

# A Research Management Guide to Mission-Driven Universities

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# MISSION

# GUIDEBOOK



AALBORG  
UNIVERSITY

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# EXECUTIVE SUMMARY

During the last decade, various research performing institutions and funding agencies have launched mission programmes. Missions are rapidly becoming a key driving factor for change across the international research and innovation ecosystem. But what defines the key features of mission-driven universities? How can universities lead missions and set the direction for societal partnerships? To what extent can universities maximise their impact and public value by designing and leading mission-driven research programmes? And how should researchers and professional staff work together to realise the potential of missions? These are some of the questions this guidebook answers.

This guidebook sets out a conceptual and practical framework to enhance the institutional capacity of universities to design, implement and manage missions. The guidebook is relevant to researchers, managers, partners, and practitioners occupied with solving societal problems such as health, energy, climate change, ageing, security, digitalisation, education, and innovation. For university staff as well as external partners, the guidebook presents a number of guiding principles for how to organise impact-oriented mission. This document is structured in three major sections.

### 1. **Universities in the mission economy.**

In the Introduction, the key driving forces behind mission-driven research are introduced. The Introduction focuses on how universities can maximise ownership, leadership, alignment, and impact across mission programmes. In doing so, the Introduction explores the difference between the historical mission programmes, which were predominantly focused on technical innovation, and today's more complex, intertwined societal problems, which call for extended multi-disciplinary and cross-sectorial collaboration.

### 2. **Partnership-driven research and knowledge mobilisation.**

In the second section, different models of knowledge production are introduced and discussed. Focus is placed on the creation of strong partnerships, the role of researchers and partners in creating joint research agendas and cultivating joint problem-solving. The chapter explores different drivers of research partnerships, interactive research, multi-stakeholder innovation, and the call for inter- and transdisciplinary research.

### 3. **Impact management and assessment.**

Finally, the third section of the report is occupied with societal impact. Central to mission programmes is the ability to identify clear impact

goals and create a clear pathway to reaching those goals working with stakeholders and partners. Based on prior work in this field, the chapter introduces the central framework of "productive interactions" as a starting point for advancing and assessing impact. Furthermore, this model is used to develop the AAU Mission Logic Model and Theory of Change (ToC). Included in this chapter is also an introduction to the RE-AIM and NoMAD impact frameworks.

The guidebook includes several examples of mission programmes and several checklists and tips for mission directors, researchers, and partners that can be used as inspiration and guiding principles. The guidebook has been designed to identify opportunities for research programmes, and to create support for effective interventions. It should be read as an attempt to create a "common language" at **Aalborg University** and beyond for working with mission-oriented research and innovation. However, a guidebook is only the starting point and does not cover all the answers to practical dilemmas and trade-offs. Ultimately, what counts as a successful and well-managed research programme depends on context, resources, partners, and the ability to mobilise the ecosystem.

# 1. INTRODUCTION

In its current strategy, “Knowledge for the world II” (2022-2026), Aalborg University has set out an ambitious target to become “mission-driven” and deliver solutions and real-world outcomes. As a comprehensive university with responsibility for promoting world-class research and excellence in research, teaching and innovation, the university’s mission programme is a new cross-cutting addition to the strategic mandate of the organisation. Building on the historical legacy of Aalborg University as driven by problem-based learning, strong partnerships with society and industry, and a strong commitment to disciplinary and interdisciplinary research, the mission programme further consolidates and expands the ambition to deliver research and innovation through partnerships.

On its journey to become mission-driven, AAU is not alone. Numerous other research institutions and funding agencies have launched mission programmes during the last decade. Missions are rapidly becoming a key driving factor for change across the international research and innovation ecosystem. But what defines the particular features of mission-driven universities? How can universities lead missions and set direction for partnerships? To what extent can universities maximise their impact and public value by designing and leading mission-driven research programmes? And how should researchers and strategic move ahead together to realise the potential of missions? These are some of the pertinent questions this guidebook answers.

Mission-oriented research and innovation is not new. In fact, some of the greatest advances in the history of science in the 20th century was produced within mission programmes. The US national security policies as well as the US moon-shot programme launched during the second half of the last century were largely organised in missions. It is safe to say that the institutions involved in large-scale mission programmes not only had the support of government: they were most often designed as funding programmes (like DARPA, ARPA, EU Horizon Europe) with significant financial capacity to back research teams and contractors. Admittedly, creating leverage for impact is easier when backed from the beginning with substantial investment, government policies, and industrial participation.

But what does the history of mission-driven research and innovation teach universities? How can universities meaningfully contribute to the “mission economy”, as British-Italian economists Mariana Mazzucato calls it (Mazzucato 2021). When universities are launching mission programmes, a number of key features need to be adapted. Unlike governments, ministries, and funding agencies, universities cannot set national impact targets or channel significant funding to large-scale partnerships. The “sphere of influence” of a university is simply different in scale than that of a government or governmental agency.

However, in the current knowledge economy, universities are important drivers of change: they create and facilitate partnerships, they mobilise students and alumni, they serve as a platform for policy dialogues and reforms, and they stimulate the creation of new industries and companies. The influence exercised by universities is by no means small. With a myriad of research programmes, centres, departments, laboratories, start-ups, and student programmes, changes in society. Especially, if universities align themselves with partners and change-makers in policy, business, and civil society.

This guidebook presents a number of guiding principles for designing, implementing, and governing university-driven missions. The aim of the guidebook is not to provide a blueprint or universal template that can be used as a silver

bullet to answer all the intricate questions about how to run missions-oriented research and innovation projects. Rather, the guidebook represents examples and tools that may help accelerate and direct missions at universities, and the functional requirements and principles that characterise missions-oriented research leadership.

The present report is the outcome of expert workshops, interviews as well as a comprehensive review of available documents and policies. The guidebook presents inspiration to researchers, technical-administrative staff, and managers involved in the mission programmes at Aalborg University and beyond. The style of the guidebook is written as an academic booklet drawing on multiple trends and findings across management studies, evaluation studies, and science and technology studies. The document is intended to serve as inspiration within Aalborg University and the wider science community. In this capacity, the report should be used to facilitate discussions within the mission programmes, departments, and research groups, and help connect ecosystems and their communities.

## 1.1. FOUR DIMENSIONS OF UNIVERSITY MISSIONS

**The template for this guidebook is simple. In order to develop, design, and implement missions at universities or any other organisations you need to clarify four interacting dimensions:**

### 1. OWNERSHIP

Any mission programme needs clear ownership and vision. This will typically be embodied by a Mission Partner Board that is composed of a Mission Manager and a panel of carefully selected partners, representing different research disciplines and societal sectors. The Mission Partner Board and the Director should have a clear vision and mandate to realise the vision. It is the task of the Mission Partner Board to define a clear impact strategy and make sure the mission is driven by a strong commitment towards joint results.

### 3. ALIGNMENT

Key to an impactful mission programme is a number of coordinated mission projects. Mission projects can be small-, medium, or large-scale. They can run for a short-, medium, or long-term, and they can integrate very clearly defined research agendas or more open-ended exploratory designs. For the mission to deliver impact, it is important that the mission partners are organised within a portfolio of strongly aligned and coordinated projects. For the Mission Partner Board as well as the Mission Managers it is critical to keep track of the mission projects, with regular check-ins and invitations for cross-cutting strategic learning. Mission programmes that are not well aligned across their portfolio of projects, will run the risk of disintegration and failure.

### 2. LEADERSHIP

Mission programmes need a clear leadership structure. It should be clarified who is responsible for the execution and delivery of the mission. Typically, this will be embodied by a Mission Unit or secretariat that is tasked with delivering the mission programme, keeping the partners aligned, and providing feedback and support to the Mission Partner Board as well as providing a platform for the mission R&D projects. Learning, monitoring, and alignment are closely interconnected and integrated by the Mission Unit and Mission Managers.

### 4. IMPACT TARGET

Finally, a key defining component of a mission programme is its ability to identify and deliver on discrete, actionable, and observable impact targets. Typically, the impact target will be defined by the Mission Partner Board and comprises strategic priorities for the university, the regional ecosystem, government policy priorities, industrial and civil interests, and transnational drivers of change. An impact target is discriminatory: it defines the horizon within which ownership (Partner Board), leadership (Mission Managers), and alignment (Mission Projects) can set a common direction and work towards shared goals. It is the impact target that defines the work programme of the missions by defining key deliverables to enhance positive real-world outcomes.

**PARTNERSHIPS:** In addition to the four dimensions, two horizontal tools need to be in place. The first is to set up a robust and well-functioning partnership programme. Missions are driven by and co-created by strong engaged partners. Delivering impact can only be achieved with partners who are confidently placed within the mission programme, either in the Mission Partner Board or as participants in the mission projects. Partnership approaches to research will be explained more in detail in the next sections. For now, it suffices to emphasise the need to integrate partners and consult with stakeholders throughout the process, from identifying an actionable impact target to organising mission projects and installing the overall mission mandate. If partners are not involved in each of the different organisational steps, they will likely not contribute the necessary resources, commit to genuine participation and collaboration, and the mission will lack leverage.

**IMPACT ASSESSMENT:** The second horizontal tool critical for mission delivery is setting up an actionable, ambitious and realistic impact plan – and monitor progress towards it. Real-time impact assessment and defining meaningful Key Progression Indicators across projects and partners are crucial to monitor success, review progress, and adjust strategy. There are different project management and impact assessment tools available in the existing literature. Importantly, the impact tool adopted by the mission programme needs to reflect both intended end-effects but also intermediary outcomes, organisational learning, and programme activities, which makes it possible to monitor how the mission projects are moving towards predicted impact. Identifying impact pathways is as important for mission delivery as end-effects and societal impact. Much of the value created by the mission, whether in terms of practical solutions, scalable products, platform learning, better regulation, or evidence-informed policies, is spun out along the research and innovation process.

Effective mission delivery is about creating an open collaborative research environment in which, intermediary outcomes, and spillovers are allowed to arise incrementally and stepwise. For these reasons, the mission management needs to put in place an impact assessment tool which is adopted to the specific impact target of the mission as well as the activities, learning, and interactions that arise through the pathway to impact. Typically, this exercise is captured by a programme-wide theory of change that all partners are committed to, and which contains central impact assumptions and a clear forecast model subject to continuing revision and assessment. The impact tool adopted by the mission is not a ranking tool: it is not about comparing performance across missions. Rather the tool should be used as a monitoring and learning device that can create data to adjust strategy, activities, and provide feedback to funders and partners.

In the next sections, the four dimensions and the two horizontal toolsets will be discussed more in detail. References to relevant literature will be provided, and discussions of dilemmas and examples of missions will be introduced to provide inspiration and explanation. However, for the reader that does not make it further than here: A university mission is about creating a strong partnership managed by a strong directional mandate, embodied by a Mission Partner Board, executed by a mission unit, organised in individual yet aligned mission projects, all of which are working towards a shared goal driven by a shared commitment to learning and impact.

## 1.2. WHY MISSIONS?

With the emergence of multiple, entangled societal crises, such as pandemics, climate change, energy transition, mental health, and geopolitical insecurity, it has become clear that democracies need access to a wide set of research and innovation capacities. Europe is finding itself confronted with massive challenges in terms of security, digitalization, inequality, energy, environment, and health. But as Mariana Mazzucato reminds governments, they have critical capacities to act. Including the capacities of universities and research funding agencies who can contribute and lead the way forward.

According to Mazzucato (2018), the key to solving some of the most pressing challenges facing society, is partnerships. Mission-oriented research and innovation means working together in partnerships: working closely together across sectors and disciplines and engaging with citizens, companies, and policymakers upstream to co-produce solutions based on realistic targets with a clear impact plan.

By their nature, grand challenges are too big, too difficult, and too complex to address from any individual perspective, sector, or discipline. Looking at UN's 17 Sustainable Development Goals, they aim at ending poverty, achieve sustainable and inclusive societies, and drive the green transition. These challenges are almost infinite in scale and need to be broken down into pragmatic steps to reach scalable solutions. Such piecemeal steps towards solving society's grand challenges are at the heart of mission-oriented research and innovation. It is a pragmatic and focused approach to reaching specific impact targets, which can act as a catalyst for stimulating new thinking, solutions, and change. Using missions to drive research and innovation at the national and regional level means focussing less on sectors (energy, health, security, education) and more on cross-cutting priorities and solutions (Mazzucato & Dibb 2019). It is worth noting that missions are not new.

Mission programmes have been used as an organising principle to achieve technological and scientific accomplishments throughout recent history. A generation of missions in the 1960s were technological – such as NASA's Apollo Mission. The “moonshot” programme required innovation in many sectors, such as nutrition, textiles and aeronautics, and hundreds of projects, many of which failed, because high-risk research programmes indeed can fail to achieve what they set out to do. However much of the technology in smartphones and computers today is the outcome of missions-driven projects, both successful and less successful.

According to Mazzucato, today's challenges are more complex than getting a spaceship to the moon. Societal challenges are “wicked problems”. They are more entangled, cross-cutting, and require action and solutions across sectors and disciplines. In his book *The Moon and the Ghetto*, Richard Nelson asked how the US government got a spaceship to the moon but still did not solve key issues around social integration and equality (Nelson, 1977). Wicked problems require more attention to the ways in which social issues interact with political and technological issues, behavioural changes, regulation, and critical feedback processes.

By setting the direction for a solution, missions do not specify how to achieve success. The right answers are not known in advance. Rather, missions stimulate the development of a range of different solutions to meet grand challenges and reward those actors willing to take risks and experiment (Mazzucato & Dibb 2019).

Organizing research and innovation capacities in ways so they can respond to cross-cutting policy priorities, and working with stakeholders from industry, policy, and civil society, are indeed among the great challenges for research and innovation in our times. What are the best practices? What are the dilemmas? What are the enabling conditions? These are some of the questions, this guide is addressing.

### 1.3. MISSION-DRIVEN UNIVERSITIES

A key question is who defines the mission? While technological missions have historically been driven top-down by governments, societal missions must involve a wider scope of stakeholders in both definition, vision, and implementation. Governments have the capacity to set ambitious targets and mobilise resources across multiple portfolios to achieve them. Agencies within government can drive social change through large-scale partnerships, clear priorities, strategic decisions and through development, deployment, and procurement of innovative solutions.

Universities, on the other hand, do not have the capacities of entire governments to mobilise collective action or stimulate social change. Rather, universities must break down societal challenges into work programmes that fit their purpose, research capacity, and impact horizon. For any organisation that want to become “mission-driven”, it is essential to define mission programmes that are aligned with the scope and ambition of the institution. Whether it is government, funding agencies, universities, or any other institution (such as public schools, hospitals, humanitarian aid projects etc.), missions can be directed to achieve actionable change only within the **sphere of influence** of the institution.

A public school cannot exert influence on an entire region, supply chain, or policy environment. But together with other schools, partners, practitioners, and change-makers a public school can set actionable targets to create more climate-friendly food options for the students or create more inclusive educational programmes. Schools, just like universities or funding agencies, can define themselves as mission-oriented to the extent their missions are possible to realise within their realm of influence. And by working actively with partners, crowdsourcing ideas, and co-creating solutions, the realm of influence can be expanded beyond business-as-usual. Partners

can create leverage. Project consortia can create new pathways to impact.

Similarly, universities have their own realm of influence. A university can exert influence on disciplines, careers, students, faculty, alumni, partner organisations, companies, business associations, industrial value chains, and regional and national policymakers. Universities have far reach and can expand their sphere of influence through active engagement and strategic collaborations. Using the university mission programme as a platform for partnerships can expand the usual sphere of influence to create leverage and new pathways to impact that traditional research and innovation projects would not achieve. Of course, universities are not legislators, and they cannot stimulate economic, behavioural, or policy change by enforcing regulation or creating national government programmes. But universities can highlight new avenues for change, cast new light onto known problems, or develop new sociotechnical solutions that engage a wide range of stakeholders and companies.

Through well-defined mission programmes focussed on solving societal challenges, universities can establish and influence strategic partnerships across multiple sectors. Since most complex societal challenges are cross-cutting in nature, they require not only technical innovation but also social innovation and behavioural change. Drawing on a wide spectrum of disciplines, from the natural and technical sciences to the human and social sciences, universities are uniquely positioned to develop innovative solutions and drive partnerships based on experimentation, collaboration, and curiosity.

Mission partners will look to universities for leadership and direction. Stakeholders can play an active part in directing missions by allocating time and resources to attend partner meetings – and by mobilising talent and capacities within companies, authorities, or civic institutions to support the missions. But in the end, partnerships need to be organised in ways that create sufficient coordination, coherence, and

alignment while at the same time allowing for bottom-up ideas, inputs, and pilots to emerge. Indeed, delivering measurable results should be based on a commitment of the involved mission partners to step up the pace and progress of their efforts. Universities are obvious candidates for undertaking the leadership and direction of these efforts.

While universities need to direct resources for mission management and create alignment across units, departments, and participating partners, they also need to re-think their role as change-makers. Universities are suffering from inertia. Throughout the last 30 years universities have increasingly become focused on academic excellence and maximising their academic impact, typically by boosting publications and citations of top-scholars and research groups. While excellence continues to be the driving force behind missions, new transdisciplinary and partnership-based approaches to research and innovation call for new capacities and skills that challenge the traditional role of universities. Rather than merely producing knowledge and making it available to society (through education, technology transfer, or publications), mission-driven universities must do more to ensure that knowledge is actively transmitted, translated and implemented in practice, policy and business.

Part of this journey towards missions-oriented universities has to do with unravelling the systemic barriers that prevents universities from effectively contributing to the transformative change needed for human wellbeing and progress. While it was evident to most citizens and policymakers how universities played an exceptional role in the response to COVID-19, the ability to produce fast-paced actionable knowledge is the exception rather than the rule at universities. Scientific research takes time. Academic faculty is primarily occupied with following and contributing to the latest developments in science. Until recently, this typically happened within disciplines and scientific networks focused on the advancement of science and protecting the autonomy and integrity of science from outside influence.

While the scientific ethos and the emphasis on values such as independence, transparency, integrity, and autonomy continue to be important features of universities, research-performing institutions today are expected to contribute to a set of complex societal challenges and tasks. Many of the most pressing social challenges are highly research-intensive: they call for novel methodologies, problem-solving, experiments, and new technologies. Societal challenges such as food, energy, climate, health, urban development, and human well-being require researchers to respond actively and rapidly, and build partnerships that lead to demonstrable change. Working closely with students, partners, companies, and policymakers to deliver knowledge for advancing human development, respecting planetary boundaries, and promoting responsible and inclusive technology, can help “unleash” the full potential of science in the current global crises, as emphasised by the International Science Council (ISC 2022).

