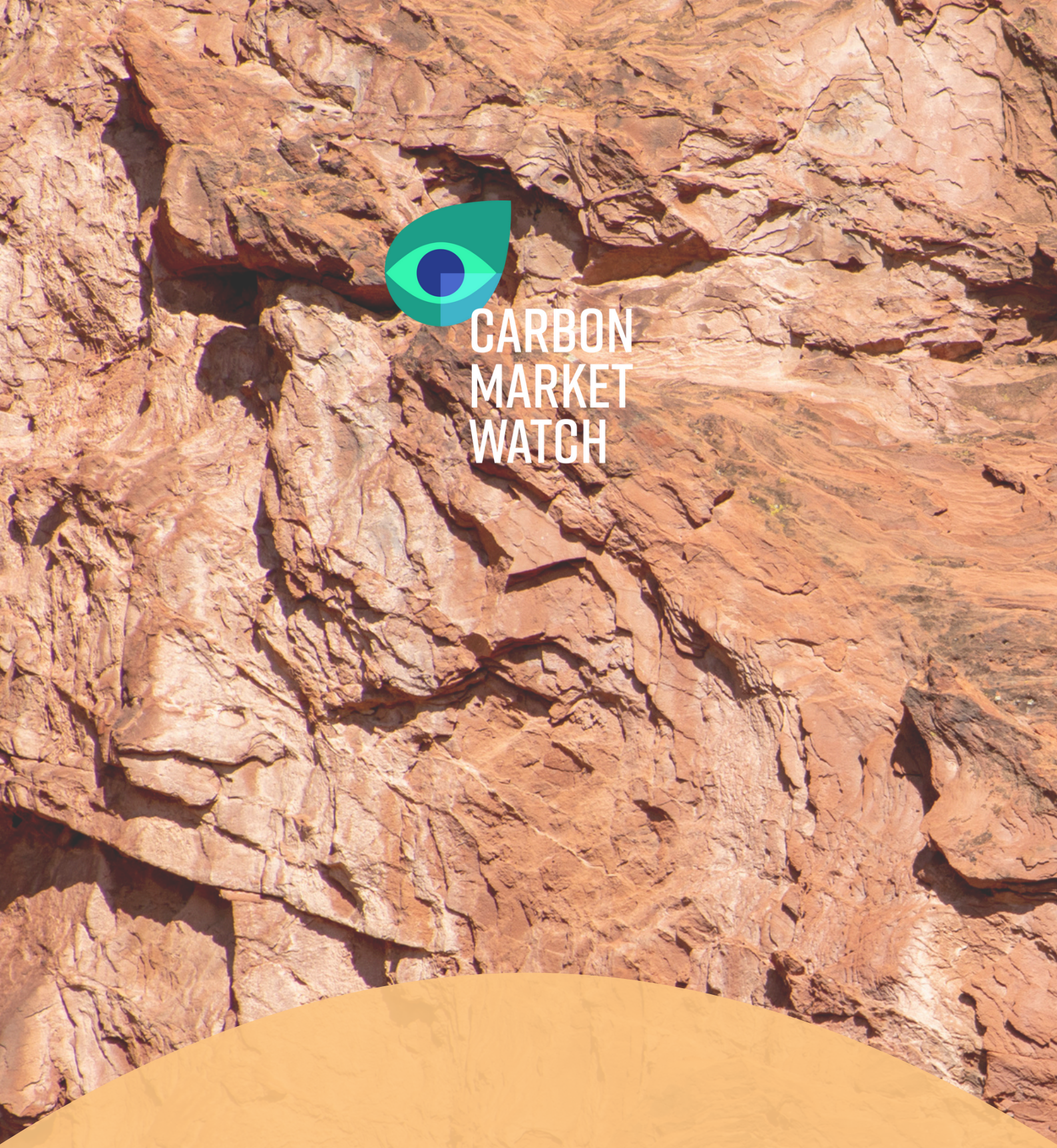

CARBON MARKET WATCH

Frequently Asked Questions

# WHY SEPARATE CARBON REMOVALS FROM OTHER CLIMATE TARGETS?

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# Introduction

To limit global warming to 1.5°C and avoid climate breakdown, carbon dioxide removals (CDR) will be needed to supplement urgent, deep and sustained emissions reductions. They will be unavoidable in balancing out those residual emissions society deems necessary and dealing with historical pollution in the atmosphere. However, carbon removals cannot replace decarbonisation.

