



Meeting new expectations on STI policy – the OECD's Transformative Agenda for STI policies

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



Outline

- Brief introduction to the OECD and its activities in science, technology and innovation
- The challenges facing STI today
- OECD Transformative Agenda for STI Policies
- OECD Framework for Anticipatory Governance of Emerging Technology
- Future activities on Strategic Intelligence

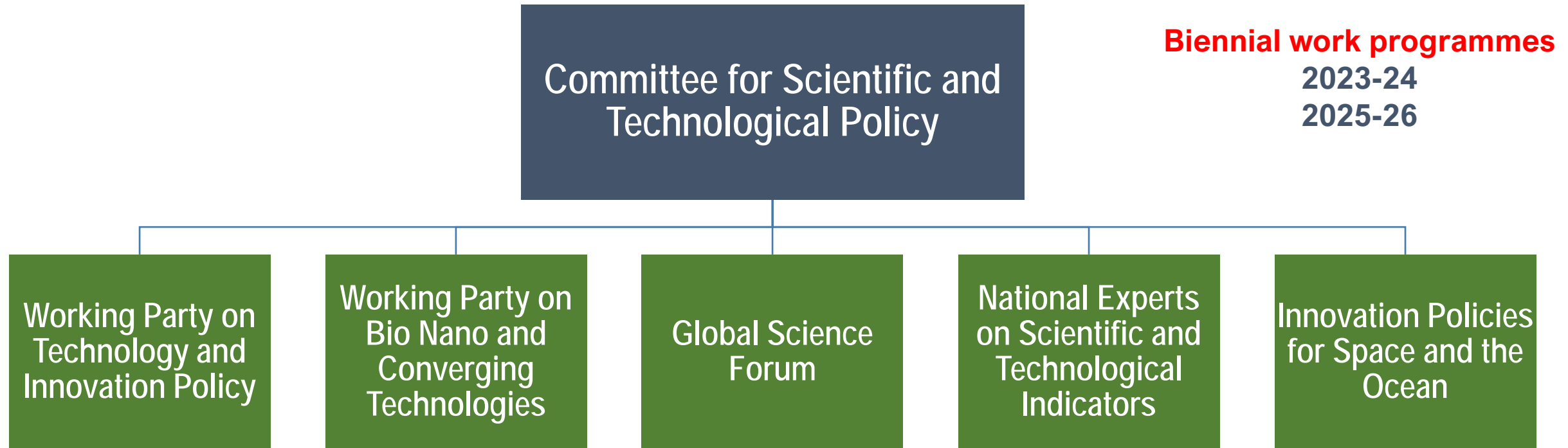




BRIEF OVERVIEW OF OECD ACTIVITIES ON STI POLICY

The OECD has been active in STI policy since its founding more than 60 years ago

Through the Committee for Scientific and Technological Policy (CSTP), the OECD seeks to enhance STI cooperation among OECD members countries and partners, with a view to contributing to the achievement of economic, social, and scientific aims, including growth and the creation of jobs, sustainable development, improved well-being of their citizens and advancing the frontiers of knowledge.





Examples of OECD CSTP outputs

The collage features several key outputs:

- OECD Main Science and Technology Indicators:** A report showing growth in R&D expenditure in 2022 with a 4% increase in inflation-adjusted estimates. It also notes a 5.1% increase in R&D expenditure in the Higher Education sector in 2022, which accounts for 74% of total Gross Domestic Product in the EU27.
- Figure 1. R&D Expenditure:** A line graph showing the index of R&D expenditure from 2007 to 2011, with 2007 as the base year (index = 100). The graph shows a general upward trend, reaching approximately 115 by 2011.
- STIP COMPASS:** A digital platform described as "Your hub for data analysis and advice". It offers interactive dashboards for visualizing STI policies and provides featured content on "STI policies for Open Science".
- OECD Science and Innovation Policy:** A report titled "Enabling Transitions in Technology and Innovation".
- OECD Science, Technology and Industry Policy Papers:** A collection of policy papers.
- Group Photo:** A large group of officials from the Science and Technology Policy Ministerial meeting, held in Paris from April 23-24, 2024.

At the bottom of the collage, there is a blue banner with the text: "Shared challenges, transformative actions Science and Technology Policy Ministerial 23-24 April 2024, OECD, Paris". The OECD logo is visible in the bottom right corner, along with the slogan "BETTER POLICIES FOR BETTER LIVES".

