

# Mission-Driven Innovation Policy

Ville Valovirta, Robin Gustafsson, Kirsi Hyytinen, Janne Lehenkari,  
Kaisa Lähteenmäki-Smith, Jorge Martins, Robert van der Have

## Abstract

Mission-oriented innovation policy is an approach to direct and accelerate innovation activities towards solving grand challenges. As it involves coordination of activities between diverse sets of actors there is a need for new types of approaches to governance of missions. In designing missions, a broad mix of policy instruments is required. This policy brief discusses the rationale of mission-oriented innovation policy and proposes a set of recommendations for policy makers when designing these policies. The recommendations are derived from the IN2MISSION project funded by Business Finland.

## Policy Design Recommendations

- Use a broad mix of instruments for mission-oriented policy design.
- Employ both demand-side and supply-side approaches.
- Apply challenge-based policy approaches.
- Use evaluation and impact assessment as strategic tools.
- Build supportive informational infrastructures.
- Strengthen demand for innovation to support missions.
- Avoid mission-policy being trapped in conventional policy practice.

**Keywords:** missions, innovation policy, transformation, societal challenges

# Introduction

---

Major societal and environmental challenges call for more intense efforts at harnessing innovation in solving them. In recent years, mission-oriented innovation policy has gained a lot of attention as a promising approach to broaden the scope towards more explicit focus on solving grand challenges with means of innovation. Missions are strategic endeavours to address pressing societal challenges with coordinated efforts resulting in significant social, environmental, and economic impacts. Missions thus extend beyond conventional support for innovation by acknowledging the complexity of challenges calling for more coordinated responses and system-wide transformation efforts. This policy brief discusses the specific characteristics of mission-oriented innovation policies and highlights issues and challenges in their design and implementation.

In the research literature, two ideal types of missions have been identified: (a) **accelerator missions**, which are initiatives oriented towards faster scientific and technological advancement with a specific scope, such as the US Cancer Moonshot accelerating cancer research; and (b) **transformer missions**, which are targeted at societal challenges implying profound behavioural and systemic changes, such as the Japanese Hydrogen Society aimed at changing energy supply, distribution and use in Japan. While accelerator missions can be mainly addressed with science, technology and innovation (STI) policy instruments, transformer missions necessitate a broader policy mix and integration of sectoral policies, as the coordination challenges increase significantly along with the number of stakeholders concerned. In this policy brief, our emphasis is on the governance issues of transformer missions addressing the systemic challenges.

# Material and method

---

This policy brief was conducted as part of the Informational Infrastructure to Accelerate Mission-Oriented System-Level Transformations (IN2MISSION) research project funded by Business Finland. In this research project, Aalto University and VTT Technical Research Centre of Finland seek to understand the most impactful innovation policy tools that will accelerate the development of solutions to grand challenges (IN2MISSION, 2024). The challenges and recommendations presented in this policy brief are based on a synthesis of a review of a number of case studies, stakeholder workshops and review of literature and international policy practices.

# Why missions?

---

Missions set *direction* and *accelerate* innovation towards specific societal goals.

## Providing directionality to innovation is called for due to the urgency of societal challenges

Many pressing social, environmental and economic challenges necessitate activating innovation in relevant domains with intensity which extends beyond generic means of supporting research and development. More directed efforts can be integrated into bundles of innovation activities to solve specific social, environmental or economic challenges. The public policy's directional role is thus to trigger or leverage private investments in societally desirable innovation and mobilise behavioural change and customer demand leading to societal change ensuring the adoption of such innovations.

## Accelerating knowledge creation and innovation activities towards societally desirable futures

In mission-oriented policy innovation priorities are not selected solely on the basis of economic growth objectives. Rather they combine societal challenges with related economic development opportunities. Prioritising acceleration of innovation on one specific area over others is underpinned by systemic dependencies between various segments of the socio-technical system needed for the mission targets to be met. Additionally, missions promote the creation of collaborative ecosystems where businesses can thrive through partnerships with diverse stakeholders, leveraging their capabilities and resources to drive transformative change. Objectives of missions are typically ones that will not be met without sets of complementary innovations becoming developed in parallel.