There is a need to clarify the supplementary climate function of carbon removals, to distinguish between different types of removals and address the potential risks associated with their deployment. In order to ensure that attention remains focused on slashing greenhouse gas emissions and protecting natural sinks, while we prepare the ground for a sustainable deployment of permanent removals, we can start by setting separate targets for gross emissions reductions, temporary carbon sequestration by natural sinks and permanent removals.

This explainer answers key questions related to the topic of carbon removals, the principle of separate targets, and their implications for implementation.

# 1. What is carbon dioxide removal?

Carbon dioxide removal (CDR), often referred to as carbon removals or negative emissions, is the process by which $CO_2$ in the atmosphere is extracted and permanently stored, with the amount of $CO_2$ removed significantly exceeding the emissions involved in the removal process. For storage to be viewed as permanent, the stored carbon cannot be re-emitted within a timeframe where it contributes to climate breakdown. In practice, this means the $CO_2$ should not be re-emitted for several centuries.

There are technical (or engineered), natural, and mixed carbon removal processes.

Natural solutions focus on enhancing carbon sequestration (i.e. the storing of $CO_2$ in carbon sinks) via natural processes in ecosystems, such as forests, wetlands, and grasslands. These solutions include protecting ecosystems, rewilding, and reforestation. Protecting natural sinks and increasing sequestration in soils and biomass is critical to addressing the biodiversity and climate crises. Some ecosystems, such as old-growth forests, have stored carbon for so long that a decline in their carbon stocks through, for example, deforestation, has the same warming impact on the Earth as the use of fossil fuels. However, in light of the high risk of human and natural disturbances to these natural sinks, they are vulnerable to loss of stored carbon and should be considered temporary in carbon accounting terms.

Some technical solutions can better ensure long-term storage and have low vulnerability. These include direct air capture and carbon storage (DACCS), which removes CO2 from the air and permanently stores it in geological formations underground.

There are also mixed CDR processes that have both technical and natural components. This is the case for boosting the capacity of rocks to store carbon through what is known as terrestrial enhanced weathering (TEW). For more information about CDR processes, check out our Negative Emissions Handbook.

Carbon removals can be defined as such only if they deliver an actual climate benefit and are not associated with more emissions being released than removed or other significant harmful environmental and sustainability impacts. This is why targets for carbon removals must be accompanied by robust accounting rules and certification methodologies.

## 2. What is mislabelled as CDR?

Some processes that do not actually remove carbon from the atmosphere and store it are often mistakenly described as carbon removals. These include carbon capture and storage (CCS) and carbon capture and utilisation (CCU), both of which capture emissions from polluting sites, such as factories or plants, not the atmosphere, and store them permanently underground or temporarily in products. Carbon capture is not sufficient for a removal to happen, the source of the carbon must be atmospheric.

## 3. Why do we need CDR?

To deal with climate change, the world needs to reach a point in which global heating stops and temperatures stabilise before ultimately returning to safer levels. To do that, the concentration of greenhouse gases in the atmosphere must reach a peak and eventually decrease.

In practical terms, emissions must be slashed, and those remaining emissions that society deems essential or very difficult to eliminate (which should also decrease over time) must be balanced out by carbon removals to reach an equilibrium (what is known as “climate neutrality” or “net-zero emissions”). After that, removals must gradually outweigh emissions so that we reach a phase in which more emissions are taken out of the atmosphere than emitted into it. This would lead to a fall in atmospheric greenhouse gas concentrations and so-called “negative emissions”.

Carbon removals, if done well, have the potential to help mitigate climate change by lowering net emissions, but they cannot replace decarbonisation. CDR remains a finite resource, with many constraints linked to its deployment, including the potential risks of

reversal, uncertainty over technological readiness, demand for scarce and overstretched sustainable biomass, energy, water, and land, not to mention negative consequences for biodiversity and local communities. Leading climate scientists have recently confirmed that there is no alternative to near-term emission reductions to limit the damages of climate change to our planet, ecosystems and people.

The Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment Report stated that CDR is unavoidable to remain within the 1.5°C warming limit of the Paris Agreement and to reach net zero greenhouse gas (GHG) emissions globally. More specifically, the IPCC identifies three roles for CDR:

1. Before net zero, supplement emission reductions and accelerate climate change mitigation.
2. Achieve net-zero by balancing out residual $CO_2$ and non-$CO_2$ GHG emissions.
3. Exceed annual GHG emissions and achieve net-negative emissions globally to draw down global temperatures.

## 4. What are separate climate targets?

Ever since the first climate negotiations between the late 1980s and early 1990s, the international community's approach to climate targets has changed several times. The first targets were based on emissions stabilisation and percentage emissions reduction objectives and later transformed into goals for appropriate levels of atmospheric $CO_2$ concentration, carbon budgets and temperature targets.

With time, these approaches gradually became reliant on the use of carbon removals to counterbalance emissions and reach apparently more ambitious net goals. Today, most countries and companies frame their climate targets as "net", which explicitly or implicitly combine gross emissions reduction objectives with current and future sequestration in natural sinks and future deployment of currently uncertain and immature technical removals into a single, overall number.

As opposed to the “net” approach, setting separate climate targets refers to the practice of clearly distinguishing between gross emissions reductions and carbon removals. Separating targets has been recommended by academics, NGOs, some companies, research institutes and others.

As the term carbon removals includes a variety of processes with different characteristics, potential benefits and risks, Carbon Market Watch and 121 stakeholders from academia, civil society, and industry have also been calling for the further differentiation between land-based carbon removals (also known as “biogenic sequestration”) in natural sinks and permanent carbon removals. This results in three different groups of discrete targets.

Another way to frame separate targets is to formulate them by sector.

## 5. Why do we need three separate targets for emissions reduction, biogenic sequestration and permanent removals?

The fundamental reason to set separate climate targets is to enhance the transparency and accountability of countries' and companies' climate plans, determine the role of removals and natural sinks in clearly set pathways to climate neutrality, and avoid an unrealistic reliance on storing carbon from the atmosphere (naturally or through technical processes). Overrelying on sinks and permanent removals undermines efforts to accelerate emissions reductions. Moreover, sustainable removal capacity is finite, limited and likely to remain expensive.

At the same time, the separate targets approach recognises the different roles that reducing emissions, enhancing biogenic sequestration through natural sinks and permanently removing CO2 from the atmosphere play in the context of the climate crisis, while allowing governments to work on all three fronts.

In fact, it is crystal clear that significantly and urgently reducing emissions across all sectors is inevitable if the world is to meet the Paris Agreement’s temperature goal and limit the damages climate change is already causing. There is also a need to build up sustainable

permanent removal capacity that will balance out those emissions we collectively deem both necessary and too hard to abate, and help us, thereafter, reach net-negative emissions so that we can start cleaning the atmosphere of legacy pollution. Last but not least, natural ecosystems must be protected and restored, as they are vital to repair and enhance biodiversity, assist the planet's adaptation to climate change, and remain a critical carbon sink that is already making up for our historical emissions.

## 6. What are the benefits of setting separate targets?

Setting separate climate targets produces several co-benefits. Firstly, it reduces the risk that the allure of carbon removals deters emissions reductions. This so-called mitigation deterrence occurs when governments and companies slow down their climate action today based on the hope that future CDR capacity will eventually save the day.

Maintaining separate targets and policy frameworks clarifies the fundamental principle that emissions reduction and removals are inherently different and cannot be used interchangeably. Carbon emissions have a lasting and often irreversible impact once released into the atmosphere. While sequestration and removals can, at best, mitigate this damage, they cannot undo emissions, nor the various other effects of extracting and burning fossil fuels, such as water, soil and air pollution, and the related impact on human health and natural ecosystems.