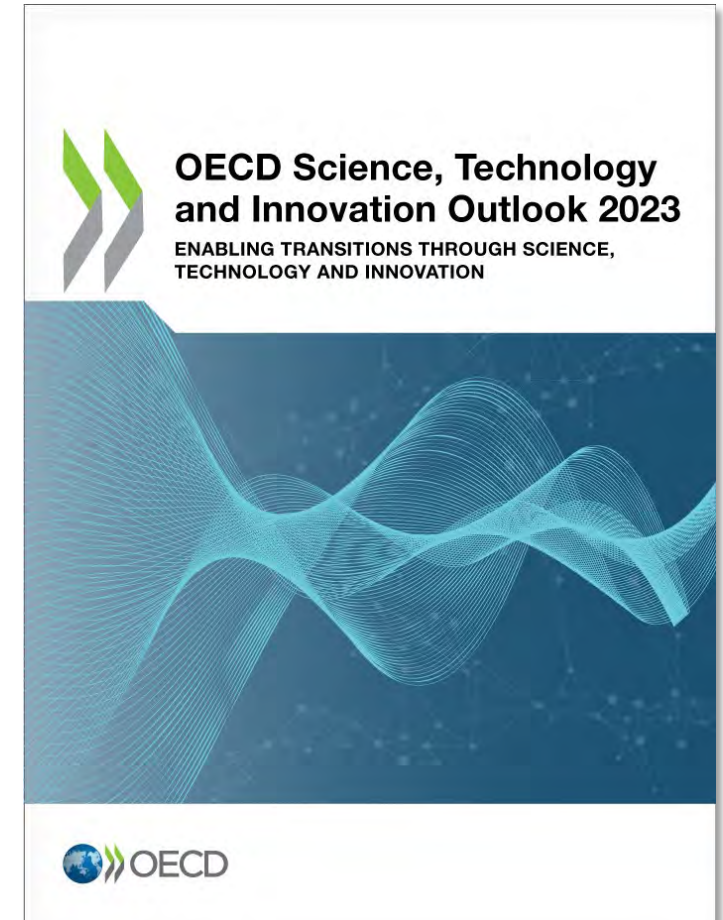


CHALLENGES FACING STI TODAY & THE OECD TRANSFORMATIVE AGENDA FOR STI POLICIES



STI in an age of disruptive change

- **Global crises** mean that managing risk and uncertainty, while promoting resilience, have moved to the fore as rationales for STI policy intervention => growing ‘securitisation’ (or ‘security turn’) in STI policy.
- Growing **geopolitical tensions** have also seen concepts like ‘technology sovereignty’ and ‘open strategic autonomy’ strongly emerge as frames for STI policy.
- This is at a time when STI policy is called upon to contribute to **sustainability transitions** in a range of areas, notably energy, food, mobility and health.





Tackling such issues calls for ambitious measures in firms, governments and society more broadly

- These measures should promote:
 - Mainstreaming of mental models and frameworks that embrace transformations and their associated values and practices;
 - New skills and capabilities to enact transformations;
 - New relationships, for example, between the public and private sectors, between different sectors of the economy, and between advanced and less-developed economies to exchange and pool resources;
 - Greater experimentation and learning that support multiple pathways to transformation and acknowledge its uncertainty and complexity.

These demands have led the OECD to develop its Transformative Agenda for STI Policies



Why the Transformative Agenda for STI policies?

- STI are a critical part of the actions needed to reform economies and societies to meet **global challenges**.
- However, **STI itself may need to reform** to fulfil this potential.
- Governments may need to revisit STI policy frameworks, visions, targets and instruments with a view to adapting them or displacing them in favour of others that are **fit-for-purpose** to promote positive transformative change.
- The CSTP has developed the Agenda for Transformative Science, Technology and Innovation Policies to support the **reappraisal and reform** of STI policy.
- Many of the suggested reforms are familiar to the STI policy community. However, they are challenging to implement effectively. Many also remain **experiments** that need scaling-up.
- The Transformative Agenda provides a **high-level orientation** for more specific and practical STI policy advice to follow that aims to help countries enact policy reforms.





Shared challenges, transformative actions

OECD Science and Technology Policy Ministerial

23-24 April 2024, OECD, Paris



Declaration

Towards an action-oriented Declaration

[Transformative Agenda](#)
[Framework for the Anticipatory Governance of Emerging Technologies](#)



Sustainability transitions

Transformative Agenda for STI Policy

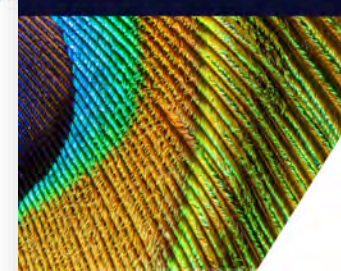
Science, technology, and innovation (STI) are a crucial element required to tackle the challenges of the 21st century. Now more than ever, a Transformative Agenda for STI Policy offers guidance on systems change at aligning STI policies



