BELLONA EUROPA

CONSULTATION RESPONSE

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Call for Input 2023: Activities Involving Removals Under the Article 6.4 Mechanism of the Paris Agreement

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CALL FOR INPUT 2023: ACTIVITIES INVOLVING REMOVALS UNDER THE ARTICLE 6.4 MECHANISM OF THE PARIS AGREEMENT

The Bellona Foundation is an independent non-profit NGO that aims to meet and fight the climate crisis, by identifying and implementing sustainable environmental solutions. Bellona welcomes the opportunity to provide input on removal activities under the Article 6.4 mechanism. We look forward to further opportunities for external stakeholders to engage with the work of the SBSTA and the Supervisory Board.

Bellona also welcomes the decision at COP27 to postpone the adoption of the recommendations on removal activities. As was raised during the call for input in 2022, the timeline of the process was excessively rapid, especially given the complexity of the topic. We again stress the need to develop robust recommendations, rather than swift recommendations. In the EU context, these discussions are expected to take several years to come to fruition and it is advisable that the Supervisory Board follow a similar timeline.

In answering the questions raised in Information note A6.4-SB004-A02, "Guidance and questions for further work on removals", we find it particularly urgent to respond to Information note A6.4-SB004-AA-A04 on "Removal activities under the Article 6.4 mechanism". The note considers the many challenges of operationalising the verification and quantification of carbon dioxide removal as a type of climate mitigation. However, it also contains many fundamental errors and logical inconsistencies that result in incorrect and inappropriate conclusions on several of these matters. Below we highlight a few of the more consequential issues, along with recommendations, though in the interest of brevity many issues were excluded.

ONLY PERMANENT NET REMOVALS SHOULD BE ELIGIBLE FOR CREDITING UNDER THE MECHANISM

If removals are to be accounted for as an equal and opposite action of the emission of greenhouse gases, **the quantified unit of removal must be the amount by which the level of greenhouse gases in the atmosphere has permanently decreased**. This requires that[1] :

1. CO_2 is physically extracted from the atmosphere.
2. The extracted atmospheric CO_2 is permanently stored out of the atmosphere.
3. All direct and indirect greenhouse gas emissions associated with the extraction and storage processes are included in the emission balance.

1 Adapted from the four principles proposed by Tanzer and Ramirez in their 2019 paper and adopted by the Advisory Council of the European Zero Emission Technology and Innovation Platform.

4. The net removal[2] is what is considered: the amount of atmospheric CO_2 removed and permanently stored that exceeds the amount of associated greenhouse gases emissions.

Ensuring the permanence of a removal is necessary to ensure that the removal has a climate benefit which may justifiably balance out the climate impact of emitting cumulative pollutants such as CO_2[3]. **Achieving permanence across different removal activities is possible but will require targeted efforts and guardrails, particularly relating to reversal liability.**

Different removal activities have fundamentally different characteristics which must be considered. Geologic storage of atmospheric CO_2 has a low risk of impermanence that decreases over time. On the other hand, enhancement of natural sinks, such as reforestation and other carbon stored in biomass, will require perpetual management to maintain the carbon storage, along with an increasing risk of reversal over time as climate impacts worsen. Other activities, such as enhanced weathering and biochar, require further development of monitoring and modelling tools to quantify and assess their risk of reversal over time.

As the Information Note mentions, **the selection of temporal boundaries is of particular consequence to how removals are accounted.** However, this temporal boundary should be based primarily on physical realities rather than economic assumptions. Once emitted, CO_2 resides in the atmosphere for 300-1000 years, thus providing a range of acceptable minimum time horizons. Paragraph 49 suggests that "physical permanence … does not have economic value beyond the time horizon" of the selected model. However, the long-lived presence of CO_2 in the atmosphere means that its removal has economic value beyond an arbitrary horizon of 100 years. Limitations of modelling frameworks should not be stated as though they represent reality.

BOTH LAND-BASED AND ENGINEERED REMOVALS SHOULD BE ELIGIBLE

Both land-based and engineered removals have the potential to play a valuable role in reducing climate change and good projects of both types should be eligible. The concerns raised regarding availability, resource-intensity, and potential negative environmental and social consequences (paragraph 39a) are valid concerns for all types of removals—or any large-scale human activity. Engineered removals and biologic removals, have trade-offs. For example, while biologic removals may have lower upfront costs, they also have a larger risk of reversal and are subject to sink saturation, whereas engineering removals allow for a high certainty of permanence with large storage capacities, if the investment is made available.

The relevance of different removal methods will vary regionally, based on the availability of resources such as land, financing, infrastructure, low-carbon energy, and geologic storage capacity. Furthermore, current policy developments foresee engineered removals as a fundamental component to a removal portfolio, including the Bipartisan Infrastructure Law and the 45Q credit in the US, the UK's Net Zero Strategy[4], and the European Commission's proposal for a Carbon Removal Certification Framework[5], among others. **Excluding engineered removal would be inconsistent with the latest scientific assessments[6] and the policy developments of multiple jurisdictions.**

2 i.e., net removal (in t CO_2e) = atmospheric CO_2 extracted and permanently stored (in t CO_2) – direct and indirect greenhouse gases associated with the extraction and storage of that atmospheric CO_2 (in t CO_2e).

3 CO_2 can reside in the atmosphere for a millennium, so 1000 years could arguably be considered a functional minimum standard for permanence (https://climate.nasa.gov/news/2915/the-atmosphere-getting-a-handle-on-carbon-dioxide/).

