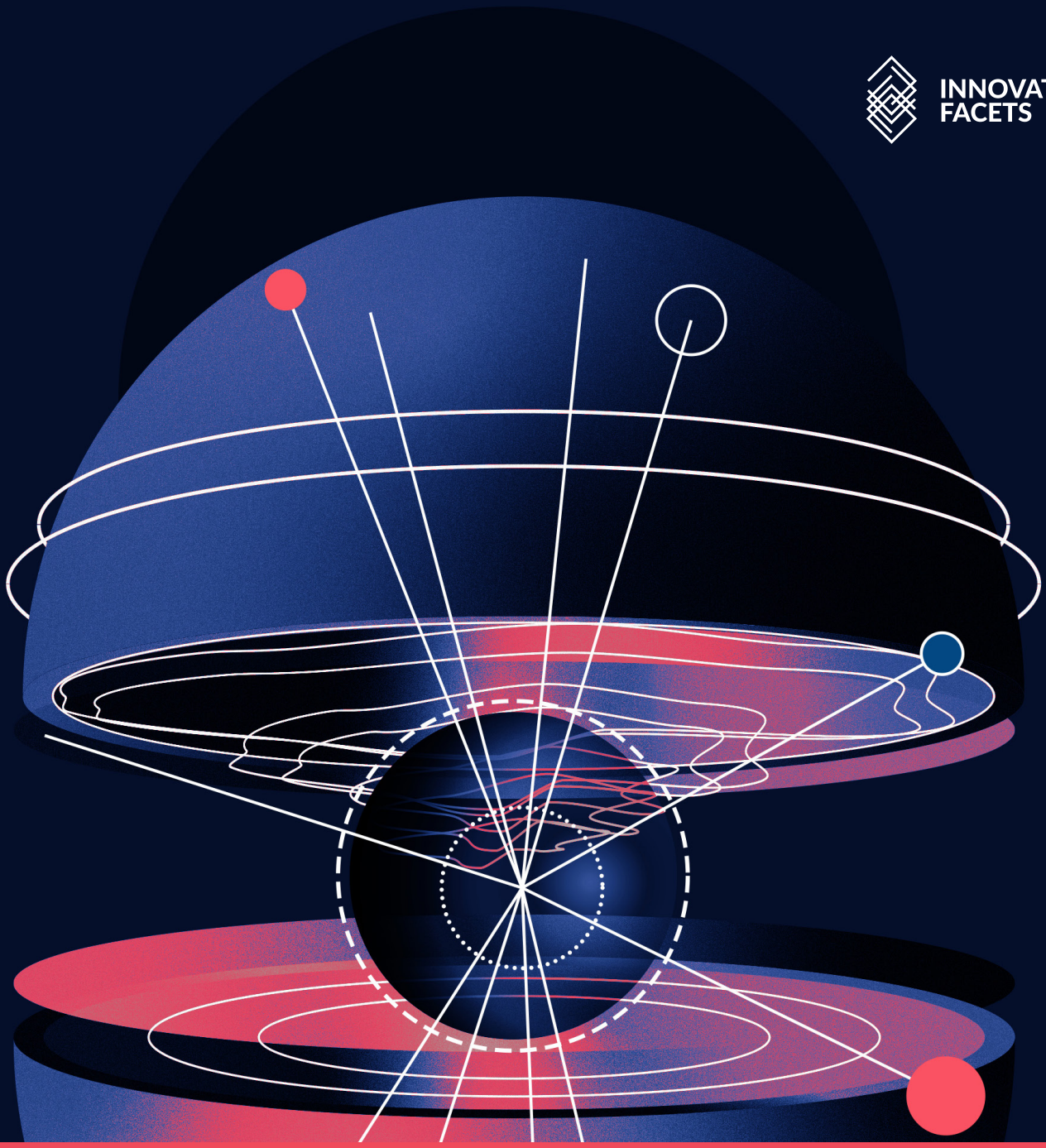
INNOVATION FACETS



Public Sector Innovation Facets

MISSION-ORIENTED INNOVATION

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CONTENTS

The Observatory of Public Sector Innovation collects and analyses examples and shared experiences of public sector innovation to provide practical advice to countries on how to make innovation work.

This report contains a summary of research and insights from practice on mission-oriented innovation. A more extensive version of this brief including detailed discussion and case studies appears as a chapter in a forthcoming OECD report.

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SUMMARY

- Short-term, single stakeholder approaches are not sufficient to address global environmental challenges such as climate change, or complex health challenges such as cancer. Mission-oriented innovation provides a policy framework for tackling the grand challenges facing governments today.
- Mission-oriented innovation serves the idea that societies should leverage innovation to achieve ambitious goals, coming either from senior government leaders or emerging from bottom-up political processes. For example, governments use mission-oriented innovation to formulate climate goals as measurable, ambitious and time-bound targets – such as achieving carbon-neutrality by 2030.
- During the coronavirus pandemic and beyond it has become clear that to achieve an overarching goal, wide engagement across policy areas and sectors is needed. Governments adopt the practice of mission-oriented innovation to address complexity and achieve systemic shifts. This practice functions as a co-ordination mechanism in response to the failure of traditional policy mechanisms.
- While many factors influence missions, current evidence shows that mission-oriented innovation is often supported by three interlinked policy structures: institutional entrepreneurship and mission governance that enable collaboration and experimentation, available funding for a portfolio of missions, and the adoption of outcome-based procurement.
- Mission-oriented innovation addresses key current policy and wider public sector challenges: it ensures inclusive governance, progressive politics, generative environments and systemic impact.

INTRODUCTION

The social, economic and ecological challenges that confront societies today require novel public sector solutions. As governments explore how to change the very foundations of governance and democracy to meet the needs of the 21st century environment, innovation is becoming an imperative to stay ahead of the curve. Governments are increasingly aware of the need to mitigate and leverage the high rate of societal and technological change, but they are still ill-equipped to innovate on a consistent basis and to anticipate signals from the external environment before they become realities.

The Public Sector Innovation Facets model provides an easy way to consider what innovative approaches and instruments governments can use to respond to emerging challenges in a timely manner. It investigates questions such as: What types of public sector innovation exist? How are innovative ideas generated in the public sector? Which methods are used to support investment in innovative projects? What capacity and resources are required for public sector innovation? The model identifies four innovation “facets” which can be used to explore the purpose and intent of innovation activites as well as how they work in practice.

The four facets of the model are as follows:

1

Enhancement-oriented innovation upgrades practices, achieves efficiencies and better results, and builds on existing structures (e.g., through digitalising services and better process management). An example of this type of innovation is the use of behavioural insights to improve the compliance rate with one-time payments.

2

Adaptive innovation tests and tries new approaches in order to respond to a changing operating environment (e.g., co-designing new community responses to emerging challenges such as the COVID-19 pandemic). Governments adopting social media as a channel for citizen interaction is an instance of adaptive innovation.

3

Mission-oriented innovation establishes a clear outcome and an overarching objective for achieving a specific mission (e.g., setting clear goals and roadmaps towards carbon neutrality). As an example, setting an objective to dramatically reduce greenhouse emissions within a decade is a mission-oriented approach to innovation.

