Transformative Mission-Oriented STI Policies – development of a policy approach and its implementation in Europe

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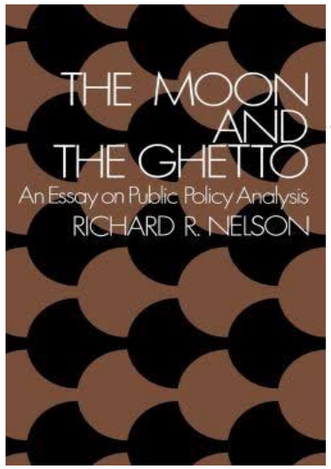
Missions – a concept with a history

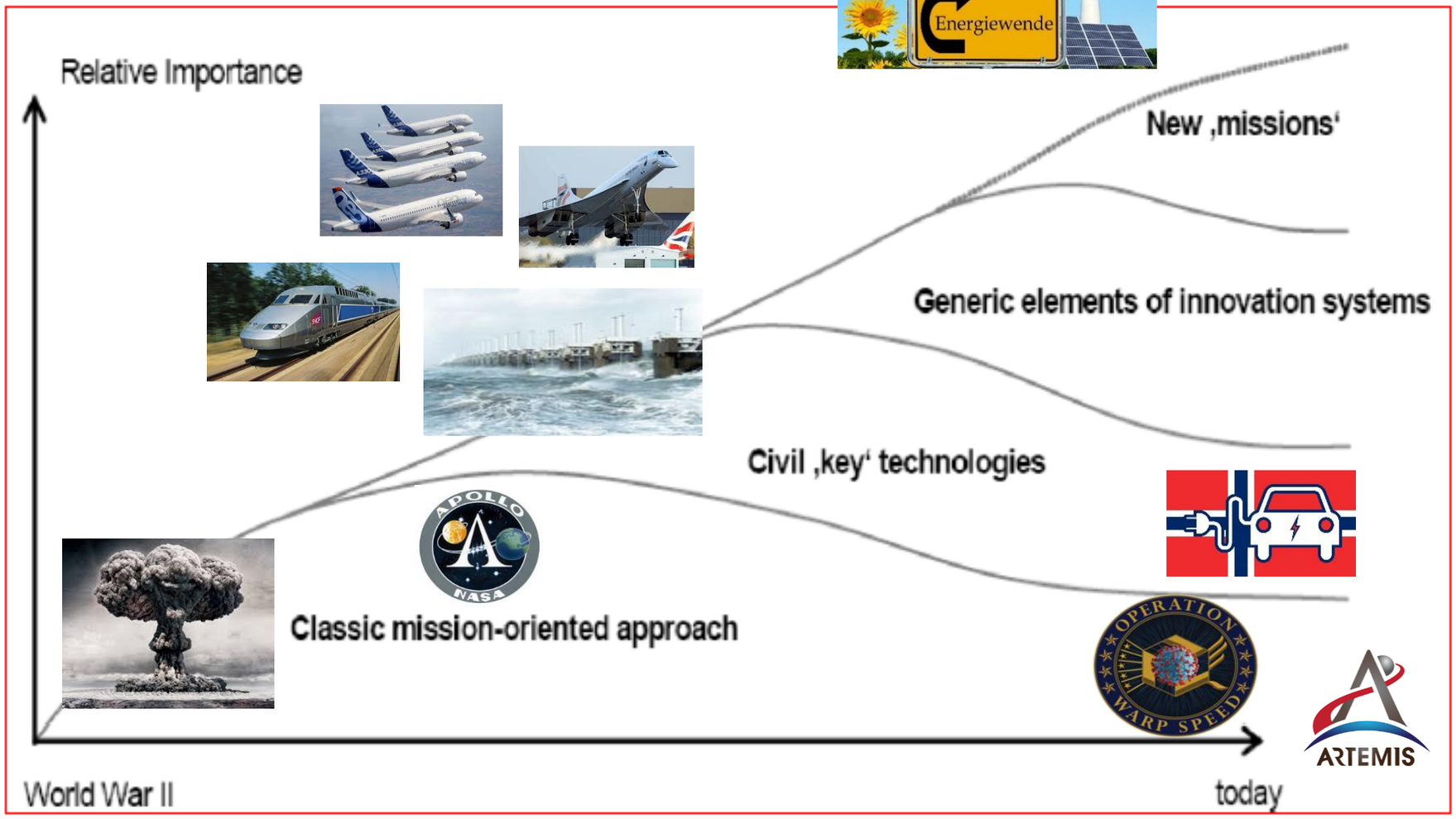


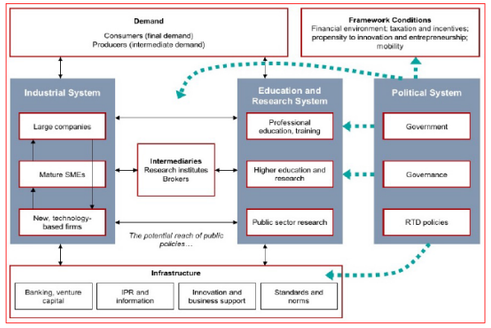
- "If we can land a man on the moon, why can't we solve the problems of the ghetto?" (Richard NELSON, The Moon and the Ghetto. An Essay on Public Policy Analysis. 1977)

- "The use of science and technology policies to achieve environmental goals constitutes a new focus for technology policy. Superficially, this requires a return to the emphasis in the 1950s and 1960s on public goals that were met through mission-oriented projects. However, there is a fundamental difference between older mission-oriented projects, for example nuclear, defence, and aerospace programmes, and new projects to support environmentally sustainable development. (Luc Soete & Anthony Arundel, Eds.: An integrated Approach to European Innovation and Technology Diffusion Policy – A Maastricht Memorandum, 1993)

