R&D policies for better post-pandemic futures: new approaches and tools

WORKING PARTY ON INNOVATION AND TECHNOLOGY POLICY

Virtual event I 20 and 21 May 2021

SUMMARY

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Ministry of Economic Affairs and Employment of Finland

VTT

OECD
BETTER POLICIES FOR BETTER LIVES

ABOUT THE EVENT

The **COVID-19 pandemic** and the policy responses to the crisis are expected to result in **lasting changes to science, technology and innovation** (STI). The unequal impacts of the crisis on R&D investments across sectors and the accelerated adoption of digital tools and techniques for research and innovation are, among other factors, likely to shape post-pandemic STI systems.

The purpose, design and execution of **STI policies could also experience fundamental change** as resilience, environmental sustainability and inclusiveness become more prominent objectives on policy agendas. Systems approaches – which consist in setting policies considering that they are part of a complex system of systems – could gain ground in policymaking, but important questions remain on how to implement them in practice in the most efficient way.

This **two-day event, which gathered more than 200 participants from over 60 countries, provided global insights on the main challenges facing STI systems in the post-pandemic world**, particularly in terms of industrial inclusiveness, and explored how to design and implement STI policies that are fit for the future. By bringing together high-level policy makers, business representatives and leading scholars, the event explored innovative STI policy approaches and tools.

The event was organised jointly by the OECD Working Party on Innovation and Technology Policy (TIP), the Ministry of Economic Affairs and Employment of Finland and the VTT Technical Research Centre of Finland. It marked the **launch of the outcomes of the 2019-20 TIP project on R&D intensity**, including a number of policy papers and country case studies.

Find the event agenda and presentations at:
http://vttresearch.com/rd-post-pandemic

Find all project materials (including policy papers and case studies) at:
http://oe.cd/tiprd

DAY 1. EVIDENCE SESSION

The discussions focused on the changing nature of innovation in the COVID-19 context and the implications of these changes for the future of STI policy, focusing in particular on policy responses to ensure inclusiveness of STI systems and the implementation of systems transformation approaches in practice.

Göran Marklund, Deputy Director General and Head of Operational Development at VINNOVA and Chair of the OECD TIP Working Party, opened the event by underlining the need for developing systemic approaches to innovation policy. Especially since the onset of the pandemic, R&D policy debates have focused on the need to tackle systemic social challenges, notably including those related to global health and the climate crisis. Societal purpose has become central to STI policy making, with mission-oriented policy approaches having played an important role in the design of recovery packages. He also highlighted, however, that implementing such systemic approaches comes with analytical challenges. To be able to measure systems, new metrics are needed that go beyond the speed and scope of what we can currently measure with bibliometrics and patent data.

Panel 1: The digitalisation of science and innovation in the time of COVID-19: opportunities and challenges for industrial inclusiveness

The first panel discussion highlighted that companies vary significantly in terms of their digital capabilities and their preparedness to leverage new digital tools. The pandemic disrupted the business environment, but its effects were uneven across industries and firms. While the full scope of these impacts will require further analysis, businesses with greater digital capabilities have managed to better respond to and survive the crisis. The panel also drew attention to the difficulties of managing large datasets and digital innovation projects, in particular among small firms; these skills have rapidly shifted from 'nice to have' to 'critical to have'. Large firms, on the other hand, seem to be much further ahead in adopting digital technologies such as AI, Internet of Things (IoT) and robotics compared to small firms. An important bottleneck, especially for SMEs, has been digital talent. Panellists agreed that there is room for policy interventions that enhance digital technology adoption among SMEs, particularly by helping them build the necessary digital capabilities.

Caroline Paunov, Head of Secretariat for the OECD Working Party on Innovation and Technology Policy, opened the panel with initial perspectives based on TIP work. The acceleration of digital technology adoption has been one of the most important impacts of the COVID-19 crisis on STI ecosystems. This may result in more opportunities to connect among innovators and researchers – for instance, work-from-home technologies and virtual conferencing erase the barriers of physical distance and allow for greater flexibility. There are, however, risks and challenges flowing from digital divides – those not having the right tools will be further behind, and among scientists there is a reinforcement of the "superstar phenomenon", where well-known researchers are increasingly solicited to participate in online conferences and discussions, while opportunities for young researchers to build their networks are reduced. Inequalities have also been reinforced across businesses: those in the digital sector thrived during the crisis, while those in sectors more affected by the crisis and with fewer capacities to quickly adopt digital technologies risk being left further behind. This also brings the risks of reinforced "winner-take-all" dynamics.

Paavo Ritala, Professor of Strategy and Innovation at LUT University (Finland), took an organisational perspective and explained that, as explored in the book "The Data

Imperative", digitalisation can be viewed from two lenses – as the search for digital omniscience or as the search for digital omnipotence:

- Omniscience refers to the ability to collect and analyse data on organisational processes, customers and partners. Some of the best companies are able to make use of a data flywheel – as they get more users, they get more data, which gives smarter algorithms and allows them to create better products and services, which might attract more users in a virtuous cycle.
- Omnipotence refers to the ability to control business processes, as well as software, physical equipment, and humans, based on data. Firms with such competences have fared very well during the crisis.

He observed that this cycle of digitalisation has been accelerated by COVID-19 by 5 to 10 years. There is a major divergence between digital champions and laggards here – with firms lacking digital competencies largely unable to serve their clients in the past year. While the strong got stronger during this crisis, it is critical that laggards react to explore new opportunities. He concluded that policy responses should address the increasing divergence in organisational readiness for digitalisation.

