Reykjavik energy storage for renewable energy

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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(external link) and HS Orka(external link) 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(external link) (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 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(external link).

Sustainable Iceland and subsequent strategy development was introduced and led by former Prime Minister Katr?n Jakobsd?ttir. 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:

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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.

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 Taup? 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(external link), 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 (external link))), funded by Horizon 2020 (the predecessor of Horizon Europe). The Hellishei?i 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.