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# Demystifying Carbon Dioxide Removal

## November roundup

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Dear all,

Is keeping global warming below 1.5°C by 2030 beginning to look out of reach? With emissions from fossil fuels expected to rise by 1% this year, COP27 in Egypt even saw some [talk among states about dropping Paris targets altogether](#). With many left frustrated by the COP's lack of ambition on fossil fuel phaseout and the glacial pace of decarbonisation, we contemplate how the fallout from Egypt might shape views of carbon removal.

We consider carbon removal developments and pledges of support as COP negotiations unfolded, and explore new reports highlighting ongoing concerns about the technologies.

We also look at negotiations around the all-important rules of carbon markets and credits at the COP, as governments settle on ambiguous conditions that may offer loopholes for countries who want to drag their feet.

I hope you enjoy this special COP27 edition. If you would like to receive future editions of this newsletter, please [sign up here](#), or [see here](#) for archived editions.

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Stat of the month:

# 1.2 billion hectares

The amount of land to be planted with trees in current net-zero or 2030 pledges - larger than the size of Australia and equal to the global amount of land currently used for growing crops. This is unrealistic and would swallow land desperately needed for food production and ecology.



## Investment in carbon capture, removal and storage forges ahead

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Spurred on by COP27, the past month has seen various countries launching initiatives and implementing legislation to fast-track investment in carbon capture, removal and storage technologies.

In early November, the United Arab Emirates, which is hosting next year's COP28, announced with the United States a joint Partnership for Accelerating Clean Energy (PACE). The USD 100 billion agreement contains [provisions for developing new technologies for carbon capture, utilisation and storage \(CCUS\)](#).

COP27 saw the creation of the [Carbon Dioxide Removal Launchpad](#), led by Canada, the US and Saudi Arabia, which aims to fast-track the development of CDR technologies. Its [goals](#) include dropping the costs of carbon dioxide removal (CDR) to less than USD 100 per ton and scaling CDR capacity to a gigaton or more over the next two decades. By comparison, the costs of wind and solar energy are wildly lower than this, with the costs mostly being offset by the benefits (see [Table 12.3 here](#)).

On a somewhat smaller scale, the city of [Stockholm is hoping to reach net-zero by 2030](#) by powering its water heating system with Bioenergy Carbon Capture and Storage (BECCS). The captured carbon will be shipped to Norway's Northern Lights storage facility, although [dumping it in a nearby oil well will probably be cheaper](#).

The Northern Lights project is a joint venture between the Norwegian Government and oil majors Shell, TotalEnergies and Equinor. It aims to develop [the world's first open-source CO2 transport and](#)

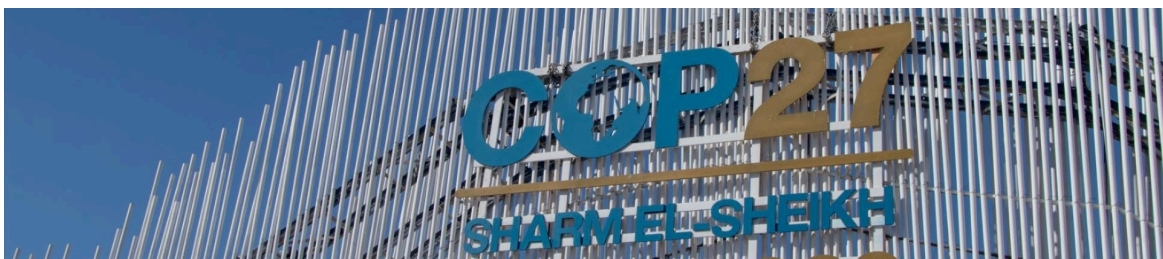
[storage infrastructure](#). Once construction of the transport ships that will pump CO2 under the seabed for long-term storage is completed in 2024, the project will be the [world's biggest effort to store carbon dioxide underground](#), and could process up to 6 million tons of CO2 per year. The [EU's annual greenhouse gas emissions are about 3.7 billion tonnes](#). [A report found](#) the project has taken longer to build than anticipated, and at a higher cost. It also noted that "carbon dioxide emissions would need to cost 10 times as much as they do today for the project to be profitable". In the meantime, media reports suggest that the geological formations of Australia are poised to become [a sink for emissions](#) from Asia.



**"...carbon removal must not become the latest in a trail of injustices whereby those who have done the least to cause the climate crisis shoulder the burden for society's response."**

Other new analyses continue to highlight uncertainties surrounding carbon removal. The [Land Gap Report](#) calculated the amount of land included in country pledges for carbon capture through afforestation. It finds that the amounts are unrealistic and would use up land needed for ecology and food production. [The lead of the report](#) says countries' net-zero plans contain too much focus on carbon removal and too little emphasis on reducing fossil fuel emissions.

[Analysis by Carbon Gap](#) found that "companies with the highest profit per ton of CO2 emitted are actually spending an 'astonishingly low' part of their revenues and profits on purchasing carbon credits". The report suggests that much more scope exists for spending on climate projects. Similarly, [Politico asks](#) whether tech firms that have committed to fund research into carbon removal will be able to fulfil their USD 1 billion plans under the [Frontier advance market commitment](#) as their profits take a hit.