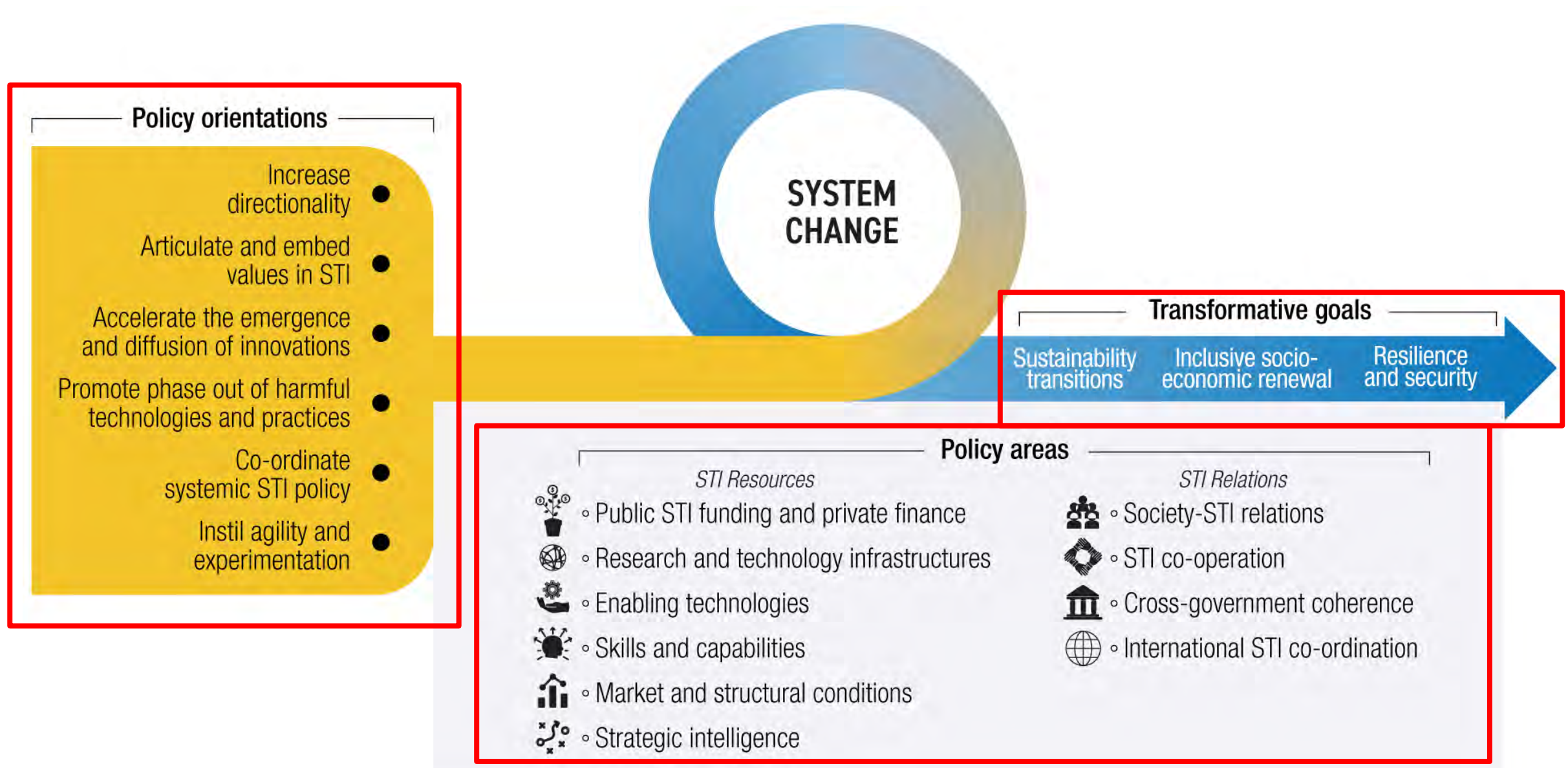
Governance

Policy Framework for the anticipatory governance of Emerging Technologies

The framework illustrates how governance practices can be integrated into decision making for emerging technologies to achieve responsible innovation.



Transformative Agenda – three main components





Transformative goals for STI to pursue

1. Advance **sustainability transitions** that mitigate and adapt to a legacy of unsustainable development
2. Promote **inclusive socioeconomic renewal** that emphasises representation, diversity and equity
3. Foster **resilience and security** against risks and uncertainties posed by the growing emergence of systemic threats





Six policy orientations that are crosscutting, promote transformation, and apply to all areas of STI policy

1. **Direct** STI policy to accelerate transformative change
2. Explicitly embrace **shared values** in STI policies that align with the transformative goals
3. Accelerate both the **emergence and diffusion** of innovations for transformative change
4. Promote the **phase out** of technologies and related practices that contribute to global problems
5. Implement **systemic and co-ordinated** STI policy responses to global challenges
6. Instil greater **agility and experimentation** in STI policy, supported by a diverse range of strategic intelligence

Applying the policy orientations to 10 STI policy areas

STI Resources



How to **direct public STI funding and private finance** to support transformative change?



How to **gear research and technology infrastructures** towards transformations?



How to **leverage enabling technologies** to advance transformations?



How to **nurture the skills and capabilities** required for STI-enabled transformation?



How to **ensure market and structural conditions** allow STI to support transformative change?



How to **develop and use strategic intelligence** to guide transformation?

STI Relations



How to **engage society in STI** to further transformative change?



How to **deepen STI co-operation between innovation system actors** for transformation?



How to **promote cross-government coherence** to co-ordinate STI-enabled transformations?

