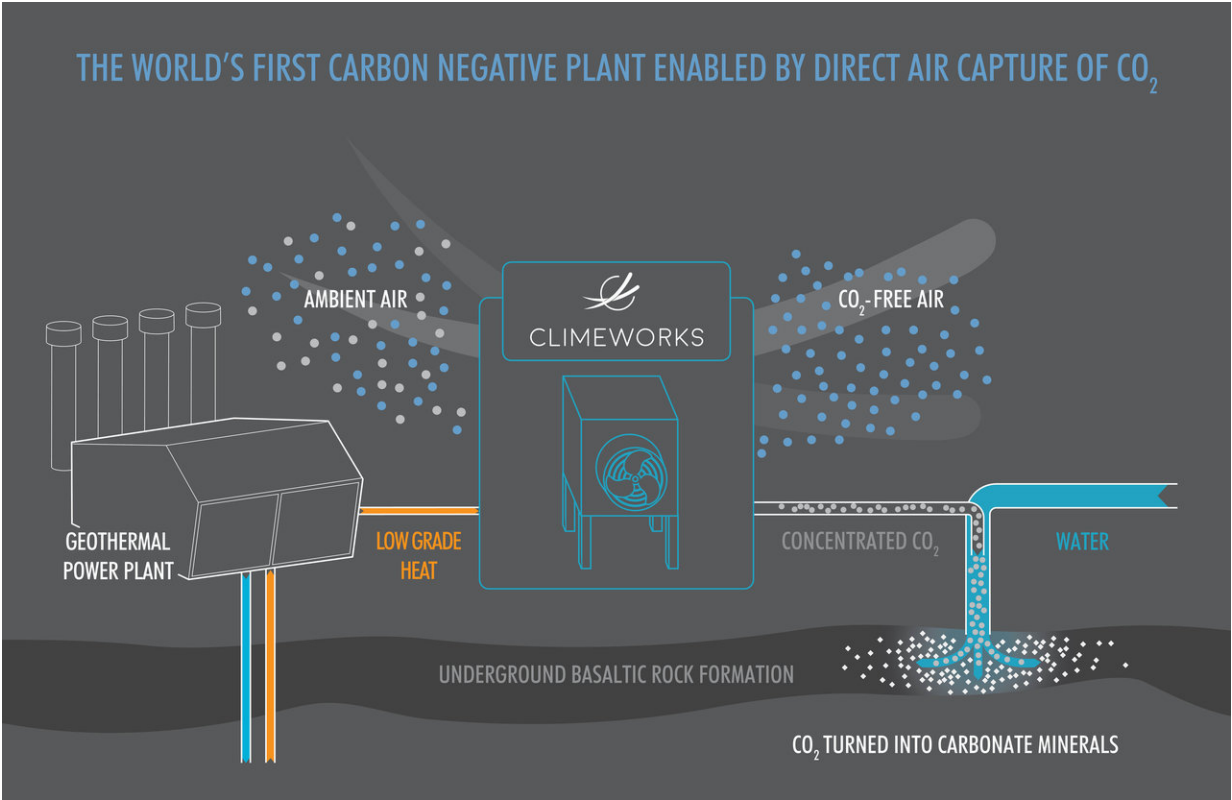


Eyes are on plant in Iceland with carbon removal solution by direct air capture

October 15 2017, by Nancy Owano



Credit: Climeworks

(Tech Xplore)—Carbon reduction is one part of the battle as countries and organizations do their bit to save our planet. Another goal drawing considerable interest now is carbon removal.

"[Scientific](#) studies have warned that the two-degree climate target is not achievable without carbon removal solutions," said *gasworld*.

What is this two-degree limit all about? Noted in the *Daily Mail*: "The Paris Agreement seeks to limit a rise in world temperatures this century to less than 2 degrees Celsius (3.6 Fahrenheit), ideally 1.5C (2.7F) above pre-industrial times."

Mark Prigg wrote in the *Daily Mail*: "U.N. data show that current plans for cuts in emissions will be insufficient, especially without the United States, and that the world will have to switch to net 'negative emissions' this century by extracting carbon from [nature](#)."