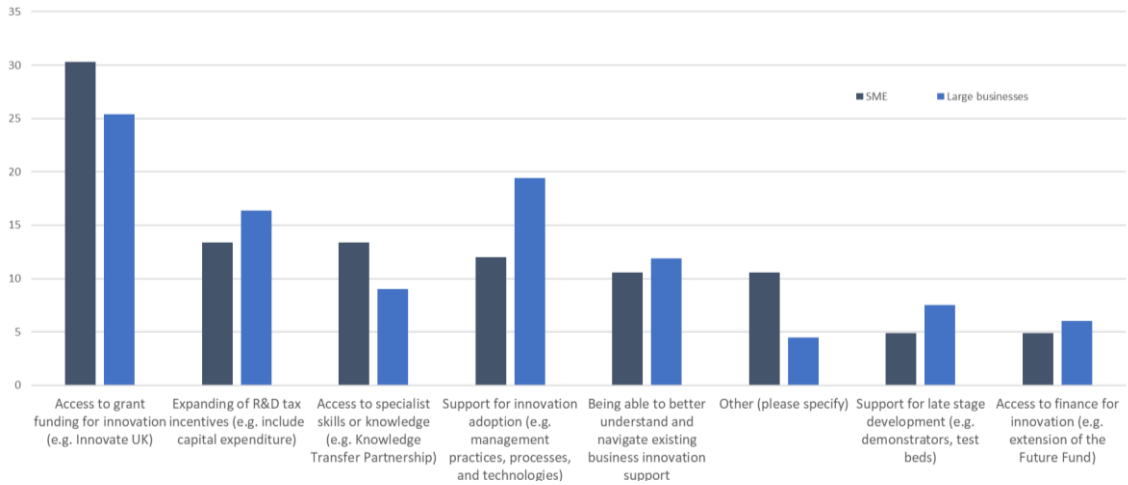
Marianne Saam, Professor of Innovation Economics and Policy at Ruhr University Bochum (Germany), presented German KFW survey data comparing German mid-sized firms before and during the pandemic in terms of their digitalisation and innovation investments. Before the COVID-19 crisis, more than half of firms with more than 50 employees completed digitalisation projects during the last 3 years, while that figure was about one third for firms with fewer than 50 employees. This offers evidence of broad-based digitalisation that happens progressively. Important differences emerged in terms of spending: for firms with fewer than 5 employees, average annual expenditures on such projects were around EUR 8,000, while firms with 50 or more employees reported an average expenditure of EUR 140,000. Smaller firms risk not spending enough to disrupt their business models.

As a reaction to the crisis, firms invested in innovation to try to mitigate the short-term damages of the crisis, instead of focusing on long-term productivity increase. She also observed that as a result of the crisis, firms have increased their investments in digitalisation more than in innovation, but R&D expenditures may well react in a delayed fashion, as compared to digitalisation expenditures. A final observation of interest concerns the increasing divergence among German mid-sized firms during the COVID-19 crisis.

Nathan Brown, Senior Policy Adviser at the Confederation of British Industry (CBI), presented survey evidence (from the CBI tech tracker, a survey of UK businesses) on the digital transformation of UK firms since the onset of COVID-19. The late-2020 survey findings show that firms of all sizes were adopting digital technologies across traditional sectors, and across UK regions. However, data revealed two clear challenges: (1) businesses are struggling to manage their data and use them for decision-making, and (2) adoption of more advanced digital technologies (AI, robotic process automation and the Internet of Things) is clearly lower for smaller firms. This underlines the fact that the true power of these technologies is not fully exploited. CBI believes that R&D policies (e.g. R&D tax credits) need to be expanded to include software and services innovation activities (Figure 1). As data are the fuel of business innovation moving forward, policy also needs to consider how data processing is handled and which ethical framework should be used. He also highlighted that only a simple and coordinated support system can help firms innovate at scale; their survey suggests that simplifying support for businesses is one of the best ways to support innovation.

Figure 1. Which of the following would have the biggest impact on your company's ability to innovate more in the next 12 months?

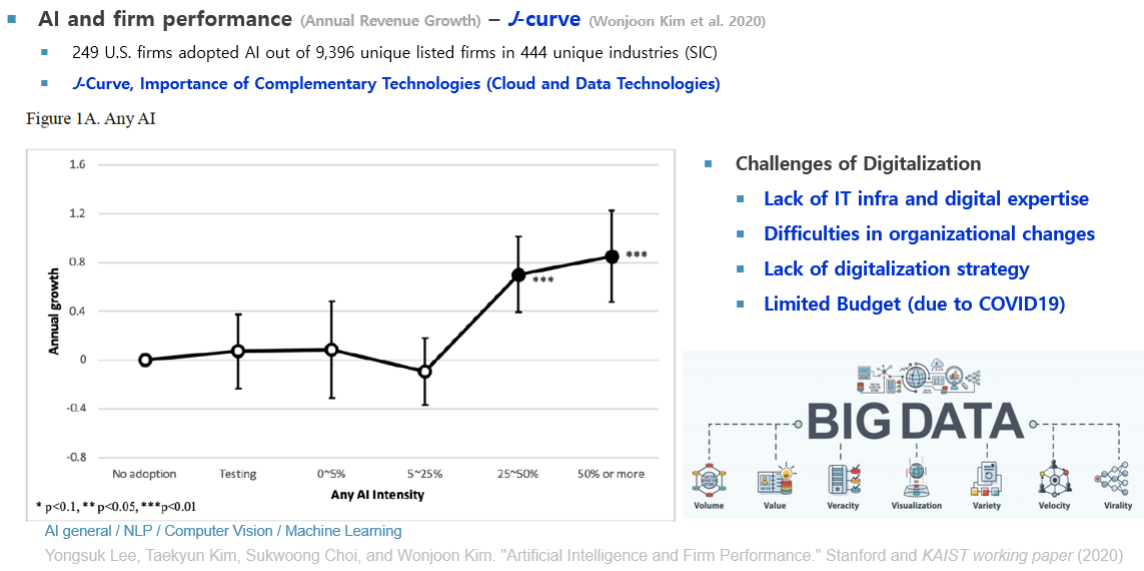
United Kingdom



Note: Based on 245 responses
Source: Presentation of Nathan Brown, available here, based on Tech Tracker Survey October 2020.

Wonjoon Kim, Head of the Graduate School of Innovation and Entrepreneurship at the Korea Advanced Institute of Science and Technology (KAIST), emphasised that COVID-19 has deepened the digital divide that has already been widening over the past years. He underlined that digital technologies should be seen as general purpose technologies (GPT), characterised by their pervasiveness, and that their effect on adopters' performance is characterised by a J-curve, which is to say that there is a time lag between its implementation and the positive impact on performance (Figure 2). STI policy measures, he argued, should focus on reducing the cost of digital transformation by supporting infrastructure and human capital development. He also pointed out that digitalisation increases R&D investments, and that the interaction of these two can bring a comparative advantage to firms.