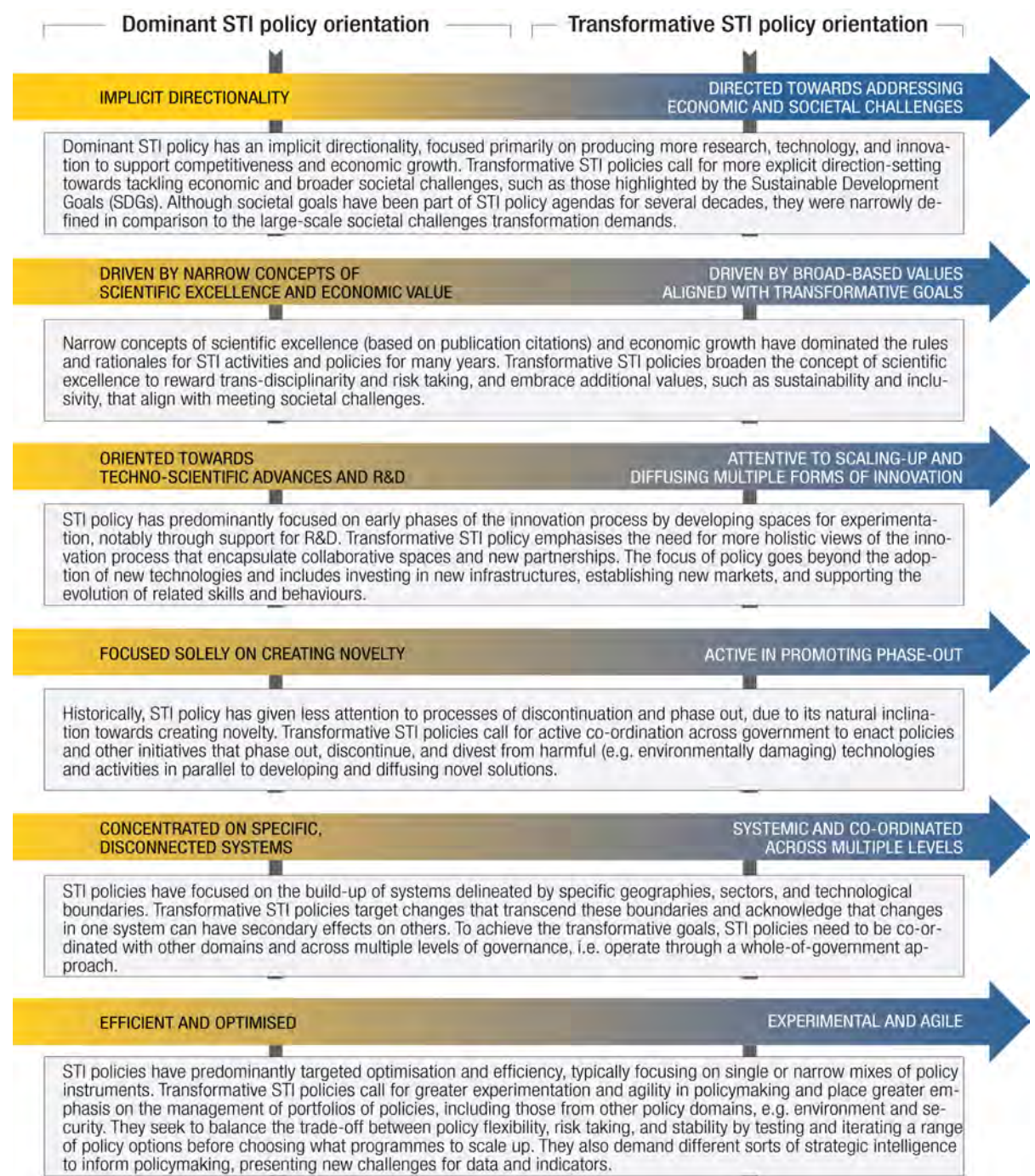


How to **leverage international STI co-ordination** to support transformation for the public good?



The Transformative Agenda implies a shift in STI policy

- Transformative change is often associated with radical reforms, but incremental changes across **many fronts** can also cause a system to shift qualitatively
- Many reform measures in the Transformative Agenda are hardly novel, and achieving transformative goals often coincides with achieving other **long-standing reforms** in STI systems
- Their **concerted adoption** would, however, represent a major shift in orientation of much STI policy seen over the last 25 years





Policy actions in practice

Types of policy instrument	Directional	Values	Whole chain	Phase out	Co-ordinated	Agile
Governance	●●●	●●●	●●●	●●●	●●●	●●●
Direct financial measure	●●●	●●	●●●		●●	●●
Indirect financial measures			●●			●●
Collaboration and infrastructure	●●	●	●●●		●●●	●●
Regulation and guidance	●●●	●	●●●	●●	●●	●

- Transformative STI policies are not specific to a narrow set of policy instruments but cover the **full range of policy actions**
- **Governance instruments** – including national strategies and agendas, the creation and reform of public bodies, including those that promote cross-government co-ordination and stakeholders' engagement, and **strategic intelligence** – are especially important
- But other instruments, such as those providing direct funding to STI activities and promoting collaboration, as well as regulation and guidance, can also play significant roles

