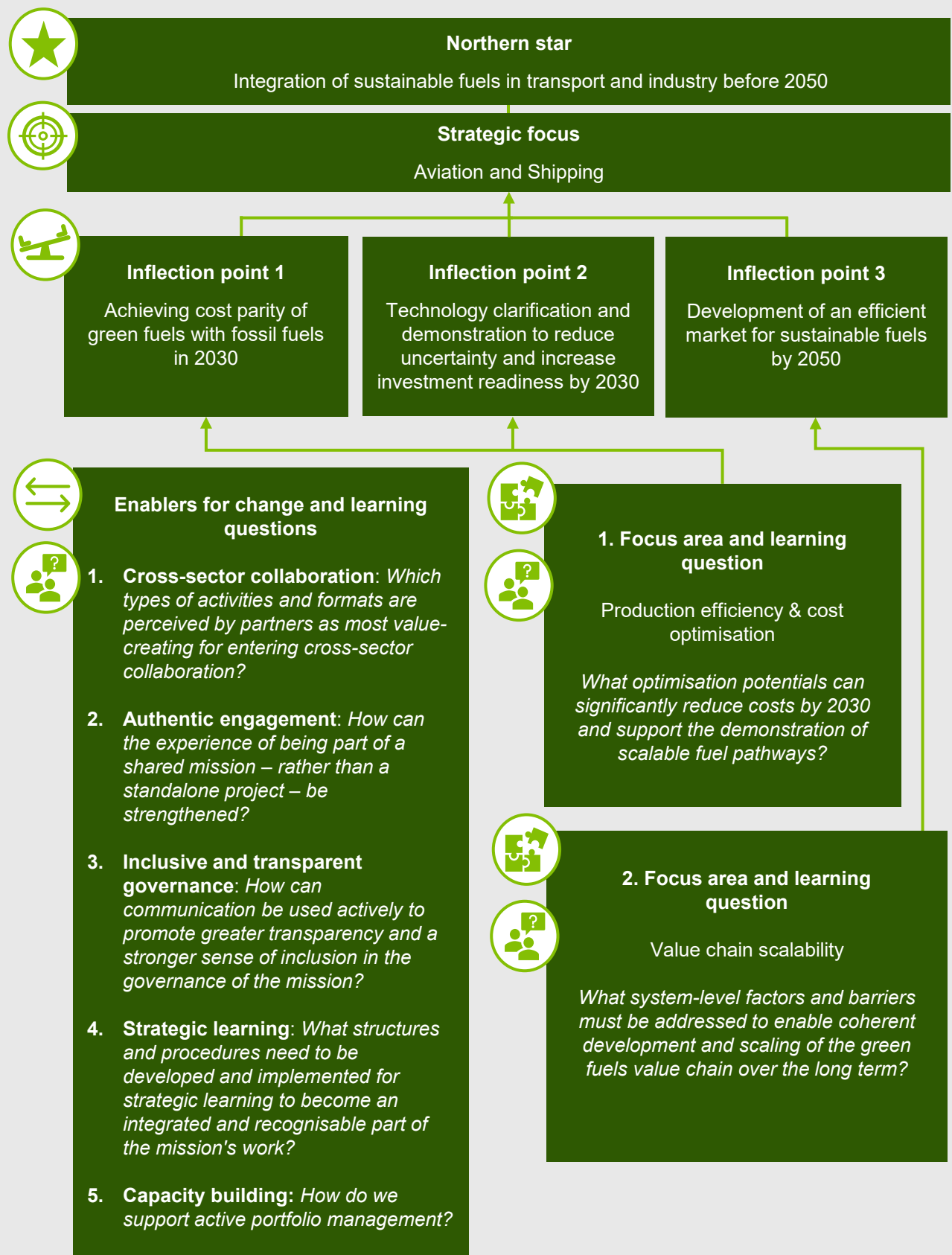


MissionGreenFuels' Impact Framework

Figure 1: Overview of MissionGreenFuels' Impact Framework, June 2025



MissionGreenFuels' Impact Framework

Summary

MissionGreenFuels is a national mission working towards Denmark's climate target of 70% reduction in greenhouse gas emissions by 2030 and climate neutrality by 2050. The mission aims to accelerate the integration of sustainable fuels in transport and industry by 2050 - with a strategic focus on aviation and shipping where electrification is not feasible or sufficient.