Missions –

a stylized history





Source: Gassler/Polt/Rammer 2008

Key characteristics of transformative and accelerator missions

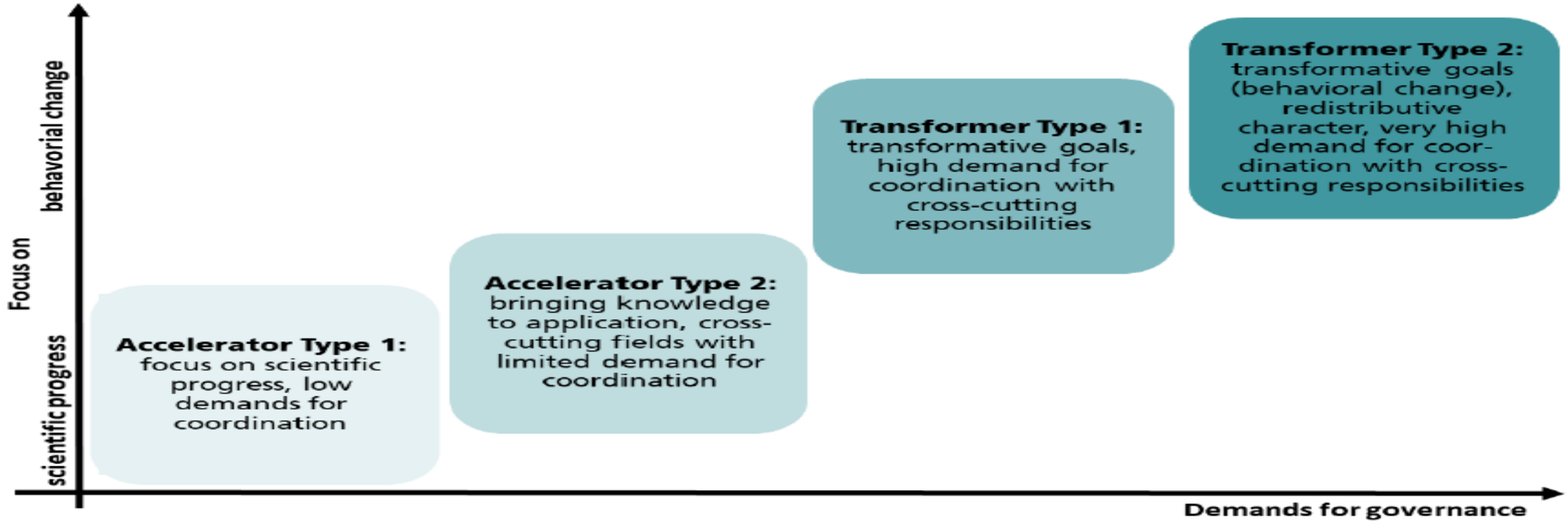


Table 1: Characteristics of different types of missions

	Accelerator Mission		Transformer Mission	
	Type 1 (A1)	Type 2 (A2)	Type 1 (T1)	Type 2 (T2)
Type of problem	Market failure	Market and structural failure	Transformational system failure	Transformational system failure
Type of solution	Scientific innovation	Technological/ regulat. change	Transformation of system	Transformation of system (behavior)
Problem vs. goal oriented	Problem-oriented	Goal-oriented	Goal-oriented	Problem-oriented
Demand for governance	Low	Medium	High	Very high

Source: Wittmann et al 2020

Key characteristics of transformative and accelerator missions

Category	Characteristics of transformative missions	Characteristics of accelerator missions
Scope	Systemic scope, requiring innovation and change in technological, economic, organisational, institutional and behavioural terms	Mainly centred onto scientific and/or technological as well as economic aspects.
Level of complexity and uncertainty	High levels of complexity and uncertainty about both problem definition and specification of solutions ("wickedness")	Moderate levels of complexity and uncertainty regarding problem definition and specification of possible solutions
Target definition and time frame	Difficulty in defining clear targets and time horizons, often long-term	Possibility to define clear targets and mid-term time horizons
Management approach	Open-ended, experimental and adaptive management of multiple recursive transformation pathways	Roadmapping and planning-type project management
Range of actors	Broad range of multi-actor, including research, industry, government, civil society, citizens	Focus mainly on research and industry (sometimes with involvement of single sectoral actors)

Source: Polt & Weber 2023 (forthcoming) adapted from Kuittinen et al. 2018; Wittmann et al. 2021

