Science and technology policy: Shared challenges, transformative actions

OECD Scientific and Technological Policy Ministerial

DEVELOPING A SHARED AND ACTION ORIENTED AGENDA IN SCIENCE AND TECHNOLOGY

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Why a CSTP ministerial

The twin crises of climate change and biodiversity loss, in the context of lessons learnt from the COVID19 pandemic, as well as the changing geopolitical context in which science, technology and innovation (STI) governance operates, call for a rethink of STI policy frameworks, practices and multilateral cooperation. We face a disruptive moment in which previous assumptions may no longer hold – the near future may look considerably different from the recent past.

The CSTP Ministerial 2024 aims to

- Deliver an action-oriented Declaration: endorse a transformative research and innovation policy agenda to address the climate challenge and support the responsible development of science and technology based on shared values
- Help raise the profile of STI policies within other policy domains, with a view to promoting cross-government cooperation on sustainability transitions
- And provide a roadmap for CSTP work in the years to come

and is organised along 3 pillars

Engagement

Engage society and strengthen multi-sectoral and multi-lateral dialogue in science and innovation.

Action

Implement transformative science and innovation policies (S&T Policy 2025).

Values

Support the responsible development of science and emerging technologies.

ACTION builds on S&T Policy 2025

We have developed a concept – S&T Policy 2025 – to help rethink, redesign and implement a more effective generation of STI policies for sustainable transitions. This ambitious agenda calls for:

- new modes of cooperation between the public, private and non-profit sectors, as well as between different policy domains across governments;
- new forms of engaging society in science and technology development, possibly articulated in a new social compact for science and technology; and
- a new paradigm for international cooperation in STI aimed at mobilising science and technology for global commons, and promote shared norms and values for the responsible development of emerging technologies.

And requires investment in strategic intelligence

The current knowledge and evidence base that supports policy decisions, such as evaluation and statistics, struggles to cope with the complexity and uncertainty of STI-enabled sustainability transitions. Governments need to invest in their “strategic intelligence” capabilities to monitor and evaluate sociotechnical transitions, and to formulate, design and implement effective STI policy agendas and measures

Source: OECD, STI Outlook 2023, chapter 3

Developing S&T Policy 2025 guidance: 3 layers

Overarching guiding vision and policy framework

Guiding star: commitments that should underlie policy practice and serve as a compass to guide policy reforms enabling just sustainability transitions

Policy reform agenda and actions

What reforms are needed in a certain area and why? What 'directions' should STI policy makers follow?

Key Policy Challenges Toolkit

Step-by-step online policy guidance on defining the policy challenge, mapping the system, and sequencing actions

Developing S&T Policy 2025 guidance: vision

Overarching guiding vision and policy framework

Guiding star: commitments that should underlie policy practice and serve as a compass to guide policy reforms enabling just sustainability transitions

Sustainability	Ensure STI policies support economic, social and environmental sustainability by promoting equality, supporting ecosystem resilience, and promoting system change, without compromising the ability of future generations to meet their own needs
Diversity	Promote resilience by supporting a range of research and technology areas involving a range of actors working on different challenges, beyond the realm of traditional STI actors
Inclusivity	Support broad participation in science and innovation and sharing of resources that contribute to transparency, trust and collaboration, while targeting the development of solutions that provide equal access and opportunities for society and promote social justice
Agility	Encourage the ability to move quickly and timely in tackling societal challenges like net-zero, supporting the acceleration of change through experimentation and adaptation of research, innovation and governance systems
Ethics	Nurture norms and principles that foster progress towards sustainability, promote justice and fairness, and account for the trade-offs emerging among multiple system dimensions by proposing actions that are consistent with the “greater good” and “what’s right”

