NATURE AND CDR: HOW SBTi's ONGOING EMISSIONS RESPONSIBILITY FRAMEWORK INCENTIVIZES BOTH

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Setting the scene

A persistent narrative in the climate space pits nature-based solutions against engineered carbon removals. In reality, achieving net-zero requires both near-term, scalable mitigation and storage in nature and the build-out of durable, long-lived removal capacity for the second half of the century.

The Science Based Targets Initiative's [Ongoing Emissions Responsibility (OER) framework] is designed to mobilise corporate action and finance across this continuum. It embeds the protection, management, and restoration of nature, together with the development of long-lived carbon-removal technologies, within a single integrity-based system. Together, they form a complementary approach to climate action, from ecosystem-based storage that delivers immediate climate benefits to engineered solutions that maintain long-term atmospheric balance.

The framing of nature-based solutions and engineered carbon removals within the OER framework signals an evolution in corporate approaches to climate responsibility. Rather than treating nature-based and technological approaches as competing priorities, the framework positions them as complementary levers of credible mitigation. It enables companies to take responsibility for their ongoing emissions through actions that simultaneously protect ecosystems, strengthen resilience, and accelerate innovation in durable carbon storage. In doing so, OER helps companies align near-term contributions with the long-term requirements of a net-zero.

This explainer discusses how OER brings together both dimensions — nature and carbon removals — in a single framework. It outlines how the framework's parameters, grounded in IPCC 1.5°C pathways, guide the gradual transition from short- to long-lived removals, and how OER channels private finance toward mitigation, adaptation, and resilience efforts that bridge immediate and long-term climate goals.

How does the CNZS V2 expand corporate responsibility for nature?

The Corporate Net-Zero Standard (CNZS V2) expands how companies can contribute to protecting and restoring nature by embedding ecosystem protection and restoration within the Ongoing Emissions Responsibility (OER) framework. Through this approach, the Standard/OER framework recognizes the role of natural systems in delivering near-term mitigation, building resilience, and generating wider social and environmental co-benefits.

Under the voluntary recognition phase, active from 2026 with the launch of the CNZS V2, companies can earn recognition for verified mitigation outcomes achieved through actions that protect, manage, or restore natural ecosystems. These actions may occur outside a company's value chain or beyond the boundaries of its validated targets, making them supplementary to core abatement efforts. Within the recognition phase, mitigation outcomes from nature-based actions may include reductions, avoidance, and removals: reductions lower emissions at their source, for example by improving fertilizer efficiency or reducing methane from livestock; avoidance prevents emissions that would otherwise occur, such as through forest conservation or peatland protection; and removals capture and store carbon by restoring or enhancing ecosystems such as forests, wetlands, or soils.

From 2035 onward, when responsibility requirements become mandatory for Category A companies, the framework begins to emphasise carbon removals, including a defined share of long-lived removals that store carbon for centuries or longer. Nature-based removals are typically shorter-lived, as carbon stored in biomass or soils can be re-released within decades through disturbance or decay. However, these “short-lived” removals remain critical for peaking and lowering atmospheric concentrations in the near term. Thus, the SBTi will continue to recognize their contribution, including at the net-zero year, when up to 59% of neutralisation may still come from short-lived reservoirs.

How does the CNZS V2 drive the scale-up of engineered removals?

The Ongoing Emissions Responsibility framework provides a structured demand signal for investment in novel CDR in several ways.

Under the voluntary recognition framework, active from 2026 with the launch of the CNZS V2, companies can earn recognition for delivering ex-post mitigation outcomes or applying an internal carbon price to their ongoing emissions and deploying the resulting finance toward eligible climate actions.

While engineered removals can deliver ex-post mitigation outcomes and would be eligible under the SBTi recognition framework, very few high-integrity novel CDR outcomes are available ex-post—i.e., removals that have already occurred, been measured, and independently verified. The current supply is limited to early-stage facilities producing long-lived removals such as direct air capture and carbon storage, biochar, or mineralisation[1].

The carbon pricing route allows companies to support ex-ante investments, research and development, and innovation-enabling activities that build the pipeline for future CDR supply. This could include long-term offtake agreements for emerging technologies, investments in verification and monitoring infrastructure, or blended-finance mechanisms that de-risk first-of-a-kind projects. By creating space for these pre-commercial and enabling actions, the OER framework helps channel private capital into the innovation and scale-up phase that will be essential for delivering durable removals at the pace required for global net-zero.