Key characteristics of transformative and accelerator missions

Type of Mission	Goals / Orientation	Examples
‚Science / Breakthrough-Missions‘	Aiming at scientific breakthroughs sometimes, but not always with view to the potential application	**Human Brain Project, Quantum Flagship, (Research on) Ebola, COVID Vaccines**
‚Technology / Accelerator‘ – Missions	Realizing functioning complex solutions, which need concerted and massive application of resources	**Apollo/Artemis-Mission, civil nuclear powerplants, TGV, Concorde, most recently: projects of the type of Important projects of common European Interest (IPCEI) (e.g. Chips Acts, Battery research, ‚Clean Steel‘)**
‚Transformative Missions‘	Change of existing (large-scale) socio-technical systems, involving social, technological, organisational and institutional innovations	**German ‚Energiewende‘, Transport/Mobilitätswende‘, sustainable and secure water management (NL)**
‚Umbrella-Missions‘	Initiatives that follow over-arching goals, including parts which are missions in the proper sense (even of different sorts)	**German High-Tech-Strategy, global CC research, Adaptation / Mitigation**

Source: Polt & Weber 2023 (forthcoming) adapted from Kuittinen et al. 2018; Wittmann et al. 2021

Findings from historical case stduies on the conditions for the successful implementation of transformative MOIP

- Has to include **application and diffusion in the desgin of the policy** (especially in the technology accelerator/ transformative types),
- Has to include **sociale innovation**
- Has to ensure **coherent application of instruments and means** (policy mix)
- Must have **reflexive mechanisms built in**
- Needs strong ‚**political ownership**‘,
- strong **operational and political governance**
- and **widespread buy-in of acteurs**
- …taken all together, MOIP calls for a **substantial overhaul of governance and policy capacities** (especially for, but not exclusively for transformative missions)