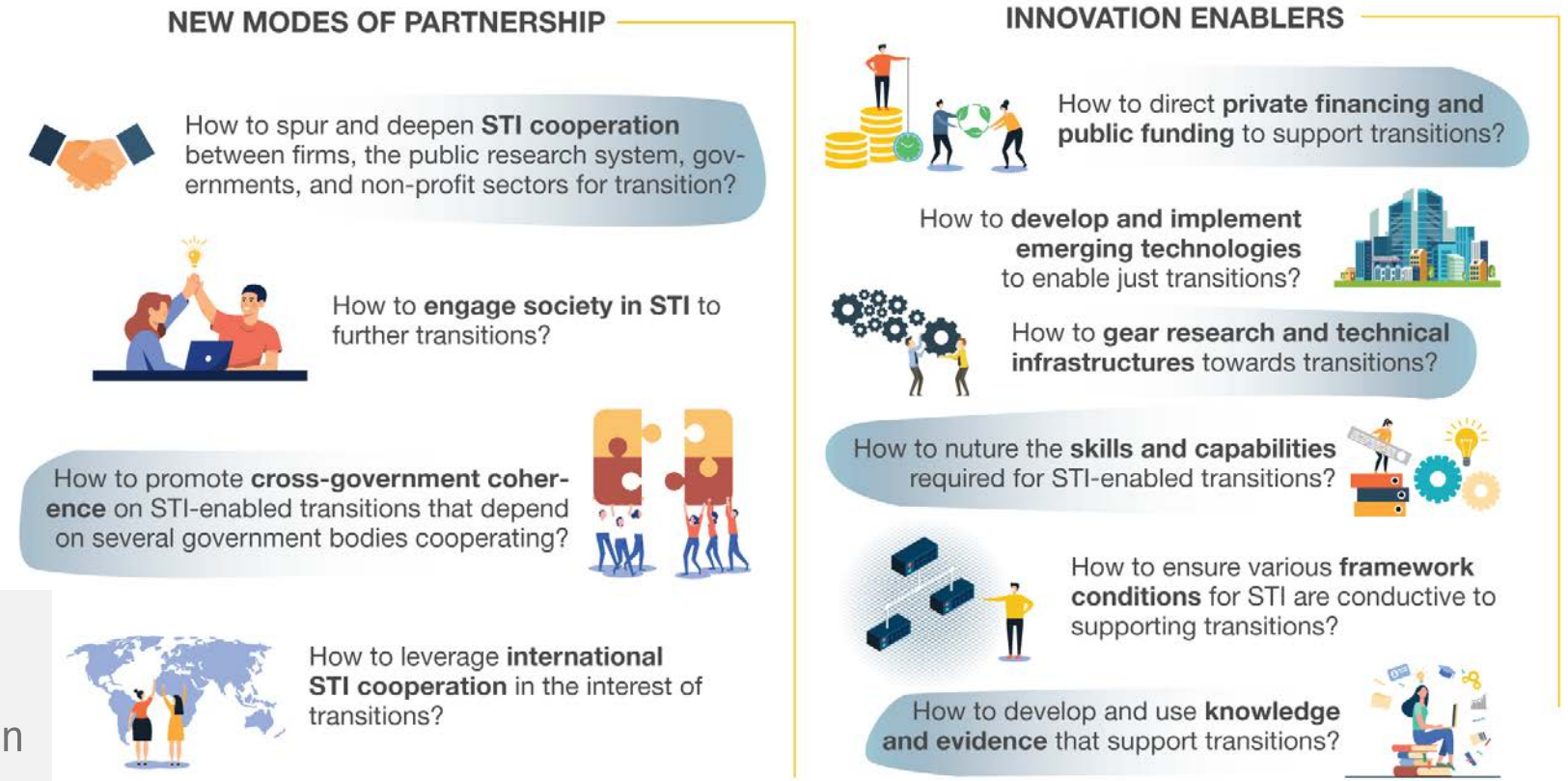
Source: OECD, STI Outlook 2023, chapter 3

Developing S&T Policy 2025 guidance: policy reform

Policy reform agenda and actions

What reforms are needed in a certain area and why? What 'directions' should STI policy makers follow?