From 2035 onward, when responsibility requirements become mandatory for Category A companies, the OER framework begins to place greater emphasis on long-lived removals (those that store carbon for centuries or longer). Under this framework, companies are required to allocate a growing share of their responsibility coverage to verified long-lived removals, in line with a durability trajectory grounded in IPCC 1.5°C-consistent pathways, which show an increasing reliance on durable carbon storage over time.

By introducing this trajectory, the SBTi sends a clear signal to markets: scaling durable carbon removal capacity is essential to achieving net zero. Corporate investment in novel CDR technologies today offers a strategic advantage, helping companies secure early access to limited long-duration storage capacity and prepare for future compliance expectations.

[1] MilkyWire (2024). [The Climate Transformation Fund](#).

How does the CNZS V2 expand corporate responsibility for nature?

The OER framework builds on evidence from IPCC 1.5°C-consistent pathways, which show how nature-based and engineered removals together support global net zero and long-term climate stabilisation.

Within the voluntary recognition framework, companies seeking “Ongoing emissions responsibility Leadership” status are required to take responsibility for 100% of their ongoing emissions (Scopes 1, 2, and 3) over each near-term target timeframe by applying a science-based carbon price (See OER Explainer 1) to determine a financial budget for supplementary climate contributions. From this budget, companies are required to support activities that deliver ex-post mitigation outcomes equivalent to 40% of ongoing emissions.

This threshold reflects the balance between emissions and removals in climate mitigation pathways that limit temperature rise to 1.5ºC with low or limited overshoot. The Ongoing Emissions Responsibility Ratio (OERR) quantifies this balance by defining the ratio of the global Carbon Removal Budget (CRB) to cumulative gross emissions between 2020 and 2100 (Figure 1). Pathways with higher mitigation ambition exhibit larger OERR values, indicating greater reliance on carbon removals under tighter carbon budgets. Across IPCC AR6 scenario categories, the OERR rises from 0.27 in 2°C pathways to 0.42 in 1.5°C high-overshoot pathways and 0.47 in 1.5°C low-overshoot or no-overshoot pathways. When sustainability and feasibility constraints[2] are applied to the 1.5°C low- or no-overshoot scenario category, the OERR converges to 0.439, indicating that roughly 40 % of cumulative emissions must be balanced by removals.

This science-based portion of responsibility can be delivered through verified ex-post mitigation outcomes, including nature-based and engineered carbon removals, as well as emission-reduction and avoidance activities, provided they meet the integrity criteria defined under the framework.

Climate scenarios also inform the share of long-lived removals from 2035 onward, guiding how the framework evolves the mix of removal types in line with scientific evidence. Across IPCC-modelled 1.5°C pathways, the mix of removal types evolves, with around 17 % of total removals delivered through long-lived reservoirs by 2035, increasing to about 41 % by 2050 as natural sinks approach saturation. The increasing share of long-lived removals reflects the need for more durable storage to maintain a net-zero balance.

[2] SBTi (2025). Cross-sector pathway documentation.

