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# Demystifying Carbon Dioxide Removal

## April roundup

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**Dear all,**

This month saw a number of reminders that CDR is less a silver bullet and more a niche and complex technology that is currently dwarfed by the scale of the challenge, no matter how simple the approach may sound.

Eyebrows were also raised about CDR companies' ties with the fossil fuel industry and the purchase of removal credits for emissions that could be easily abated.

Finally, we take a look at how the dominance of the CDR industry by the EU and US leaves unanswered questions about how removal technologies might be expanded in the Global South.

As always, please feel free to share this newsletter with anyone who may be interested. You can [sign up here](#), or [click here](#) to see an archive of previous editions. Don't hesitate to reach out if you have any suggestions or feedback.

**Till next time,**

**Victoria**

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Stat of the month:

200,000 tonnes

The amount of CDR purchased by the [NextGen CDR Facility](#), a joint venture between Mitsubishi and South Pole, equivalent to about a quarter of all CDR purchases to date.



## Let's not bank on CDR

In all the hype of CDR announcements and business promises, are we forgetting that rapid and immediate emissions cuts are our best hope at limiting warming? This is the question asked by David Ho, professor of oceanography at the University of Hawaii at Manoa, in his [op-ed in Nature](#). He doesn't deny the need to develop CDR methods over the long term, but highlights that CDR will be of little use "until society has almost completely eliminated its polluting activities".

For example, the four direct air capture (DAC) hubs funded by USD 3.5 billion from the US government are each anticipated to remove a million tonnes of CO<sub>2</sub> annually. Ho suggests thinking of CDR as a time machine - each hub could turn back global emissions of CO<sub>2</sub> by 13 minutes, but in the time taken to remove those 13 minutes of CO<sub>2</sub> "the world would have spewed another full year of CO<sub>2</sub> into the atmosphere". Basically, he says CDR without reducing emissions to almost zero is "futile".

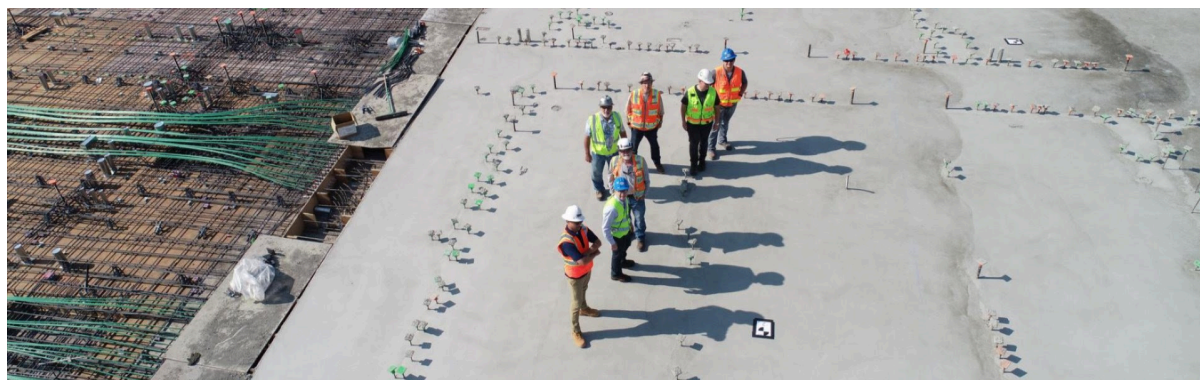
Ho expresses the value of developing CDR methods now so that they will be available in the future, but ultimately believes "[we must be prepared for CDR to be a failure](#)" given the scale of the task at hand. Friederike Otto, a lead author of the IPCC, expressed similar views in [a recent article](#): "My feeling about CDR is that we should pretend it is not an option. We should act as if CDR will never be achievable. We do not have a technology at the moment that works at scale... so we should make our policies as if CDR is not an option."

US Special Presidential Envoy for Climate [John Kerry also made headlines](#) by stating that relying solely on CO<sub>2</sub> removal technology is "dangerous" and that we should not assume we can reverse overshoot of 1.5°C with CDR. However, the US is still backing CDR, recently launching a joint "[Carbon Management Challenge](#)", hoping for concrete national announcements at COP28 on CDR and carbon capture utilisation, or CCUS, and storage for emissions that cannot be avoided.

