STRATEGIC INTELLIGENCE

ACTIVITIES AT THE OECD

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NanoTrust 14th September 2023
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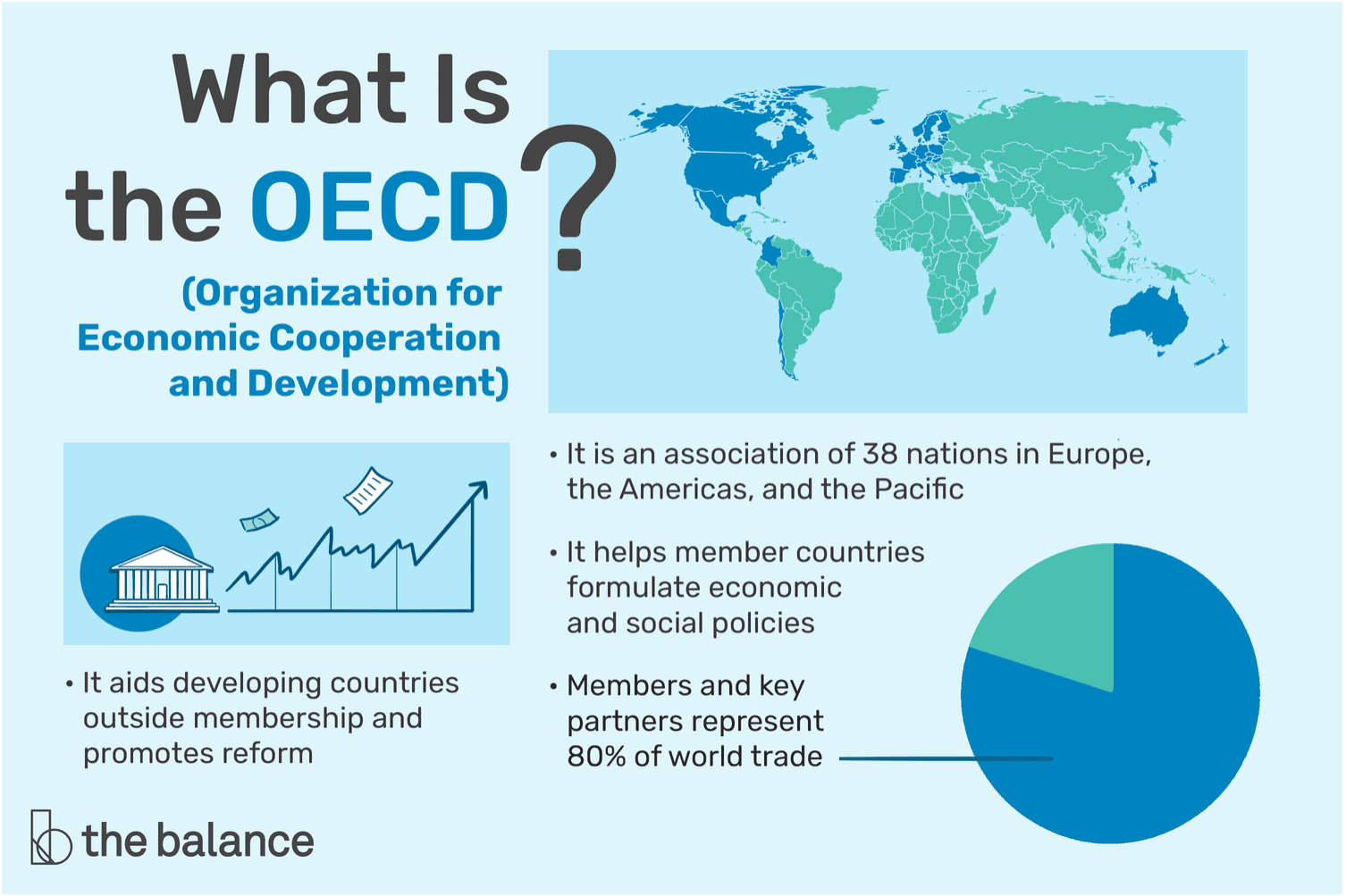
OECD
BETTER POLICIES FOR BETTER LIVES

Organisation for Economic Cooperation and Development (OECD)



Provides economic and policy advice on a range of global issues: finance, employment, education, environment, health, science and technology … and more

Science and Technology Policy division. All work is done in conjunction with (and endorsed by) a committee of member states (often Ministries of research and innovation, but not solely)***….potential for great impact on policy!***

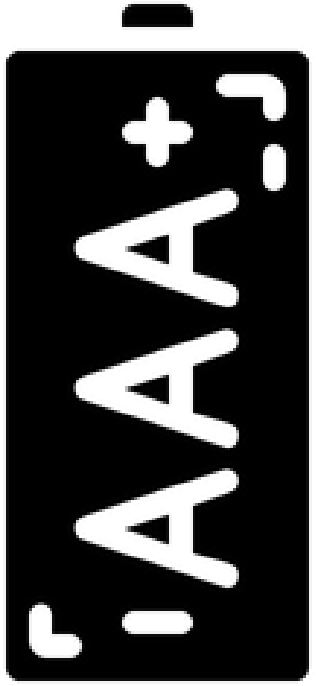
Outline

- Why is the OECD exploring Strategic Intelligence
- Exploring new requirements driving TA tools and practices
- A very short note on how strategic intelligence is being mobilised this year (not exhaustive)
- Current project on Advanced Materials *(if time allows)*

WHY IS STRATEGIC INTELLIGENCE FOR THE OECD?

Why strategic intelligence?

….OECD general principles for responsible innovation and governance!



Agile

Keep pace with rapid changes, help steer in desirable directions *(in real time!).*

Anticipatory

The forward-look is essential to gain insights into potential futures *(desirable, undesirable, transformative…).*

Adaptive

Be reactive, responding to the intelligence received to enable desirable technological impacts and constrain negative ones.