The impact framework outlines how MissionGreenFuels works towards this goal. To support this transformation, the mission focuses on three inflection points that must be achieved to unlock long-term change. By 2030, the focus is on enabling conditions by achieving cost parity with fossil fuels, and increasing technological clarity and investor confidence. By 2050, the focus is on laying the groundwork for a mature and efficient market. These breakthroughs are not endpoints but essential steps toward a future where sustainable fuels become the mainstream choice.

To guide future calls and sharpen the portfolio's strategic direction, MissionGreenFuels has identified two critical focus areas:

- **Production efficiency and cost optimisation** - chosen to identify systemic optimization opportunities across the entire production segment that can significantly reduce costs and demonstrate scalable fuel pathways.
- **Value chain scalability** - selected to uncover system-level enablers for coordinated, long-term deployment of green fuels across sectors.

These priorities reflect where deeper insights are needed to move forward to secure long-term impact.

To support this and the portfolio of projects, MissionGreenFuels works systematically to strengthen its capacity for collaboration, engagement, governance, and learning. Five strategic enablers of change ensure that the mission organisation and its partners are equipped to work in a mission-driven way with shared direction, trust, and adaptive learning over time.

MissionGreenFuels' journey so far

In the first project calls, MissionGreenFuels primarily focused on supporting technology development as the main driver of change. With the development of MissionGreenFuels' impact framework, the mission adopted a broader and more integrated perspective. Today, the emphasis is on how different actors, technologies, and infrastructures connect across the entire value chain, and on identifying the systemic changes needed to achieve long-term impact. This shift recognises that success depends not only on advancing individual technologies, but also on enabling institutional readiness, coherent frameworks, and cross-sector collaboration.



MissionGreenFuels' Northern Star

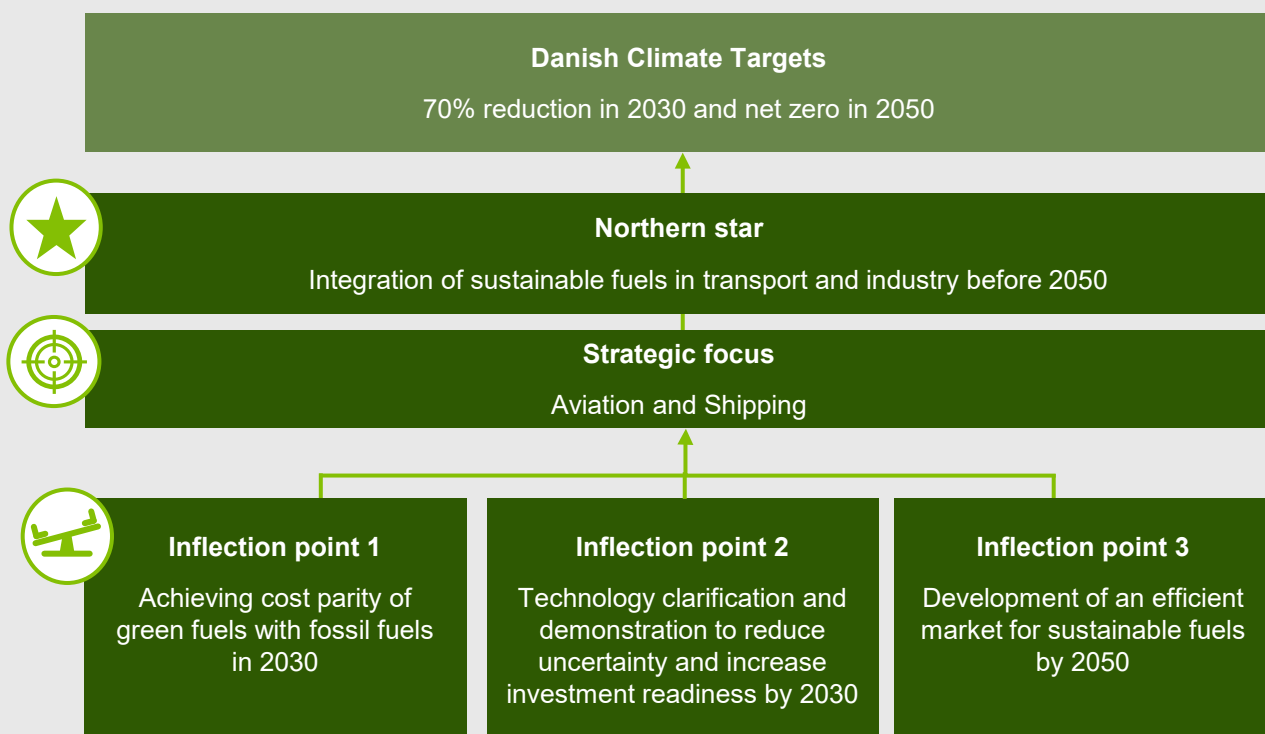
Integration of sustainable fuels in transport and industry by 2050