# Carbon credit and trading developments

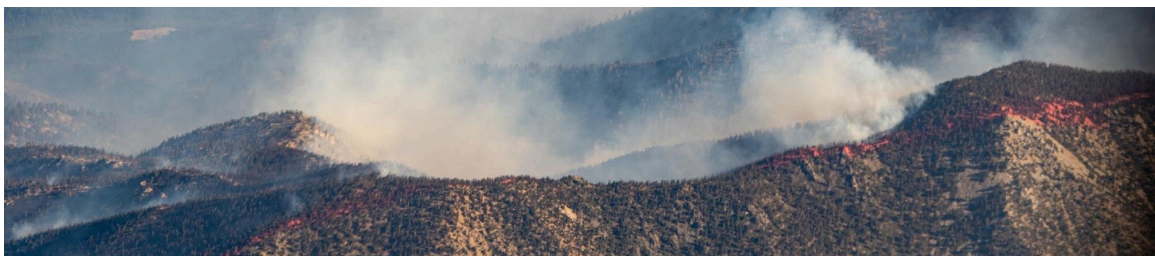
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COP27 saw the finalisation of details relating to Article 6 - a key component of the Paris Agreement that dictates how countries use carbon credits to reduce emissions and reach climate targets. The negotiations were eagerly anticipated but ended disappointingly. “Instead of agreeing on carbon markets with exemplary transparency, robust governance, and stringent accounting provisions, governments did not rule out arbitrary secrecy and weak oversight,” [according to](#) Carbon Market Watch’s policy director, Sam Van den plas.

Under Article 6.2, which allows bilateral trading of carbon credits among countries to reach their NDCs, governments at COP27 agreed on rules that allow trading information to be kept confidential, including the type and quantity of traded offsets. In another controversial development, provisions for credits from avoided emissions - such as paying for a forest to not be cut down - which were excluded under Article 6.2 at COP26, [may be up for future consideration](#).

Under Article 6.4, which involves the establishment of a new global carbon market, serious concerns were raised about the broad definition of carbon removals credits and the lack of consideration of human rights, particularly by the [Climate Land Ambition & Rights Alliance](#) and the [Centre for International Environmental Law](#). Pressure from civil society resulted in this aspect being kicked down the road to COP28 next year.

COP27 also left open the risk of [double counting](#), in which a carbon credit sold by a country is claimed by both the seller and the buyer of the credit. This occurred with the confirmation of the existence of [credits that do not have to be authorised or removed from the host country's balance sheet](#) when they are transferred to another owner.



## Greenwash questioned

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It is important that the accounting and transparency of carbon credits and markets are scrutinised. A [report launched by the UN High-Level Expert Group at COP27](#) cautions that the promises made by companies, banks and cities are fraught with greenwashing, with the expert group chair warning that [“bogus net-zero claims drive up the cost that ultimately everyone will pay”](#). The report provides guidelines for credible net-zero emissions targets, including checklists for companies and cities.



In other analyses, Bloomberg Green recently found that many global brands are [relying on incredible renewable energy offset purchases](#). A research paper reported that the loss of carbon dioxide from burnt forests in the forest carbon offsets programme of California may have resulted in the [reversal of up to 6.8 million credits](#).

The European Commission's [proposal](#) for a Carbon Removal Certification Framework (CRCF), which aims to set out how carbon removals will be certified, monitored and accounted for in the EU, has also [raised concerns](#). Foremost, what constitutes a removal is poorly defined. Other concerns are that non-permanent and permanent removals are seen as equally valuable storage solutions, that greenhouse gases from natural carbon sinks are not counted, and that activities related to 'carbon farming' - which is carbon sequestration in land sinks such as forests and soils - are included. These oversights mean that the framework could possibly be misused for offsetting fossil fuel emissions - and therefore greenwashing. [Wijnand Stoefs from Carbon Market Watch emphasised](#) that "The CRCF should have slammed the door tightly shut against the sale of carbon removals as offsets on voluntary and compliance carbon markets". The framework also needs to [clarify](#) how the certifications will fit in with current EU carbon removal policies and goals. Environmental groups, including the Centre for International Environmental Law, have appealed to the EU to [drop carbon removal](#) from its climate plans, citing greenwashing concerns.



## The Global South

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COP27 saw an ongoing focus on the politics of North/South cooperation and conflict over climate. [There is concern](#) among some observers that the CDR debate is being too heavily shaped by Western governments and financial interests. All carbon removal technologies come with serious ethical considerations in this context, whether it be the replacement of indigenous vegetation with monocultures, which could [disrupt water security and reduce access to traditional medicines and foods](#), or the issue of [intergenerational equity](#) if the West relies on future (and therefore unreliable) negative emissions technologies to excuse its emissions now.