Akshat Rathi in *Quartz* put this in a sobering perspective: "We produce 40 trillion kg of [carbon dioxide](#) each year, and we're on track to cross a crucial emissions threshold that will cause global temperature rise to pass the dangerous 2°C limit set by the Paris [climate](#) agreement."

So what about adding an option, not reductions, but direct air capture for carbon removal?

The technology is in greater focus now, with a test to twin [carbon capture](#) from air with carbon burial, in that carbon capture will enter geological storage. Climeworks and Reykjavik Energy are joining hands on a project in Iceland.

Reuters and other news sites are reporting that Climeworks, a Swiss company, has embarked on the initiative to extract carbon dioxide from thin air in Iceland. The goal is to transform the gas into rock far below ground, said Reuters.

Climeworks said its direct air capture plants remove CO₂ from the atmosphere "to unlock a negative emissions future." The company's

Christoph Gebald and Jan Wurzbacher had done their research on direct air capture in their masters studies at ETH Zürich.

BusinessGreen said the Iceland site was being hailed as the first facility "to [remove](#) carbon dioxide straight from the air and store it underground." The Thursday report from *The Engineer* said it was a trial scheme.

Reuters provided some numbers: "Climeworks plans to suck 50 tonnes of carbon dioxide from the atmosphere over a year." That was "roughly the [greenhouse gas emissions](#) of a single American family."

That brings home the fact that this is a pilot system.

Although the project is small scale, "the main reason is to prepare a scale-up" of the [technology](#), Jan Wurzbacher, director of Climeworks, told Reuters.

"The potential of scaling-up our technology in combination with CO₂ storage is enormous," said Christoph Gebald, founder and CEO of Climeworks in *The Engineer*. "Not only here in Iceland but also in numerous other regions which have similar rock formations."

Nonetheless, Reuters also quoted a researcher who said it was promising "but it's not a silver bullet" for climate change. Jessica Strefler, a researcher at the Potsdam Institute for Climate Impact Research, commented on removing carbon dioxide from air. "Every ton of carbon dioxide we don't emit in the first place means we don't have to take it out later on," she said.

The trial will test the technology being used for this under specific weather conditions at the [location](#) in the South West of Iceland, said *The Engineer*.

The technology works by capturing carbon dioxide from ambient air, which is binded to a filter and heated with waste energy from the power station. CO₂ is sent underground.

The plant is in Hellisheidi, Iceland. The geothermal power plant is fitted out with the capture and storage equipment.

The company's installation in Iceland is the first true "negative emissions" plant, said Akshat Rathi in *Quartz*.

Rathi explained more about the unit; it is capturing carbon dioxide from the air and transferring it to CarbFix to inject underground. "Because CarbFix has been monitoring the injection sites for the last three years, they can be sure there will be no leakage. And once mineralized, the CO₂ will remain trapped for thousands or millions of years. This makes the Climeworks-CarbFix system the world's first verified 'negative emissions' plant."

CarbFix2 is the name of the project, led by Reykjavik Energy and this undertaking is part of that project.

"We are excited to announce that we are combining safe and permanent geological storage with our highly scalable [carbon](#) removal technology through direct air capture of CO₂. The pilot plant is part of the CarbFix2 project which stores the air-captured CO₂ safely and permanently in basalt, leading us closer to our efforts to achieve global warming targets," said Climeworks.

This is how Climeworks explains what the system does: The DAC module captures CO₂ from ambient air. The CO₂ binds to their patented filter. Once the filter is saturated with CO₂, it is heated by low-grade waste heat from the geothermal plant. The CO₂ is released and bound to water. The carbonated water is pumped more than 700 metres

underground. It reacts with the basaltic bedrock, forming solid minerals.

Climeworks said the partnership is helping the company realize its mission: to capture 1% of global emissions by [2025](#).

More information: [www.climeworks.com/climeworks- ... -direct-air-capture/](http://www.climeworks.com/climeworks-...-direct-air-capture/)

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