4

Anticipatory innovation explores and engages with emergent issues that might shape future priorities and future commitments (e.g., conducting experiments to explore the future of work). An example of anticipatory innovation is the use of a sandbox to explore the impact of Artificial Intelligence on service delivery in health.

Different types of innovation are needed across the public sector to ensure that it is as productive, responsive and future-ready as possible. This brief focuses on mission-oriented innovation in the public sector. In order to understand key trends in the emerging field of mission-oriented innovation, the Observatory of Public Sector Innovation (OPSI) conducted research and invited public servants to share their experiences and examples of mission-oriented innovation in the public sector. Insights are provided on the following key themes: approaches to mission-oriented innovation, main drivers and support structures in the public sector, tools and methods, and skills and capacities needed. A more extensive version of this brief, including detailed discussion and case studies, appears as a chapter ("Mission-oriented Innovation") in a forthcoming OECD report. The present Public Sector Innovation Facets brief is intended as a summary for policy makers and practitioners.

WHAT IS MISSION-ORIENTED INNOVATION?

Mission-oriented innovation serves the idea that societies should leverage innovation to achieve clear, ambitious goals. The goals can either come directly from senior government leaders or emerge from bottom-up political processes. The goals serve as an overarching driver and uniting force for innovation that guides relevant ecosystem players (within and across organisations, government and sectors) to work together to achieve them. This top-level objective can provide the umbrella and resources for driving experimentation and exploration as long as the overarching goal is achieved – even if the path to get there has not been determined or made explicit. Mission-oriented innovation offers a framework that overcomes policy co-ordination challenges and succeeds at mobilising a wide variety of technological and innovation efforts under a single challenge with considerable spill-over effects. Mission-oriented innovation policy measures possibly span different stages of the innovation cycle from research to demonstration and market deployment, mix supply-push and demand-pull instruments, and cut across various policy fields, sectors and disciplines.[1]

The challenge

In the pre-COVID-19 world, governments in Europe and elsewhere increasingly turned their attention towards tackling "grand challenges" or "wicked issues", such as climate change, cancer and aging, through science, technology and innovation (STI) policies. During the pandemic, it has become clear that to achieve the desired effects, wider -government engagement across policy areas and sectors is needed to attain these societal goals. Governments were faced with the limitations of traditional STI policies to achieve systemic shifts, such as weak directionality, lack of holistic co-ordination and fragmentation of the policy mix. It is no longer sufficient to tackle such major challenges in research institutions or single ministries in a siloed manner – a new approach is needed. In policy practice, this trend has culminated in the European Union's Horizon Europe funding programme, which has committed to spending EUR 5 billion up to 2027 across five mission areas, and has encouraged member states to refocus their STI policies according in line with a mission-oriented approach.[2] From Latin America to Australia, governments are experimenting along similar pathways.[3] This so-called "post-growth" or normative turn,[4] also found in STI policies, is likely to be reinforced through COVID-19 responses that promise to build back better. They represent a wider shift in policy making towards tackling interconnected societal challenges through co-ordinated and systemic efforts.

1 Larrue, P. (2021). "The design and implementation of mission-oriented innovation policies: A new systemic policy approach to address societal challenges", *OECD Science, Technology and Industry Policy Papers*, No. 100, https://doi.org/10.1787/3f6c76a4-en. Hereafter referred to as Larrue (2021).

2 The five mission areas are: 1) cancer, 2) adaptation to climate change including societal transformation, 3) healthy oceans, seas coastal and inland waters, 4) climate-neutral and smart cities, and 5) soil health and food. For more information, see: https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/missions-horizon-europe_en#what.

3 For more information, see the OECD Mission-Oriented Innovation policies online toolkit: https://stip.oecd.org/stip/moip

4 Uyarra, E., B. Ribeiro and L. Dale-Clough (2019), "Exploring the normative turn in regional innovation policy: Responsibility and the quest for public value", *European Planning Studies*, Vol. 27, No. 12, pp. 2359-2375, doi:10.1080/09654313.2019.1609425.

Approaches to mission-oriented innovation

There is no one way of doing missions, rather a variety of practices are emerging in public sector organisations. Academic and policy discussions utilise two definitions of mission-oriented innovation: a narrow definition focusing on science, technology and innovation policies, and a broader public sector reform-oriented one.

In the STI policy space, mission-oriented innovation policies target societal challenges with an underlying economic logic. In this view, missions are a pathway towards a different kind of economy and economic growth. They are a way to co-ordinate large-scale public sector STI efforts towards achieving a new direction. One example is the Moonshot Research and Development Programme launched in 2020 by the Cabinet Office of the Japanese Government to promote high-risk, high-impact R&D to solve issues facing future society such as super-aging populations and global warming.[5]

Broader understanding of mission-oriented innovation is more recent. It locates missions within a public sector reform discussion about government that is more responsive and innovative in its public service provision. In this context, missions target societal challenges with an underlying public value logic. Missions are a pathway towards different ways of working across the public sector and creating better public value for citizens. Missions thus are a way to reframe existing siloed policy practices and introduce new policy-making methods and tools (to which STI policy can contribute). In effect, they are a form of "problem-based governance … [with] impact upon the rate, direction, and quality of activities in the innovation system".[6]

MAIN DRIVERS AND ENABLING CONDITIONS OF MISSION-ORIENTED INNOVATION

Main drivers

The most complex challenges that governments face require a wide range of solutions from basic scientific advances to modifying human behaviour. For example, Australia's drought resilience mission aims to reduce drought impacts, which requires expertise in agricultural science, climate science and biosecurity as much as resilience in rural communities[7] (see Box 1). Governments adopt the practice of mission-oriented innovation to address this complexity. Mission-oriented innovation functions as a co-ordination mechanism, responds to the

5 OECD (2020), Moonshot Research and Development Program, https://stip.oecd.org/stip/moip/case-studies/16 (accessed 4 October 2021).

6 Jannsen, M.J. et al. (2021), "Promises and premises of mission-oriented innovation policy – A reflection and ways forward", *Science and Public Policy*, Vol. 48, No. 3, pp. 438-444, https://academic.oup.com/spp/article/48/3/438/6298315 (accessed 7 August 2021). Hereafter referred to as Jannsen et al. (2021).

7 Ministry for Industry, Science and Technology (2021). "CSIRO missions to help transform Australia's agriculture sector", www.minister.industry.gov.au/ministers/porter/media-releases/csiro-missions-help-transform-australias-agriculture-sector (accessed 4 October 2021).

Table 1. Types of mission-oriented innovation

TYPE	LEADERSHIP	MISSIONS	EXAMPLES
Overarching mission-oriented strategic frameworks	• Center of government • High-level committee	• Multiple missions or mission areas • Pursuing ambitious challenges • Long-term horizon	• Horizon Europe's missions (European Union) • Mission-driven Topsector and Innovation Policy (Netherlands) • High Tech Strategy 2025's missions (Germany) • Moonshot R&D Program (Japan)
Challenge-based programmes and schemes	• Agency	• Focused • Seeking acceleration of (most often technological) innovation • Mid- to long-term horizon	• Pilot-E (Norway) • Industrial Strategy Challenge Fund (United Kingdom) • The Genomics Health Futures Mission (Australia) • Science Foundation Ireland's Innovative Prize (Ireland)
Thematic mission-oriented programmes	• Ministry • Agency	• Focused on competitiveness in the research consortia of the 1980s – 1990s • Mix of societal and competitive challenges in current programmes	• VLSI (Japan) • USABC (United States of America) • Mobility of the Future (Austria) • Building of Tomorrow/Cities of the Future (Austria)
Ecosystem-based mission programmes	• Ministry • Agency	• Innovation agenda developed by the innovation actors themselves, with neutral support from public authorities	• SIP (Sweden) • Vision-Driven innovation milieus (Sweden)

Source: Larrue (2021).

