The OECD STI Policy 2025 initiative Enabling transitions through STI

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40th SciREX Seminar

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Overview

❑ Context: trends, drivers and the normative turn in STI policy

❑ S&T Policy 2025: objectives and approach
- STI challenge roadmaps
- Other project activities and deliverables
  - Foundational background reports
  - Sectoral outreach activities
  - Policy dialogues
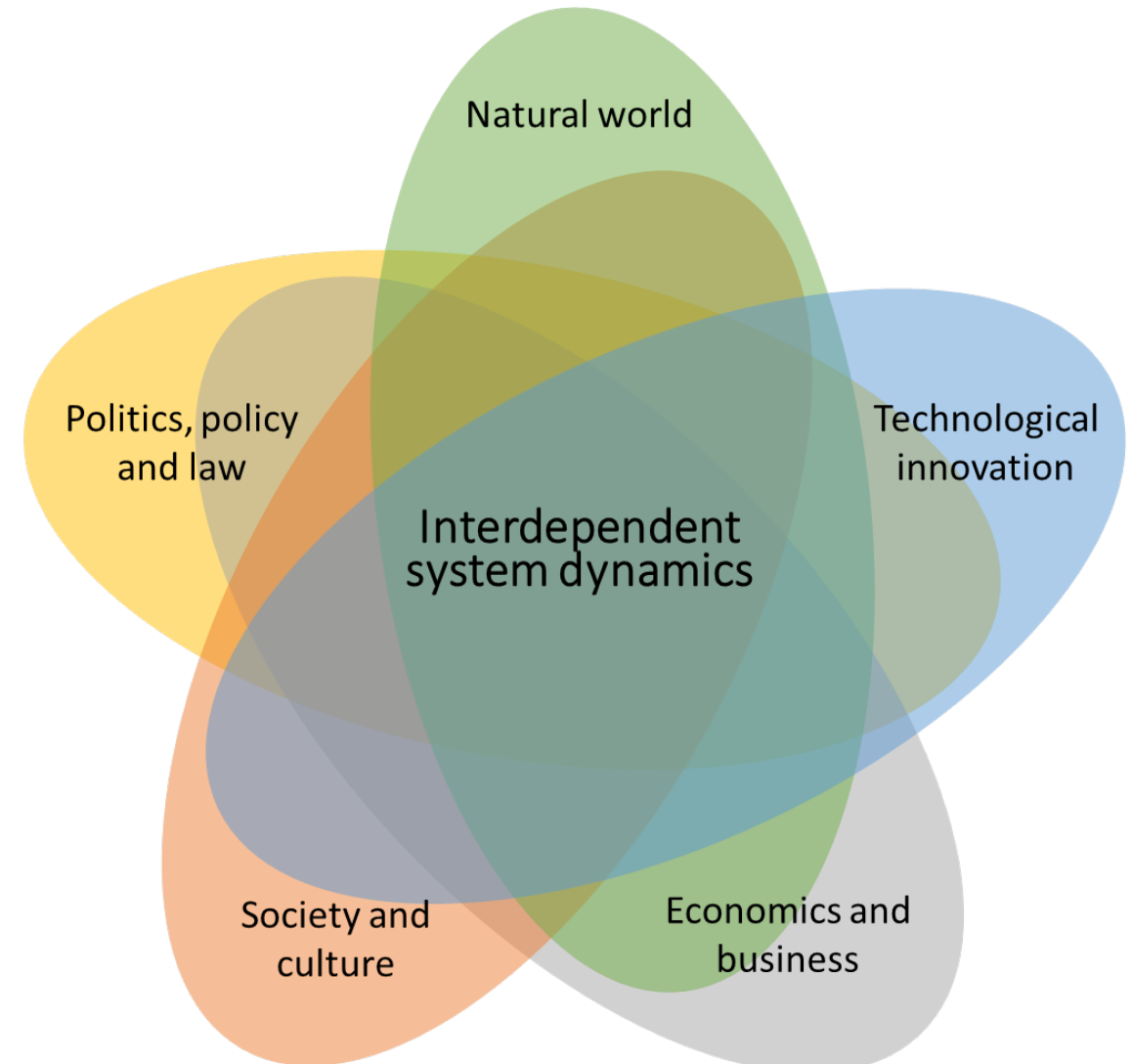
❑ Next steps and the way ahead
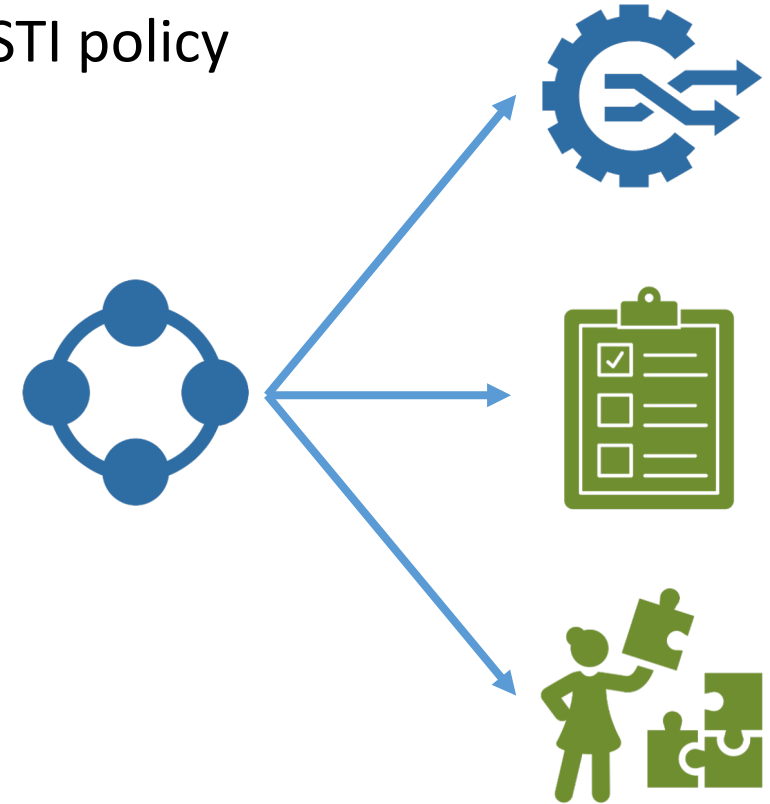
CONTEXT AND PROJECT OUTLINE

Long-term trends and drivers (+ disruptors)

- Demographic change
- Rise of China
- Climate change
- Biodiversity loss
- Digitalisation and automation
- Financialisation and asset economies
- Productivity growth slowdown
- Growing inequality
- ...

Normative goals for STI policy

❑ A 'normative turn' in STI policy has been apparent now for more than a decade

❑ Evident in strategies and some policies

❑ Accelerating => profound, widespread impacts of Covid and climate change + their growing urgency

❑ The scale and urgency of reform to meet these normative goals call for an ambitious, wide-ranging, disruptive and visionary policy agenda

❑ But what to do? And how to do it?

Security

Prosperity

NORMATIVE GOALS

Inclusion

Sustainability

Resilience

What are the main areas in need of reform?

Reform agendas cover potentially all aspects of STI policy and governance, including funding, human resources, infrastructures, coordination mechanisms, and measurement. The following challenges point to specific areas for policy reform:

How to build more challenge-based funding into STI public funding systems?