- ❑ Societal engagement
- ❑ Cross-government coherence and coordination
- ❑ Skills and capabilities
- ❑ Funding and financing
- ❑ Multilateral action



Source: OECD S&T Policy 2025 project website, https://www.oecd.org/sti/inno/stpolicy2025

Developing S&T Policy 2025 guidance: example

Policy reform agenda and actions

What reforms are needed in a certain area and why? What 'directions' should STI policy makers follow?

How to **engage society in STI** to further transitions?

- What is societal engagement in science, technology and innovation and why is it essential for transitions?
- What are the varieties of societal engagement in STI? E.g. participation in STI activities; participation in STI policy development; STI communication through museums, the media, etc.
- Where in the innovation chain and STI policy cycle is societal engagement useful? E.g. during technology development, at the policy agenda-setting stage, etc.
- What does a desirable vision for societal engagement in STI look like? E.g. diverse and representative, multi-directional learning, usable outputs for STI policy, etc.
- What are the main barriers to achieving this vision? E.g. time and resource constraints, lack of trust, perceived lack of value, capability constraints
- What policy actions could improve societal engagement in STI and contribute to transitions? E.g. creating spaces and institutions that support experimentation in societal engagement in STI; improving scientific literacy; promoting transdisciplinary research, etc.
- What country policy examples offer useful lessons?

Developing S&T Policy 2025 guidance: toolkit

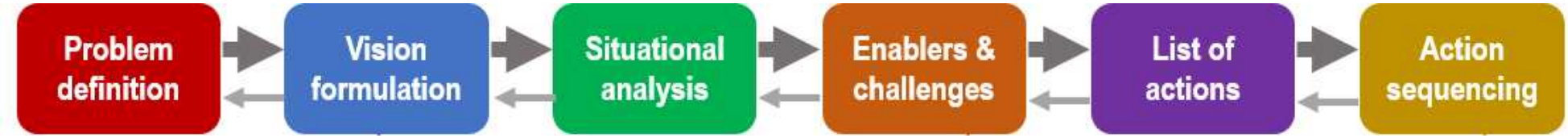
Key Policy Challenges Toolkit

Step-by-step online policy guidance on defining the policy challenge, mapping the system, and sequencing actions

Societal engagement module (pilot)
- Engaging citizens in STI policymaking
- Promoting citizen participation in science and technology activities

International STI cooperation module (pilot)
- Promoting international STI cooperation to better manage common pool resources (such as biodiversity)
- Supporting international technology diffusion and deployment in less developed countries

Candidate topics in other modules, e.g.
- Promoting transdisciplinary research
- Funding high risk / high reward research
- Developing future skills for sustainability transitions
- Using blended finance across the low-carbon innovation chain
- Orienting PRIs / RTOs for transformative change
- Embedding upstream and anticipatory technology governance
- Monitoring and evaluating STI policy for sustainability transitions



VALUES builds on an anticipatory framework for emerging techs

- ❑ Evolving
- ❑ Potential high social impact or controversy
- ❑ Enabling broad range of applications

Values

Support the responsible development of science and emerging technologies.

