

How carbon removal fits into the architecture of EU climate policy

March 28 2024, by Ulrich von Lampe



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The EU has recently made far-reaching decisions on rapid greenhouse gas emissions reduction. For example, from 2027, like in the energy and industry sectors, it will also cap emissions in the problem sectors of

heating and transport through emissions trading, and gradually reduce them toward zero.

But how can the EU also realize rapid growth in "negative emissions," i.e., large-scale carbon removal from the atmosphere, without which its goal of "[climate](#) neutrality 2050" cannot be achieved? A [new study](#) by the Berlin-based climate research institute MCC (Mercator Research Institute on Global Commons and Climate Change) and the Potsdam Institute for Climate Impact Research sheds light on this. The study has now been published in the journal *FinanzArchiv*.

"Carbon removals as the second pillar of climate protection will be very costly in the second half of the century—estimates range from 0.3% to 3% of global economic output," says Ottmar Edenhofer, Director of MCC and PIK and one of the authors. "Yet the [scientific literature](#) on this topic has so far revolved around technological aspects rather than the economic issue of efficiently tackling this Herculean task. In the meantime, this is precisely what is being discussed intensively in the EU capital Brussels. We now provide a theoretically sound and very specifically elaborated governance concept."

The study gives a brief overview of technical methods with costs and conceivable quantities, but then starts with a fundamental economic consideration: just as the state makes CO₂ emissions more expensive in order to limit their [negative consequences](#), it should subsidize CO₂ removals.

As a basic principle for cost minimization, the same price should be used for each ton of CO₂ removed and permanently stored as for the emission of one ton of CO₂ into the atmosphere. Furthermore, the research team analyzes the consequences of a natural inadequacy: since removals are not always permanent, the climate gas must frequently be removed again.

Seemingly cheap land-based options, such as afforestation or [carbon sequestration](#) in farmland, can thus become decisively less attractive compared to, for example, air filter systems with permanent underground storage. To illustrate this, the study calculates that if a non-permanent CO₂ storage lasts only 10 years, with the costs of this storage increasing by 1% annually and the real interest rate being 2%, then the provider of such a procedure should actually set aside 10 times the original investment sum for follow-up investments.

This poses challenges for policymakers, for example with regard to the point of regulation for carbon pricing and removal subsidies, as well as in terms of risk management and liability. It is against this background that the research team develops its governance concept. For example, it seems sensible for the EU to initially link subsidies to the permanence of removals from the outset ("upstream pricing"). Only when CO₂ emissions in the land sector are also comprehensively monitored and subject to pricing can removals be promoted equally.

"For such governance to be successful, it is important that the responsibilities are transparently and robustly anchored in the EU power structure," says Artur Runge-Metzger, MCC Fellow and also one of the authors. "The four crucial levers are quantity control of net emissions, regulation of liability for non-permanent removals, [financial support](#) for expansion and innovation of carbon removal, and certification of providers."

For the first two tasks, the study proposes a European Carbon Central Bank, plus two further authorities for financing and quality control. Runge-Metzger has served as Director in the EU Commission's Directorate-General Climate Action for many years, and has been strengthening MCC at the interface with policy since 2022. He emphasizes, "We think this proposal is viable within the current EU policy architecture."

More information: Martin Beznoska et al, On the Governance of Carbon Dioxide Removal – A Public Economics Perspective, *FinanzArchiv* (2024). [DOI: 10.1628/fa-2023-0012](https://doi.org/10.1628/fa-2023-0012)

Provided by Mercator Research Institute on Global Commons and Climate Change (MCC) gGmbH

Citation: How carbon removal fits into the architecture of EU climate policy (2024, March 28) retrieved 28 April 2024 from <https://phys.org/news/2024-03-carbon-architecture-eu-climate-policy.html>

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