How to mobilise a diverse set of actors to cooperate on STI solutions for global challenges?

How to make research career pathways more open and equitable?

How to develop and implement policy frameworks that promote values-based technology, responsible innovation, and inclusive transitions?

How to promote effective coordination between STI and other policy domains on sustainability transitions?

How to foster and support open access to research data by default, while respecting privacy and security concerns?

How to step up multilateral cooperation on sustainability transitions, given their scale and global nature, and at a time when STI multilateralism is increasingly under pressure?

How to develop measurement systems that support meeting challenge-based socio-technical objectives?

Concerns like these are evident in Japanese STI policy

- ❑ Context: megatrends, Covid impacts, net zero targets, circular economy aspirations, and decentralised society – the need to formulate a mobilising vision for 2030

- ❑ Society 5.0 core concept

- ❑ High risk, high reward research, open science, HEI reform

- ❑ Pursuit of sectoral strategies, e.g. through PPPs
  - ▪ Ecosystems for nurturing start-ups and collaborations, embedded in cities and regions, but also for addressing global challenges – implies an holistic, systemic perspective that also considers, for example, the demand side, the skills and capabilities for co-creation, etc.

- ❑ Upstream consideration of ethical, legal and social implications (ELSI) that take into account wide-ranging and complex social issues
  - ▪ Diversity and values
  - ▪ Evidence base, incl. DSIP, foresight, evaluation, indicators
  - ▪ Mission-oriented innovation policies
  - ▪ Strategies and institutions to instill flexibility to adapt as the context changes
  - ▪ Convergence of knowledge including the humanities and social sciences

- ❑ Strengthen command and control function to eliminate policy duplication and promote collaboration
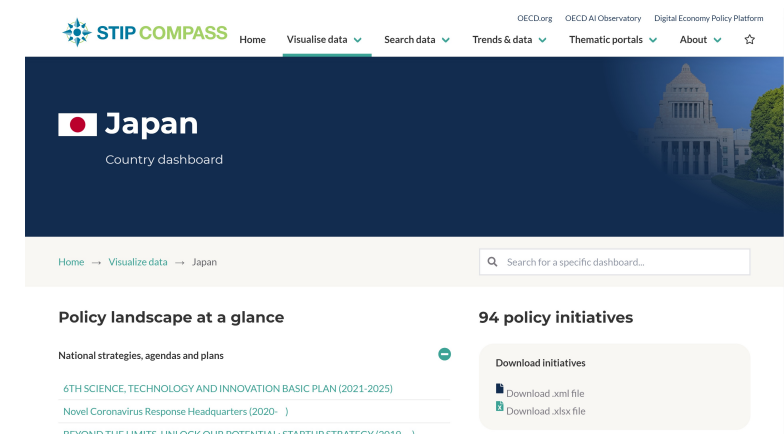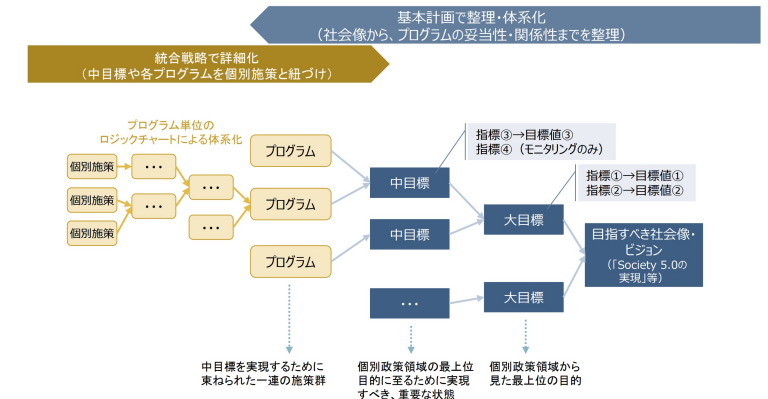
Covid-19: a window of opportunity for reforms?

OECD Science, Technology and Innovation Outlook 2021
TIMES OF CRISIS AND OPPORTUNITY
OECD

Main elements of STI policy reform to tackle the challenges of sustainability, inclusivity and resiliency

STI POLICY REFORM

Rebalance the STI policy mix to target societal challenges

Acquire dynamic capabilities in governments

Promote transdisciplinarity to deal with complex problems

Implement global solutions for global problems

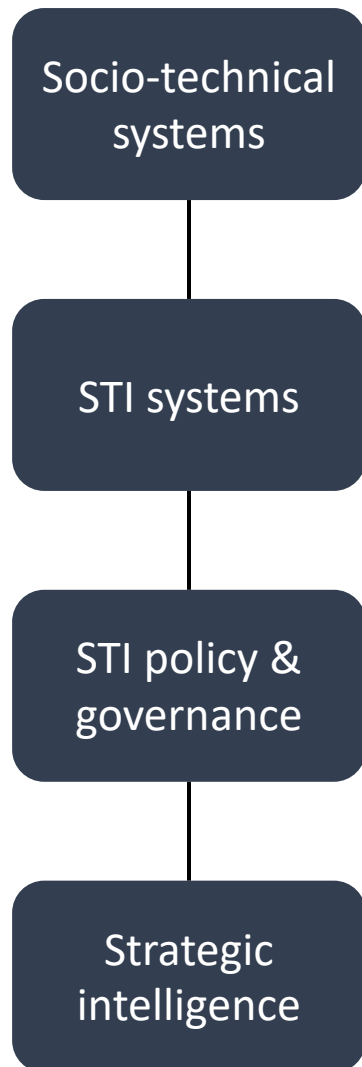Reform PhD training to support career path diversity

Multi-level transitions that raise important STI policy questions

- Socio-technical systems
- STI systems
- STI policy & governance
- Strategic intelligence

1. *Socio-technical transitions of large-scale systems*, such as energy, mobility, food, heavy industry, etc.: **How to position STI and STI policy in government-wide discourses, strategies and initiatives that address sustainability transitions and resilience?**

2. *STI system transitions*: **How to influence the STI priorities and practices of firms and the public research system, who need to adapt to meet the challenges of sustainability transitions and resilience?**

3. *Transitions in STI policy and governance arrangements*: **How to adapt STI policy priorities and practices to meet the challenges of sustainability transitions and resilience, particularly with respect to their rationales, objectives, instruments and the groups they target**?

4. *Transitions in the provision and use of strategic intelligence*: **How to develop the knowledge base, frameworks, institutions, learning networks, and capabilities to inform and deliver an STI policy that contributes to sustainability transitions and resilience?**

Objectives

❑ **Develop a vision and practical guidance** that help policymakers reorient STI systems towards addressing global challenges, building on lessons from the successful COVID-19 response

❑ **Help raise the profile of STI within other policy domains**, with a view to breaking down silos and promoting cross-government cooperation on sustainability transitions

❑ **Better link national STI reform agendas with the need to step up multilateral cooperation on sustainability transitions**, given their scale and global nature

Deliverables

❑ **Reference roadmaps with short-term (2025) stretch targets** that suggest appropriate policy steps and sequences in pursuit of STI-enabled transition pathways

❑ **Background papers and policy dialogues** that offer practical guidance and analytical support to policymakers engaged in transitions

❑ **Multilateral action-oriented vision** – possibly in the form of an OECD Declaration – that encapsulates an action plan for reorienting STI policy over the next decade. More speculatively, this could be endorsed by a CSTP ministerial meeting, which could be organised in 2023-24, depending on country interest

Future STI policy – what directions and by what means?