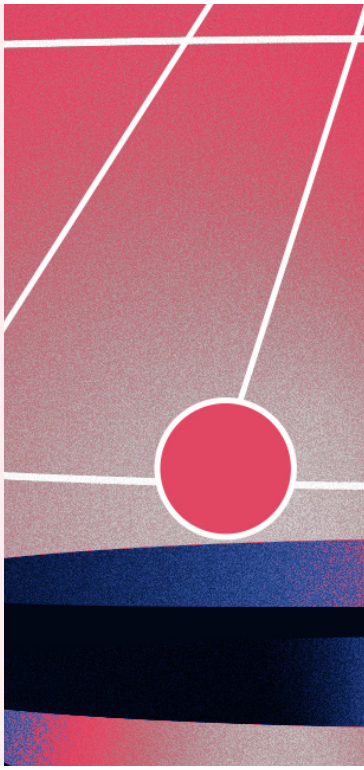
failure of traditional policy mechanisms and increases policy effectiveness. Mission-oriented innovation schemes take different forms in practice. No common classification of mission-oriented innovation types has emerged to date. The OECD uses the following types: overarching mission-oriented strategic frameworks, challenge-based programmes, thematic programmes, and ecosystem-based programmes[8] (see Table 1).

8 Larrue (2021).

Box 1. Australia's Drought Resilience Mission

In 2021, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia's national innovation agency, launched the Drought Resilience Mission. It addresses climate extremes that are predicted to increase in frequency and severity in the Australian land sector. The mission objective is to build rural resilience with the aim of reducing drought impacts by 30% by 2030. This goal assumes that climate-related challenges for agriculture will persist, but that impacts can be reduced considerably through a mix of innovations. This includes on-farm innovation, new off-farm risk management tools, and implementation of water security and resilience innovations in rural communities. The mission will combine economic and climatology expertise within government agencies, the research sector, as well as industry and communities working to address aspects of climate change, adaptation and mitigation (for instance the National Farmers Federation). The private sector will be crucial to the delivery of information, tools and technologies. CSIRO contributes expertise in the areas of agricultural science, hydrology, climate science, biosecurity, digital innovation and socio-economics.

Source: Ministry for Industry, Science and Technology, Government of Australia (2021).



Enabling conditions

While many factors influence missions, current evidence indicates that mission-oriented innovation is often supported by three interlinked policy structures: institutional entrepreneurship and mission governance, funding missions and procurement.

1. INSTITUTIONAL ENTREPRENEURSHIP AND MISSION GOVERNANCE

Mission-oriented innovation needs institutional infrastructure to discuss, design and implement the directions of innovation systems. As mission-oriented innovation typically targets "wicked" policy issues through co-ordination and long-term planning, a frequently used approach is the creation of new co-ordination mechanisms (e.g., missions boards created by the European Union). Mission governance can also be supported through the evolution or repurposing of existing co-ordination mechanisms (e.g., the Topsectoren approach in the Netherlands,[9] see Box 2). In addition, mission directionality and entrepreneurship can be provided by creating new leadership posts. For example, the Swedish innovation agency Vinnova created a new post of Director of Strategic Design to rethink its approach to transformative innovation policy.[10] When looking at mission-oriented innovation through the broader lens of public sector reform, many governments attempt to establish transformative change agents through the creation of innovation and policy labs (e.g., the creation of a Missions Lab by the OECD in 2021, or the establishment of a rapid transitions lab for Vinnova's food mission).[11]

9 OECD (2020). "Mission Driven Top-Sector Policy", https://stip.oecd.org/stip/moip/case-studies/3 (accessed 4 October 2021).

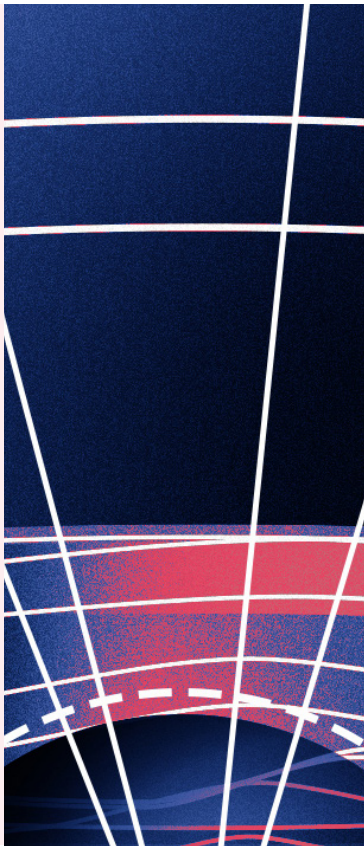
10 Hill, D. (2020). "Realizing mission-oriented innovations in a fast-moving world", International Science Council, 1 May, https://council.science/current/blog/realizing-mission-oriented-innovations-in-a-fast-moving-world (accessed 30 June 2021).

11 Dark Matter (2021). "Towards healthy, sustainable and just Swedish and planetary food system", https://darkmatter-labs.medium.com/towards-healthy-sustainable-and-just-swedish-and-planetary-food-system-3354b72461cb (accessed 7 August 2021).

Box 2. The Topsectoren approach in the Netherlands

The Topsectoren approach is an industrial policy introduced in the Netherlands in 2011 to strengthen co-ordination and collaboration between STI system actors. Covering research, higher education and innovation, nine key economic areas (the Top Sectors) were selected based on R&D activity and export-intensive domains. Initially, the primary goal of this approach was to improve the match between innovative firms' knowledge demands and the activities of research institutes. However, it gradually shifted toward more transformative goals in the form of the "Mission-oriented Top Sector and Innovation Policy". Since 2018, this Policy has focused on 25 missions around four challenges with strong potential societal impact, such as reducing CO2 emissions, enhancing digital security and increasing the years of healthy life for all. The transition to mission governance included the creation of mission teams, which function as engines for driving change through collaborations with ecosystem actors. To this end, the top sectors jointly developed an Integral Knowledge and Innovation Agenda in each of the four societal challenge areas to reach specific targets within a certain period. The Dutch Ministry of Economic Affairs leads the reform and works with industry and other authorities across diverse policy fields on the development and implementation of the programme. The strategy is revisited every four years.

Source: OECD (2020).



