

PATHWAYS FOR CARBON DIOXIDE REMOVAL IN THE EUROPEAN GREEN DEAL

Unattributed event summary

Carbon Gap and PIK

› Introduction

On 3 July 2024, Carbon Gap hosted an event together with the Potsdam Institute for Climate Impact Research (PIK) in Brussels, Belgium. The event was a closed-door session on pathways for carbon dioxide removal in the European Green Deal. The event involved around thirty policymakers, industry and civil society representatives, and academics discussing how to best integrate carbon dioxide removal (CDR) in EU climate mitigation efforts.

This document provides an unattributed summary of the high-level panel and the breakout discussions held during the event, a brief summary of the initial remarks provided by Carbon Gap, and the keynote by Ottmar Edenhofer (PIK). The summary intends to help identify main questions raised, points of agreement and contention, and next steps. It is an attempt to provide a snapshot of the thinking on carbon removal in EU policy circles at a specific point in time, informing legislative efforts to be undertaken during the new political mandate. Whilst some areas in which views seemed to converge or diverge are highlighted, the summary focuses on arguments and new ideas and proposals.

Whilst this document is based on extensive notes taken throughout the day, it does not provide a complete record of the rich and complex discussions taking place during the event. Furthermore, any conclusions and recommendations set out in this document stem from the discussions during the day and do not necessarily reflect the positions and views of the organisers. Where relevant, references to positions and work by the organisers are provided in footnotes.

› Opening remarks from Carbon Gap: reaching EU climate targets for 2050 by acting now

The EU has committed to reaching climate neutrality by 2050, and to reach net negative emissions thereafter. It can only reach this goal through prioritising continued emissions reductions, whilst deploying a portfolio of carbon removal methods to address residual emissions and deliver net negative emissions. Urgent action to support CDR is needed if the EU is to scale up CDR sufficiently to reach EU climate targets. There is also a possibility of real economic and social gains associated with the successful creation of a CDR industry in Europe.

Carbon Gap believes the EU needs clear rules on MRV, a dedicated target for CDR for 2040, and a coherent EU strategy for CDR. In addition, specific policies to drive demand for CDR must be developed to help CDR providers survive the 'valley of death' in which many currently find themselves. In the longer term, policymakers should develop an enduring

policy framework for CDR to create lasting incentives to remove carbon in the EU.¹ The objective of possible integration of CDR in the EU ETS or another compliance mechanism must be to scale CDR as quickly and efficiently as possible, whilst maintaining the environmental integrity of EU climate policy.

› **Setting the scene keynote by Ottmar Edenhofer²**

In his keynote, Ottmar Edenhofer clarified that only large-scale deployment of CDR will effectively halt and potentially reverse the increasingly likely overshoot of the emission budget implied by the Paris climate goal. CDR will be a game changer for climate policy, enabling ‘cleaning up’ the atmosphere and smoothing transition costs. For the EU, the European Climate Law formulates the commitment not only to achieving net zero emissions by 2050, but also to attain negative emissions thereafter. To that end, integrating novel removals into the EU’s climate policies is essential, but requires balancing trade-offs between cost-efficiency, environmental integrity, and distributional concerns.

With a view on how to implement and govern integration, Edenhofer presented recent research by him and colleagues³ on (a) how CDR could be integrated into the ETS in a sequential stage-gate approach and on (b) a new proposal to create ‘clean-up certificates.’ These certificates would allow additional flexibility that could be used to increase ETS ambition and reveal firms’ expectations about future CDR availability and costs. He concluded that a new governance framework is necessary for CDR deployment and that a new European Carbon Central Bank could fill many, if not all the necessary functions for governing CDR.

› **Summary of discussions: a clear case for scaling up carbon removal**

In the discussions that ensued, there appeared to be convergence around the fact that carbon removal will need to be significantly scaled up to achieve long term climate targets as a matter of urgency and political priority, where CDR could be characterised as a public good akin to planetary waste management.

One of the main questions discussed during the event was how carbon removal could best contribute to the main goal of the EU’s climate policy of net zero greenhouse gas emissions by 2050 and net negative emissions thereafter. Due to the significant time needed to scale CDR to the required volumes to reach EU climate targets by 2050 and beyond, it appeared clear that incentives for carbon removal need to be introduced as soon as possible.