Figure 2. Digitalisation and J-Curve



Source: Presentation of Wonjoon Kim, available here.

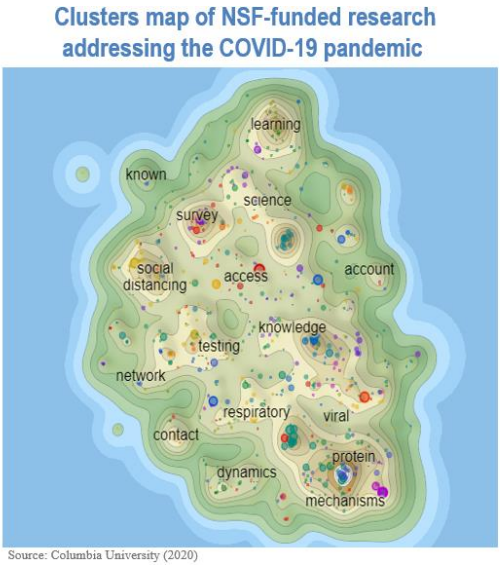
Panellists agreed that access to digital skills is the main bottleneck which has been driving divergence between sectors and firms. Policy should focus on upskilling the current labour force, supporting education from a young age, as well as on fostering entrepreneurship. Producing both high-end and low-end experts in digitalisation will be an important task for intermediaries. Educating generally in digital skills is one approach; another is up-skilling the existing workforce.

Panel 2 - The changing nature of innovation policies: moving towards systems transformation approaches

David Legg, Regional Manager for London and South East England at Innovate UK, opened the discussion by providing a brief overview of UK's STI policy responses to COVID-19. He explained that GBP 400 million of new investment has been provided to over 3,000 R&D-intensive businesses across the UK. Innovate UK EDGE has provided expert advice on finance, growth, and globalisation to a further 2,700 companies, while core-programmes such as Smart Grants, Women in Innovation, the Industrial Strategy Challenge Fund and Young Innovators saw double, sometimes triple-figure growth in applications.

Sandra Planes-Satorra, Policy Analyst at the OECD, provided initial perspectives based on TIP work. She observed the increasing directionality of STI policy. The shift of STI policy towards addressing a wider set of goals going beyond growth (e.g. environmental sustainability, inclusiveness, resilience) requires understanding and addressing complementarities and trade-offs between these objectives. The crisis also highlighted the need for systemic approaches (the formulation of policies considering their impacts on the entire system). This will require the use of new data and data analytics tools (e.g. semantic analysis, visualisation tools), which were widely experimented with during the crisis (Figure 3). Embedding foresight in policymaking processes can help reveal vulnerabilities and interconnections between systems and can enhance the preparedness of policy responses and increase the resilience of systems. Overall, the key challenge ahead for policy makers is how to put systems transformations approaches into practice.

Figure 3. New data and better data analytics tools are key to implement systems approaches



- **Large-scale experimentation with granular and timely data** during COVID-19 (e.g. mobility data, social media data, pulse surveys)
- **Semantic analysis and AI techniques** to analyse large-scale real-time data → can help map entire systems and detect where vulnerabilities exist
- New **visualisation tools** to render large amounts of data useful to policy

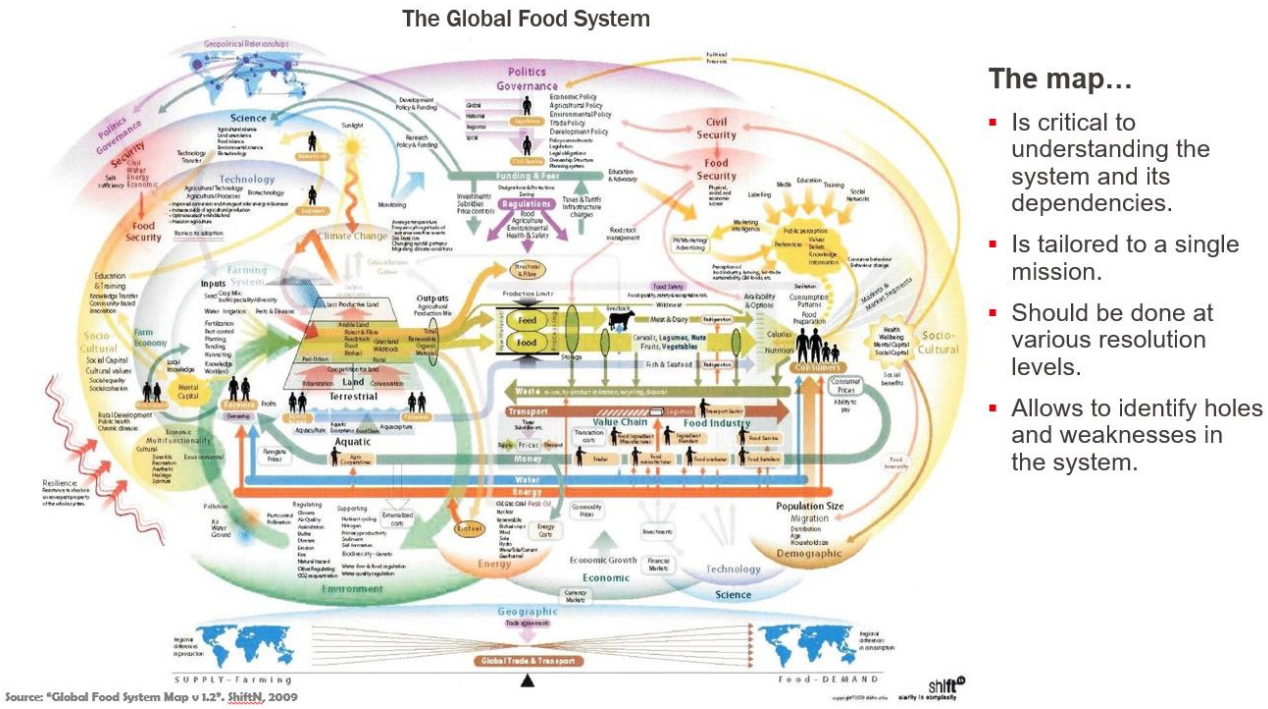
Source: Presentation of Sandra Planes-Satorra, available here.