2. FUNDING MISSIONS

Finance is an important factor in mission-oriented innovation, especially in regard to its influence on policy co-ordination, institution building and risk taking. For example, mission-oriented public funding can make (and in many countries has made) a difference in renewable energy technology innovation. Wind energy technologies are vastly more developed than marine technologies, where the latter have only deployed demonstration projects and are nowhere near being cost-competitive.[12] While the private sector finances the majority of less risky wind energy R&D, public funds dominate the riskier marine sector. This suggests that public funds play a very important role, especially in the early development of green energy. This type of public direct investment has been found to mobilise private investment in renewable energy. In fact, mission-oriented public investment has the largest positive effect on private investment compared to other traditional policy tools.[13] Thus, missions as transformational policy goals rely on the financial ecosystem to support innovations.

Missions are funded through multiple avenues. Governments can repurpose or upgrade existing funding mechanisms or institutions to be more mission-oriented. For instance, in 2021 Denmark's Innovation Agency published a funding call for roadmaps for mission-driven green partnerships.[14]

12 Semieniuk, G. and M. Mazzucato (2018), *Financing Green Growth*, IIPP WP 2018-0, Institute for Innovation and Public Purpose, London.

13 Deleidi, M., M. Mazzucato and G. Semieniuk (2020), "Neither crowding in nor out: Public direct investment mobilising private investment into renewable electricity projects", *Energy Policy*, 140, p. 111195, https://doi.org/10.1016/j.enpol.2019.111194.

14 For further details, see: https://innovationsfonden.dk/en/news-press-jobs/now-open-call-roadmaps-mission-driven-green-partnerships.

Another example from Denmark is the public energy company Ørsted, which adopted a mission-oriented investment strategy[15] (see Box 3). Efforts to "green" central banks and financial regulations have become a pivotal area for supporting transitions to sustainability in particular. For example, the European Investment Bank has become one of the main providers of long-term mission-oriented finance as well as risk-sharing in the European Union, and has taken the lead in key policy areas such as climate action finance (by committing to dedicate 50% of financing to climate action by 2030).[16]

Alternatively, governments can create entirely new funding mechanisms and institutions. In 2020, Scotland created "a mission-led development bank providing patient capital to build a stronger, fairer, more sustainable Scotland".[17] The bank is capitalised with GBP 2 billion of public funds and focuses on three missions. The most widespread examples of new mission-oriented funding mechanisms are green and gender budgeting. These allow governments to go beyond isolated research activities to look at public sector investments as a whole rather than a singular field of research. Other new approaches are participatory budgeting to help establish new, contextual and community-based missions and phenomenon-based budgeting to align investments with mission portfolios.[18] Advancing these funding mechanisms is essential to making missions work.

3. PROCUREMENT

Public procurement is one of the key enabling conditions for mission-oriented policies. It is a demand-based instrument to incentivise private and third-sector partners to generate new solutions or adjust their production-related processes to a mission. Governments can use public procurement to stimulate private providers to carry out R&D and innovation in areas where market interest is muted due to high uncertainty, specifically around societal grand challenges such as ageing, environmental sustainability and health.

Green procurement, for instance, is a direct case of public sector purchasing power being directed towards a grand challenge or a mission. For example, in 2016 Germany changed its national laws to better enable public organisations to include strategic goals such as environmental requirements in

15 Voldsgaard, A. and M. Rüdiger (2021). "Innovative Enterprise, Industrial Ecosystems and Sustainable Transition: The Case of Transforming DONG Energy to Ørsted", in M. Lackner, B. Sajjadi and W.Y. Chen (eds), *Handbook of Climate Change Mitigation and Adaptation*, Springer Publishing, https://doi.org/10.1007/978-1-4614-6431-0_160-1. Algers, J. and R. Kattel (2021). "Equinor and Ørsted: How industrial policy shaped the Scandinavian energy giants", www.ucl.ac.uk/bartlett/public-purpose/publications/2021/mar/equinor-and-orsted-how-industrial-policy-shaped-scandinavian-energy-giants (accessed 9 August 2021).

16 Mazzucato, M. and O. Mikheeva (2020). "The EIB and the new EU missions framework", www.ucl.ac.uk/bartlett/public-purpose/

17 The quote is taken from the website of the new public bank: www.thebank.scot. See also: Mazzucato, M. and L. Macfarlane (2019). "A mission-oriented framework for the Scottish National Investment Bank", www.ucl.ac.uk/bartlett/public-purpose/publications/2019/mar/mission-oriented-framework-scottish-national-investment-bank (accessed 20 June 2020). publications/2020/nov/eib-and-new-eu-missions-framework (accessed 9 August 2021).

18 Tõnurist, P. (2021, 28 September). "Towards an anticipatory innovation governance model in Finland", https://oecd-opsi.org/wp-content/uploads/2021/09/Anticipatory-Innovation-Governance-in-Finland.pdf (accessed 4 October 2021).

the award criteria of bidding processes, so that public authorities can actively practice green procurement by incorporating environmental requirements into their tenders.[19]

Another approach to mission-oriented innovation is to procure specific solutions to problems (rather than specific existing products). This so-called functional procurement "specifies what function is to be achieved rather than how the function is to be achieved".[20] An example of mission-oriented or functional procurement is the application of agile practices in the UK Government Digital Service (GDS). Founded in 2011 to reform IT procurement, GDS successfully reshaped digital procurement practices through spending controls and the creation of a digital marketplace.[21]

Box 3. Mission-oriented investment strategy - Danish public energy company Ørsted

The Danish public energy company Ørsted has adopted a wholesale renewable energy strategy. The move towards renewable energy started in 2008, when the firm was almost completely reliant on fossil sources for electricity generation. In the increasingly climate-conscious landscape, the executive management group made the decision to focus on renewable energy development. In 2009, the company launched the 85/15 strategy, which aimed to generate 85% of electricity from renewables and 15% from conventional sources by 2040. The firm optimised its internal operations and co-ordinated its supply chain to become a leader in offshore wind by 2013. Through a partnership with Siemens Wind Power (SWP), it gained access to turbines in exchange for stable demand. Industrialisation of the supply chain, managed competition between upstream suppliers and partnerships with institutional investors reduced uncertainty and costs for all energy actors. As a result, the firm changed the industrial landscape in offshore wind in Denmark. In 2019, the ambitious 85/15 goal was reached, 21 years ahead of schedule. In 2018, a new strategy was adopted with planned investments of DKK 200 billion in renewable energy over 2019-25, with the aim of reaching renewable capacity of 30 GW by 2030. By the end of 2019, Ørsted had invested DK 193 billion in renewable energy and was being hailed as the "first green energy major".

Source: Voldsgaard and Rüdiger (2021), Algers and Kattel (2021).

19 Bundesregierung (2016). "Gesetz zur Modernisierung des Vergaberechts (VergRModG)", in *Bundesgesetzblatt Jahrgang 2016*, Teil I, Nr. 8. Bonn (in German).

20 Edquist, C. and J.M. Zabala-Iturriagagoitia (2020). "Functional procurement for innovation, welfare and the environment: A mission-oriented approach", *Papers in Innovation Studies*, 2020/1. Lund University, CIRCLE – Center for Innovation, Research and Competences in the Learning Economy, https://ideas.repec.org/p/hhs/lucirc/2020_001.html (accessed 20 June 2020).