[Brain computer interfaces](), OECD 2022

The Time for Geoengineering Is Now

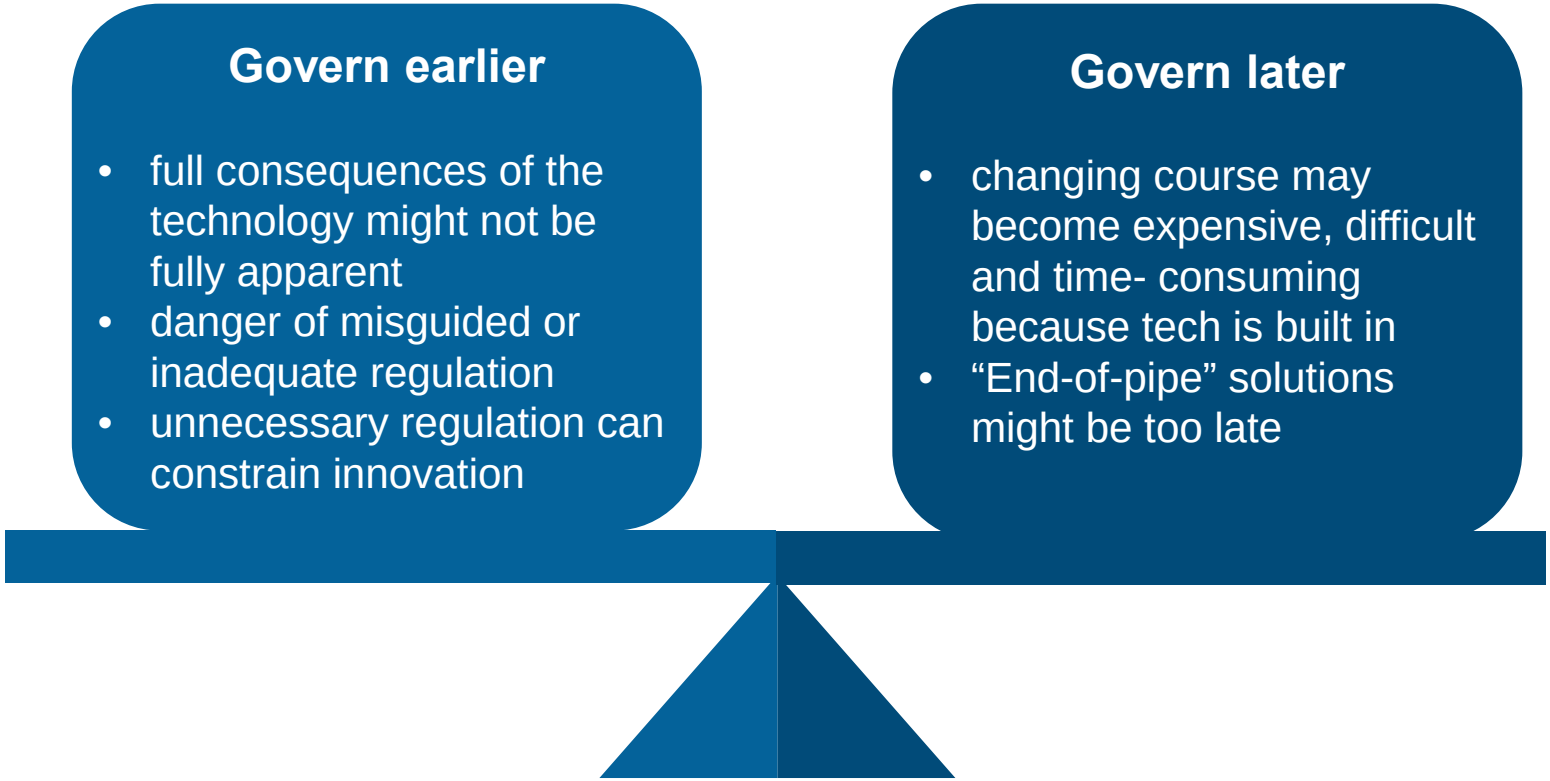
Drastic Climate Change Calls for Drastic Measures

[Foreign Affairs, October 2022]()

VALUES builds on an anticipatory framework for emerging techs: Collingridge dilemma

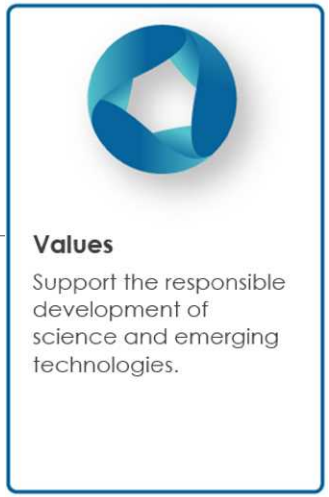
Values

Support the responsible development of science and emerging technologies.



