# Policy Brief

Recommendations from the Research Council of Norway's International Advisory Board **Issue 2** / **May 2020**

# Addressing global challenges through mission-oriented policy

**Increased awareness of the need to engage research and innovation in the quest to solve global challenges has put mission-oriented programming back on the agenda. Norway must take the next step beyond its current thematic and challenge-oriented approach to research and innovation policy and deploy missions as part of a transformative policy agenda – a transformation that is required in the wake of Covid-19 and in light of pressing challenges such as the climate crisis.**

Missions are key to support attempts to restructure economies, change development paths, and address grand challenges and inertia. Norway has favourable socio-political conditions for engaging in mission-oriented programming. It should capitalise on these and add missions to its overall well-functioning portfolio of research and innovation support instruments:

- Norway should embrace a mission-oriented research and innovation (R&I) policy more proactively, deploying it for challenges for which direction-setting and momentum can help overcome barriers to change.
- Missions should be selected based on explicit criteria to ensure robustness and legitimacy; they should primarily be established in areas where Norway has competitive advantages, where institutional capacities are strong and where national, social, economic or environmental challenges are critical.
- New forms of funding, governance and leadership should be explored in order to implement missions effectively.
- A first pilot mission should be established swiftly to respond to the urgency of the climate crisis in an area where Norway has comparatively well-developed capabilities such as carbon capture and utilization, sustainable maritime transport, or offshore wind.

## Norway should embrace a mission-oriented R&I policy

There is a new awareness of the need to orient scarce R&I resources towards grand challenges, such as poverty, public health, climate change, pollution of the oceans and biodiversity, to name but a few pressing issues. The Sustainable Development Goals (SDGs) of the United Nations represent an agenda which is increasingly embedded in national R&I policies world-wide [1].

OECD's recent innovation review of Norway concluded that Norway is faced with a triple transition imperative [2]:

- Shifting towards a more diversified economic structure, meaning less reliance on the oil and gas industry
- Moving towards a more competitive, effective and efficient innovation system
- Achieving these structural transitions while ensuring that grand challenges are addressed

The current context for R&I policy demonstrates significant systemic and transformational failures. Inherent path dependencies and inertia in the way goods and services are produced and delivered result in pressures on the planet's carrying capacity. However, it is increasingly acknowledged that addressing the SDGs effectively may represent a vast economic potential. The current Covid-19-crisis highlights the

existence of unforeseen risks and disruptions that may need a rapid, co-ordinated response at the global level.

A sound mission-oriented policy may have significant benefits for Norway. It can contribute to the necessary diversification of the economy, help address grand challenges, bring research and innovation closer to its citizens and help ensure the necessary investments in the science system of the future.

"Mission-oriented policies can be defined as systemic public policies that draw on frontier knowledge to attain specific goals[…] Missions should be broad enough to engage the public and attract cross-sectoral investment; and remain focused enough to involve industry and achieve measurable success. By setting the direction for a solution, missions do not specify how to achieve success. Rather, they stimulate the development of a range of different solutions to achieve the objective" [3].

Mission-oriented policies are large-scale initiatives with clear objectives, and they have a significant research and innovation component as part of a wider package of policies or instruments, e.g. regulatory measures [4]. The following are the key ingredients to a well-founded mission-orientation in R&I to address global challenges [5]:

- A mix of supply-side and demand-side instruments
- Long-term direction setting with strong public leadership and funding
- Horizontal and vertical coordination between levels of government and agencies
- Dynamic and purposeful regulation, policy and legal frameworks
- Demand articulation and engagement of users and citizens
- Rigorous monitoring and evaluation systems
- Empowered governance (structure) that can be easily identified and that can be held accountable for achieving the results
- A sense of urgency that is shared amongst a broad category of stakeholders

In order to successfully implement a mission-oriented policy, appropriate socio-political institutions and capacities must be in place. Norway is well equipped in this regard, as it has:

- Good capacity for social dialogue through tri-partite cooperation.
- A sector principle in R&D policy which implies that each sectorial ministry is responsible for R&D policy in their sector or area. This creates coordination costs, but it has the advantage that all ministries see R&D as key to achieving their goals. Missions may provide incentives to improve collaboration across ministries and policy areas.
- Well established 21-processes, which are multi-stakeholder commissions responsible for prioritization in key areas of Norwegian research and innovation policy, providing a bottom-up perspective on priorities to be chosen.
- A mixed economy in which the role of the state is relatively large. This may not have a direct bearing on the relevant capacities, but it illustrates that economic policy does not rely singularly on market failure corrections.