¹ Carbon Gap: [Envisioning a carbon removal strategy for Europe](#), pp. 21-29

² Slides available at: <https://www.pik-potsdam.de/en/institute/departments/transformation-pathways/research/climate-and-energy-policy/carbongap-pik-event-on-cdr-in-brussels>

³ Research papers available at: <https://www.pik-potsdam.de/en/institute/departments/transformation-pathways/research/climate-and-energy-policy/carbongap-pik-event-on-cdr-in-brussels>

» What is in a target? The potential role(s) of a binding and separate target for permanent carbon removal for 2040

With an interim climate target for 2040 in the works, participants discussed whether there was a need to introduce a separate target for carbon removal by this date to help incentivise CDR.

Participants in favour of a CDR target in 2040 (which could be broken down into subtargets for land-based and permanent removals) argued that it could help to reduce the risk of mitigation deterrence.⁴ Participants also saw dedicated target for CDR as an important political signal to suppliers and investors on the commitment of the EU to CDR, helping drive demand in the short- to medium-term.

In contrast, some participants argued that what is needed to create a CDR industry in Europe and bring permanent CDR through the valley of death is tangible long-term incentives and policies rather than an EU target for CDR.

Many participants saw the need to improve the bankability for CDR projects as important and also called for continuous dialogue with industry representatives about the specific needs of the sector. Bankable contract (provided by the government through for instance carbon contracts for difference – CCfDs) could help industry raise additional funds for investments by crowding in private funding.

Improving bankability was seen as being intimately linked with the question of who pays for CDR, i.e., the ‘paymaster’ responsible for driving demand. Diverging views on the answer (i.e. emitters, consumers, taxpayers) to this question suggest that further discussion will be needed. During the discussions, some participants argued that the principle of having the polluter pay, be it for emissions in the future or for past emissions, should be an important part of deciding who pays for CDR.

Some participants found that the nature of carbon removal as a public good meant national and other public entities could have an incentive to freeride, making them less willing to pay for carbon removal to take place.

Some participants suggested that if CDR resembles waste management, then there are ample examples of such public goods being provided, or supported by, public entities such as municipalities and national governments. The damages associated with exacerbated climate change in the absence of carbon removal could function as a driver motivating public authorities to invest in CDR. Participants brought up examples such as Denmark, Switzerland and Sweden.

Regardless of whether a separate EU target for CDR is introduced for 2040 or not, and regardless of who is held responsible for financially delivering on it, many participants found it necessary to clearly designate which policies would deliver carbon removal as part of reaching the net emissions target for 2040. There was some convergence regarding policy options that could help deliver CDR by 2040; the ETS or an alternative compliance market

⁴ Carbon Gap: [How to avoid carbon removal delaying emissions reductions \(carbongap.org\)](https://carbongap.org/en/how-to-avoid-carbon-removal-delaying-emissions-reductions/)

such as an RTS, public procurement policy, LULUCF (Land Use, Land Use Change and Forestry), CAP (Common Agricultural Policy), and – depending on whether waste incineration will be included in the ETS – the ESR (Effort Sharing Regulation).

› Means of scaling CDR: should CDR be made part of an EU compliance mechanism, and if so, how?

There was divergence amongst participants regarding the need to integrate carbon removal in the EU ETS or an alternative compliance mechanism, as some questioned the ability of such a mechanism to drive significant demand for CDR while maintaining environmental integrity. Others argued that such integration would help improve the bankability of CDR projects, provide some of the sorely needed funding for CDR in the mid-to long term, and – given that adequate governance rules are in place – help stabilise the ETS as the emissions cap gets tighter.

Nonetheless, a significant share of the discussions during the event focused on whether and how to integrate carbon removal into the EU Emission Trading System (ETS) or an alternative compliance scheme such as a removal trading scheme (RTS). Participants saw these issues as key in developing a roadmap for CDR in the European Green Deal.

Discussions centred on what the objective should be for integrating CDR in a compliance scheme, and under what conditions this integration should take place. There was no clear agreement on the first question, with possible objectives listed below:

- › Driving demand for CDR;
- › Putting a (stable and appropriate) price on carbon removal;
- › Sending a political signal of support for CDR to providers and to industry;
- › Driving net negative emissions upon reaching climate neutrality;
- › Addressing (narrowly defined) residual emissions;
- › Ensuring economic efficiency;
- › Managing overshoot.

