

Start-up and Entrepreneurship
CTI Start-up

Success story

From climate killer to climate protector



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Although carbon dioxide is a natural component of air, as a greenhouse gas it has a bad reputation. The ETH spin-off Climeworks AG has developed a kind of vacuum cleaner which filters CO₂ from the air; the gas can then be used to create synthetic vehicle fuels or in other industrial processes.

At the chair for renewable energies at the ETH Zurich, currently held by Professor Aldo Steinfeld, for the last fifteen years or so research has been done into filtering CO₂ from the air and putting it to good use. From early on the aim was to find a way of using CO₂ to produce synthetic fuel. In 2009 two PhD students at the ETH, Jan Wurzbacher and Christoph Gebald, founded the spin-off Climeworks so that they could pursue this idea on a commercial basis. In 2010 they were joined by a further research partner, the Applied Wood Research Department at Empa in Dübendorf. As Jan and Christoph were both employed part-time at the ETH or Empa, this set them off to a good start: "We had somewhere to work and could use the ETH and Empa laboratories without first having to make investments ourselves," Wurzbacher explains.

Empa helps to develop filter material

In 2010 Climeworks was successful in Venturekick and so received the funds it needed to take on the first employees. In the same year the business began CTI Coaching. It was

also successful in attracting over CHF 2.25 million in funding from private investors and the Zürcher Kantonalbank, and so in 2011 was able to set up on its own in the Zurich Technopark. At the same time, it continued to work with Empa on the second part of the innovation, the filter material which collects CO₂. At the end of 2012 large-scale production of the filter material began, and Climeworks developed an installation which can extract one tonne of CO₂ from the air each year.



Up to four kilos of CO₂ can be filtered from the air each day: Climeworks demonstrator.

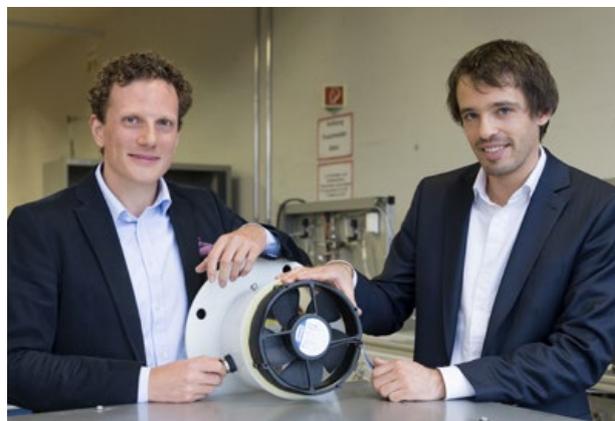
The next step in moving towards large-scale production came in mid-2014 with the prototype of a CO₂ collector – a basic module in the construction of large installations. “The installation works well in tests,” says Wurzbacher. “Now we are planning an installation with an annual capacity of 1000 tonnes, comprising 18 of these basic modules.”

Audi trusts in Climeworks

Thanks to over CHF 3 million more received in funding, Climeworks now has 14 employees and is on a sound financial footing. In October 2014 the young company received the CTI Start-up label. The CO₂ extractor is not just a crazy idea, as the research and development partnership with German car manufacturer Audi, which has already been running for two years, proves.

“A Climeworks installation will extract CO₂ from the air this year and Audi will be able to feed it into a fuel synthesiser and create renewable fuel,” says Jan Wurzbacher. The vision of a closed carbon cycle will be realised.

Climeworks technology can also be used in greenhouses. “We can take the waste heat from an incineration plant, use it to extract CO₂ from the surrounding air and then feed this into a greenhouse,” explains Wurzbacher. A greenhouse requires 1000 tonnes of liquid CO₂ each year; this is delivered by truck and costs between CHF 200 and 300 per tonne. At the moment, Climeworks cannot compete with these prices, but that situation should change.



Aiming to produce synthetic fuel: Christoph Gebald and Jan Wurzbacher, directors of Climeworks.

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Jan Wurzbacher, co-director of Climeworks

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