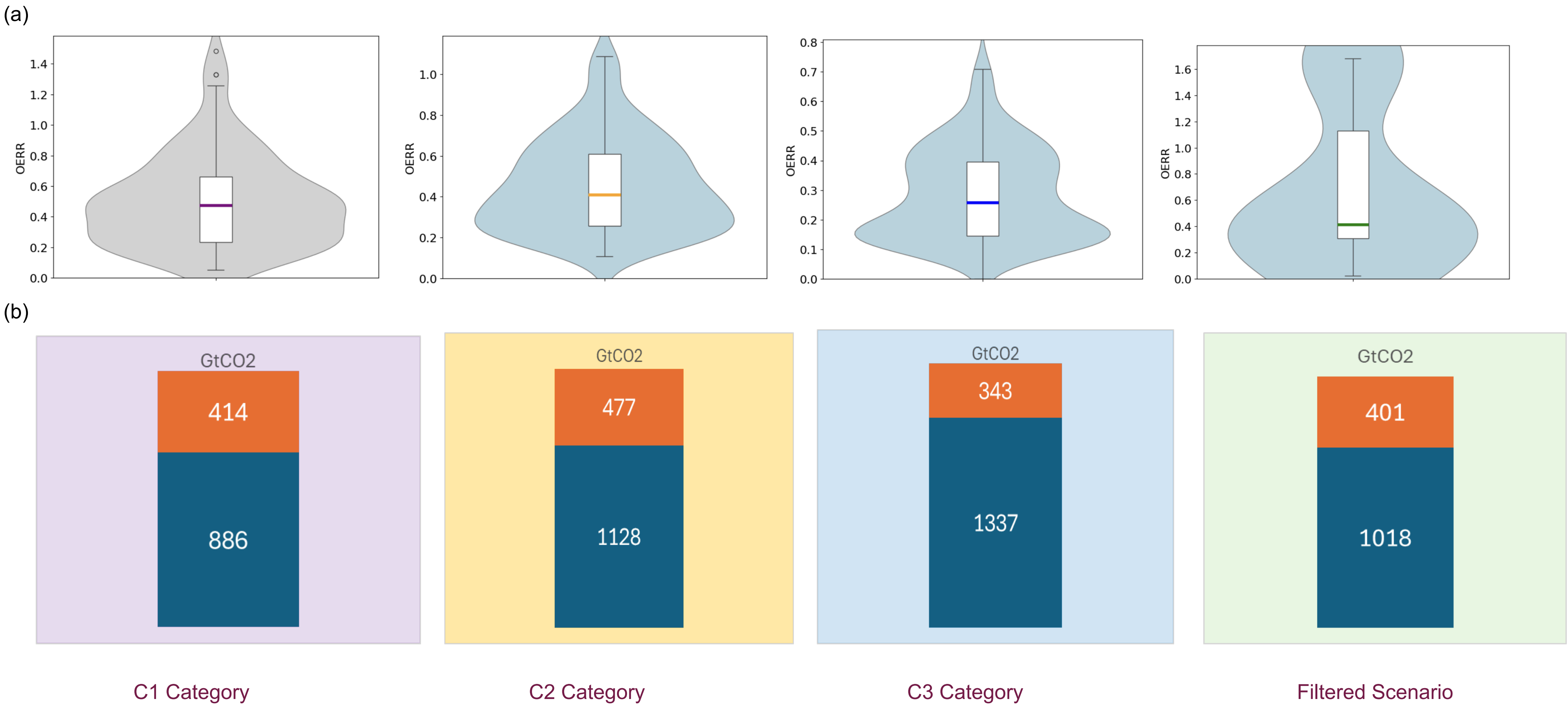

Figure 1. Ongoing Emissions Responsibility Ratio (OERR) across IPCC AR6 scenario categories. Panel (a) shows the distribution and median of OERR across scenarios in each IPCC scenario category. Panel (b) presents the median cumulative gross CO_2 emissions (blue) and removals (orange) for the same scenario categories. C1 represents scenarios that limit warming to 1.5°C (>50%) with no or limited overshoot; C2 represents scenarios that return warming to 1.5ºC after high overshoot (>67%); C3 represents scenarios that limit warming to 2°C; and the Filtered scenario represents a subset of C1 pathways after applying principled filtering criteria[3].

[3] SBTi (2025). SBTi Cross-sector pathway.

How does the OER framework account for the evolving science around carbon removals?

While the OER framework is grounded in 1.5°C-consistent pathways, it does not prescribe a fixed mix of removal types in the transition to the net-zero year. This reflects both the evolving science around Carbon dioxide removals (CDR) and the current limitations of Integrated Assessment Models (IAMs). Instead, the framework aims to signal the direction of travel, toward an increasing share of long-lived removals, while remaining responsive to evolving scientific evidence and updates in modelling approaches.

Most of the mitigation pathways assessed by the IPCC are derived from Integrated Assessment Models (IAMs), which simulate global energy, land, and economic systems to estimate emissions, removals, and associated trade-offs in simplified form. These models feature a limited number of CDR solutions, primarily afforestation, reforestation, and bioenergy with carbon capture and storage (BECCS)[4]. In contrast, emerging methods such as direct air capture (DACCS), biochar, and enhanced weathering are only partially included. Table 1 illustrates the uneven representation of CDR methods across IPCC scenarios, highlighting data gaps and methodological constraints in modelling a broader range of removal options.

In addition, IAMs do not explicitly model the permanence or reversal risk of carbon storage: once carbon is removed, it is assumed to remain stored over the model horizon. Consequently, the evolution of removal types in 1.5°C pathways is an outcome of how IAMs optimise across physical and economic constraints, not from any explicit durability requirement. These modelling simplifications mean that IAMs do not yet represent the full diversity or storage characteristics of carbon-removal methods. Expanding the representation of removal approaches in IAMs could lead to a more balanced deployment of individual options[5].

Table 1: Summary of IPCC AR6 scenarios, highlighting the number of scenarios that include CDR method as a variable[6]. Values in parentheses indicate the percentage of scenarios in each category/scenario ensemble that include the corresponding CDR method.