Under “uncertainty” traditional regulatory instruments might focus on the management of immediate or quantifiable consequences or enter only after key decisions about technology design have been made

VALUES builds on an anticipatory and common framework for emerging techs



Global challenges have implications for national and international technology governance systems

A common Framework helps governments design national governance systems with an international outlook (**prerequisite for international collaboration** on emerging tech governance):

- ❑ **Might reinforce commitment to shared values**
  (e.g. human rights, responsibility, integrity, ethics, international co-operation and democratic governance)
- ❑ **Might pave the way for the development of common international approaches**
  (e.g. in strategic intelligence, stakeholder and societal engagement, and soft law tools like OECD recommendations)

Ministerial event structure (agenda in the making)

Day 1 - Multistakeholder high-level Dialogue: Engaging actors to realise the potential of science and technology

- Consider the opportunities that science and innovation offer in **tackling global challenges**, and identify existing and future barriers to realising this ambition
- Encourage **in-depth dialogue** on the role that governments and other stakeholders have in supporting sustainable transitions via science and technology, without leaving anyone behind
- Consider how societal values and public interest should be embedded in technology developments and **what government and industry should do** for the responsible development of new technologies

Participants: High-level with some ministers – CSTP Bureau Ministers, Ministers from non-OECD Members, and high-level representatives from other fields businesses, academics, entrepreneurs, chief scientists, etc. depending on the sessions

Multistakeholder dialogue: Engaging actors to realise the potential of science and technology

Plenary: Future frontiers in science and technology: how to engage future generations?

Breakout: **The future we want in science and technology**
Inclusivity, diversity, societal engagement in science and technology

Breakout: **Equipping society in a fast-changing world**
S&T skills and capabilities for transitions

Breakout: **Protecting the future with science and technology**
Actions for climate and biodiversity

Plenary: Societal effects and public policy implications of science and technology futures: policy tools and resources for policy making

Ministerial event structure (agenda in the making)

Day 1 & 2 – Ministerial meeting: Getting it right – New S&T policy approaches for transformative change

- Strengthen international cooperation in science and technology and **identify concrete actions to address climate challenges**
- Create a **common understanding and shared agenda** for transformational change in science and technology and identify where government should be leading, and where other stakeholders should be empowered
- Establish a dialogue and **promote coordinated and collaborative approaches** to anticipatory governance of emerging technologies

Ministerial meeting: how do we deliver the change?

Panel: Getting it right – how to do science and technology policy in times of disruptions and transitions?

VALUES

Responsible science and technology: aligning values for good governance

Develop consensus on common values and goals in science and tech development and concrete actions for international cooperation in this area

ACTION

Getting it right: transformative science and technology approaches for climate challenges

Highlight policy experimentation with directional and inclusive STI policies and endorse a shared agenda on scaling these up

ENGAGEMENT

Joined up science, technology and innovation actions for global challenges

Join up science and technology actions for the climate challenge: where do we see scope for international action?

Ministerial meeting: how do we deliver the change?

Getting it right – New S&T policy approaches for transformative change

VALUES

Responsible science and technology: aligning values for good governance

Develop consensus on common values and goals in science and tech development and concrete actions for international cooperation in this area

Proposed theme:

Technologies for augmenting life: human rights and shared values

For example, engineering biology sees the augmentation of living systems to produce vaccines, manufacture chemicals and to capture carbon from the air. Neurotechnology is already augmenting the lives of debilitated patients and promises a revolution in brain-computer interfacing.

- ❑ What are the greatest challenges and opportunities for the increasingly rapid development of technologies for augmenting life?
- ❑ What values should drive their evolution, and how can they be ensured throughout the course of innovation?
- ❑ What international actions can be taken to promote shared norms and values for the responsible development of human-centered and challenge-driven technologies?

