁴ According to this analysis, all Central and Eastern European member states excluding Estonia are classified as ‘modest’ or ‘moderate’ innovators.⁵

Nevertheless, assessing innovation performance is a complex exercise and such aggregation conceals differences both across the innovation chain and within Central and Eastern European member states. For example, researchers in Bulgaria and Estonia submitted more intellectual property applications in 2019 than the EU average, and there was a greater proportion of small and medium enterprises (SMEs) conducting innovation activities in-house in Lithuania, Czechia and Estonia than the EU average. Hungary had the second-highest percentage of employment in fast-growing firms in innovative sectors in the EU, with Slovakia, Czechia, Bulgaria, Poland and Latvia also performing above the EU average.⁶ There is also significant variation in innovation performance within Central and Eastern European countries, with capital regions in particular tending to be the most innovative.⁷

In addition, aggregate measures of innovation performance are in part determined by differences in national R&D spending. If differences in innovation

³ Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.

⁴ The *European Innovation Scoreboard* is a comparative analysis of innovation performance in EU countries https://ec.europa.eu/growth/industry/policy/innovation/scoreboards_en

⁵ Categories of innovation performance in the European innovation scoreboard from lowest to highest: ‘modest’, ‘moderate’, ‘strong’, ‘innovation leader’

⁶ European Commission, 2020, European Innovation Scoreboard https://ec.europa.eu/growth/industry/policy/innovation/scoreboards_en

⁷ European Commission, 2019, Regional Innovation Scoreboard, <https://ec.europa.eu/growth/sites/growth/files/ris2019.pdf>



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‘inputs’, including public and private expenditure, are separated from differences in innovation ‘outputs’ such as SME innovation and trademarks, thereby assessing the ‘efficiency’ of the innovation system, innovation performance across EU member states looks very different (see Figures 1 and 2).

Figure 1: Performance of EU Member States’ innovation systems (aggregate innovation performance)

Source: European Commission, 2020, European Innovation Scoreboard, <https://ec.europa.eu/docsroom/documents/42981>

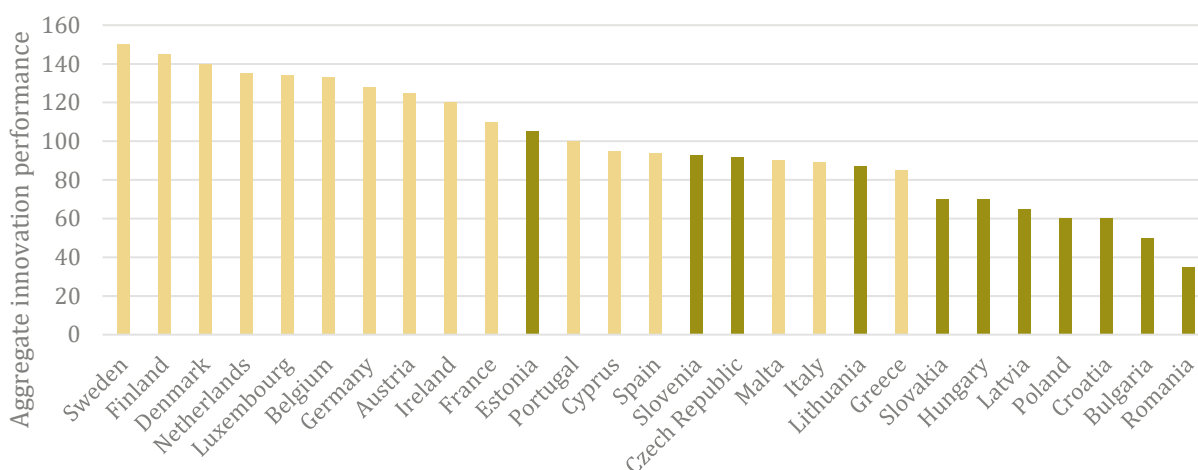
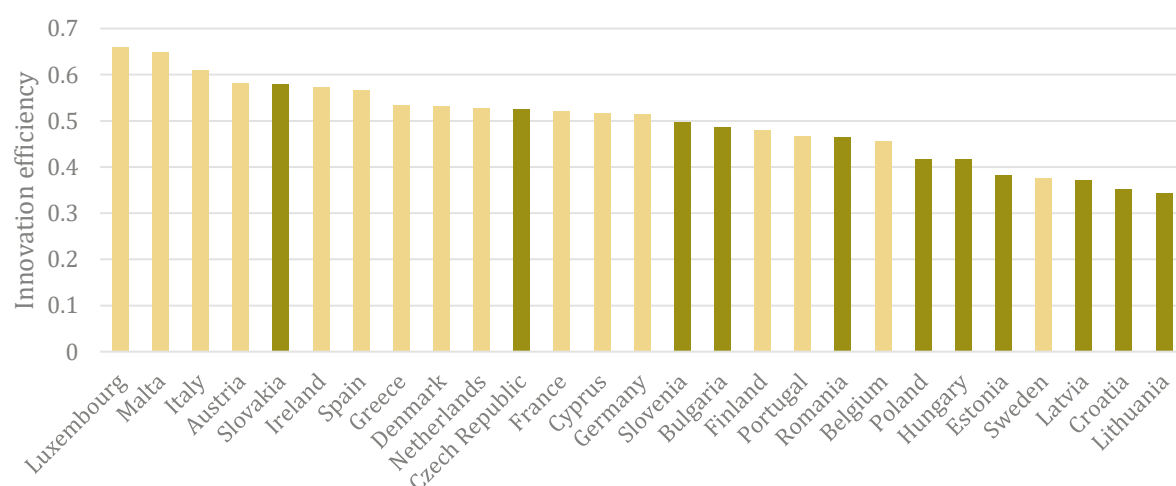


