

Tips

for Reporting on Carbon Dioxide Removal (CDR)

These insights are distilled from Solutions Journalism Network's Climate Primer seminar series. The series is intended to provide journalists with timely, topical deep-dives into the science, complexity and nuances of covering climate change through a solutions lens. Have ideas for topics you'd like us to tackle in the future? Send them to climate@solutionsjournalism.org. You can find condensed videos of the CDR sessions at youtube.com/@SolutionsJournalism

1 Know who's behind the specific CDR initiative you're covering — and who's benefiting.

Some CDR projects come from tech start-ups, others from companies looking to address their own industrial emissions, or even fossil fuel companies that plan to use carbon dioxide removal as part of oil prospecting. All these players have different motivations and reasons to want to remove carbon from the atmosphere, not all of which provide actual benefit to the public, said Nick Kusnetz, reporter for Inside Climate News, a nonprofit, nonpartisan news organization that provides reporting and analysis on climate change, energy and the environment. He offered an example of an oil company with plans to use the CO₂ gas it captures to push more oil out of the ground, calling the endeavor "net-zero oil."

Is it wrong for companies to profit from CDR? Not necessarily. But if a company also engages in more fossil-fuel burning activity as a result, it's hard to argue that the

project is a win in the high-stakes game of carbon accounting. As Kusnetz said of his example company: “This is certainly not, from a holistic standpoint, the kind of carbon removal that a lot of people who care about real impact are talking about.”

But don’t categorically discount fossil fuel players as legitimate leaders in CDR, said Simone Stewart, industrial policy specialist with the National Wildlife Foundation. “We can’t necessarily write off every fossil fuel company that is going to participate in the CDR sector,” she said. “Oftentimes we will see [fossil fuel companies] at the forefront of this sector because they have had the money, the freedom and the time to help develop the technology and bring it to scale. But, of course, their solutions need to be held to high standards that sift real solutions from greenwashing, she added. Some companies fund CDR as a future tool to compensate for their emissions. “There’s been a wave of investment in carbon removal from technology companies like Microsoft and Stripe and Shopify, who have the philosophy that we will need these technologies in the future,” said Emily Pontecorvo, a senior reporter with Grist, a nonprofit media organization dedicated to telling stories of climate solutions and a just future. “They’re looking at their own emissions and saying, ‘We’re gonna need these technologies in order to make good on our climate commitments.’ ”

That thinking is reasonable, said Vanessa Suarez, managing environmental justice advisor for Carbon180, a U.S. nonprofit that works with policymakers, entrepreneurs and peer organizations to design policies that will bring necessary carbon-removal solutions to gigaton scale. But she notes that CDR should be part of a portfolio of strategies that also include emissions reduction. “Carbon removal is essential, but it should not detract, by any means, from emissions reductions, which are priority number one.”

2 Use a climate-justice lens (both historical and current) to evaluate the impact.

Climate justice — i.e., acknowledging inequity in the impacts of environmental pollution and climate change, and repairing that harm — is both a global and a local issue. The Global North, including most industrialized and developed nations, is responsible for the majority of carbon emissions historically, but the impacts of climate change are accruing faster and with more severity in the Global South. Additionally, within countries like the U.S., harms related to environmental pollution, carbon emissions and climate change have fallen more heavily on marginalized communities.

To avoid perpetuating this dynamic, communities impacted by CDR initiatives should always have a voice at the table, said Yessenia Funes, climate director at Atmos, a nonprofit magazine curated by artists, activists and writers that focuses on ecological and social justice. “As journalists we need to talk not only to the companies who have a financial stake, but with the communities who have a stake in projects culturally and emotionally,” Funes said.

Stewart recommends scrutinizing a company’s overall record of prioritizing marginalized communities to understand the authenticity of its motives: “I would look for companies that have good social standing and that talk about environmental-justice principles as a part of how they run their company.”

3 CDR is very small, and scaling slowly. But the planet still needs it.

CDR is in its infancy, and its significance as a climate crisis solution remains unclear. “Currently, tech-based CDR absorbs around 40 seconds’ worth of global emissions every year,” said Paul West, senior scientist for ecosystems at Project Drawdown, a nonprofit that provides scientific guidance regarding which climate actions the world should prioritize — across sectors, timescales and geographies. “We should be investing a lot more in what we know already works. Unfortunately, a lot of our best [emission reduction] solutions aren’t as exciting and sexy [as CDR]. But at the current rate, CDR will offset maybe five gigatons or so by 2050. That’s like a month’s worth of current emissions. That’s nowhere near the scale that’s needed.”

Despite its limitations, many experts still believe that carbon removal will be necessary as a way to address legacy emissions, now that governments have missed so many target goals for reduction. “We have been emitting greenhouse gas emissions for the past two centuries, and the only way to draw down the carbon that exists in the atmosphere right now is through carbon removal,” said Suarez. “We’re going to need drastic emissions reductions, but there is a small chunk that we need to address through carbon removal to get to those emissions that have historically been emitted.”

4 Accountability and measurement matter.

When it comes to CDR projects, accountability takes multiple forms. In addition to researching the primary players, journalists should understand the project’s funding sources as well as the means by which the project will measure and prove the durability of the carbon removal.

The metrics and measurement of carbon removal are complex and fraught. How much carbon will be captured and how will it be stored (and for how long) to prevent it from returning to the air? “There’s a big conversation around permanence,” Pontecorvo said. “Solutions that involve storing carbon in biology, like in trees, in soil or in mangroves, have a much shorter carbon cycle than solutions like storing carbon underground or in a product like cement, where it’s going to stay for thousands of years. But trees can burn and the carbon injected underground has the potential to leak. Every solution has different risks to permanence.”

