

Integrating carbon dioxide removals into corporate climate action

Carbon dioxide removals are essential for reaching net zero, both for companies and globally^{1,2}, and companies need to integrate removals into their climate strategies now, alongside emissions reductions. Companies with net zero targets have implicitly agreed a volume of residual emissions that they will counterbalance via appropriate carbon removals at net zero.

We propose that companies:

- a) include the volume of carbon removals they are likely to require in their net zero target statements
- b) start investing in removals now, with interim milestones for increasing volumes towards net zero.

Companies with net zero targets should start investing now so that sufficient affordable, effective and durable carbon removals are available at their net zero target dates³. Investments in removals, whether within value chain, beyond or both⁴, will go hand-in-hand with deep reductions in emissions across value chains, protecting nature, scaling climate solutions and wider climate action in society.

This proposal has been integrated into the latest version of the [Exponential Business Playbook](#)⁵. It is intended to support implementation of an essential, but so far overlooked, element of companies' climate strategies. However, this proposal is not intended to address broader questions about Scope 3 emissions, the need to restore nature, or the use of carbon credits now or at net zero.

The guiding principles below are a starting point. Details on how the principles can be implemented in practice will be outlined in a supporting document.

Principles

1. Companies should start investing in carbon removals now⁶, and the volume should rise each year to reach the level required to counterbalance any residual emissions at net zero, with interim milestones along the way⁷.
2. Companies can invest in a mix of different types of removals⁸ with ranges of expected time to drawdown, storage durations and risks of reversal.
3. Overall carbon storage durability levels in their removals portfolios should rise over time so that residual emissions at net zero are counter-balanced appropriately and the net zero balance maintained^{9,10}.
4. All removals should be quantified according to robust methodologies and companies should have robust mechanisms for monitoring their removals portfolios and managing reversal risks¹¹.
5. Companies should report publicly the types, drawdown dates, expected durability, potential reversal risks, any co-benefits, and retirement dates of the removals they invest in.
6. Companies should be recognised and celebrated for their extra commitment if they: invest in more removals than required on this separate track; front load investment to secure access to earlier removals; and/or use long-term offtake agreements to support carbon removal scale-up.

Notes and references

- 1 Rockström, J. et al. (2017). A Roadmap for rapid decarbonization. *Science* 355, 1269- 1271 and IPCC. (2022). *Climate Change 2022 Mitigation of Climate Change Working Group III Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*.
- 2 This follows from the definition of net zero as a balance of sinks and sources and from IPCC estimates demonstrating the need for 10 gigatons of CO₂ to be removed and stored annually by 2050 to keep within Paris Agreement temperature targets.
- 3 According to the CDR.fyi platform, 125,000 tons of durable CO₂ removals were delivered in 2023. This industry needs to scale to deliver. According to the [Race to Zero 2030 Breakthroughs](#), 3.5 million tonnes of removals are needed annually by 2030, with 500,000 tons of these removals having storage durability of at least 100 years.
- 4 If removals within the value chain are deducted from emissions to use a net figure as the net zero target (for example in the FLAG sector), these removals may not also be counted as counterbalancing residual emissions. If removals within the value chain are not deducted from emissions, then they may be counted as part of the removals track. In this case residual emissions will likely be counterbalanced by a combination of within and beyond value chain removals.
- 5 And therefore also incorporated into Exponential Roadmap Initiative's assessments of companies' overall climate action.
- 6 A minimum starting point for removals in the first year could be, for instance, 1% of unabated emissions. Further work on the starting volume to define best practice will follow.
- 7 As recommended in the [Race to Zero 2022 Leadership Practices](#) - Pledge. 8 Carbon removals include afforestation, reforestation and restoration, soil carbon, biochar removal, enhanced rock weathering, bioCCS, direct air capture, ocean alkalinity enhancement and other removal technologies or hybrid approaches in development. 9 From the start a share of the removals portfolio should be ring-fenced for higher durability removals, with durability measured in thousands of years. Maintaining the net zero balance will require like-for-like counter-balancing of durable emissions with removals of equally durable storage.
- 10 The [Oxford Principles for Net Zero Aligned Carbon Offsetting \(Revised 2024\)](#) outline the need for removals with storage with low risk of reversal and high durability over the long term (centuries to millennia) to maintain a net zero balance for any ongoing residual fossil emissions. Axelsson, K. et al. (2024). Oxford: Smith School of Enterprise and the Environment, University of Oxford.
- 11 Different types of removals and storage have different risks of reversal which can also vary within type depending on environmental and governance factors. See Oxford Principles for Net Zero Aligned Carbon Offsetting (ibid).