❑ Main assumption: there exist **gaps** between current **STI policy and governance** arrangements and those required for transitions

❑ Bridging these gaps will require a range of **reforms**, including

- the sorts of **problems** policies seek to solve
- the **groups** and **activities** targeted by policy interventions
- the mix and design of policy **instruments** that are used

❑ **All aspects of STI policy and governance** are implicated, including funding, human resources, infrastructures, coordination mechanisms, and measurement

MULTIPLE PATHWAYS POSSIBLE

SUB-SYSTEM FOR REFORM

DESIRED FUTURE OUTCOME

2025 Stretch Target
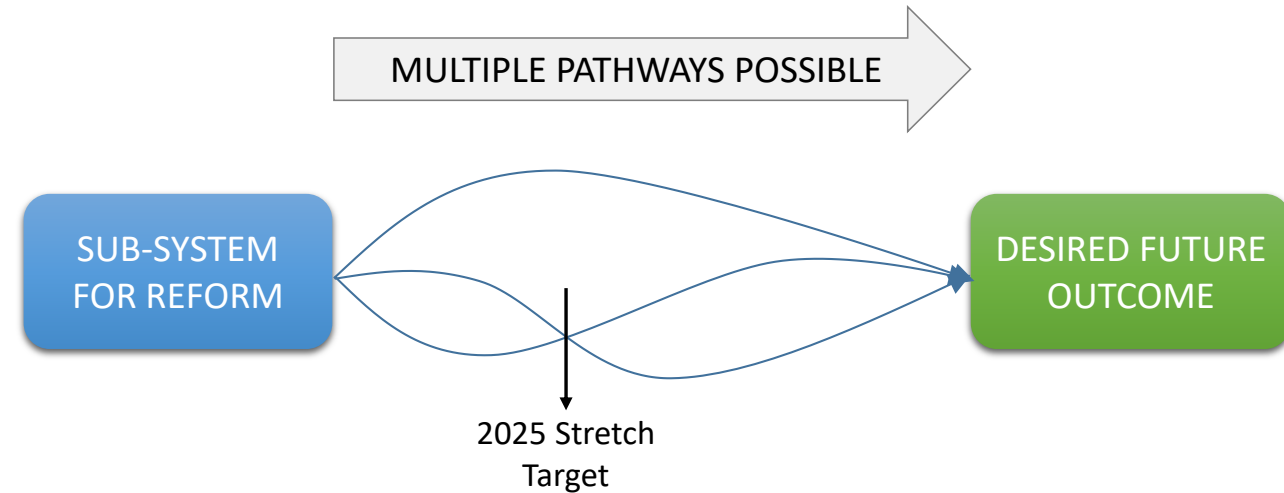
Why 2025? If STI is to contribute to socio-technical transitions over the long-term, the STI policy reform process must start now. Over the coming few years, specific measures should be put in place to ensure STI policy is on track to make these contributions. The project seeks to determine what these measures should be and what could be achieved by 2025 through an ambitious policy agenda.

Main project elements
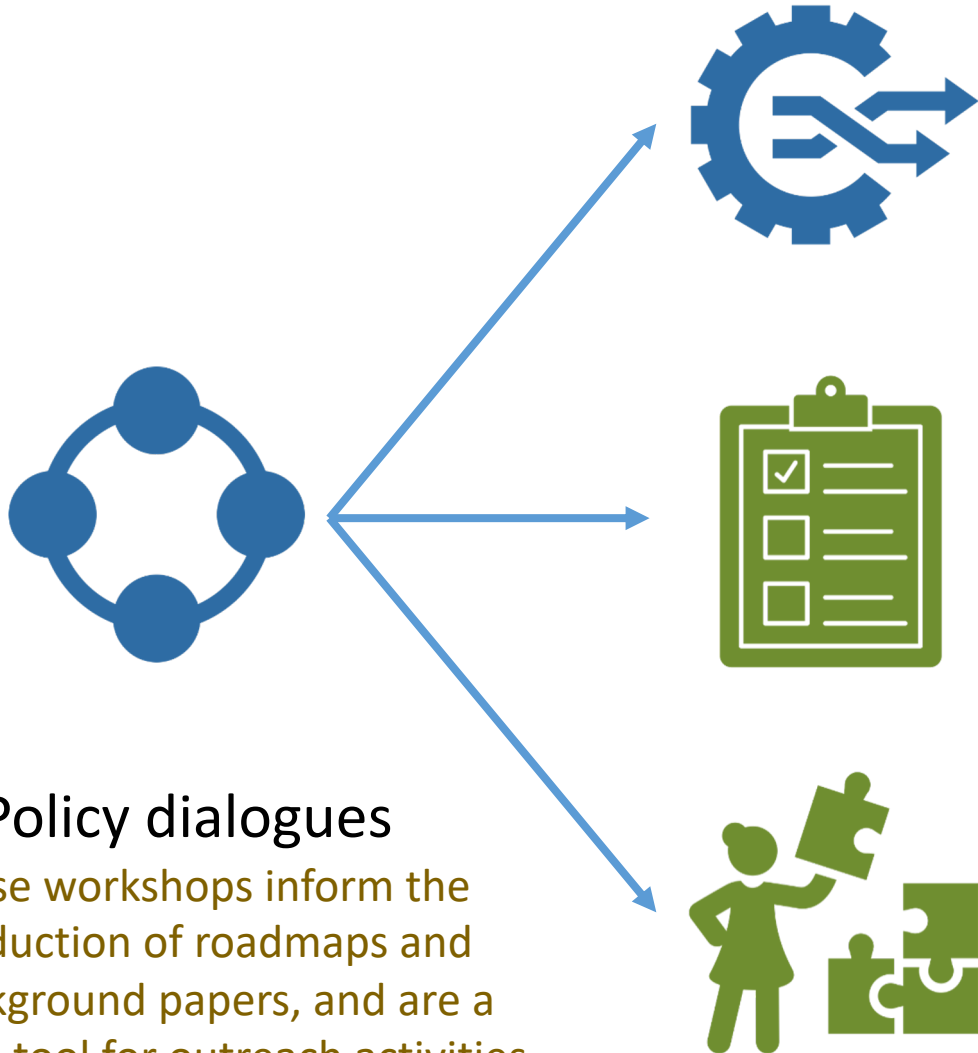
1. STI challenge roadmaps

These outline sequences of actions and developments along a fixed timeline, with an intermediate 2025 stretch target. They focus on a specific challenges, e.g. co-creation, technology governance, STI careers, etc.

2. Background foundational papers

These provide insights on the state-of-the-art on selected practices used in the project, e.g. roadmapping, and on specific issues that are central to STI policy contributions to transition, e.g. multilateralism, cross-govt coordination, etc.

3. Cross-government outreach activities

Socio-technical transitions are cross-sectoral and cross-govt, so STI policy should develop stronger links with other policy domains. The project includes efforts to promote dialogue and coordination between STI and sectoral policy domains.