4 BEIS, Net Zero Strategy.

5 Proposal for a Regulation on an EU certification for carbon removals 2022/0394(COD).

6 E.g., in Chapter 12 of the IPCC's 6th Assessment Report Working Group 3 Report.

Eligibility of a removal method should be based on whether a method results in a permanent net removal of carbon dioxide from the atmosphere. For the eligibility of a specific removal activity of any type—engineered or biologic—guardrail regulations can be used to define storage permanence, sustainability criteria, community engagement, and avoid indirect and inequitable impacts[7]. Simply put, if an activity is unable to provide removals in a manner that meets those criteria, then it should not be eligible to be certified in the Article 6.4 mechanism.

THE "TONNE YEAR" CONCEPT DOES NOT REFLECT THE PHYSICAL REALITY OF REMOVALS AND SHOULD BE ABANDONED

The tonne-year accounting method proposed fails to reconcile the economic value of carbon removal activities with the physical realities of climate change. Vitally, it fails to recognise that the climate benefit of a removal is dependent on its permanence and on atmospheric concentrations of greenhouse gases. Climate impacts increases non-linearly as atmospheric concentrations increase: a rise of 2°C does more than twice as much damage as a rise of 1°C[8]. For example, as temperatures rise, the risks of hitting environmental tipping points greatly increases. Consequently, delaying emissions is likely to lead to worse environmental damage[9] if atmospheric concentrations of CO_2 are higher than they are today. Kalkuhl et al 2023[10] show that relying on temporary storage is a Sisyphean task—it places an undue burden on future generations due to the increasing amount of work required to negate the detrimental climate impacts of delayed emissions. To build on the analogy, relying on 'temporary removals' is like pushing a boulder of increasing size (growing stock of reversible removals) up an ever-increasing slope (increased risk of reversibility with time). **Near-term permanent removals have the potential to limit temperatures to lower levels, not just to postpone them[11].**

Tonne-year accounting is a financial model of risk that does not accurately reflect the physical risks of delayed emissions versus high-risk removals versus permanent removals[12]. In particular, the assumption is made that a shorter time horizon allows for more certainty, as if expecting a return from an investment. However, the logic fails as many types of biologic removals are not inherently time-limited, but rather have highly uncertain risks of reversals that lead to a shorter average expected residence period with negative consequences (rather than a positive return) at the end of that period. **Over-reliance on high-risk high-uncertainty removals could create a "carbon timebomb" where stored carbon could be rapidly re-emitted at an unexpected point in time** (e.g., large scale forest dieback) that we may or may not be equipped to deal with.

Instead, **liability mechanisms can ensure removal permanence via the obligation to perpetually**

7 Sustainability criteria and accounting for indirect impacts are included in the Proposal for a Regulation on an EU certification for carbon removals 2022/0394(COD)

8 In economic modelling terms, the damage function has a positive second derivative. See this article.

9 This affects several parts of the information note, including tables 7 and 8. Furthermore, Paragraph 53 refers to marginal damage remaining constant, which they do not under any realistic set of scenarios, especially if the risk of tipping points is taken into account. Similarly, paragraph 59 is incorrect in its conclusion that offer C is preferred because it ignores is a rising cost of damages. Paragraph 54 cites reference 56a to suggest a different approach, but this reference considers only periods of net negative emissions when atmospheric concentrations are decreasing, which are at least several decades away, and does not support the assertion made in paragraph 54. The study's main implication is that emissions reductions are all the more urgent.

10 See this article.

11 Similarly, in Table 7 response 2(c), it says that "evidently" N tonnes of removals stored for 10 years ican counteract the impact of a tonne of emissions. This is incorrect. After 10 years, both the original emissions and the re-emission of the previously stored CO_2 are in the atmosphere contributing to raised temperatures, irrespective of N.

12 Similarly, paragraph 60 refers to "Mitigation, or avoided climate damage, is fundamentally an economic value…", which neglects the wider implications in terms of physical, societal and ethical issues raised by climate change, including implications for ecosystems.

monitor and manage high-risk carbon sinks and rectify any reversals should they occur, as explored further in our 2022 policy brief, Addressing Differences in Permanence of Carbon Dioxide Removal.

SOME REMOVAL ACTIVITIES MAY NOT BE APPROPRIATE FOR MARKET-BASED MECHANISMS

Given the inherent difficulties, outlined above, of removing CO_2 from the atmosphere and preventing it from returning to the atmosphere, it is very likely that some carbon removal approaches may not be sufficiently robust to be eligible for market-based mechanisms. Specifically, activities with high risk or likelihood of reversal should not be included in the scope of Article 6.4 and should instead be supported via alternative means.

The information note, and subsequent recommendations, requires substantial revision to adhere to a standard of scientific rigour and nuance that is acceptable to facilitate informed decision-making on the complex and consequential subject of carbon removal accounting. **Accounting of removals must be based on a foundation of physical climate science rather than stylised financial modelling.**

FURTHER READING FROM THE BELLONA FOUNDATION

- Addressing Differences in Permanence of Carbon Dioxide Removal
- Carbon Credits Conundrum: Why Governments need to regulate CDR Addressing differences in permanence of Carbon Dioxide Removal
- Global Governance of Negative Emission Technologies and Platforms: Global Supply Chains and Coherent Accounting
- List of Bellona's CDR articles

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