Ministerial meeting: 3 breakout sessions

Getting it right – New S&T policy approaches for transformative change

ACTION

Getting it right: transformative science and technology approaches for climate challenges

S&T POLICY 2025
Enabling Transitions through Science, Technology and Innovation

Highlight policy experimentation with directional and inclusive STI policies and endorse a shared agenda on scaling these up to enact the sorts of ambitious change global challenges call for

Plenary Themes - examples: Innovative funding and partnership models to direct science and innovation towards the climate challenge; Innovative skills and training programmes for the digital and green transitions

Breakout sessions: S&T Policy 2025 practical Guidance: the HOW

Engaging society in STI for transitions

HOW TO engage society in science, technology and innovation to further the green/twin transitions

Directing funding to address challenges

HOW TO direct private financing and public funding to support the climate challenge

Engaging the whole of government

HOW TO promote cross government coherence to support transitions

Ministerial meeting: how do we deliver the change?

Getting it right – New S&T policy approaches for transformative change

ENGAGEMENT

Joined up science, technology and innovation actions for global challenges

Join up science and technology actions for the climate challenge: where do we see scope for international action?

Focus on concrete actions governments and stakeholders could undertake in science and technology to cooperate on addressing global challenges. e.g. climate/biodiversity, one-health, with respect to selected policy issues (e.g. funding of R&D as a global public good, brain circulation, north-south knowledge exchanges, open science mechanisms, global missions) and discuss possible actions.

- ❑ Where do you see scope for international action around the chosen challenge?
- ❑ What are the top 1-3 challenges in implementing the action?
- ❑ What can the OECD, and in particular CSTP, do to support the implementation of the actions?

Outcomes and supporting deliverables

1) Action-oriented Ministerial Declaration centered on 3 pillars (engagement, action and values)
2) Supporting deliverables (to be welcomed in the declaration):
    a) Action Plan for S&T Policy 2025
    b) A policy framework for anticipatory governance of emerging technologies
    c) Potential launch of initiatives @ OECD: Launch of the Research and Innovation Careers Observatory; Launch of Technology futures programme (strategic intelligence for anticipatory governance of technology)
3) Potential commitments/concrete actions as milestones for other global initiatives (e.g. ocean science 2025 conference), Global Forum on Technology

Action-oriented Ministerial Declaration

Preamble	Current context, motivation, link to other work
Guiding Vision	Need for a more ambitious and transformative set of STI policies to guide policy reforms and facilitate transitions; key areas where change is mostly needed
Values	Recall common and shared values, norms and principles (e.g. respect for human rights, academic freedom and scientific inquiry, gender equality, and research integrity in international co-operation, and the responsible development of emerging technologies) and commit to STI policies that support … (e.g. sustainability, diversity, inclusivity, agility, ethics)
Engagement	On societal engagement and new forms of partnership; cross-ministerial coordination; areas for multilateral action to address challenges
Action	Welcomes the S&T Policy 2025 guidance, a framework for the governance of emerging technologies, other initiatives

S&T Policy 2025 Policy Guidance

Overarching guiding vision and policy framework

Informs the Ministerial Declaration

Policy guidance welcomed by the declaration
Informs key issues paper

x10

Module 'Actions'

What reforms are needed in this area and why? What 'directions' should STI policy makers follow?