Promising technologies and challenges for evidence-based assessment

Governance from the early stages of innovation,
to *harness* the benefits of new and emerging technologies, and *mitigating* potential risks,

Anticipation
key design criterion of technology governance

- Emerging technologies offer hope and concern: there is a need to shape at early stages
- High uncertainty during early stages of development creates challenges for governance of emerging technology ***= a need for anticipation***
- Traditional evidence-based risk assessment is not possible at early stages of technology emergence
- Forward-looking insights help fill this gap
  = a need for Strategic Intelligence

What is 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”*

* Robinson D. K. R. et al. (2021) Policy lensing of future-oriented strategic intelligence. Technological Forecasting and Social Change. https://doi.org/10.1016/j.techfore.2021.120803

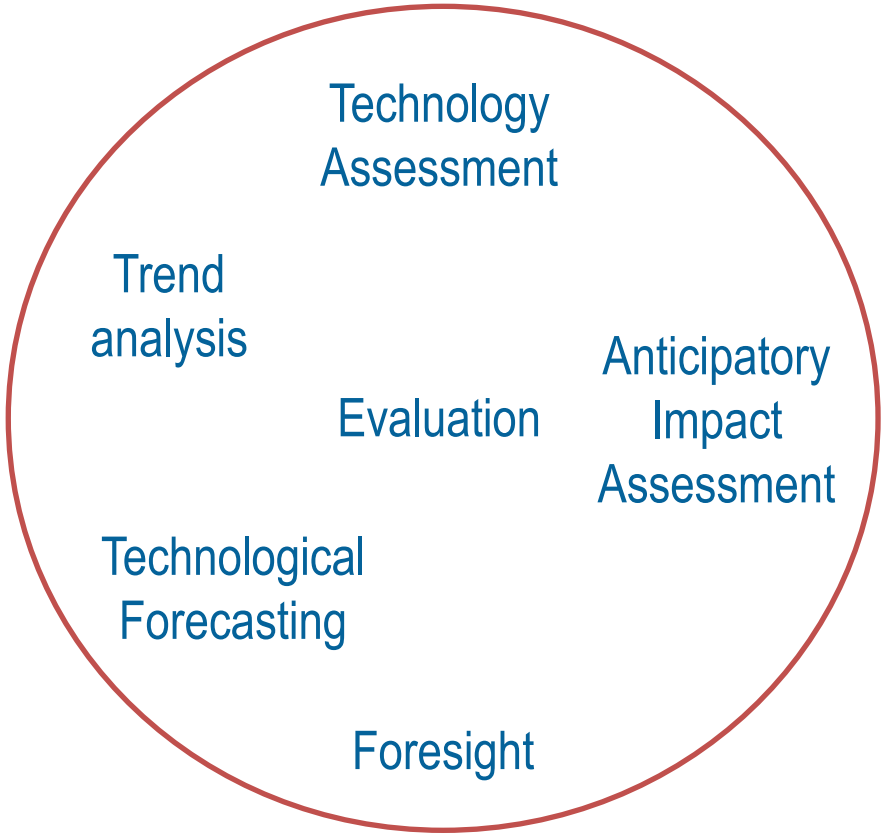
Uses of Strategic Intelligence for STI

(informing)

Anticipatory Technology Governance

(aiding)

Design, Implementation and Monitoring of Transition(s) Policies



(facilitating)

Sense making of emerging technologies and their potential impacts

(coordinating)

A shared forward-look as a means of international cooperation and co-creation of technology and society

TECHNOLOGY ASSESSMENT FOR EMERGING TECHNOLOGY

MEETING NEW DEMANDS FOR STRATEGIC INTELLIGENCE

POLICY PAPER [DSTI/STP/BNCT(2022)8/REV1]

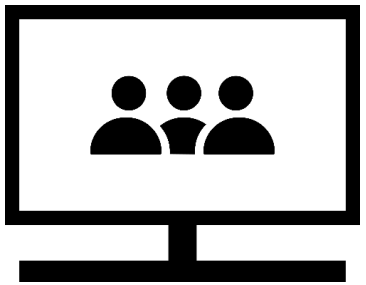
OECD
BETTER POLICIES FOR BETTER LIVES

Guiding questions for the BNCT TA Steering Group

- What are the different rationales for doing TA (different countries and contexts)?
- What are the STI / Tech Governance needs driving new requirements for TA (and how is TA responding)?
- What are the dimensions to consider when commissioning or designing robust and trustworthy TA?
- How can TA be positioned in a broader technology governance framework?

Nine case studies shared, explored and compared

- Building an Industry & Manufacturing Agenda 2030
- Biotechnology Assessment in Korea
- Value-directed Artificial Intelligence
- Dialogue on genetically modified embryos
- Nanotechnology Governance
- NIH NExTRAC
- NNI Strategic Planning
- Genome editing in crops
- Assessment of Vaccine Development Technologies