21 Kattel, R. and V. Takala (2021). "Dynamic capabilities in the public sector: The case of the UK's Government Digital Service", UCL Institute for Innovation and Public Purpose, www.ucl.ac.uk/bartlett/public-purpose/publications/2021/jan/dynamic-capabilities-public-sector-case-uks-government-digital-service (accessed 19 March 2021).

TOOLS AND METHODS

Mission-oriented innovation is still an emerging practice and can in principle rely on a wide variety of policy-making tools and methods for implementation. The tools and methods increasingly favoured by public organisations implementing missions are experimentation and stakeholder engagement, a portfolio approach to funding and governance of projects, and new public value and spill-over-focused evaluation frameworks.

Due to economic and STI-centricity, the tools and methods currently available for missions mostly rely on the differentiation between market failure fixing or market shaping as a justification for public sector activities.[22] While market failures are concerned with non-competitive markets (e.g., monopolies), externalities (e.g., pollution), or co-ordination and information failures hampering investment, a market-shaping approach is concerned with the collective production or co-production of social and economic value.[23] Table 2 summarises these two approaches to policy justification and shows how they lead to different assumptions about policy processes and tools, including measurement and evaluative frameworks.

Box 4. Participatory mission-setting in Barcelona

The Barcelona Metropolitan Strategic Plan (PEMB) is a multi-year plan for the city of Barcelona and the surrounding areas. In 2020-21, the PEMB identified 68 challenges facing the region. These will be transformed into 10 to 12 missions. Each mission will address four values: increasing resilience, prosperity, cohesion and creating a smart metropolis. As an example, one of the missions addresses local food security and will aim to derive at least one-third of food consumption from local products. For each mission a pilot group will be set up, consisting of members of civil society, academia, the public sector, the private sector and the media (based on a quintuple helix model). One particular challenge identified by the PEMB is the difficulty of creating convincing narrative and societal support for projects. However, the PEMB employs participatory processes such as the pilot groups to ensure that the transformation into missions is well-informed.

Source: OECD Interview.

22 Kattel, R. et al. (2018). "The economics of change: Policy and appraisal for missions, market shaping and public purpose", UCL Institute for Innovation and Public Purpose, www.ucl.ac.uk/bartlett/public-purpose/publications/2018/jul/economics-change-policy-and-appraisal-missions-market-shaping-and-public (accessed 20 June 2020).

23 Mazzucato, M. (2018). *The Value of Everything: Making and Taking in the Global Economy*, 1st edition, Allen Lane, London.

Table 2. Market failure vs. market fixing approach

	MARKET-FIXING	MARKET-SHAPING/MISSION-ORIENTED
Justification for the role of government	Market or co-ordination failures: • public goods • negative externalities • imperfect competition/ information	All markets and institutions are co-created by public, private and third sectors. The role of government is to ensure markets support public purpose.
Policy appraisal	Ex-ante cost-benefit analysis (CBA) – allocative efficiency assuming static general relationships, prices, etc.	Focused on systemic change to achieve mission – dynamic efficiency (including innovation, spillover effects and systemic change)
Underlying assumptions	Possible to estimate reliable future value using discounting/monetisation of externalities/risk assessment; the system is characterised by equilibrium behaviour	Future is uncertain because of the potential for novelty and non-marginal change; the system is characterised by complex behaviour
Policy evaluation	Focus on whether specific policy solves market failure and whether government failure is avoided (Pareto-efficient)	Ongoing and reflexive evaluation of whether the system is moving in the direction of the mission via achievement of intermediate milestones. Focus on the portfolio of policies and interventions and their interaction
Approach to risk	Highly risk-averse; optimism bias assumed	Failure is accepted and encouraged as a learning device

Source: Adopted from Kattel et al. (2018).

Experimentation and stakeholder engagement

Policy makers are learning from the implementation of mission-oriented innovation and incorporating new methods and analytical tools such as strategic design, complexity economics, foresight, policy labs and others.[24] For instance, Swedish innovation agency Vinnova co-ordinated intensive co-design sessions across Sweden, with up to 400 different stakeholder organisations engaged in "actor workshops". The underlying principle behind this extensive engagement process is to generate a different kind of knowledge base for innovation policy action, one that is closer to "users" of specific policy outcomes such as school pupils, teachers and parents. Other examples of bottom-up inclusive processes that lead to mission formulation are Barcelona's pilot groups (see Box 4) and the Province of Fryslan's innovation networks[25] (see Box 5).

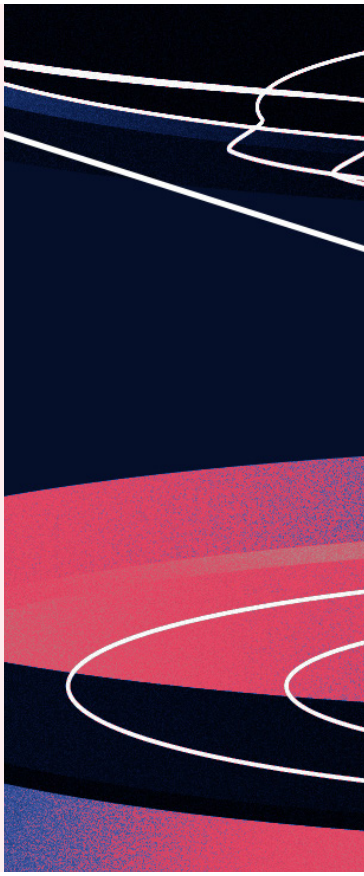
24 Tõnurist, P., R. Kattel and V. Lember (2017). "Innovation labs in the public sector: What they are and what they do?", *Public Management Review*, Vol. 19, No. 10, pp. 1455–1479. doi: 10.1080/14719037.2017.1287939.
van Buuren, A. et al. (2020). "Improving public policy and administration: exploring the potential of design", *Policy & Politics*, Vol. 48, No. 1, www.ingentaconnect.com/content/tpp/pap/2020/00000048/00000001/art00001 (accessed 20 April 2020).

25 SDG Netwurk Fryslan (2021). "Blue Delta", http://sdgnetwurk.frl/nieuws/blue-delta (accessed 4 October 2021).

Box 5. Bottom-up approach of the Province of Fryslan

The Dutch Province of Fryslan developed the "Blue Delta" mission to address rising sea levels. The process was kick-started by a photograph taken from the International Space Station in 2018, which illustrated the vulnerability of this coastal region of the Netherlands to climate change. The Province held a dialogue on the future of the region, which focused on the topics of circular economy, water technology and management, and local communities. It launched a series of bottom-up projects and co-operated with the University of Groningen to develop an evaluation method to assess new projects against the Sustainable Development Goals (SDGs) and other eco-indicators related to the mission. There is no formal process for defining and updating the Blue Delta mission. However, the province placed great emphasis on engaging with broad parts of the population during the initial development stage, and ongoing adjustment and evaluation of the mission. The province also used an innovative approach to stimulate co-operation at the regional level. It convened an "innovation roundtable" with experts, project owners and idea holders to forge connections between related projects. It also redirected funding from concrete projects to the early phase ideation stage of project development and helped start-ups to use festivals as a testbed for their products. It was particularly important to follow through on every ideation meeting and present clear concepts for the next stage of implementation.