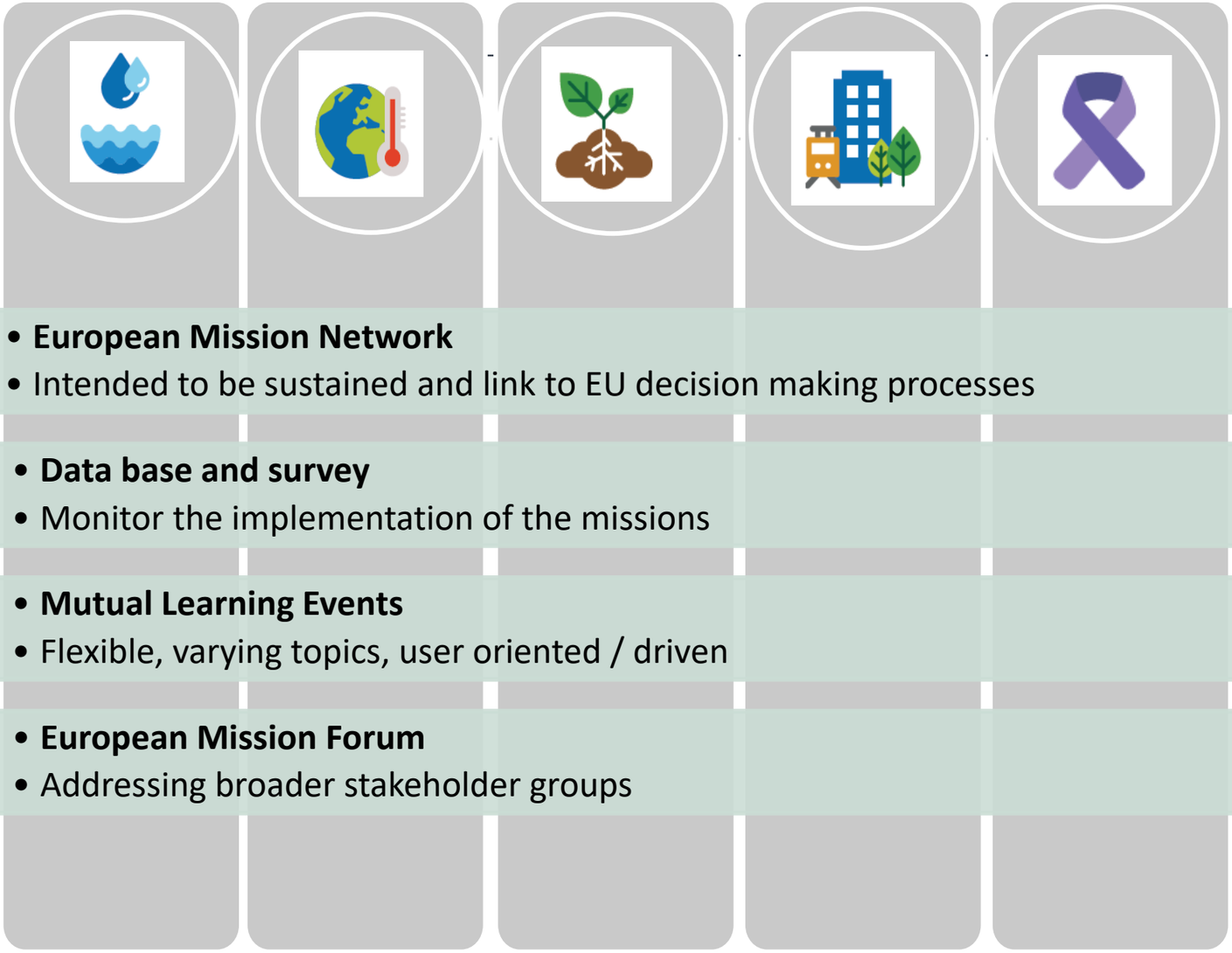
Source: JIIP 2018, Polt et al 2021

Objectives of EU Missions under Horizon Europe until 2030

- Mission CANCER: Improving lives of 3 million people through prevention, cure and care
- Mission CLIMATE: Support 150 regions and communities to become climate resilient
- Mission CITIES: 100 climate-neutral and smart cities
- Mission SOIL: 100 living labs and lighthouses to lead the transition towards healthy soils
- **Mission WATERS: Restore our oceans and waters**

…to be translated into national objectives, measures and impact

TRAMI – the project to create formats for sustained learning and collaboration on missions..