x2/3 per module

Key Policy Challenge Toolkit

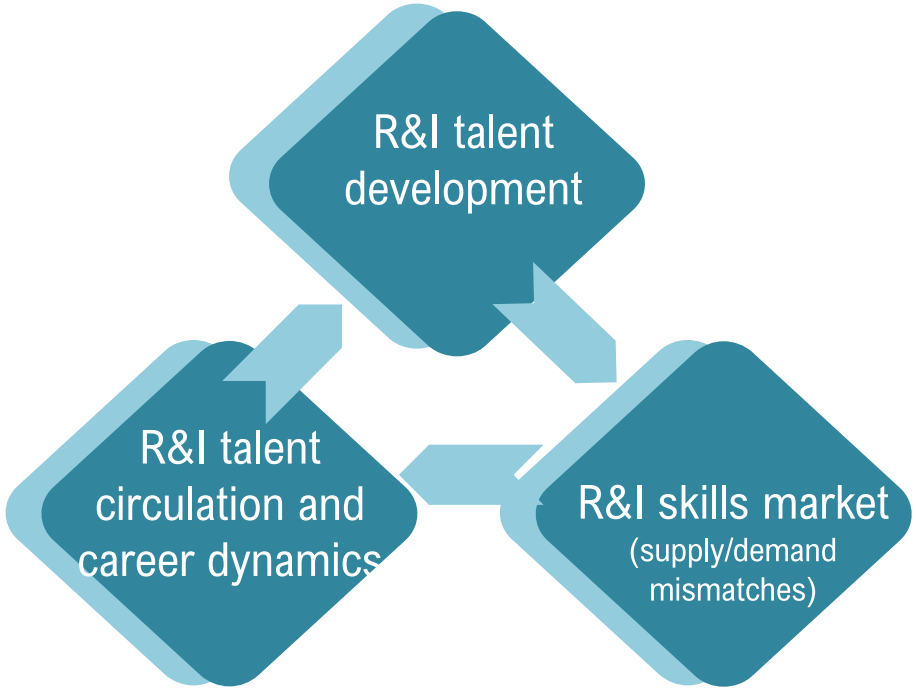
Step-by-step online policy guidance on defining the policy challenge, mapping the system, and sequencing actions

Linked Resources

- OECD Publications
- Case Studies Repository
- Policy Tools Briefs
- STI.Scoreboard Statistics
- STIP Compass

Launch of the OECD research and innovation careers observatory

- Launch of the ReICO observatory, in collaboration with the European Commission, with the aim to monitor R&I talent development, deployment and circulation across OECD and EU countries and partners.
- Multi-year initiative not only giving access to reliable and internationally comparable statistics, but also driving co-ordinated action towards filling data gaps and facilitate policy engagement in building and using effectively an evidence base on careers for policies to foster R&I systems



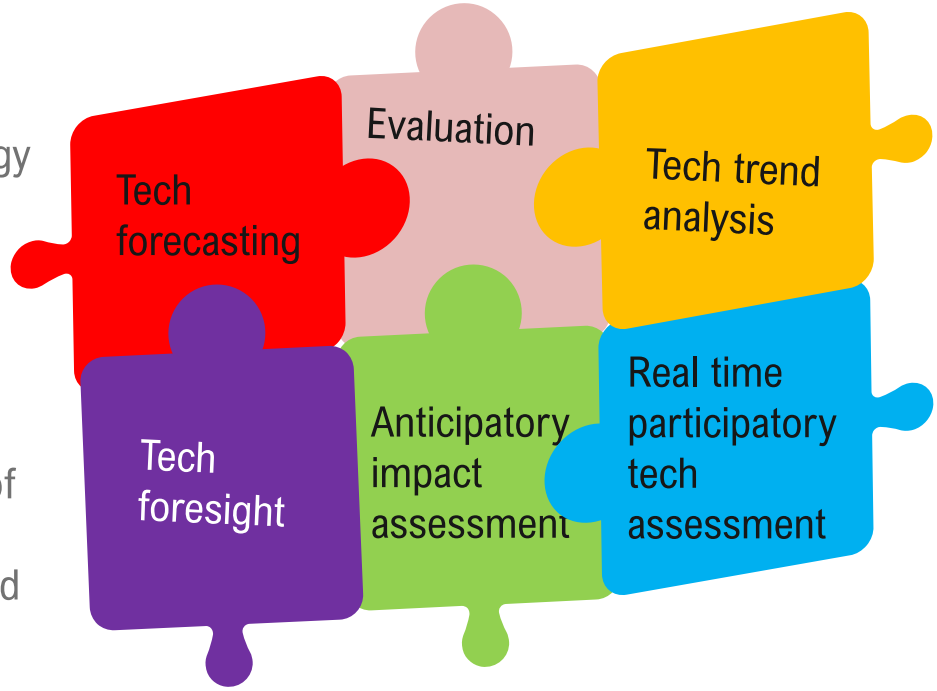
Potential launch of the OECD Technology futures initiative (strategic intelligence for anticipatory governance of technology)

- STI policies for transitions, such as mission-oriented and transformative innovation policies, target complex systemic problems with high uncertainty requiring countries to integrate complex data from a variety of sources with very different formats and natures.
- Crises, such as pandemics, require rapid response and scaling of solutions beyond a single science or technology area, requiring intelligence on portfolios of science and technology options as well as on the value chains that will produce solutions at scale.
- The OECD could be tasked to build technology governance capacity by facilitating coordination and collaboration in the area of technology assessment, technology foresight, anticipatory impact assessment, tech data analytics and tech mining communities.