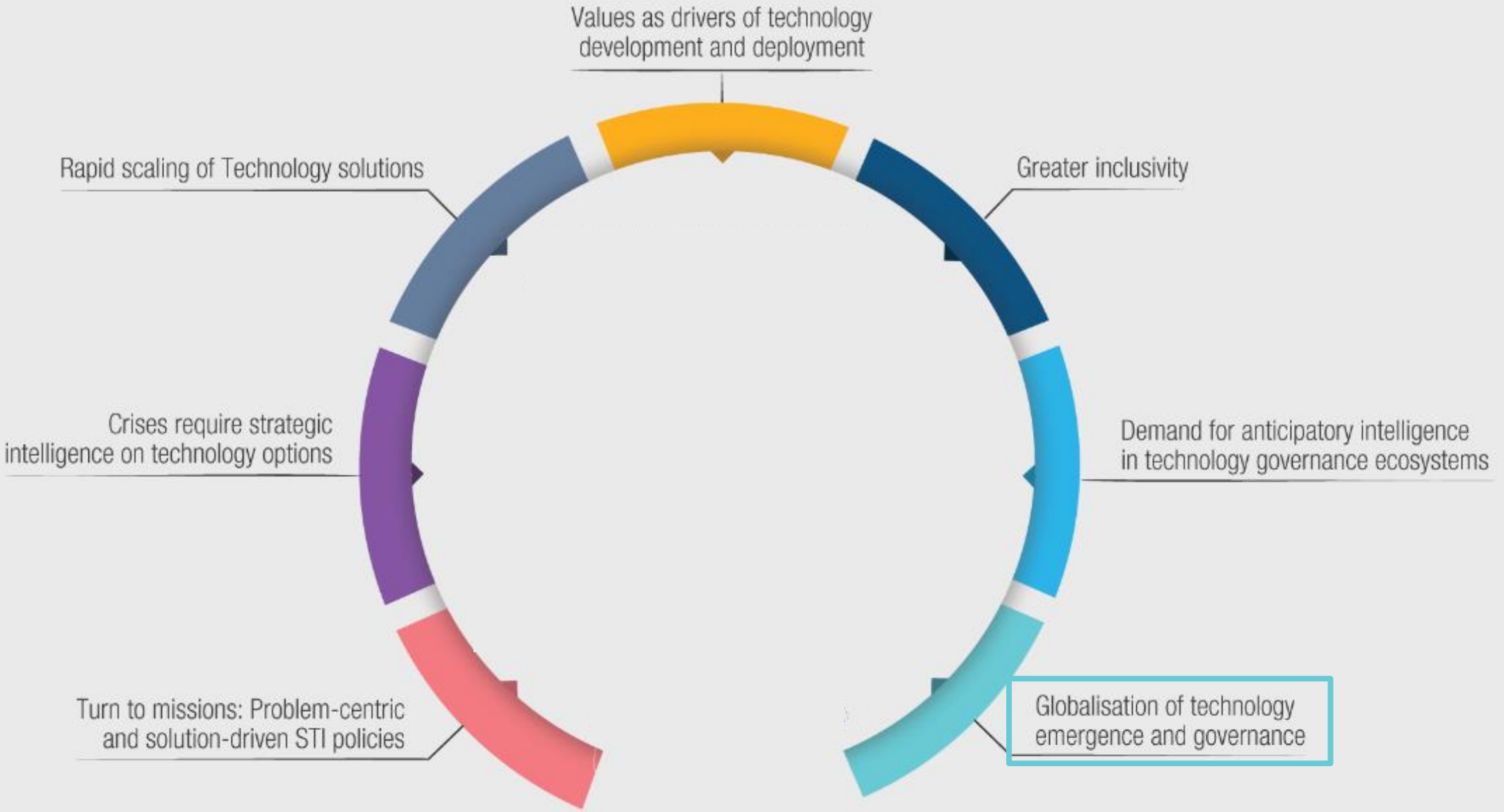


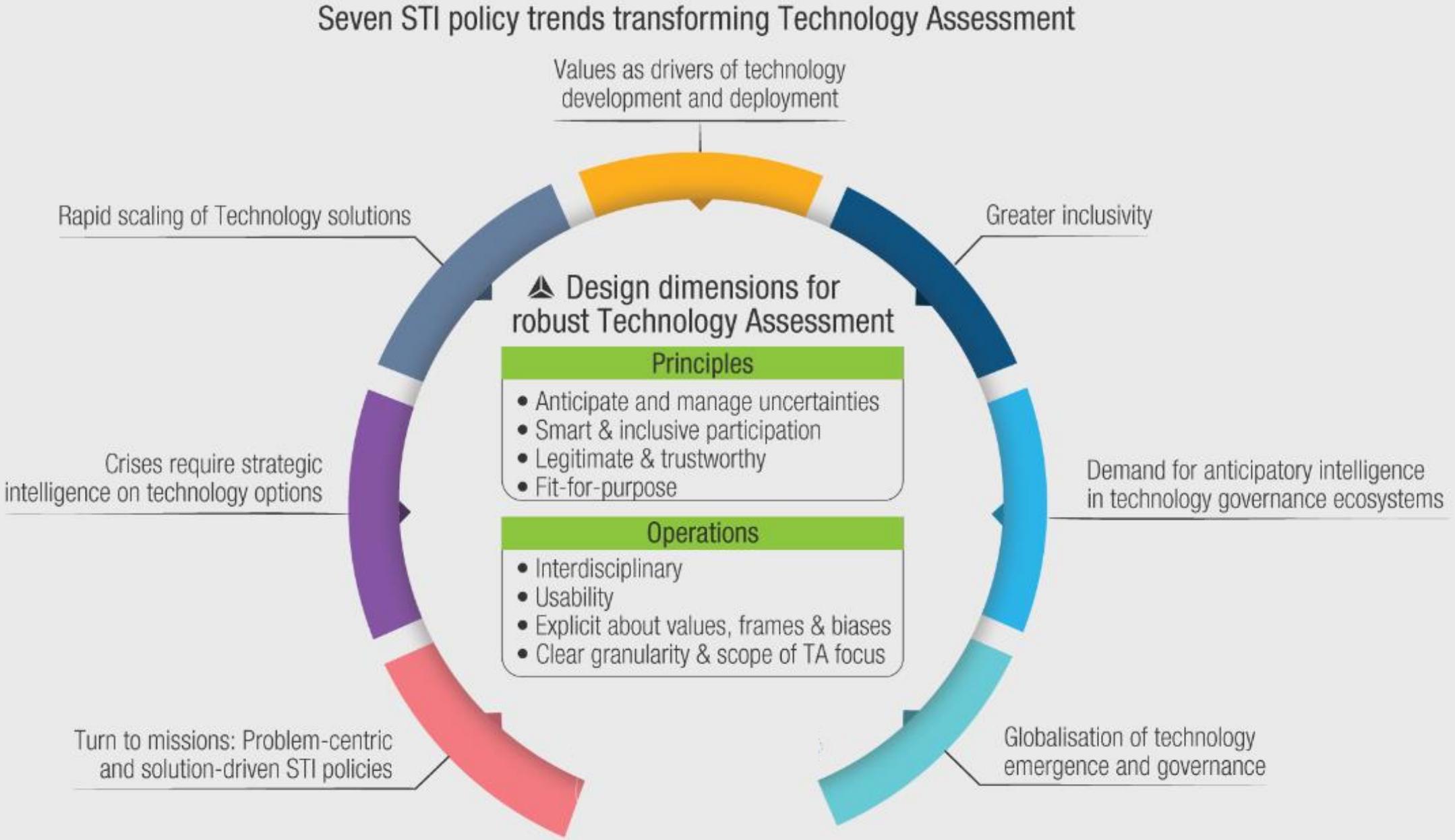
Steering Group Meetings
(during 18 months ~ every 3 weeks)