Figure 2: Performance of EU Member States’ innovation systems (innovation efficiency)

Source: Barbero et al., 2021, Technovation





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Central and Eastern European member states generally perform better when looking at such measures of innovation ‘efficiency’ that disentangle innovation ‘inputs’ from innovation ‘outputs’.⁸ This finding **suggests that bridging the funding gap between Central/Eastern and Western Europe would have significant impact on EU R&I performance.**

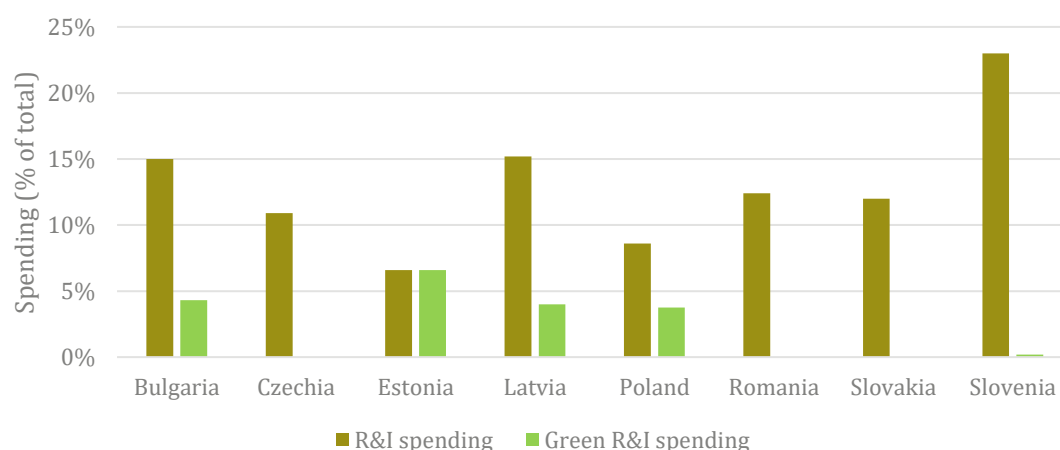
Research & innovation in recovery plans

The Green Recovery Tracker, a joint project between E3G and Wuppertal Institute has analysed RRP in collaboration with national partners to see whether they live up to the ambition of supporting the green transition.⁹ The following country profiles build on that analysis to summarise R&I measures in the RRP submitted to the European Commission by Poland, Slovakia, Slovenia, Lithuania, and Romania and drafts plans from Bulgaria, Estonia and Czechia.

Overall, many Central and Eastern European member states are going in the right direction by allocating substantial amounts of recovery spending to research & innovation. However, a much smaller share of this funding is currently geared specifically towards green research & innovation (see Figure 3).

Figure 3: Research & innovation spending in analysed Central and Eastern European member state Recovery and Resilience plans (% of overall spending)

Source: E3G analysis, based on Green Recovery Tracker data, <https://www.greenrecoverytracker.org/>



⁸ Data for aggregate innovation performance from European Innovation Scoreboard, https://ec.europa.eu/growth/industry/policy/innovation/scoreboards_en; data for innovation efficiency from Barbero et al., 2021, ‘Benchmarking innovation systems with DEA-TOPSIS: On the relevance of decreasing returns on waning performance’, *Technovation*

⁹ Data and results available on the Green Recovery Tracker website, <https://www.greenrecoverytracker.org/>



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Many of the R&I measures proposed remain relatively vague. **This indicates a clear opportunity to strengthen green research & innovation measures as further details are defined and the RRP are implemented.** In addition, there is a risk that R&I measures that seem green at a high level may end up supporting fossil fuels when implemented in practice (for example support to hydrogen projects that are not limited to renewable hydrogen).