Source: OECD interview (2021), SDG Network Fryslan (2021).

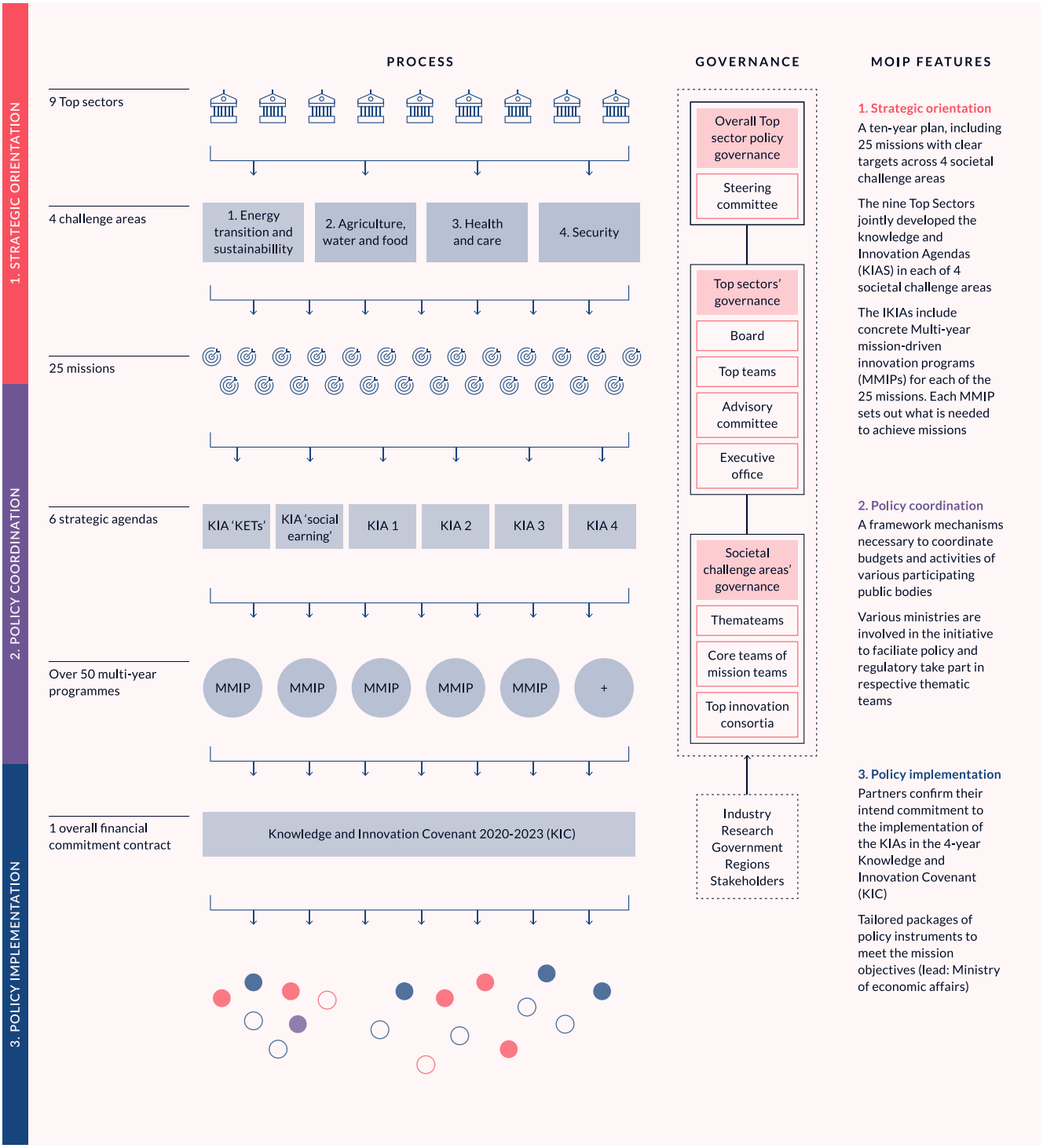


Portfolio approach to funding and governing initiatives

Operational autonomy of mission-oriented funders and flexibility of mission-oriented funding are vital to avoid lock-in into one type of solution to solve a mission. The US Government's defence research agency DARPA, for instance, relies on organisational structures that are flexible, adaptable and able to foster bottom-up solutions, and often serves as an example of the portfolio approach to mission-oriented investment. The portfolio approach to funding missions can take the form of specifying mission themes and challenges, and then funding multiple projects with complementary approaches to solving the problem. Such a structure can be seen in the case of the Dutch Topsectoren missions (see Box 2 and Figure 1). Multilateral organisations such as the United Nations Development Programme (UNDP) are rethinking the ways in which they support development initiatives by bringing together funders around challenges to be addressed through a multitude of projects. For instance, the UNDP is exploring the creation of a "systemic fund" for financing portfolios with flexible resources[26] (see Figure 2).

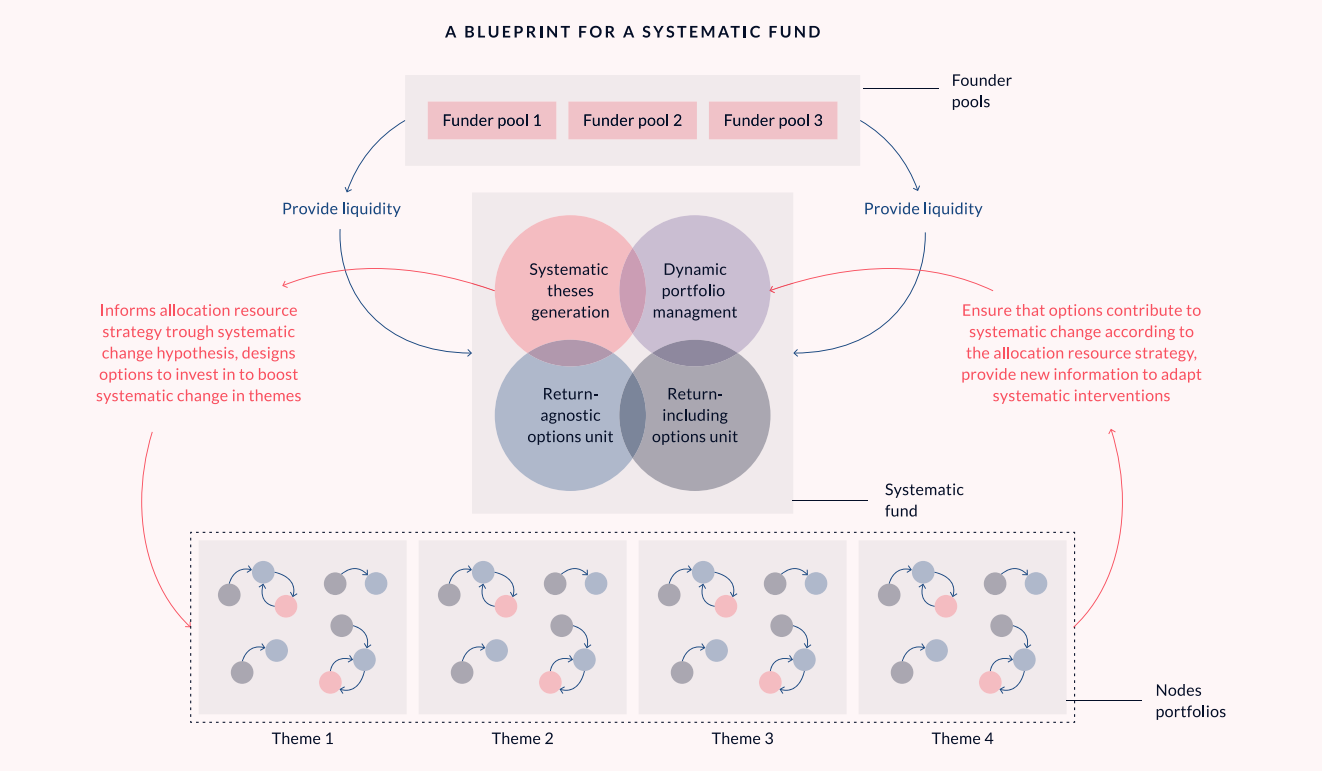
26 Gurciullo, S. (2021). "Deploying Systems Finance for Development: A Multi-Asset Approach to Accelerate SDG Localisation", https://docs.google.com/document/d/1mIOOiXgwJSmDNPnMXjt_msc8rz5DT55lwWpnJ-Ml6mw/edit?usp=embed_facebook (accessed 9 August 2021).

