Zurich, 13th April 2023

In line with climate science, Climeworks calls for a clear distinction between emission reductions and carbon removals

To maximize our chances of limiting global warming to 1.5°C above pre-industrial levels, global greenhouse gas emissions must be reduced at an unprecedented speed over the next decades: CO_2 emissions must decrease by at least 90% by 2050 according to the SBTi. In addition, carbon dioxide removal (CDR) solutions are needed to neutralize any residual emissions and thus enable the world to achieve net zero CO_2 by 2050.

In line with what climate science states, Climeworks is calling for a clear and distinct role of CDR, which can be summarized as follows:

- Besides emission reductions, CDR has an important role to play in the fight against global warming.
- More importantly, it has a *different* role to play and should not be substituting emission reductions.
- Hence, emission reductions and CDR should be clearly distinguished from each other – in climate pathways, target setting as well as in industry standards.
- A clear distinction is moreover needed in marketplaces and certificates generated from the two activities: whilst they are important and meaningful for the achievement of a net-zero world, credits generated from emissions reductions and avoided emissions should cease to exist, as soon as a net-zero state is achieved. At the same time the world will continue to rely on CDR markets to neutralize residual and historic emissions to maintain net-zero CO_2, and later on realize net-negative CO_2 emissions globally.
- Further, by explicitly splitting the contributions from emission reductions and removals, moral hazard is addressed, namely the claim that investing into CDR today could distract from emission reductions.

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Carbon dioxide removal and emissions reductions have different roles to play in the fight against global warming

Climeworks has always been vocal about the fact that high-quality CDR, such as provided by direct air capture and storage (DAC+S), is not an alternative to drastic emissions reductions.

Emissions reductions remain key priority: in order to keep the goals of the Paris Agreement within reach and avoid the most drastic effects of climate change, net zero CO_2 emissions must be realized by mid-century, and net-negative CO_2 emissions after that. To achieve this, global emissions need to be reduced at an unprecedented speed, leading towards a CO_2 reduction of min. 50% by 2030 and at least 90% by 2050 according to the SBTi.

Here, CDR has different roles to play:

- CDR will enable the world to achieve and maintain net zero: some CO_2 emissions are hard to abate (residual emissions) and need to be actively removed in order to get to net zero. The rule of thumb here should be: 90-95% emissions reduction, 5-10% emissions removal, which is understood and enshrined in leading initiatives such as the SBTi.
- In the long-term, CDR will be required to realize net-negative CO_2 emissions globally: on top of residual emissions, CO_2 that has accumulated in the atmosphere (historic emissions) must be removed to achieve net-negative emissions and reduce the CO_2 concentration in the atmosphere to a level that complies with the goals of the Paris Agreement.

Emissions reductions and CDR fulfil two fundamentally different purposes in solving the climate crisis and present differing dynamics (see IPCC's Sixth Assessment Report, Working Group III). Hence, the two solutions should be clearly separated and treated differently.

The comparison between DAC+S and fossil carbon capture and storage (CCS) is a good example to illustrate the difference between removals and reductions. CCS typically captures fossil CO_2 at the point source: it therefore prevents new fossil CO_2 emissions from entering the atmosphere. DAC+S, on the other hand, removes CO_2 from ambient air, making for a different outcome compared to emission reductions: it removes CO_2 emissions that are already in the atmosphere and subsequently locks them away, resulting in carbon dioxide removal. Figure 1 illustrates the CO_2 flow for DAC+S and fossil CCS.

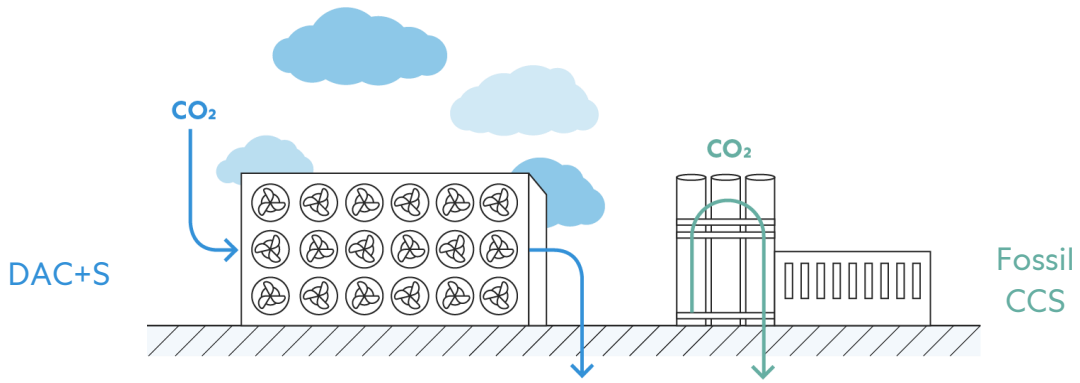

Figure 1: the difference between DAC+S (removal) and fossil CCS (reduction)