›› Carbon removal and the EU ETS

Whilst some participants saw CDR as key to solving the 'endgame for the ETS,' others raised the question of whether this role was appropriate for CDR in EU policy, and whether the ETS would ensure sufficient deployment and scale-up of different CDR technologies in the short term.

Some argued that whilst the ETS would not be able to drive sufficient demand in the 2020s, the perspective of eventual integration of CDR in the ETS would send an important investment signal and provide an incentive for CDR suppliers to reduce their costs to be competitive.

Others added that integration could help improve the bankability of CDR projects. Several participants noted the failure of compliance markets to drive down costs for other cleantech solutions in the past, arguing that government subsidies and procurement schemes are more effective means of increasing learning rates and down-costing innovative technologies.

Many participants highlighted that integration of CDR into a compliance scheme (ETS or RTS) must ensure environmental integrity of climate policy. Some participants found that this stipulation meant continuing to prioritise emissions reductions over carbon removals, whilst ensuring that a removal certificate issued under the scheme is linked to the permanent removal of a tonne of CO₂ from the atmosphere.

The risk of mitigation deterrence under certain ETS integration scenarios was raised repeatedly by several participants, with a gradual 'stage-gate' integration approach for deliberate management such mitigation deterrence, or a separate removal trading system, proposed to address this risk. One participant raised concerns that integrating BECCS (Bioenergy with carbon capture and storage) into the ETS could risk creating unsustainable levels of demand for biomass. Others explained that a prerequisite for BECCS integration would be adequate biomass regulation to mitigate sectoral leakage effects (e.g. emission pricing in the land sector or BECCS quota under ETS). There was clear agreement amongst participants on the need to avoid carbon and business leakage to other jurisdictions resulting from EU policies, with a preference for a combination of sticks and carrots in the policy mix to help build an industrial base for CDR in Europe.

Participants converged on the need for additional policies to support CDR in the short to medium-term, agreeing that policymakers could introduce a potential compliance mechanism in the late 2020s at the earliest, or in the early 2030s as trading for phase 5 commences. One participant suggested that the Commission could use existing provisions in the ETS to test the integration of CDR into the ETS, using article 24 to allow member states to opt-in to the system through additional activities such as removed carbon.

The lack of agreement on the rationale for, and aim of, integrating CDR into a compliance market highlights the need for further discussions on this issue. The objective for a compliance scheme should therefore adequately consider both the needs of the fledgling CDR ecosystem and the political realities facing existing EU policies.

» Scaling CDR through a dedicated removal trading system (RTS)

The possibility of a separate and dedicated removal trading system was raised by several participants as a means of addressing the various risks associated with partial or full integration of CDR into the existing ETS.

Some participants found that a separate RTS would allow the EU to set a trajectory for the scaling up of CDR through a dedicated compliance system, obliging a set of entities to either directly perform or purchase a minimum-and-gradually-escalating volume of CRCF-certified removals to achieve net zero emissions. It could cover different or additional

sectors of the economy and might provide a stable price for CDR. Some made the case that an RTS would not require the injection of CDR certificates directly into the ETS, thereby reducing the risk of mitigation deterrence and avoiding undermining the integrity of the ETS. It emerged that there would inevitably be a trade-off between the potential of a separate system to effectively scale CDR, and the significant effort needed to design and agree such a separate system.

Some participants argued that a separate system for removals would not help solve the issue of lacking liquidity in the existing EU ETS, which would make it difficult for covered entities to address their residual emissions. There was no agreement amongst participants regarding whether ETS integration or a separate RTS would be preferable. Additional modelling on the workings and contribution of an RTS to EU climate targets should be conducted as part of that exercise, considering linkages between an RTS and an ETS.

› **Banking on CDR: the role of a facility dedicated to CDR**

It was repeatedly raised that carbon removal could and should impact how the EU governs its carbon markets in the long term, raising the possibility of having compliance policy deliver net negative emissions after reaching climate neutrality in the EU.

Various organisations have proposed an institution such as a European Carbon Central Bank to help stabilise the supply and demand, and by extension the price, of carbon removal credits in an ETS or RTS. The facility could be a successor to the existing Market Stability Reserve (MSR) operating under the current ETS, with the additional function of issuing carbon 'clean-up certificates' that would allow more flexibility.