Erkko Autio, Chair in Entrepreneurship and Technology Venturing at Imperial College London, approached systemic transformations from an innovation management perspective and asked how we can better accelerate solutions to systemic challenges. In tackling complex problems through the *wicked acceleration labs* technique, stakeholders first envision desirable futures through collective imagination, subsequently orchestrate resources and finally accelerate moon shots and deep tech to address grand challenges. Such bottom-up approaches would avoid the limitations of top-down, prescriptive policy. He also argued that public investment is needed to de-risk innovation.

Maria Savona, Professor of Economics of Innovation at SPRU, University of Sussex, underlined three areas of work that require particular attention. First, the need to realign STI policy priorities and the United Nations Sustainable Development Goals (SDGs), where STI is considered a means of dealing with global challenges. Second, better understanding the impacts of the digital transformation on the future of jobs. Third, setting up a proper governance of data framework, building on the GDPR but going beyond preserving data privacy, to facilitate the exploitation of data for the public good.

Gaetán de Rassenfosse, Assistant Professor at École Polytechnique Fédérale de Lausanne (Switzerland), explained that to approach system transformations, an office of strategic planning should be created that transcends the STI ministry and is overseen by a high-power office that has reach in all ministries. In turn, that office should have the following characteristics: 1) be staffed with a multidisciplinary team (e.g. including medical doctors, scientists, engineers, jurists, economists); 3) work on a clear mission that is as wide as possible but as narrow as necessary; 4) be equipped with an effective delegation mechanism; and 5) focus, among other tasks, on the design of mission-specific, high-resolution maps, which are critical to understanding the system and its dependencies. Such maps would make it possible to identify holes and weaknesses in the system.

Figure 4. An example: mapping the global food system



Source: Presentation of Gaetán de Rassenfosse, available here

Masaru Yarime, Associate Professor at the Hong Kong University of Science and Technology, focused on the role of data-driven innovation for social good. Promising experimental approaches will need to be based on stakeholder participation and engagement and can help develop personalized advice and services, for example based on the integration of environmental and health data. He also argued that data-intensive approaches with an evaluation of risks will be increasingly introduced into policy making. Privacy and security concerns and challenges in the governance of data circulation in the innovation system will need to be addressed. For these approaches to succeed, citizens' trust in institutions for data governance will be key.

The panellists agreed that the use of data can help accelerate system transformations. Maria Savona gave the example of the EU data governance act that creates a data market with intermediaries that act on behalf of individuals. She sees, however, a lack in precision on how this will work. A balance needs to be found between the scale of data gathering and the preservation of privacy and individual rights so as to be able to build trust. Experiments, for instance in the form of regulatory sandboxes and living laboratories, are good ways to test policy approaches.

The discussion confirmed that current governance structures are inadequate to fully tackle system transformations. Systemic transformations require a broad view of societal trade-offs, take a long time to materialize and therefore a partial solution can only be offered by independent bodies that exist across government terms. It was also pointed out that in some cases an international group could be better in facilitating transformations than a national one.

Tiago Santos Pereira, Principal Researcher at the Centre for Social Studies, University of Coimbra (Portugal), concluded the session by distilling the main takeaways of the first day of discussions. He pointed out that the discussions reflected two existing parallel priorities in STI policies: one related to the setting of R&D targets and its socioeconomic impacts, and another one related to digitalisation and its contribution to innovation and societal change more broadly. A broader remit for STI policy would require social consent and engagement. He also highlighted the increasing complexity and change in vocabularies in the domain of STI policy, where innovation is not an objective in itself but a means of reaching the needed systems transformation.

DAY 2. HIGH-LEVEL POLICY DISCUSSION

The second day of the event featured high-level policy discussions on future directions for innovation policy based on perspectives from policy makers and business representatives.

Dirk Pilat, Deputy Director of the OECD Directorate for Science, Technology and Innovation, started by listing a number of strengths and limitations of using R&D intensity as a policy target. He observed that COVID-19 brought more challenges and that STI systems were not very well equipped to react to shocks, with more agility necessary. However, shocks also offer opportunities to change direction and build back better: since the pandemic, many countries are focusing on the objectives of building systems that are more inclusive, resilient and environmentally sustainable. This has reinforced the trend towards increased directionality in STI policy. A main challenge ahead is to break policy silos and to design and implement coherent and coordinated policy actions.

He concluded by listing three key questions: (1) how can we put new approaches into practice?; 2) what can we learn from policy experiences during the COVID-19 crisis, and what does it mean for policy moving forward?; and (3) how can international exchanges help in shaping the post-pandemic future?

Antti Vasara, President of EARTO and CEO of VTT, emphasised the need to have a systemic and integrated innovation policy approach, which needs coordination to reach targets. A study performed 10 years ago by the Ministry of Economic Affairs in Finland already pointed to three key messages that are still critical today:

- Designing STI policies that take a holistic view, embracing both public and private actors. This has traditionally been the role of the Research and Innovation Council in Finland, although individual prime ministers also have a significant impact on how policies take root and how policies translate into action.
- Looking at the totality of innovation from fundamental research to commercialisation, and having well-working public-private partnership efforts and mechanisms to connect actors together are extremely important.
- Predictable public policies and stable public spending for the private sector to invest.