MissionGreenFuels aims for the integration of sustainable fuels in transport and industry by 2050. The long-term goal is to ensure that sustainable fuels are integrated into sectors where electrification is not feasible or sufficient. Integration refers to the targeted and meaningful deployment of sustainable fuels in hard-to-abate areas such as heavy transport, aviation, shipping, and energy-intensive industries.

Sustainable fuels are defined as climate-neutral, fossil-free fuels that can be produced and used without increasing greenhouse gas emissions over their lifecycle. This includes biofuels, e-fuels, hydrogen-based fuels and other synthetic alternatives derived from renewable energy sources.

MissionGreenFuels is working toward a future where fossil fuels in these segments are fully phased out and sustainable fuels have become the viable and widely adopted alternative.

Figur 2: The top levels in MissionGreenFuels' Impact Framework





Strategic Focus

Strategic focus on Aviation and Shipping

Within the framework of the Northern Star – the integration of sustainable fuels in transport and industry by 2050 - MissionGreenFuels has a strategic focus on aviation and shipping. These sectors will depend heavily on sustainable fuels to decarbonise, as electrification alone cannot meet their energy demands. With long asset lifetimes and high fuel requirements, early action in aviation and shipping is essential to ensure that green fuels are available, scalable, and integrated in time to support the 2050 climate goals. This focus ensures that MissionGreenFuels directs its efforts where sustainable fuels can have the most significant long-term impact.





Inflection points

From short-term breakthroughs to long-term transformation

To reach MissionGreenFuels' North Star, key inflection points must be reached along the way. These inflection points mark critical moments of change that shift the conditions for sustainable fuels from potential to practical, and from marginal to mainstream.

The three inflection points outlined below reflect two distinct time horizons. By 2030, the focus is on enabling conditions: reducing uncertainty, improving competitiveness, and laying the foundations for adoption. These early breakthroughs are not endpoints but steppingstones - pivotal shifts that make deeper change possible. Without them, the long-term transition will stall. By 2050, the goal is to have a well-functioning market that can sustain the large-scale use of sustainable fuels in sectors where electrification is not possible.

Inflection point 1: Achieving cost parity between sustainable and fossil fuels by 2030

To unlock widespread use of sustainable fuels in hard-to-abate sectors, achieving cost parity with fossil fuels is a critical inflection point towards 2030. This inflection point marks the moment where the cost of buying and using sustainable fuels – including e-fuels, biofuels, and synthetic fuels – aligns with or falls below the cost of fossil fuels. This can happen through multiple pathways: by lowering the production costs of sustainable fuels, by increasing the cost of fossil fuels through regulation, or by raising willingness to pay among market actors. We expect it will be a combination of all three.

Cost parity is essential because it removes the economic barrier to adoption. As long as sustainable fuels are significantly more expensive, actors may delay transition or continue to pay penalties and offset fees rather than change fuel type. When parity is achieved, the green choice becomes not just morally justified, but also economically rational.

Importantly, this inflection point does not imply full market transformation or universal adoption by 2030. Instead, it is the point where early movers begin integrating sustainable fuels into procurement and investment decisions without relying on exceptional subsidies. It enables marginal market shifts, stimulates early demand, and sets the stage for large-scale adoption and deeper systemic change.