Unleashing the potential of universities to drive missions for change requires new incentives, rewards, and funding instruments that **stimulate collaboration, solutions, and impact**. Researchers are primarily rewarded by publishing papers and producing original research. To deliver on missions these essential tasks need to be complimented by a new set of incentives and roles, such as knowledge brokering, stakeholder management, science communication, and community-building which are not traditionally parts of the academic career. For the same reasons, research professionals and managers are needed to facilitate mission partnerships and to work closely together with the academic faculty in an integrated division of labour. ISC describes the need for change like this:

As it is currently organised, the science system produces significant but narrowly-focused, fragmented and compartmentalised knowledge that is often disconnected from society’s most immediate needs. In short, much of science funding supports research that is limited in its ability to contribute to the transformative, systemic

changes needed for human wellbeing to thrive (ISC 2022, 9).

However, to support missions-oriented research and innovation programmes, universities do not need radical reforms. They need to add new organisational units and roles that are mandated to set clear targets, follow a clear direction, and work collectively to achieve impact. Mission programmes do not require the entire university to change or adopt missions across the entire research and teaching portfolio. Rather, missions should be viewed as **partnership programmes** driven by clear impact goals and embedded in the existing research traditions.



FIGURE 1: ADOPTED FROM MAZZUCATO & DIBB, 2019.

## 1.4. GUIDING PRINCIPLES FOR MISSION-ORIENTED RESEARCH

Moving from grand challenges to specific missions involves a strategic process in which the university (i) defines a set of societal problems, which the institution realistically can address within its realm of influence, (ii) building on a mapping of its current research capacity, (iii) a mapping of impact areas in which the university has past track record, and (iv) an active dialogue with contributing partners and problem-owners. In addition, a mission that is situated clearly within a policy framework (and cites policy priorities, targets, or investments) is likely to harness greater support. The mission must set clear objectives that can be achieved by a portfolio of different projects and interventions. For example, removing microplastics from the ocean may require new material detection

standards, removal technologies, and waste platforms that require artificial intelligence and robotics for bioplastic digestion.

Understanding the nature of the problem and creating a clear storyline that mobilise partners is essential. For example, engaging citizens in plastic removal and detection along coastal lines can create momentum for the mission, navigating sociocultural contexts, and understanding and appreciating ocean life, sustainable fisheries, and small businesses. One mission project may contribute to enhanced plastic detection and removal technologies, while another project explores coastal life and culture in affected communities (see Figure 1). Importantly, there needs to be a strong alignment across mission projects to ensure that they are contributing to **the same objectives**, emphasising the need for cross-team collaboration and regular interaction and integration.

In her framework, Mazzucato operates with five criteria for the development of missions. They should:

**1. Be bold, inspirational and with wide societal relevance:** Missions should engage the public. They should make clear that through ambitious, bold action, solutions will be developed that will have an impact on people's daily lives.

**2. Set a clear direction – targeted, measurable, and time-bound:** Missions need to be clearly framed. While enabling long-term impact, they need a specific target that can either be formulated in binary ways (as clearly as whether the mission has reached the target or not) or quantified (as clearly as whether a certain percentage of reduction/enhancement e.g., in carbon emissions, are measured against a baseline).

**3. Be ambitious yet realistic:** Mission objectives should set ambitious objectives (taking risks), centred on research and innovation activities across the entire value-chain, including the feedback effects between basic and applied research.

**4. Encourage crossdisciplinary, cross-sectoral, and cross-actor collaboration:** Missions should be framed in such a way as to spark activity across, and among, multiple scientific disciplines (including social sciences and humanities), across different industrial sectors (e.g. transport, nutrition, health, services), and different types of actors (public, private, third sector, civil society organisations).

**5. Involve multiple, bottom-up solutions:** Missions must be open to different types of solutions, and should not be achievable by a single development path or technology.

A mission-oriented approach to research and innovation requires a fundamental reappraisal of the role of universities to go beyond "market pull" (centrally featured by neoclassical economics) to a "co-creating" or "market-shaping" role. University leaders and governmental agencies have a significant role in shaping society rather than passively responding to the needs of industry. Companies as well as public authorities cannot be expected to formulate clear research needs that universities are responding to. Rather, solutions emerge in a process of co-creation at the interface between institutions, leading to a joint problem space focused on creating public value.

# 2. METHODS AND TOOLS FOR ORGANISING MISSIONS

Research systems are traditionally organized in, and produce knowledge and technology through, the natural sciences, social sciences, applied sciences, humanities and the arts, sometimes in collaboration with industry and policy. Mission-oriented research is markedly goal-oriented and solutions-focused. Missions should be of significant size, scope, and ambition. And while focused on a clearly defined topic, question or goal, missions require interdisciplinary and transdisciplinary approaches to research and innovation: the input from a wide range of knowledge-holders and stakeholders, integration across disciplines and “styles of reasoning”, the development of applied as well as fundamental knowledge and direct engagement with those who will enact policy and practical changes in response to the generated knowledge (ISC 2022, 15-16).

Mission partners need to work together in a way that resembles “co-creation” and “trans-disciplinary” collaboration, that is, framing questions and research agendas by including different sectors, generations, geographies, and knowledge communities. Researchers and practitioners within mission programmes need to work creatively together to identify problems, define research questions, as well as generate and integrate new knowledge. In addition, beyond merely working together across disciplines, academic staff and mission managers should work proactively with external “non-academic” partners to create system-oriented solutions. More specific tools and methods for stimulating community- and partnership-driven research are introduced in the next sections.

## 2.1. PARTNERSHIP APPROACHES TO RESEARCH AND INNOVATION

Mission-driven research, as it is described in the prior sections, should be understood as an attempt to break away from how “traditional” research is undertaken and supplement universities with new capacities for collaboration and impact. Central to the success of missions are the concept of research-practice partnerships. To understand the drivers of such partnerships and their organising principles, it is helpful to take a closer look at the working definition suggested by Coburn et al. (2013) in a white paper prepared for the William T. Grant Foundation.

Scholars and practitioners use the term “partnership” to refer to many different things: consulting relationships; university-industry partnerships in which companies adopt or absorb technology or IP from a university; traditional research projects in which studies or interventions take place in social, policy, or industrial settings with limited participation by external stakeholders etc. The term is so widely used, in fact, that it has little meaning without further clarification.

In the report “Research-Practice Partnerships: A Strategy for Leveraging Research”, the authors define partnerships as “long-term, mutualistic collaborations between practitioners and researchers that are intentionally organized to investigate problems of practice and solutions for improving [social] outcomes” (Coburn et al. 2013, 2). As is evident from this definition, partnerships should be planned to be long-term. While some might start from a one-off research project, research-to-practice partnerships should be working towards establishing mutual relationships and action plans. A longer time horizon permits the partnership to mature and develop into productive relationships.

Research-practice partnerships require representatives from academia and practice to come together repeatedly to help each other understand problems, work through their implications, and manage communication with a variety of stakeholders, all while protecting trust and establishing collective problem-solving capacities.

Mutual collaborations means that each participating partner must accept that he or she is not representing a privileged perspective or “view from nowhere” over and above that of other participants. Rather, the partners need to come together to “reset” their disciplinary or social hierarchies, and listen to each other’s perspectives, problems, ideas, needs, and solutions. For researchers, this means that scientific productivity does not come first: placing data collection and publications at the forefront of a partnership will not produce a “mutualistic collaboration” because the criteria of success will be defined by the researchers and not by an integrated partnership. Likewise, for company representatives, immediate commercial outcomes do not come first: placing commercial results and business models above mission delivery will not lead to mutual benefits.

Instead, researchers, companies, citizens, and regulators need to put their individual perspectives (and interests) aside to create a common framework and shared understanding of the research questions relevant for the missions, the resources available to answer them, and the leverage required to achieve impact. By establishing a “joint problem space” the partnership will become “bigger than the sum of the parts”, meaning that new forms of expertise and problem-solving can emerge, which allow a deeper understanding of concepts, problems, and solutions that can lead to unexpected findings and previously unexplored research.

This leads to the final part of the definition above: the research itself should be organised to address problems of practice and develop solutions for improving outcomes.

This focus ensures that research questions are developed jointly between researchers and practitioners. Research-practice partnerships are meant to develop transdisciplinary questions that are relevant to practitioners. By formulating research questions together, there is a higher chance that the research will actually find its way into practice and make a demonstrable change. Indeed, supporting companies, policymakers, and citizens in their efforts to implement research solutions in practice is often a key objective across mission programmes and a significant reason for why partners should dedicate time and resources to participate. The William T. Grant Foundation offers an online resource with concrete steps to establish and support research-practice partnerships:<sup>1</sup>

### BOX 1. FINDING MISSION PARTNERS

Identifying the right partners to bring together is a function of leadership and alignment. Some partners may be critical to engage throughout the mission. Others might need to engage at key moments while they can be kept informed at other times. When inviting partners, it is important to start with a future-thinking approach (imagining a desired future and the change needed to reach it) and going back in time to see who needs to be involved to get there;

	Obligatory/necessary/responsible (high degree of power, influence, authority)	Discretionary /optional/affected (lower degree of power, influence, authority)
High interest / concern	<ul style="list-style-type: none"> <li>Who makes the ultimate decision?</li> <li>Who is in a position to make a decision?</li> <li>Whose support and engagement are essential?</li> <li>Who has the relevant expertise or information?</li> <li>Who has control over key resources?</li> </ul>	<ul style="list-style-type: none"> <li>Whose work, lives, well-being are affected?</li> <li>Who is most motivated to participate?</li> <li>Who has influence on those in power?</li> <li>Who are the champions, opinion leaders, and influential communicators?</li> <li>Who can help identify the right stakeholders?</li> </ul>
Low interest / concern	<ul style="list-style-type: none"> <li>Whose work, lives, well-being are affected (even if they do not know it yet or exhibit interest)?</li> <li>Who has indirect influence?</li> <li>Who can block a decision?</li> <li>Are there gatekeepers who can motivate others to participate?</li> </ul>	<ul style="list-style-type: none"> <li>Who would gain an advantage from participating in the mission?</li> <li>Who has relevant experience?</li> <li>Who has the relevant experience needed to ensure successful processes?</li> <li>Who has influence on those in power?</li> <li>Who do you want to learn from and connect with?</li> </ul>

The above matrix can assist an initial mapping exercise of relevant experts and societal partners.

Source: Resilience Metrics, Getting the Right People in the Room (ISC 2022, 34).

<sup>1</sup> The following paragraphs are quoted in extenso from the online resource and adapted to mission-driven research and innovation programmes at universities. Read more about the background [rpp.wtgrantfoundation.org](http://rpp.wtgrantfoundation.org).

## **STRUCTURING A PARTNERSHIP**

A research partnership represents a commitment to a long-term, mutually beneficial relationship that is based on a joint research agenda. This shared purpose informs specific agreements – such as signing a memorandum of understanding (MOU), charters, operating principles, codes of conduct etc. – that provide direction, structure, and clarity as to how each partner work with others.

Productive partnerships begin with each party agreeing to work together on a project in which all benefit. There are several ways to get started, for example: 1) a researcher-initiated partnership with a single practitioner or consortium of partners that share an interest in a set of research questions; 2) a strategic partnership, usually initiated through established networks, associations or alliances; or 3) a funding-based partnership in which the partners have created a grant proposal and received funding to work together on a specific project or research agenda.

A checklist of questions can be helpful to keep in mind when starting a partnership, which both researchers and practitioners consider at the beginning of a collaboration. For example: are the partners committed to working together?; does the partner understand the time, energy, and resources required to establish and maintain the collaboration?; is there genuine interest in establishing a joint programme?; do partners recognize that important expertise comes from both researchers and practitioners?; is there prior evidence that the potential partner is trustworthy (e.g., earlier collaborations)?; is there a shared understanding of the importance of high-quality research in the decision making process?; and is the organizational support for the partnership in place and relevant leaders involved? These can be helpful questions for the project manager or leading scientists to ask and answer in dialogue with partners.

## **DEVELOPING A JOINT RESEARCH AGENDA**

A joint research agenda forms the shared learning space around which practice partners and researchers work together. The agenda

should be shaped by issues emerging from practice, policy, and implementation. Partners from practice and policy need to articulate what type of priorities and problems they face. Research questions should balance such concerns with the research partners' needs and scientific interests, which may not initially align with practice and policy concerns and timelines. Developing a common understanding of needs and interests from all stakeholders, and a respect for what each entity brings to the table, will inform the ways in which the research comes to life and becomes rooted in the practical realities and goals on all sides of the partnership.

In the case of missions, it is important for partners to base the research agenda on real-world priorities and challenges that stakeholders face. The research must be relevant to practical problems that are informed by multiple stakeholders' perspectives. They may be wide-ranging, and could include specific practices, decisions, or wide structural, institutional, or behavioural changes. It is important that the involved partners are committed to working closely together from the beginning and integrate ongoing communication throughout the mission lifecycle. Practitioners and researchers are co-designers of a research agenda. The iterative, collaborative dialogue continues as specific projects are developed and launched. It is not important that all partners deliver the same efforts in the mission or contribute equally. But recurrent and consistent participation in activities such as meetings, planning, and validation of outcomes is essential.

Finally, it is important to stay on target once a research agenda has been established. Some of the steps needed to ensure a robust impact plan are introduced in later sections, but in general it is important to clarify expectations, map differences, solve conflicts, and keep the research agenda focused on practical problems, supported by relationships and reinforced by regular team meetings and open communication. Use documents and project plans to clarify key agreements and principles at the outset of projects, while also allowing for flexibility and

recurrent revisions of impact targets (see Section 3.3 and 3.4, below).

### **DEVELOPING DATA SHARING AGREEMENTS**

This perhaps is not the typical priority for mission partnerships. Nonetheless, data sharing agreements provide partners with guidance for some of the most essential functions of their work. Agreements address the distinct concerns of each partner and contribute to the formation and maintenance of mutual trust between partners. In addition, data sharing agreements allow partnerships to acknowledge and address concerns, establish expectations and processes, and keep data protected. While the formality and specificity of such agreements vary, most cover fundamental topics such as how and with whom data will be shared and what protocols will be established for working with data and communicating about findings.

Partners from practice may need to set parameters on who has access to data and how data will be used. In some contexts, there are rules and limitations around data-sharing dictated by legal or administrative practices. Researchers may express concerns about maintaining their independence from industry and policy in the use and interpretation of data, managing the transfer of data across systems, and aligning data management practices. Common elements in data-sharing agreements include: authorizations and protocols for handling data; limitations on the use of data; the right to review findings before publication; and a plan for data security.

### **COMMUNICATING RESEARCH**

Engaging stakeholders and communicating research upstream and downstream are crucial elements of effective partnerships. Communication is a matter of circulating information about the partnership to promote transparency, learning, or increased visibility and problem-solving. Internal engagement is secured by establishing an active dialogue among partners, and providing relevant decision makers,

practitioners, or other stakeholders with a platform to inform and be informed by the partnership. Seeking and obtaining funding, demonstrating impact, and encouraging the use of research are highly dependent on communication. Responsive communication ideally should be used to make the needs and perspectives of all stakeholders heard, and thereby contribute to more buy-in and legitimacy around key decisions.

Effective communication begins with clear and specific goals that feed into a consortium-wide communication and dissemination plan. The appropriate channel and content will be determined by context, goals, and the needs of the partnership. Partnerships benefit from having clear agreements about the frequency and nature of communications, and clear points of contact for sharing information. Communication can be carried out in different ways for different purposes, including memos, emails, progress reports, annual meetings, presentations, policy briefs, and non-technical summaries of findings.

Communication is also needed for keeping all partners involved and over time developing a common language in the partnership. Partners need to receive feedback on findings, and time to respond to questions and concerns that may arise with new research, particularly when findings are unexpected. Partners should have opportunities to meet in-person both at the level of the Mission Partner Board meetings but also at the level of subgroups and team meetings. Often, the most effective and fruitful discussions involve informal but frequent exchanges and knowledge sharing.

Besides internal communication, research-practice partnerships need to communicate proactively with the outside world. This may include but are not restricted to non-academic stakeholders, affected communities, policy-makers, and civil audiences. Only by sustaining a culture of open knowledge sharing and communication will project result translate into impact. For some partnerships it may be relevant to hire a specific communication agent specialised in translating research findings to non-academic audiences. Other programmes

may choose to invest in training their researchers to communicate with different audiences or hosting science communication workshops. For researchers at universities, communication officers from special communication units can help disseminate project results in accessible formats.

## USING RESEARCH IN PRACTICE, POLICY, AND BUSINESS

Using research to improve services, policies, or practices, of course, is one of the most important features of mission-driven partnership. However, using research is not a linear process whereby knowledge is transferred from universities to industry, practice, or policy. Effective research use requires planning, resources as well as monitoring and continual learning. For example, usefulness of findings can be explored – and expanded – by including active science communicators, knowledge brokers, and knowledge sharing facilities and skills. Studies in science and innovation management have shown that research is more likely to make an impact if it is co-produced from the beginning, and if knowledge is disseminated continuously throughout the research process.

Enhancing research-use is a matter of unpacking findings and determining how to apply results and conclusions in different user-cases and contexts. For this purpose, the partnership needs a clear communication plan, a clear alignment of roles and expectations, and a joint agenda that makes explicit who will use the research and for what purpose.

In fact, there exist an entire literature with tools and methods for how to organise and maximise research use in practice, which this guidebook can only touch upon. However, a common feature in the literature is a recognition that research-use is dependent on context, purpose, and scope of the partnership, and that different forms of use are relevant in different settings.

Among the different uses of research is what Carol Weiss (1993) called “instrumental use”, that is, situations in which research findings

are used to solve problems or support specific decisions that mitigate a well-described problem. For many policymakers and evaluators, this is the typical example of research impact: research that makes a demonstrable and observable change to practice, business, or policy and which enhances the problem-solving capacity of the involved partners by creating a specific technology, solution, or platform.