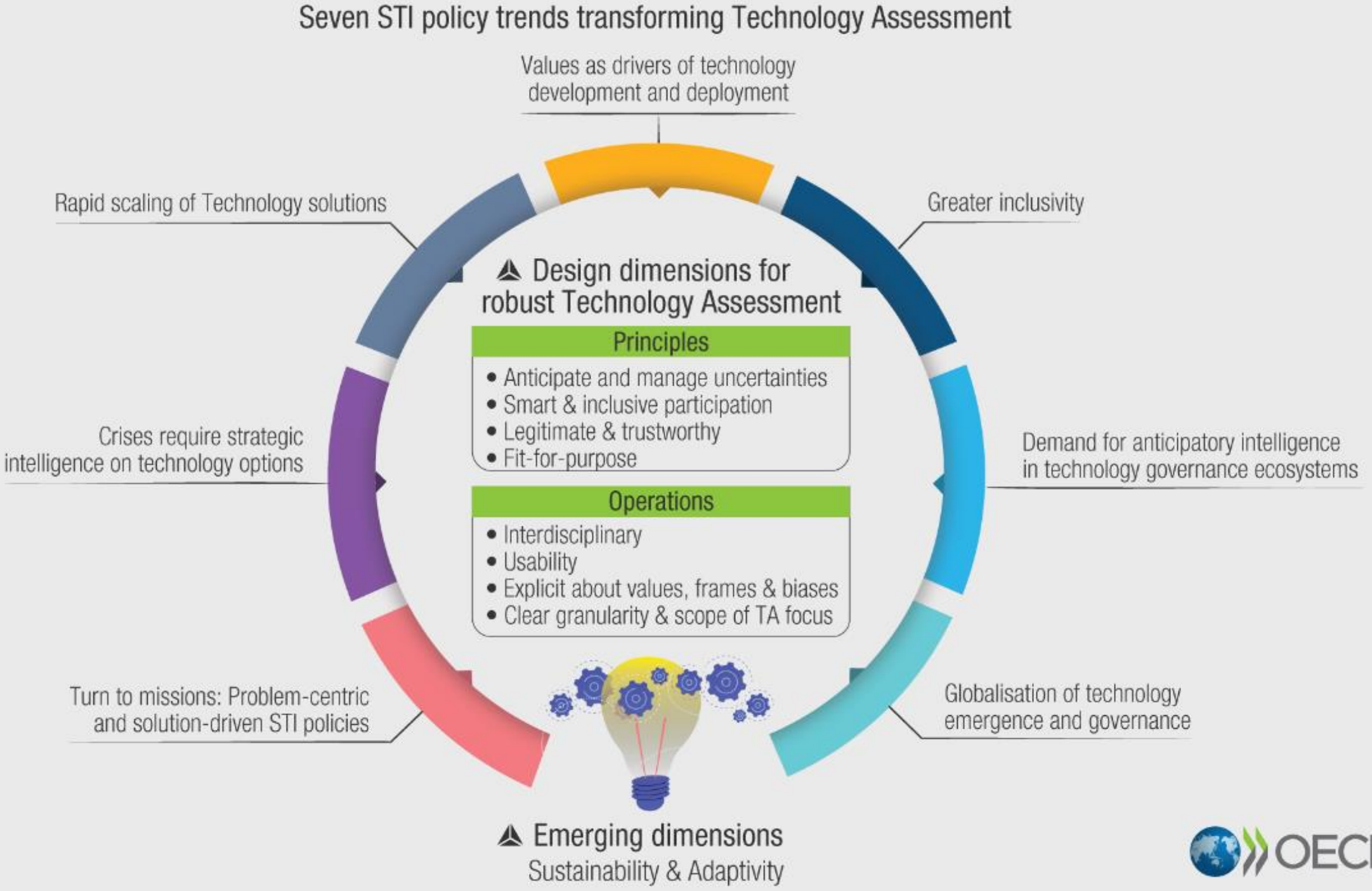
1 ½ day workshop in
Vienna/Austria, June'22

