

Iceland Renewable Energy Cluster

Innovation Mapping Project Outcomes

Executive Summary:

This report summarises the findings from a three-month strategic analysis conducted on data from members of the Iceland Renewable Energy Cluster. The project aimed to identify sector-level gaps and barriers across Iceland's energy innovation landscape, focusing on geothermal, hydrogen, e-fuels, wind, and emerging technologies. The process involved a multi-phase approach, combining quantitative surveys, structured member workshops, and targeted focus groups.

The outcome was a picture of Iceland's innovation bottlenecks, and a roadmap for how private-public collaboration can accelerate innovation and unlock scale. **One of the clearest takeaways from the research is the structural disconnect between national energy ambitions and the actual mechanisms available to support innovation.** Across all sectors, firms expressed readiness to act, both technically and commercially, but cited a lack of continuity in funding, regulatory clarity, and institutional alignment. These findings underline the urgency of moving from fragmented support toward a system-level approach that can unlock Iceland's unique position as a clean energy testbed.

Preliminary Research Phases:

1. Survey Phase Summary

The project began with the design of a national innovation survey distributed to all Cluster members. The survey included both quantitative metrics (scored responses across energy security, funding readiness, innovation environment and sector collaboration etc.) and qualitative open-response questions.

Over 20 firm-level responses were collected across key energy sectors. Most participants rated Iceland's innovation environment between 4 and 5 out of 10—highlighting the gap between national ambition and the practical tools available to support innovation. Participants commonly pointed to the concentration of grant funding at early research stages and a lack of continuity in support from concept to deployment. Many also noted that public programmes are misaligned with industry timelines and lack the flexibility to respond to permitting and infrastructure delays.

2. Workshop Phase Summary

The workshop phase was structured into three sequential rounds and gathered cross-sector stakeholders—including energy developers, researchers, engineering firms, and public representatives—with the objective of unpacking systemic constraints and identifying collective priorities for Iceland's Power-to-X and broader energy innovation landscape.

Round 1 (Innovation Mapping):

Participants described active and emerging projects, including hydrogen production from geothermal, ammonia trials, and e-fuels research. While promising, these efforts were described as fragmented and lacking in coordination or visibility, with limited technical workforce capacity to support scale.

Round 2 (Gaps & Bottlenecks):

This round focused on identifying what was holding the Icelandic energy ecosystem back. The lack of a national roadmap, prolonged permitting timelines, and limited early-stage de-risking tools were widely cited. Stakeholders also pointed to weak alignment with pathways between academia and industry. Limited engagement on public trust-building around hydrogen and e-fuels.

Round 3 (Strategic Prioritisation):

Four main themes emerged for top priorities. First, participants agreed on the need for a **structured P2X value chain**, including **end-use and export strategies**. Second, they called for **shared infrastructure**—especially energy storage and transport corridors. Third, they identified the urgent need for **regulatory overhaul and permitting reform**. And fourth, they highlighted the importance of **lighthouse projects** that can elevate Iceland's global positioning.

A thematic clustering of all input showed the strongest emphasis on: (1) collaboration and cross-sector governance, (2) energy infrastructure and storage, (3) public perception and trust, and (4) talent pipeline and research support. These results underscored the structural—not just technical—challenges facing Iceland's clean energy ambitions.

Cross-Sectoral Key Insights:

Permitting complexity remains the most cited barrier across all sectors. Stakeholders described the process as inconsistent and slow, often involving overlapping approvals from multiple agencies with limited coordination.

On the funding side, **many firms pointed to a disconnect between R&D grants and later-stage capital** needed for infrastructure, integration, or commercial demonstration. One hydrogen startup described building a working electrolyser prototype but then hitting a wall due to the absence of risk-tolerant capital to support next-phase development. A geothermal group similarly noted that moving onto test wells or pilot systems lack sustained funding despite early-stage research results. In essence, **public funding mechanisms are misaligned with the real-world timelines of energy project development**. Milestone structures are too rigid and often ignore delays caused by permitting, procurement or research. As a result, projects stall or lose momentum early/mid-cycle.

Despite these issues, **participants expressed optimism about Iceland's potential to become a real-world testbed for clean energy solutions**—particularly if policy, funding, and infrastructure strategies are better aligned. The country's resource base, research ecosystem, and public trust were seen as major assets that can be leveraged with the right enabling framework.

Sector Outcomes (Focus Groups)

Geothermal

Iceland's geothermal sector is technically robust but suffers from underutilisation and weak strategic visibility. Participants described a fragmented pipeline where high-potential ideas are not advancing beyond

concept or small pilot stages due to regulatory lag and funding gaps. The sector lacks high-profile demonstration projects that could anchor policy, attract capital, and build public momentum.

Insight Category	Observations
Project Visibility	No pipeline for new flagship projects; few signals for next-gen geothermal applications
Permitting & Risk Sharing	Delays common; no cost-sharing or milestone-based public support beyond R&D

Hydrogen & E-Fuels (Power-to-X)

This group presented perhaps the most fragmented ecosystem. While interest in PtX technologies is high—particularly in electrolysis, ammonia, and e-methanol, firms expressed concern over weak coordination, unclear eligibility for SAF classification, and the absence of long-term support infrastructure. **A central tension was the disconnection between Iceland’s green power output potential and the lack of domestic market clarity for e-fuels.**

Insight Category	Observations
Regulatory Ambiguity	CO ₂ stream classification and SAF eligibility unclear; inhibits bankability and project scale-up
Infrastructure Readiness	No shared storage, pipeline, or transport strategy; key for linking electrolyzers to industrial demand centres
Project Viability	Projects stall post-feasibility; funding is short-cycle, not matched to capex scale or even potential offtake timelines

Final Reflections

The findings presented in this report reflect a collective willingness across Iceland’s energy ecosystem to innovate. But also, a shared frustration with structural friction that prevents good ideas from becoming impactful projects. **From permitting delays and funding misalignment to gaps in policy clarity and coordination**, the barriers are real but addressable. Iceland has all the right ingredients to lead as a clean energy testbed: world-class geothermal talent, abundant resources, and a small and agile sector. **The next step is aligning around a common direction, letting go of hesitation and ensuring that domestic ambition is met with clear pathways to achieve commercial results.**