

R&I Chief Economist Team

Science, Research and Innovation Performance of the EU (SRIP)

European Innovation Scoreboard (EIS)

Expert group on the economic and societal impact of research and innovation (ESIR)

OECD



Foresight

Macroeconomic modelling

R&I paper series

Policy experimentation



SCIENCE, RESEARCH AND INNOVATION PERFORMANCE OF THE EU 2022

Building a sustainable future in
uncertain times

Red I+D+i - 23 November 2022

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DG Research and Innovation
European Commission

Research and
Innovation



EUROPE NEEDS TO ACT ON

LONG-TERM CHALLENGES

such as climate change



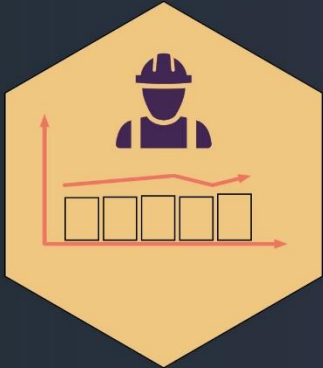
loss of biodiversity



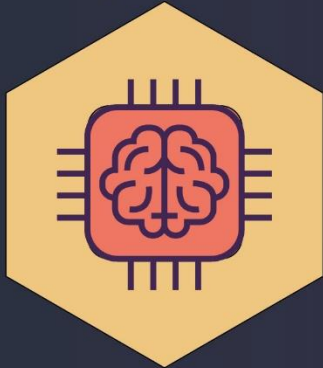
ageing population



low productivity growth



digitalisation

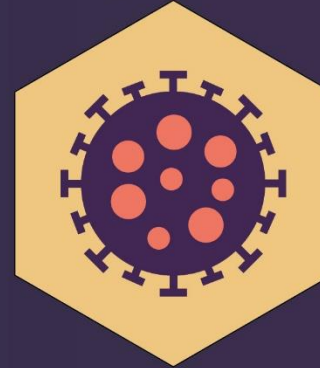


growing inequalities



IMMEDIATE CHALLENGES

COVID-19 pandemic recovery



shifting global geopolitics





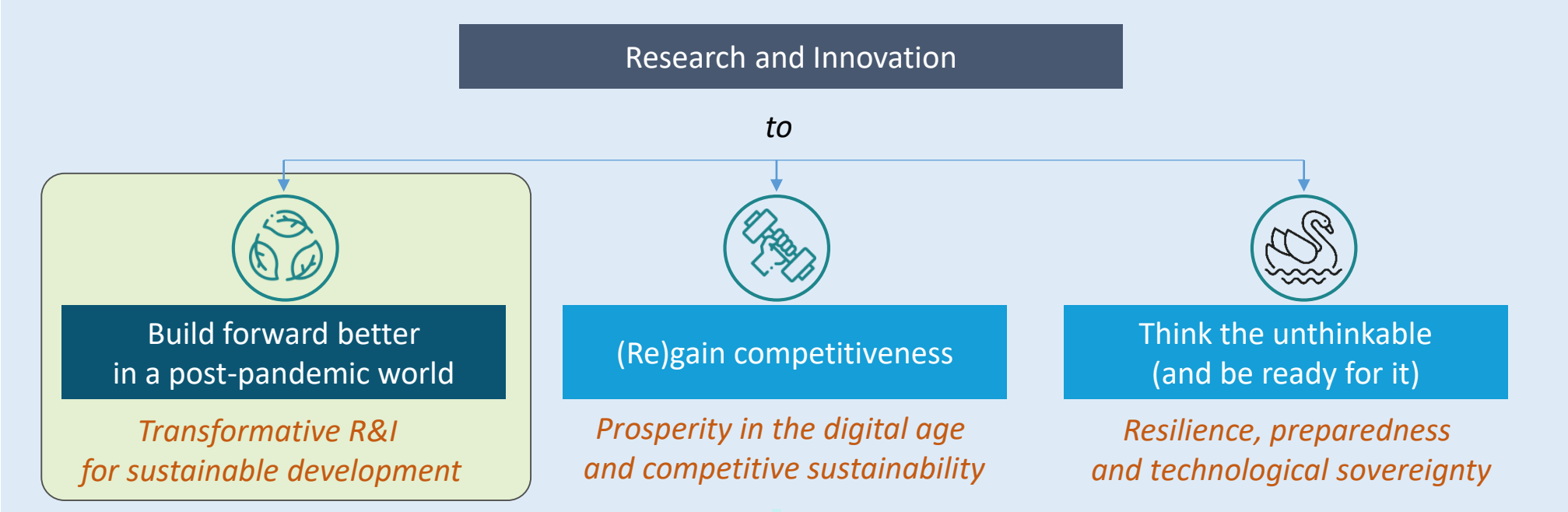
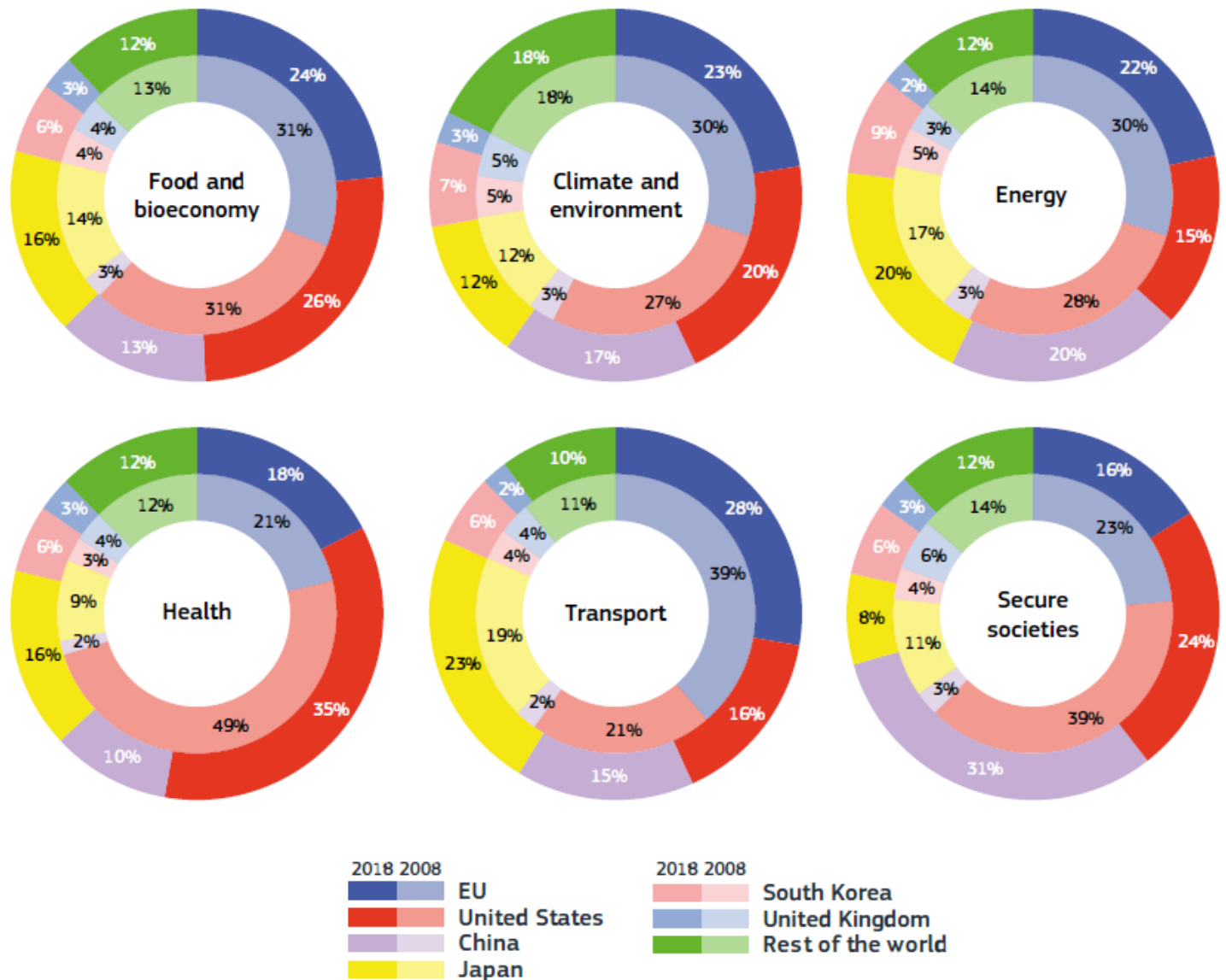


