

The Next Frontier: Negative Emissions Technologies' Contribution to Climate Solutions

Highlights and Links



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Holly Jean Buck
University at Buffalo

We need to balance the need for negative emissions with our other climate goals and sustainable development goals. Ideally, NETs develop concurrently with social and environmental justice.

We need communities to develop environmental justice frameworks for carbon removal, including procedural, reparative, intergenerational, and recognitive aspects (to name just a few).

Carbon is deeply engrained into our national revenues, society, and everyday lives. What does a just transition mean and how does carbon removal fit into that? One example could be carbon take back obligations.

How do we recognize the values, cultures, and situations of places and peoples that may be affected by scaling-up of new industries and approaches? It is essential to recognize the size and cost of carbon removal will require a huge social buy-in.

[After Geoengineering: Climate Tragedy, Repair, and Restoration](#)

[Buying Time In The Climate Crisis](#)

[Negative emissions and the long history of carbon removal](#)

[Principles for Thinking about Carbon Dioxide Removal in Just Climate Policy](#)



Christopher Neidl
OpenAir

The classic innovation model of firms addressing markets (with potential government interventions) is not the only means by which we can drive innovation in carbon dioxide removal technologies.

The OpenAir collective seeks to accelerate direct air carbon capture and sequestration through a peer-production (open-source, distributed, online, volunteer) network.

It is early days, and we can only speculate on what trajectory NETs may take. The answer might only be clear in retrospect. It is critical that we allow ourselves the imaginative and unexpected when contemplating negative emissions technologies and deployments.

Getting new technology out into the world, in any way or form – making it accessible – can access the creative efficacy of a larger and more diverse community of innovators.

[The OpenAir Collective](#)

[Violet: Introducing the world's first open source hardware Direct Air Carbon Capture DACC machine](#)

[More OpenAir on YouTube](#)

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Jennifer Wilcox
University of Pennsylvania and
World Resources Institute

Negative emissions should not be viewed as a replacement for deep decarbonization but rather both will be required to meet climate goals. In addition, to achieve net zero emissions, carbon removal will be required for handling difficult to avoid sectors, such as industry, transport, and agriculture.

Due to the dilution of CO₂ in air, it tends to be costly to do direct air capture using chemicals. Coupling to low-carbon waste heat is a strategy to get projects started at lower costs.

For direct air capture, technologies exist today and are ready for increased deployment and this is where investments should be prioritized.

[Negative Emissions Technologies and Reliable Sequestration: A Research Agenda \(2019\)](#)

[A new way to remove CO₂ from the atmosphere](#)

[How Can We Remove CO₂ From The Atmosphere? Will We Do It In Time?](#)

[The Challenge of Scaling Negative Emissions](#)

[The Essential Role of Negative Emissions in Getting to Carbon Neutral](#)

[The Giving Earth](#)



Kirsten Zickfeld
Simon Fraser University

We have a limited carbon budget remaining to avoid an average temperature increase of greater than 1.5° C – in the vicinity of eight to nine years of current emissions.

Negative emissions extracting CO₂ from the atmosphere must capture an excess of CO₂ to account for the carbon debts retained by ocean and terrestrial reservoirs.

We must not neglect the importance of decarbonization when contemplating how to invest towards climate solutions.

Careful consideration of Earth System uncertainties and feedbacks is required to ensure that scaled-up NETs are aligned with desired climate outcomes.

[Special Report: Global Warming of 1.5C](#)

[Working Group I The Physical Science Basis](#)

[Climate Change 2013: The Physical Science Basis \(Ch6\)](#)

[Climate Literacy 101: The State of the Climate](#)

[Can planting trees save our climate?](#)

[Atmospheric carbon dioxide removal: long-term consequences and commitment](#)