EMIN	• **European Mission Network** • Intended to be sustained and link to EU decision making processes
MAPPING	• **Data base and survey** • Monitor the implementation of the missions
MLE	• **Mutual Learning Events** • Flexible, varying topics, user oriented / driven
EMIF	• **European Mission Forum** • Addressing broader stakeholder groups

Competing governance approaches

State-centric

- Missions with clear goals and targets
- Market creation and public finance as key mechanisms
- Entrepreneurial State plays proactive role in early high-risk phases
- Comprehensive policy mix

Bottom-up

- Open-ended „wicked“ challenges, with unclear problems and solutions
- Niche-based experi-mentation, learning and generalisation
- Enabling role of government and temporary protection

State-sceptical

- Stress key role of private entrepreneurs
- Contest ability of the state to lead change processes
- Restrict government to an enabling and regulating role
- Market-based search for solutions

Ideal-type models to draw upon in a pragmatic fashion

→ Suitability of the models depends on the types and characteristics of the missions in question

→ Political cultures and policy styles influence the inclination towards the different models

Assessment of the advancement of missions

„Mission readiness“ is uneven	▪ Some countries and regions have set up mission governance structures and programmes already; others only about to start
No single best model	▪ Trajectories of national political systems matter; missions need to be embedded in and aligned with existing structures, institutions and initiatives, including pre-existing national missions
Need for alignment	▪ Need for EU missions to be aligned and synchronised with pre-existing strategies, initiatives, and even missions on the national and regional leveland synchronization
STI and policy trap	▪ Mission-oriented policies need to go beyond STI policy (”whole of government”), and beyond policy circles. Involvement of business and citizens still to be strengthened in the individual missions.

Governance challenges in practice

- Policy coordination
  - Multi-level from European to local
  - Horizontal with sectoral policies
  - Vertical between ministries and implementing agencies
  - Temporal of policy mixes over time
- Drawing on existing structures vs. building new ones (“mission agencies”)
- Definition of clear targets vs open-endedness of ‘wicked’ challenges
- Balancing bottom-up experimentation and learning vs. top-down goal-oriented guidance and planning

Ways ahead

- Invest **“patient” public and private capital** into the missions and give them time to develop and mature
- Broaden the scope of missions from an STI focus towards a **“whole-of-government”** approach
- Endow the actors with appropriate resources and capabilities to engage in **institutional capacity-building** with a long-term view
- Selection of **missions in the future should reflect the sense of urgency** needed for their timely and successful implementation.

- To learn more about the project and its partners, visit our Website: www.trami5missions.eu

- To learn more about EMiN Website: https://www.trami5missions.eu/about-emin

- Stay informed about current activities, suscribe to the TRAMI Newsletter (registration on the website)

- Connect via LinkedIn (just look for #TRAMI)

- Or get in touch with me directly: **wolfgang.polt@joanneum.at**

Addendum

JOANNEUM RESEARCH POLICIES

Case studies of MOIPs

Title	Country	Thematic area	Type	Level	Timeline
Active and Assisted Living Programme (AAL)	EU	Health	Programme	International	2013-2020
Cancer Moonshot	US	Health	Initiative	National	2016-2023
Circular Flanders	Belgium	Circular economy	Initiative	Regional	2012- 2020
Clean Air London	UK	Climate change / Health	Initiative	City	1999 – ongoing
High Tech Strategy (HTS)	Germany	Re-industrialisation	Policy approach	National	2006 – ongoing
Hydrogen Society	Japan	Energy and transport	Policy approach	National	1991-2040
KIRAS – Sicherheitsforschung (security research)	Austria	Security	Programme	National	2005-2020

Case studies of MOIPs

Title	Country	Thematic area	Type	Level	Timeline
Airbus	France, Germany, Spain and the United Kingdom	Transport	Initiative (private)	International	1967-
Apollo Project	US	Aerospace	Programme	National	1961-1972
Brain Initiative	US	Health	Initiative	National	2013-2025
Concorde	France, United Kingdom	Transport	Initiative (private)	International	1962-2003
Delta Plan / Delta Programme	Netherlands	Security and resilience, climate change	Programme	National	1937-2050
e-Estonia	Estonia	IT/Digitalisation (multi-sectorial)	Policy approach	National	1997-current
Electric vehicle initiative	Norway	Transport	Policy approach	National	1989-2025
Energiewende	Germany	Energy, climate change	Policy approach	National	2010-
Human Brain Project	EU	Health	Initiative	European	2013-2023
New Energy Vehicles (NEVs)	China	Transport	Policy approach	National	2001-2020/2025

Perceptions on Mission-oriented Policy

Fig. 2: Response to the statement *'Missions should be an important part of STI policy in the future'* by target groups

