

PRESS RELEASE

## **Climeworks AG builds first commercial scale CO<sub>2</sub> Capture Plant**

Zurich / 21.10.2015

- Plant in Hinwil (Canton of Zurich, Switzerland) has the capacity to capture 900 tons of CO<sub>2</sub> from the atmosphere per year
- Captured CO<sub>2</sub> will be sold to a greenhouse to enhance the growth of vegetables and lettuce by up to 20 percent
- Project partners are Gebrüder Meier Primanatura AG, KEZO and Swiss Federal Office of Energy (SFOE)

Today the ETH spin-off company Climeworks AG, provider of solutions for efficiently capturing CO<sub>2</sub> from ambient air, announced to construct and operate an industrial scale CO<sub>2</sub> capture plant, which will worldwide for the first time sell atmospheric CO<sub>2</sub> to a customer. The plant will be operational by mid-2016 and annually capture 900 tons of CO<sub>2</sub> from the atmosphere, enhancing the growth of vegetables und lettuce in a nearby greenhouse of Gebrüder Meier Primanatura AG by up to 20 percent. The plant, which will be constantly delivering CO<sub>2</sub>, is constructed as part of a three-year pilot and demonstration project with Gebrüder Meier and Zweckverband Kehrrechtverwertung Zürcher Oberland KEZO (a municipal waste disposal company) as project partners. The project is supported by the Swiss Federal Office of Energy (SFOE).

The main goal of the project, with development and building costs of 3-4 million EUR, is to industrialize Climeworks' unique Direct Air Capture (DAC) technology and continuously operate an industrial scale plant that captures CO<sub>2</sub> from ambient air. Another goal is to determine the plants' operational costs, which is currently controversially discussed in the research community. This is an important finding in order to define business models for implementing the technology internationally.

The plant will be installed at the waste incineration facility of KEZO, in Hinwil (Canton of Zurich, Switzerland), which is subsequently powering the DAC plant with heat and electricity. The high purity CO<sub>2</sub> product is then delivered to a neighboring greenhouse operated by the Gebrüder Meier Primanatura AG. The gas is injected into the greenhouse atmosphere in order to enhance the growth of vegetables and lettuce by up to 20 percent.

The project is a crucial milestone in supporting Climeworks' vision to close the carbon cycle due to the fact, that it allows a technology transfer from a novel technology originally developed at ETH Zurich and EMPA for industrial application. Furthermore, it will deliver reliable mass and energy balances as well as economic data as basis for further Climeworks systems on industrial scale.

Based on the results of this project Climeworks' product will be further industrialized to eventually supply air captured CO<sub>2</sub> to Power-to-Gas / Power-to-Liquids technologies to efficiently store renewable electricity by producing synthetic fuels. These fuels, produced from atmospheric CO<sub>2</sub>, water and renewable electricity are carbon-neutral and not in competition with food production for agriculture.

Climeworks' technology enables a closed carbon cycle, where CO<sub>2</sub> emitted from any source or even the past can be captured and re-used for the production of carbon-neutral fuels. In the short-term Climeworks' technology shall be used to supply CO<sub>2</sub> for beverage companies, currently receiving its CO<sub>2</sub> majorly as waste product from industry, in turn stemming from the combustion of fossil fuels.

The Climeworks CO<sub>2</sub> capture technology is based on a cyclic capture / regeneration process and a novel filter. During the capture process, atmospheric CO<sub>2</sub> is chemically bound to the surface of the filter. Once the filter is saturated, the CO<sub>2</sub> is released by heating it to a temperature of about 100° Celsius (212 °F), thereby delivering high-purity gaseous CO<sub>2</sub>. The CO<sub>2</sub>-free filter can be re-used for numerous capture /regeneration cycles.

### **Project Partners**

**Climeworks AG** is the leading partner within the project and responsible for design, construction and operation of the DAC plant. Climeworks was founded at the end of 2009 as a spin-off company of the ETH Zurich and has since then developed its proprietary technology from laboratory to industrial scale. In late 2014 Climeworks announced the commissioning of an industrial scale CO<sub>2</sub> capture unit - called 'CO<sub>2</sub> Kollektor' - with a capacity of capturing 50 tons CO<sub>2</sub> per year. Since then the CO<sub>2</sub> Kollektor has proven to operate successfully, thus standing for the final developmental step of Climeworks' technology. Commercial plants will be built from units of the same size in a modular way to meet the customers' individual requirements.

**Zweckverband Kehrichtverwertung Zürcher Oberland (KEZO)** is a municipal waste disposal company and supplies the energy required to operate the DAC plant. Almost 90 percent of the energy demand can be supplied in the form of process heat, which in the case of waste incineration, has a renewable fraction of 50 percent.

**Gebrüder Meier Primanatura AG** is the CO<sub>2</sub> customer. The air captured CO<sub>2</sub> is sold to the greenhouse operator and is then used for maintaining sufficiently high CO<sub>2</sub> levels in the greenhouse for enhancing the growth of vegetables and lettuce.

**Swiss Federal Office of Energy (SFOE)** supports the project within the framework of its pilot and demonstration program.

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