This is not the only form of research use relevant for mission-driven projects. In addition, it is important to explore the “conceptual use” of research, that is, situations in which research helps stakeholders understand and frame an issue differently. More indirect than instrumental uses of research, conceptual use occurs when research shapes how decision-makers understand a problem and its potential solutions. “Symbolic” or “political” uses of research may arise in situations where decision-makers have already developed a plan to deal with a certain issue but needs research to provide support and evidence for their position. Research findings can be used to persuade others to also adopt the position or strengthen an alliance of supporting stakeholders.

Finally, studies of research impact have identified several other types of research use, for instance, “relational” use describes situations in which the research leads to new relations, networks, or alliances that would not have been possible without the partnership, and “capacity-driven” research use describes situations in which the partnership leads to enhanced capacities to act (not as a direct effect of any particular finding but as the accumulated effect of learning). The latter emphasises the value of the research process itself rather than merely focusing on outputs or research findings. Participating in research processes can lead to changes in ways of thinking and ways of behaving.

Project managers and participants have several resources available to further accelerate the uptake of research. As will become clearer in later sections, partners can develop a **Theory of Change** that should be used both as a guiding

principle for planning and assessing research outcomes and impacts. In Section 3, this framework is explained in detail. The core principle of a Theory of Change (ToC) is to provide all involved partners with a platform to articulate their vision and assumptions about the impact on behavioural, organisational, practical, or social change that the missions is expected to deliver – and design research activities with that understanding in mind.

Part of the process of establishing a ToC is understanding the different organizational contexts, attitudes, structures, resources, and routines that are influencing the partnership and which can be crucial for the success (or failure of) the mission. Alignment of partners and ensuring that the research produced within a partnership is compatible with the organisational priorities of the policy, industry or practice partners are crucial drivers for the useability and relevance of the resulting research.

An important aspect of mission programmes is the recognition that research use and impact does not simply follow a push-pull-model. Mission-driven partnerships cannot expect or model their impact on the assumption that research is readily available and needs to be “pushed” forward to practitioners. Likewise, mission partnerships cannot expect companies or government agencies to “pull” research from universities and implement findings and technologies in practice. This model of supply-and-demand is not accurate and can create bottlenecks and unwarranted assumptions in the collaboration. Rather, what is needed to create societal change is iterative, collaborative interactions, co-production of knowledge, and upstream sharing of knowledge needs, priorities, policies, and expertise. Instead of expecting partners to “demand” certain results, mission partnerships have the potential to further create “absorptive capacity” among practitioners by including them in the research itself.

## **MONITORING AND ASSESSING PARTNERSHIPS**

For partners to have access to real-time

monitoring and learning, it is crucial to establish a monitoring and assessment framework that fits to the purpose of the partnership. To some extent, this is the function of a ToC. But after having discussed and decided the guiding assumptions and expectations for the collaboration it is important to feed learning and outcomes back to the participants. This can be done in multiple ways, e.g., by defining specific measures, metrics, or indicators of progress. Monitoring of project activities and outcomes can help research-practice partnerships improve their work, demonstrate their effectiveness to stakeholders and funders, and provide opportunities to readjust strategy and research agenda.

But this work is not without risks and pitfalls. Choosing the wrong assessment framework lead to misguiding results. Promising practices for mission evaluation and mission indicators are still very much emerging, and it is helpful to keep an open mind and experiment with different frameworks. Clearly, traditional approaches to assessing the impact of a research, such as the number of publications in peer-reviewed journals, citations, or patents, will not capture the most interesting aspects of mission delivery and learning. For this reason, it is important to collect data and establish indicators that will inform the specific mission partnership to improve. Setting up an evaluation framework may begin by collectively asking in partners “what makes an effective partnership”, or “what is the added value for your organisation”, or what impacts would you like to see. In Section 3 more inspiration is provided. But in general, it is important for assessments to focus on intermediate outcomes and activities rather than final impacts.

For example, partnership may find it useful to evaluate, e.g., participation in project activities, support and funding received, relationships established, number of interactions with key decisionmakers, the perceived understanding of research results and their relevance, perceived satisfaction with project management, received invitations to inform non-participating stakeholders, number of visitors to websites, number of subscribers to newsletters and policy

briefs (see Chapter 3 for an elaborate indicator framework). Indicators focused on intermediary outcomes will provide a better understanding of programme effectiveness and should provide clues about ways to improve project design.

When assessing programme delivery, it is important to resist the temptation to use of-the-shelves indicators or plug-and-play consultancy services. It is important for the legitimacy and cohesion of the partnership that partners are involved in co-designing evaluation indicators and are asked to provide feedback on progress and learning. For example, project participants may be asked to rank the quality of relationships, the outcomes of meetings and joint projects, and estimate their satisfaction with project management, working models, and joint decision making. These indicators are feasible to measure but require data from different sources.

Much of what has been discussed in this section is generally relevant for project management of research programmes and collaborative team science. However, in contrast to “regular” teamwork, research-practice partnerships and missions are more demanding to manage since they often involve multiple partners and organisations. Integration and interaction are therefore crucial elements to manage, both at the planning, execution, and evaluation stage of the collaboration. As was stated in the Introduction, a clear vision is needed combined with clear leadership and governance focused on maximum alignment, mutual trust and communication, driven by ambitious yet actionable impact goals

## BOX 2. PLAN 'B' IF THE PARTNERSHIP GOES WRONG!

Sometimes, a mission partnership does not evolve as planned. Some partners may lose commitment due to restructuring within their organisation, changing priorities, or because they struggle to see the return on investment. In this situation, it is important to have a Plan B in place:

- **Managing expectations:** First of all, it is important to clarify expectations and develop an engaging work plan that encourages active participation from all partners and allocates active roles to all partners.
- **Communication:** Open and transparent communication is key. Try to discuss the problem / issues with your partners in a constructive manner. Identify the specific problems or challenges and explore potential solutions.
- **Reassess goals:** Sometimes, partnership suffers from active participation due to misaligned goals. Take the time to reassess the goals and expectations of the partnership. Ensure all partners have clear understanding of their roles, responsibilities, and objectives.
- **Modify the partnership agreement:** If communication and reassessment do not resolve the issues, you may want to modify the terms of the partnership. This could involve renegotiating deadlines, participation, resource allocation, support.
- **Terminate the partnership:** In rare instances, you may need to terminate the partnership and pass on the role to another partner. If this becomes relevant, you need to ensure to act respectfully and professional, and consider any legal or contractual obligations.

Research partnerships can be challenging and complex. Remember that with patience, communication, flexibility, and mutual respect most issues can be resolved successfully.

## 2.2. INTERACTIVE RESEARCH

For the most part, university mission programmes should be focused on partnership approaches to research and development, as outlined in the prior sections. For researchers involved in mission programmes it may be helpful to think about missions not only as organisational entities but as a research methodology. A promising framework for conceptualising research methodologies within missions can be adopted from the tradition of “interactive research”. Interactive research is an approach within a broad family of collaborative research methods that support theoretical innovation and change processes in organizations. One of the distinguishing features of interactive research is a focus on continuous joint learning processes between the researchers and the involved practitioners similar to the focus within research-practice partnerships (Ellström et al. 2020).

Interactive research is about advancing scientific knowledge in a way that both aligns with scientific rigour and practical relevance. This type of research makes it possible for practitioners to participate at various levels of the research process, from the programme level, to research and development projects, to the individual level. A particular challenging feature of interactive research is that results should both be considered valid on standard academic terms and at the same time valid in relation to societal needs. Ellström et al. (2020) emphasises that researchers who participate in research-practice-partnerships should balance their epistemic interests in academic research with addressing practical social problems. Similarly, partners from practice need to enhance their ability for using research-based knowledge for organisational decision-making (Nutley et al. 2007). A general argument in the literature is that interactive research should have a “built-in” focus on the dual tasks of contributing both to long-term theory development and to innovation and change in organizations.

As used here, the notion of partnership-driven research is seen as an umbrella concept including a wide range of research models and methodologies, including action research, implementation science, participatory design, knowledge mobilization, triple helix research, mode-2 knowledge production etc. (Gibbons et al. 1994). The elementary feature of interactive research is that it is based on collaboration between researchers and practitioners throughout the research process. That is, from the definition of a problem, through data collection and analysis, to feedback and implementation of results.

Interactive research should be understood as a collaborative design approach “characterised by recurrent interactions and joint learning activities between researchers and practitioners in commonly agreed upon efforts to foster change and innovation in organisations” (Ellström et al. 2020, 1520). According to the framework, involving different stakeholders in the research process is a way to increase the validity of research results, to shorten the time from research to practical application and to increase the probability of achieving sustainable impact of the research among the participating organisations (Svensson et al. 2007, Van de Ven 2007).

Interactive research is informed by theories of joint learning and requires a commitment to shared knowledge creation and activities between researchers and practitioners. Compared to other research methodologies, such as action research, interactive research includes a strong emphasis on knowledge interests (e.g. theory development) combined with a focus on research impact. For this reason, interactive research is an approach to designing the entire research process rather than as a specific set of deliverables or activities.<sup>2</sup> The aim of interactive research is to conduct critical analyses of the research object, to contribute both to long-term theory development (e.g. new concepts or models) and to meeting the practical needs of participants (Ellström et al. 2020, 1521).

Although interactive research is based on the ambition to conduct research together with practitioners during the entire research lifecycle – from the definition of the problem to the implementation of results – there is at the same time need for division of labour between researchers and practitioners:

The researchers and participants have different roles and perform different tasks within the common framework of an interactive research process based on different knowledge interests, responsibilities, and competencies. These differences partly have their roots in cultural differences between the two spheres of research and practice (e.g. differences with respect to autonomy. (...)) To establish a mutually acceptable ethical framework, it is necessary to discuss and establish a consensus concerning the values and goals underlying the research effort (Ellström et al. 2020, 1521).

This dual commitment also implies tensions and dilemmas related to trade-offs between the aims of researchers and those of practitioners. For instance, the researchers need to retain the right to publish data and formulate conclusions, emphasising their academic freedom, including methodological and theoretical autonomy. Stakeholders participating in mission partnerships should not be allowed to edit research results or silence contrarian views since this would pose threats to the integrity and validity of research.

However, if the processes of obtaining and interpreting data are governed by scientific autonomy, there is no need to suspect that research results from collaborative projects are of lower quality compared to mainstream research. In many cases, research quality and

practical relevance might be complementary rather than conflicting and add more layers of peer review and validation.

As shown in Figure 2, the conceptual model includes three interacting organizational systems: at the upper level, research-performing organisations (such as universities) and at the lower level, partners from practice, policy, and industry. The activities in both systems respectively (research activities and organizational activities), are assumed to be informed by joint problem-solving and knowledge sharing in the third system: the knowledge translation system (Mission Partner Board, Mission Unit, Knowledge Broker).

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<sup>2</sup> At times, the notion of interactive research has been defined as a critique of how action research is understood and practised in the Scandinavian context (Svensson et al. 2007). According to Ellström et al. (2020), action research tends to sacrifice traditional research interests (e.g. theory development) for a kind of “practicism”. Thus, as noted decades ago by Seashore (1976), action research risks becoming a justification for practical development work that masquerades as research and, conversely, for research being reduced to a consultancy role (e.g. some kind of action learning or change management effort).

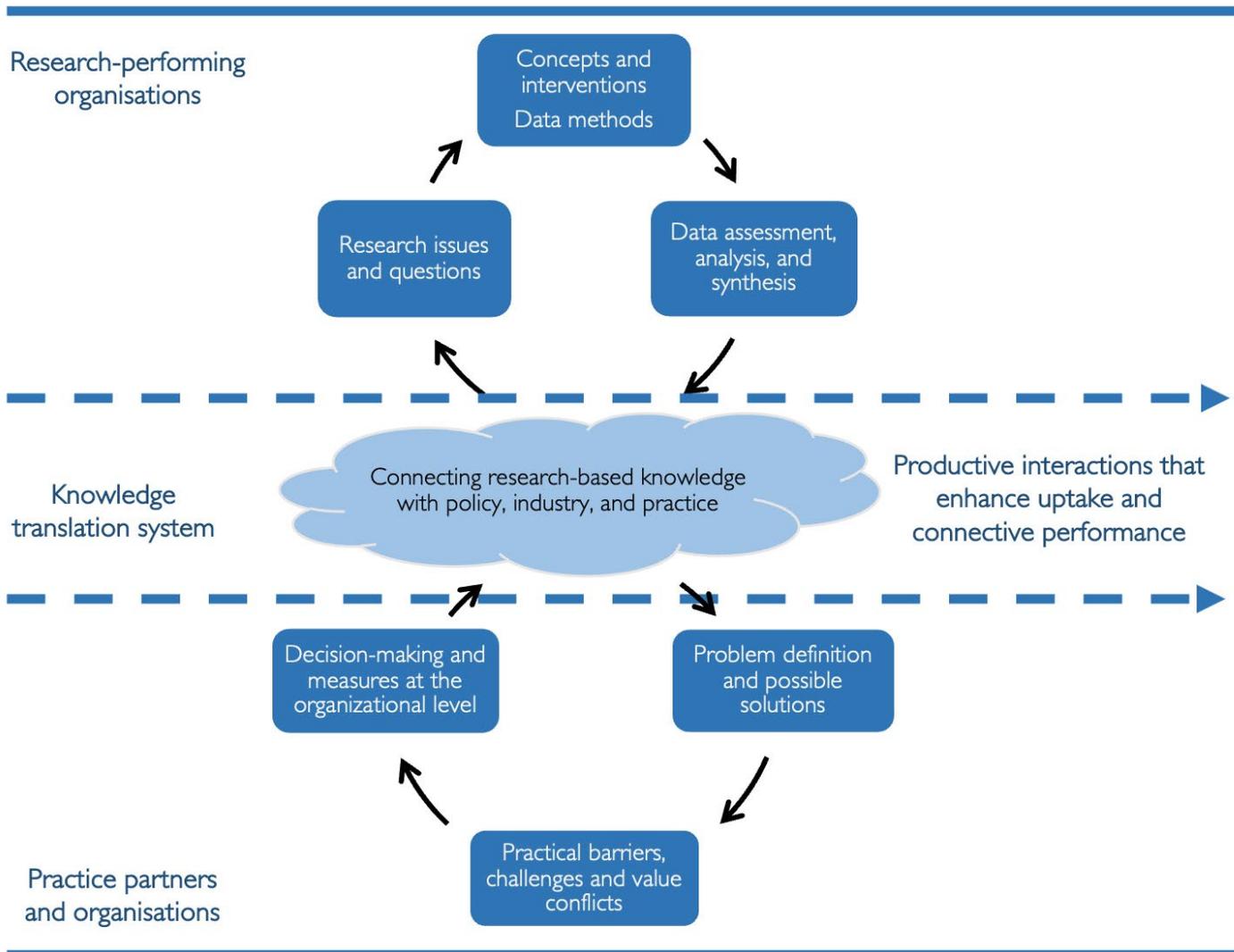


FIGURE 2. INTERACTIVE RESEARCH (ADAPTED FROM ELLSTRÖM ET AL. 2020)

### BOX 3. AN INTEGRATED MODEL FOR MISSION GOVERNANCE

1. The Mission Partner Board represents the members of the partnership. The composition of the Board is crucial. Its main task is, in co-operation with the Mission Manager, to take an active role in decisions about research agenda, problem-definition, the overall mission design, and budget based on the vision, goals and strategy of the mission. The Board comprises industry partners, representatives from civil society, and public institutions. Mission projects should be developed with partners who share co-ownership from the inception during the design and conceptualization phase, through to execution and implementation.
2. The Mission Management team is comprised of a Scientific Director, a Mission Officer, and several Mission Developers, who are tasked with implementing decisions made by the Mission Partner Board, organising the research and innovation teams, partnership meetings, fundraising etc. Important tasks include planning and co-ordinating resources, grants, proposals, conferences, seminars, team meetings, communication, advocacy, policy interactions, dissemination activities and other activities.
3. The mission research and innovation teams are organised within a shared portfolio, supported by the Mission Unit and supervised by the Mission Partner Board. There should be able space for discussing ongoing projects, testing new project ideas, developing research and innovation activities and supporting the integration of knowledge across research groups.

As described by Ellström et al. (2020) what is crucial about interactive research is to feed “cognitive inputs” back into practical problem-solving activities, which then feeds learning back into the next cycle of research activities. For this reason, interactive research is a cyclical (non-linear) process of knowledge creation consisting of the **interaction and integration of collective learning** that over time generate a more comprehensive understanding of the research object. Interactive research consists of a two-way flow of problems, solutions, learning, and knowledge. Here are a few schematic steps that might be helpful to establish interactive research programmes:

1. The collaborative research process starts with a joint diagnosis and problem-definition, where the researchers and partners aim to conceptualize and isolate the problems and issues that should form the basis of a common research agenda. The problem-definition process may require an empirical study of the problem (“a pilot study”) to define the research object and the problems to address.
2. As the research project takes form, the degree of interactivity typically varies between projects over time. Regular team meetings, face-to-face interactions, proximity to leaders, check-ins, joint presentations, and other shared activities can help facilitate a higher level of interaction throughout the research and innovation process.
3. As results start to accumulate and move closer to interventions and prototypes, activities again can vary in degree of interactivity. While data collection is primarily the responsibility of the research team, joint learning activities are relevant for all partners and can help foster a shared language and common understanding. For example, partners can be asked to help test, translate, and implement findings in specific contexts, and examine different assumptions or workflows relevant for

implementation, thus making new discoveries and generating new knowledge at the interface between research and practice.

4. According to Ellström et al. (2020) a promising method to foster joint learning is collaborative analytical seminars, where researchers and partners jointly analyse and discuss findings, and where new interpretations and suggestions for innovation are explored. “Considered in this way, analytic seminars have the potential to integrate research-based and practice-based knowledge through joint critical reflection between researchers and participants” (p. 1524).
5. Finally, project outcomes need to be communicated based on mutual agreement. While some partners will be included as co-authors, not all organisations want to have their names on scientific publications. Getting research published in a timely manner is about finding the right venue, and agreeing on what elements of the research project that can be shared – and what elements that might have commercial value, sensitive data, or dual use (in case of defence, there might be special constraints). For interactive research to be successful, it is important to remember that academic publications are just one among several tools for communication. Significant results should also be communicated in other formats, e.g., non-technical summaries, reports, websites, video and audio, infographics etc. which can feed back to partners and lead to increased problem-solving and impact.