OUTCOMES

Seven STI policy trends transforming Technology Assessment




Seven STI policy trends transforming Technology Assessment
Values as drivers of technology development and deployment
Greater inclusivity
Demand for anticipatory intelligence in technology governance ecosystems
Globalisation of technology emergence and governance
Turn to missions: Problem-centric and solution-driven STI policies
Crises require strategic intelligence on technology options
Rapid scaling of Technology solutions
Design dimensions for robust Technology Assessment
Principles
• Anticipate and manage uncertainties
• Smart & inclusive participation
• Legitimate & trustworthy
• Fit-for-purpose
Operations
• Interdisciplinary
• Usability
• Explicit about values, frames & biases
• Clear granularity & scope of TA focus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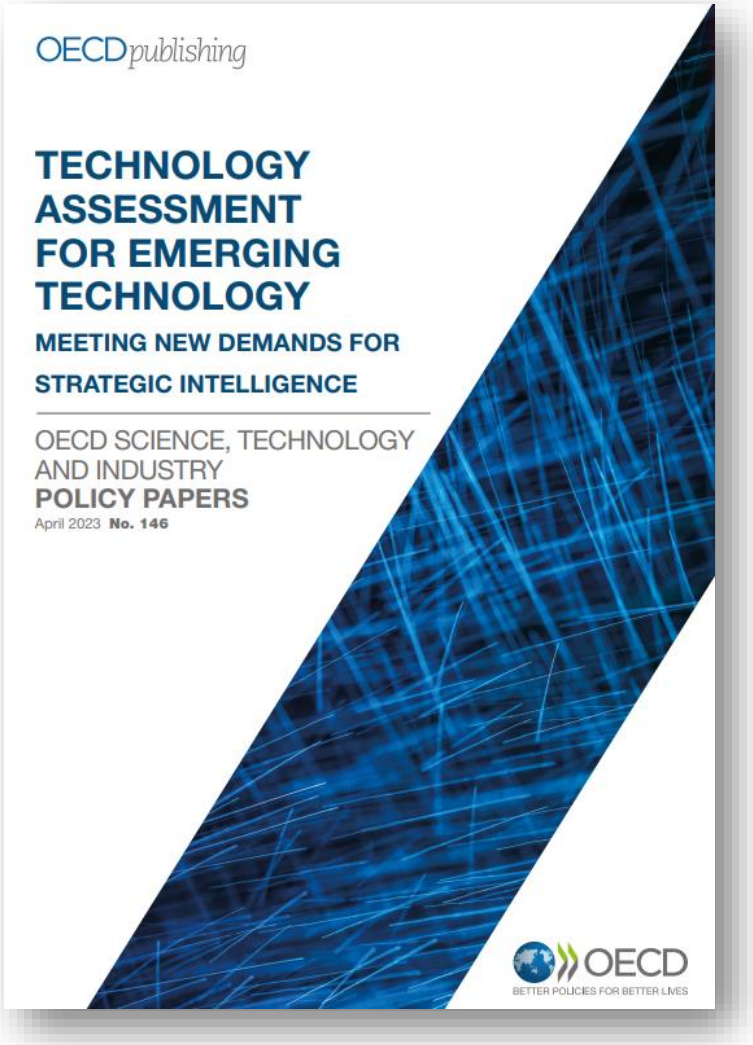
Emerging dimensions
Sustainability & Adaptivity

Policy report is out



https://doi.org/10.1787/e738fcdf-en

- Biotechnology Assessment i Korea
- NANOTRUST: Nanotechnology Governance
- Value-directed Artificial Intelligence
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- Building and Industry & Manufacturing Agenda 2030
- National Institutes of Health NExTRAC

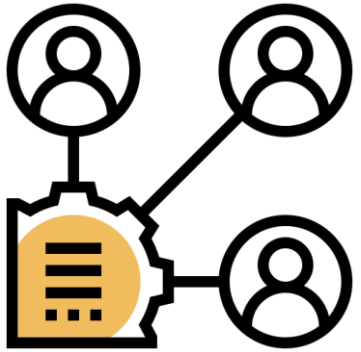
DSTI/STP/BNCT(2023)5/FINAL.

Other outcomes from the steering group

INTERNATIONAL HUB *integrating* insights and intelligence

- An observation that a hub at the international level for the INTEGRATION of different forward-looking insights around policy challenges would be advantageous (and is missing)

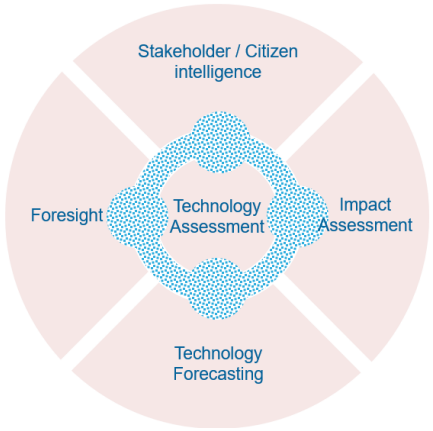
BUILD A NETWORK *interfacing* intelligence producers and users

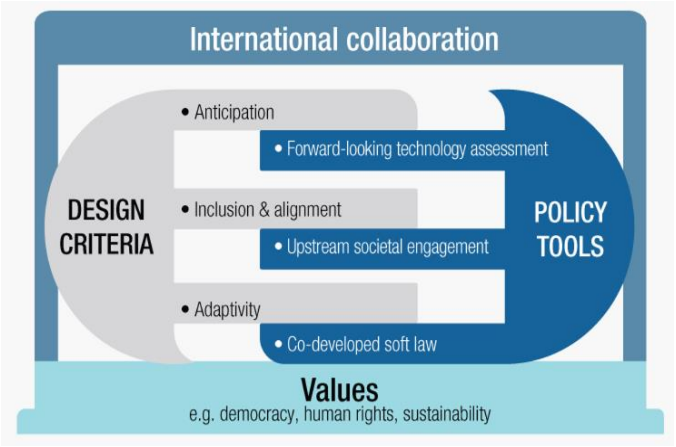


- An observation that INTERFACING intelligence producing communities would allow for a more holistic forward look on key topics

- An observation that INTERFACING the outputs of technology assessment with Policy use is a challenge and could be addressed through an international forum

Legacy of the TA activity for *2023-2024*





Continuing interest from the BNCT delegates

- Understanding the use of strategic intelligence for driving advanced material innovation and for good governance

- Technology Assessment and foresight for pandemic preparedness from a OneHealth perspective (a focus on engineering biology)

Other large scale initiatives at the OECD

- **Global Forum on Technology**: High-level forum for aligning global practices on key technology domains (currently, quantum, immersive tech and synthetic biology)

- **Going Digital IV:** a cross OECD initiative A focus on strategic intelligence for informing anticipatory governance (a State-of-the-Art review)

Exploring

The hub recommendation, exploring complementarity with other initiatives (EPTA network, global TA etc.).

STRATEGIC INTELLIGENCE FOR ADVANCED MATERIALS

OECD activity 2023-2024

BETTER POLICIES FOR BETTER LIVES

Why Advanced Materials?

- **Sustainability and circularity relies on Adv Mat:** To be able to achieve a circular economy, to reach climate neutrality and sustainability in transport, packaging and electronics, advances in material science and innovation are key.

