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## **In depth: Audi and Climeworks store CO<sub>2</sub> from the atmosphere underground**

- **Climeworks is building the world's largest direct air capture and storage facility in Iceland**
- **4,000 metric tons of CO<sub>2</sub> will be stored as rock underground each year**
- **Hagen Seifert, Head of Sustainable Product Concepts at AUDI AG: "Important measure for reaching the Group's climate targets"**

**Ingolstadt/Zurich, September 7, 2020 – The Swiss company Climeworks is building the world's largest direct air capture and storage facility for converting atmospheric CO<sub>2</sub> to rock in Iceland. Audi is partnering with the Zurich-based environmental start-up and promoting a future technology with the project. The facility will filter 4,000 metric tons of carbon dioxide from the air and mineralize it underground. Climeworks is removing 1,000 metric tons thereof from the atmosphere on behalf of Audi.**

### **The process – how the CO<sub>2</sub> gets deep underground**

With direct air capture technology, carbon dioxide is extracted from the ambient air and air free of CO<sub>2</sub> is returned to the atmosphere. Climeworks' new facility in Iceland transports the CO<sub>2</sub> filtered out of the air below the Earth's surface, where natural processes then mineralize it. The carbon dioxide is thus permanently removed from the atmosphere.

The facility first draws in air and feeds it into the CO<sub>2</sub> collector, which contains a selective filter material. This uses a specially developed adsorbent to bind the CO<sub>2</sub> in the air. When this filter is saturated with CO<sub>2</sub>, it is heated to 100 degrees Celsius using waste heat from a nearby geothermal plant to release the CO<sub>2</sub> molecules. Water from the Hellisheiði power plant then flows through the facility and transports the carbon dioxide roughly 2,000 meters below the surface of the Earth. The CO<sub>2</sub> molecules react through natural mineralization processes with the basalt rock and are converted to carbonates over a period of several years, thus permanently storing the CO<sub>2</sub> underground. The water returns to the cycle of the geothermal power plant. The facility will operate 24 hours a day, seven days a week, and will filter 4,000 metric tons from the atmosphere each year. One quarter of that will be credited to Audi. 80,000 trees would be needed to bind this amount naturally.

The direct air capture technology from Climeworks boasts two major advantages: Lifecycle analyses show that 90 percent of the CO<sub>2</sub> filtered out of the air is effectively and permanently stored underground. This high reduction capacity makes the facility particularly efficient. The technology can also be scaled up to the megaton-per-year range and thus harbors great potential from the future.



Iceland is one of several places on Earth offering the ideal conditions for this process. Its volcanic origin makes the country one of the world's most potent geothermal regions. The particularly high geothermal energy means that the Earth's heat can be converted to electricity cost-effectively and virtually CO<sub>2</sub> neutrally. Furthermore, the rock in Iceland has the ideal composition for storing large amounts of CO<sub>2</sub>.

### **The mission – why Audi is involved**

Hagen Seifert, Head of Sustainable Product Concepts at Audi, says, "From a scientific perspective, the adsorption of carbon dioxide from the atmosphere is an important measure in addition to reducing emissions for reaching the Group's climate targets. We are contributing to decarbonization through our involvement in the Climeworks CO<sub>2</sub> capturing project." Audi is once again following its holistic approach here and is participating in the project to promote the development and meaningful implementation of innovative climate protection technologies.

Audi has been supporting the development of CO<sub>2</sub> capturing technology from the Zurich-based environmental start-up Climeworks since 2013. Two years ago the two companies built a facility in Hinwil, Switzerland, that filters CO<sub>2</sub> from the air and provides it to the beverage industry, where it is converted to carbonic acid. Audi is extending this successful partnership with the project in Iceland and taking it to the next level. Because the carbon is placed underground, the brand with the Four Rings is helping to close the cycle by permanently storing the bound CO<sub>2</sub> in the ground. Audi is also supporting the Swiss start-up with its technological know-how, such as for the development of new heat exchanger concepts.

By 2025, the Volkswagen Group wants to reduce the ecological footprint of cars and light utility vehicles along the entire value chain by 30 percent relative to 2015. Audi has therefore set ambitious targets in all areas of the company with the goal of achieving net CO<sub>2</sub>-neutrality company-wide by 2050.

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The Audi Group, with its brands Audi, Ducati and Lamborghini, is one of the most successful manufacturers of automobiles and motorcycles in the premium segment. It is present in more than 100 markets worldwide and produces at 16 locations in 11 countries. 100 percent subsidiaries of AUDI AG include Audi Sport GmbH (Neckarsulm, Germany), Automobili Lamborghini S.p.A. (Sant'Agata Bolognese, Italy) and Ducati Motor Holding S.p.A. (Bologna, Italy).

In 2019, the Audi Group delivered to customers about 1.845 million automobiles of the Audi brand, 8,205 sports cars of the Lamborghini brand and 53,183 motorcycles of the Ducati brand. In the 2019 fiscal year, AUDI AG achieved total revenue of € 55.7 billion and an operating profit of € 4.5 billion. At present, 90,000 people work for the company all over the world, 60,000 of them in Germany. With new models, innovative mobility offerings and other attractive services, Audi is becoming a provider of sustainable, individual premium mobility.

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