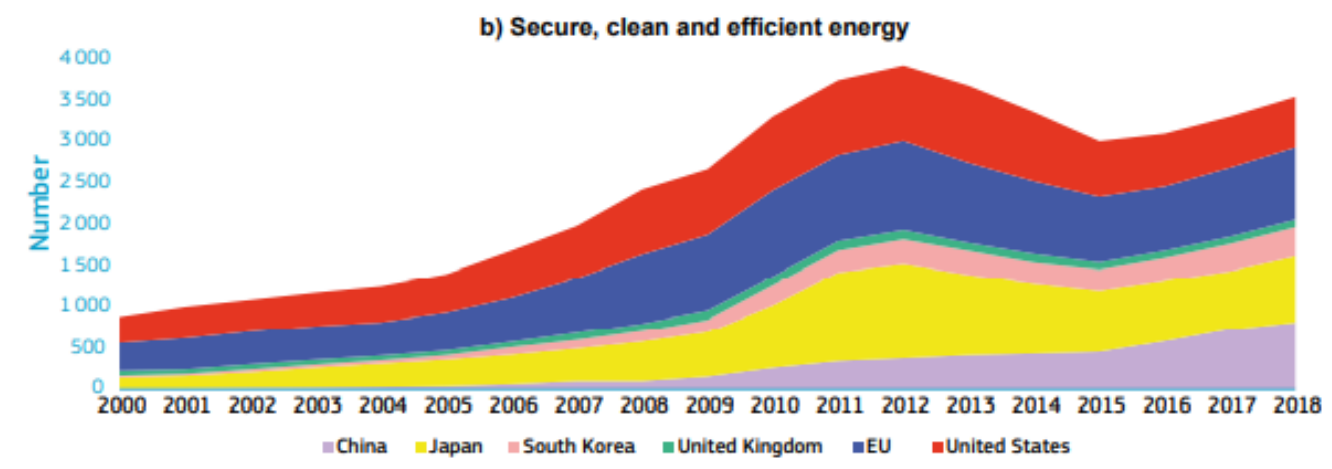
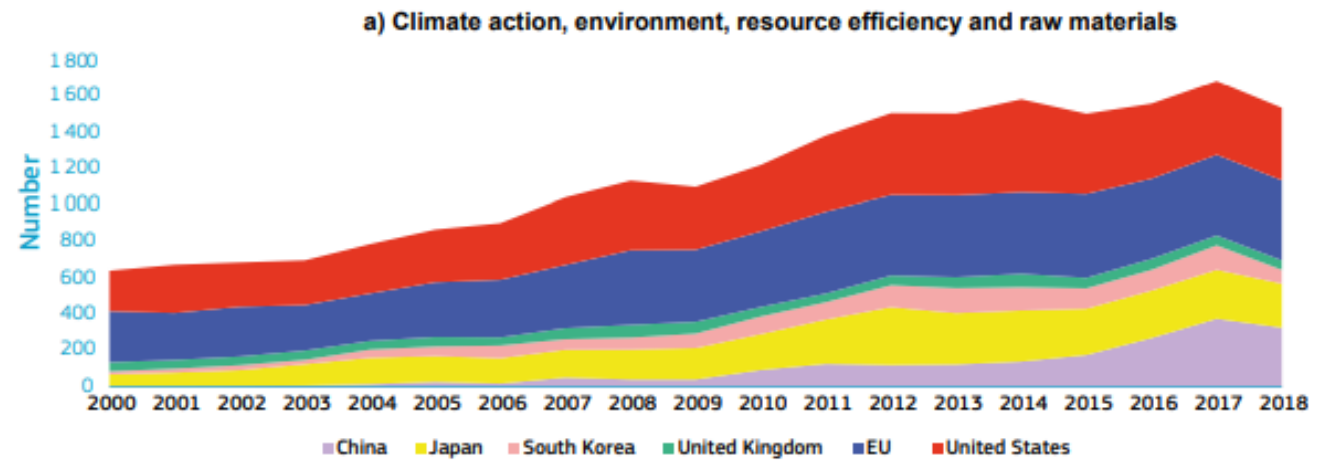
Figure 6.3-15: Share in the world (%) of patent applications filed under the PCT⁽¹⁾ by country/region and Horizon 2020 Societal Grand Challenge, 2018 (exterior) and 2008 (interior)



R&I and societal challenges

The EU remained the top worldwide patent applicant in the fields of climate & environment, energy and transport.

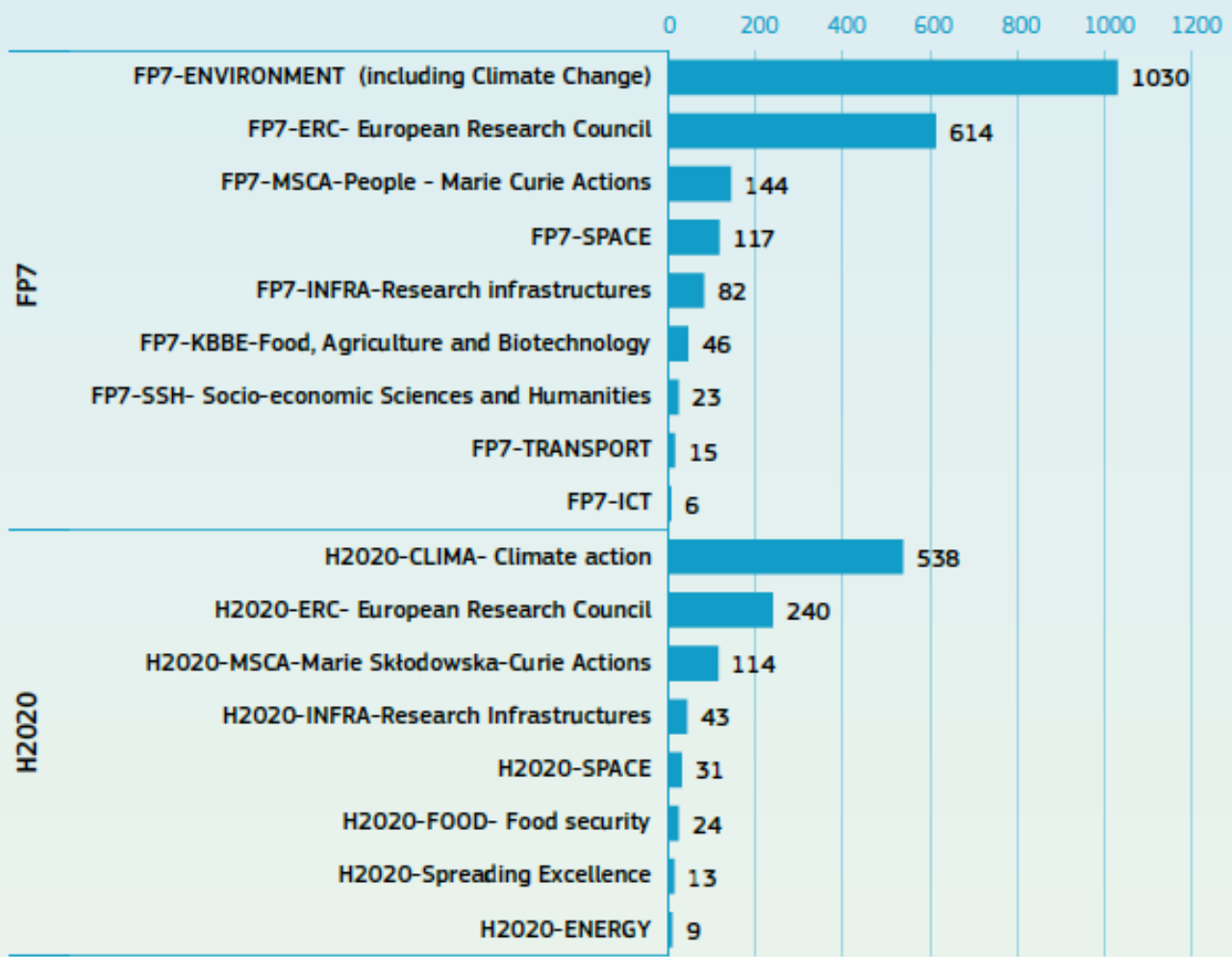
Figure 3-9: Evolution of number of patent applications⁽¹⁾ filed under PCT in climate action, environment, resource efficiency, raw materials and clean energy, 2000-2018