- **Strategic autonomy:** Material consumption expected to rise*, access of OECD countries to critical raw materials, means advanced materials are a key strategic area going forward.

- **Growing new markets:** Advanced materials enable new markets e.g., printed electronics , advanced drug delivery, smart packaging etc.

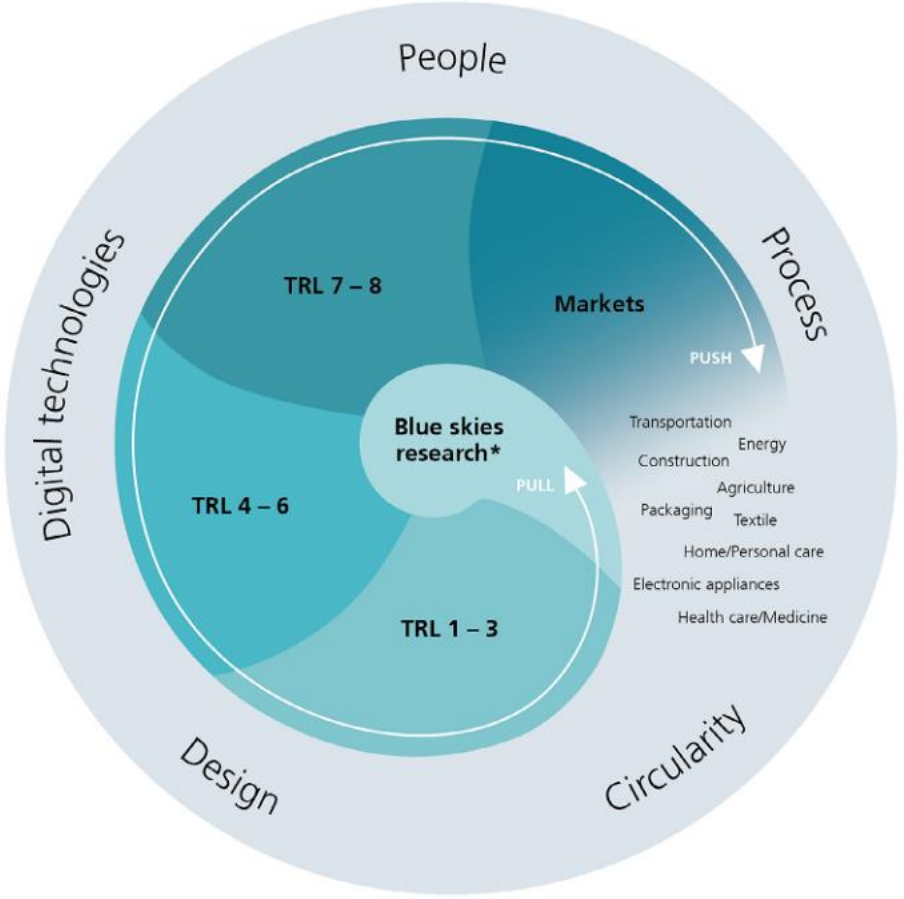
- **Safer products through SSbD advanced materials:** Improve safety, environmental and human health through advances in materials

* OECD, Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences (OECD Publishing, Paris), 2019.

Forward-looking strategic intelligence needed for **aligning value chains and catalysing market formation**

Graphene, nanocarriers and other smart materials, promise to impact a range of sectors up to and creating new markets.

- How will these materials be scaled up and incorporated into value chains?
- How are industrial actors and public agencies anticipating and coordinating to create future innovation pathways?
- How do countries diagnose the “technology delivery system” that can supply advanced materials at scale?
- What forms of forward looking insights are being developed in different countries?



* Research where „real-world“ applications are not immediately apparent

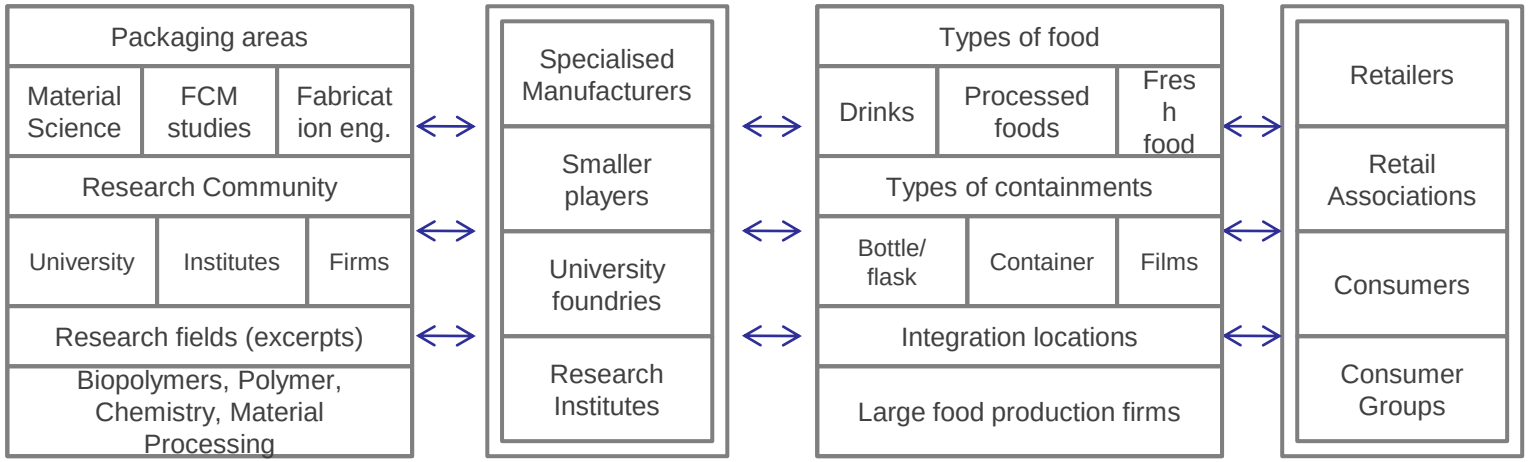
Source: https://research-and-innovation.ec.europa.eu/system/files/2022-02/advanced-materials-2030-manifesto.pdf

Nanomaterials for Active & Intelligent

FOOD PACKAGING

Emerging Value Chains

Packaging R&D | **Packaging Manuf.** | **Packaging meets food** | **In the shops**



Look at the current industrial value chain (here for food packaging)

Adapted from: Douglas Robinson, Lu Huang, Ying Guo & Alan Porter (2013)
Forecasting Innovation Pathways (FIP) for New & Emerging Science & Technologies.

