NEW ZEALAND
FOREIGN AFFAIRS & TRADE
Manatū Aorere

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Iceland: green transition & renewable energy

MARKET INTELLIGENCE REPORT

Summary

- Iceland's volcanic landscape has led to advanced developments in geothermal technology.
- Geothermal innovation parks in Iceland are making use of the abundant heat, water, and residual electricity and have aided innovation in carbon capture, utilisation, and storage.
- Iceland sees itself as a rising world leader in geothermal, renewables and associated technology. This leadership goal is highlighted by the 'Sustainable Iceland' strategy released in July 2024.
- There is much New Zealand and Iceland can continue to learn from one another as we collaborate through the International Renewable Energy Agency geothermal chapter, the World Geothermal Congress and the International Geothermal Association.

Report

Iceland's geothermal technology and innovation

As a result of its unique and active geography, Iceland has developed advanced geothermal energy plants, geothermal heating technology and associated infrastructure. 90 per cent of central heating in Iceland comes from a geothermal source and 10 per cent from electricity. Electricity sources are 100 per cent renewable, with 30 per cent from geothermal powerplants and 70 per cent from hydropower.

Geothermal innovation parks at Hellisheidi and HS Orka power stations make use of residual water, steam, renewable electricity and carbon dioxide. Technology developments include aquaculture; geothermal tourism spas; microalgae growth by VAXA technologies for Omega-3 and protein; and mineral supplement development by Geo Silica. Another example of innovation is the Iceland Deep Drilling Project (IDD) which is investigating the economic feasibility of drilling 5 kilometres underground for energy heat transfer.

Iceland's geothermal parks also host carbon capture, utilisation and storage (CCUS) developments. Carbfix captures CO2 emissions from the Hellisheidi Geothermal Plant and mixes these with water. This is injected underground into ballast rock, where a mineralisation process occurs. The CO2 SeaStone project is testing use with seawater which would increase use in dry climates.

These developments have received international attention with visits in 2023 from Canadian Prime Minister Justin Trudeau and a delegation of US Senators. Carbfix has received funding from the European Union (EU)[1] to build the Coda terminal in Straumsvik Iceland, which will receive CO2 from industrial projects across Europe for CCUS. Swiss Company Climeworks is developing technology to capture CO2 directly from the atmosphere and has partnered with Carbfix to store this underground.

Iceland's Sustainable Development Strategy

Iceland released their strategy 'Sustainable Development until 2030' on 2 July 2024. The strategy will be led by cross-government organisation Sustainable Iceland. The strategy highlights Iceland's goal to be an international leader in geothermal, renewable energy and CCUS. It outlines how Iceland can meet the United Nations 2030 Sustainable Development Goals (SDGs), and Iceland's 2030 Paris Agreement commitments. This document builds on Iceland's 2020 Climate Action Plan.

Sustainable Iceland and subsequent strategy development was introduced and led by

former Prime Minister Katrín Jakobsdóttir. The initiative is now chaired by Prime Minister Bjarni Benediktsson. The Sustainable Iceland strategy has wide representation, with consultation beginning in May 2023. The draft was published in February 2024 allowing for several months of feedback.

The strategy contains the following key developments:

- Outcomes will be measured against the SDGs and 40 wellbeing indicators. The indicators stem from the Wellbeing Economy Governments (WEGO) initiative that Iceland is part of along with New Zealand, Finland, Scotland, Wales and Canada.
- A just transition is required for all groups of society to ensure green transition benefits are shared fairly and consider gender and equality in all aspects of decision making.
- Consideration is made for an economically sustainable society and emphasises Iceland's advantage in sustainable energy production, energy exchange, energy efficiency, and efficient use of multiple energy sources.
- It outlines Iceland's goal of 55 per cent reduction in net greenhouse gas emissions by 2030 and carbon neutrality by 2040. Sustainable energy will play a key role. Iceland plans to use CCUS alongside traditional methods of reforestation, land reclamation and restoration of wetlands.
- Responsible consumption and production is identified as a key challenge for Iceland, and where it is most behind on its SDGs.
- It considers the impact of Iceland's consumption on other countries' ability to achieve their climate change goals, how Iceland's overseas development assistance (ODA) can support other countries with their climate change goals, and Iceland's leadership role in green energy and CCUS innovations.

Green by Iceland's support for international green transition business collaboration

Green by Iceland, established in 2019, is a mechanism to support Iceland's international cooperation on climate issues. It is a collaborative project between Business Iceland and Groenvangur (a business - government collaboration on green solutions). In 2023, Green by Iceland hosted 40 international delegations.

Green by Iceland showcases and supports development of international private business collaboration on geothermal internationally and within Iceland.

Why does this matter for New Zealand?

There is much New Zealand and Iceland can continue to learn from each other. New Zealand and Iceland collaborate through the International Renewable Energy Agency geothermal chapter, the World Geothermal Congress and the International Geothermal

Association. There were a number of keynote presenters from Iceland at New Zealand Geothermal Week 2024 in Taupō in early July, and there is active New Zealand-Iceland engagement through Women in Geothermal (WING). Several engineers and scientists from New Zealand and Iceland already work closely together on bespoke developments.

Iceland's decision to take a targeted leadership role in renewable energy and carbon capture, utilisation and storage progresses based on their expertise may also provide insights for New Zealand's clean technology journey.

Iceland, alongside New Zealand, is an associated country to Horizon Europe, the EU's key funding programme for research and innovation, and participates in European Geothermal Research. Iceland is part of the Geothermal Emissions Control project (see GECO – Geothermal Emission Control (geco-h2020.eu)), funded by Horizon 2020 (the predecessor of Horizon Europe). The Hellisheiði geothermal plant in Iceland is used as a demonstration site for GECO, and Reykjavik energy coordinated the project alongside other Iceland entities. Horizon Europe could provide a good opportunity to further New Zealand-Iceland research cooperation.

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[1] CarbFix: an innovative Icelandic climate solution supported by the European Union | EEAS (europa.eu) and How Iceland's Carbfix is harnessing the power of turning CO2 into stone | Reuters

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