R&I and societal challenges

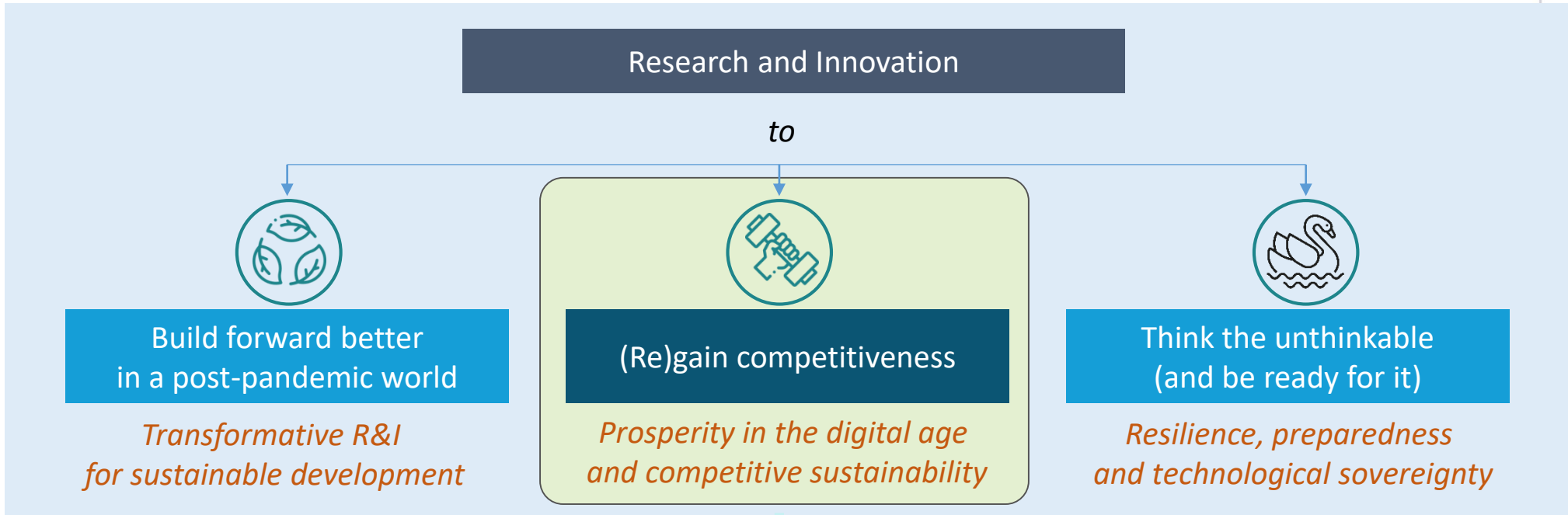
There has been a global decline in clean and efficient energy patenting since the early 2010s, though more recently this trend has reversed

Figure 3-21: Publications referenced in IPCC reports by FP sub-programmes



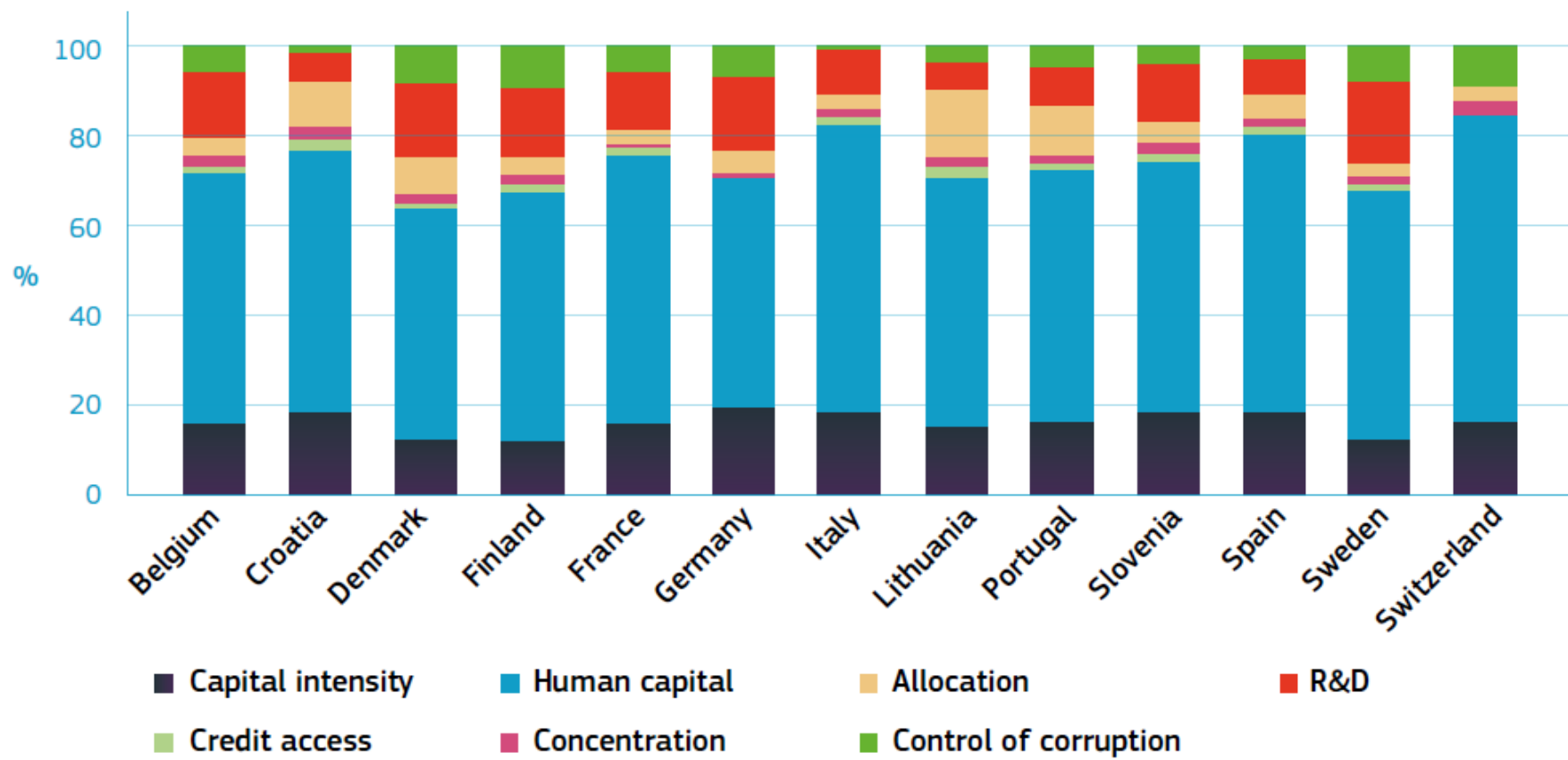
Contribution of EU R&I FP to evidence in IPCC reports

Over 2,500 publications cited by the IPCC (about 12% of the total references) have been totally or partially funded by the EU funding.