COP27 was dubbed 'the African COP' and saw the African Carbon Markets Initiative (ACMI) [launch its roadmap to scaling voluntary carbon markets](#) on the continent. It aims to build a thriving voluntary carbon markets ecosystem by 2030 with a focus on job and revenue creation for local communities. However, [African climate activists are sceptical](#) of the whole enterprise, saying the "climate crisis cannot be solved by shifting air from one part of the world to another which this initiative essentially will be doing, making Africa some sort of a virtual dumping site while our leaders cash in on another false solution."

It is important that the burdens and responsibilities of carbon removal projects are not placed on the Global South while the benefits are enjoyed by the West. Perhaps local projects are part of the answer? Powered by renewable geothermal energy, the [Nairobi-based Octavia Carbon](#) is a direct air carbon capture (DACC) start-up that “aims to establish East Africa as a leading global hub for DACC deployment and durable geostorage”. Octavia’s DACC design will become open-source early next year in hope of attracting collaboration for optimising the technology.



## News in brief

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[Carbon-Capture Projects Are Taking Off. Here's How They Stash the Greenhouse Gas](#) (The Wall Street Journal)

*“Sixty-five miles off the coastal Norwegian city of Bergen, a drilling rig is punching through layers of mud and rock below the North Sea. The energy firms behind the rig aren’t prospecting for oil or gas. They are searching for a place to stash vast amounts of the greenhouse gases emitted by industrial facilities across Europe.”*

[Protecting forests is even more powerful in the climate fight than we thought](#) (Marketwatch)

*“Through their impacts on the movement of moisture and heat into and through the atmosphere, forests improve food and water security, protect human health, and enhance our ability to adapt to a warming planet — and also supercharge tropical forests’ already significant global cooling benefits... In fact, scientists estimate that the global cooling effects of tropical forests are as much as 50% greater than the effects measured by carbon alone.”*

[Shell, Sinopec, Baowu and BASF to study feasibility of building massive China carbon capture project](#) (South China Morning Post)

*“Global oil and gas giant Shell has teamed up with China Petroleum & Chemical (Sinopec), China Baowu Steel Group and BASF to study the feasibility of building a large-scale carbon capture and storage (CCS) project in China.”*

[Singapore to kick-off S\\$15 million carbon credit research in South-east Asia](#) (The Business Times)

*“Singapore will spend S\$15 million to further carbon credit research in South-east Asia, after research found that Asia-Pacific hosts the highest concentration of the most profitable carbon projects that can generate returns on investments at close to US\$25 billion a year.”*

[Make Australia the carbon sink of Asia: Chevron](#) (Financial Review)

*"Oil and gas giant Chevron says Australia has "huge" potential to become a sink for carbon emitted by other nations and will study a project to bury Singaporean carbon dioxide permanently in Australian geology."*

[Carbon Engineering secures millions from Airbus, Air Canada to scale carbon extraction technology](#)

(The Globe and Mail)

*"B.C.-based Carbon Engineering Ltd. has secured multimillion-dollar investments from Air Canada [AC-T](#) and aircraft manufacturer Airbus SE to scale up and improve its technology for extracting CO<sub>2</sub> from the atmosphere, the latest in a series of funding announcements from big-name backers."*

[SoCalGas and Captura Begin Testing Innovative Direct Ocean Carbon Removal Technology](#) (PR Newswire)

*"[Southern California Gas Co.](#) (SoCalGas) and [Captura](#), a carbon removal company founded at [Caltech](#), announced the deployment of an innovative, direct ocean carbon removal technology that uses 100% renewable energy and ocean water to draw down surplus atmospheric CO<sub>2</sub>....Captura plans to scale up the technology to remove millions of tons of atmospheric CO<sub>2</sub>, which could help accelerate achieving California's climate goals."*

[It's time to give carbon removal a chance](#) (Al Jazeera)

*"We don't have time to choose between stopping emissions and removing CO<sub>2</sub> from the air. We need to do both to survive....Leaders must act to accelerate research for carbon dioxide removal strategies and enact equitable policy frameworks that ensure solutions are guided and owned by affected communities. This work can happen at the same time that the crucial work of mitigation takes place."*



## Useful resources this month

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[Explainer](#): How close are we to passing 1.5 degrees Celsius of global warming?

[Expert commentary](#): Comparing approaches for carbon dioxide removal

[Expert perspective](#): Climate change: carbon offsetting isn't working – here's how to fix it

**[A research paper:](#)** Procure, Bank, Release: Carbon Removal Certificate Reserves to Manage Carbon Prices on the Path to Net-Zero

**[Expert perspective:](#)** Behind the scenes: How COP27 reached a deal that supports better monitoring of oceans to curb climate crisis

**[Tweet:](#)** On the UN's report on net-zero commitments

**[Expert perspective:](#)** COP27 was disappointing, but 2022 remains an historic year for international climate policy

**[Expert perspective:](#)** Ending the climate crisis has one simple solution: Stop using fossil fuels

**[Upcoming webinar:](#)** COP27 and carbon removal, hosted by the Institute for Carbon Removal Law and Policy, Monday 5 December

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