Figure 1. The Dutch Mission-driven Top Sectors and Innovation Policy: process, governance and main mission-oriented policy features



Source: Larrue (2021).

Figure 2. A blueprint for a systemic fund by the UNDP



Source: Gurciullo (2021).

Evaluating mission-oriented innovation

Perhaps the key issue in the portfolio approach to transformational public policy is the framework and the concrete methodologies to appraise and evaluate such portfolios. It is not enough to evaluate mission outcomes; there is a need for reflexive measurement that captures how missions relate to systemic transformation[27] (see the example a holistic evaluation progamme in Japan[28] in Box 6).

Another way to appraise and evaluate missions is the application of public value. Public value mapping can be used to gauge the market-shaping impact of public organisations.[29] A well-known example is the British Broadcasting Corporation (BBC), the national broadcaster of the United Kingdom, which uses public value tests to understand and justify its impact on the economy and society[30] (see Figure 3).

27 Jannsen et al. (2021).

28 OECD (2020). Cross-ministerial Strategic Innovation Promotion Program (SIP), https://stip-pp.oecd.org/stip/moip/case-studies/15?answerId=A13-15 (accessed 4 October 2021).

29 Bozeman, B. (2002). "Public-value failure: When efficient markets may not do", *Public Administration Review*, Vol. 62, No. 2, pp. 145-161. https://doi.org/10.1111/0033-3352.00165.

30 Mazzucato, M. et al. (2020). "Creating and measuring dynamic public value at the BBC", UCL Institute for Innovation and Public Purpose, www.ucl.ac.uk/bartlett/public-purpose/publications/2020/dec/creating-and-measuring-dynamic-public-value-bbc (accessed 21 March 2021).

Box 6. Japan's cross ministerial innovation evaluation programme

The cross-ministerial Strategic Innovation Promotion Programme (SIP), implemented by the Government of Japan, aims to provide holistic support throughout the innovation cycle from the research phase through to early market application, including regulatory reforms and necessary system changes. The SIP programme relies on ex ante and post ante assessments. Policy evaluation is continuous and carried out before, during and after programme implementation via regular expert reviews and self-assessments. Evaluation indicators include the effects of implementation of SIP relative to targets, cross-ministerial collaboration, co-operation with and between research and academic stakeholders, expected spill over effects and Technology Readiness Levels (TRL) for each research subject. In addition, the SIP evaluates the contribution to social innovation and addressing social issues in the economy and society, and the clarity of the commercialisation strategy. The evaluation extends beyond merely assessing whether targets have been reached, to consider the root causes and success factors of the programmes. The assessment outcomes impact the budget allocation year on year and can lead to research, governance or management changes to the programmes.

Source: OECD (2020).

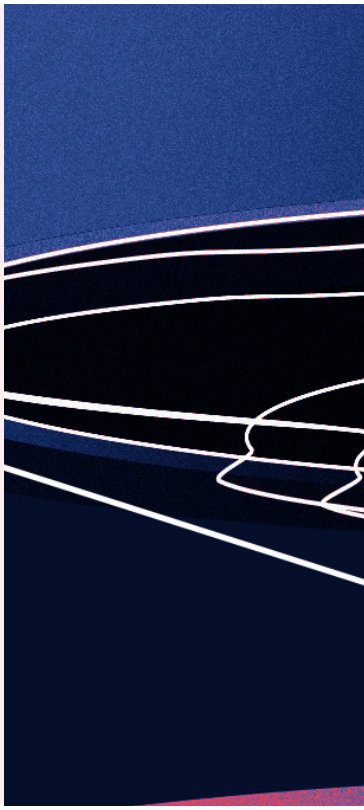
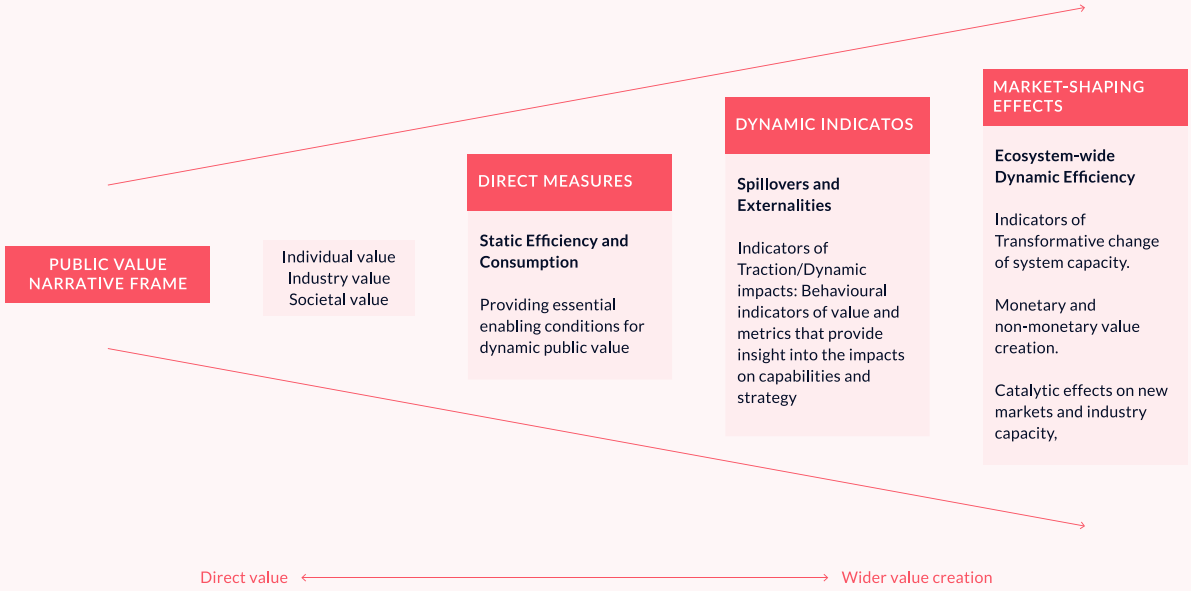


Figure 3. A prototype framework for assessing value creation



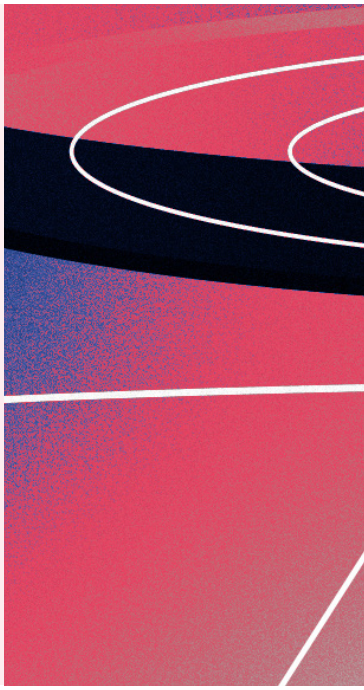
Source: Mazzucato et al. (2020).