Productivity as engine of competitiveness

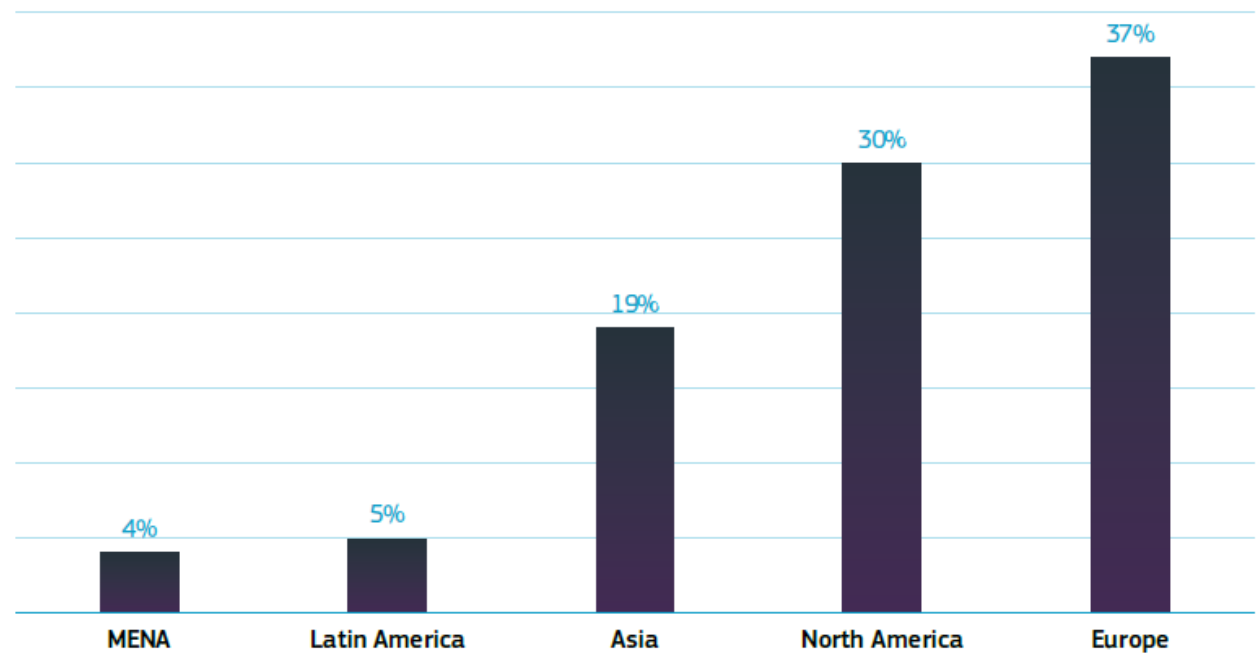
Figure 4.1-7: Explained contribution to labour productivity (2016)



Human capital is the most crucial contributor toward labour productivity, followed by physical capital and R&D investments.

Start-ups and scale-ups play a pivotal role in fostering innovation and addressing the challenges of the twin transition

Figure 4.2-8: Share of emerging start-up ecosystems by world region, 2020

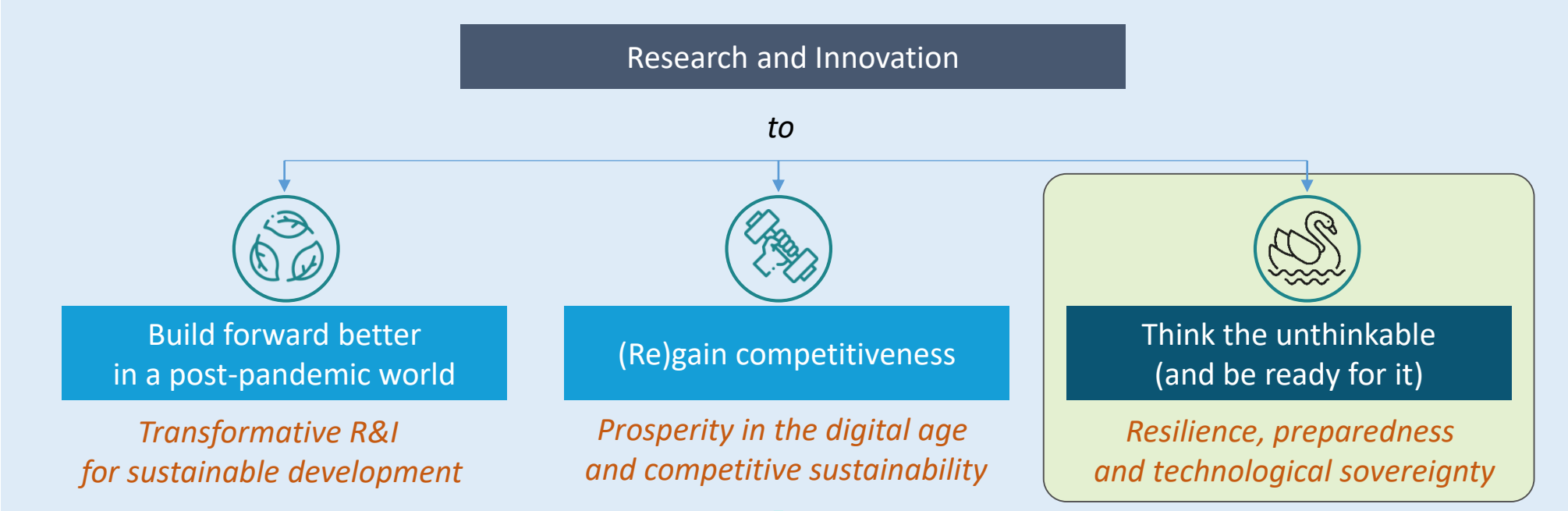


- The EU lags behind its main international competitors in terms of start-up ecosystems (with North America and Asia hosting respectively 50% and 27% of Top 30 ecosystems in the world.)
- Nevertheless, the EU performance is improving and, in 2020, the EU was in the lead in terms of emerging ecosystems.

Science, Research and Innovation Performance of the EU 2022

Source: Startup Genome, 2021

Note: Emerging ecosystems are defined as ecosystems at the early-stage of their growth



Technological leadership and vulnerabilities

Figure 2.1-6: EU strategic capacity: strong in some technologies, highly dependent in others

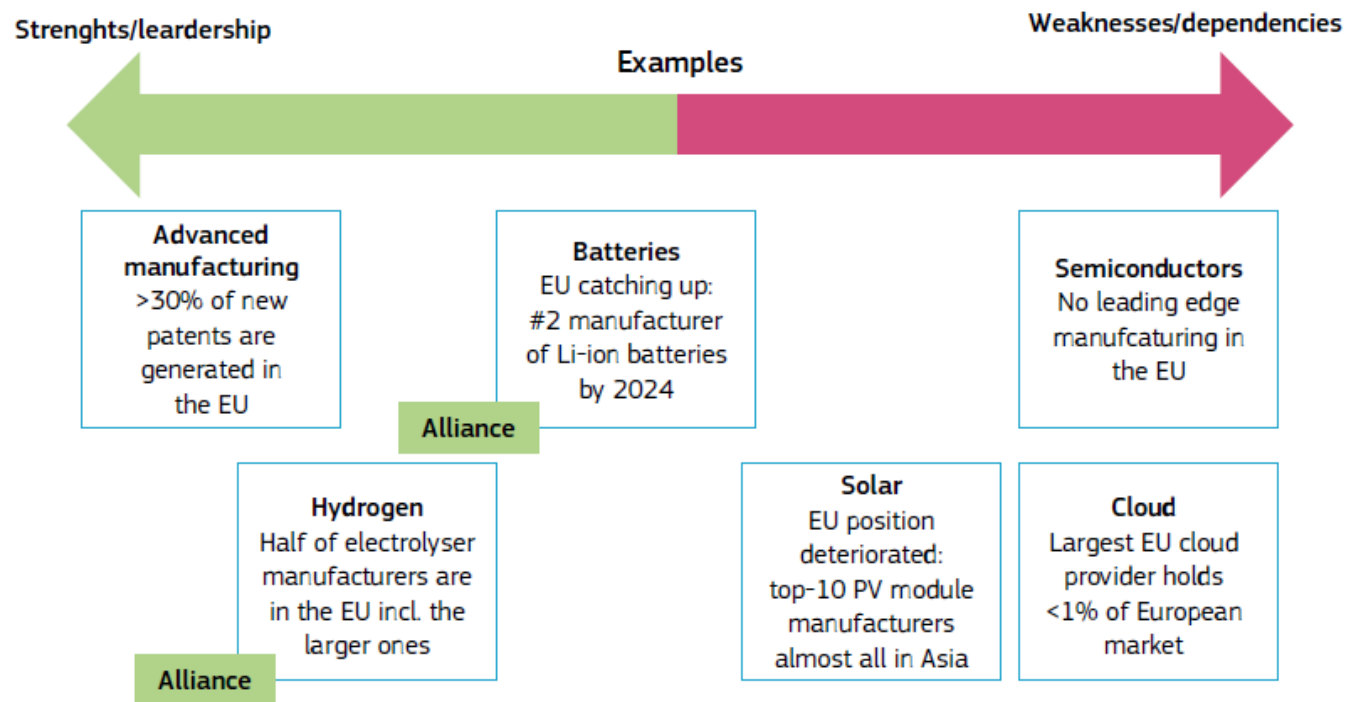
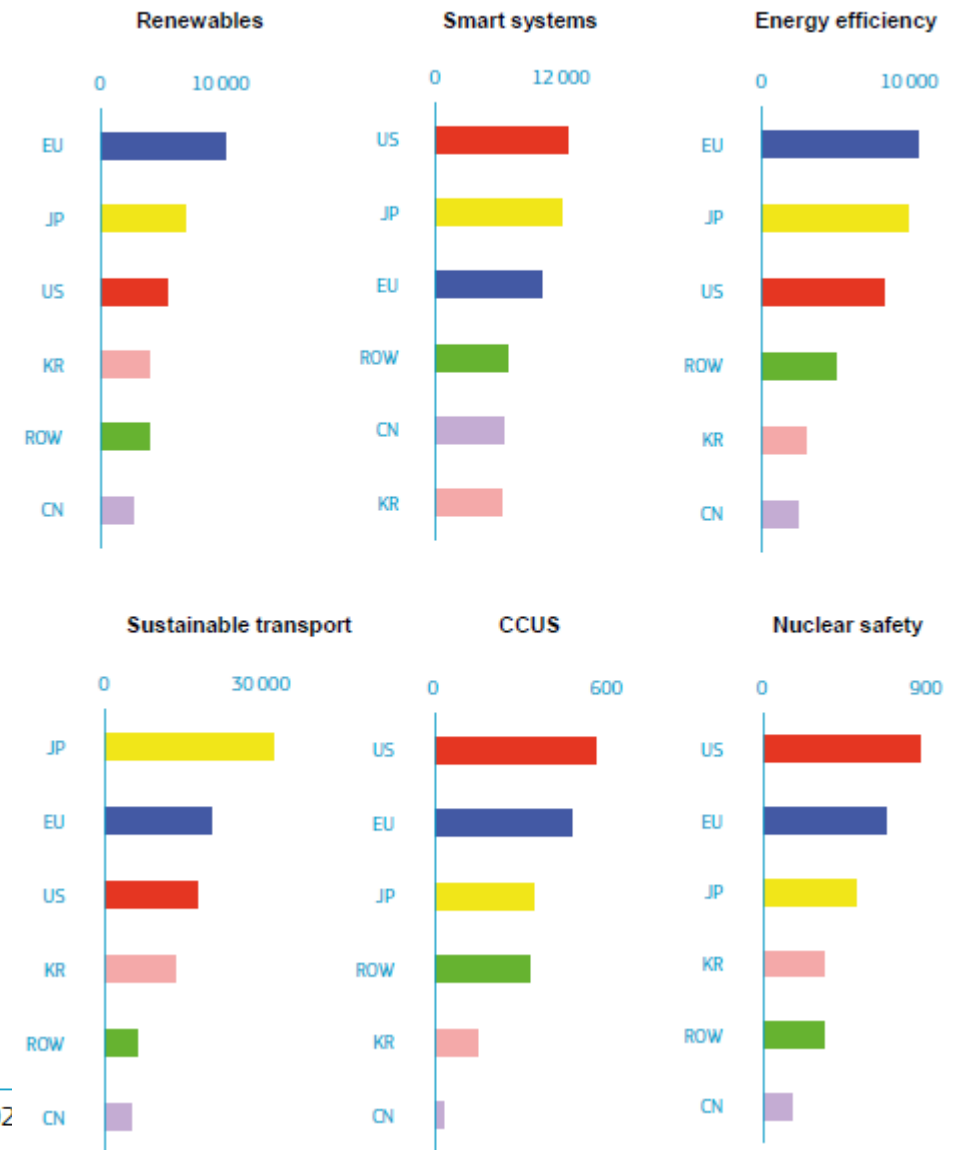