Mission-oriented programmes are not intended to crowd out other instruments, but rather be used as a complement to other initiatives in the existing policy or programme mix to achieve desired changes. Mission-oriented policy may help bring science, technology and innovation closer to the public and hence ensure greater legitimacy and support for R&I investments.

Mission-oriented projects are characterised by a very broad and multi-faceted variety. As missions are initiated and implemented in very diverse political, social and economic contexts, there is no ideal type. However, it is possible to make a useful distinction between two main types of missions [6]:

- Accelerators: Mission projects that aim at accelerating progress towards some target, normally technological ambitions or capacities.
- Transformers: Mission projects that are broader and aim at transforming a complex system, notably addressing global challenges.

The former may feed into the latter, while the latter is becoming more relevant with the looming global risks and the increasing pressure to address these challenges. Real missions are adapted to real problems and are often a mix of the two. For example, delivering emission-free maritime transport will often require

technological progress, but such progress may also contribute to a wider agenda of addressing climate change and enhancing national competitiveness. Norway already has several initiatives in place which are similar to accelerator missions. Examples are Research Council of Norway (RCN) R&I programs such as IKTPLUSS and CLIMIT, or PILOT-E – an R&I program jointly financed by RCN, Enova and Innovation Norway (IN). These are all programs which are problem oriented, with extensive cooperation with other institutions, agencies, hospitals or industry.

**IAB recommends that the government should consider:**

- Capitalizing on the country's inherent institutional capacities such as social dialogue and cooperation to engage in mission-oriented policies in order to address key challenges facing Norwegian society
- Applying a mission-approach in cases where there is a strong need to overcome inertia and barriers and set a clear direction through ambitious stewardship and funding

## Missions should be selected based on explicit criteria

Prioritizing one or more missions at the national level will require in-depth discussion of which challenge(s) are suitable for such a policy approach. At the outset, selecting mission projects should follow some principles, such as the ones proposed by Mazzucato [7]:

- Bold, inspirational with societal relevance
- A clear direction: targeted, measurable and time-bound
- Ambitious but realistic research and innovation actions
- Cross-disciplinary, cross-sector and cross-actor innovation
- Multiple, bottom-up solutions

A true mission-oriented project or policy requires high-level prioritization. A governmental strategy is necessary, aimed at one or more identified challenges, fit for mission-orientation. Government leadership must be sufficiently strong and clear to incentivize involved actors to do their part. Challenges must be decomposed into problems that are solvable and achievable within a given time- and resource-frame. Learning by doing will be necessary, as key stakeholders and agencies must build a common understanding of which challenges are suitable for a mission-approach, what a mission-approach means in practice, and which governance systems are needed.

The wider policy context needs to be taken into consideration when selecting missions. Missions may be conceived, crudely, on two levels; international and national. Norway participates in the current European framework programme for research and innovation, H2020, and is likely to participate also in the next framework programme Horizon Europe, in which missions will be a key ingredient. These EU level missions are formulated more as umbrellas under which problem-driven missions will be defined.[8] Even if the EU missions are intended to address grand challenges experienced by all or most countries, there is a need to carve out a strategy for participation in these missions that is in line with Norwegian needs and priorities.

National missions are defined in line with national priorities, such as white papers, long term plans, specific national ambitions, etc. They are often meant to achieve certain policy targets while at the same time improving certain capabilities in the domestic system, such as R&D and industrial or technological capacities. National missions should strive to meet selected challenges in a way that strengthens the competitiveness of the Norwegian economy and/or increases national social capital and capabilities. Strong links to international (including missions being developed in EU) or global challenges are likely to create stronger overall impact.

Mission-oriented projects or policies should be established in areas where Norway has a competitive advantage, where institutional capabilities are strong and where national, social, economic or environmental challenges are critical. Prioritization of missions should on the one hand be based on the potential for popular, widespread support. On the other hand, missions should be firmly linked to overarching governmental priorities or strategies such as the government's *Long-term plan for research and higher education* to ensure political and institutional acceptance and support.

Appropriate capacities and capabilities in the research and innovation systems are needed to fuel missions. A high-quality science base and higher education system is of paramount importance. High-quality human capital, infrastructure and funding is paramount, but the system must also be able to engage in large collaborations across sectors, deploying cross-disciplinary approaches and practices.