The European Commission should work with member states to ensure that a greater share of research & innovation funding goes to areas that would support the green transition. This is also likely to increase the climate spending share, which is key as Green Recovery Tracker analysis currently suggests a majority of RRP may fall short of the 37% of funding earmarked for green investments.

Bulgaria

High share of spending allocated to research & innovation, particularly through measures to develop the research landscape and support innovation in the health sector. A smaller share of spending is allocated to green research and innovation with a focus on hydrogen and biogas, although the extent to which these measures are classified as green depends on further definition and implementation.

Total funding requested:	€7 billion
Status:	Draft plan ¹⁰
Measures clearly tied to research & innovation:	€1.09 billion (15% of total)
Of which measures clearly tied to green research & innovation:	€301 million (4.3%)

- Measures that are clearly tied to research & innovation: includes investments into research in universities, and specifically building innovation capacity of the Bulgarian Academy of Sciences, as well as a scheme to support innovation in the health system. Also includes a broader measure to strengthen research & innovation potential.
- Measures that are clearly tied to green research & innovation: includes support to green hydrogen and biogas pilot schemes and digital innovation for the electricity system operator. The extent to which these measures are classified as green depends on further definition and implementation.

¹⁰ February 2021 plan. As of the time of writing, Bulgaria had not yet submitted its final RRP



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- Other measures that may have an innovation component¹¹: include funding for industrial parks (€212 million), technology modernisation (€495 million), green transition fund (€249 million), energy efficiency investments (housing, municipal buildings €1.2 billion) and construction of solar PV power generation in the area of railway stations (€3.6million).

Czechia

Substantial share of overall funding allocated to research & innovation, with a focus on digitalisation and the private and health sectors, although few details are available. From the few details available, it seems that no funding will be dedicated specifically to green innovation.

Total funding requested:	€7 billion
Status:	Draft plan ¹²
Measures clearly tied to research & innovation:	€763 million (10.9% of total)
Of which measures clearly tied to green research & innovation:	€0 (<i>from the details currently available</i>)

- Measures that are clearly tied to research & innovation: includes measures to support innovative start-ups and digitalisation, new technologies for railway infrastructure digitalisation, research in the health sector, and research & development in enterprises.
- Measures that are clearly tied to green research & innovation: From the details available, no funding is clearly tied to green research & innovation.
- Other measures that may have an innovation component: includes measures to support energy efficiency (in public buildings and lighting, €230 million), new solar PV installations (€192 million), modernisation of district heating system (€64 million), energy savings and replacement of old heating sources in residential buildings (€712 million).

Estonia

Relatively low share of funding allocated to research & innovation and these remain relatively vague. Depending on how these measures are implemented, they may contribute to green innovation.

¹¹ Not included in the calculation of measures clearly tied to innovation, as the level of details does not allow to specify whether these are or not.

¹² April 2021 plan. As of the time of writing, Czechia had not yet submitted its final RRP.



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Total funding requested:	€1.1 billion
Status:	Final plan
Measures clearly tied to research & innovation:	€73 million (6.6% of total)
Of which measures clearly tied to green research & innovation:	€73 million ¹³ (6.6% of total)

- Measures that are clearly tied to research & innovation: includes broad measures to adopt innovative and resource efficient technologies, with a particular focus on the introduction of integrated hydrogen technology.
- Measures that are clearly tied to green research & innovation: depending on how the above broad measures are further defined and implemented, these may be classified as tied to green research & innovation. It is currently unclear what type of innovative and resource efficient technologies would be promoted and in particular whether the proposed support for hydrogen technology would be limited to renewable hydrogen.
- Other measures that may have an innovation component: include investments into the energy grid, energy storage and renewable energy (€45 million), support for companies' green transition investments (€100 million) and for business model change for industry (€9 million), as well as training and reskilling for the green and digital transitions (€25 million).

Latvia

High share of spending allocated to research & innovation, with a focus on digital technology, the public sector and University reform. A smaller share of spending is allocated to green research & innovation measures, particularly to increase renewable energy use and incentivise energy efficiency measures in business.

Total funding requested:	€1.8 billion
Status:	Final plan
Measures clearly tied to research & innovation:	€275 million (15.2% of total)
Of which measures clearly tied to green research & innovation:	€80 million (4% of total)

- Measures that are clearly tied to research & innovation: includes measures to support digital technologies including a national cloud and AI use for railway freight scanning, innovation in public administration, and an innovation cluster programme and research & development

¹³ Dependent on how the measures are defined and implemented



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consolidation grants as part of the University reform. Also includes broader innovation management measures.