Even planting trees, the seemingly most straightforward carbon removal approach, is not a credible solution. According to an [article by the Financial Times](#), governments have promised to plant 633 million hectares of trees - an area bigger than the Amazon rainforest. Further pledges from the public and private sector amount to a trillion trees. But, the article highlights, "there is simply not enough [land] for ambitions to be met" and attempts to plant trees at such scale could be harmful. It also reiterates that "planting a tree and expecting it to permanently store carbon is unrealistic."

Reforestation projects don't usually monitor the survival of trees over long time spans, which means that carbon removal is often overstated and short-lived, rather than providing permanent carbon

removal. “[Corporations are greenwashing us](#) when they say they will achieve net zero if that is relying on removing carbon through tree planting,” says Melbourne University lecturer Kate Dooley.



## Who should be involved in CDR?

The US Inflation Reduction Act has provided a large amount of funding for CDR and attracted companies to start engaging in carbon removals, including some with ties to the fossil fuel industry. One is Occidental Petroleum, one of America's biggest oil and gas producers, which is spending over USD 1 billion on developing DAC technology. According to the Wall Street Journal, [up to 45% of its initial per-tonne costs of carbon removal will be covered by government tax incentives](#). Concerningly, Occidental's CEO Vicki Hollub sees the company's expansion into [CDR as a lifeline for pumping oil](#), claiming that Occidental's efforts on DAC would allow it to keep up its investments in oil and gas - while becoming a “net-zero emitter”.

Another company trying to establish itself in the DAC world is Global Thermostat. The recent launch of its Colorado demonstration facility was attended by high-profile politicians, [including Former House Speaker Nancy Pelosi](#). The facility's purpose is merely to demonstrate it can capture CO<sub>2</sub> directly from the air, rather than sell removal credits. Global Thermostat plans to [sell the technology itself](#), for example to carbonated beverage companies and fossil fuel companies, which could use it for enhanced oil recovery, where CO<sub>2</sub> is pumped underground to increase the flow of oil. Global Thermostat has already partnered with ExxonMobil and Tokyo Gas, [sparking criticism from environmental groups](#). Additionally, DAC frontrunner Climeworks, which initially distanced itself from fossil fuel companies, has also announced it will [partner with oil firm California Resources Corp](#) as it [sets up DAC plants in the US](#).



**"Companies are already purchasing removal credits to offset current emissions that are not necessarily hard to abate."**

While there are some potential reasons for fossil fuel companies to be engaged in CDR, including access to facilities and underground storage, Erin Burns, executive director of DAC consultancy Carbon 180, highlights that it's "really essential for the success of DAC that [it] be about [removing legacy emissions and not be about continued fossil fuel use](#)."

Further concerns have been raised about those purchasing CDR credits. This month saw the second largest CDR purchase announcement to date by NextGen CDR Facility - a joint venture between South Pole and Mitsubishi Corporation - of [almost 200 thousand tonnes of CDR](#). New Climate Institute researcher Takeshi Kuramochi described [Mitsubishi's involvement as "disturbing"](#), arguing that the company "[would better contribute to \[emissions reductions\] by first accelerating its transition of fossil fuel-heavy energy business to renewables](#)". Climeworks has tried to counter this point by calling for a [clear distinction between emissions reductions and carbon removals](#) in industry standards, claiming that they play different roles in the fight against warming. "What we are saying is that removals [should not stand as an excuse to not reduce your emissions](#)," says Climeworks policy manager Louis Uzor.

Differentiating between removals and offsets from the reduction or avoidance of emissions is a good idea in theory but, in practice, companies are already purchasing removal credits from Climeworks and others to offset current emissions that are not necessarily hard to abate. Tech giant Apple just invested another [USD 200 million into its CDR fund](#), financial technology firm Tide just purchased [3,711 tonnes of removal credits](#) to offset its emissions, and four companies, including finance services company JP Morgan and fashion retailer H&M, [invested an additional USD 100 million](#) towards CDR.