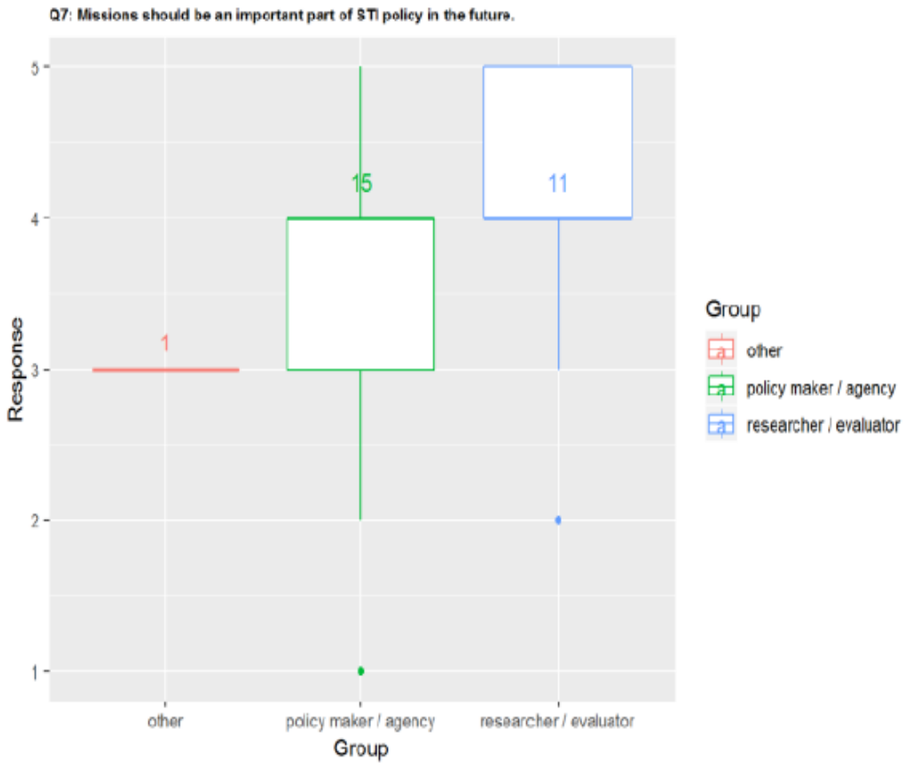
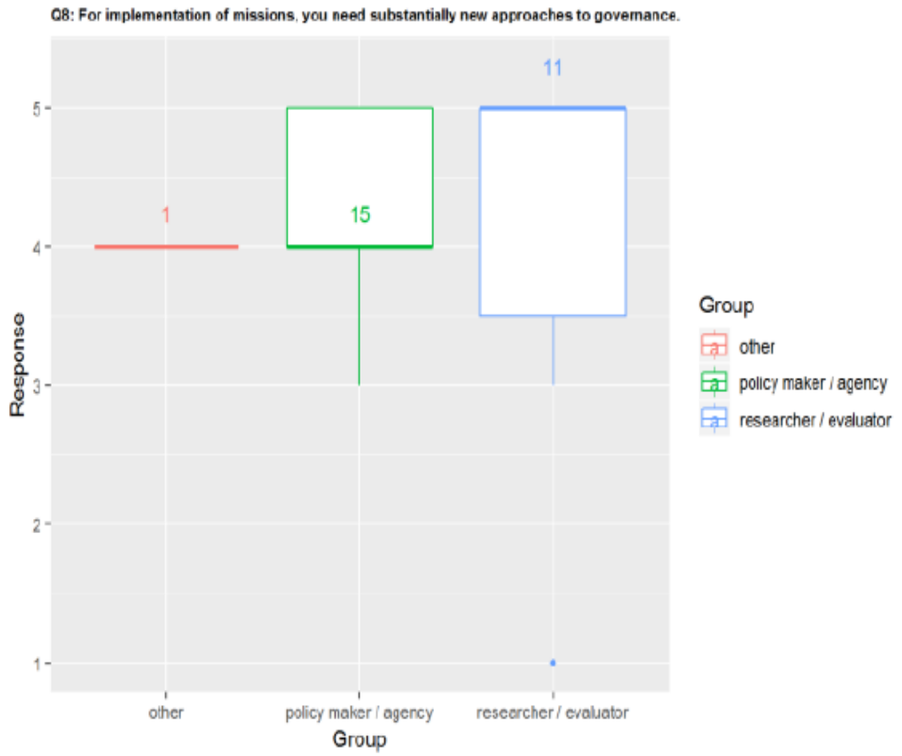