# EXAMPLES OF MISSION PROGRAMMES IN DENMARK

## **ADD** – ALGORITHMS DATA AND DEMOCRACY

The ADD-project explores how algorithms and big data fundamentally changes the way in which citizen form opinions and make decisions. The 10-year research programme is conceptualised as a mission to advance digital democracy spanning six subprojects located at five Danish universities. In 2021, the project received 100 million DKK to investigate, study and mitigate controversies about digitalisation as they play out on digital platforms and are shaped by digital technologies. To answer the question of how to organise data and algorithms for the greater public good, the project brings together an interdisciplinary team of researchers spanning the humanities, social science, and computer science. The project is organised in a series of work packages, covering theory, methodology, and empirical studies. In addition, the ADD-project consists of a Knowledge Broker Unit and an Outreach Partner who are responsible for establishing a large research partnership of Danish and international stakeholders, including more than 100 representatives from government, public policy, civil society, the third sector, and industry. Among other things, the mission includes co-creation with practice partners, for instance, through formats of Policy Labs and small-scale research partnership. [algorithms.dk](http://algorithms.dk)

## **MADE** – MANUFACTURING ACADEMY OF DENMARK

MADE was launched as an independent association in 2014 by Danish companies, universities, RTOs, various associations, and public and private funding, including Innovation Fund Denmark. More than 140 members have now joined the mission, including 100 SMEs. MADE aims to facilitate the development of innovative world-class manufacturing solutions in Danish industry, enabling Denmark to compete globally and create employment within Denmark. MADE achieves its goals through the development of strategic partnerships between research institutes, RTOs and industry. The mission platform strives to support and strengthen the manufacturing industry in Denmark through the implementation of state-of-the-art manufacturing technologies. MADE has two main platforms where industrial and academic partners work together: 1. MADE SPIR (Strategic Platform for Innovation and Research) which aims to develop and implement Advanced Manufacturing technologies and strengthen the Danish manufacturing ecosystem (suppliers, end user companies, research-focused and educational institutions) 2. MADE Digital which is a platform centered around research and innovation that aims at developing a Danish approach to Industry 4.0. [www.made.dk](http://www.made.dk)

## **MISSION GREEN FUELS** – GREEN FUELS ROADMAP TOWARDS A FOSSIL FREE FUTURE

MissionGreenFuels is one of Denmark's four mission-driven partnerships to speed up the green transition. The programme is initiated and funded by the Innovation Fund Denmark as part of the government's green research strategy. The partnership is led by Aalborg University, anchored in the AAU Mission Unit. MissionGreenFuels is a public-private partnership focused on advancing green fuel technologies to drive systemic change in the energy sector. The goal is to catalyse innovation, collaboration, and investment to accelerate the transition to a sustainable, low-carbon economy. The MissionGreenFuels Partnership consist of more than 100 partners across knowledge institutions, GTS institutions, private companies, public companies and organisations. The mission partnership was established as a means to secure a significant contribution to achieving the Danish government's climate goals on CO2 reduction, through green fuels solutions. [missiongreenfuels.dk](http://missiongreenfuels.dk)

## 2.3. QUADRUPLE HELIX INNOVATION

Parallel to the developments in partnership-driven, new models of innovation have been developed to support the role of universities in the regional and national innovation ecosystem. From a traditional “linear” notion of technology transfer and industry-academia collaboration, innovation today is perceived to take place in a complex ecosystem of interacting institutions, competences, investments, infrastructures, and knowledge flows. Innovation is the result of multiple interacting parts that together creates the breeding ground for fertilisation of new business models, products, and processes. In this emerging landscape of open and multi-stakeholder innovation, university missions can be used to involve a broader set of actors in the innovation process, including industry, public, and civil society partners.

A useful heuristic for describing this widening of institutions and actors in the innovation ecosystem, is the Quadruple Helix framework (Wallin 2010). The framework builds upon and expands the notion of Triple Helix, originally developed by Etzkowitz and Leydesdorff (2000) as an integral part of the 1990s and 2000s innovation policy in the OECD countries. Whereas, triple helix networks consist of state-industry-academy relations, the Quadruple Helix framework adds a fourth dimension by including the role of citizens and civil society in driving innovation. This trend resonates with broader currents within innovation theory, such as stakeholder-driven innovation, user-centred innovation, social innovation, and open innovation. The core idea is that government, industry, academia, and civil society work together to create joint solutions and drive structural changes (Sgaragli 2014).

From the 1950 to the 1990s, the basic understanding of national innovation systems was that scientific findings and inventions spontaneously lead to economic development and prosperity. According to the so-called linear model of

research and innovation, championed by Vannevar Bush in his highly influential report to the US President, *Science the Endless Frontier* (1945), research and development proceeds in stages from basic to applied science, and further to industrial research and development. In this model, members of the public are more or less passive recipients of innovation embedded in marketable products. However, over the last two decades, a new approach has gained prominence. A mounting amount of studies show that government agencies play a far more active role in driving innovation than the classical entrepreneurial model indicates. Government agencies help drive innovation through progressive stages from basic research to industrial application by supporting investments, infrastructure, incentives, skills, social security, etc.

At the same time, research and innovation programmes need public support and should be aimed at creating positive public impact, defined with input from the public itself. Acceptability, expectations, user-journeys, practical expertise, and participatory processes are necessary for societal stakeholders to re-align innovation trajectories with public preferences and create sustainable and inclusive solutions (Schütz et al. 2019, 129). This model of innovation (Figure 3) highlights the role of society as a major actor in national innovation ecosystems as well as the importance of actively integrating the public into innovation projects.

The Quadruple Helix framework (Figure 3) is closely aligned with the model of mission-driven research and innovation. Governments and innovation funding agencies are increasingly looking to involve societal stakeholders in co-creation of research, development, and innovation. Mission partnerships is a promising method to strengthen the multi-stakeholder dialogue across the different helixes.

As described in Section 2.1, co-creation and cross-disciplinary partnerships are the backbone of mission-driven research programmes, enabling a better understanding of societal problems, and strengthening outcomes and

#### Government

Innovation support, policy framework, regulation, professional expertise, scalability

#### Business

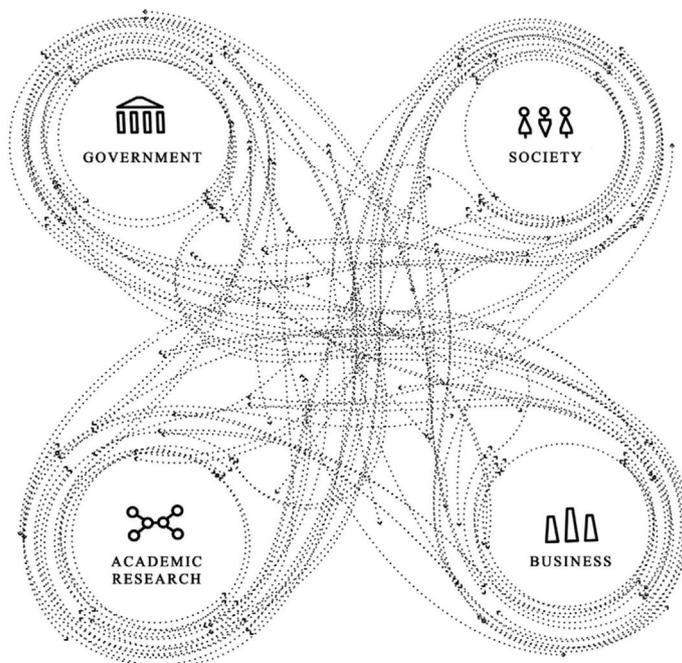
Entrepreneurship, R&D, venture capital, product and service development, market needs,

#### Academia

Basic and applied research, education, capacity-building, competence framework, incubator, spinoffs,

#### Civil society

Collaboration, practical know-how, networks, mobilisation, legitimacy, acceptability, lay expertise



**FIGURE 3. QUADRUPLE HELIX FRAMEWORK (ADAPTED FROM SCHÜTZ ET AL. 2019)**

impacts of research initiatives. Thus, collaborating with societal partners is a key feature of mission-oriented innovation, not only because inclusion and participation leads to higher levels of acceptability and legitimacy, but because diverse stakeholders contribute with valuable insights, expertise, and know-how required for collective problem-solving in e.g., health, urban living, energy transition, education.

A major challenge of university-driven mission programmes is to find suitable ways to include citizens in the innovation process. Mission programmes need to prioritise public involvement in the knowledge production process by clarifying roles and expectation, and by identifying desirable and productive forms of interaction between the scientific community and the public. Collaborating with stakeholders from industry and policy is often relatively straightforward. These sectors are organised in *hierarchies* with levels of decision-making power. They can sign contracts, commit resources, and clarify rights to data and

intellectual property. The public includes a more varied, diverse, and unorganised set of actors. Involving the public can be done by facilitating public meetings, workshops, hearings, or by hosting co-creation workshops, open door initiatives, and by using participatory methods.<sup>3</sup> Using the Quadruple Helix framework in mission programmes is aligned with current trends towards *open innovation* and *user-centric innovation* in which citizens' input is regarded as the engine of innovation. For participants to get involved in specific projects, programme managers need to work with clear criteria and tools to facilitate interactions between the partners. Adding complexity can lead to both serendipity and increased real-world value. But the process can also lead to challenges in terms of finding the right venues for co-creation. Without a clear purpose, citizen engagement can become unorganized and contested, and end up as purely "consultation" rather than participation. Finding the right time and place to engage citizens is key.

<sup>3</sup> It is worth noting that more and more stakeholders and sectors, including local governments traditionally associated with strong hierarchies are taking up a mission-oriented and collaborative approach. Municipalities, associations, confederations, academies, think tanks etc. are increasingly initiating societal missions and partnerships, in particular across the Scandinavian countries.

## BOX 4. AAU INNOVATION SUPPORTS THE MISSIONS

AAU Innovation offers comprehensive support to researchers, students, and graduates at Aalborg University, enabling them to create meaningful impact by transforming their expertise into sustainable and innovative solutions and businesses. AAU Innovation works actively to help researchers and students at Aalborg University transform knowledge and research results into entrepreneurial ideas for the benefit of society.

AAU Innovation works across disciplines and sectors to support the entrepreneurial environment and mindset of researchers, students, and staff at Aalborg University. The teams at AAU Innovation are responsible for commercial utilization of research, particularly inventions and software. Responsibilities include:

- Guidance and assistance throughout the entire commercialization process
- Information and guidance on various funding and financing options
- Workshops and PhD courses designed to enhance entrepreneurial skills.
- AAU Proof-Of-Concept and assistance with intellectual property.

A primary goal of AAU Innovation is to make entrepreneurship accessible to all students at AAU, regardless of professional backgrounds and careers. To achieve this, priorities include:

- Supporting a variety of entrepreneurial courses and activities, both within and outside curriculum.
- Developing educational programs together with study programs.
- Running different entrepreneurship programs, e.g. AAU Startup Program
- Offering workshops for AAU students to collaborate with students from different fields of study

Physically, AAU Innovation is located at the innovation center (INNOVATE) and consists of offices, laboratories, meeting facilities, and labs that support interdisciplinary innovation, business ideas and entrepreneurial endeavors. Support is offered in various ways, including organizing events, managing exhibitions, prototype development and providing dedicated workshop supervisors for the laboratories in the building.

## **BOX 5. AAU SUPPORTS INNOVATION ACROSS ALL STAGES OF RESEARCH**

World-class research is recognized as the cornerstone for developing creative solutions to the world's major challenges. The goal of Aalborg University is to position innovation as a central activity within the university, leveraging AAU's extensive knowledge base to benefit society on multiple levels – regionally, nationally, and globally.

This is achieved by facilitating and supporting the necessary processes that foster an environment where creativity can thrive, and innovation can be cultivated. At AAU Innovation, innovation is defined as the successful transformation of creative ideas and knowledge into new groundbreaking solutions. Similarly, entrepreneurship is defined as the act of identifying opportunities and ideas and converting them into societal value, economically, socially, and culturally.

The interplay between innovation and entrepreneurship is essential, as an entrepreneurial mindset is crucial for transforming ideas into actionable solutions. The overarching aim of AAU is to develop a dynamic ecosystem where creativity, research, and collaborations can flourish. By offering researchers and students a unique environment to refine and accelerate their ideas, AAU Innovation works to promote solutions that improve quality of life, sustainability, competitiveness, and effective utilization of knowledge.

Read more: [www.innovation.aau.dk](http://www.innovation.aau.dk)

## 2.4. INTER- AND TRANS-DISCIPLINARY RESEARCH

The scientific advances needed to shape mission partnerships require inter- and transdisciplinary collaboration. Drawing on the input and contributions from multiple disciplines, including the social sciences and humanities, will lead to more effective and system-focused solutions. Besides technical knowledge, understanding behaviour, communication, cognition, culture, design, values, institutions, law, and history etc. are required to deliver real-world impact.

With the advent of so-called ‘wicked problems’, solutions to societal problems cannot be expected to emerge within mono-disciplinary research. Societal challenges are cross-cutting, complex, and intertwined across domains and disciplines. Natural problems, such as climate change and renewable energy, immediately lead to social problems, such as distribution, access, and security. Technical advancements, such as development of artificial intelligence, immediately leads to human questions about ethics, regulation, privacy, and democracy. Therefore, missions should give prominence to the role of social sciences and humanities while at the same time stressing the importance of natural, medical, and technical sciences.

As emphasised in this guidebook, mission-oriented research is impact-oriented and solutions-focused. Missions are significant signature projects with a clear scope and ambition, which involve a suite of long- and medium-term research projects, as well as commitment and investment from partner organisations. While mission programmes should be focused on a clearly defined topic, question, or goal, they require interdisciplinary and transdisciplinary approaches that may take longer time to develop. Building competences for inter- and transdisciplinary research as well as integrating input from a wide range of knowledge-providers and stakeholders, are crucial capabilities needed for mission programmes (Pedersen & Hvidtfeldt 2021).

There is a vast literature on inter- and transdisciplinary research, ranging from studies of team science and team leadership to models of evaluation, funding, and career management (Stokols et al. 2008, Broham et al. 2016, Bennett et al. 2018, Banal-Estañol et al. 2019). For the same reason, questions such as “what is interdisciplinary research” and “what is the best way to organise transdisciplinary research” have triggered multiple conversations and raised several dilemmas. Despite heterogeneity, most discussions support the frequently cited definition of interdisciplinarity adopted by the US National Academy of Sciences (2005b).

Interdisciplinary research is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline (NAS 2005, 2).

It is worth noticing that the literature operates with several different notions of interdisciplinarity, which need brief clarification. According to Stokols et al. (2008) the three leading definitions are:

- **Interdisciplinarity** is commonly understood as an interactive and integrative process in which researchers work jointly to address a common, “complex” research problem. In many cases, team members not only combine concepts and methods drawn from different fields, but work to integrate their divergent perspectives.
- **Multidisciplinarity** is a process in which scholars from disparate fields work independently or sequentially, periodically coming together to share their individual perspectives for purposes of achieving broader-gauged analyses of common research or societal problems. Participants in multidisciplinary teams remain anchored in the concepts and methods of their respective fields while working towards joint solutions.

- **Transdisciplinarity** is a process in which scientific and non-scientific partners work together over extended periods to develop joint research agendas, joint solutions to real-world problems, and joint learning, often by using methods such as co-creation, co-production, or participatory design.

## TEAM LEADERSHIP SKILLS

Five inter- and transdisciplinary skills can be distilled in the context of mission management. These skills relate to the importance of developing a robust vision and shared narrative as a precondition for successful collaboration:

1. **Establishing inter and transdisciplinary teams** require a strong vision and shared narrative (goal, mindset, problem-definition). A key feature of successful collaboration is the ability to combine efforts, build relationships, promote shared values, and establish personal relations.
2. **Mission projects require knowledge brokers** who can connect otherwise isolated individuals and can help to diffuse innovative ideas within the partnership. Knowledge brokers may facilitate the involvement of stakeholders and collaborators, which, in turn, is associated with higher societal impact (see Section 2.5).
3. **Onboarding** should be part of an ambition to build an integrated team driven by shared objectives and problem-solving. Part of this task is to develop clear processes for assessing whether and with whom to partner, and how to measure the success of partnerships. Regular team meetings, face-to-face interactions, retreats, and co-creation can further enhance integration.
4. **Experimentation** are key to successful teams. Team leaders should bring potential research collaborators together early to agree on research problems and questions. Reading and discussing key articles together is helpful. Participants should not be afraid to disagree or disengage from partners that cannot find ways to work together.
5. **Building trust and shared values** is critical for high-performing teams. Open-mindedness to other disciplines and learning from other team members can facilitate collaboration and enable trust, problem-solving and integrated workflows.

These skills may be provided by mission programmes through training and capacity-building. The key to success for inter- and transdisciplinary teams is their ability to create an interactive and integrated research environment that effectively harness the contributions of all team members (Pedersen & Hvidtfeldt 2021, 23).

## BOX 6. AAU INTERDISCIPLINARY LEADERSHIP COURSE

The persisting character of complex societal challenges and the cross-cutting nature of mission-driven research and innovation have prompted Aalborg University to develop a dedicated leadership course. At the course, participants are introduced to leadership skills that facilitate integration, communication, and mission partnerships across SSH, STEM and HEALTH. This course offers a learning platform to support:

1. Leadership skills and models for composing interdisciplinary projects and teams.
2. Insights into mission-oriented research and innovation practices.
3. Tools to effectively communicate and interact across disciplinary boundaries.
4. A framework for planning and managing impact and collaborating with partners

During the 4-day course, the participants learn how to position themselves within a broader context of research management and research collaboration with a special focus on interdisciplinary team science and missions-oriented research and innovation projects. The participants will bring home a set of tools that can be activated to achieve more integrated approaches to collaboration, communication, and impact across AAU and beyond.

## 2.5. KNOWLEDGE BROKERS

As mentioned in the previous section, mission partnerships can benefit from including “knowledge brokers” who connect diverse interdisciplinary experts and help diffuse innovative ideas within a network. Knowledge brokering and knowledge mobilisation strategies enables the translation, implementation, and absorption of research in policy and practice. In addition to traditional forms of academic expertise, mission teams need experts in knowledge integration and implementation that represent an emergent form of expertise beyond scientific excellence. This section explores some of the features and skills that characterise effective knowledge brokering and mobilisation.