In terms of measuring success and evaluating missions in practice, there is still a lack of practical tools and methods. This is something that the OECD's Mission Action Lab[31] is trying to address (see Box 7).

Box 8. The Mission Action Lab at the OECD

The OECD Mission Action Lab is a joint initiative of the OECD Observatory of Public Sector Innovation (OPSI), the OECD Directorate for Science, Technology and Innovation, and the OECD Development Co-operation Directorate. The OECD Mission Action Lab sets out to identify and analyse mission governance practice, and package insights into advice for governments. This advice aims to support governments in defining, setting up and governing large-scale missions. The Mission Action Lab aims to identify, compare and analyse practices, develop in-depth knowledge, and issue practical guidance addressing science and technology concerns and broader policy making and governance issues around mission-oriented innovation. It focuses on strengthening cross-sectoral and cross-disciplinary collaboration in countries. The work of the Mission Action Lab is action-oriented and focuses on tools and methods developed together with countries through concrete missions.

Source: OECD Observatory of Public Sector Innovation (2021).



SKILLS AND CAPACITIES NEEDED FOR MISSION-ORIENTED INNOVATION

A major conceptual lesson from the COVID-19 response is the distinction between long-term capacities and dynamic or agile capabilities in the public sector. A combination of both is key to successful mission-oriented innovation. Long-term capacities include the capacity to set a direction for development while continuously stress-testing the relevance of a mission in the future, govern and direct resilient production systems, and build public service infrastructure. Dynamic capabilities, on the other hand, refer to the capability to adapt and learn in the short term, harness citizen initiatives and innovation, and govern data and digital platforms.[32] In addition, reflexive and flexible governance is increasingly important in the context of missions to reassess and adapt missions to new developments.

31 OECD Observatory of Public Sector Innovation (2021). OECD Mission Action Lab, https://oecd-opsi.org/projects/mission-oriented-innovation/#missionactionlab (accessed 4 October 2021).

32 Mazzucato, M. et al. (2021). "COVID-19 and the need for dynamic state capabilities: An international comparison", UNDP-IIPP Working Paper.

The following long-term capacities and dynamic capabilities are relevant in the context of mission-oriented policies:[33]

1. **Institutional entrepreneurship.** Missions require strong political and managerial leadership to galvanise support and ensure the implementation of complex policy processes, e.g., political contestation practices open to new political leaders, or means to purposefully create new public organisations to break institutional inertia or bring new skills into the public sector.

2. **Investment.** Mission-oriented innovation often relies on long-term financial planning and capabilities around devising a portfolio of investments and other financial instruments (e.g., financial regulations, grants) to fund public, private and third-sector actors. Such capabilities are relevant for public financial institutions (e.g., investment banks), research and innovation funding agencies. Typically, these agencies are independent of the central government and succeed under circumstances of relatively strong operational autonomy.

3. **Market shaping.** These capabilities relate to policy structures and tools focusing on (re-)shaping markets, such as through regulation, procurement, labour rules, etc. The capabilities are relevant to central government ministries and local government departments engaging directly with creating and implementing market rules and legislation.

4. **Coordination, engagement and experimentation.** These capabilities refer to new ways to design policies and engage with stakeholders and citizens, such as innovation labs. The capabilities are typical for new types of public organisations such as digital agencies, but are also applicable to welfare services and across the public sector.

5. **Anticipation and stress-testing.** These capabilities describe the ability to anticipate different avenues to solve a mission or use foresight to stress-test the relevance of a mission in the future.

6. **Evaluation.** Equally important are evaluation capabilities that do not simply rely on market-failure-based approaches (e.g. cost-benefit analysis), but can also integrate user research, social experiments and system-level reflection (e.g. dynamic efficiencies) as well as help govern portfolio approaches to investment and co-ordination and engagement processes.

33 Fisher, R. et al. (2018). Mission-Oriented Research and Innovation Inventory and characterisation of initiatives (Final Report). doi: 10.2777/697082.
Kattel, R. and M. Mazzucato (2018). "Mission-oriented innovation policy and dynamic capabilities in the public sector", Industrial and Corporate Change, Vol. 27, No 5, pp. 787-801. doi: 10.1093/icc/dty032.
Kattel, R. et al. (2020). "Alternative policy evaluation frameworks and tools", www.ucl.ac.uk/bartlett/public-purpose/publications/2020/nov/alternative-policy-evaluation-frameworks-and-tools (accessed 6 August 2021).

POLICY RELEVANCE

In the context of "wicked" challenges such as climate change, cancer or clean oceans, short-term, single stakeholder approaches are no longer sufficient. Mission-oriented innovation can produce more effective ways to tackle the "grand challenges" facing governments today. This approach shifts missions away from a narrow focus on specific sectoral policies (e.g., STI policies) and places systemic change at the centre.

The main premises of mission-oriented innovation address key current policy and wider public sector challenges. They ensure inclusive governance, progressive politics, a generative environment and systemic impact.[34] For instance, the creation and maintenance of inclusive governance structures, which form part of mission-oriented innovation, are vital for wider societal discussion and engagement, and legitimise efforts to act on grand societal challenges. For example, mission-oriented innovation formulates grand societal challenges, such as climate goals, as measurable, ambitious and time-bound targets (e.g. becoming carbon-neutral by 2030).

Missions are political by nature; they reflect wider societal and political debates about the nature and direction of economic growth, innovation and public services. For instance, the STI and wider policy landscape is undergoing a shift towards an increasingly green focus and responsible innovation. Traditionally, most STI or public service design and implementation processes are not open to such wide-ranging debates, as they rely on existing political and mostly top-down practices or industry-led incremental development. Mission-oriented innovation can help in this regard.

Missions can act as a tool for wider co-ordination across multiple sectors and policy arenas. Mission-oriented innovation can help policy makers engage incumbent actors (industry, universities) in mission-oriented policy discussions, especially in contexts where such actors, often in the private sector, lead in R&D investments (e.g. in countries such as Germany). In countries without strong incumbents, mission-oriented innovation can engage emergent actors in collaboration at different levels of development and/or economic specialisation.

34 Jannsen et al. (2021).

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