OECD Technology futures initiative
(a support facility for anticipatory governance of technology)

Informing
Anticipatory Technology Governance

Facilitating
Sense making of emerging technologies and their potential impacts

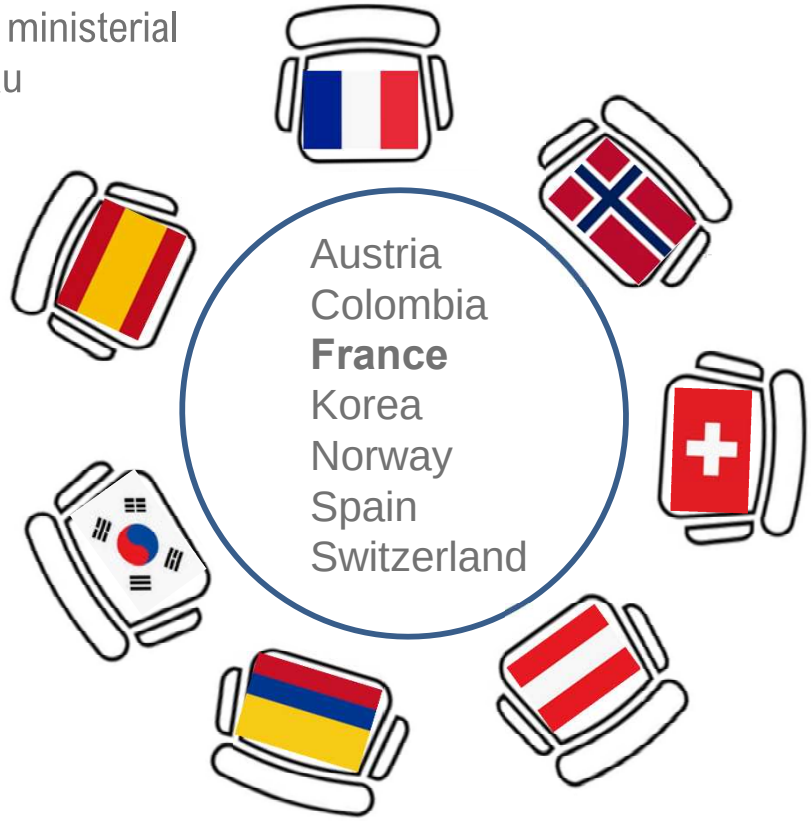


Supporting
Design, Implementation and Monitoring of policies

Coordinating
A shared forward-look to facilitate international cooperation in technology policy

CSTP 2024 Ministerial chaired by France

CSTP ministerial Bureau



CSTP 2024 Ministerial chaired by France

Sylvie Retailleau, ministre de l'Enseignement supérieur et de la Recherche

Discussion

- Which thematic discussions better resonate with the science, technology and innovation policy agenda in Japan?
- What would you be looking for in a discussion on the governance of science and emerging technologies and what are possible concrete actions for international cooperation in this area?
- Do policymakers in Japan have adequate access to expertise and resources to evaluate the societal effects and public policy implications of emerging technologies? Do you see scope for international coordination in this area and a potential role for OECD?
- Deliverables and outcomes – see preliminary list – which potential deliverable would your minister attach more value/find more useful? Perhaps it is not on the list, what is it?
- Concrete actions – what concrete and multilateral actions/commitments could be taken? Is there an action Japan would wish to spearhead?

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THANK YOU!

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