Appointing specialist knowledge brokers within mission teams have a dual purpose, corresponding to the distinction between inter- and transdisciplinarity. On the one hand, knowledge brokers can help to bridge the gap between academic disciplines and integrate different theories, methods, and findings across departments to create a more comprehensive understanding of a problem. On the other hand, knowledge brokers should work with external stakeholders and co-creation partners who are representing non-academic (policy, industrial, civic) interests and knowledge needs. In a report from the Canadian Health Services Research Foundation (2003), the core role of knowledge brokers is defined as follows:

Knowledge brokering is an umbrella term for a process in which a person, group or organisation take on the professional responsibility to support the translation and exchange of knowledge between researchers, practitioners and decision-makers, and/or contribute to the interpretation and adaption of research knowledge in a user context (CHRSF 2003).

Knowledge brokers are individuals who work at the interface between researchers and knowledge-users who can enhance communi-

cation to facilitate research-uptake and bridge the research-to-practice gap. “They lead to the development of ideas, or management of a particular common interest shared by their colleagues and facilitate learning.” (Hurtubise et al, 2016, 187). In this capacity, knowledge brokering is an essential skillset when leading mission programmes, since missions include a broad range of partners (Section 2.1), interactive knowledge production (Section 2.2), multi-stakeholder innovation (Section 2.3) and inter- and transdisciplinary collaboration (Section 2.4).

Knowledge brokering emphasises the non-linear, interactive process of research conducted within mission programmes. Rather than traditional “technology transfer”, knowledge exchange and translation (KTE) embody the attempt to include stakeholders upstream, listening to partners, and co-creating outcomes and solutions. Knowledge brokers are boundary-spanners who can navigate complex project consortia and mediate between different “cultures” of different partnering organisations, businesses, industries, authorities, and citizens (Meerkerk & Edelenbos 2018, Stephens et al. 2024).

Appointing knowledge brokers and providing them with skills, resources, and decision-making power, creates integration and consistency across the individual mission projects. Knowledge brokers are typically associated with the role of Mission Managers (and the lead scientific investigators), but they may also be directed by professional staff or communication officers. The “art of collaboration” and knowledge integration cannot be assumed to be a natural part of academic training and should be articulated and supported with resources, for instance, peer learning exercises, project management courses and capacity-building.

**Knowledge mobilisation**, as opposed to knowledge transfer, is not about transmitting research and evidence to practitioners and policymakers. Rather it is about listening and harvesting insights from the perspectives of knowledge-users and integrate different

contributions into a unified field of expertise. In this capacity, knowledge mobilisation is the shared responsibility of research-practice-partners and works best when practitioners and researchers seek to learn from each other and enhance their joint problem-solving capacities. Although concepts pointing to a linear thinking and particularly to research-push processes (such as knowledge transfer, transmission or dissemination, and knowledge-to-action) are still influential, the emerging field of knowledge mobilisation emphasises a more complex and dynamic interplay between partners, institutions, and sectors (OECD 2022, Oliver 2022, Pedersen 2023).

According to this model, knowledge is circulated, translated, and co-opted in a mutual process involving several steps and stakeholders who contribute different competences and perspectives. Of course, the role of researchers is to collect, analyse and synthesise data and produce reliable explanations and predictive models etc. But this is only one step of the process. When research is activated and integrated into practice it is crucial that it happens through a stepwise, cyclical process in which practical expertise plays an equally important part. Working together with partners, understanding their knowledge needs, analysing practical problems, considering barriers, working with policymakers and legislators, evaluating market models, scrutinizing ethical dilemmas, and prototyping solutions are at the core of knowledge mobilisation and mission programmes.<sup>4</sup>

Knowledge mobilisation is about mobilising the ecosystem of stakeholders and getting the different partners together to discuss and develop ideas and solutions. It is not about presenting or persuading an audience about pre-established

“truths” but about co-creating scenarios and solutions together across disciplinary and institutional boundaries. Sometimes, knowledge mobilisation activities require designated brokers and intermediaries who work intensively with practitioners, facilitating workshops, building capacity, understanding impact readiness, and cultivating the preparedness of practitioners to change perspective, practice, or policy.

In terms of missions, knowledge brokering and mobilisation are promising techniques to get missions of the ground and work actively with stakeholders. Knowledge mobilisation is about working pro-actively with stakeholders from the beginning of the research and innovation process, listening to ideas and perspectives bottom-up, and clarifying expectations and strategic research plans based on mutual engagement.

Importantly, mission programmes should not be confused with industrial research programmes or innovation projects, such as grand solution instruments and the like. Missions cannot be organised through the principles of research-pull and research-push, or through a linear model of supply and demand. Yes, some stakeholders may have very articulated knowledge needs, and may have accumulated evidence and knowledge about the solutions needed to create desirable outcomes. But missions, in contrast to typical innovation projects, include a broader “value-chain” perspective, which also (but crucially) involves policymakers, change-makers, and citizens. Knowledge mobilisation and brokering can be used to engage in systemic, solutions-oriented, holistic conversations about knowledge needs, policy options, change processes, and sociotechnical innovation.

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<sup>4</sup> The notion of knowledge mobilisation itself raises questions about the nature of “knowledge”. It is beyond the scope of this working paper to introduce in detail the epistemological dimensions of the knowledge mobilisation literature. But when talking about “knowledge” in this context, it generally refers to “research knowledge” – also known as scientific or factual knowledge (OECD 2022). However, different types of non-academic knowledge play equally important roles in creating sustainable and scalable solutions, such as technical knowledge, practical experience, professional expertise, etc. Research-based knowledge is often not used directly by decision-makers or practitioners, but rather shape their attitudes, perspectives, and ways of understanding problems in indirect and subtle ways, if linked to their own knowledge (Nutley, Powell and Davies, 2013, Cain, 2015).

## BOX 7. KEY SKILLS FOR KNOWLEDGE BROKERS WORKING AT THE SCIENCE-SOCIETY-POLICY INTERFACE

Working at the interface between science, policy and practice requires a number of skills and competences that can be cultivated and developed by professional training. These competences include synthesising research (generating state-of-the-art knowledge about a policy problem) and understanding the reality and feasibility of policymaking (knowing when and how to present evidence effectively). The European Commission's Joint Research Centre has created a Competence Framework for Policymakers and Researchers that consists of eight clusters of skills with underlying recommendations and training modules:

- 1. Synthesising research:** Policymakers are overburdened by the supply of information. Translating research into policy and practice calls for the ability to produce, synthesise and prioritise the most robust and relevant knowledge.
- 2. Managing expert communities:** Most societal problems are complex and interrelated, calling for cooperation between disciplines and 'joining up' a wide range of policies.
- 3. Understanding policy and science:** The policy process is best understood as an ecosystem (rather than a cycle with linear stages), calling for new ways to understand and link evidence and policy.
- 4. Interpersonal skills:** Brokers need to create trust and respect, understanding both scientists and policymakers, and reflect on behavioural biases, behaviour, and mental heuristics.
- 5. Engaging with citizens and stakeholders:** Knowledge brokering needs to be informed by citizen and stakeholder input. Scientists should not present complex issues as only technical.
- 6. Communicating scientific knowledge:** Stakeholders do not always search for evidence or have access to scientific expertise but needs active engagement, communication, and translation.
- 7. Monitoring and evaluation:** Brokers need to ensure routine monitoring of policy impact, evaluate success, and hold policymakers accountable.
- 8. Achieving impact:** Brokers should actively seek to cause behavioural and policy change by presenting recommendations but not influencing policy, respecting the role as 'honest broker'

Topp et al. 2020

# 3. IMPACT MANAGEMENT AND ASSESSMENT

After having described the different modes of knowledge production and the skills and methods needed to connect different stakeholder communities, we now turn to the question of impact planning and assessment. As it was stressed in the Introduction to this guidebook, impact planning and assessment are critical for mission delivery. By planning and monitoring actionable, ambitious yet realistic impact goals, mission programmes are provided with an essential learning tool that is useful for internal project management and external communication and accountability.

Since missions are often complex and multi-faceted, involving different stakeholders across a portfolio of mission projects, keeping track of impact and setting clear impact goals are important for creating a shared vision and joint results. Like the topics of previous chapters, impact planning and assessment have attracted substantial scholarly and policy attention. This chapter makes no attempt to cover the entire conversation but will serve as a starting point for further reflection and inspiration.

A central condition for understanding the impact of mission programmes is to acknowledge that missions are situated within local contexts. For this reason, impact cannot be assessed by using ranking list for performance or outcomes. Missions take their departure in specific, locally configured, and unique societal problems embedded in complex systems of interacting institutions, interests, and infra-structures. To compare the impact of different missions is at best futile, and at worst counter-productive since it can discourage researchers and practitioners from pursuing difficult societal missions. Much more than a ranking tool, impact assessment should be used to define key assumptions about change, goal-setting, and partner involvement through the mission lifecycle.

Different project management and impact assessment tools are available in the existing literature. What is important is to develop a portfolio of approaches to monitoring, evaluation, and measurement that is aligned with the goals of the mission rather than using universal standards or metrics. This is rooted in the realisation that research programmes cannot transform complex systems through business-as-usual approaches founded on linear modes of planning, management, and evaluation (Haldrup 2022). Instead, mission programmes need to develop new ways of monitoring and evaluating outcomes that are consistent with the complex nature of the challenges facing society. For this reasons, impact assessment and monitoring are not about establishing benchmarks for academic outputs (such as publications, citations, patents etc.) but about assessment of Key Progression Indicators, for example:

1. Productive interactions across the mission partnership
2. Intermediate outcomes produced by the partnership
3. Long-term societal changes influenced by the mission

Importantly, the impact assessment framework adopted by the mission programme needs to focus on intermediate outcomes, organisational learning, and programme activities, which makes

it possible to monitor how the mission projects are moving towards planned impact. Identifying impact pathways and creating milestones for mission progress are as important as describing end-effects and final impacts. The value created by missions, whether in terms of practical solutions, scalable applications, enhanced learning, or better regulation, are enabled by **productive interactions** throughout the research and innovation process.

The impact frameworks outlined in this chapter align with the ambition of mission-oriented research and innovation to foster significant breakthroughs, and positive societal impacts across public health, sustainability, innovation, and education. Any choice of impact tools (ex post and ex ante) should underscore the partnership's **purpose and dedication** to creating meaningful and lasting impacts, bridging the gap between scientific discovery and societal needs (Christensen 2024). To promote research-for-impact, missions can benefit from developing a tailored Mission Logic Model incorporating different initiatives, planning tools, and interventions.

### 3.1. PRODUCTIVE INTERACTIONS

Since mission-oriented research and innovation is predominantly driven by partnerships and interactive research, a particular priority should be given to understanding and assessing the productive interactions enabled by the missions. That is, the interactions through which the mission partnership establishes internal and external pathways to impact as well as supporting **conditions for impact** (Pedersen & Hvidtfeldt 2023). An evaluation framework for mission-oriented research and innovation therefore needs to focus both on the processes and the outcomes of interventions.

One particularly relevant approach comes from the field of research impact assessment. The SIAMPI framework (acronym for ‘Social Impact Assessment Methods for research and funding instruments through the study of Productive Interactions between science and society’) provides a set of actionable evaluation tools based on the central notion of productive interactions (de Jong et al. 2011). The model is built around a non-linear understanding of societal impacts as a result of dynamic interactions and joint efforts between several actors inside and outside the scientific community. The SIAMPI model is particularly well-suited for studying mission partnerships where research outputs are typically part of a more complex change process.

The theory of productive interactions highlights how interactions between actors can lead to dynamic exchanges of knowledge. The framework states that “it is only by analysing the **processes that induce social impact** that we have a chance of recognising potential research impacts” (Spaapen & van Drooge 2011). In another version of the same argument, the authors state:

In open, non-linear and networked systems, academic knowledge should be seen as a dynamic part of a wider process of knowledge production in which stakeholders

bring in their own expertise, knowledge and insight. Societal impact is thus the outcome of the creative encounter of stakeholders and their contributions to a common goal (Akker & Spaapen 2017).

These guidelines can be adapted to the evaluation of mission outcomes. Instead of focusing on linear models of knowledge dissemination and transmission, measured by quantifiable outputs (such as reports, citations, or other proxies), an assessment framework based on productive interactions focuses on the dynamic interactions of mission partnerships and their links to the wider ecosystem (such as government agencies, companies, stakeholder groups etc.). The productive interactions framework captures the flow of knowledge between sectors rather than focusing only on uptake and end-effects (Pedersen 2023, 13).

In terms of data collection and analysis, impact assessment based on productive interactions uses databases, surveys, and interviews with stakeholders, e.g., focusing on key interactions, such as meetings, learning activities, co-production events, in-person participation, products, prototypes, and financial contributions, including in-kind resources. Project managers can develop quantitative measures to track and assess formal interactions (such as funding, contracts, briefings, meetings, policy labs, consultations, partners etc.) and construct qualitative case studies that contextualise the data. Case studies highlight how mission partnerships play a catalytic role as platforms connecting different stakeholders, policymakers, and publics.

The SIAMPI framework distinguishes between three kinds of productive interactions that reveal how knowledge is produced and circulated between stakeholders. These three types of interactions show how mission partners interact with another and with external stakeholders:

The productive interactions framework assumes that a successful mission partnership is part of a larger web of interconnected institutions and

<b>DIRECT INTERACTIONS</b>	<ul style="list-style-type: none"> <li>• Face-to-face interventions with stakeholders, clinical staff, professionals, peer groups, authorities, companies, etc.</li> <li>• Number of consortia meetings, workshops, conferences.</li> <li>• Number of external members in mission partnerships</li> <li>• Number of presentations for stakeholders and citizens</li> <li>• Number of presentations for stakeholders and citizens</li> </ul>
<b>INDIRECT INTERACTIONS</b>	<ul style="list-style-type: none"> <li>• Contextual Response Analysis (CRA): analysis of use and uptake of outputs (e.g. reports, papers, datasets, website etc)</li> </ul>
<b>FINANCIAL INTERACTIONS</b>	<ul style="list-style-type: none"> <li>• Contracts, licences, project grants, sharing of facilities, sponsorships, fellowships, in-kind contributions, etc.</li> </ul>

stakeholders who interact through various steps of the research process. As an evaluation tool, the objective is to locate and describe these interactions, their intensity, and their quality. The assessment of productive interactions reflects how knowledge flows in multiple ways, e.g., into policy guidelines, white papers, websites, business models, infrastructures etc., and how impact is enabled by multiple types of interactions: from face-to-face meetings to analysis of use and uptake of research outputs.

The distinction between **direct interactions, indirect interactions and financial interactions** is useful for the assessment of different types of mission outputs and outcomes. In practice most

successful missions consist of a combination of productive interactions, which are themselves part of larger networks of interactions. In some cases, initial interactions may lead to cascades of long-term interactions which accumulate as they reach higher levels of impact (Pedersen 2023). Yet, the baseline for the framework is a real-time mapping of different intermediate outcomes and activities at the programme level. Monitoring and tracking interactions will give programme evaluators and partners valuable insights into the contribution of the mission partnership to the wider ecosystem, while focusing less on final impact beyond the project lifecycle. In the next section, this approach is integrated into a more comprehensive mission logic model.

## 3.2. MISSION LOGIC MODEL

Based on the monitoring of productive interactions it is possible to construct a logic model and theory of change. In Figure 4, a mission partnership, a mission partnership is described via an adapted logic model, consisting of **inputs** (strategic priorities, funding, staff, technologies), **activities** (co-produced research and innovation), **outputs** (products) and **outcomes** (uptake and influence) and **impacts** (implementation and long-term societal change). For schematic reasons, the model is depicted as a linear progression of how mission projects may influence society, moving from inputs and research activities at the programme- and project-level through productive interactions and outcomes for industries, decision-makers and citizens, and, ultimately, their potential long-term societal impacts. While the AAU Mission Impact Model is represented as linear, it should be stressed that there are numerous iterations and flow of knowledge back-and-forth throughout the process of mobilising research in practice (van Eerd et al. 2020). However, it is difficult and counterproductive to describe this level of complexity in a simple and accessible model.

In a logic model, **inputs** include investments, resources, staff, existing capacity, allocated time, etc. In mission-driven research, inputs also include political strategies, priorities, legislation, funding, and existing partnerships and alliances. **Activities** are all the actions that need to materialise to create a viable research design, implement the research plan, and deliver the agreed results and products, including involvement of co-creation partners and validation of research results with partners, creating new tools, and disseminating the research to different audiences.

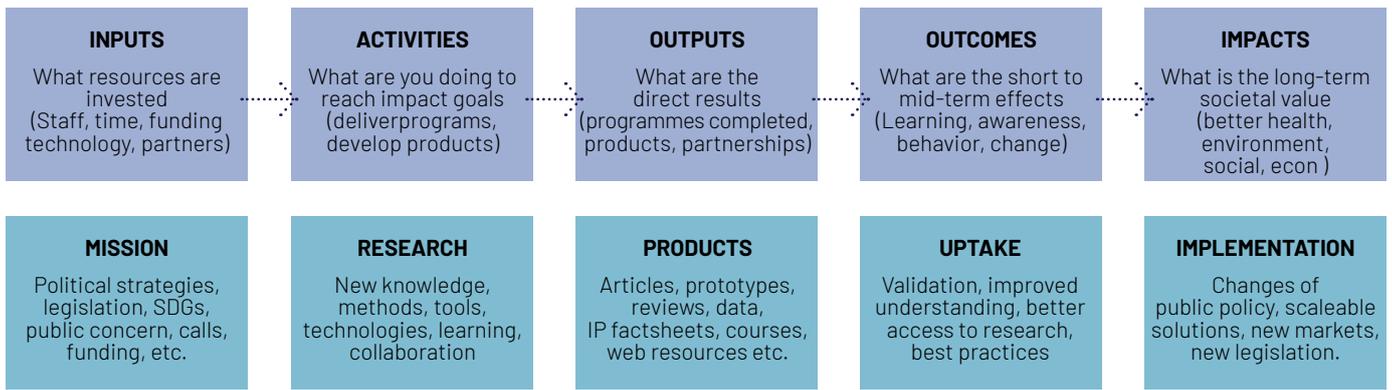
**Outputs** are the immediate direct results of completed activities and projects, such as partnerships, prototypes, publications, datasets, technologies, events, artefacts, tools, and inventions. These have been published or

otherwise made available to partners who directly benefit from training, recommendations, learning, testing, and acquisition of technologies, standards or guidelines. If outputs are accessed and implemented by partnering organisations, they turn into **outcomes**, which add value to partners in terms of improved understanding, practices, policies, programmes, and knowledge uptake. Finally, **impacts** describe the long-term societal value of the mission programme, which is obtained through lasting organisational, behavioural, cultural change. To create a more comprehensive representation of actual mission projects, more layers can be added to the impact model that include examples of R&D capacities, intermediate outcomes, and final outcomes.