A sound forward-looking approach is necessary in order to successfully identify and select appropriate missions. As missions are often long-term initiatives involving significant investments and mobilization of resources, these decisions should be de-risked through solid intelligence about future developments. While there are several methods and practices available to produce such intelligence, it is important that forward-looking approaches are clearly and firmly linked to decision- and policy making. Political and strategic ownership to such processes is of utmost importance if they are to have the desired impact on developing mission policy.[9]

**IAB recommends that the government should consider:**

Applying a set of transparent criteria when assessing mission candidates, to make sure that the selection is robust and that the missions in question fit into a wider national and international policy mix:

- **National key criteria:**
  - They should address one or more agreed national challenges.
  - They should support diversification of Norway's economy, structural change and enhance productivity.
  - Capacity building in the R&I-system, industrial sectors and the public sector should be a key ingredient in mission policies.
- **International linkages:**
  - They should support international efforts to address the UNs Sustainable Development Goals.
  - They should link to one or more of the mission areas identified in Horizon Europe.
- **Process:**
  - They should be based on a constructive consultation with key stakeholders and communities.
  - A forward-looking approach should guide prioritization and selection.
- **Policy:**
  - They should be equipped with clear objectives and achievable targets.
  - They should contain a visible and ambitious R&I component without which the mission in question will not be relevant.
  - They should be based on a package of cross-sectoral policies and instruments.

## New forms of funding, governance and leadership should be explored in order to implement missions effectively

Achieving systemic change and significant transformations in the economy and society to more effectively address global challenges requires direction and momentum. However, legitimacy needs to be ensured amongst stakeholders and the public: Missions should on the one hand be perceived as important by the public at large, and on the other hand the public should have a greater say and be more actively involved in designing and implementing missions [10, 11]. Missions may also be scrutinized through technology assessment by institutions like "Teknologirådet", broadening the engagement and insight in missions design and implementation.

Implementing missions requires effective coordination. Governments typically needs to bridge, or even break down, the "silos" of sectoral structures. More effective co-ordination and co-working between ministries, agencies and various levels of government institutions is adamant to bringing about a whole-of-government approach to missions. Such institutional capabilities need to be realised through pro-active action[12]. In the Norwegian setting, the normal mechanisms for policy coordination should be exploited to the full, such as the Government's *Long-term plan for research and higher education* which will be revised in 2022. This plan serves as a key

strategic and coordination mechanism and should be better exploited. A visible missions-oriented policy should be included in the 2022 revision of the plan, with committed buy-in from all relevant ministries.

The agency level is key in the Norwegian system. RCN has strong institutional capabilities that should be exploited when developing and implementing mission-oriented programming. RCN constitutes a unified funding agency covering all subject areas in the whole spectrum from basic science to research-based innovation. RCN serves as a key coordination platform in the Norwegian system, turning funding from sectorial ministries into broad R&I programmes in line with government policy. Recently, it has developed a portfolio approach to R&I investments which may prove conducive to mission-oriented programming.

The capabilities of other key actors at the agency level such as Innovation Norway, ENOVA, etc. should also be exploited effectively in implementing a mission-oriented approach. Ensuring constructive cooperation between them will be key. Several Norwegian mission-oriented initiatives have already been implemented that are built upon effective collaboration between funding agencies, such as PILOT-E.

Both supply side and demand side instruments must be deployed actively in a successful mission-oriented policy. RCN and IN already jointly run a programme for public innovation procurement, as well as an initiative on cooperative innovation between industry and the public sector. Public innovative procurement represents an often-undervalued instrument in innovation policy and has large potential as illustrated by the innovative or pre-commercial procurement scheme run by the European Commission[13]. Furthermore, the wider policy system of regulations, taxation and the very role of the public sector with its institutions and procurement power will need to be engaged in a mission-oriented policy.

As missions are typically ambitious and long-term, implementing them often require new forms of funding, governance and leadership. While the government needs to have strong ownership of the missions chosen, the governance of missions may differ. Existing or new agencies may take a lead, or industry may lead missions that are based on industrial activities; public-private partnerships have proved essential mechanisms in missions-oriented policy[14]. Independent evaluation and monitoring should be embedded in effective mission governance[15].

**IAB recommends that the government should consider:**

- Initiating a process which will ensure broad constructive cooperation among key stakeholders in identifying missions. RCN, as the largest agency in this context could take a lead in a national, collaborative process to identify mission candidates. The government should extend an invitation to RCN to undertake such a role.
- Putting in place evidence-based governance systems to ensure leadership, commitment and accountability in selected missions. Cross-ministerial groups and advisory boards with representation from key stakeholders should be considered. Missions should be endorsed by government but led by industry, clusters or agencies as appropriate.
- Deploying a whole-of-government approach and identifying cross-sectorial policy packages that will ensure the necessary momentum and strategic coherence in implementing missions, including demand-side instruments and the wider policy system, such as regulations and taxation.

