

MCC Press Release

Capturing carbon directly from the air – that has a future

Study under MCC leadership analyzes energy requirements for negative emissions technologies.

Berlin, 04/03/2019. Using special filters to remove the greenhouse gas carbon dioxide (CO₂) directly from the air could be the best way to generate so-called negative emissions, at the scale of many billions of tons of CO₂ per year throughout the world by 2050. “Direct Air Capture” has many characteristics that can make it a more effective and affordable technology than the presently more widely discussed “Bioenergy with Carbon Capture and Storage”. This is the result of a new study conducted by the Berlin climate research institute MCC (Mercator Research Institute on Global Commons and Climate Change) together with partners in Princeton, Oslo and Lappeenranta. The study has now been published in the renowned journal *Energy & Environmental Science*.

“At present, the costs incurred by test facilities for this type of carbon capture are more than 600 dollars per ton,” explains Felix Creutzig, who coordinated the study and heads the working group Land Use, Infrastructure and Transport at the MCC. “The alternative of extracting carbon indirectly from the air by growing biomass incurs only a fraction of the cost and is much more in the focus – even though it consumes a lot more land and the negative emissions are more difficult to verify.” The study analyzes the perspectives for Direct Air Carbon Capture and Storage as well as for Bioenergy with Carbon Capture and Storage. And it finds startling repercussions on energy systems: Whereas using bioenergy as a means to sequester carbon would provide electricity, direct air capture would require large proportions of the electricity and heat produced in the future.

“However, our study shows that direct extraction is becoming a serious alternative for three reasons,” says Creutzig. “First, there are signs of considerable cost-saving technical progress. Second, it is more scalable due to its smaller space requirements. And third, filtering carbon out of the air becomes more effective if the energy required for this comes from renewable sources.” The decarbonization of the global economy is therefore doubly important: “It prevents us from needing negative emissions in unrealistic proportions and at the same time makes them more affordable. For any negative emission technology to be effective, it is necessary to have strong short-term progress on decarbonisation.”

About the MCC

The MCC explores sustainable management and the use of common goods such as global environmental systems and social infrastructures in the context of climate change. Seven working groups conduct research on the topics of economic growth and development, resources and international trade, cities and

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infrastructure, governance and scientific policy advice. The MCC was jointly founded by the Mercator Foundation and the Potsdam Institute for Climate Impact Research (PIK).

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