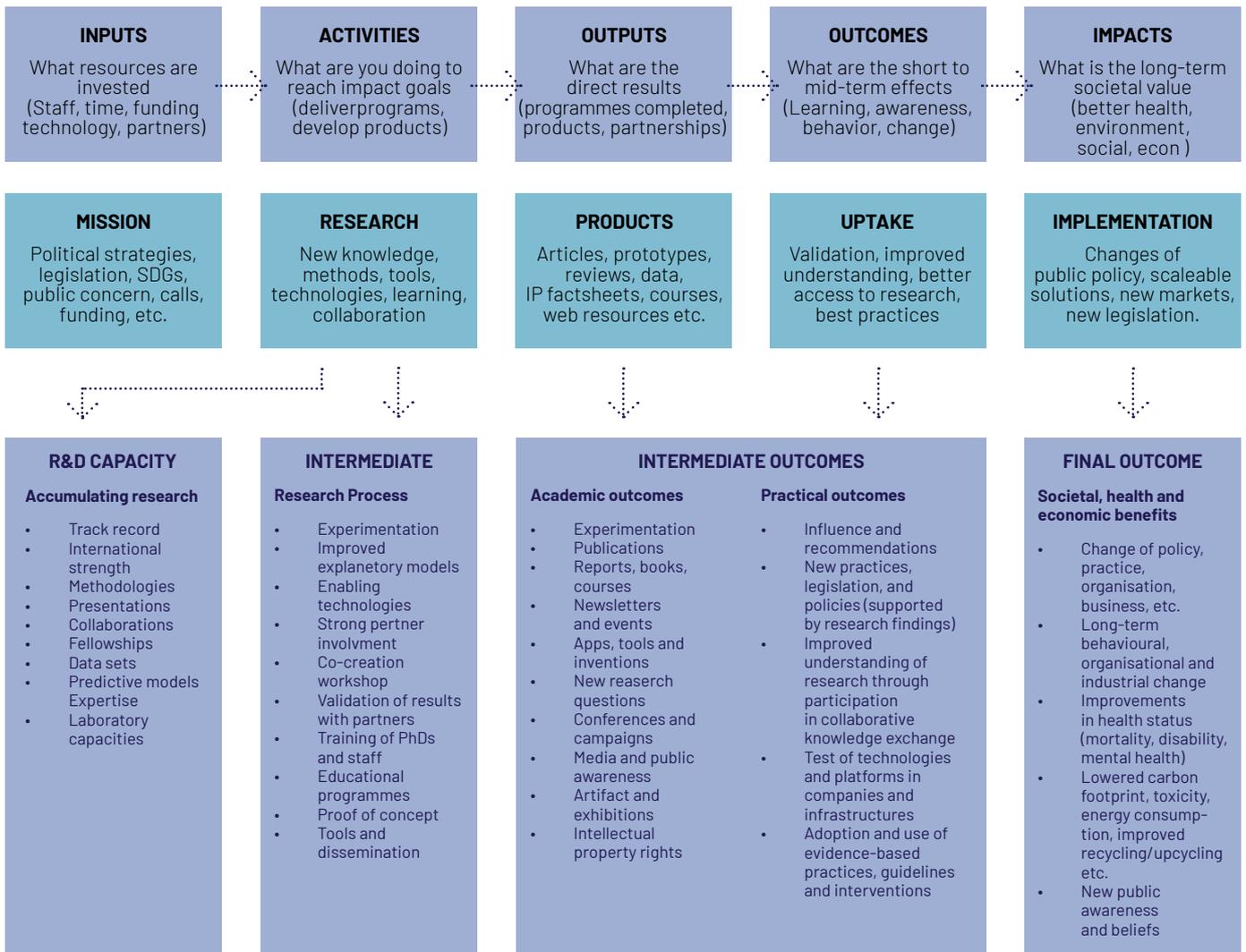
In Figure 5, additional layers are added to describe the enabling function of productive interactions throughout the research process, including the role of co-creation partners, knowledge mobilisation initiatives as well as the long-term knowledge spillovers from mission-driven research. The complete model shows how missions require that researchers engage with communities, policymakers, industries, and other (quadruple helix) partners throughout the mission lifecycle. This continuing engagement ensures that research is informed by a diverse range of perspectives and is attuned to real-world contexts and needs. By stimulating collaborations across different disciplines as well as various societal sectors, mission programmes aim to catalyse innovative solutions that are holistic and likely to make a difference.

The circular arrows in the lower part of the diagram illustrate that co-creation partners need to be involved from the beginning and should be invited to validate and provide inputs throughout the mission lifecycle. In the end, successful missions are the result of co-produced pathways to impact that occurs when university researchers collaborate with non-academic partners and together co-design products, policies, and services to the benefit of end-users and society. However, in most mission programmes, it is not feasible for an intervention to directly induce societal impact in a linear manner and within a

**FIGURE 4. THE AAU MISSION LOGIC MODEL**



**FIGURE 5. EXTENDED MISSION LOGIC MODEL**



limited project timeframe. For these reasons impact planning and assessment should focus on **intermediate outcomes** that are likely to lead to further changes of behaviour, practice, and policy in the longer term. The further one moves from inputs ) outputs ) outcomes ) to impacts, the less direct causal influence the mission will exert. Rather, long-term impacts are the result of interacting indirect conditions and contributions from stakeholders and sectors that lead to accumulating spillovers (Christensen 2024, 2).<sup>5</sup>

## IMPACT ASSESSMENT

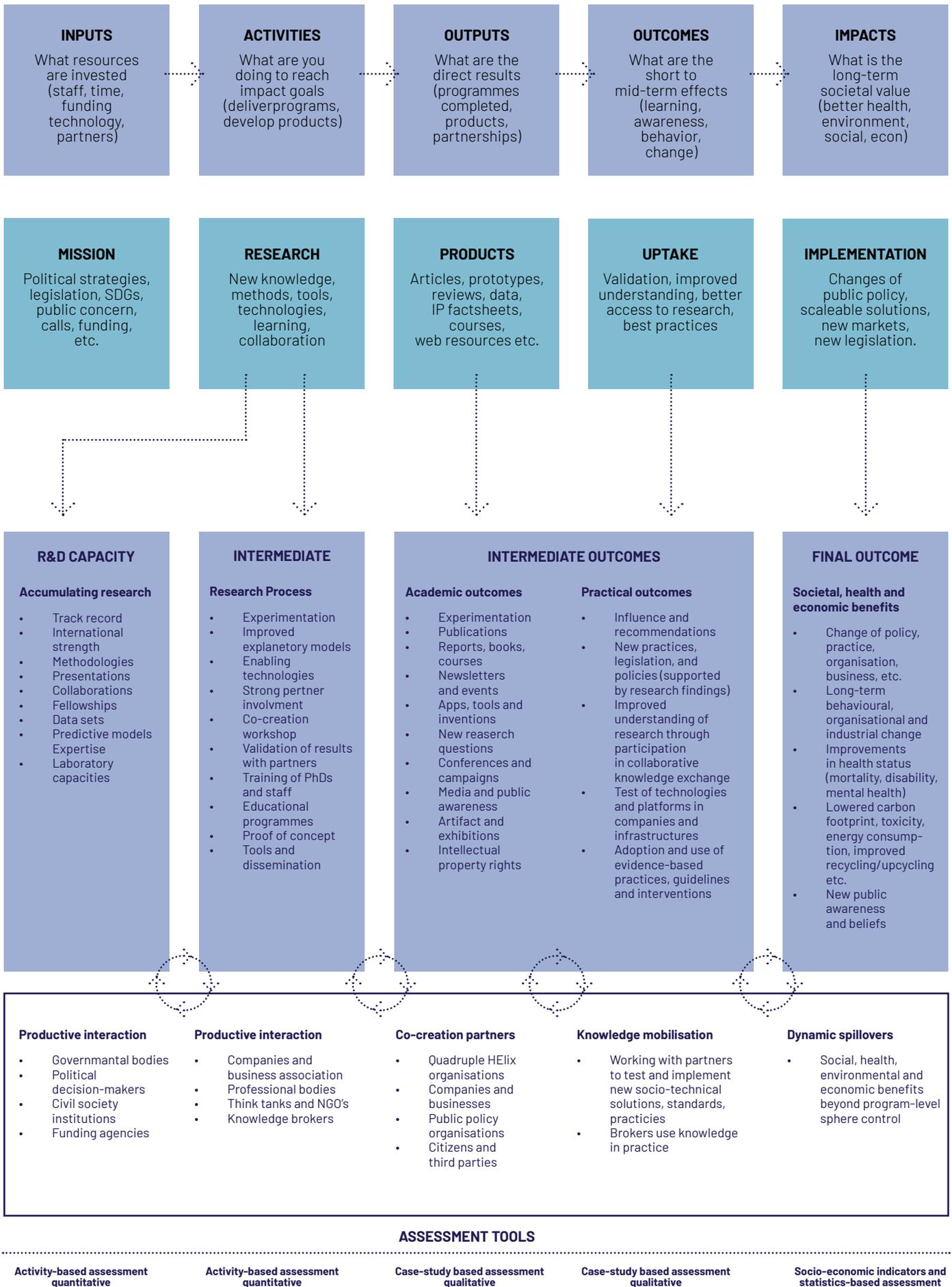
As illustrated in Figure 5, the AAU Mission Impact Model consists of multiple pathways to impact that enable the monitoring of progress. However, different assessment methods are required for different stages. At the first stages (inputs, activities, and outputs), performance can be captured by quantitative metrics, e.g., the number of meetings, partners, activities, events, publications, grants, etc. At the following stages (intermediate outcomes) narrative case studies are more likely to capture the context and key steps in the change process. For these reasons, intermediate outcomes are best captured by impact case studies and qualitative methodologies such as interviews, focus groups, and surveys. Finally, documenting the long-term outcomes and (societal) impact should be based on statistical analysis, indicators, and longitudinal studies.

The AAU Mission Impact Model – as presented here – illustrates the causal relationship between the different stages of the pathway to impact, but it does not say anything about the size of the changes, their significance for society, or the uncertainties and barriers to changes during the pathway. Several tangible and intangible changes may occur as a consequence of mission programmes that need long-term assessment and use of mixed-methods approaches integrating programme-level activity data, outputs, indicators, and case studies. Particular attention should be devoted to identifying and clarifying key impact assumptions together with partners and validating progress throughout the mission lifecycle, adjusting strategy, agenda, and work programme. Monitoring and evaluation of intermediate outcomes will provide mission partners with a tool to steer the partnership towards desirable outcomes, while at the same time accepting that final impacts (desirable as well as undesirable) are the effect of multiple interacting factors.

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<sup>5</sup>The model illustrated in Figure 5 creates a pathway to impact that enables the monitoring of progress. By understanding the goals of each stage of the pathway to impact, it is possible to assess the benefits emerging along the pathway. However, the linearity of the model is a limitation. Linear models of research-use have long been abandoned in favour of more iterative models of research impact that show sustained engagement between researchers and non-academic partner organizations (Nutley, Walter, & Davies, 2007, Greenhalgh & Wieringa 2011). Linear models can give the false impression that research simply is “transferred” to end-users, which is not the case.

**FIGURE 6. AAU MISSION THEORY OF CHANGE**



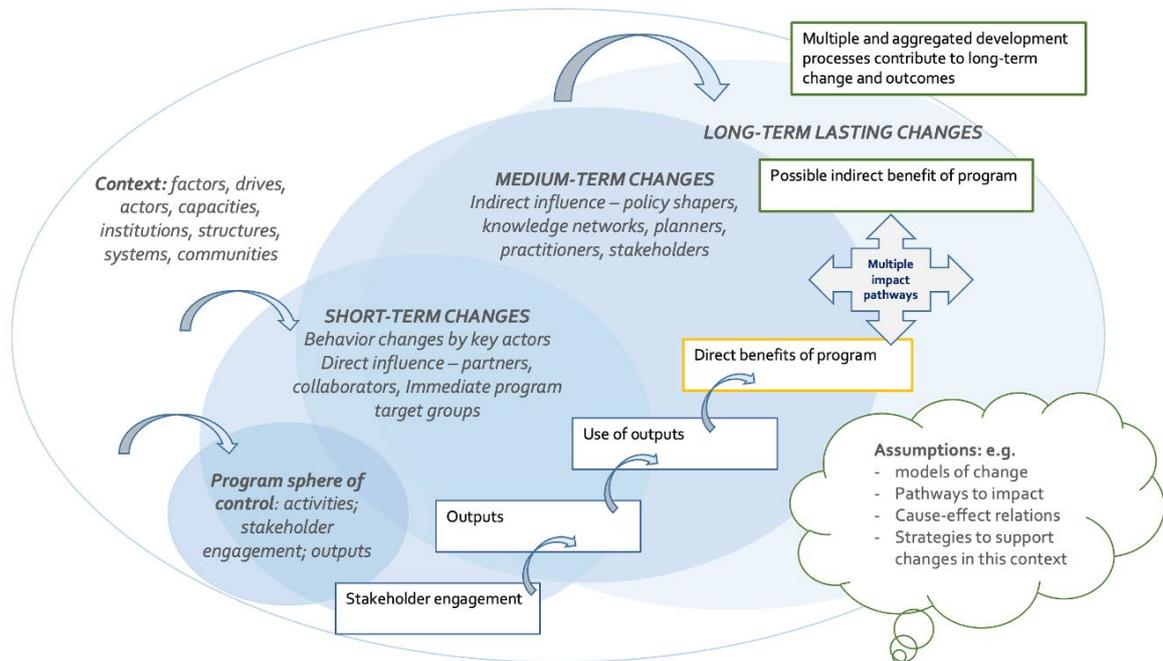


FIGURE 7. THEORY OF CHANGE

### 3.3. THEORIES OF CHANGE

For larger programmes, a single logic model is typically not sufficient, since it may not capture all the nuances and intended changes involved. Hence, the mission programme will benefit from developing a general overarching **Theory of Change (ToC)**, which provides a more long-term and multi-dimensional learning model for the partnership. ToCs are useful because they give researchers, partners, and evaluators a clearer understanding of the connection between long-term objectives and planned inputs, activities and outputs (Christensen 2024, 4). At the same time, a theory of change helps to guide strategic planning and support, while fostering reflections about impact hypotheses and assumptions among key stakeholders.

Developing a ToC should be undertaken collaboratively with mission partners to enhance joint learning, transparency, and accountability towards results. At the same time, the ToC framework makes clear that several interacting

factors may influence the uptake, implementation, and use of research beyond the mission programme. While missions can strive to improve readiness, preparedness and absorptive capacity, the success of missions are not solely the responsibility of university researchers or mission managers but dependent on the joint efforts of organisations and stakeholders who are responsible for mobilising research in practice. Long-term effects and impacts can only be realised if the ecosystem is prepared to use research to create practical, industrial, and policy change.

Based on work at the United Nations Development Programme, Haldrup (2022) gives four reasons for using ToCs as a tool for monitoring and evaluating non-linear mission-oriented programmes that aim at changing complex societal systems and practices. When it comes to selecting the right monitoring and evaluation methods, he encourages evaluators, researchers, and managers to:

- **Learn and adapt:** Because mission partners do not know in advance how to solve complex problems, such as transitioning the economy to a circular model, there is need to continuously learn and adapt based on learning and prior performance.
- **Adopt longer time-horizons:** Evaluators and funding agencies need to deal with the fact that it takes time for substantive change to materialize, and that mission partners do not know up-front what such change looks like. This makes it important to use ToCs to understand if the mission partners are on track and whether they should do anything differently.
- **Capture impact at the aggregate level:** Mission programmes should not evaluate individual interventions. Usually, missions tackle systemic and interconnected challenges through a portfolio of interventions and projects that accumulate effects over time.
- **Focus on contribution over attribution:** Mission partners should focus on capturing their contribution to bigger change processes rather than seeking to attribute impact to particular outputs or results. The contribution of missions to societal change is not linear. Instead, multiple interacting factors are necessary to foster impact. Recognising this, shifts the lens from “attributions” to an understanding of the combined efforts of actors to “contribute” to change.

### 3.4. **REACH, EFFECTIVENESS, ADOPTION, IMPLEMENTATION, AND MAINTENANCE**

Within the field of implementation science, several frameworks have been developed to guide the translation and integration of research into practice, which may inspire further method development. The RE-AIM framework (Reach, Effectiveness, Adoption, Implementation, and Maintenance) was originally developed as a model for consistent reporting of research results and has been used to determine impacts in such diverse fields as health policy, environmental change, children’s mental health, occupational health, and practice-based research.

RE-AIM can be used to translate research into practice and to help guide research programme and improve their chances of leading to “real-world” changes. The RE-AIM framework has also been used to understand the strengths and weaknesses of different approaches to health promotion and chronic disease self-management. The overall goal of the framework is to encourage programme managers, evaluators, and funding agencies to pay attention to essential programme-level elements including external validity that can improve the adoption and implementation of effective, generalisable, evidence-based interventions. The purpose of the RE-AIM framework is to identify and monitor progress across five parameters of impact planning and assessment.

The goal of RE-AIM is to improve assessment and reporting of multi-level factors critical for the delivery and success of interventions (e.g., missions) and address context and external validity issues across the different pathways to impact. For example, defining “reach” early in the mission partnership, includes systematic attempts to include key stakeholders in the partnership, e.g., health organisations, schools,

communities, companies, policymakers etc. Furthermore, the framework helps to identify the relevant practitioners within these settings (e.g., clinicians, teachers, staff, policymakers) who take an interest in the intervention and can help create support for it. The framework takes its original point of departure in clinical research in which it is crucial to consistently include and monitor the commitment to an intervention across patient groups, families, medical staff, and hospital managers. Mission-driven interventions will typically include a broader range of stakeholder – not all of whom can be monitored in the same way as medical interventions. Yet, the framework can help guide mission partnerships towards better and more well-informed goal-setting, effectiveness, implementation, and maintenance of solutions after the original research process is completed. Figure 8 and 9 can be used as a guide for programme managers to check if the different steps towards implementation are aligned. Specifically, the right column can be used as checklist for mission managers to interview, survey, or communicate with key partners.