Emerging Value Chains

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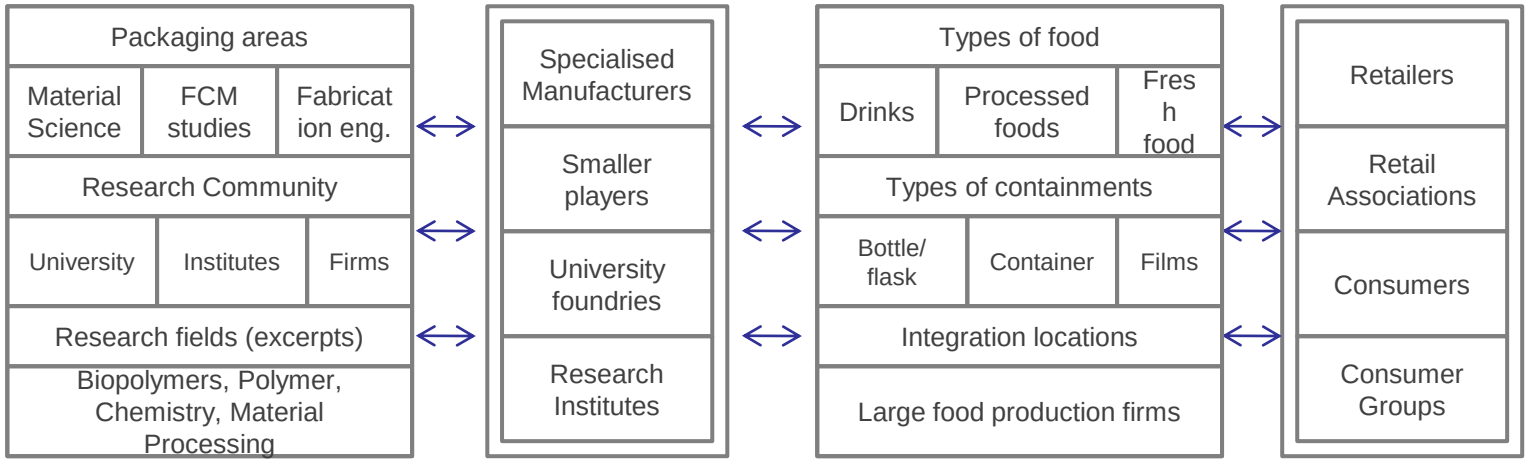

Adding nanotechnology creates new supply chains in nanomaterials, but shapes the Framing conditions that effect the food packaging value chain (leading to a number of challenges and opportunities)

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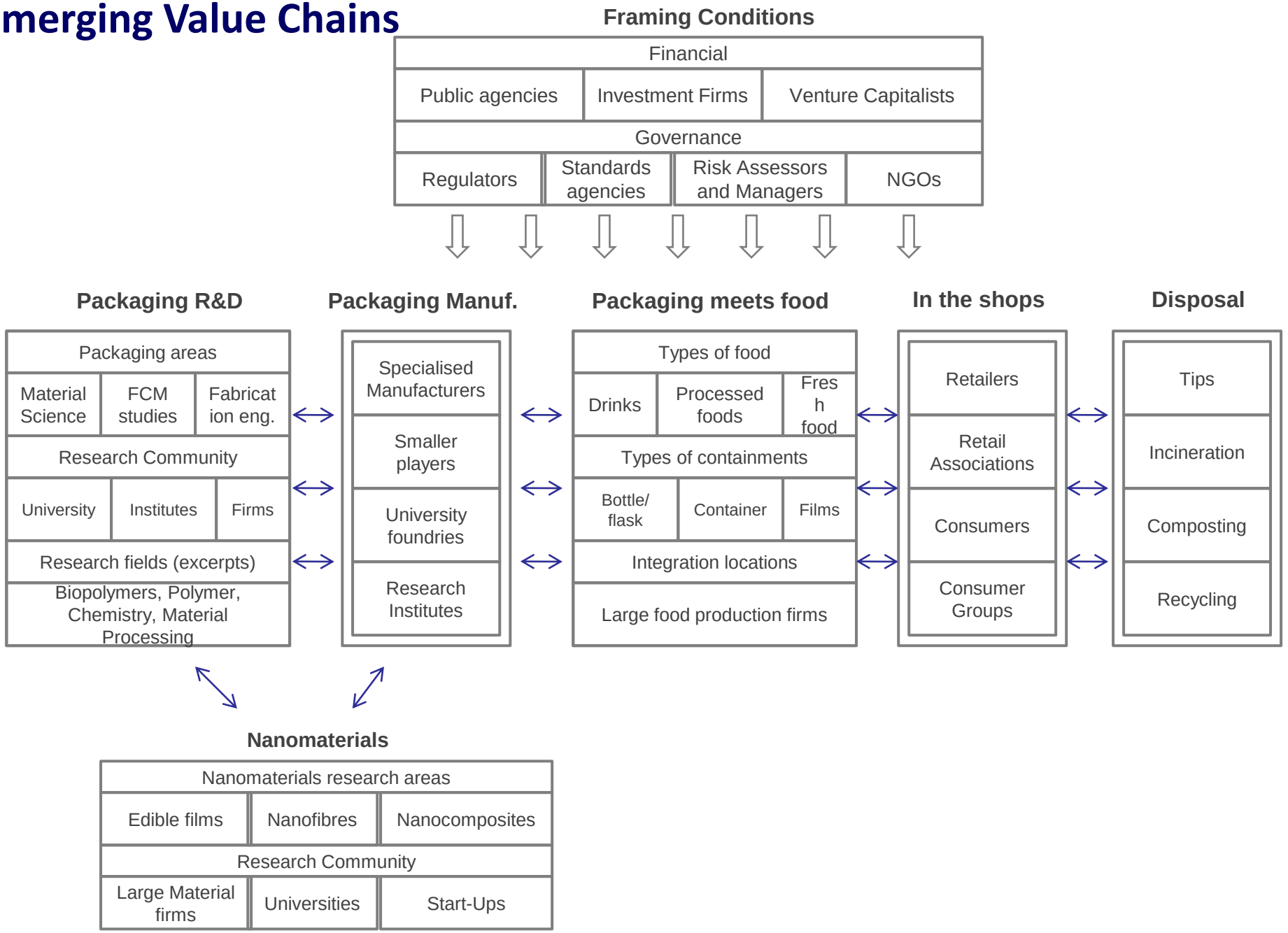
Emerging Value Chains