With questions being asked about the effectiveness of carbon reduction and avoidance projects in the voluntary carbon market, "[it's led to this kind of perverse outcome where everyone's chasing removals](#)," says Stockholm Environment Institute's Derik Broekhoff. As highlighted above, this could seriously undermine efforts to reduce emissions and hit climate targets.



## CDR going global

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The majority of media attention on CDR focuses on what is happening in Europe and the US, but there are developments happening outside these areas. For example, Klarna has purchased thousands of tonnes of CDR credits from a [biochar project in Cambodia](#), CDR start-up Brilliant Planet has announced plans to [start construction on its new algae farm in Morocco](#), and Kenya-based Octavia is developing DAC technology that aims to capitalise on the [country's abundant geothermal energy](#).



Non-profit Precision Development joined a webinar by the Institute for Carbon Removal Law & Policy this month on what [enhanced rock weathering might look like in the Global South](#). The webinar highlighted there could be [some benefits](#) for local communities and farmers, such as increased soil quality, if effective and fair payment schemes are implemented. However, many unanswered questions remain, particularly given the lack of research undertaken in the Global South to date. For example, the majority of studies on soil quality have been undertaken in the Global North.

Such concerns were expressed in [a new research paper](#) that interviewed 90 different experts on expanding carbon removal to the Global South. The paper reiterated that CDR researchers, innovators and companies all have pre-dominance in the Global North, meaning that assessments of benefits and risks, research and regulatory measures so far have “taken place with an EU and US-focused perspective that functionally prioritises sectors, governments, and publics in the industrialised countries of the Global North”. A major shortcoming of the study was that it relied “mostly on Global North researchers and innovators active in carbon removal”, highlighting the need for more diverse perspectives and influence.



## Our pick of the news

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[This Ocean Monster Offers a Potential Climate Solution](#) (Bloomberg)

Bloomberg explores why a UK startup sees a 10 million pound mass of seaweed as a way to remove CO<sub>2</sub>.

[Protesters urge caution over St Ives climate trial amid chemical plans for bay](#) (The Guardian)

Campaigners and the local council of St Ives protest over the trials by CDR start-up Planetary to add magnesium hydroxide to the wastewater pipe leading to sea.

[An L.A. Startup Aims To Turn The Oceans Into A CO<sub>2</sub> Sponge And 'Green' Hydrogen Machine](#)

(Forbes)

UCLA's Institute for Carbon Management is commercialising an ocean-based CO<sub>2</sub> reduction and hydrogen production technology.

[We're halfway to a tipping point that would trigger 6 feet of sea level rise from melting of the Greenland Ice Sheet](#) (CNBC)

Research suggests we are halfway to a crucial tipping point, and CDR is not going to help us avoid it anytime soon.

[Carbon copy: Draft European Parliament report fails to correct faulty carbon removals framework](#)

(Carbon Market Watch)

A draft report on the European Commission's original proposal for a Carbon Removal Certification Framework contains small improvements but "fails to correct fundamental flaws".



## Useful resources this month

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[Explainer](#): The World Resources Institute has put together four things to know about new developments in CDR.

[Study](#): Researchers demonstrate that, once the impacts of reversal and ongoing measuring, reporting and verification costs are accounted for, the cost of permanent removal is generally lower than that of non-permanent removal.

[Research](#): A new study proposes that salting and burying biomass crops in dry landfills could economically capture greenhouse gases for thousands of years.

[Paper](#): New research finds German citizens' prefer afforestation over DAC, but a combination of both approaches is likely to be needed.

[New finding](#): Scientists have discovered a microbe in a volcanic hot spring that they think can break down CO<sub>2</sub>.

[Policy brief](#): Confused about the US Farm Bill and what it means for carbon removal? The Carbon Business Council has written a policy brief to answer all your questions.

[Symposium](#): A carbon removal symposium is being held on 21-22 June in Washington DC, organised by a group of carbon removal institutes and councils.

[Tracker](#): NGO Carbon Gap has put together a policy tracker to help you navigate CDR policy development across Europe.

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Each month the demystifying carbon dioxide removal newsletter digs into the world of CDR to bring you the latest stories on everything from carbon credits and net-zero plans to nature-based solutions (NbS) and new technologies. Feel free to forward this email to your colleagues!

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