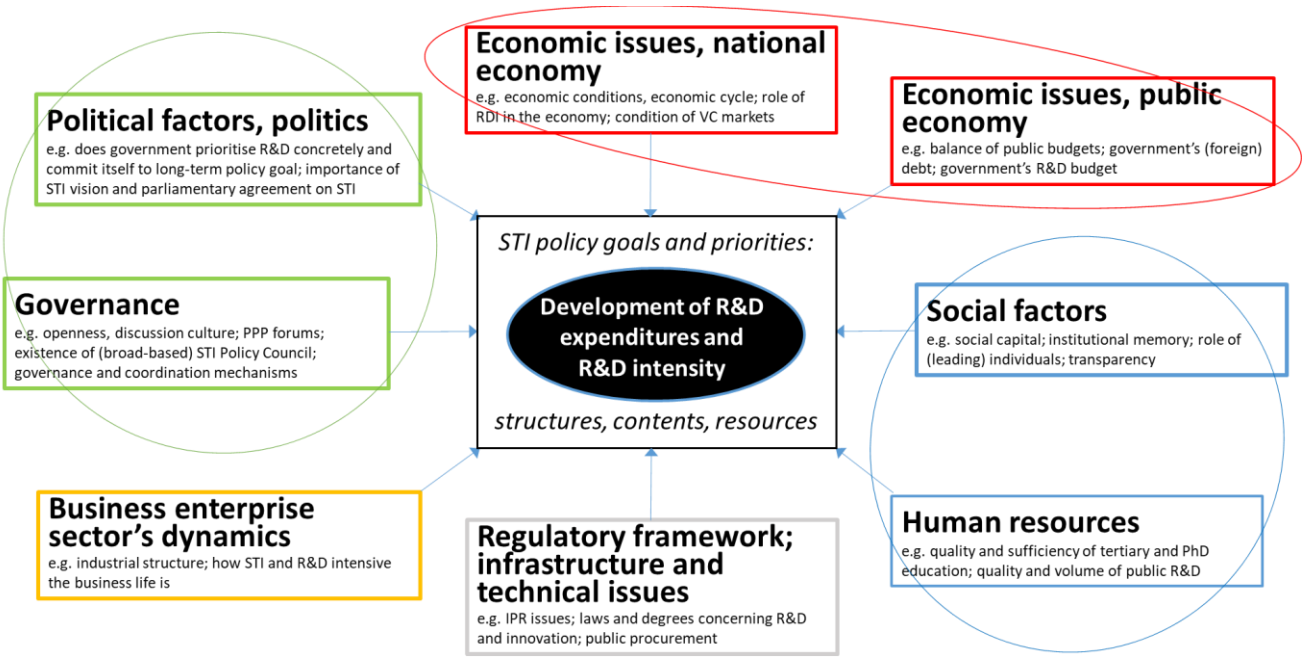
Source: Presentation of Antti Vasara, available here.

He briefly narrated the long-term evolution of R&D intensity in Finland, noting that the country was able to almost always meet its targets across 40 years of ambitious growth. The financial crisis and its aftermath have made it more difficult to continue this trend.

Taking a look at the current context, he stressed that the best form of building resilience to shocks is to invest in long-term capabilities in research and innovation. He also explained that VTT's analysis suggest that the best STI initiatives are the ones that create incentives and tools to bring different actors together in innovation ecosystems. Public-private partnerships are a core tool and need to be strengthened. He concluded by emphasising that research and technology organisations (RTOs) bring value in a variety of ways, including by having excellence in specific technical areas. They serve to speed up and scale up academic research.

Kai Husso, Chief Planning Officer at the Ministry of Economic Affairs and Employment of Finland, provided an overview of R&D developments and R&D policy actions in Finland over the past 15 years. He explained that the events affecting Nokia and the forestry sector in Finland after the financial crisis led to a "lost decade" starting in 2008. GDP and productivity both declined, and the productivity gap between Finland and its OECD peers widened. In 2017, an OECD Review of Innovation Policy was conducted in Finland, which provided important insights for policy makers to enhance STI performance in the country. He then referred to the case study developed by Finland in the context of the TIP R&D intensity project, which identified key factors affecting R&D intensity and funding over time, including social factors, governance, political factors, and business dynamics, among others (Figure 5). He concluded by explaining that Finland increased funding available for R&D, with the aim of reaching 4% of GDP by 2030. The government set up a parliamentary working group that will outline possible incentives to be announced as part of the 2022 budget in September 2021 and later this year.

Figure 5. Drivers of R&D intensity at national level: a multi-factor model



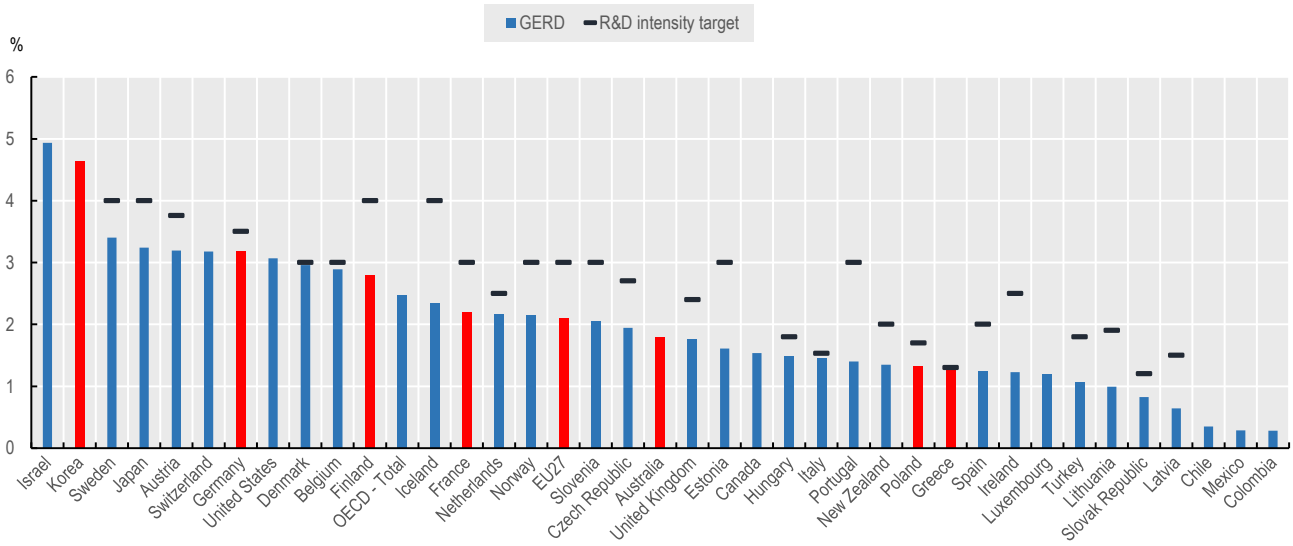
Source: Presentation of Kai Husso, available here

Caroline Paunov and **Sandra Planes-Satorra**, from the OECD Directorate for Science, Technology and Innovation, presented some key lessons from the case studies of the TIP R&D intensity project, available at http://oe.cd/tiprd. They explained that while other STI targets exist, R&D intensity is by far the most popular STI target (Figure 6). However, they drew attention to the fact that: 1) R&D intensity levels do not reflect geographic, sectoral and firm disparities; 2) the role of R&D varies across sectors (e.g. manufacturing tends to invest more in traditional R&D than services sectors), and therefore R&D intensity is largely a reflection of the industrial composition of countries; 3) R&D is often concentrated in a few leading firms; 4) Policy mixes supporting business R&D are shifting towards tax incentives in many countries, which limit the capacity for directional policy, among other implications.