4. Policy dialogues

These workshops inform the production of roadmaps and background papers, and are a core tool for outreach activities with other policy domains.

Builds on the work of the OECD CSTP and its working parties

Biennial work programmes
2021-22
2023-24

Committee for Scientific and Technological Policy

Working Party on Technology and Innovation Policy

Working Party on Bio Nano and Converging Technologies

Global Science Forum

National Experts on Scientific and Technological Indicators

S&T POLICY 2025
Enabling Transitions through Science, Technology and Innovation
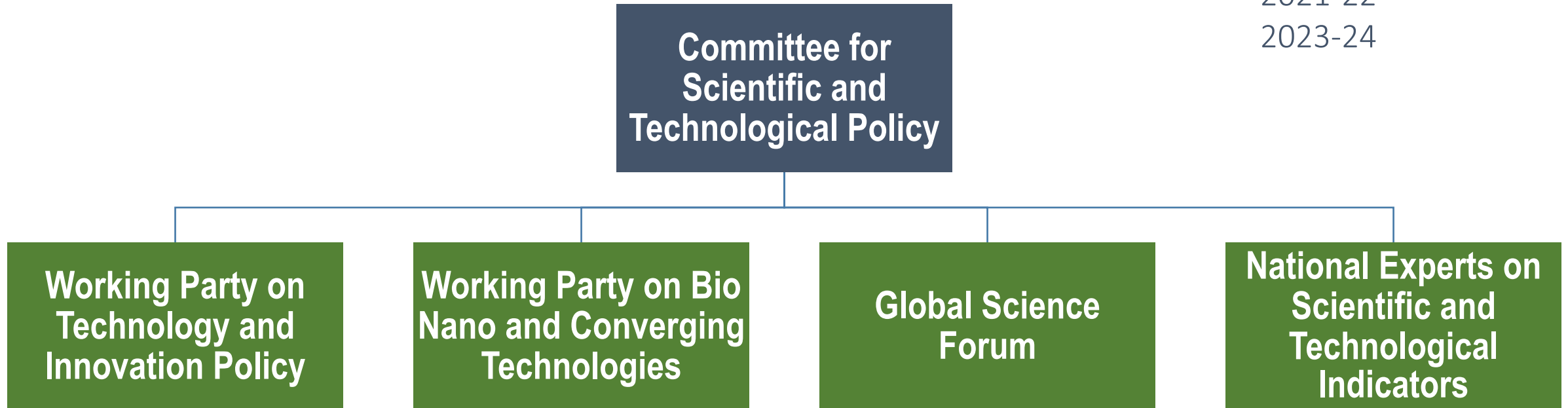
1. STI CHALLENGE ROADMAPS

Developing STI policy challenge roadmaps

- Transition pathways call attention to **policy steps and sequences** for reaching desirable outcomes

- The S&T Policy 2025 project could generate a **series of 'reference' roadmaps** that outline sequences of actions and developments along a fixed timeline, with a 2025 stretch target

- Since STI policy is broad and complex, it makes sense to develop roadmaps for **specific policy challenges**

- These can be thought of as '**entry points**' for mapping the comprehensive range of STI policy reforms needed for transitions

- Choices need to be made on which challenges to focus on, given finite resources, and on where to draw **boundaries**

- The project will focus on policy challenges where countries are in search of mutual learning and practical guidance

Common elements in roadmaps

❑ **Desirable outcomes** that are embedded in a long-term vision within a defined time horizon (typically 2030-2040, depending on the STI challenge).

❑ Profiles of the **main actors** implicated in meeting the STI challenge, including policy makers and analysts.

❑ Past, present and future trajectories of the **key activities** implicated in the STI challenge and the **framework conditions** that shape them.

❑ Past, present and future **policy interventions** that influence these key activities and their framework conditions.

❑ Short-term '**stretch targets**', e.g. for 2025, that should be both challenging and feasible to achieve, with roles assigned to specific actors, and necessary resources / conditions indicated.

❑ A **framework of indicators**, both quantitative and qualitative, to monitor progress along transition pathways.
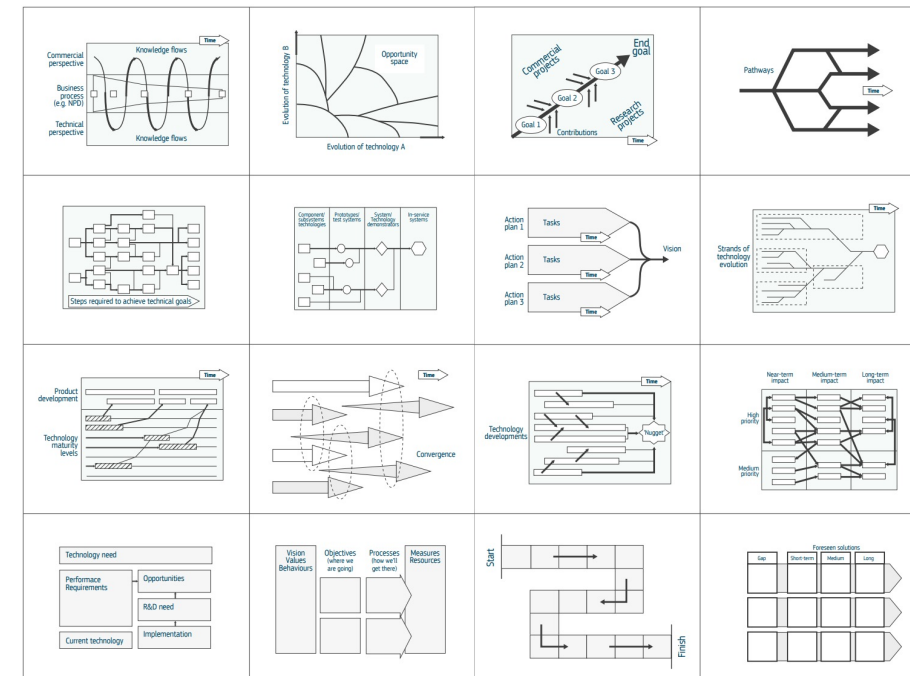
Source: Phaal (2010)