It is worth noting that successful mission partnership needs specific impact targets, and that these impact targets can be conceptualised and monitored as interventions in the broadest sense of the term. Explicitly using implementation strategies can improve access to mission results, awareness of key findings, and further expand and consolidate the appropriateness and relevance of an intervention to meet the needs of the partners. For some missions, research efforts will be closer to standard clinical interventions, e.g., promoting community health, equity, administering self-management strategies for treatment, reducing consumption of tobacco and alcohol, or reducing anxiety and self-harm. In these contexts, RE-AIM can increase the understanding of access, awareness, appropriateness of the produced research and the success of the intervention strategies adopted (Holtrop et al. 2021).

More than 700 publications have been published that use RE-AIM for impact planning and evaluation. Numerous papers, case studies, and planning

**FIGURE 8. RE-AIM IMPLEMENTATION MODEL**

<p><b>Reach</b> Description of target audience, partners and institutions reached by programme</p>	<p>The number, proportion, and representativeness of individuals who are willing to participate in a given initiative, intervention, or program. Reasons for not participating.</p>	<p>How do the mission reach the targeted partners with the interventions?</p>
<p><b>Effectiveness</b> reported subjective or objective measure related to intermediate outcomes</p>	<p>The impact of an intervention on important outcomes, including potential negative effects, quality of life, and economic outcomes. Heterogeneity of effects and reasons for success or lack of such.</p>	<p>How do mission partners know their interventions are effective?</p>
<p><b>Adoption</b> Qualitative and quantitative measures of contextual factors related to adoption</p>	<p>The number, proportion, and representativeness of a) partnering organisations (Partners who actively participate in the mission) and b) who support the mission. REasons for adoption or non-adoption.</p>	<p>How do mission partners develop organisational support to deliver the interventions?</p>
<p><b>Implementation</b> multi method assessment for capturing implementation and adaption</p>	<p>At the planning stage, implementation refers to the intervention agents' commitment to the various elements of an intervention's protocol, including consistency of delivery and the time required. At the individual level, implementation refers to clients' use of the intervention and implementation.</p>	<p>How do mission partners ensure that interventions are delivered properly?</p>
<p><b>Maintenance</b> Data on outcomes post intervention and long-term outcomes and improvements</p>	<p>The extent to which: a) behavioural, policy, or industrial change is sustained after intervention; and b) a program or policy becomes institutionalized or part of the routine organizational practices and policies. Including assessment of continuation of the intervention and reasons for maintenance/discontinuance.</p>	<p>How do mission partners incorporate interventions in lasting organisational changes?</p>

**FIGURE 9. RE-AIM CHECK-LIST**

RE-AIM Dimension	Key priorities to consider and answer
<b>Reach (individual level)</b>	Who is (was) intended to benefit and who actually participates or is exposed to the 'mission' or intervention?
<b>Effectiveness (individual level)</b>	What is (was) the most important benefit the team was trying to achieve and what is (was) the likelihood of negative outcomes?
<b>Adoption (Setting levels)</b>	When will (was) the programme become operational? How long will (was) it be sustained? How long are the results sustained (individual level?)
<b>Implementation (Setting levels)</b>	How consistently are (were) programme results or interventions delivered? How will (were) they adapted? How much will (did) it cost? Why will (did) the results come about?
<b>Maintenance (Individual &amp; setting levels)</b>	When will (was) the programme become operational? How long will (was) it be sustained? How long are the results sustained (individual level?)

toolkits are openly available at the website: [www.re-aim.org](http://www.re-aim.org). The website serves as a repository of various resources and tools including self-assessment reports, checklists, figures, tables, measures, and recommendations that can facilitate the application of RE-AIM across diverse interventions and settings.

### 3.5. NORMALIZATION PROCESS THEORY

Normalization Process Theory is a sociologically informed theory that can be used to understand the dynamics of implementing, embedding, and integrating new technologies and science-based interventions in real-world settings. The framework is grounded in “action theory”, which is concerned with explaining what people do rather than their attitudes, assumptions, or beliefs. In that sense, it differs from Theories of Change, which evolve around identifying and articulating impact assumptions. Normalization Process Theory consists of different so-called “constructs” that represent generative mechanisms of social action. Each construct represents different kinds of actions that people do as they implement a set of new practices, whether this is a new technology, policy, or behavior. The constructs are:

1. **Coherence** which emphasises the work individuals and collectives put into sense-making when they are faced with the problem of operationalizing a set of new practices. How much time and effort do they spend on understanding, translating, and implementing new practices?
2. **Cognitive participation** describes the relational work that people do to build and sustain a ‘community of practice’ around a new technology or evidence-informed intervention.
3. **Collective action** refers to the operational work that individuals or organizations do to enact a set of new practices, whether these are new technologies or evidence-informed interventions.
4. **Reflexive monitoring** includes the appraisal work individuals or organisations do to assess and understand the ways that a new set of practices affect them and others around them.

By using these constructs to develop systematic stakeholder surveys, Normalization Process Theory can provide valuable information about the degree to which evidence-informed interventions (such as mission programmes) become routinely embedded (integrated) in organisational and professional practices as the result of people actively working to implement them. Embedding an intervention in practice is the product of concrete social actions (the things people do), not necessarily people’s attitudes (how they think what they do), or their intentions (what they say they do). The four constructs can help evaluators and programme managers understand how integration of an interventions requires investment by individuals and organisations through a series of interconnected actions that ensures real-world implementation. It is not enough to adopt and diffuse an intervention: people need to keep investing in it and making it work in practice (Finch et al. 2015). This can be monitored and surveyed.

Normalization Process Theory has led to the development a measurement tool: the Normalisation MeASURE Development questionnaire (NoMAD), which consists of 20 survey items for assessing implementation processes from the perspective of professionals involved in implementation of new technologies or evidence-informed interventions (see Figure 10). For example, the survey items can be used to describe participants’ investment and work with interventions, their expectations about whether it could become a routine part of their work, and its prospective impacts. The implementation assessment questionnaire can be used as a way of improving implementation by identifying areas that need further work. For example, the responses may indicate that the intervention “makes sense” to participants (coherence) but that specific aspects of engagement (cognitive participation) appear low, suggesting that further efforts should be targeted at broadening participation, or working to create a stronger commitment from partnering organisations.

## FIGURE 10. NORMALIZATION OF MISSION OUTCOMES MEASUREMENT INDEX

Adapt the questionnaire to the purpose of the mission programme by specifying the (intervention) Finch et al. 2015

	I disagree	I somewhat disagree	Neither agree or disagree	I somewhat agree	I agree
1. I can distinguish (the intervention) from usual ways of working	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Staff in this organisation have a shared understanding of the purpose of (the intervention)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I understand how (the intervention) affects the nature of my own work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I can see the potential value of (the intervention) for my work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. There are key people who drive the delivery of (the intervention) forward	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I believe that participating in (the intervention) delivery is part of my role	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I am open to working with colleagues in new ways to use (the intervention)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I will continue to support (the intervention)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I can integrate (the intervention) delivery into my existing work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. (The intervention) delivery disrupts working relationships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I have confidence in other's ability to use (the intervention)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Work is assigned to people with skills appropriate for (the intervention)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Sufficient training is provided to enable staff to implement (the intervention)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Sufficient resources are available to support (the intervention)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Management adequately supports (intervention) delivery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I am aware of reports about the effect of (the intervention)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. The staff agree that (the intervention) is worthwhile	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I value the effects of (the intervention) has on my work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Feedback about (the intervention) can be used to improve it in the future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. I can modify how I work with (the intervention)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The NoMAD assessment survey instrument needs to be customised to the specific objectives of the mission and the appropriate target respondents. This includes adding a specific introduction to the survey about the relevant intervention, adding relevant questions about the respondents' roles, and potentially including additional general questions about the intervention that you are also interested in. Programme managers should also decide who should complete the survey and who to involve among the partners. The template is useful for providing a general assessment of participants' experience and expectations to the implementation process. After having received answers from survey respondents, it is possible to conduct statistical analyses, look for patterns, and identify venues for improvement, adjustment of strategy, and highlight workflows that need attention. For example, tables summarising the frequency of responses to items can indicate where participants are providing more positive or negative responses<sup>6</sup> NoMAD is freely available and can be adapted for use in research and mission projects. To access it, visit the website: [www.implementall.eu](http://www.implementall.eu)

<sup>6</sup> For an example of a more advanced analysis based on survey results, see Finch (2018). In this representation, the different survey items are divided by the aforementioned "constructs", corresponding to coherence (item 1-4), cognitive participation (item 5-8), collective action (item 9-15) and reflective monitoring (item 16-20).

### 3.6. RESEARCH INDICATORS AND INCENTIVES

A substantial part of what has been described in the prior sections hinges on the availability of data and indicators that can track and support mission-driven research activities. Closely related to impact assessment is the question of incentives and rewards. This is a hot topic in contemporary research management since incentives are the “nuts and bolts” of encouraging researchers to produce desirable outcomes. For many years, career promotion, research funding, and academic reputation were almost exclusively associated with publication records and publication-centric metrics. Academics who publish most and accumulates most citations have typically been selected for jobs and funding. There are natural reasons for this, among others, that publications are highly valuable channels for communicating research.

However, with the emerging landscape of mission-driven universities, incentives solely driven by publications, pose a challenge. First, publications are simply not the most important outcome of mission partnerships. Publications may be relevant and may be encouraged to present mission results and outcomes. But missions are not -- and cannot be -- driven by publishable results. Many outputs, outcomes, and impacts of mission programmes need to be communicated in other forms, such as data-sheets, websites, catalogues, recommendations, policy briefs, instructions for practitioners, events, and learning materials. Only a fraction of the total output from missions will be captured by academic publications (no matter how important, academic publications are for scientific credibility).

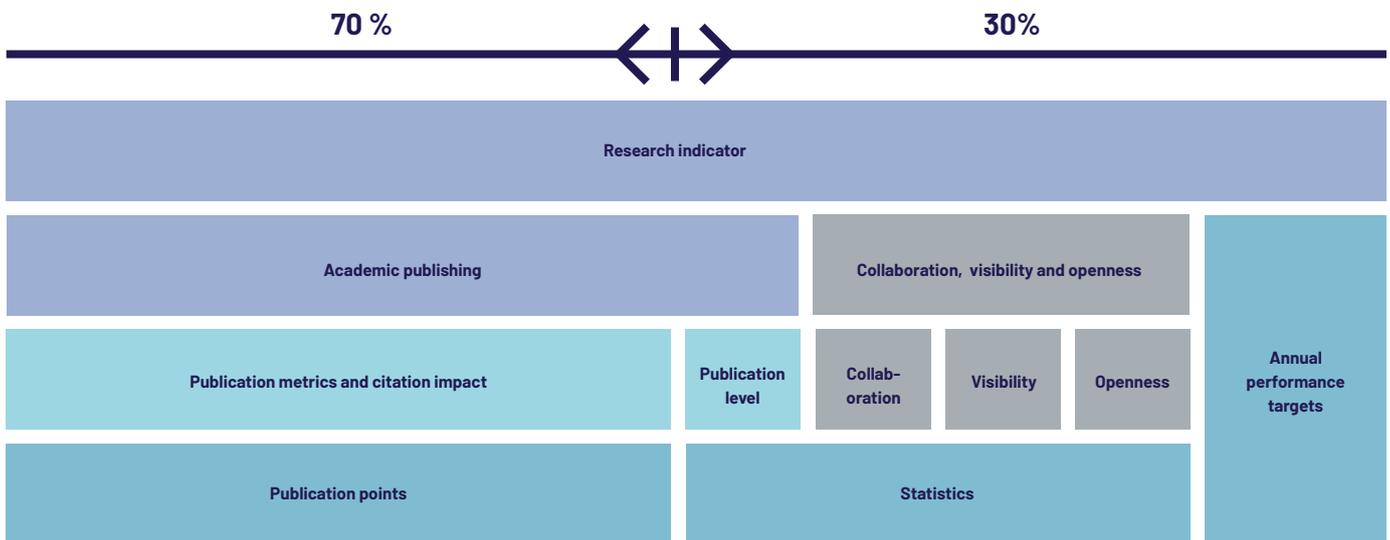
Second, the ambitions to publish academic papers needs to be balanced with the ambition to create **societal impact**. Not only can societal impact not be traced or assessed using publication records. Activities that promote impact needs to be part of the incentive structure in order to receive proper recogni-

tion from universities and funding agencies. To promote research-for-impact also means to **promote research careers** and **incentive structures** that actively encourage researchers to spend time on missions, e.g., engaging with partners, defining joint research agendas, participating in co-creation workshops, advising policymakers, testing products with industry, and developing actionable and lasting solutions. Much of this work will not be captured – or incentivised – by research publications.

As an example, Aalborg University has develop a new research indicator that replaces the Danish Bibliometric Research Indicator terminated by the Ministry of Higher Education and Science in December 2021. The AAU Research Indicator retains several elements of the previous BFI indicator but also includes several new elements for assessing mission-driven research teams and advancing European research assessment reforms.

In addition to accounting for peer-reviewed journal articles (and other traditional academic outputs, such as book chapters, monographs, etc.), the indicator also rewards collaboration with external stakeholders and societal impact where research has contributed to changing practice. The AAU indicator consists of two parts, weighted 70 and 30 percent, respectively. Part A focuses on scientific publications and is based on bibliometric methods, i.e. publication points based on publication type and citations. Part B looks at research impact distributed across three dimensions: Collaboration, Visibility and Openness (see Figure 11).

Part B is designed to be compliant with the EU Commission’s agreement document Agreement on Reforming Research Assessment (ARRA), and the formation of the **Coalition for Advancing Research Assessment** (CoARA). In a background report by the Working Group several examples are provided for how ‘Collaboration, Visibility and Openness’ are measured for each department. How strong a department is at collaborating is measured, for example, by the number of collaborative projects and activities. ‘Visibility’



**FIGURE 11. AAU RESEARCH INDICATOR**

is measured by the number of media mentions and records of ‘societal impact’ registered in the central university database (PURE), and ‘Openness’ is assessed using the proportion of a department’s scientific publications that are available via Open Access, i.e. published in journals where all content is freely available to the public (Stoustrup et al. 2023).

The basic idea here is that each department needs to define targets for each of the three parameters and that the department can choose to focus on specific targets which are part of its strategy. Such decisions, and the data supporting them, are defined in annual performance contracts and should aim at reflecting different disciplinary differences and positions of strength. Data sources are comprised of quantitative (bibliometric data, activity data, and other sources) and qualitative data and impact case studies. In accordance with the guidelines of CoARA and DORA the resulting metrics and performance records are not used for individual review (and are not related to ‘Journal Impact Factors’) but aim at assessing programme- and department-level performance. Metrics should include a diversity of publication types and dissemination pathways to stimulate and incentivise openness, transparency, and inclusion of stakeholders, including time spent on teamwork and external collaboration.

### COMMON FEATURES OF IMPACT FRAMEWORKS

Mission managers and researchers may find it difficult to develop measures of implementation that are sufficiently precise and predictive for impact. There will be many uncertain variables and uncontrolled factors in any mission. Yet, planning and assessing impact through carefully considered interventions is what missions are about. Assessment and implementation tools can help guide missions towards planned outcomes and – importantly – help participants to modify and adjust the research strategy as they move forward. Learning is at the central stage of effective impact management.

Common for the frameworks discussed in this section is that they focus on:

1. Creating observable and demonstrable change based on individual and collective actions.
2. Enhancing the learning capabilities of mission partners, stakeholders, and funders.
3. Incorporating new technologies and evidence-based solutions in new practices.
4. Increasing the problem-solving capacity and collective agency among partners.
5. Providing monitoring and evaluation devices to track impact and end-effects.

In conclusion, impact planning and assessment in mission research programmes should be driven by a “capability approach” evaluating the enhanced adaptive learning of partners, the strategic capacities obtained through the partnership, and the habitual integration of results from interventions and experiments into routine practices. Impact management and assessment tools help project participants think beyond research outputs and consider the broader implications of their work. It compels researchers and partners to articulate the intended impacts and establish pathways between their research and desired outcomes.

In this way, tools such as logic models, theories of change, and implementation frameworks can help mission participants make underlying assumptions more explicit and develop tailored plans for project management, delivery, and impact. The tools presented in this section are supposed to inspire – and challenge – mission managers, researchers, and partners to identify key impact assumptions and determine effective impact pathways based on collective action.

### **BOX 8. OECD SURVEY CALLS FOR BETTER IMPACT METRICS**

In a survey conducted by the OECD in collaboration with Danish Design Center in 2022, data was collected among a total of 227 individuals to understand gaps, needs, and challenges working with mission-oriented innovation.

Some of the key challenges mentioned by the respondents include collecting data and insights from mission projects to feed back to the mission work programme, e.g., when developing new projects, initiatives, and experiments.

Among key methodological challenges, a majority of respondents (N: 132) mentioned that they “lack evaluation tools for missions” and they “lack tools to align actions across the ecosystem (e.g. co-creation)” (OECD 2022, 27).

Implementation assessment frameworks, such as RE-AIM, can help to address this need. Assessment tools, such as RE-AIM and NoMAD (see below) provide programme managers and researchers with adaptable tools to manage and evaluate implementation processes embedded within complex social systems. Similar to mission programmes, implementation processes are non-linear, dynamic, and emergent. They involve complex interactions between actors and their social contexts.

# 4. CONCLUSION

This guidebook has described some of the central features and drivers of the shift towards mission-driven universities. At Aalborg University, a number of selected missions have been identified and adopted by the University Board of Governors. They share a common commitment to work on complex inter-connected problems, such as the transition to human-centric energy systems and improved well-being among children and youth in Denmark (see: <https://www.missions.aau.dk>). In partnerships with companies, civil society, public-sector authorities, the university seeks to take advance of its strong tradition for creating sustainable solutions.

This guidebook has provided recommendations and conceptual frameworks for how universities can work with partners from civil society, industry, and policy, and at the same time assess and incentivise work at the interface between science and society. The guidebook calls for a unified and holistic approach to mission-driven universities according to which support, funding, management, evaluation, and rewards are aligned to create impact.

The guidebook is occupied with the central question: how can transformative, mission-oriented research make a difference in society? For mission partnerships to succeed, stakeholders need to engage from the beginning, co-designing research projects, influencing research priorities, and assessing intermediate outcomes, while experimenting and adopting them in practice. To be successful, mission partnerships should include a wide range of influential stakeholders, including policymakers and decision-makers at all levels, relevant leaders from industry, funding agencies, the non-profit world and civil society at large. When missions work well, the research agenda is not driven by scientists or science funders alone but is co-created with societal partners. The number and specific characteristics of societal partners will vary by mission but should include a variety of disciplines and sectors.