A separate targets approach also allows for a more balanced and accountable approach by ensuring transparency on the planned reliance on CDR. It encourages countries to identify a more sustainable and clearly defined role for removals and the land sink. At the same time, such an approach enables policymakers to tailor specific policies and measures to enhance progress on permanent removals and biogenic sequestration, thus guaranteeing better governance of potential benefits and negative impacts of these sectors without undermining decarbonisation.

This separation also reduces regulatory uncertainty for land-based carbon sequestration and permanent removal project developers. Maintaining a separate biogenic sequestration

target to be reached through nature protection and restoration measures allows for flexibility without excessively burdening landholders. At the same time, setting a target for permanent removals reduces regulatory risk and supports investment in the sector.

Some challenges need to be addressed, too, in order to implement such an approach. Setting a separate target for permanent removals involves determining a sustainable quantity of achievable removals as well as the quantity of residual emissions. The latter requires a serious discussion about what types of emissions, in which sectors, can be considered “hard to abate”. While difficult, this political debate has to happen sooner rather than later and should be based on social justice considerations and inclusive public engagement.

Another aspect that, for some, makes the implementation of separate targets more demanding is the need to set up new policy frameworks dedicated to permanent removals.

## 7. How should separate targets be set?

Targets for permanent removal and biogenic sequestration through natural sinks should be set in addition to gross emissions reduction targets. All these targets should be binding, transparent, and regularly reviewed based on the best available science.

In the case of permanent removals, targets should reflect the best scientific and technological removal methods knowledge and be updated in response to decreasing residual emissions and current social and technological considerations. The targets should take account of justice, sustainability and planetary boundaries. A good practice would be to express these targets both in volume and as a percentage of 1990 emissions. In the EU, targets for permanent removals should be set at the Union level and fairly allocated among member states based on their differing socio-economic conditions.

Targets for biogenic sequestration from natural sinks can be incorporated into regulations dedicated to the protection and management of natural ecosystems, such as those addressing the Land Use, Land Use Change and Forestry (LULUCF), nature restoration or

the agricultural sectors. Due to its temporary nature, biogenic sequestration by natural sinks cannot and must not be used to counterbalance, compensate for or offset emissions.

## 8. Do current policy frameworks in place enable the implementation of separate targets?

Current policy frameworks lack clarity on the role of carbon removals. In a 2023 analysis of 20 countries and jurisdictions worldwide, Carbon Market Watch found that only a handful of them acknowledge the climate function of removals as supplementary to emissions reduction in their non-legally binding strategies. Carbon removals are very often used to offset emissions to meet net reduction goals.

Some countries are making progress towards adopting climate plans framed in a three or two-target approach. In the EU, Germany announced its plans to set a separate target for "technical" removals, in addition to the target for land-based removals enshrined into law. In Sweden, the country identified a minimum amount of emissions reductions to reach the net-zero greenhouse gas emissions target in 2045, but the categories of biogenic sequestration and permanent removals that can be used to counterbalance residual emissions are not well separated.

## 9. Is the EU planning to set three separate climate targets?

Currently, the EU has net targets for 2030 (a 55% net reduction compared to 1990 levels) and 2050 (a net-zero GHG target or climate neutrality) enshrined into law. The 2030 target establishes a partial separation, as the contribution of Land Use, Land Use Change and Forestry removals towards the achievement of the target is limited to 225 million tonnes of CO2 equivalent (which amounts to be about 4% of the EU's 55% net target).

As the European Commission is due, in the course of 2025, to put forward a proposal to amend the EU Climate Law to include a climate target for 2040, many, including Carbon Market Watch, believe this is the right moment to set three separate targets. The European

Parliament, individual MEPs and some EU countries have also recently shown support for the three-targets approach.

Although the support for separating climate targets is growing in the EU and other parts of the world, the European Commission has not officially confirmed its plans to go in that direction. Not including this principle in the upcoming EU's 2040 target proposal and the subsequent EU's Nationally Determined Contribution under the United Nations Framework Convention on Climate Change (UNFCCC) would be a missed opportunity. However, the EU could potentially still have the chance to formalise the three-target approach when adopting the package of policies and revisions of current legislation needed to implement the new 2040 target.

CARBON MARKET WATCH


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