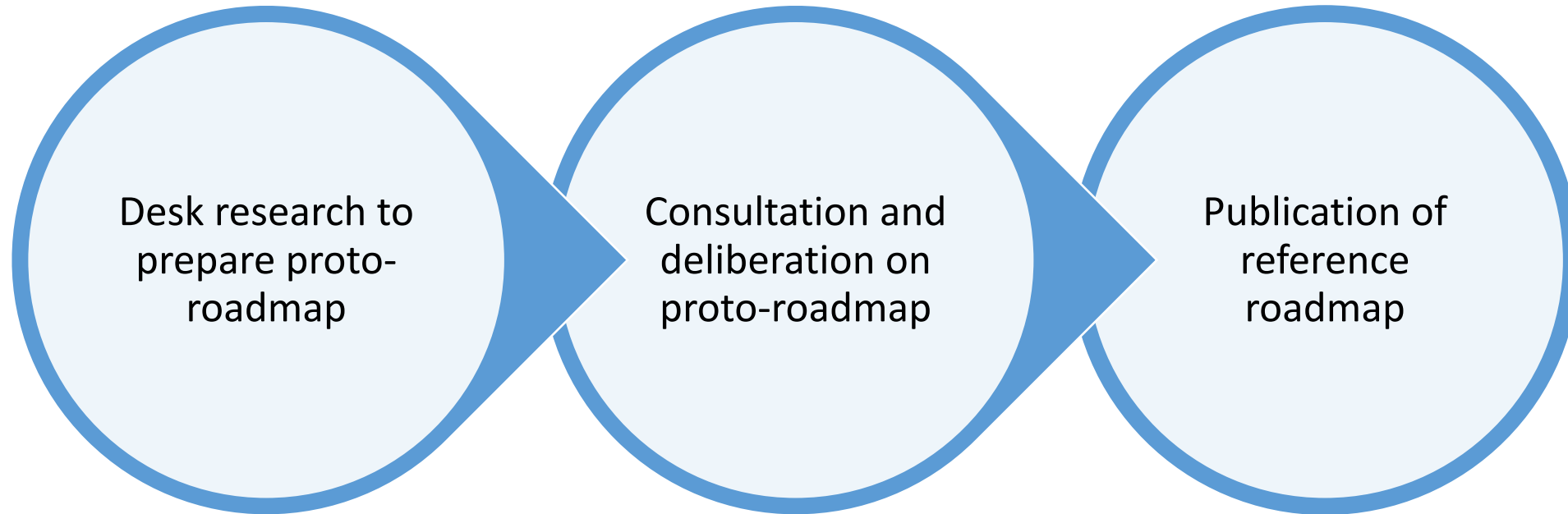# Challenges in mapping transition pathways

- ❑ Transitions rarely follow smooth trajectories but **proceed unevenly**, which should be taken into account when developing roadmaps

- ❑ Transition pathways should be informed by '**theories of change**' that identify 'leverage points' for intervention

- ❑ Roadmaps incorporate **multiple layers** that should bundle interrelated issues, actors and policies, and articulate the links between them

- ❑ Roadmaps should help reveal **trade-offs** and policy dilemmas, and help highlight opportunities for policy experimentation

- ❑ Roadmaps should not over-simplify what are **complex systems** and dynamics and nor should they give a sense of top-down control

- ❑ At the same time, roadmaps are **heuristics** and should not confuse and overwhelm the intended user with paralyzing complexity

Roadmapping process

Desk research to prepare proto-roadmap

Consultation and deliberation on proto-roadmap

Publication of reference roadmap

I. OECD Secretariat uses a **desk-based approach** that draws on existing (OECD and other) data and analysis to develop draft STI challenge roadmaps

II. Consultation and deliberation on draft roadmaps, involving **delegates and other experts**, which could be done (in part at least) through dedicated **policy dialogues**

III. The revised STI challenge roadmaps, which will include stretch targets for 2025, would then be **published and shared** for countries to use

While several draft roadmaps could be assembled in 2022 on the basis of desk research, the full process to revised, published versions will need to be piloted. It is proposed to implement the full three-stage process for two STI challenge roadmaps in 2022 as a pilot and to cover the remainder during 2023

Roadmaps assemblage >>> S&T Policy 2025 agenda

- ❑ Roadmaps will be designed for **use and adaptation** in countries

- ❑ Process could offer a **test-bed** for using these techniques in countries

- ❑ Assembling roadmaps >>> **holistic vision and action plan** for the STI policy field

- ❑ Combining challenge roadmaps will also highlight common tendencies and factors that underlie many challenges in the STI policy domain, and help **reveal leverage points**
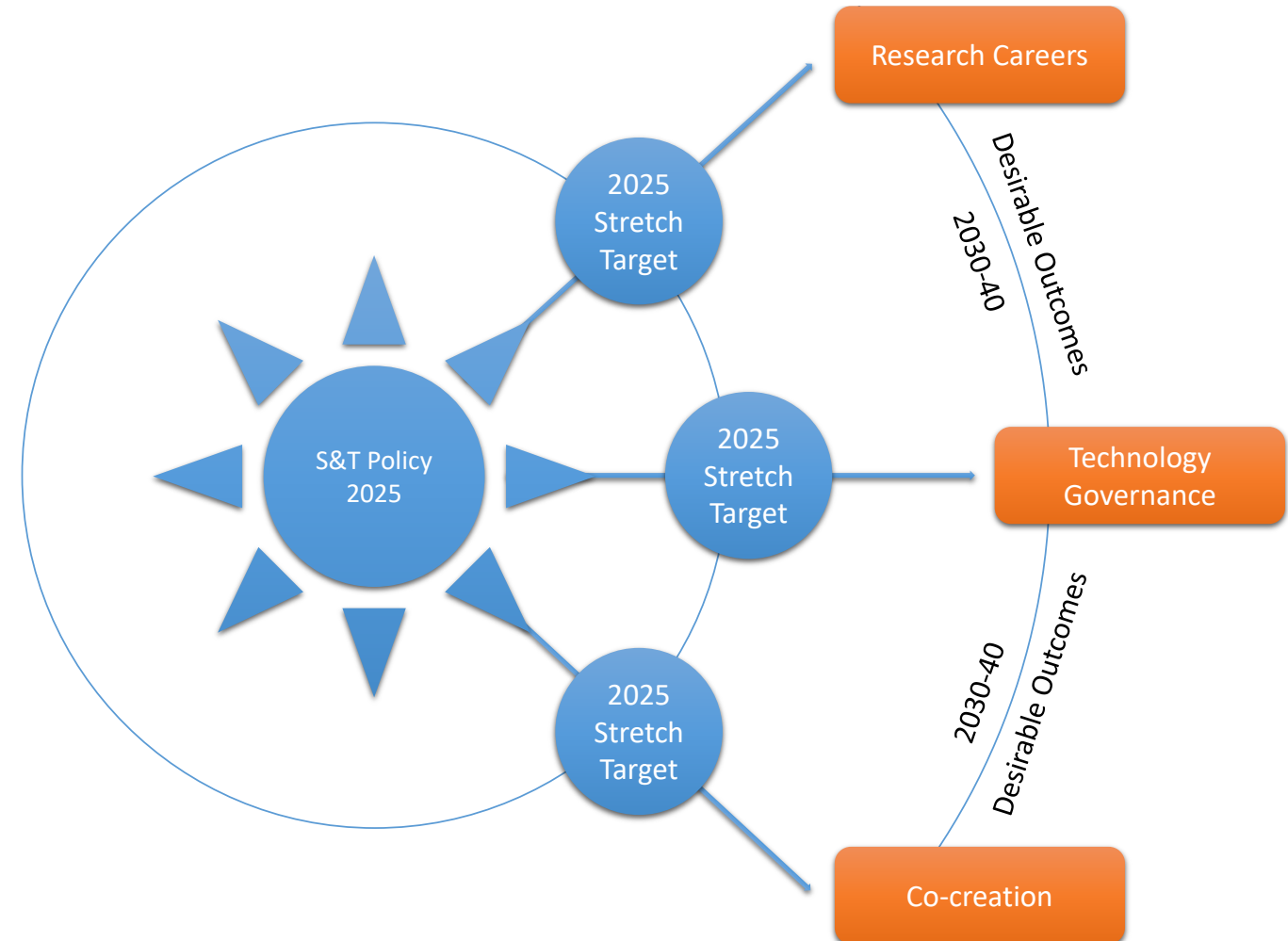
2. FOUNDATIONAL PAPERS

3. CROSS-GOVERNMENT OUTREACH

4. POLICY DIALOGUES

Review of practical **policy tools** for **mapping transition pathways**

Review of **STI cross-sectoral interfaces** for transitions

Review of **STI multilateralism** for transitions

Mapping of and guide to novel **foresight practices**

Review of practical **policy tools** for **mapping STI system dynamics**

How to map transition pathways using roadmaps?

