Carbon Dioxide Removal and Certification – What is it and why is it needed?

Reducing greenhouse gas (GHG) emissions is the primary goal in fighting global warming. However, to achieve net zero carbon dioxide (CO_2) or GHG emissions, we will need to deploy carbon dioxide removal (CDR) to counterbalance residual emissions, as laid out in the latest Intergovernmental Panel on Climate Change (IPCC) report.

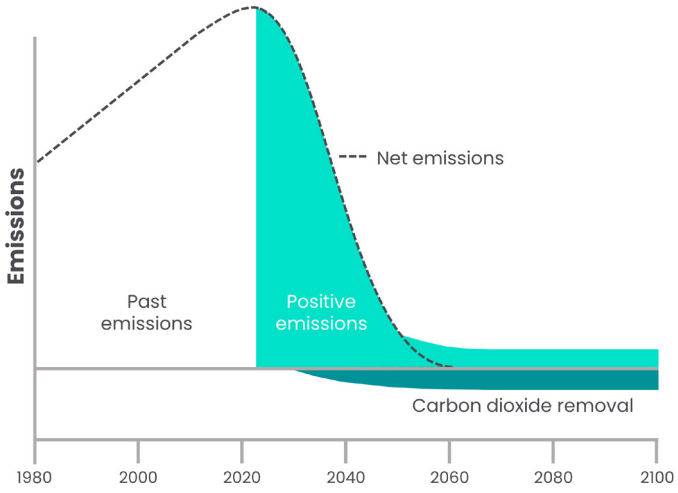
The IPCC defines CDR as a set of "anthropogenic activities removing CO_2 from the atmosphere and durably storing it in geological, terrestrial, or ocean reservoirs, or in products." Given their potential to create 'negative emissions', scaling these activities has gained significant traction among scientists and policymakers seeking to reduce the stock of atmospheric CO_2.

Achieving net zero and, further, net negative emissions requires building public trust, creating new policies, and scaling up multiple CDR methods. To stand at least a 50% chance of limiting global warming to 1.5°C with no or limited overshoot, realistic pathways **project the need for 20-660 gigatons net negative CO_2 emissions until 2100**, meaning gross CDR deployment will likely need to be even higher.

CDR methods vary significantly in terms of how CO_2 is extracted from the atmosphere, where the carbon is stored, and for how long. They also vary in terms of resource requirements, and other positive and negative effects they create beyond the climate benefit they deliver.

Illustrative pathway to net zero

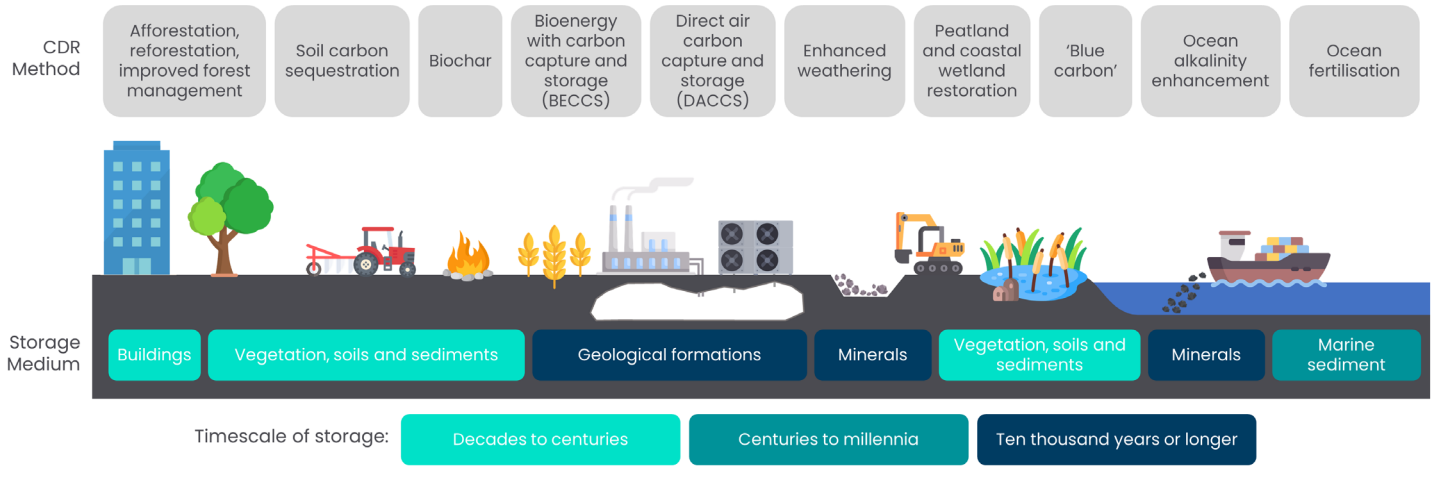
Figure 1: Illustrative emissions pathway towards reaching net-zero GHG emissions.