## Socio-technical transformation requires promoting innovations across their lifecycle

Socio-technical transformation towards sustainability goals is not progressing at desired pace due to various systemic hindrances: lock-in to existing technologies, path dependency, and systemic bottlenecks in innovation adoption due to prohibitively high costs of sustainable solutions in the early stages of lifecycle. As missions aim at bringing about socio-technical transformation, not only creation of new knowledge, goods and services, but also their demonstration and adoption by consumers, businesses and governments becomes necessary. Transformative innovations need to compete with incumbent players, well-established institutions, and interests. Missions may thus need to promote different types of innovation, covering technology, business models, social practices, public policies and regulatory change.

## Mission-oriented innovation policies to shape markets

Mission-oriented policies need to mobilize policy actions which shape the markets towards favouring societally desirable innovations. For doing this, various demand-side measures need to be considered, such as regulatory changes, standardisation, certification schemes, or gearing public procurement toward innovation.

# Mission governance challenges and dynamics

---

As missions typically address systemic challenges whose attainment requires complementary innovations and socio-technical change, large number of stakeholders, as well as more cross-sectoral and cross-disciplinary approaches are required to implement missions. This calls for approaches to governance of missions as coordination of distributed activities between diverse sets of actors.

## Interdependency of solutions creates coordination challenges

The coordination challenge stem from the interdependency of necessary solutions contributing to societal problem solving. The typical coordination challenges may vary between industries, but examples include value chain disconnections for circular materials, network externalities in digital solutions, or chicken-and-egg dilemmas between clean technology adoption and supporting infrastructure investments. In some cases, these challenges can be described as ‘wicked’ problems, in which there is no consensus on the problem definition or practicable solutions among the stakeholders. Coordinating innovation activities in these circumstances often implies interacting with a large number of disjointed actors across private and public sectors.

## Flexibility and experimentation is required by all stakeholders

Flexibility and experimentation are required for implementing missions, which involve fostering effective public-private partnerships and overcoming the limitations of traditional governmental roles. To achieve this, leadership and engagement capabilities are required to co-create markets rather than only fixing them. Therefore, missions require bold vision and engagement with diverse social actors to address grand challenges. Flexibility is crucial to prevent missions from becoming excessively rigid plans, which can be overcome through bottom-up engagement and adaptability. Coherence in policy mixes and coordination are essential for mission success. Experimentation and evaluation capabilities are also essential, which can be concretised through social experiments and system-level reflexivity. Further, at the administrative level, diverse expertise and skills are needed, with a particular focus on human-centric design and cross-organisational collaboration to overcome functional silos. Implementing missions requires adaptive modes of management which enable providing direction and incentivizing actions, but remaining open for learning, adaptation, and exploiting emergent phenomena. In so far, evidence of which specific coordination mechanisms and governance structures would be most effective is only beginning to accumulate. Nevertheless, promising experiences have been gained from use of foresight, participatory design, and portfolio management approaches.

## Involvement of diverse actors requires effective multi-stakeholder governance

Multi-stakeholder governance is key to better alignment and coordination among problem-solving and innovation actors. The need for multi-stakeholder governance, including a wider range of societal actors such as businesses, NGOs, and citizens, stems from the recognition that achieving missions requires multitude of players across the innovation landscape. Within the government, a ‘whole-of-government’ approach is presented as a necessary orientation which enables going beyond traditional government-led innovation policy coordination and requires sensitivity to sectoral policy specificities.

## Missions need to be supported by informational infrastructures

Informational infrastructures are strategic, generative assets, aimed at facilitating collaboration and knowledge sharing among diverse stakeholders. They play a performative role by being not mere passive repositories of data, rather providing constitutive elements to value creation processes in innovation activities, business operations and public service provision. Shared information sources – such as data exchange platforms, best practice repositories or public procurement data platforms – on missions and their progress can be part of such infrastructure design.

# Policy Design Recommendations

---

## Use a broad mix of instruments for mission-oriented policy design

There is a strong emphasis on the need for a broad mix of policy instruments, governance, and coordination mechanisms to address the complexities of mission-oriented innovation. This includes considering technological, institutional, and behavioural solutions within policy mixes. Means comprise *financial* instruments, such as grant, loans, and tax benefits; *normative* such as regulation and standards; and *informational* means such as awareness building campaigns, capacity building programmes, environmental labelling, or open data initiatives. Their application should be considered across the entire innovation process covering various levels of maturity of the technology life cycle from development to demonstration, adoption and diffusion.