They also highlighted several key policy lessons: R&D targets should not be used in isolation, and should be accompanied by strategic vision and direction; R&D strategies need to be tailored to specific research and innovation ecosystems; and participatory governance models and political commitment are essential for systemic changes.

Figure 6. R&D intensity and targets in selected economies, 2019

As percentage of GDP

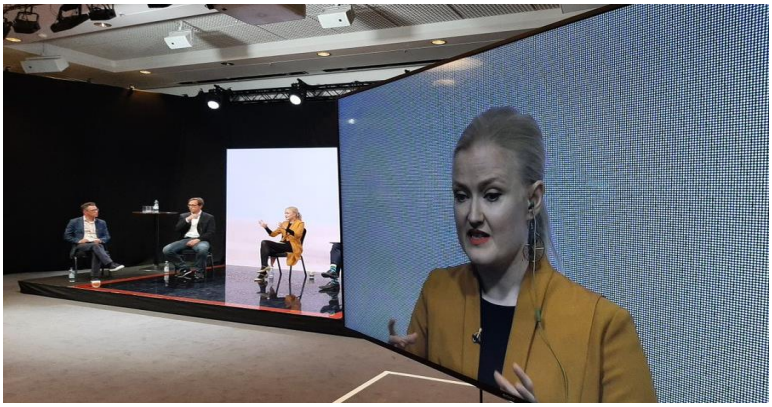


Note: Ten countries and the European Union, that contributed case studies to the TIP R&D project, are highlighted in red. The graph also illustrates the current R&D intensity targets across countries. For most countries, targets are for 2020, except for Turkey (2023), Germany (2025), United Kingdom (2027), and Finland, Norway and Portugal (2030).
Source: Presentation of Caroline Paunov and Sandra Planes-Satorra, available here, based on OECD (2021), "Main Science and Technology Indicators", OECD Science, Technology and R&D Statistics (database), https://doi.org/10.1787/data-00182-en (accessed on 01 April 2021).

Panel 3 - Industry perspectives on R&D activities and policy support

Jaakko Hirvola, CEO Technology Industries of Finland, explained that from the Finnish tech-industry perspective four key issues are of importance to driving R&D:

- Access to national and EU R&D funding should be enhanced: firms (especially small ones) face important barriers to accessing EU funds due to the complexity of application processes. Public funding ats as a seed for private investment and growth.
- Access to skills: the mobility of high-skilled individuals should be promoted, and programmes should be established to attract foreign talent. Localized academic-industry clusters are still highly relevant in the context of access to skilled human resources for innovative enterprises.
- Appropriate regulatory frameworks: the establishment of the minimum of regulation that is necessary, which should be technology neutral. For innovation in the tech industry, test beds and regulatory sandboxes can be very helpful instruments.
- Appropriate and business-friendly operating environment.



Annu Nieminen, Founder and CEO of Upright, highlighted that it is crucial to understand the different types of R&D and how well each contributes to the specific outcomes we are looking after. It is important to differentiate between at least two dimensions: (1) incremental versus transformational R&D, and (2) the primary impact and the role of R&D (i.e. boosting commercial success of one company or contributing to the broader society). According to Annu Nieminen**,** a positive example of policy is the Sustainable Finance Disclosure Regulation (SFDR) implemented for the finance industry in the EU in early 2021. This regulation obliges finance companies for the first time to report on financial risks of sustainability factors but also on the actual impact of business on sustainability (double materiality of sustainability). While the regulation mainly quantifies the principle of adverse impact and disregards value creation, it is considered a step in the right direction to focus on and incentivize investments that have a holistically positive yield and a transformational potential.

Timo Ahopelto, Founding partner of Lifeline Ventures, stressed that radical innovation often does not happen in big firms. Radical innovation depends on bright individuals and entrepreneurs. But talent needs to be everywhere, not only in the start-ups but also in the R&D centres of multinational corporations – as is for example the case in Israel and Canada, where tax incentives and other systemic policies are used to attract the R&D centres of multinational firms. He also argued that, while policy is crucial in setting the stage for talent attraction, an important insight on how scale-ups grow is that they do not wait for talent to show up or for countries to get their talent attraction frameworks right; instead, they go after the talent and open up offices around the globe.

Another key insight brought up during the industry session is that currently competition happens at the level of cities and not necessarily at the level of countries. With every city

wanting to become a tech hub, this competition enriches the whole European tech ecosystem. Timo Ahopelto argued that competition between countries can be dangerous, while competition between cities makes everyone better off, as the market for technology and innovation is big enough for all actors involved to benefit. When asked about the need to focus on either competition or cooperation when facing common problems, Annu Nieminen responded that when problems are large enough, collaboration is needed. The panellists also agreed that competition goes hand in hand with technological innovation.

When **Matthias Deschryvere,** Senior Research Scientist at VTT Technical Research Centre for Finland, brought up the fact that innovation can amplify the inequalities between regions, the panellists stressed that innovation should not be hindered because of inequality fears. Complex challenges such as climate change all require innovative solutions. Decisions have to be taken subsequently as to how to distribute the income generated by such activities, to avoid leaving anyone behind. Jaakko Hirvola remarked that regions should specialise in areas of innovation in which they have a comparative advantage, and set the bar high.

A final insight showed that while COVID-19 has brought stress and challenges to our societies, for business it has also created opportunities – for example in the digital healthcare space. Especially for VC-backed start-ups that have no clients yet, the pandemic has made it possible to focus on improving internal processes. After all, compared to the 10-year start-up cycles of ambitious firms, the one-year-long period of lockdowns is relatively short.