This clear distinction between reductions and removals is fundamental to the long-term success of climate policy and action: scholars have repeatedly pointed out that scaling CDR should not come at the cost of prioritizing emissions reductions. No less, they have warned that betting on CDR to substitute for unprecedented reductions of emissions makes a moral hazard that will lead to increased temperatures and the surpassing of temperature targets set in Paris. Explicit and clear differentiation between the two solutions is needed to prevent this from happening.

From commitment to action: how Climeworks lives up to this principle

The distinction between reductions and removals is particularly relevant in monitoring, reporting and verification (MRV), carbon market standards, as well as when setting climate targets: national and corporate climate strategies should have separate targets for emissions reductions and CDR, with clear and distinct roadmaps for action (incl. milestones/intermediate targets).

Carbon crediting standards quantify the impact of various climate solutions and set out the quality criteria that must be met by them. Subsequently, they certify credits for use on markets. Given its distinct characteristics, it is clear that CDR credits must be considered a separate category from emissions reductions and avoidance. Conversely, presenting emission reductions as identical and/or fungible with carbon dioxide removals is a dangerous framing that is harmful to the achievement of our global climate objectives.

Following this principle, Climeworks decided to take several actions:

- Climeworks signed an open industry letter calling for strong standards to assess the performance of different CDR methods. Climeworks' Christoph Beuttler, Chief Climate Policy Officer, and Friedel Pretorius, Carbon Market Development Manager, are among the signees, underlining Climeworks' commitment to setting robust and distinct industry standards for CDR.
- Climeworks participated in an open letter requesting the Net Zero Asset Owners Alliance (NZAOA), representing over USD 11 trillion of capital from the world's largest and most forward-thinking institutional investors, to introduce targets specifically for carbon removals, separate from existing carbon reduction targets, supporting a combined approach of urgently reducing emissions and allowing for the removal of residual and historic emissions. Similarly, Climeworks co-signed an industry letter asking for further, science-based guidance on removals under the SBTi.
- Launched in February 2023, Climeworks joined the board of the Carbon Removal Alliance, uniting several carbon removal developers with the goal to advance policies and develop science-based MRV methods specifically for permanent CDR in the USA.
- In Europe, Climeworks is founding member of the Negative Emissions Platform (NEP). Among other things, the NEP advocates for a clear differentiation between reduction and removal credits. Climeworks is moreover involved in the EU's efforts to develop tailored certification methods for CDR activities led by the European Commission, following the proposal for a first EU-wide voluntary framework to reliably certify high-quality removals.
- As a member of the CCS+ Initiative, Climeworks is pushing for the clear separation of emission reductions and CDR in industry standards. The CCS+ Initiative is developing methodologies for certification under the world's most widely used voluntary carbon market standard VCS, managed by Verra. While the initiative rightly and importantly focuses on developing robust carbon accounting methodologies – both for emissions reduction and CDR –, the VCS currently does not yet consider CDR a separate category.

In summary, Climeworks will continue to push for a distinct CDR placement in climate policy, carbon markets and climate action, to align with scientific assessments and to install the best possible framework to realize the 1.5°C temperature target.

> **Christoph Beuttler, Climeworks' Chief Climate Policy Officer**, comments:
> *"Besides and additional to more ambitious emissions reductions and avoidance, carbon removal is needed to neutralize residual or historic emissions to get to net zero GHG emissions. Climate policy and climate action via carbon markets need to internalize this logic to realize their full potential. In practice this translates to separated targets as well as distinct credit categories for activities that reduce or avoid emissions compared to carbon removal. To inform meaningful net-zero strategies today, market standards should clearly distinguish between offsets from emission reductions/avoidance and carbon removal from the atmosphere."*

The distinction between reductions and removals enjoys great support across the industry

Various leading industry stakeholders share Climeworks' view that emissions reductions and CDR are two complementary solutions that should be treated differently:

"Voluntary carbon market needs to clearly distinguish emission reduction or avoidance credits from carbon removal credits. Reductions and removals play different roles in achieving net zero targets, and the ability to match the types of credits with specific claims is at the core of the market integrity. This differentiation is crucial on methodology and standard level, and needs to be reinforced by the IC-VCM and VCMI initiatives." – **Eve Tamme, Managing Director, Climate Principles**

