

Global Stocktake Submission by Iceland August 5, 2022

Iceland welcomes the opportunity to submit input to the Global Stocktake. Iceland regards the Global Stocktake process as a key element in reaching the Paris Agreements collective goals and raising ambition. In the efforts to limit warming to 1.5°C robust climate solutions are necessary. In this submission Iceland will draw attention to good practice and experience related to geothermal energy utilization and new emerging Carbon Capture and Storage technology.

As reflected in the recent IPCC Working Group III report, there are mitigation options which are feasible to deploy, and the right solutions will depend on national circumstances. The right policy advice is an essential part of successful implementation of new and existing technologies, scaling up of climate solutions and making sure finance flows are directed to the most efficient solutions.

With this submission we would like to draw attention to the examples of geothermal utilisation and new CCS technology which have been developed due to national circumstances in Iceland, circumstances that can be found elsewhere in the world and have scale-up potential.

Utilization of geothermal energy

Iceland is a pioneer in the use of geothermal energy for space heating. About 90% of buildings are heated with geothermal district heating and 30% of electricity produced in Iceland is generated from geothermal energy. Geothermal water is directly used for example for bathing and swimming pools and in industry, fish farming and greenhouses.

Geothermal energy is a clean and sustainable energy source, and one of the sustainable climate solutions that are available. The climate, environmental and social co-benefits of the utilization of geothermal energy for example for district heating, are significant and environmental impact minimal.

Although it is important to acknowledge, that there are environmental impacts of geothermal utilisation, both from direct use and electricity production, it must be acknowledged, that the impacts are manageable.

Capacity building – Geothermal Training Programme¹

For over 40 years, as part of its developmental aid, Iceland has hosted a postgraduate training programme aiming at assisting developing countries in capacity building within geothermal exploration and development. The programme consists of six months annual training for practicing professionals from developing and transitional countries with significant geothermal potential.

In the selection process, priority is given to experts from countries where geothermal development is under way, to maximize technology transfer. The training is tailor-made for the individual and the needs of his institution/country.

¹ <https://www.grocentre.is/gtp>

In line with the gender equality policy of the Government of Iceland and the SDGs, the Geothermal Training Programme supports gender equality in its cooperation countries through a gender-based candidate selection as well as gender equality consideration in all its operations.

More than 700 experts from 63 countries have attended the programme.

The Government of Iceland has, as a direct response to the outcome of the Glasgow Climate Pact, committed to increase contributions to the Green Climate Fund and to contribute new funding to the Adaptation Fund.

Carbon Capture and Storage (CCS)

Carbon Capture and Storage will play a significant role in reaching net zero emissions and is one of the options to reduce emissions from large-scale fossil-based energy and industry sources, provided geological storage is available.

Implementation of CCS currently faces technological, economical, institutional, ecological, environmental and socio-cultural barriers. Currently, global rates of CCS-deployment are far below those in modelled pathways limiting global warming to 1.5°C or 2°C.

As is stated in the AR6 IPCC Working Group III report, the regional availability of geological storage could be a limiting factor. If the geological storage site is appropriately selected and managed, it is estimated that the CO₂ can be permanently isolated from the atmosphere.

CarbFix – Permanent CO₂ mineral storage

There is a need to pay attention to the different CCS technologies that have and are emerging. Some technical solutions are clearly more sustainable than others in terms of cost, environmental impact, and social acceptance. One of these is the CarbFix method that can be described as a process of carbon capture and mineralization.

Vast quantities of carbon are naturally stored in rocks. The Carbfix-process imitates and accelerates these natural processes, where carbon dioxide (CO₂) is dissolved in water and interacts with reactive rock formations, such as basalts, to form stable minerals providing a permanent and safe carbon sink. The Carbfix-process captures and permanently removes CO₂. The technology provides a complete carbon capture and injection solution, where CO₂ dissolved in water – a sparkling water of sorts – is injected into the subsurface where it reacts with favourable rock formations to form solid carbonate minerals via natural processes in about 2 years. For the Carbfix technology to work, one needs to meet three requirements: favorable rocks, access to water and a source of carbon dioxide.

The Carbfix-process has been applied to significantly reduce CO₂ as well as H₂S emissions (SulFix) from the Hellisheiði Power Plant in Iceland since 2014, following successful pilot-scale injections in 2012. The technology can be adapted to other carbon emitting industries, such as steel, iron, and cement production. It has been proven to be an economic and environmentally friendly solution for the permanent removal of these gases.²

²<https://www.carbfix.com/>