Generally, carbon stored in terrestrial reservoirs and living biomass (short-cycle removal methods) is more vulnerable and exhibits shorter storage durations than carbon stored in geological reservoirs (long-cycle removal methods). However, large-scale increases of carbon removals via both method groups will be necessary to limit global warming to 1.5°C or 2°C.

Overview of CDR methods

Figure 2: Overview of CDR methods, their storage media, and timescales of storage, adapted from the IPCC, 2022.



Why high-quality certification for CDR matters

To ensure environmental and consumer protection, stakeholders need to measure, validate, and certify carbon removals. Presently, there is a lack of common rules and standards on accounting, and monitoring, reporting and verification (MRV), and the definition of carbon removals. Creating **an effective certification framework can ensure that only high-quality and reliable CDR is credited.** This is a first step toward helping the EU and other jurisdictions recognise and reward CDR without hampering decarbonisation, thereby aiding in the scale-up of carbon removals.

Certification as the foundation for strengthening CDR in EU climate policy

The European Commission has recognised the need to develop a set of standards for certifying carbon removals and encourages the use of innovative solutions to capture, recycle and store CO_2 by farmers, foresters and industries. The **Certification Framework for Carbon Removals (CRCF)** will provide the first regulatory framework to monitor, report, verify and certify activities which remove CO_2 from the atmosphere in the EU. Highlights of the CRCF proposal include:

- Voluntary regulatory framework for certifying carbon removals in the EU according to quality criteria for carbon removal activities to ensure carbon removal benefit and sustainability.
- Categorisation of removal methods into three categories: permanent carbon storage, carbon farming and carbon storage in products.
- All information on the certified removals to be made publicly available and traceable.

What's next in the EU Certification Process?

The European Commission has proposed a regulation that requires co-adoption from the European Parliament and Council, and will be accompanied by a technical expert group to develop the certification methodologies. The Commission will further create delegate and implementing acts to clarify operational aspects of the regulation.

Bibliography

European Commission, 2022. COM(2022) 672 final.

IPCC, 2022. Climate Change 2022: Mitigation of Climate Change.

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Establishing quality criteria for carbon removal certification

In order to certify removals as 'high-quality', the following criteria should underpin a set of minimum standards in any current or upcoming certification scheme:

- **Creating real climate benefit** - certify that CO_2 has been removed from the atmosphere and is being durably stored. When calculating removals, GHG emissions along the entire lifecycle, as well as other factors affecting climate-forcing (e.g. albedo) need to be considered.
- **Measurable** - the removed CO_2 is quantified via robust MRV rules.
- **Permanent** - CO_2 should be stored away long-term (over centuries) with the goal of storing it permanently. A legally binding and financially solid framework will be needed to ensure the permanence of CO_2 storage. Any potential reversal occurring due to emissions at storage sites should be addressed via legal and financial mechanisms.
- **Additional** - CDR activities should go beyond what is required by other policies and regulations.
- **Avoiding leakage** - CDR activities should not cause emissions at other geographical locations due to market or other shifts.
- **Avoiding double counting** - removal certificates for the same activity should not be issued, used or claimed more than once or by more than one entity.
- **Avoiding unintended impacts** - negative externalities should be accounted for through strict regulation to ensure that CDR projects result in no net-harm to the environment and people.

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