Inflection point 2: Technology clarification and demonstration to reduce uncertainty and increase investment readiness by 2030

Before industries and investors commit to scaling sustainable fuel solutions, they must have confidence in which pathways are viable - technically, economically, and operationally. This inflection point is reached when key technologies and value chains have been sufficiently demonstrated and clarified to reduce uncertainty and increase readiness for investment.

Reaching this inflection point is crucial by 2030 because long investment cycles in sectors like aviation and shipping mean that today's uncertainty becomes tomorrow's stagnation. If we fail to clarify and demonstrate viable solutions soon, capital will flow elsewhere, and we will miss the window to influence long-term fleet renewal and infrastructure design.

This inflection point is not about final commercialization, but about showing what works, building investor confidence, and translating technological potential into practical readiness. Rather than attempting to pick winners, the mission focuses on building a robust evidence base that enables markets and industry to take the next steps with greater certainty and speed. By clarifying which technologies are viable and scalable, we reduce the risk of stalled progress and missed opportunities. In short, reaching this inflection point means lowering uncertainty now so that future investments are better placed, better timed, and potentially more impactful.

Inflection point 3: Development of an efficient market for sustainable fuels by 2050

To realise MissionGreenFuels' North Star – the integration of sustainable fuels in transport and industry by 2050 – it is essential to ensure that these fuels are not only technologically viable and cost-competitive but also embedded in a well-functioning market. This applies specifically to sectors where electrification is not feasible or sufficient, such as aviation and shipping.

This inflection point marks the transition from isolated projects and policy-driven pilots to a mature market system in which sustainable fuels are produced, traded, and integrated into business operations as a regular and viable option. A well-functioning market allows these fuels to be accessed on predictable terms, supports long-term planning and procurement, and provides confidence for both public and private investment.

An efficient market goes beyond fuel pricing. It involves reliable infrastructure for production and distribution, common standards and certification to ensure quality and compatibility, visibility of long-term demand, and a stable regulatory framework – ideally harmonised across borders. It also includes transparent competition among suppliers, clear signals to investors, and stable conditions for investment and innovation.

Achieving this inflection point by 2050 is vital because it secures the conditions for durable and scalable adoption of sustainable fuels. Without such a market, green fuels risk remaining marginal – dependent on subsidies, disconnected from mainstream logistics systems, and unable to achieve the impact needed for decarbonisation. A functioning market ensures that sustainable fuels become a normal part of the energy system – used where they make the most sense.



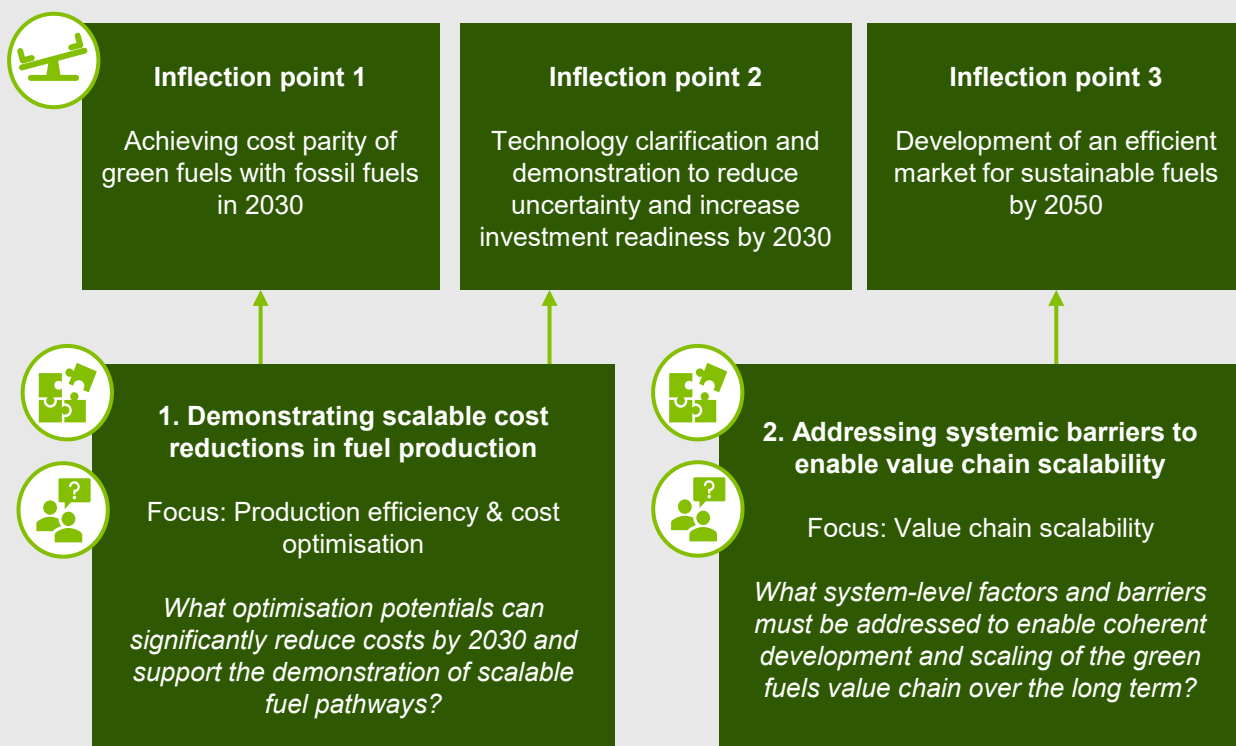
Portfolio: Focus areas and learning needs