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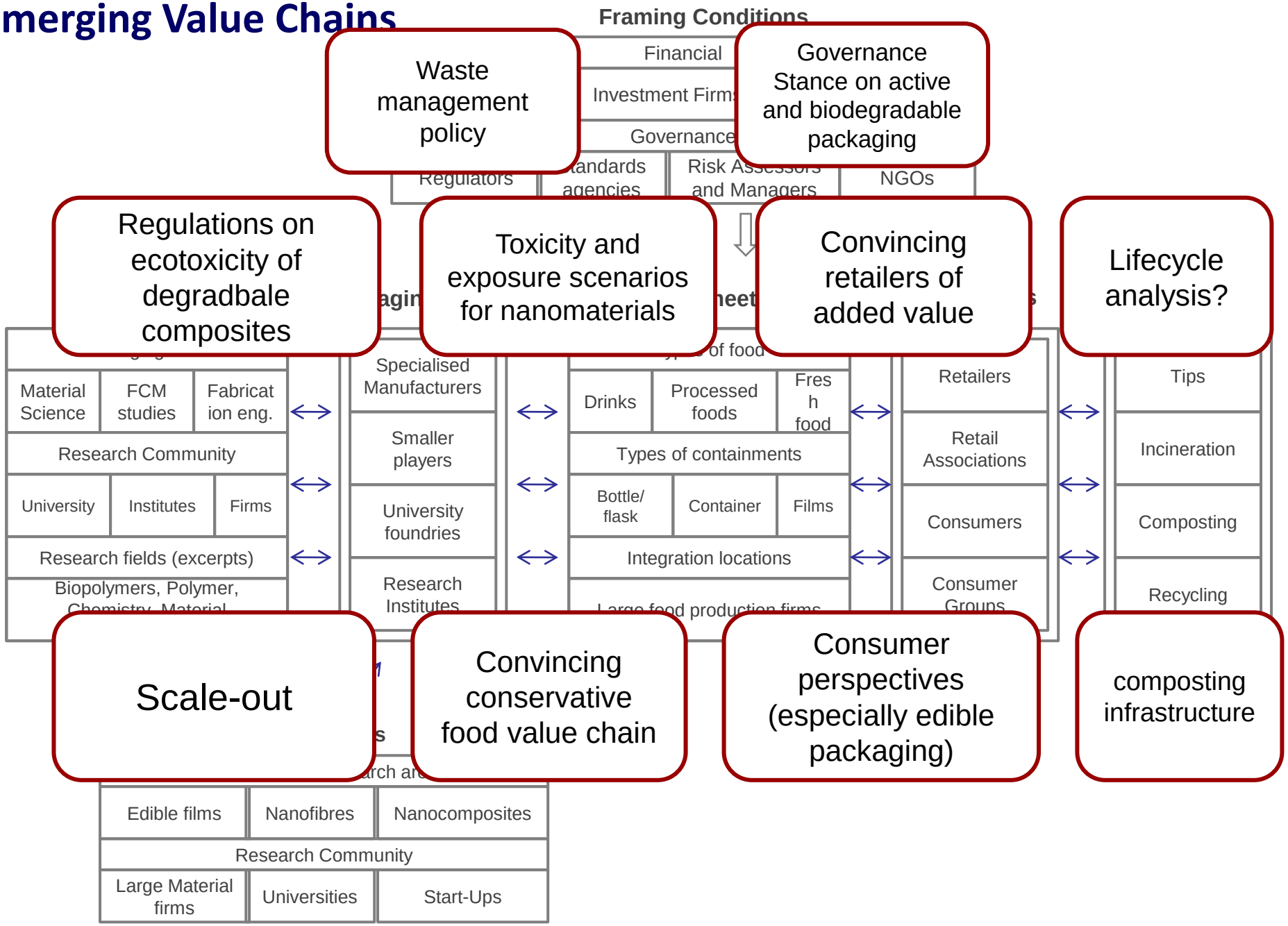

Waste management policy

Governance Stance on active and biodegradable packaging

Regulations on ecotoxicity of degradbale composites

Toxicity and exposure scenarios for nanomaterials

Convincing retailers of added value

Lifecycle analysis?

Scale-out

Convincing conservative food value chain

Consumer perspectives (especially edible packaging)

composting infrastructure

Adapted from: Douglas Robinson, Lu Huang, Ying Guo & Alan Porter (2013)
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Strategic intelligence needed for **anticipatory governance**

For early-stage advanced materials, where systematic data on the novel material is scarce, non-traditional information must be mobilised.

- What are current practices?
- Which methods are being experimented with in different countries?
- How is the mosaic of non-traditional information being integrated to inform Safe and Sustainable by Design approaches

Figure 1: A comprehensive, yet not exhaustive list of safety and sustainability dimensions to assess and design sustainable chemicals, materials, products and processes.

Source: https://cefic.org/app/uploads/2022/04/Safe-and-Sustainable-by-Design-Guidance-A-transformative-power.pdf

Thank you!

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