Realising the full potential of mission-oriented research and innovation requires bold, strategic, and collaborative action from university leaders, researchers, and science funders. The planning, partnership, and evaluation models presented in the guidebook are rooted in the realisation that mission programmes cannot transform complex social systems through business-as-usual approaches. Rather, universities need to step out of traditional, linear modes of planning, monitoring, and research management, and create supportive institutional arrangements for systemic change. Delivering measurable results should be based on a strong commitment of the involved partners to step up the pace of their efforts. This calls for courage. And commitment.

Read more about the missions and follow the launch of mission programmes at Aalborg University at [www.missions.aau.dk](http://www.missions.aau.dk)

# 5. GLOSSARY

**Guidebook** is a document that gives information about a place, such as a city, region, or country. Guidebooks usually start with an introduction to the area. The introduction sketches the main characteristics of the place. Often, this sketch is followed by more background information and a step-by-step outline of how to navigate the area. In this report, the term guidebook is used to guide evaluators of national science-for-policy ecosystems. The term is used interchangeably with report.

**Impact assessment** is a term used in the guidebook to describe a unified set of guidelines, principles and indicators used for monitoring and evaluation of research-for-impact. An impact assessment framework entails a comprehensive account of the activities, plans, and actions taken by the mission partnership to conduct a coherent and valid evaluation of societal impact. The term evaluation framework is used interchangeably with assessment framework, evaluation design, evaluation process etc.

**Inter-, multi-, and transdisciplinary research** are used in the policy and academic literature to designate different forms of research collaboration. Interdisciplinary typically refers to the integration of different perspectives and scientific models from two or more disciplines. Multidisciplinary research refers to the coordination and collaboration between disciplines. Transdisciplinary research describes constellations in which external (non-academic) partners participate actively in the collaboration.

**Knowledge mobilisation** is a term broadly used in the academic literature to describe the circulating, integration, and implementation of research-based knowledge in practice. Knowledge mobilisation strategies can help researchers share their research with the people who can use it. It is about sharing knowledge between different communities to create new knowledge to catalyse change. Knowledge mobilisation strategies should be integrated throughout your research programme. It involves a two-way dialogue between researchers and research-

users so that knowledge can be shared to create new knowledge to catalyse change.

**Mission-oriented research** refers to goal-oriented and solutions-focused, research programmes conducted for a limited period until a substantial challenge has been addressed. Missions are of significant size, scope, and ambition; and while focused on a clearly defined topic, question, or goal, require inter and transdisciplinary collaboration: the input from a wide range of stakeholders, integration across disciplines, the development of applied as well as basic research and direct engagement with policy and practice professionals.

**Qualitative and quantitative methods** refer to two distinct analytical and scientific approaches to studying the social reality. Quantitative research is often used to test hypotheses, identify patterns, and make predictions across smaller or larger numerical datasets and outputs. Qualitative research, on the other hand, is based on non-numerical data and focuses on exploring subjective experiences, opinions, and attitudes, often through observation and interviews.

**Science-for-policy ecosystem** is a metaphor adapted from biophysical ecosystems in which individual components, functions, and mechanisms interact in dynamic and emergent ways. Likewise, a national ecosystem of science for policy consists of an interlinked set of institutions, structures, mechanisms, and functions that interact at different levels to provide scientific evidence for policy. The term is used interchangeably with 'advisory ecosystem' and 'evidence ecosystem'.

## 5. APPENDIX: LIST OF MISSION INITIATIVES

By: *Ulrikke Dybdal Sørensen & Rolf Hvidtfeldt*

This appendix provides an overview of international mission programmes, organisations, calls, and strategies. Only programmes that support actual missions are included. The collection is based on desk research from websites, calls, strategies, and white papers.

### **Global Call on Science Missions for Sustainability**

The International Science Council and Global Commission on Science Missions for Sustainability seek novel, innovative, collaborative, and diverse consortia to co-design and embark on ground-breaking Science Missions to tackle complex sustainability challenges. The goal is to develop fully actionable, integrated, and engaged research missions, aiming at solutions that match the scale of humanity's most critical challenges. Realizing this by 2030 demands immediate recalibration of global and national science priorities focused on sustained, collaborative, and significantly expedited actions.

The Global Call select up to five Pilot Missions to test and refine the transformative model by thoroughly examining the execution, outcomes, and impact. These Pilot Missions are envisioned as beacons of transdisciplinary collaboration, accelerating progress towards the SDGs, and catalysing a shift towards sustainable societal models. The aim is to secure up to \$250,000 per Pilot Mission in the 18-month co-design phase.

Read more:

[council.science/mission-science/](https://council.science/mission-science/)

### **German High-Tech Strategy 2025**

The German High-Tech Strategy (HTS) provides a framework for Germany's Federal Government's research-, technology, development- and innovation-oriented policies since 2006. Its

objectives are adapted to refocus on emerging and strategic needs with every new legislation period. The High-Tech Strategy focuses on tackling grand challenges by following a mission-based approach focusing on for example achieving substantial greenhouse gas neutrality in industry and creating sustainable circular economies. Thus, one of the main goals for the HTS 2025 is to enable industry to achieve greenhouse gas neutral emissions by 2045. The HTS 2025 defines 12 long-term missions to be accomplished as a concerted effort across almost all federal ministries to tackle major six global challenges: 'Healthcare', 'Sustainability, Climate Action and Energy', 'Mobility', 'Urban and Rural Areas', 'Safety and Security', and 'Economy and Work 4.0'. The HTS is an umbrella for many activities and individual initiatives, which makes it unfeasible to provide precise budget figures for the ongoing period. The implementation of each mission is financed by thematically relevant funding programmes, administered by the respective departments. However, as for the 2010 HTS, EUR 14.7 billion were spent under HTS which does not include expenses for military science. The HTS is implemented by all respective federal ministries in Germany, while the Ministry of Education and Research is in charge of coordinating all activities. Leadership is also ensured via the High Tech Forum that maintains a regular dialogue with the parliament in expert panel meetings.

Read more:

[www.bmbf.de/SharedDocs/Publikationen/de/bmbf/FS/657232\\_Bericht\\_zur\\_Hightech-Strategie\\_2025\\_en.pdf?\\_\\_blob=publicationFile&v=2](https://www.bmbf.de/SharedDocs/Publikationen/de/bmbf/FS/657232_Bericht_zur_Hightech-Strategie_2025_en.pdf?__blob=publicationFile&v=2)

### **Mission-oriented Innovation by VINNOVA Sweden**

Vinnova is Sweden's innovation agency, responsible for promoting sustainable growth by funding research and innovation projects. It is constituted as a part of the Swedish Ministry of Climate and Enterprise and is also the national contact authority for the EU framework programme for research and innovation. Vinnova has identified a number of missions based on societal challenges and opportunities where

innovation can make a significant impact. Missions are aligned with national and global agendas such as sustainability, digitalization, health, climate change, and urban development. Vinnova aims to ensure that Sweden is an innovative force in a sustainable world through focusing on eight areas that are vital in creating a sustainable society. The goal of mission-oriented innovation is to achieve long-term societal impact rather than short-term gains. For example, The Sustainable Mobility Mission has the goal of ensuring that every street in Sweden is “healthy, sustainable, and vibrant” by 2023. Every year, Vinnova invests approximately SEK 3.5 billion in research and innovation. As a part of the mission programme the agency has developed a 300-page mission playbook *Designing Missions for working with mission-oriented innovations*.

Read more:

[www.vinnova.se/en/our-activities/changing-for-a-sustainable-future/](http://www.vinnova.se/en/our-activities/changing-for-a-sustainable-future/)

### **EU Horizon Europe’s Mission Programme**

EU Missions is a coordinated effort by the European Commission to combine research and development with the necessary resources in terms of policies and regulations to create societal change. The aim of the EU Missions is to mobilise and activate public and private actors, such as EU Member States, regional and local authorities, research institutes, farmers and land managers, entrepreneurs, and investors to create real and lasting impact. Missions engage with citizens to boost societal uptake of new solutions and approaches and support the priorities of the Commission. Each mission programme operates as a portfolio of projects and actions – such as research programmes, policy measures, and even legislative initiatives – to deliver concrete results by 2030. For example, the EU Mission for Adaptation to Climate Change should result in supporting at least 150 European regions and communities to become climate resilient by 2030, or the mission A Soil Deal for Europe with the goal of 100 living labs and lighthouses to lead the transition towards healthy soils by 2030. Each mission has a

Mission Manager, a dedicated Mission Board, and a Mission Assembly that help specify, design, and implement specific missions in Horizon Europe.

Read more:

[research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe\\_en](https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe_en)

### **South Korean Care Robot Programme**

The Korean Care Robot Programme, also known as the Translational Research Program for Care Robots, is an initiative launched by the South Korean government to advance the development and deployment of robots for elderly care and healthcare applications. The program aims to address demographic challenges posed by an ageing population and the increasing demand for caregiving services. The primary objective of the program is to develop and commercialize robotic technologies that can assist and support elderly individuals in their daily activities, improve their quality of life, and alleviate the burden on caregivers. The program also seeks to stimulate innovation in the robotics industry and enhance Korea’s competitiveness in this field. The programme is organised under the auspices of the South Korean government, Ministry of Health and Welfare, National Rehabilitation Center Research Institute jointly with the Ministry of Trade, Industry and Energy.

Read more:

[www.nrc.go.kr/eng/html/content.do?depth=n\\_ri&menu\\_cd=02\\_03\\_05](http://www.nrc.go.kr/eng/html/content.do?depth=n_ri&menu_cd=02_03_05)

### **UK Industrial Strategy Challenge Fund**

The Industrial Strategy Challenge Fund (ISCF), managed by UK Research and Innovation (UKRI), is aimed at propelling research and innovation to tackle the UK’s primary industrial and societal challenges. The goal is to contribute to reaching net zero carbon emissions by 2050 but also to transform existing industries and creating entirely new ones. The UKRI Challenge Fund is multi-billion-pound investment delivered by UK

Research and Innovation and is backed by £2.6 billion of public money, with £3 billion in matched funding from the private sector. The Challenge Fund addresses large-scale societal challenges in UK businesses focused on 23 challenges, covering the four themes of the government's industrial strategy: Clean growth – supporting the development of low-carbon technologies for clean growth; Ageing society – supporting innovation in health technologies, therapies, and treatment; Future of mobility – improving transport technologies and reducing the UK transport footprint; and Artificial intelligence and data economy – aiming to drive development in AI, machine learning, and the data economy.

Read more:

[www.ukri.org/what-we-do/ukri-challenge-fund/](http://www.ukri.org/what-we-do/ukri-challenge-fund/)

### **US ARPA-E Programme**

The Advanced Research Projects Agency-Energy (ARPA-E) is a United States government agency tasked with promoting and funding research and development (R&D) projects aimed at advancing energy innovation and addressing energy-related challenges. ARPA-E is a part of the U.S. Department of Energy. The agency periodically issues challenges and competitions to spur innovation in specific areas of energy technology focused on overcoming technical barriers around specific energy areas. These challenges (missions) offer financial incentives and support to teams or organizations that can develop breakthrough solutions to important problems in energy creation, distribution, and use. The primary objective of ARPA-E's challenges is to catalyse breakthroughs in energy technology that can lead to significant improvements in energy efficiency, renewable energy generation, energy storage, grid resilience, and other areas critical for the transition to a sustainable energy future.

Read more:

[arpa-e.energy.gov/](http://arpa-e.energy.gov/)

### **Netherlands' Mission-driven Top Sectors**

The Netherlands' top-sector policy embraces a mission-driven approach, where cross-cutting societal challenges and goals guide innovation and investment efforts. These missions are ambitious, long-term objectives aimed at addressing pressing societal issues such as climate change, health, sustainability, and digitalization. The Programme addresses 25 missions across the 4 key societal areas. The Top Sector Policy Programme provides a framework to coordinate budgets and activities of various participating public bodies in each of the four societal challenge areas: Energy transition and sustainability, Agriculture, water and food, Health and healthcare, and Security. All four areas have a clear goal set to be achieved by a fixed date. For example, for Health and healthcare: By 2024 all Dutch citizens will live at least five years longer in good health while the health inequalities between the lowest and highest socio-economic groups will have decreased by 30%. The policy is led by the Dutch Ministry of Economic Affairs and involves a range of other authorities across various policy fields for its development and implementation, in close interaction with industry. It is revised every 4 years.

Read more:

[stip.oecd.org/covid/moip/case-studies/3](http://stip.oecd.org/covid/moip/case-studies/3)

### **Australian Genomics Health Futures Mission**

The Australian Genomics Health Futures Mission (GHFM) is a significant national initiative aimed at utilizing genomic information and technologies to improve healthcare outcomes for Australians. The mission focuses on integrating genomics into clinical care and research to better understand diseases, develop personalized treatments, and enhance preventative strategies. The objective of the GHFM is to deliver better diagnostics and targeted treatments, avoid unnecessary health costs, and improve patient experience and outcomes. This will be achieved through partnership with state and governments as well as public and private entities in healthcare. The goal of the GHFM is to save or transform the lives of over 200,000 Australians through genomic

research for better testing, diagnosis, and treatment. GHFM is the centrepiece of the Australian Government's 1.3 billion AUD National Health and Medical Industry Growth Plan that was announced in May 2018. The mission attracts 500 million AUD for a 10-year period.

Read more:

[business.gov.au/Grants-and-Programs/Genomics-Health-Futures-Mission-Projects-Grants](https://business.gov.au/Grants-and-Programs/Genomics-Health-Futures-Mission-Projects-Grants)

### **Japan Moonshot Research and Development Programme**

The Japanese Moonshot R&D Programme focuses on addressing a range of challenges across various domains, including healthcare, environmental sustainability, disaster prevention, mobility, and digital transformation. It promotes high-risk/high-impact research aiming to achieve ambitious Moonshot Goals and solve issues facing future society such as super-aging populations and global warming. The goals are ambitious, set to achieve transformative breakthroughs, and are characterized by scale, complexity, and impact. Examples of Moonshot Goals include the realization by 2050 of a society in which humans can be free from limitations of body, brain, space, and time, or the creation of an industry that enables sustainable global food supply by exploiting unused biological resources. A five-year fund of Yen 100bn (about Euro 815 million) was created in 2018, to which Yen 15bn (about Euro 122 million) were added in 2019. Funds originate from MEXT (Yen 80 billion) and METI (Yen 20 billion). The whole programme is meant to last at least 5 years.

Read more:

[www.jst.go.jp/moonshot/en/index.html](https://www.jst.go.jp/moonshot/en/index.html)

### **US Cancer Moonshot**

The US Cancer Moonshot Programme is a White House initiative from President Biden that mobilize an American national effort and commitment to making progress and to leverage the whole-of-government approach and national response that the challenge of cancer demands.

It represents a concerted effort to reimagine cancer care and research, with the overarching goal of reducing the deadly impact of cancer, enhancing the lives of those affected by this disease, and improving patient experiences in the diagnosis, treatment, and survival of cancer. Central to the Moonshot's mission is the mobilisation of resources and expertise to revolutionise cancer prevention, diagnosis, treatment, and survivorship. The mission aims to prevent over four million cancer deaths by 2047, to improve the experience of people who are touched by cancer and, over the next 25 years, cut today's age-adjusted death rate from cancer by at least 50 percent. The Moonshot unites various federal agencies under the leadership of a Cancer Cabinet, convened by the White House, to synergise efforts. With collaboration across multiple federal agencies, including the National Institutes of Health (NIH), the National Cancer Institute (NCI), the Food and Drug Administration (FDA), and the Department of Defense (DoD), it aims to leverage the expertise and resources of various agencies to advance cancer research and innovation.

Read more:

[www.whitehouse.gov/cancermoonshot/](https://www.whitehouse.gov/cancermoonshot/)

### **Innomissions Denmark**

The Innomissions consist of four partnerships led by Innovation Fund Denmark (IFD). The investments in mission-driven partnerships aim to accelerate the development of breakthrough green solutions through research that spans from strategic research to commercialisation. The four green partnerships bring together the country's top researchers, companies, and organizations to bring Denmark to the forefront in the field of storage and use of CO<sub>2</sub>, Power-to-X, climate- and environment-friendly agriculture, and food production, as well as a circular economy with a focus on plastics and textiles. The purpose of the Innomission programme is to accelerate the development of cutting-edge solutions to societal challenges, with an equal focus on short-, mid- and long-term impact. The missions' overall goal is to contribute to a 70% reduction in

greenhouse gas emissions in Denmark by 2030 and net-zero emissions by 2050 as well as to increase the competitiveness of Danish companies and industry. In the agreement on the research reserve 2021, the government together with the other parties in the Danish Parliament set aside a total of DKK 700,000,000 for the establishment of green research and innovation partnerships that fulfil the specific missions.

Read more:

[innovationsfonden.dk/da/p/innomissions](https://innovationsfonden.dk/da/p/innomissions)

Read more: [www.regjeringen.no/en/dokumenter/meld.-st.-5-20222023/id2931400/?ch=1](https://www.regjeringen.no/en/dokumenter/meld.-st.-5-20222023/id2931400/?ch=1)

### **Norwegian Long-Term Plan for Research and Higher Education 2023–2032**

The Norwegian government introduced missions as a policy instrument in their long-term plan for research and higher education 2023–2032. The Government wishes to contribute to research-based knowledge being used to solve the concrete problems that are the challenges of the current age. The missions are intended to contribute to new innovations and technological solutions being implemented and to ensure close collaboration between research, higher education, and relevant stakeholders to reach the goals. They are formulated in relation to the thematic priorities: Security, Climate and loss of natural diversity, Energy, Trust, and Demographics. The government proposes two social missions: one on sustainable food in aquaculture, i.e., food for farmed fish and livestock should in the future come from sustainable sources, thus reducing greenhouse gas emissions from food systems. The second mission is about the inclusion of children and young people in education, employment, and society, and aims to reduce the proportion of young people not in education or work or taking part in society through cross-sectoral and targeted efforts geared towards factors for a good childhood. A third mission has later been added in the political negotiations and adaptation of the long-term strategy, which centres on Circular Economy. The Norwegian mission programme seeks to develop new and targeted social missions in the further planning period within green transition and growth.

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