Figure 2.1-10: EU positioning in high-value patents in the energy union R&I priorities (total over 2005-2018)



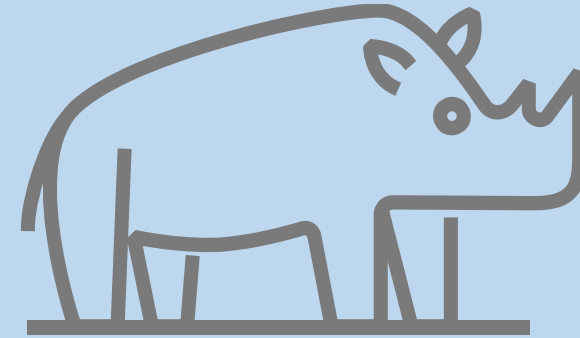
Science, Research and Innovation Performance of the EU 202

Source: European Commission, DG Internal Market, Industry, Entrepreneurship and SMEs.

Bringing resilience to an unstable world



Black swans



Grey Rhinos

European Commission, DG R&I

- **Foresight, Preparedness, Flexibility, Response**
- **Frame more accurately what we know**
- **More emphasis on long-run risk assessment**



R&D Investments - trends

Figure 5.2-2: R&D investments in billion euro, 2000-2019

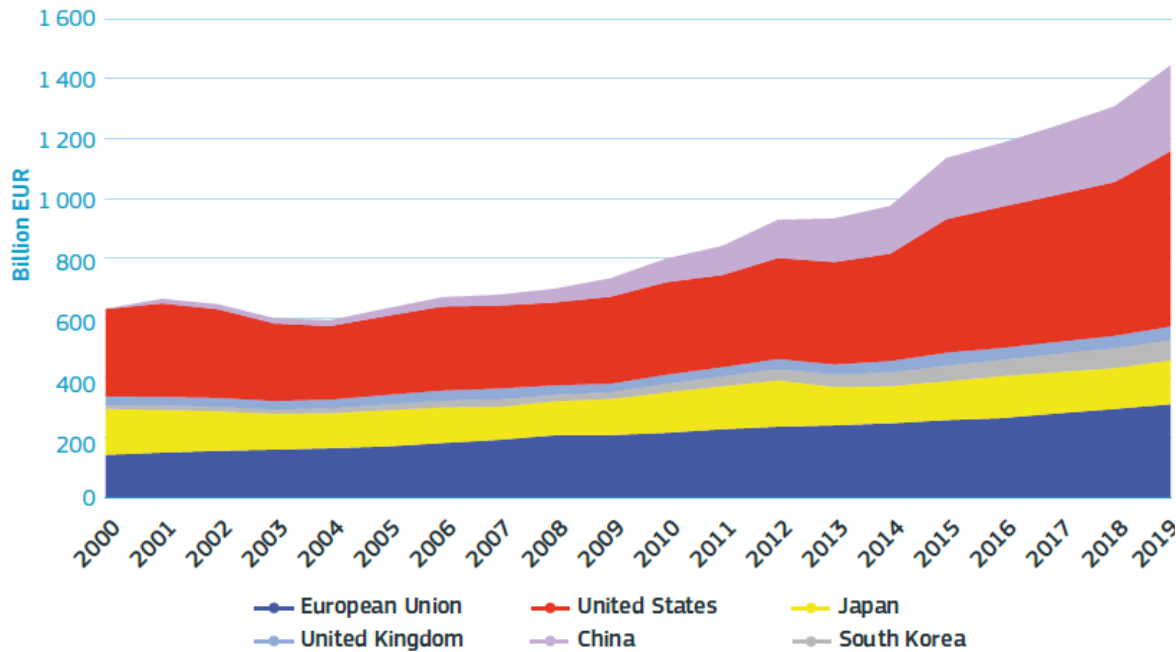


Figure 5.2-9: R&D investment gap in the EU, 2000-2020

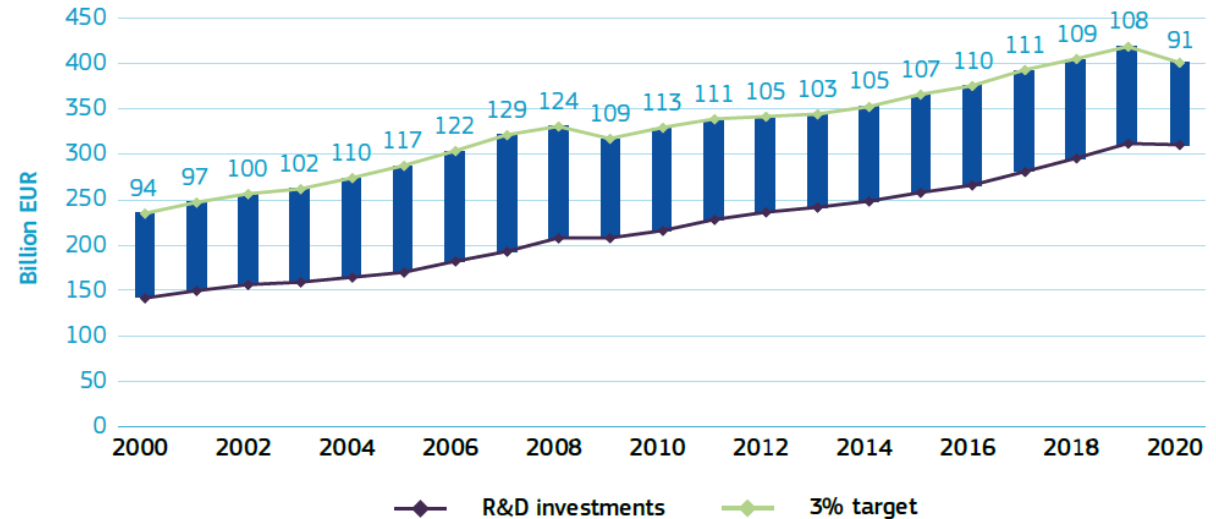
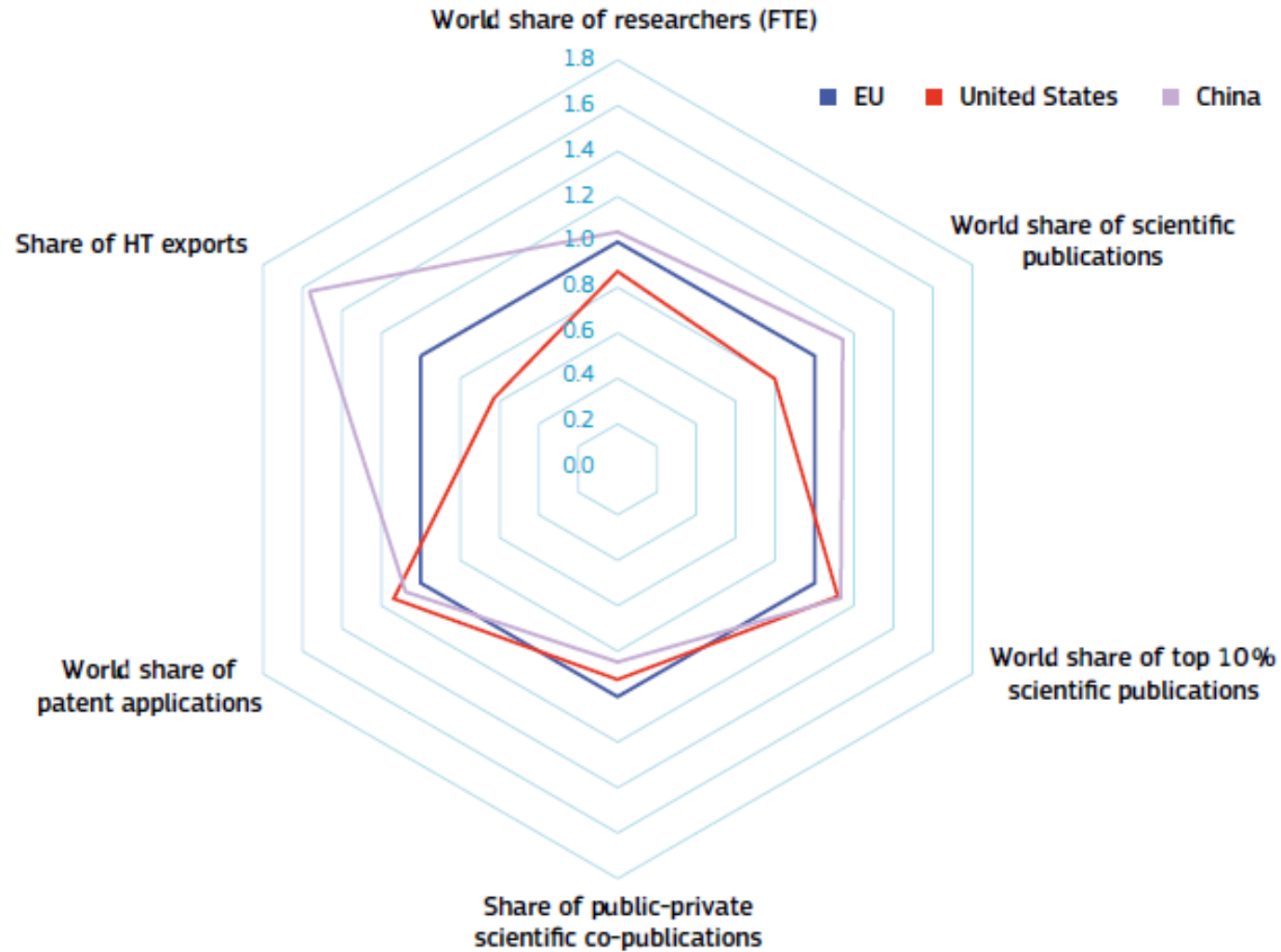


Figure 6.3-29: Knowledge valorisation approach, latest available year



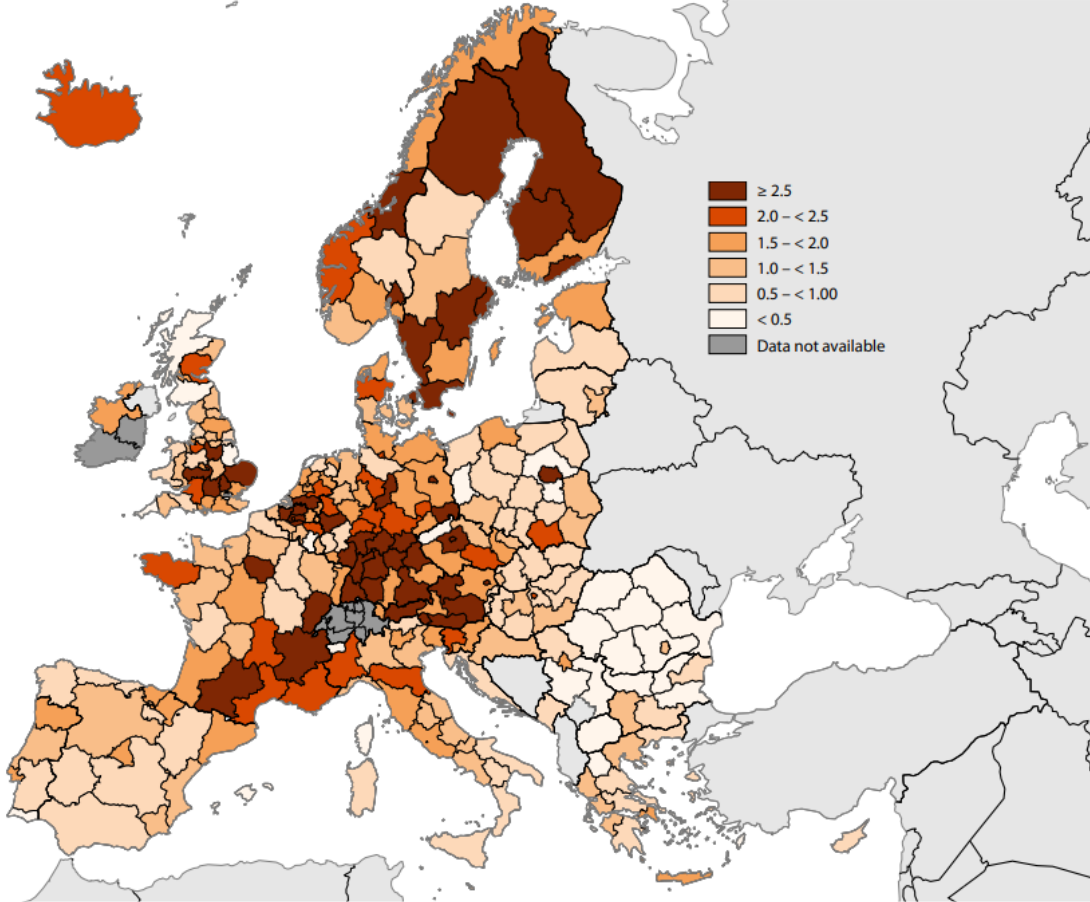
Knowledge valorisation

More efforts are needed to bridge the gap between basic research, innovation and marketable solutions.