"Climate science clearly outlines a need for both unprecedented emission reductions and carbon dioxide removal activities on top of that. At the same time, only a permanent removal can neutralize the climate effect of emitting residual fossil carbon. Therefore, separate climate targets along with clear distinctions between these two approaches is needed for transparency and to minimize the risk of undermining efforts to significantly cut emissions." – **Mark Preston Aragonès, Policy Manager Carbon Accounting at Bellona Europe**

"The CCS+ Initiative is developing a comprehensive modular carbon accounting methodology infrastructure for carbon capture, utilization and long term storage that recognizes distinctions between emissions reductions and carbon removals. The Initiative separates emissions reductions from carbon removals at the methodology level and is engaged in efforts targeting a clear separation at the level of carbon market standards." – **Matthias Krey, Secretary General, and Christiaan Gevers Deynoot, Deputy Secretary General, CCS+ Initiative**

"We welcome the clarity that differentiating between emission reductions and carbon removals can achieve. Distinct targets, classifications and frameworks for removals make building a market to remove CO_2 more feasible, while ensuring decarbonization efforts are not adversely impacted." – **Philip Moss, Global Director for Tech Removals, South Pole**

"To meet our most ambitious climate goals we will need to reduce emissions by around 90%. Carbon dioxide removal is part of the set of solutions, but we should avoid seeing it as a silver bullet or as an alternative to emission reductions and avoidances. At the same time, 10% of the solution to a problem as big as climate change is one we cannot ignore, and investments today play a critical role in enabling this technology to scale in decades to come. By creating separate targets for emissions reductions and removals, we can avoid the risk of problematic trade-offs between the two." – **Zeke Hausfather, Climate research lead at Stripe**

What's next: more guidance expected in 2023

Developing high-integrity standards for CDR will continue to be a priority in the industry, and more guidance is expected in the coming weeks and months. Initiatives such as the Integrity Council for the Voluntary Carbon Market, the Voluntary Carbon Markets Integrity Initiative as well as the UN-led Article 6.4 Supervisory Body have issued or are planning to issue further guidance on principles for CDR in the (voluntary) carbon market in 2023. The EU is further working on a certification guidance for carbon removals, the EU Carbon Removal Certification Framework (EU-CRCF) – another forum, where the clear distinction between removals and reductions matters.

> In Microsoft's contribution to the feedback opportunity on this framework, **Adina Braha-Honciuc, Microsoft's Director of Sustainability Policy in Europe**, writes: *"Clearly distinguishing removal from avoidance credits will be critical for our collective remediation of historic emissions. For instance, Microsoft has committed to remove from the environment all the carbon the company has emitted since it was founded in 1975. Only removal credits should*

count towards remediating historical emissions. With clear crediting for removals, companies can continue to focus on driving deep emissions reductions and separately purchase carbon removals to cover emissions from hard-to-abate sectors and historical emissions."

Climeworks will continue to advocate for both, stringent accounting standards for CDR and a science-based reflection of CDR's role in achieving the Paris accord. For the latter,

we urge emerging initiatives and existing standard setters to align with the principle of separating emission reductions and CDR to facilitate climate action in a just and responsible way.

Clear rules on key criteria for CDR – such as durability, additionality and quantifications based on cradle-to-grave life cycle assessment – are only effective when CDR is subsequently placed in a science based manner, i.e. as an additional and complementary tool to emission reduction efforts. This framing is needed now, before the industry massively scales: a high-quality CDR market serving global climate goals must be incentivized via clear structures. Now is the time to do so.

Editor's Notes

- Images of Climeworks' technology are available in Climeworks' newsroom
- For media enquiries, please contact media@climeworks.com

About Climeworks

Climeworks empowers people and companies to fight global warming by offering carbon dioxide removal as a service via direct air capture (DAC) technology.

At Orca, Climeworks' DAC facility in Iceland, the CO_2 is permanently removed from the air by capturing and geologically storing it for thousands of years with Climeworks' mineralization partner Carbfix.

Climeworks' DAC facilities run exclusively on clean energy, and their modular CO_2 collectors can be stacked to build machines of any capacity.

Founded by engineers Christoph Gebald and Jan Wurzbacher in 2009, Climeworks is on a journey to climate impact at scale. To do so, it strives to inspire 1 billion people to act and remove CO_2 from the air.

Climeworks is spear-heading the DAC industry globally, with the world's only commercial DAC facility and storage installation in operation and a team of 300 Climeworkers determined to contribute to a net-zero future. Their growing customer base includes more than 18,000 individual Climate Pioneers as well as over 160 companies, including multinationals such as Microsoft, BCG, UBS or Swiss Re.

Remove CO_2 from the air – with Climeworks:
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