- Measures that are clearly tied to green research & innovation: includes investments to increase renewable energy and energy efficiency use in business (specifically mentioning research & development & innovation activities)
- Other measures that may have an innovation component: include measures to green the Riga transport system (€294million), incentivising the shift to renewable energy and increasing energy efficiency in apartment buildings, municipal buildings and historical buildings (respectively €36million, €29million and €36million).

Poland

Substantial share of measures clearly tied to research & innovation, with a focus on mobility, infrastructure and medicine, although few details are available on the type of research & innovation measures envisioned. Just under half of the innovation-relevant measures are tied to green innovation, with a focus on mobility, the built environment and hydrogen.

Total funding requested:	€36 billion
Status:	Final plan
Measures clearly tied to research & innovation:	€3.14 billion (8.6% of total)
Of which measures clearly tied to green research & innovation:	€1.3 billion (3.75% of total)

- Measures clearly tied to research & innovation: includes measures to support autonomous mobility, public e-services and R&D in medical and health sciences. This is alongside broader measures such as large innovative projects, environmental technology and innovation, and innovative solutions in creative industries.
- Measures that are clearly tied to green research & innovation: includes measures to promote a circular economy, the development of transmission networks and intelligent electricity infrastructure, support for innovation in the built environment including passive buildings. Also includes a measure to promote hydrogen technology and other alternative fuels, although it is unclear whether these would be renewable energy-based, which would affect whether this is classified as a green research & innovation measure.
- Other measures that may have an innovation component: include support for use of green solutions in enterprises (€400 million), energy efficiency and renewable energy investments (€3.8 billion), heating and building modernisation (€649million).



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Romania

Substantial share of funding going to research & innovation, although few details are available on the type of research & innovation measures envisioned. From the few details currently available, it seems that no funding is specifically dedicated to green research & innovation.

Total funding requested:	€41 billion
Status:	Final plan
Measures clearly tied to research & innovation:	€510 million (12.4% of total)
Measures clearly tied to green research & innovation:	€0 (<i>from the details currently available</i>)

- Measures that are clearly tied to research & innovation: includes broad measures to fund research, development and innovation.
- Measures that are clearly tied to green research & innovation: None
- Other measures that may have an innovation component: includes funding for buildings renovation (€2.2 billion) and support for renewables and energy efficiency (€1.3 billion)

Slovakia

Substantial share of overall spending allocated to research & innovation, although these remain relatively vague. From the few details currently available, it seems that no funding is specifically dedicated to green research & innovation.

Total funding requested:	€6.6 billion
Status:	Final plan
Measures clearly tied to research & innovation:	€800 million (12% of total)
Of which measures clearly tied to green research & innovation:	€0 (<i>from the details currently available</i>)

- Measures that are clearly tied to research & innovation: includes measures to strengthen funding for research & innovation and funding for university performance.
- Measures that are clearly tied to green research & innovation: No funding clearly tied to green research & innovation.
- Other measures that may have an innovation component: include renewable energy and energy infrastructure investments (€220million), buildings renovation (€650million), decarbonisation of industry (€350million).



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Slovenia

Very high share of spending allocated to research & innovation, with a focus on digital technology and alternative fuels. From the few details available, it seems that only a small share of this funding will be dedicated to measures relevant to green research & innovation, although this will depend on how the measures are further defined and implemented.

Total funding requested:	€2.5 billion
Status:	Final plan
Measures clearly tied to research & innovation:	€579 million (23% of total)
Of which measures clearly tied to green research & innovation:	€5.7 million (0.2% of total)

- Measures that are clearly tied to research & innovation: includes measures to support investment in alternative fuels, the digital transformation in business and society. Also includes a broader measure to support research & development & innovation investments.
- Measures that are clearly tied to green research & innovation: investment in alternative fuels, although whether this is classified as a 'green' investment or not depends on how the measure is further defined and implemented.
- Other measures that may have an innovation component: include investments in renewable energy and energy efficiency, particularly geothermal energy (€118.5million), building renovation (€86million), broader funding for sustainable and green transition (€39million).

About E3G

E3G is an independent climate change think tank accelerating the transition to a climate-safe world. E3G builds cross-sectoral coalitions to achieve carefully defined outcomes, chosen for their capacity to leverage change. E3G works closely with like-minded partners in government, politics, business, civil society, science, the media, public interest foundations and elsewhere.

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