Fig. 3: Response to the statement *'For the implementation of missions you need substantially new approaches to governance'* by target groups

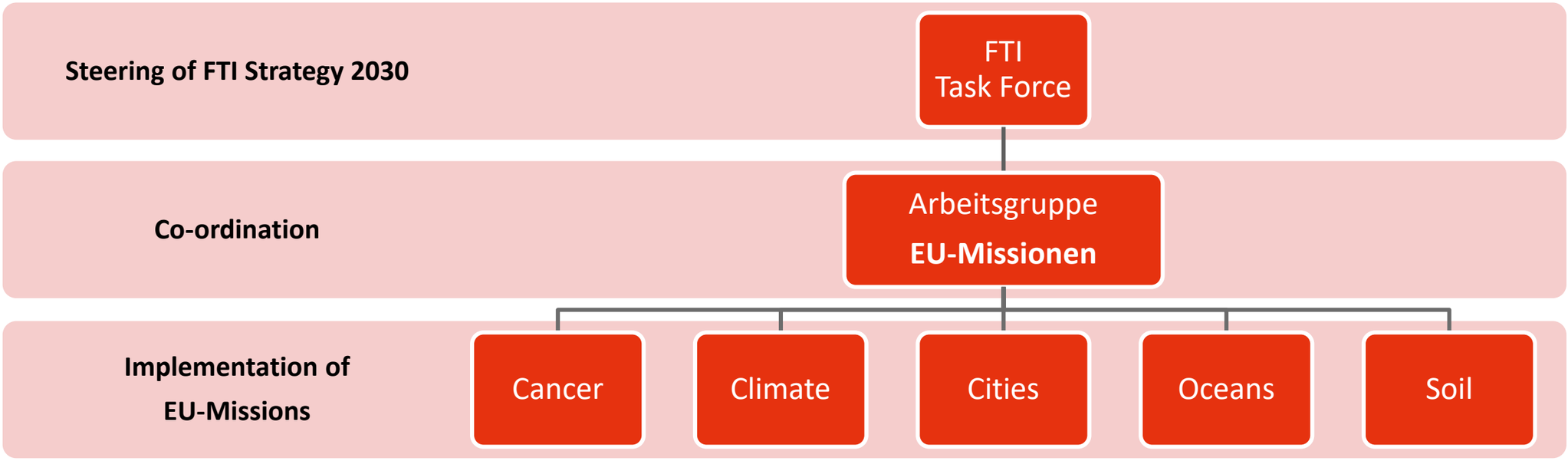


Source: Polt, Schuch, Weber et al (2019)

An example of a national Governance Structure: Austria

Governance-Strukturen of the WG „EU-Missions“

(est. per decision of the FTI-Task Force from 29. April 2021)



Austrian governance of EU Missions

Federal Ministry
Republic of Austria
Climate Action, Environment,
Energy, Mobility,
Innovation and Technology

Ministries of Defence, Agriculture, Digitalisation, ..

Federal Ministry
Republic of Austria
Education, Science
and Research

Working Group „EU Missions“

Office (Support)