Implementing the Transformative Agenda: 3 primary layers



Case studies

Policy briefs

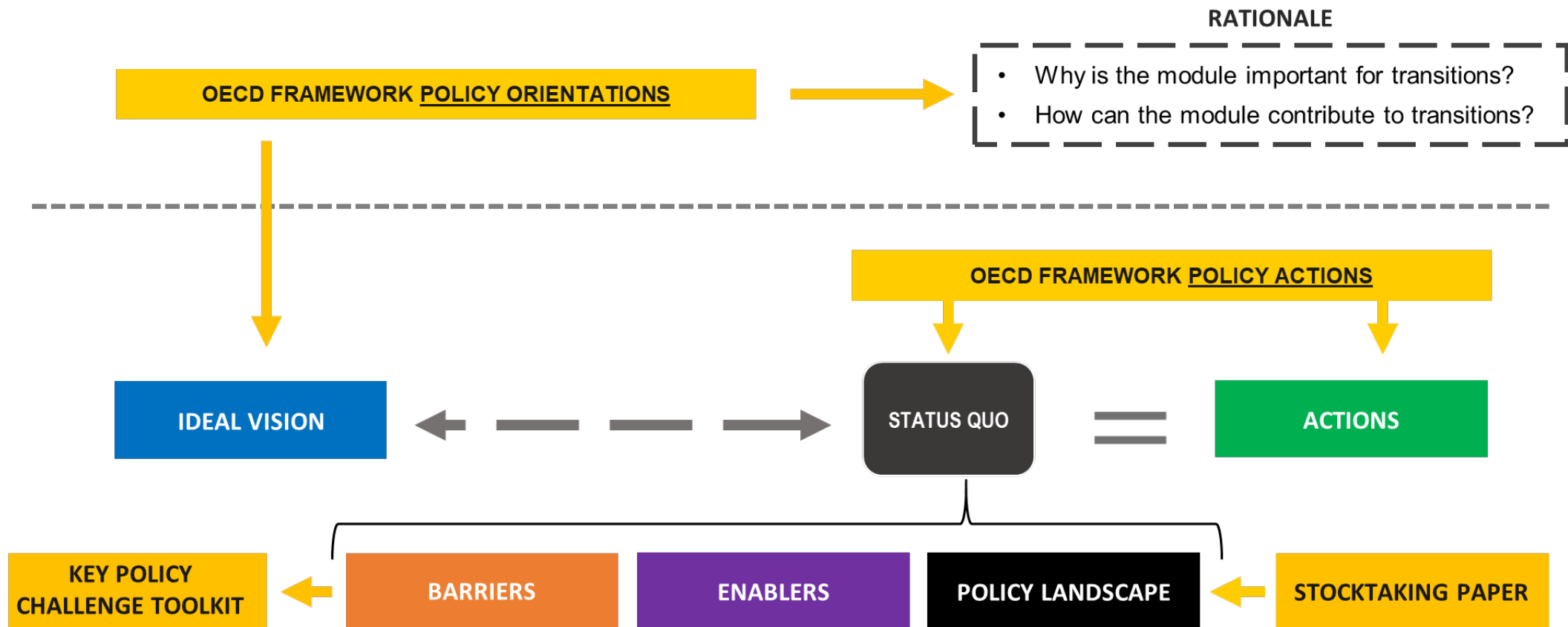
STIP Compass

STI.Scoreboard

Publications

Policy guidance for specific STI policy areas

This largely repackages and adapts existing OECD work into a policy guidance format that offers deeper insights on the reform measures policymakers could pursue in specific STI policy areas





Example of policy guidance: Strategic Intelligence

Strategic Intelligence

“useable knowledge that supports policy makers in understanding the relevant aspects and scope of the impacts of science, technology and innovation, and their potential future developments”



Technology Assessment



Strategic Foresight



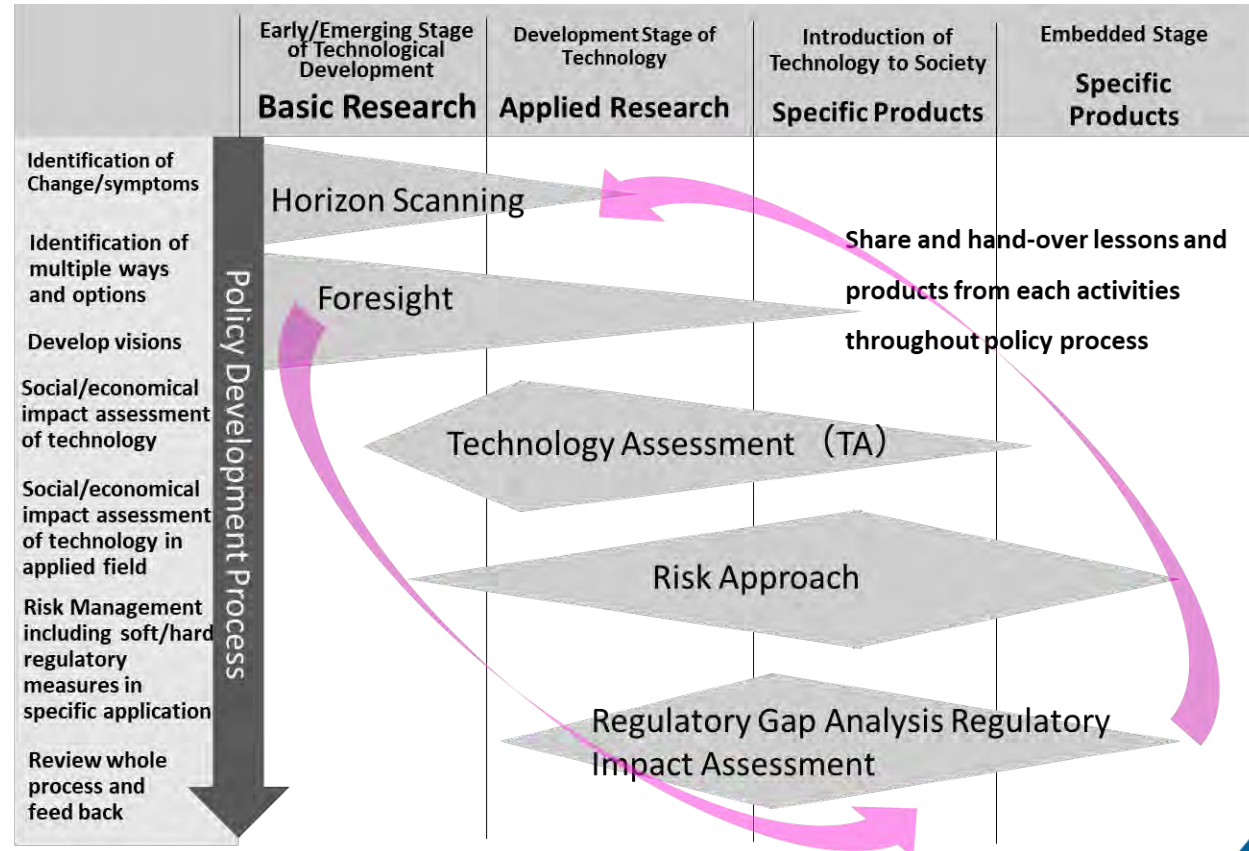
Evaluation



Statistical Indicators



Modelling



Makiko Matsuo and Atsuo Kishimoto (2017) **Analysis on Tools and Approaches in Policy Process for the Governance of Emerging Technologies**, *Shakaigijyutsu Ronbunshu*, Vol.14, 84-94, June 2017
 松尾・岸本 (2017) 「新興技術がバランスのための政策プロセスにおける手法・アプローチの横断的分析」
 社会技術研究論文集 Vol.14, 84-94, June 2017
http://shakai-gijutsu.org/vol14/14_84.pdf