Whilst there was broad recognition that some kind of reserve or facility should accompany a compliance mechanism to help provide price stability and manage the system, there was no agreement on the scope and role of this facility or Bank entity. Some participants expressed concerns regarding the feasibility of introducing a central bank responsible for carbon management due to the political unwillingness to support new EU entities or institutions. There was little detailed discussion on other key functions that such an entity could provide. Auxiliary functions could include procuring CDR directly or acting as a carbon clearing house, facilitating the purchase and sale of carbon removal credits.⁵

⁵ Carbon Gap: [Envisioning an EU CDR Strategy](#), p. 28

› **Beyond long term compliance schemes: developing a broader array of policies to scale CDR**

Recognising the fact that the ETS or another compliance scheme would likely not be sufficient to boost demand for CDR in the short term, many participants called for complementary policies to be introduced in the policy mix, using a portfolio approach to CDR that would support both land-based and industrial carbon removal methods.

Some participants argued that boosting short-term demand would help prepare the ground for the introduction of CDR in an EU compliance mechanism. A pilot procurement programme based on the Innovation Fund was put forward as one viable option allowing the EU to model good behaviour and signal support for CDR by purchasing small quantities of carbon removal directly.⁶ Participants saw Carbon Contracts for Difference (CCfDs) for CDR as another possible option in the medium term, with the EU and individual member states committing to pay suppliers of high-quality CDR a premium consisting of the difference between the EU ETS carbon price and an agreed-upon strike price.⁷ If the market price is lower than the strike price, the agent receives the difference.

› **Conclusion and next steps**

The closed-door session with key stakeholders saw constructive and detailed discussions on key policies and approaches to making CDR a part of delivering on the European Green Deal, and successfully identified areas of convergence and divergence on several key issues. As such, the findings from the session could help shape the role of CDR in delivering on EU climate policy in the years ahead.

There was some convergence in the room around the importance of CDR in the European Green Deal, with new and ambitious policies needed to help integrate various carbon removal methods in ongoing mitigation efforts.

Whilst there was some discussion regarding the ability of a dedicated target for carbon removal in 2040 to help drive demand, it was clear that most participants expected more clarity on what the contribution of carbon removal should be in the overarching net reductions target.

Participants appeared aligned on the need for both short-term policies to drive demand and mid- to long-term policies creating incentives and a market for CDR through a compliance scheme accompanied by some kind of facility to provide price stability. These policies ought to be designed to work together as part of a larger EU strategy on CDR that could help guide the deployment and scale-up of carbon removal in the coming years.

⁶ Ibid., p. 19

⁷ Carbon Gap has previously proposed that CCfDs could be facilitated and awarded through an EU Carbon Clearing-house, mirroring the purported role of the EU Hydrogen Bank. For more information, see [Envisioning an EU CDR Strategy](#), p. 20

Based on the discussions, the path to integrating CDR into EU climate mitigation efforts appears to be taking shape. Work would need to start immediately on designing short-term policies to drive demand for CDR in the EU, focusing on how to operationalise a pilot procurement programme on the European level. These efforts could also consider embedding incentives to remove carbon from the atmosphere in EU policy over the long-term. A dedicated target for carbon removal in 2040, which saw divergent views amongst participants, along with public procurement policies could be important steps in this direction, potentially helping improve project bankability and crowding in additional funding from market actors whilst paving the way for the integration of CDR in an EU compliance mechanism.

A compliance mechanism for CDR could become necessary, but may not be sufficient, to help drive the scale-up of CDR in the 2030s. The design of such a mechanism (i.e. integration of CDR in the existing EU ETS, or the development of a separate RTS) will need to be determined by what the objective of the mechanism itself is. Balancing the need to drive CDR demand with the decreasing liquidity in the existing ETS would be essential, whilst keeping an eye on the ability of the compliance mechanism to deliver net negative emissions in the long term.

Carbon Gap is an independent, philanthropically funded, non-profit organisation focused on responsibly scaling up carbon dioxide removal in Europe, as an important complement to emissions reductions. We work across all carbon removal methods, bringing the best technical expertise to inform European policymaking. Our advocacy efforts are focused on Brussels, with additional staff presence in France, Switzerland, and the UK. Carbon Gap LTD is a registered charity (charity number 1200562) and a private company limited by guarantee (company number 13557860), registered in England and Wales. Registered office address: 71-75 Shelton Street, Covent Garden, London, WC2H 9JQ, United Kingdom. Carbon Gap LTD's EU Transparency Register no. is: [159208346089-06](#).