High-level policy roundtable: Innovation and innovation policy post-COVID-19

In short

The high-level roundtable focused on the COVID-19 pandemic, and speakers emphasised that RDI, STI and entrepreneurship activities have been quite resilient during the crisis, contrary to the expectations. An important question in the light of the global pandemic was raised: **can purpose-, need-, or mission-driven innovation policy be a driver of international collaboration?** This would seem desirable and could still be boosted further. Panel members also stressed the need for increased cross-sector collaboration, open science and innovation and multi-disciplinarity in tackling STI and SDG objectives, once again pointing to **the need for increasingly systemic and collaborative action. A challenge in this context was also raised: the issue of sovereignty in the STI arena.**

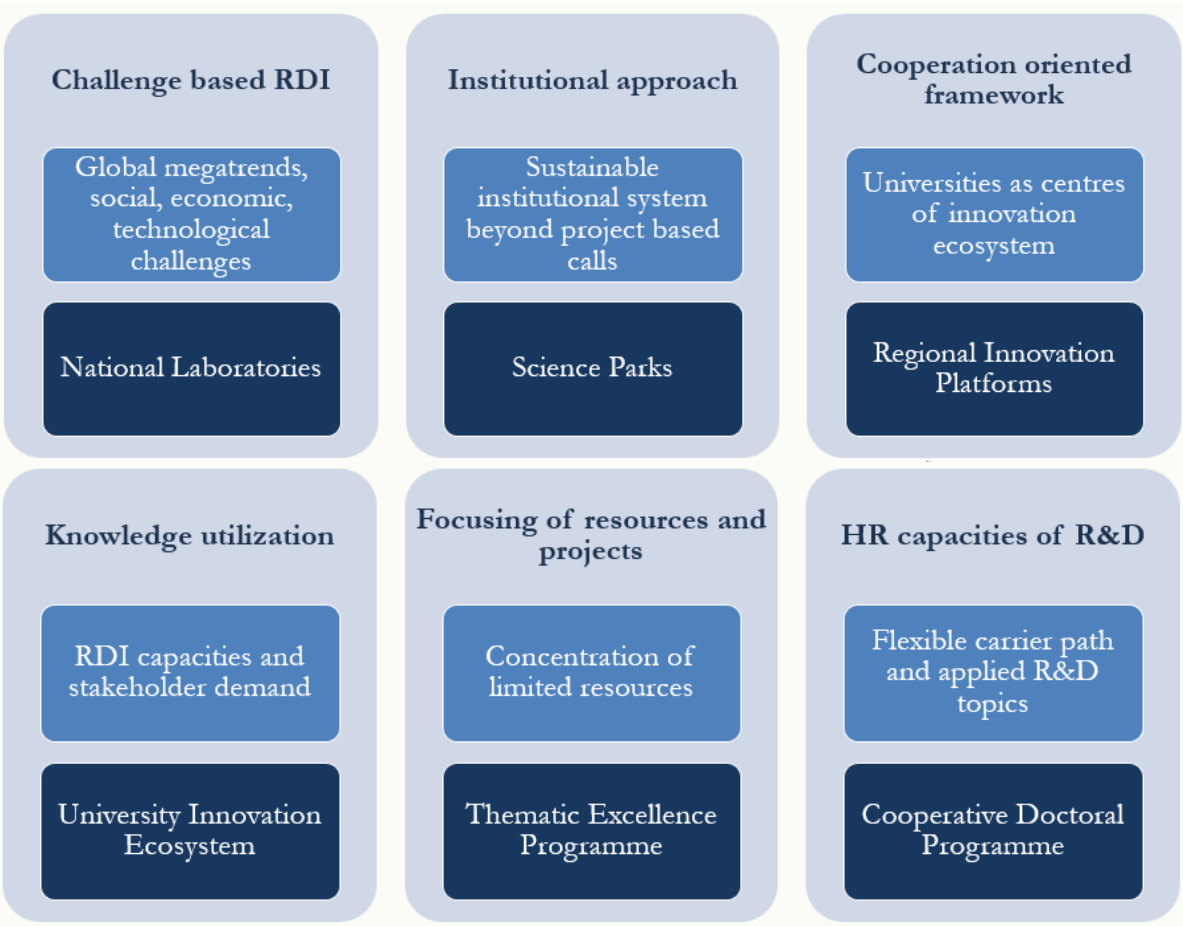
Julien Guerrier, Director of the Common Policy Centre, DG Research and Innovation of the European Commission, started by emphasising that countries were already facing a fast-changing context before the COVID-19 crisis, with climate change, growing inequalities and the changing dynamics of innovation in the digital age; the pandemic has accelerated all of these trends. Overall, the crisis demonstrated that research and innovation are essential to respond to the health crisis. Several innovative practices at the EU-level have been nudged by the crisis: (1) enhanced flexibility in existing EU policy instruments, (2) reinforced purpose-driven cooperation between sectors and disciplines, and coordination between countries to address complex challenges by giving directionality to funding on R&I, (3) increased focus on open innovation and open science (e.g. with the organisation of the *EUvsVirus* hackathon followed by a *matchathon*, the launch of the European COVID-19 platform for metadata, etc.).

Michiel Sweers, Director of Innovation and Knowledge at the Ministry of Economic Affairs and Climate Policy of the Netherlands, explained that an overall decline in R&D investments in the Netherlands was not observed during the crisis, but sectoral differences did appear. Sectors that undertook earlier investments in digitalisation tended to perform better. In terms of policy reactions, the Netherlands responded quickly with broad schemes following the principle that "it is better to overshoot that to be too limited in your actions". In the field of R&D policies, the country targeted sectors and firms that were hardest hit, for instance by raising the budget for tax credits for R&D investments by SMEs, by introducing grants for the automotive, aeronautics and maritime industry and by introducing new funds to start-ups and scale ups in the deep tech sector.

He then emphasised that the crisis accelerated existing trends, such as the vulnerabilities of supply chains, highlighting the need for building more resilient systems. The pandemic has showed the Netherlands the power of mission-driven innovation policies in delivering massive and rapid results based on large scale public-private partnerships, international collaboration, open innovation and a government that is willing to give direction and take risks. This experience strengthened the belief of Dutch policy makers that their mission-oriented innovation policies are on the right track. Thanks to appropriate preparation and investment in agile approaches, however, fundamental changes in STI policy will not be necessary.