Strategic Intelligence diagnostic and policy actions

DIAGNOSTIC

- Increasing recognition that knowledge and evidence to support decision-making, experimentation and learning are needed for contexts that are systemic, transdisciplinary, complex and uncertain
- While knowledge is distributed and diverse, it is often siloed
- Some strategic intelligence is valued more than others, often on account of bias and lock-in
- There are disconnects between knowledge production and use in policy settings
- There is under-investment in and lack of policy attention to strategic intelligence

Transformative Agenda policy actions on strategic intelligence

- Support novel and **distributed sources** of strategic intelligence to tackle global challenges
- Develop arrangements to **combine different sorts of strategic intelligence** for STI policymaking
- Cultivate skills and capabilities that promote the **utilisation of strategic intelligence** in STI policymaking
- Implement a **strategic ‘policies for evidence’ agenda** that promotes the production and use of strategic intelligence for transformative change

Implementing the Transformative Agenda: 3 primary layers



Case studies

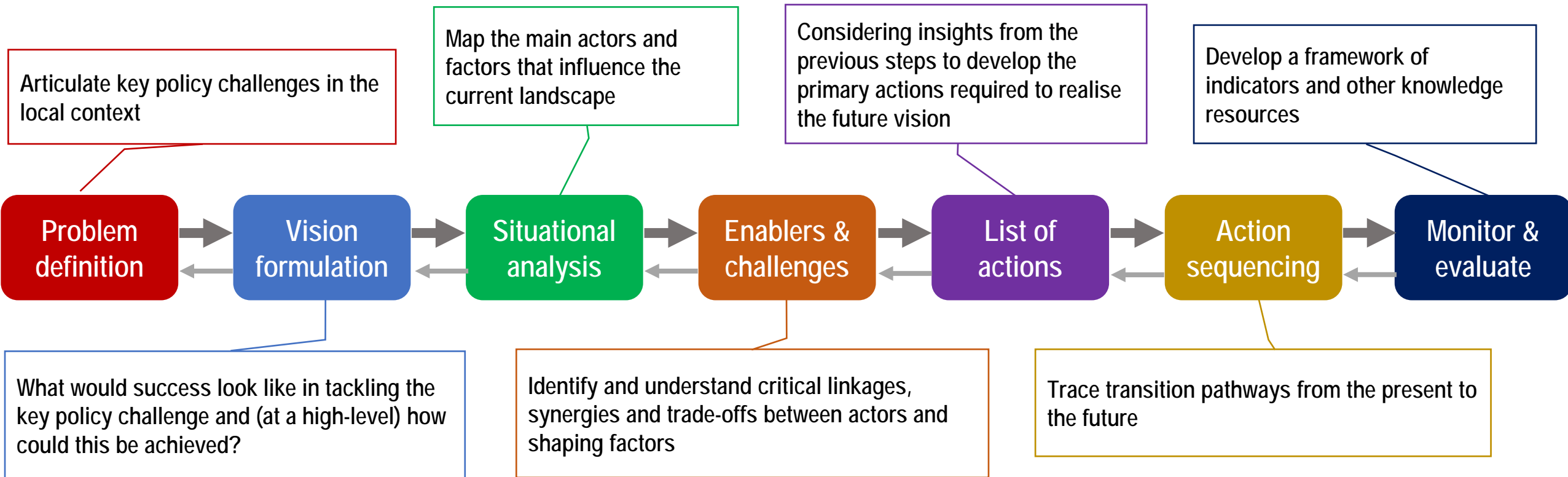
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Publications

Toolkits sequence of guidance steps






Toolkits use interactive, prefilled canvasses with links to data


PENTAGONAL MAP FOR SYSTEM ANALYSIS

This introductory tool provides a process for system mapping through a transitions lens to identify a sociotechnical regime. It can be used by individuals or groups and an accompanying blog sets out practical experience of testing the resource with users and coaches.