EU innovation divide

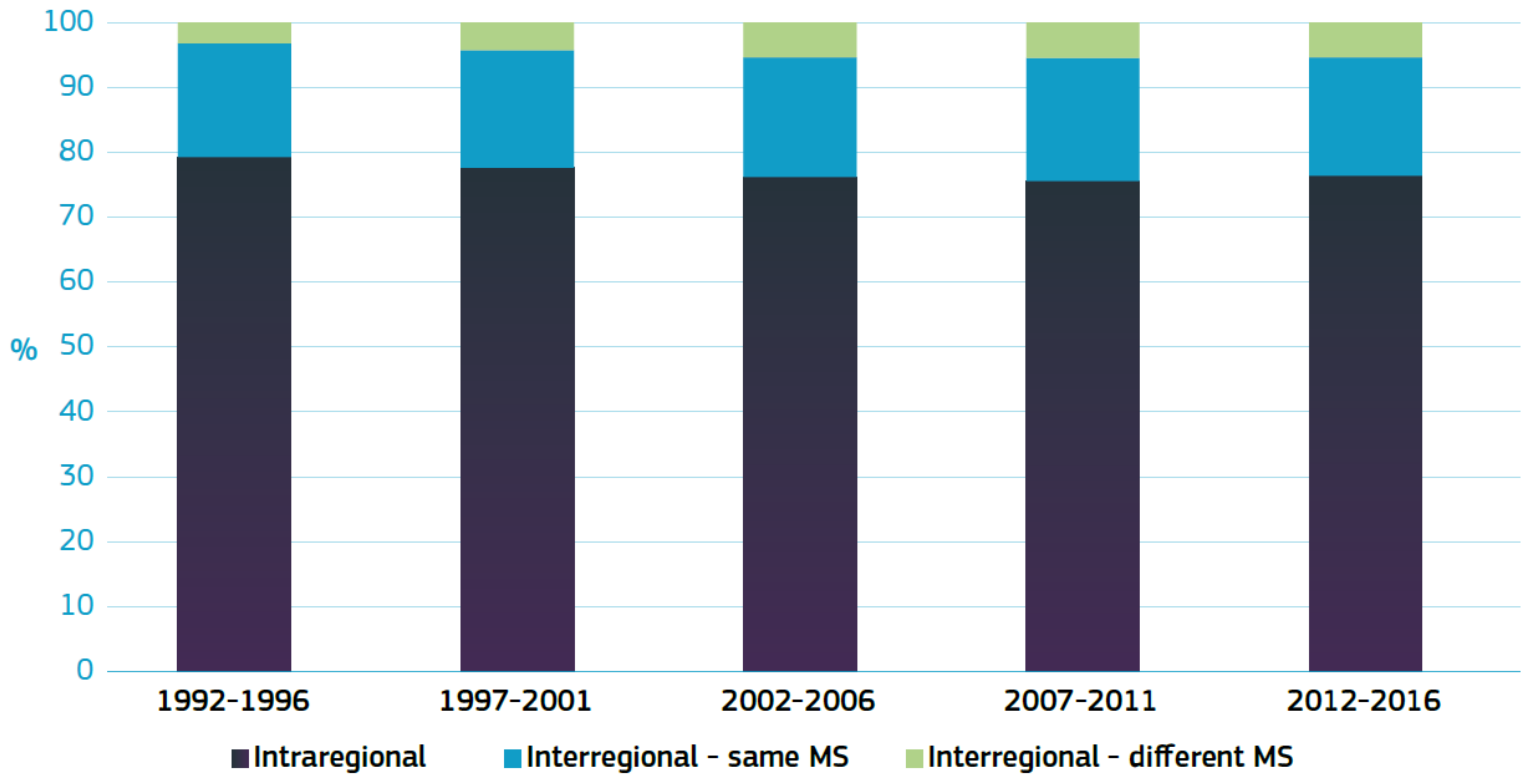
Figure 2.2-1: R&D intensity (Gross R&D investment as % of GDP), 2019 or latest year available



In the last decade, some regions with high R&D intensity continued to increase their R&D expenditures further. Only some regions with lower R&D intensities managed to catch up, and the gap with the top-performing regions remains significant

EU innovation divide

Figure 2.2-16: Inter- and intra-regional collaboration in patenting (co-patenting) in Europe over the period 1992-2016



Interregional co-patenting remains very limited in the EU, even if it has slightly increased from 1992 to 2016

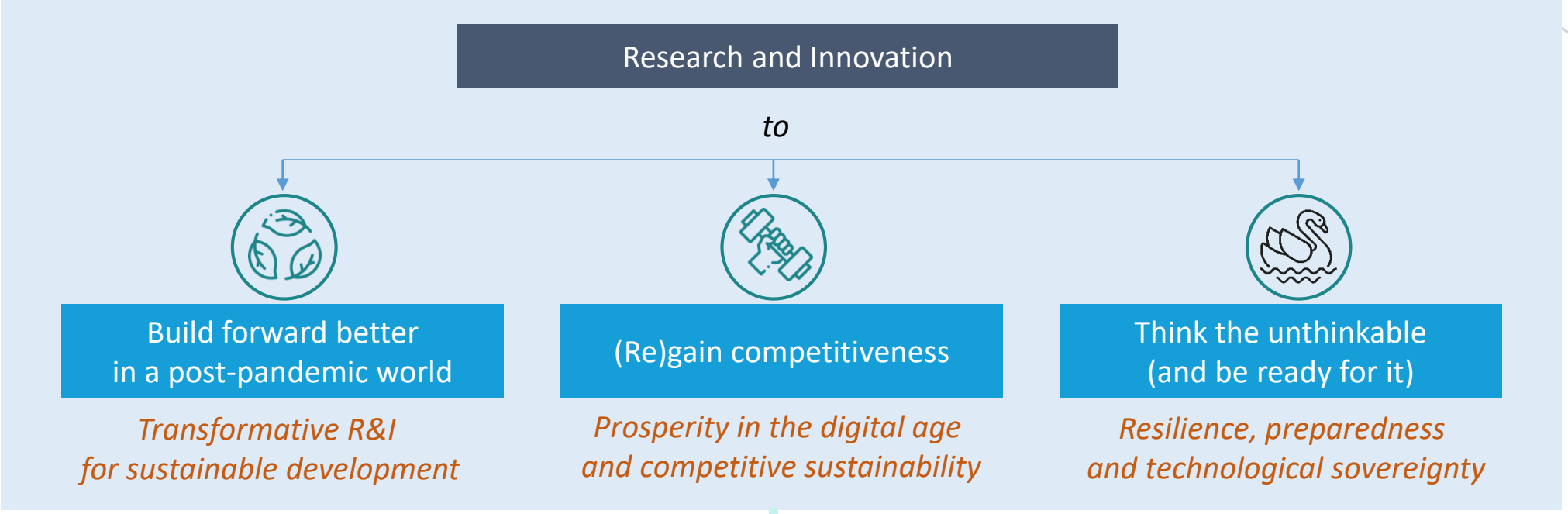
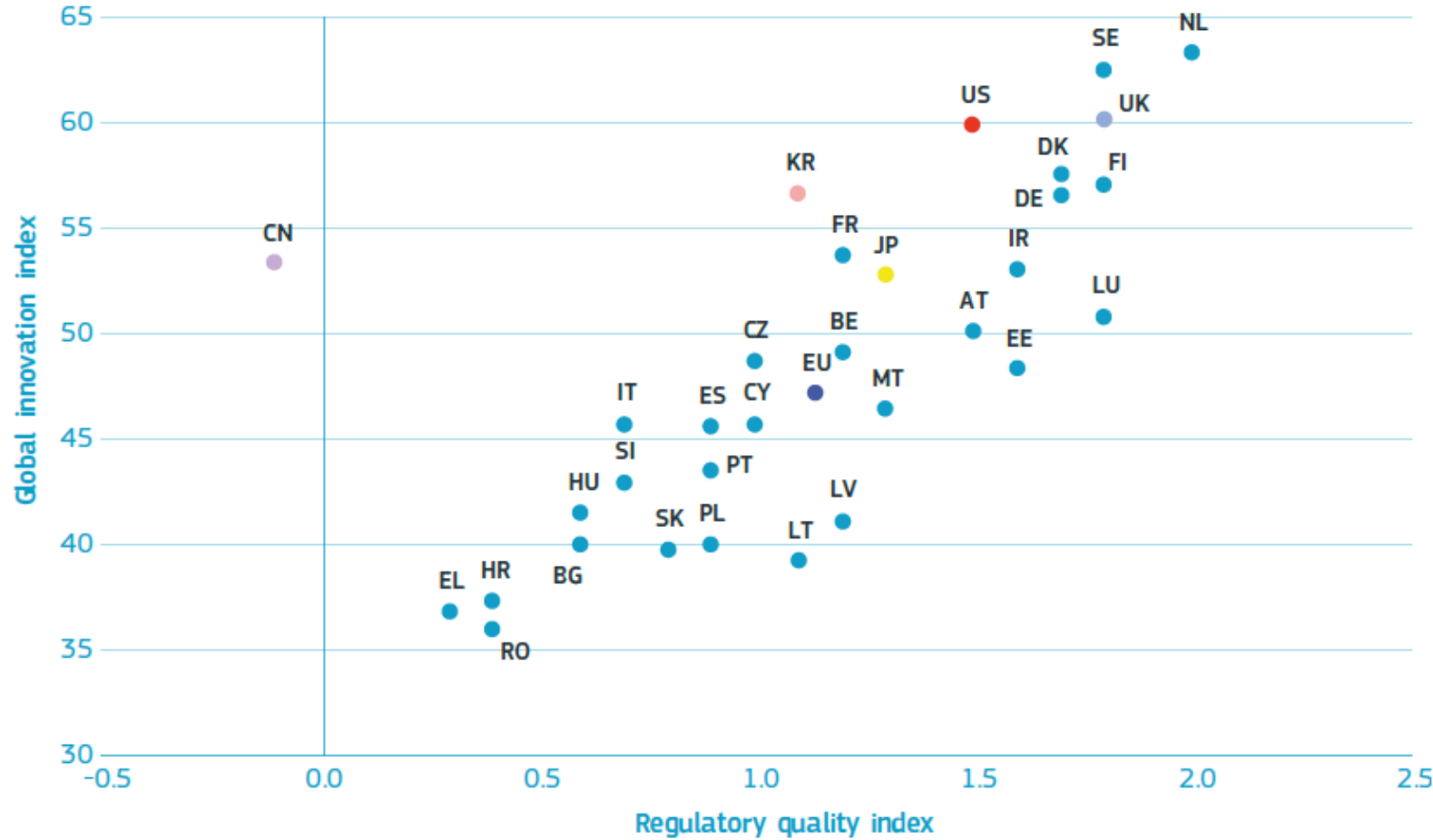