István Szabó, Vice President for Science and International Affairs, National Research, Development and Innovation Office of Hungary (NKFIH), underlined that in Hungary two existant trends were accelerated by the pandemic, namely the increasing cooperation between domestic partners and between domestic and international partners. Hungary reacted swiftly to the pandemic by building up its own capacities to move towards self-sustainability. The Hungarian system took a clear mission-driven approach in that it posed challenges to the researcher community and to do so it institutionalized a system of national laboratories with critical mass that focused on challenge-based RDI. In addition, Hungary paid more attention to the quality of research by setting up advisory activities and a drive towards openness. A key lesson learned is that international cooperation platforms that were established during the pandemic played a crucial role for sharing knowledge and finding solutions and that similar actions concerning the climate crisis and other societal challenges should be made more visible by the international community and the OECD.

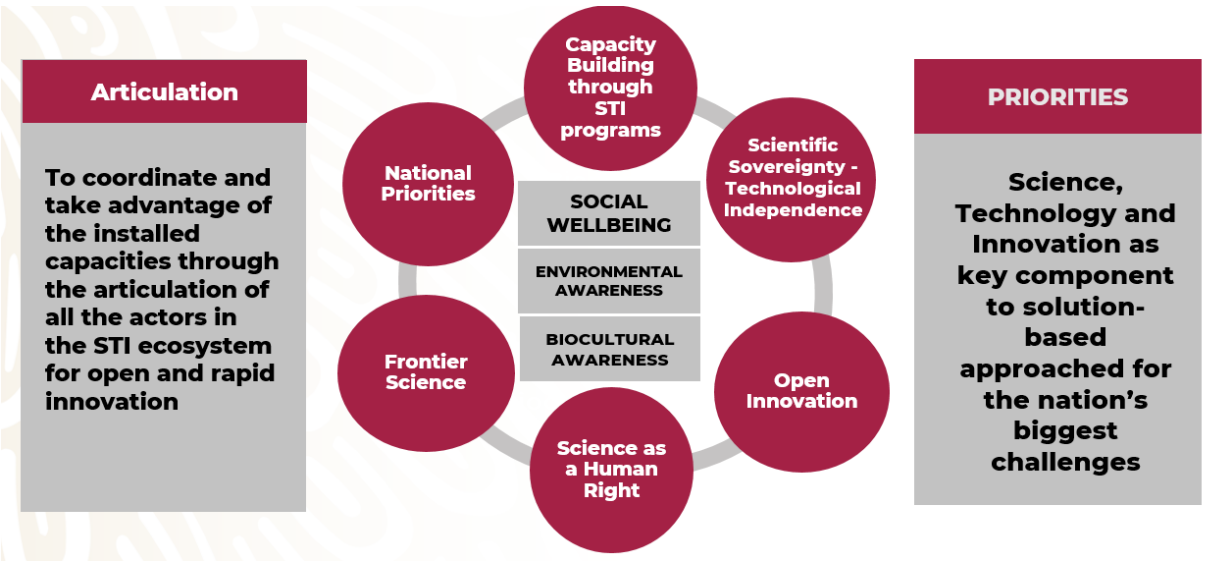
Figure 7. Pillars of post-COVID-19 innovation policy of Hungary



Source: Presentation of István Szabó, available here

Carlo Andrés Altamirano Allende, Director of Planning and Evaluation of the National Council on Science and Technology (Conacyt) of Mexico, told the audience Mexico has been following a solutions-oriented approach with strategic national programs to fund research that is in line with the UN Sustainable Development Goals (SDGs) but are specifically tailored to the context in Mexico. In this sense, human and environmental wellbeing have been placed at the centre of STI policy initiatives and programmes (Figure 8). He stressed that an important question is also how the processes of government agencies can be innovated so as to react optimally to complex challenges such as the pandemic. A main lesson learned in Mexico during the crisis is that, to advance more rapidly, science needs to be more democratic and inclusive, with an emphasis on openness.

Figure 8. New STI policy approach in Mexico



Source: Presentation of Carlo Andrés Altamirano Allende, available here

According to the high-level policy roundtable panel, the main takeaway is the importance of international collaboration and internationalization in solving challenges. While we have a good basis to increase international cooperation, we need to move beyond national solutions and increasingly open research programs for global collaboration to be able to better tackle the challenges that our societies and planet are facing.

More information

Event website (including agenda, background report, presentations): http://vttresearch.com/rd-post-pandemic

Project website (containing all project outputs, include 11 country case studies): http://oe.cd/tiprd

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- OECD: Caroline Paunov (Caroline.PAUNOV@oecd.org) and Sandra Planes-Satorra (Sandra.PLANESSATORRA@oecd.org)
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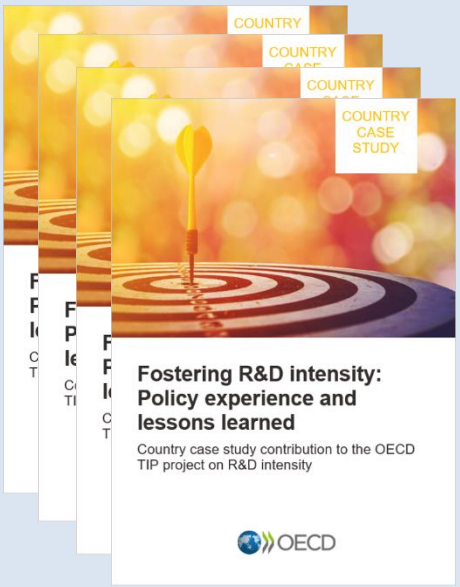
FEATURED PUBLICATIONS

On the impacts of the COVID-19 pandemic on STI

- Paunov, C. and S. Planes-Satorra (2021), "**Science, technology and innovation in the time of COVID-19**", *OECD Science, Technology and Industry Policy Papers*, No. 99, OECD Publishing, Paris, https://doi.org/10.1787/234a00e5-en
- Paunov, C. and S. Planes-Satorra (2021), "**What future for science, technology and innovation after COVID-19?**", *OECD Science, Technology and Industry Policy Papers*, No. 107, OECD Publishing, Paris, https://doi.org/10.1787/de9eb127-en.

On countries' policy experiences in targeting R&D investments

- **11 country case studies**: Australia, Finland, France, Germany, Greece, Hungary, Ireland, Korea, Netherlands, Poland, European Union
- **Synthesis report** providing an overview of lessons from the 11 case studies



The case studies and synthesis report are available at: http://oe.cd/tiprd