PENTAGONAL MAP FOR SYSTEM ANALYSIS (INDIVIDUAL VERSION)

A step-by-step Miro tool, designed for individual use, that will help you to



PENTAGONAL MAP FOR SYSTEM ANALYSIS (GROUP VERSION)

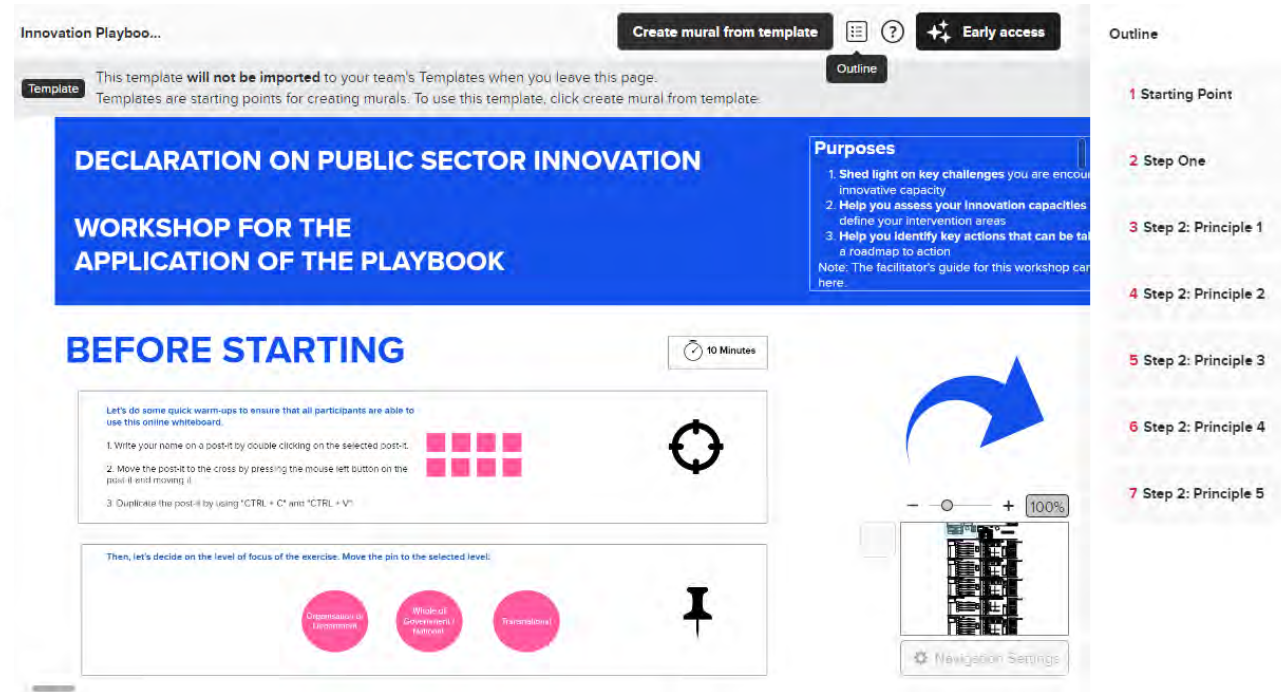
A step-by-step Miro tool, designed for group use, that will help a team to



BLOG: SNAPSHOT OF EXPERIENCE: TESTING THE PENTAGONAL MAP TOOL

The pentagonal map for system analysis tool was tested in June 2022, with a 90-

[TIPC Resource Lab](#)



DECLARATION ON PUBLIC SECTOR INNOVATION

WORKSHOP FOR THE APPLICATION OF THE PLAYBOOK

Purposes

1. Shed light on key challenges you are encountering in your public sector and how you can improve your innovative capacity.
2. Help you assess your Innovation capacities and define your intervention areas.
3. Help you identify key actions that can be taken to address the challenges you are facing and create a roadmap to action.

Note: The facilitator's guide for this workshop can be found [here](#).

BEFORE STARTING 10 Minutes

Let's do some quick warm-ups to ensure that all participants are able to use this online whiteboard.

1. Write your name on a post-it by clicking on the selected post-it.
2. Move the post-it to the cross by pressing the mouse left button on the post-it until moving it.
3. Duplicate the post-it by using 'CTRL + C' and 'CTRL + V'.

Then, let's decide on the level of focus of the exercise. Move the pins to the selected level:

Departmental | National Government | International

Outline:

- 1 Starting Point
- 2 Step One
- 3 Step 2: Principle 1
- 4 Step 2: Principle 2
- 5 Step 2: Principle 3
- 6 Step 2: Principle 4
- 7 Step 2: Principle 5

[Playbook in support of the OECD Declaration on Public Sector Innovation](#)



Support to operationalising and implementing the Transformative Agenda

- Several CSTP projects proposed for **2025-26** take deeper dives on different aspects of the Agenda. Several will develop toolkits.
- A **peer learning support facility** will also be established to focus on specific challenges of common interest in implementing aspects of the Agenda – including on **strategic intelligence**
- A new generation of **country reviews** and tailored support to country's STI policy reform efforts
- More broadly, the CSTP will use the Agenda as one of its main points of reference in formulating its **future strategy and programme**