A useful tool to understand a project’s commitment to permanence is the Climate, Community & Biodiversity Standards, which are criteria developed by an alliance of NGOs to determine whether a given land-use project is delivering tangible climate, community and biodiversity benefits. While the criteria apply primarily to land-use management, the standards also provide a framework for thinking about holding CDR accountable, said Katherine Hamilton, an independent conservation policy and finance advisor. “They provide criteria not only for carbon accounting, but also for impacts on water and biodiversity and multiple other dimensions,” Hamilton said. “It’s a way to understand any investment’s impact holistically.”

5 Follow the money.

Look into the sources of investment money — and into where any dividends are going. While a significant portion of CDR efforts are privately financed, more efforts are using government tax breaks as incentives, said Kusnetz of Inside Climate News.

For example, the Biden administration recently included more than \$18.9 billion for five years of carbon management through its bipartisan Infrastructure Investment and Jobs Act (IIJA). These investments will be governed by the Justice40 Initiative. Justice40 requires that benefits from federal investments in clean energy and climate resilience are distributed equitably, with a particular focus on low-income communities and communities of color that have historically been disproportionately affected by pollution and environmental degradation. The initiative takes its name from the goal of directing at least 40 percent of the overall benefits from relevant federal investments to disadvantaged communities.

Whenever taxpayer funds are in use, the threshold of accountability is higher, said Stewart of the National Wildlife Foundation. She pointed to efforts such as Justice40 and Massachusetts' Clean Energy and Climate Plan as good examples of potential climate justice criteria. "[Massachusetts legislators] did a great job of talking about the environmental justice implications and requiring reporting and surveying from their bidders," Stewart said. "They even talked about liability — that the state can audit a project at any point in time, and if it is not meeting the environmental justice goals that the vendor outlined, the state has the ability to revoke the contract."

Stewart said governance controls that are key to ensuring climate justice should be on all journalists' checklists for accountability. "It's really important to think about disadvantaged communities and to force companies to think about them."

Two Types of CDR

Carbon dioxide removal (CDR) can be achieved through nature-based methods and technological approaches. Below are the key differences between the two.

Nature-Based Methods

Land- and ocean-based methods of carbon dioxide removal involve leveraging natural ecosystems to capture and store carbon. These methods rely on the ability of plants, trees and natural processes to absorb and sequester carbon dioxide from the atmosphere. Some examples of these CDR methods include:

- **AFFORESTATION AND REFORESTATION:** Planting trees in areas where they did not previously exist or restoring forests that have been depleted can remove carbon dioxide from the atmosphere because trees absorb carbon dioxide through photosynthesis, storing carbon in their biomass and soils.
- **FOREST MANAGEMENT:** Sustainable forest-management practices, such as reducing deforestation and promoting sustainable logging, can enhance the carbon storage capacity of forests.
- **SOIL CARBON SEQUESTRATION:** Implementing agricultural practices that enhance soil health, such as cover cropping, crop rotation and conservation tillage, can promote the sequestration of carbon in the soil, helping to mitigate climate change.
- **COASTAL AND MARINE ECOSYSTEM CONSERVATION:** Restoring coastal wetlands, mangroves, seagrass beds and coral reefs creates marine habitats that are highly efficient at capturing and storing carbon dioxide from the atmosphere.

Nature-based methods of CDR can offer additional benefits, such as biodiversity conservation, improved water quality and ecosystem resilience. They often have lower upfront costs compared to technological approaches, and they can provide a range of other ecosystem services that support human well-being.

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Technological Approaches

CDR technologies involve the use of engineered systems and processes to capture and remove carbon dioxide from the atmosphere. These methods are typically more resource intensive and require infrastructure, energy inputs and advanced technologies. Some examples of technological CDR approaches include:

- **DIRECT AIR CAPTURE (DAC):** Large-scale machines directly capture carbon dioxide from ambient air, and then the captured carbon dioxide can be stored underground or used for other purposes, such as enhanced oil recovery or the production of synthetic fuels.
- **ENHANCED WEATHERING:** Grinding rocks and exposing them to carbon dioxide accelerates natural weathering processes because the carbon dioxide reacts with the minerals to form stable carbonates, permanently storing the carbon.
- **BIOENERGY WITH CARBON CAPTURE AND STORAGE (BECCS):** Generating energy from biomass (such as crops or forestry residues) and capturing the resulting carbon dioxide emissions for storage can effectively remove carbon dioxide from the atmosphere. This process only qualifies as capture if no new carbon is generated: Plant material emits carbon during decomposition anyway, so, unlike an industrial process, burning it does not create new carbon emissions. There are also challenges related to how the plant material is sourced. For example, tearing down old-growth forest to create “green energy” is not an environmental win.
- **BIOMASS CARBON REMOVAL AND STORAGE (BiCRS):** There is no energy production in BiCRS; it is purely for the purpose of sequestering carbon dioxide. Many of the same concerns that exist for BECCS also exist for BiCRS — how is the biomass sourced, grown, transported and converted?

Technological CDR methods hypothetically have the advantage of scalability. However, they often come with higher costs, energy requirements and potential environmental impacts associated with infrastructure development and operation. Most of these technologies are also in development or functioning at a very small scale. Current tech-based CDR efforts can offset less than 40 seconds of the world’s global annual emissions.