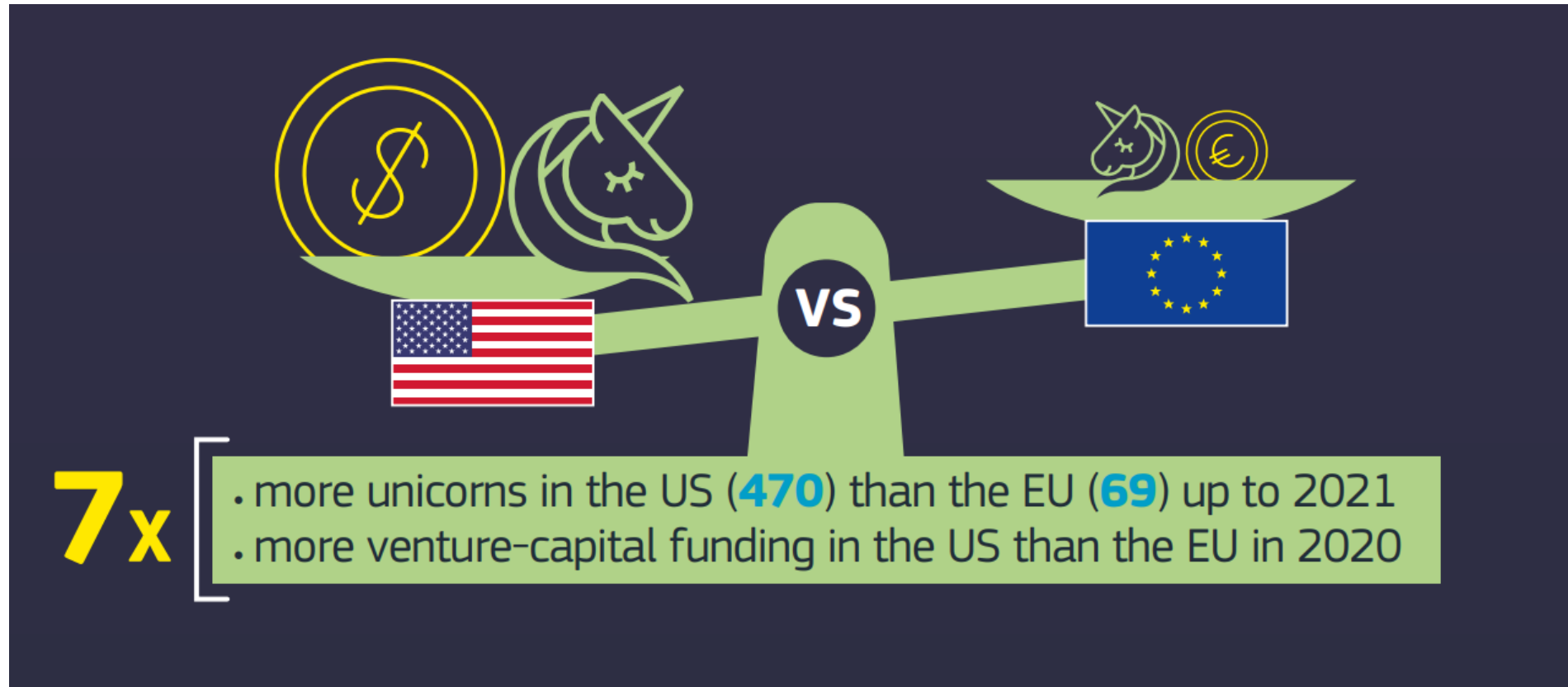
Figure 7.2-4: Regulatory quality index and global innovation index, 2020

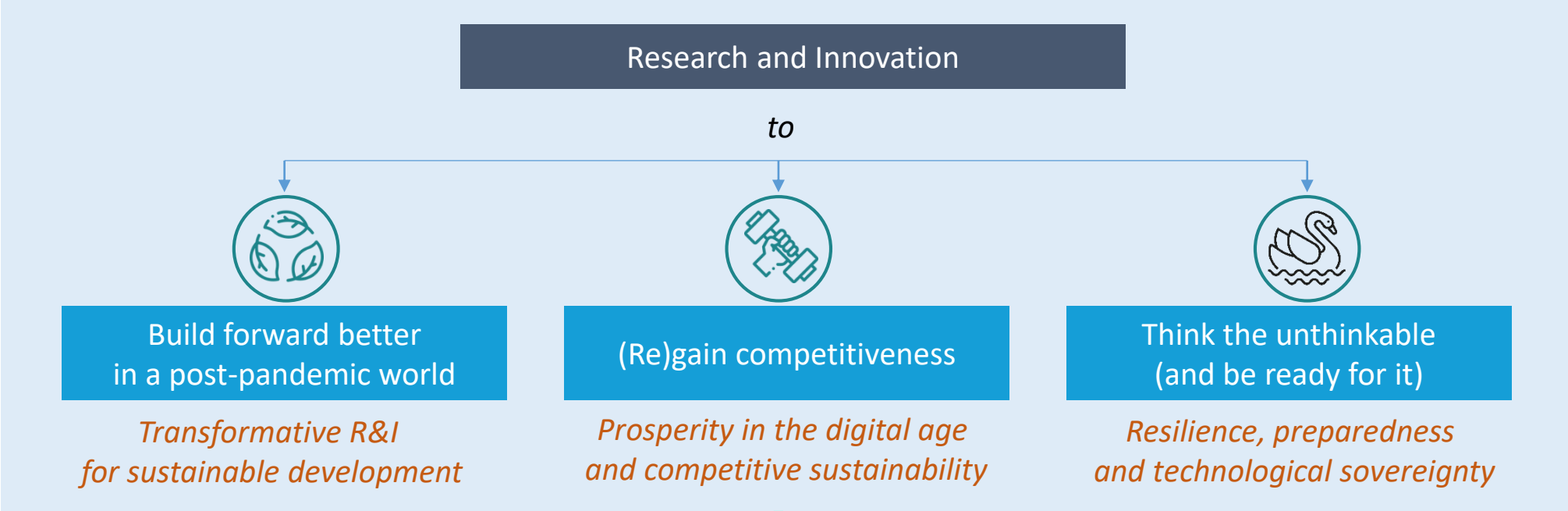


Regulatory quality

Source: World Bank

Lower availability of Venture Capital for scaling-up





Thank you!