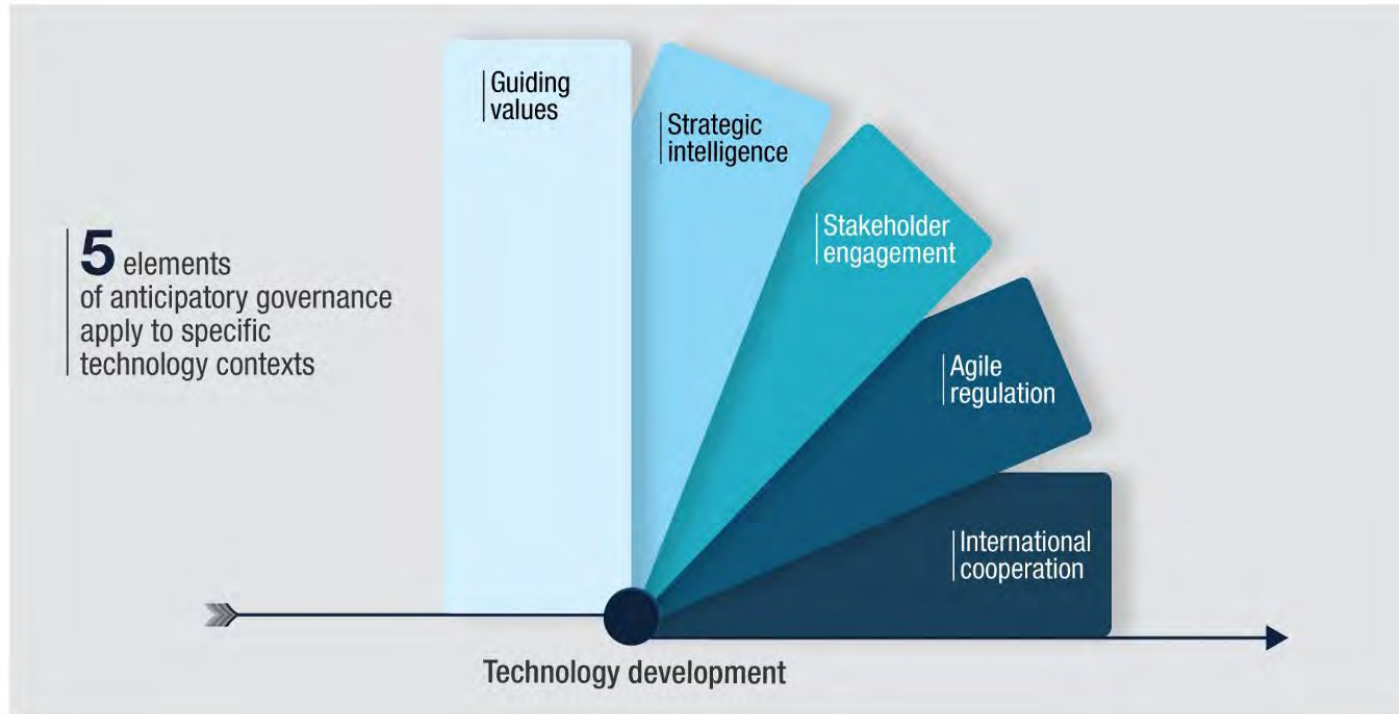




FRAMEWORK FOR ANTICIPATORY GOVERNANCE OF EMERGING TECHNOLOGY

Framework for anticipatory governance of emerging technology

- Promotes anticipatory governance of technologies



- Includes several key actions on **strategic intelligence**, e.g. nurture ecosystems of intelligence; and build capacities through international cooperation and best practice exchange



The three-step approach from horizon scanning to extended appraisal



Am I sufficiently aware of early stage emerging tech and related issues?

NO

1. Horizon scanning
Search regularly for signals regarding emerging technologies and their implications¹.

2. Preliminary diagnosis
Use 6 dimensions to assess whether governance and/or deeper intelligence might be needed².

Are there areas of interest?
(potential opportunities or threats)

YES

3. Extended appraisal
Targeted deep dive analysis drawing from a range of strategic intelligence tools and approaches³.

Are there evidence and/or governance gaps?

YES

I pursue a governance approach informed by deeper intelligence.

NO

¹Scan for New technologies, Techno-environmental issues, New societal issues and Risks and opportunities.

²The 6 dimensions are: Uncertainty, Risk and Scale, Level of Public Concern, Pace of Maturation, Strategic Importance and Governance Gaps.

³Strat intelligence toolbox: Tech Forecasting, Technology Foresight, Technology Assessment, Emerging Risk, Assessment

Building our Biofuture

Policy issues and opportunities for next generation biotechnologies

Global Forum on Technology

- The OECD launched the GFTech in 2023 to provide a venue for regular in-depth dialogue to foresee and get ahead of long-term opportunities and risks presented by technology
- It covers three technology areas: Immersive technologies; Quantum technologies; and Synthetic Biology
- Its activities include:
 - Fostering strategic evidence-based dialogue and international cooperation
 - Exploring nascent approaches to policy challenges and opportunities posed by emerging technologies



OECD
Global Forum
on Technology



GFTech is unpacking synthetic biology futures with an expert focus group

- 68 participants (expect to continue to grow): Natural scientists and engineers; Social scientists; Gov actors; Non-profit organisations; Firms; Societal interface organisations
- 32 countries (Africa, Asia, Europe, North America and Latin America)

Japanese Members of Focus Group

Akihiko Kondo, Kobe University

Makiko Matsuo, University of Tokyo

Takeo Miyake, Waseda University

Wataru Mizunashi, NEDO



Experts drawn from organisations from 32 nations



FUTURE WORK ON STRATEGIC INTELLIGENCE TO SUPPORT THE TRANSFORMATIVE AGENDA AND TECHNOLOGY GOVERNANCE FRAMEWORK



Future project on strategic intelligence

- Scan and exchange with others on strategic intelligence tools and practices
- Facilitate (do) strategic intelligence work on selected technologies, including future-oriented technology analysis and the development of indicators
- Support capacity building and dig deep into strategic intelligence and the policy interface
- Support mutual learning on new institutions for strategic intelligence
 - For instance, many governments are experimenting with dedicated strategic intelligence units (e.g. Sweden, Czech Republic, Portugal, Korea, Chile, etc.) and some are developing training courses for public servants and policymakers in using strategic intelligence tools (e.g. The Netherlands)
- Link this work to both the Transformative Agenda and Technology Governance Framework





Thank you!

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