MissionGreenFuels has identified two central focus areas for the upcoming period, each linked to a critical learning question. These learning questions are designed to guide the next project call and ensure strategic alignment with MissionGreenFuels' long-term goal. Together, they reflect the need to generate actionable insights that support both near-term progress and long-term transformation of the green fuels value chain.

1. Demonstrating scalable cost reductions in fuel production

By 2030, green fuels will continue to face cost challenges compared to fossil fuels, particularly in hard-to-abate sectors like shipping and aviation. Without substantial cost reductions or bridging mechanisms, their large-scale adoption risks being delayed. Biofuels and early-stage e-fuels, especially those close to commercial maturity, are expected to play a pivotal role in the short-term decarbonisation of these sectors by leveraging existing infrastructure and feedstocks. To support this development, there is a need to identify systemic optimisation opportunities across the entire production segment – from electrolysis and synthesis to integration and deployment – that can significantly reduce costs and demonstrate scalable fuel pathways by 2030.

Figur 3: Learning needs in the project portfolio





Portfolio: Focus areas and learning needs

This learning need is primarily linked to inflection point 2, which centres on demonstrating viable, replicable technologies and reducing uncertainty for investors and industry. At the same time, it contributes to inflection point 1, by identifying system-level cost reductions that may help close the gap to fossil alternatives, making early market adoption more feasible.

Learning question: *What optimisation potentials can significantly reduce costs by 2030 and support the demonstration of scalable fuel pathways?*

This question calls for system-level thinking across the production segment: How can processes be designed, integrated, and operated in ways that both lower costs and enable replication across contexts? It invites a broad and applied exploration of process improvements, energy and material efficiencies, and integration opportunities – including electrolysis, synthesis pathways, and industrial symbiosis. The aim is to identify scalable solutions that advance fuel production technologies while directly supporting the MissionGreenFuels's ambition to reduce cost and enabling confident investment in green fuels.

2. Addressing systemic barriers to enable value chain scalability

Achieving large-scale deployment of green fuels is not only a matter of technological readiness in the short term. It also requires long-term strategic coordination across standards, regulation, infrastructure, and market frameworks. Due to the long investment cycles in sectors targeted by MissionGreenFuels, action is needed today to ensure that the green fuels value chain can deliver within the established frames of 2050.

To prepare for this future, MissionGreenFuels must understand the systemic enablers and barriers that will shape the transition ahead. This includes identifying gaps and opportunities in certification regimes, regulation, trade mechanisms, infrastructure planning, and demand-side frameworks. It calls for a learning effort that goes beyond technology and addresses how different actors, systems, and institutions must evolve together.

This learning need is closely aligned with inflection point 3, which focuses on ensuring that proven and scalable fuel pathways evolve into fully operational market systems within established regulatory, commercial, and infrastructural frameworks.

Learning question: *What system-level factors and barriers must be addressed to enable coherent development and scaling of the green fuels value chain over the long term?*

With this question, MissionGreenFuels invites a cross-cutting, analytical exploration of what it takes to move from technical demonstration to institutional readiness. The aim is to generate actionable insights that can guide future calls, support roadmap updates, and inform strategic decisions by the Board of Directors.