How can cross-government links be harnessed for transitions?

How can international links be harnessed for transitions?

How to define shared, desirable future outcomes?

How to map existing systems and appreciate their dynamics?

MULTIPLE PATHWAYS POSSIBLE
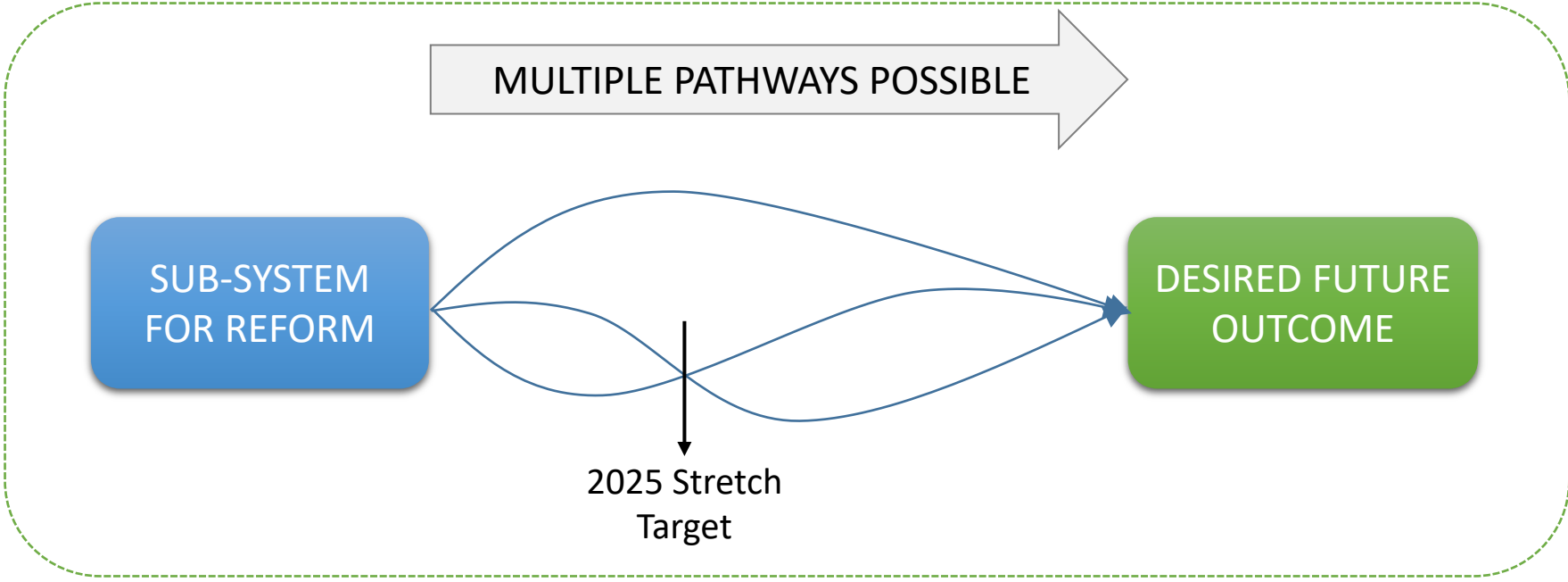
What future developments should be taken into account?

SUB-SYSTEM FOR REFORM

DESIRED FUTURE OUTCOME

2025 Stretch Target

Megatrends report and database

How to develop practices and capabilities in governments to enable transitions?

How to balance different values and goals for the future?

Review of **emerging policy practices, new capabilities, and new organisations** for transitions

How to develop the strategic intelligence to enable transitions?

Report on **strategic intelligence for transitions** – new practices, institutions, infrastructures and capabilities?

New measurement agenda

Report on **synergies and tensions** among the multiple **goals for STI policy**
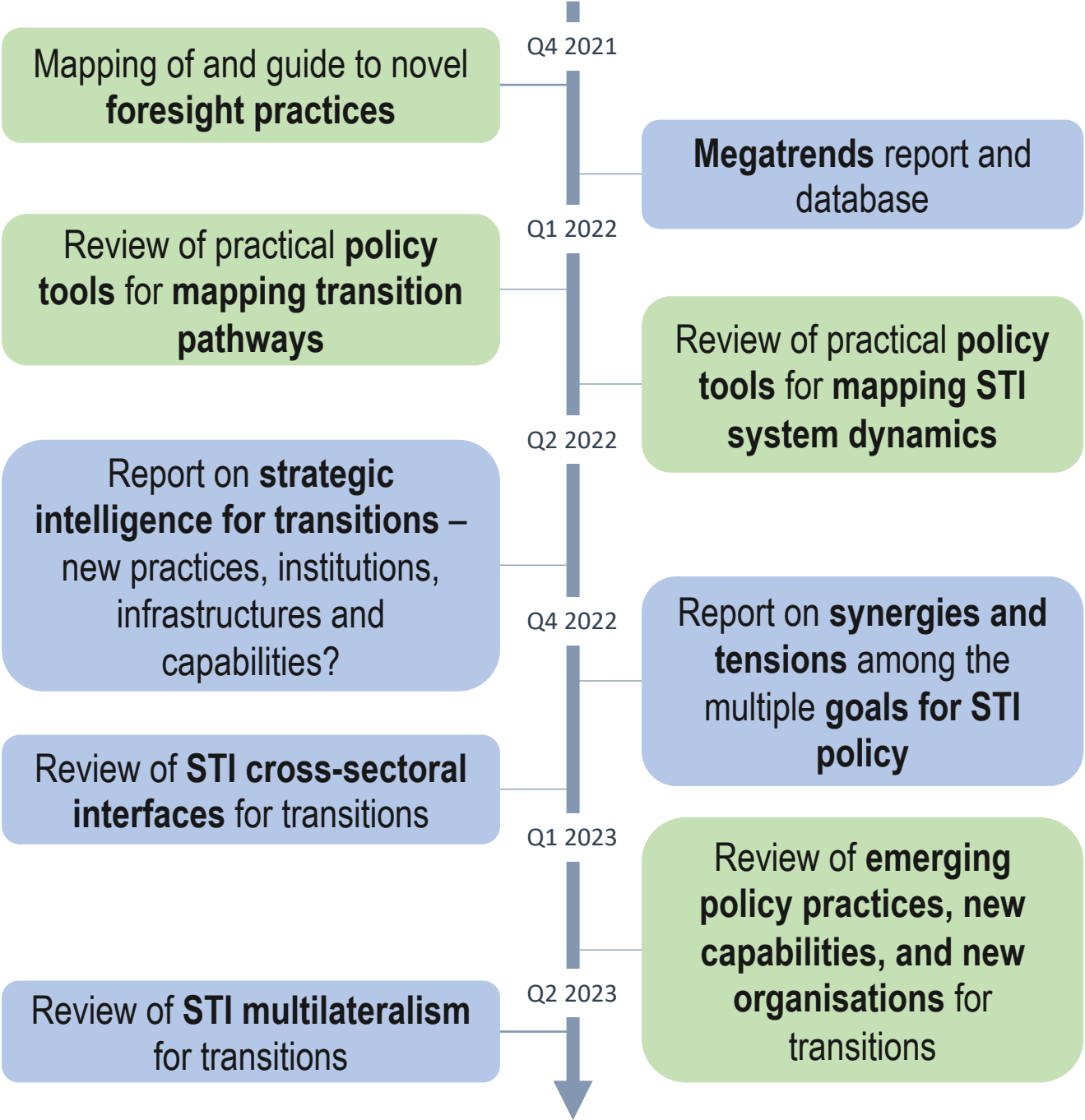
Foundational papers: tentative list and timetable