## Employ both demand-side and supply-side approaches

One of the demanding tasks in mission governance is to coordinate various policy instruments which are under responsibility of various policy sectors and operate under distinct logics. Moreover, many demand-side policy tools are not dedicated to pursuing innovation but address multiple other objectives in parallel. Aligning innovation impacts with sectoral objectives becomes of paramount importance.

## Apply challenge-based policy approaches

One of the usual criticisms of mission-driven policy is that it leads to governments aiming to pick the winners. While this risk needs to be considered seriously, it can be mitigated by challenge-driven approaches which specify the societal problem to be solved instead of a specific technology as a solution to it. Challenge contests, performance-based regulation, and outcomes-based procurement models are examples of models of this type.

## Use evaluation and impact assessment as strategic tools

The role of evaluation and impact assessment should be an important aspect of mission-driven initiatives. Evaluation should be used as a tool for assisting mission governance in a dynamic fashion, not only for the purpose of making public policies accountable or responding to legitimacy concerns but to maximise the mission impacts for business growth and societal well-being. An overall impact framework can be part of the policy instrument design, and even allow for societal stakeholders writ large to become involved in the design and implementation of missions. This would allow a multi-perspective approach in target setting allowing for better uptake and comprehensive socio-economic impacts.

## Build supportive informational infrastructures

Informational infrastructures are highlighted as key tools in pursuing missions within innovation policy. They are the digital and organisational frameworks that enable the efficient flow of data, knowledge and strategic insights, and create a forum for societal dialogue. They encompass a spectrum of tools and systems, practices and functions from digital platforms and data analytics to collaborative networks and communication channels. They offer a variety of roles, including governance support, aiding innovation activities, and facilitating business and societal transactions. Informational infrastructures provide the structure for interaction across diverse communities involved in mission implementation.

## Strengthen demand for innovation to support missions

Directionality can be strengthened through a number of ways and governance roles, including a stronger focus on demand-oriented policy instruments, which actively steer the policy design towards more mission-driven and societally motivated policy goals and objectives. Public procurement should be more actively targeting transformative purposes, and regulation could more actively support the conditions for change and delivering more transformative innovation policy goals. Through soft steering, e.g. informational or network steering they can also feed the public debate on the direction of policy, and by so doing increase the interest and buy-in from various stakeholders. Bringing the societal demand and needs more explicitly onto the innovation policy agenda, one could also shift the focus towards more transformative innovation policy paradigm, which could in turn increase the interest and sense of urgency for innovation policy, thus also helping to make it more cross-sectoral and cross-disciplinary.

## Avoid mission-policy being trapped in conventional policy practice

There are several potential pitfalls in designing and implementing missions as a policy approach. The implementation may be caught in a *STI policy trap*, whereby the mission remains within the bounds of traditional science, technology and innovation (STI) policy and falls short in mobilising other sectors and activities. Another risk is over-reliance on vertical steering leading to *top-down design trap* where the government policy fails to effectively engage markets and societal stakeholders. The third peril is *mission washing*: conventional policy designs are relabelled as 'missions' without introducing any new incentives, collaboration mechanisms or pathways of change.

## Contact

---

### **Ville Valovirta, Senior Scientist**

VTT Technical Research Centre  
P.O. Box 1000, FI-02044 VTT  
Tel. +358 50 354 3280  
ville.valovirta@vtt.fi  
@VilleValovirta #IN2MISSION

### **Associate Professor Robin Gustafsson**

Aalto University, Department of Industrial  
Engineering and Management  
P.O.Box 15500, FI-00076 Aalto  
Tel. +358 50 316 0981  
robin.gustafsson@aalto.fi  
@robingustafs #platformeconomy  
#IN2MISSION

## More information

---

More information on the IN2MISSION project can be found on the project website.  
The project's other policy briefs are:

[Accelerating circular economy through informational infrastructures](#)

[Artificial intelligence solutions to accelerate impactful data-driven cancer innovation and research: a deep dive into data challenges](#)

[Catalysing transformation: The imperative of informational infrastructures in mission-driven innovation policies](#)

[Fostering sustainable finance and corporate sustainability by means of well operating informational infrastructures](#)

[Informational Infrastructures for Impactful Mission-Oriented Innovation Policy](#)

[IN2MISSION website: aalto.fi/en/IN2MISSION](#)

[Aalto University Policy Briefs: ourblogs.aalto.fi/politiikkasuosituksia-policy-briefs](#)