EU Mission Boards

EU Mission Groups

Strategic Programme Committee Horizon Europe

EU Project „Coordination of complementary actions“

ERA Policy Agenda

OECD „MOIP Project“

Advisory Board Foresight & Citizens

Advisory Board Strategic Intelligence

Mission Management Group

*Mission **Cancer** Action Group*

*Mission **Climate** Action Group*

*Mission **Cities** Action Group*

*Mission **Waters** Action Group*

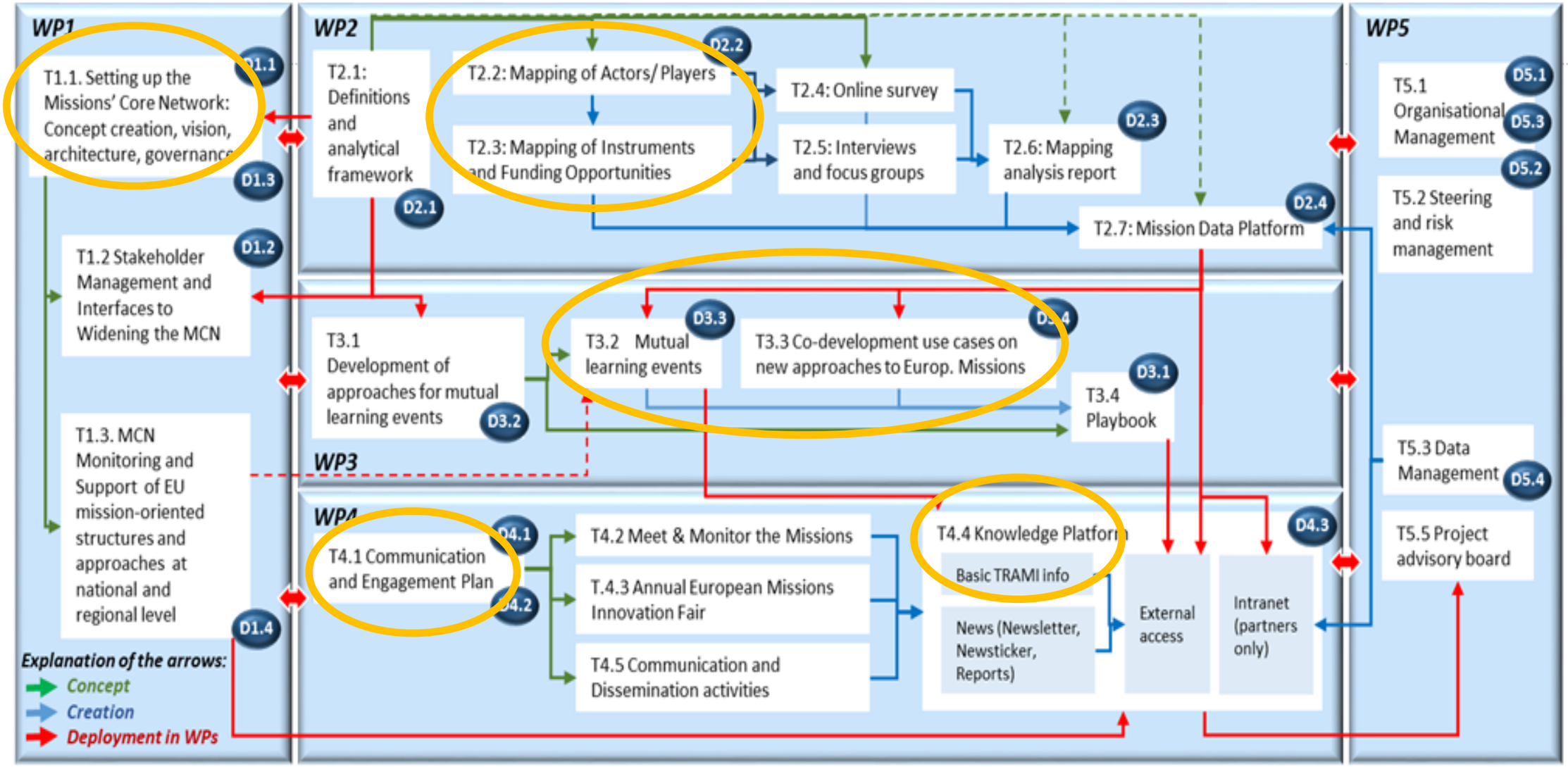
*Mission **Soil** Action Group*

An initiative for coordination of Efforts of Missions' implementation:

the TRAMI (TRAnsnational cooperation on the Missions) project

25 (26) partner from 16(17) MS
Duration: 2Q2022 - 2Q2024

Architecture of the TRAMI project



Architecture of the TRAMI project

- 25 (26) partners from 16(17) MS, mostly administrations and agencies tasked with the implementation of missions
- Duration: 2Q2022 - 2Q2024

Expected Outcomes (i.a.):

- **Shared vision** for Mission implementation at the level of MS and AC
- **Multi-level core network of engaged MS/AC** with a tailor-made governance, co- operation models, roles and responsibilities
- **Map of effective governance approaches and effective instruments** for implementation
- Mutual **learning toolbox**, knowledge exchange and mutual learning events, **co-developed use cases**
- **Knowledge platform**

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