- Cover a **range of topics** to aid project thinking and processes

- Production will be **staggered** over next 18 months (sooner would be better!)

- **Co-produced** by S&T Policy 2025 team, working parties, and external experts

- Drafts discussed at dedicated **policy dialogues**

- Several will be the basis for OECD **STI Outlook** chapters

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Ongoing / continuous preparation

Extended **scoping report** on S&T Policy 2025 concept and how it could be implemented

New measurement agenda

Mapping of and guide to novel **foresight practices**

Q4 2021

Megatrends report and database

Q1 2022

Review of practical **policy tools** for **mapping transition pathways**

Review of practical **policy tools** for **mapping STI system dynamics**

Q2 2022

Report on **strategic intelligence for transitions** – new practices, institutions, infrastructures and capabilities?

Q4 2022

Report on **synergies and tensions** among the multiple **goals for STI policy**

Review of **STI cross-sectoral interfaces** for transitions

Q1 2023

Review of **emerging policy practices, new capabilities, and new organisations** for transitions

Q2 2023

Review of **STI multilateralism** for transitions

Cross-government coordination in support of transitions

- Socio-technical transitions require greater **cross-government cooperation**

- Efforts to promote cross-government STI linkages are not new, nor are complaints about their **inadequacies**

- We need to move from the general to the specifics of coordination challenges

- One approach: identify specific issues of **common interest** and **broker discussions** within the OECD, e.g. by
  - organising **policy dialogues** between STI and sector domain policy communities
  - leveraging **data infrastructures**, such as STIP Compass, e.g. net zero portal,* or conducting **joint projects** to help establish long-lasting links

Health
[ELS]

Energy
[IEA, NEA]

Food
[TAD]

Mobility
[ITF]

Overseas
Aid
[DCD]

Biodiversity
[ENV]

Oceans
[STI, ENV]

Cities
[CFE]

Shipbuilding
[STI]

Public
admin
[GOV]

Steel
[STI]

STI
Policy
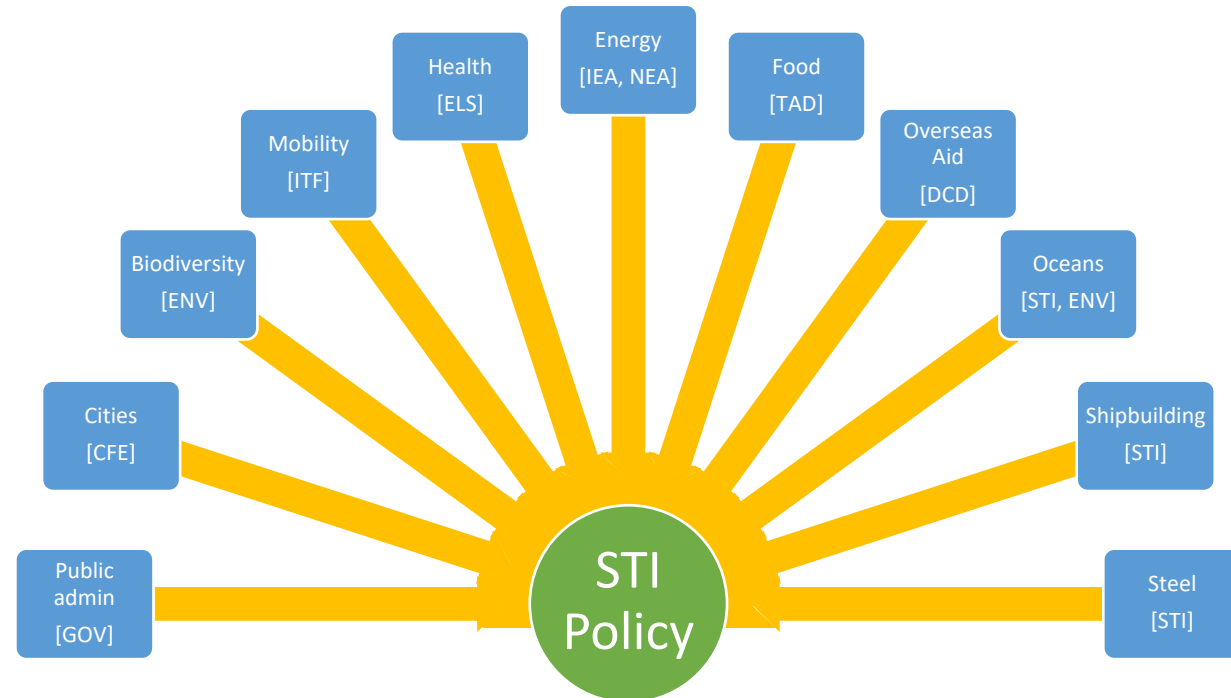
*The net zero portal is a collaboration between the EC, IEA and OECD
https://stip.oecd.org/stip/net-zero-portal

Policy dialogues – three main types

❑ **Background foundational papers:**

- Exchange on current practices
- Dialogue with experts and practitioners

❑ **STI policy challenge roadmaps:**

- Likely led by a working party or CSTP project
- Structured around discussions of draft roadmap

❑ **Cross-government outreach:**

- Dialogue between two or more policy domain areas
- Focus on various, but specific, coordination challenges

The condition for organising any type of policy dialogue is that there is new data and/or analysis for discussion available in advance, typically in a draft report