CDR method	Below 1.5ºC with low or no overshoot (C1)	Below 1.5°C with high overshoot (C2)	Likely below 2°C (C3)	Filtered scenario ensemble
Number of scenarios that feature **Conventional and Novel CDR***	70	106	231	18

[4] Riahi, K., R. Schaeffer, J. Arango, K. Calvin, C. Guivarch, T. Hasegawa, K. Jiang, E. Kriegler, R. Matthews, G.P. Peters, A. Rao, S. Robertson, A.M. Sebbit, J. Steinberger, M. Tavoni, D.P. van Vuuren, 2022: Mitigation pathways compatible with long-term goals. In IPCC, 2022: *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*[P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.005.

[5] Grant, N., Hawkes, A., Mittal, S., & Gambhir, A. (2021). The policy implications of an uncertain carbon dioxide removal potential. *Joule*, *5*(10), 2593-2605.

[6] Smith, S. M., Geden, O., Nemet, G., Gidden, M., Lamb, W. F., Powis, C., Bellamy, R., Callaghan, M., Cowie, A., Cox, E., Fuss, S., Gasser, T., Grassi, G., Greene, J., Lück, S., Mohan, A., Müller-Hansen, F., Peters, G., Pratama, Y., Repke, T., Riahi, K., Schenuit, F., Steinhauser, J., Strefler, J., Valenzuela, J. M., and Minx, J. C. (2023). The State of Carbon Dioxide Removal - 1st Edition. The State of Carbon Dioxide Removal. doi:10.17605/OSF.IO/W3B4Z

Number of scenarios that feature **Conventional CDR on land***	70	106	231	18
Number of scenarios that feature **Novel CDR**	91 (94%)	122 (92%)	294 (95%)	16 (84%)
BECCS	91 (94%)	122 (92%)	289 (94%)	16 (84%)
DACCS	31 (32%)	24 (18%)	91 (29%)	2 (10%)
Enhanced rock weathering	2 (2%)	1 (1%)	1 (1%)	0 (0%)

** Total number of scenarios is lower than for novel CDR because data required for the estimation of conventional CDR on land is not available for all scenarios[6]. C1 scenarios include 97 scenarios, C2 scenarios include 133 scenarios, C3 scenarios include 311 scenarios[7], and the Filtered scenarios include 19 IPCC scenarios.*

Beyond verified mitigation, how does the CNZS V2 channel climate finance to nature and engineered solutions?

The OER recognition framework creates space for companies to deploy climate finance towards verified mitigation outcomes and forward-looking actions that build long-term mitigation capacity, accelerate innovation, strengthen adaptation and resilience, and address unavoidable climate impacts.

Beyond verified mitigation outcomes, the OER framework also recognizes that climate finance plays a vital role in sustaining progress along the full climate-action continuum. Companies can use finance to expand current mitigation through nature and novel removals, and also enable the systems, innovation, and resilience needed to reach and maintain net zero.

Through this route, OER helps channel private capital toward a wider portfolio of outcomes:

- Ex-ante mitigation funding – providing upfront capital or long-term offtake agreements that help bring emerging carbon-removal technologies and large-scale restoration projects to market.
- Funding for mitigation-enabling outcomes – supporting the enabling conditions that make both nature-based and engineered solutions viable at scale, such as carbon-storage infrastructure, landscape planning, or policy reform.
- Funding for adaptation and resilience outcomes – investing in ecosystem-based or community-based actions that reduce vulnerability to climate impacts, for example, mangrove restoration, watershed management, or climate-resilient agriculture.
- Funding to address unavoidable climate impacts – contributing to loss-and-damage or recovery programs that support affected communities and help integrate resilience into rebuilding efforts.

[7] IPCC, 2023: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, 184 pp., doi: 10.59327/IPCC/AR6-9789291691647.

Importantly, under the OER framework, companies applying a carbon-pricing approach for ‘Recognized’ status and those seeking ‘Leadership’ status can deploy finance toward verified ex-post mitigation outcomes, as well as toward the wider portfolio of climate outcomes described above. In doing so, the financing mechanism enables companies to deliver immediate, measurable climate impact alongside forward-looking or capacity-building actions.

By integrating these finance pathways within the same integrity framework, OER enables companies to support a full spectrum of outcomes, from conserving and restoring natural carbon stocks today to building the durable carbon-removal capacity of tomorrow, while also strengthening resilience and addressing the unavoidable impacts of climate change.