**IAB recommends that RCN should consider:**

- Offering strategic advice on mission-oriented policy in the lead-up to the next revision of the *Long-Term Plan for research and higher education*, including advice on how a mission-oriented policy may increase the effectiveness and impact of the plan.

## A first pilot mission should be established swiftly to respond to the urgency of the climate crisis

The climate crisis needs urgent attention and action. This challenge calls for a multitude of approaches to decarbonize the energy system and ensure fast tracks to zero- or low-emission energy technologies across sectors. Norway should contribute in areas where it has comparatively well-developed skills and capacities. Norway is well-placed to make an impact in areas such as carbon capture and utilization, sustainable maritime transport, and offshore wind. Such a priority is well in line with the afore-mentioned guidelines for mission selection.

A dedicated mission-oriented initiative with direction and momentum could serve as an important policy vehicle to address the climate crisis and ensure impact in a world of complementary initiatives. The mission should find an appropriate balance between the accelerator and transformer type, with a view to ensure rapid decision-making and implementation. While missions do not guarantee the desired transformation of the systems for energy production and use, they do provide direction and momentum in a way that other policies can't. Swiftly implementing a mission aimed at responding to the critical challenge of climate change, will provide Norwegian R&I stakeholders with an opportunity for learning while doing, providing valuable insight and developing good practice for future Norwegian missions.

**IAB recommends that the government should consider:**

- Developing a first mission-01 to respond to the climate crisis. This mission should exploit Norway's industrial competence, value chains and stakeholder commitment to address global challenges and contribute to economic restructuring.
- Given Norway's area of specialization and the looming climate crisis, the mission should target decarbonization of industrial activities and/or transport, such as carbon capture, utilization and storage; low-emission maritime transport; or offshore wind power.
- This mission should serve as a vehicle for learning and developing good practice for additional missions to be defined and implemented subsequently.

## References


1) Sachs, J.D., G. Schmidt-Traub, M. Mazzucato, D. Messner, N. Nakicenovic, and J. Rockström (2019). *"Six Transformations to Achieve the Sustainable Development Goals"*. Nature Sustainability. DOI: 10.1038/s41893-019-0352-9.

2) OECD (2017). *Reviews of Innovation Policy*, Norway. Paris: OECD.

3) Mazzucato, M. (2018). *Mission-Oriented Research & Innovation in the European Union Missions: A problem-solving approach to fuel innovation-led growth.* Brussels: European Commission, DG-RTD.

4) Fischer et al. (2018). Mission-oriented Research and Innovation: *Inventory and Characterization of Initiatives. Final report.* The Joint Institute for Innovation Policy (JIIP), Joanneum Research, Tecnalia, TNO, VTT, and the Danish Technological Institute (DTI). Brussels: European Commission.

5) Arnold, E. et al. (2019). *Raising the Ambition Level in Norwegian Innovation Policy*. Technopolis.

6) Fischer et al, (2018). Op cit.

7) Mazzucato, M. (2018). Op cit.

8) Cancer, Climate change, Productive oceans, Sustainable cities, Sustainable agriculture and food production.

9) See e.g. Popper, R. and Teichler, T. (2011) P*ractical Guide to Forward-looking Activities (FLA). Practices, Players and Outcomes*. European Foresight Platform.

10) Mazzucato, M. (2019). *Governing Missions in the European Union. Brussels, Directorate for Research and Innovation.* Brussels: EU Commission, DG RTD.

11) Kuittinen, H. and Velte, D. (2018). European Commission: Mission-oriented R&I Policies: Case Study Report Energiwende (DE). Brussels: European Commission. The "Energiwende", the German mission policy to decarbonize the German energy system, has partly been a result of strong influence by the "green" movement in that country.

12) Kuittenen, H. and Velte, D. (2018). Ibid.

13) "Public Procurement of Innovative Solutions", PPI: https://ec.europa.eu/growth/single-market/public-procurement/innovative_en

14) Fischer et al. (2018). Op cit.

15) Fischer, et al. (2018). Ibid.

## RCNs International Advisory Board

The International Advisory Board is an independent standing committee of international experts, appointed by RCNs Chief Executive to provide advice on research and innovation policy.

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