Format

❑ Virtual, 3-4 hours each

❑ Variation depending on type and focus

❑ Exchange, sense-making

Planned in 2022

❑ 4 foundational papers

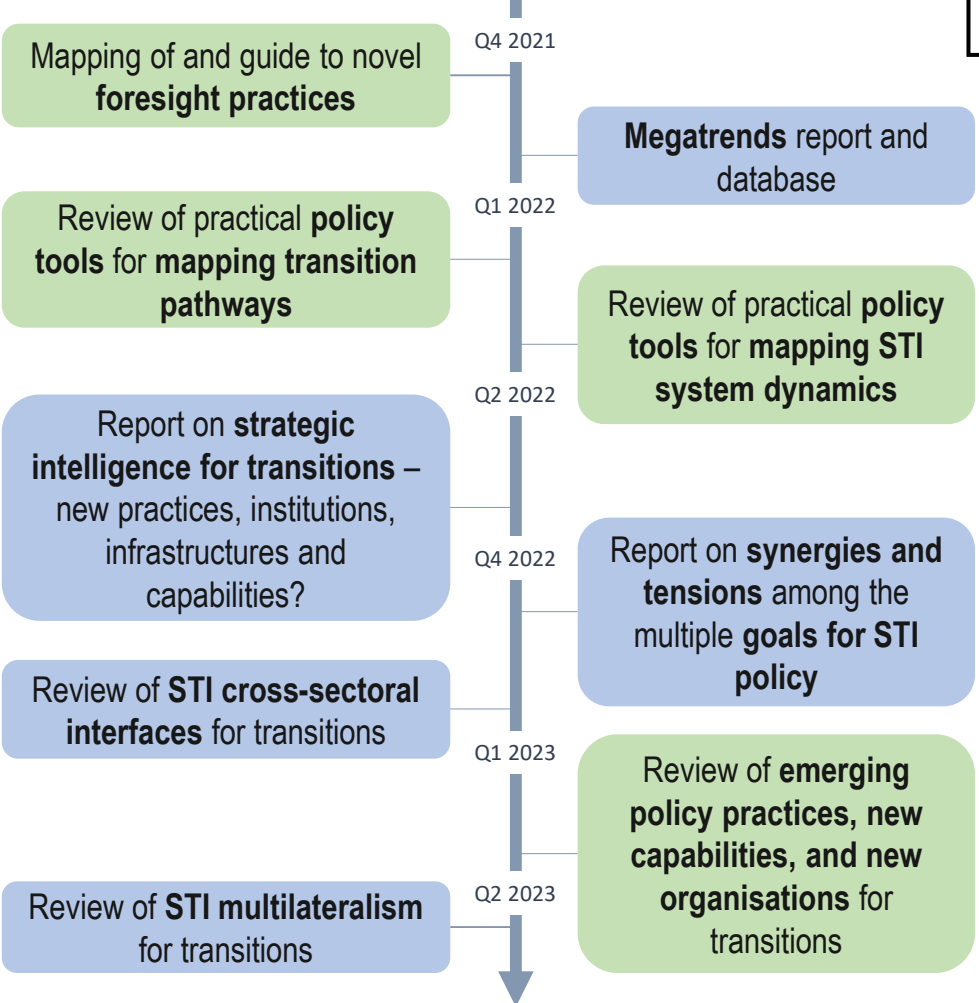❑ 2 pilot roadmaps

❑ 1 cross-government outreach: net zero portal
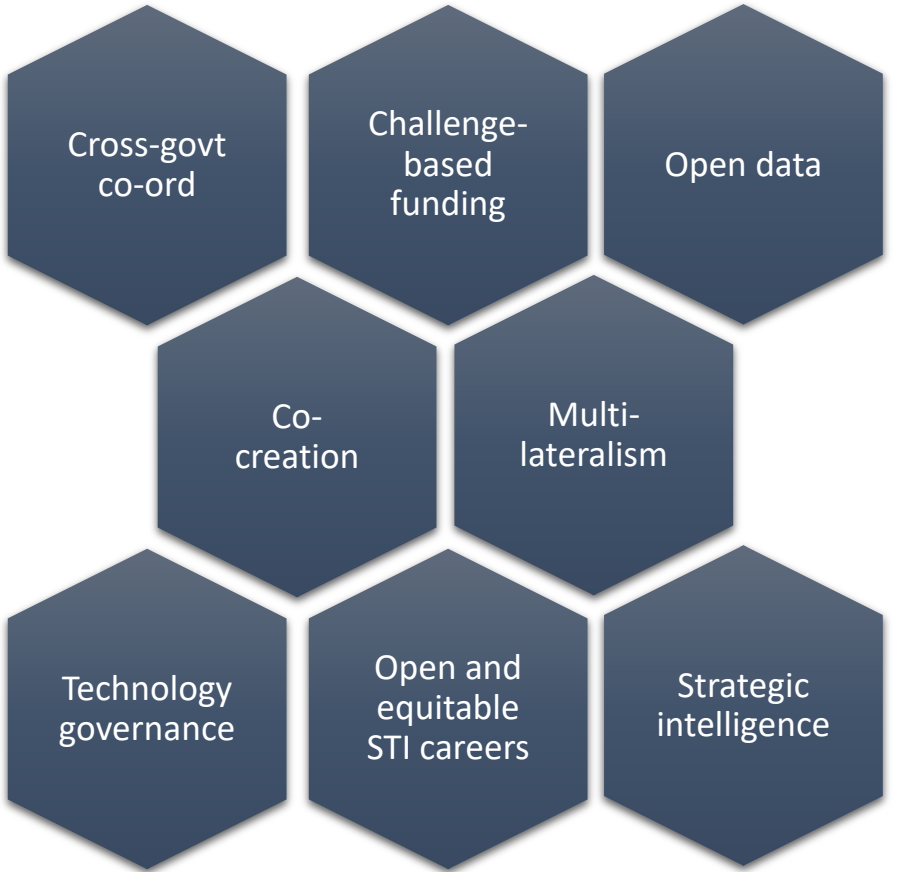
SUMMARY AND NEXT STEPS

Project overview

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

Background foundational papers

STI challenge roadmaps
Cross-govt outreach

Longer-term outputs

Q4 2021

Mapping of and guide to novel **foresight practices**

Megatrends report and database

New **measurement agenda**

Q1 2022

Review of practical **policy tools** for **mapping transition pathways**

Review of practical **policy tools** for **mapping STI system dynamics**

New template / **framework** for conducting **country reviews**

Q2 2022

Report on **strategic intelligence for transitions** – new practices, institutions, infrastructures and capabilities?

Q4 2022

Report on **synergies and tensions** among the multiple **goals for STI policy**

Review of **STI cross-sectoral interfaces** for transitions

Q1 2023

Review of **emerging policy practices, new capabilities, and new organisations** for transitions

Q2 2023

Review of **STI multilateralism** for transitions

Cross-govt co-ord

Challenge-based funding

Open data

Co-creation

Multi-lateralism

Technology governance

Open and equitable STI careers

Strategic intelligence

OECD Declaration that encapsulates a **vision and action plan for STI policy over the next decade or so** ?

Ministerial meeting 2023-24 ?

Policy dialogues

Moving forward

❑ The S&T Policy 2025 concept and project **continue to evolve**

❑ **A soft coordination mechanism** to promote and align activities that help **join the dots** around a **mobilising collective vision**

❑ There is need to **intensify discussions** over the next few months on what challenge roadmaps to develop (and how); and what cross-domain outreach opportunities to actively pursue

❑ **Member countries** will play critical roles in scoping and supporting these activities, their outputs, and their impacts, e.g.

  ▪ Japanese participation in project Steering Group and Advisory Board
  ▪ Japan's representatives in the CSTP and its working parties, which will contribute to the project

❑ How else to become involved?

  ▪ Support specific foundational **papers**, **roadmaps**, **policy dialogues**
  ▪ Test the translation / adaptation of the project's reference roadmaps into **country specific roadmaps**
  ▪ Test a new framework for conducting **country reviews**

THANK YOU!

For more information, check out the S&T Policy 2025 website:

https://www.oecd.org/sti/inno/stpolicy2025