Enablers for change and learning needs

To succeed with a mission-driven approach, it is not enough to fund the right projects. The broader conditions that enable change must also be nurtured.

These conditions are referred to as “enablers of change”: the underlying capacities, collaborations, and institutional practices that make it possible to work in a mission-oriented way.

In the coming period, MissionGreenFuels will actively strengthen these enablers to ensure progress across the portfolio. This includes investing in internal capacity within the secretariat, supporting cross-sector trust and collaboration, strengthening authentic partner engagement, and embedding governance structures that promote transparency and inclusivity. Moreover, strategic learning must become a more visible and integrated part.

Each of these enablers is associated with a specific learning need. These learning needs are designed to guide efforts to improve how the mission is organised, communicated, and steered.

Figur 4: Learning needs to improve enabler of change



Cross-sector collaboration



Which types of activities and formats are perceived by partners as most value-creating for entering cross-sector collaboration?

Authentic engagement

How can the experience of being part of a shared mission – rather than a standalone project – be strengthened?

Inclusive and transparent governance

How can communication be used actively to promote greater transparency and a stronger sense of inclusion in the governance of the mission?

Strategic learning

What structures and procedures need to be developed and implemented for strategic learning to become an integrated and recognisable part of MissionGreenFuels' work?

Capacity building

How can MissionGreenFuels strengthen its internal capacity for strategic portfolio management?



Enablers for change and learning needs

Cross-sector collaboration

Increased focus will be placed on fostering mutual understanding and knowledge exchange between partners across projects and sectors. When project partners gain insight into each other's knowledge, needs, and practices, new opportunities emerge for professional collaboration and joint solutions. By testing new formats and meeting forums that accommodate the realities of diverse partners, MissionGreenFuels aims to strengthen exchange, build relationships, and make collaboration more continuous, and value-creating.

The learning question to be addressed is:

Which types of activities and formats are perceived by partners as most value-creating for entering into cross-sector collaboration?

Authentic engagement

In the coming year, MissionGreenFuels will strengthen the shared mission narrative and make it more tangible and applicable for partners. When partners understand how their efforts contribute to a broader shared ambition, it creates both direction, motivation, and a stronger sense of meaning. This increases willingness to engage across the portfolio, share knowledge, and take co-ownership of the overall mission effort. With a clear and compelling narrative, MissionGreenFuels aims to make it easier for partners to talk about the mission and invite others in.

The learning question to be addressed is:

How can the experience of being part of a shared mission – rather than a standalone project – be strengthened?

Inclusive and transparent governance

MissionGreenFuels will strengthen transparency around decision-making processes and the distribution of roles in the mission's governance. When structures and responsibilities are clearly communicated – and when it is clear how and when partners can gain insight and influence, a trust-based foundation for collaboration can be established. Through improved communication practices, MissionGreenFuels will support efforts to ensure that all actors in the mission experience governance as transparent, understandable, and meaningful.

The learning question to be addressed is:

How can communication be used actively to promote greater transparency and a stronger sense of inclusion in the governance of the mission?



Enablers for change and learning needs

Strategic learning

The aim is to develop and implement a systematic approach to learning. To work strategically with development and adjustment, MissionGreenFuels needs clear and recognisable methods for capturing knowledge and experiences. When learning becomes a visible and integrated part of everyday practice, it strengthens the basis for reflection and direction and makes it easier to make informed decisions and ensure coherence in the mission's development.

The learning question to be addressed is:

What structures and procedures need to be developed and implemented for strategic learning to become an integrated and recognisable part of the mission's work?

Capacity building

As the portfolio grows in size and complexity, MissionGreenFuels must strengthen its internal capacity to actively manage and support the project portfolio. A key capability lies in being able to assess and visualise the relationships between projects, identify synergies and gaps, and understand how new activities align with or build upon existing ones. This requires tools and routines for portfolio sense-making, as well as a shared language for articulating contributions to the inflection points and the Northern Star across the secretariat, the board, and partner organisations.

The learning question to be addressed is:

How can MissionGreenFuels build the capacity to continuously assess and guide the management of the portfolio?