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Bellona input to the structured public consultation on Removal activities under the Article 6.4 mechanism

ARTICLE 6.4 MECHANISM - A6.4-SB005-A02

This document provides Bellona's input to the Supervisory Body's consultation as set out in annex 2 to SB005 meeting report: "Response to Guidance and questions for further work on removals version 2.0".

The Bellona Foundation is an independent, non-profit organisation that meets environmental and climate challenges head on. We are solutions-oriented and have a comprehensive and cross-sectoral approach to assess the economics, climate impacts and technical feasibility of necessary climate actions. To do this, we work with civil society, academia, governments, institutions, and industries.

Key points raised in this submission relate to:

- the supplementary role of CDR in global climate action;
- the use of conservative estimates wherever there is a range of uncertainty;
- the need to focus on storage permanence and risk of reversibility;
- and the need to develop scientifically robust criteria which removal activities must comply with, as opposed to designing the criteria to fit the needs of specific activities.

Cross-cutting questions

Question 1 - Balancing removals with emissions mid century

In considering these issues there should be explicit recognition of the primary role of emissions reductions, the risks of mitigation deterrence from removals, and the likely constraints on removals. Even with concentrated efforts, removal activities will be small relative to needed emissions reductions over the next three or four decades. While the IPCC clearly spells out the fact that CDR will be unavoidable, it also stresses the need for significant emission cuts as a pre-requisite.

With regards to the availability of CDR to balance out residual emissions, the oft-cited range of 'required' CDR deployment from the IPCC's scenarios should be taken with a grain of salt since they often do not include real life constraints to the deployment of CDR approaches, such as limited biomass availability, energy requirements and infrastructural needs to achieve the temperature targets[1]. These modelling exercises should not be understood as being prescriptive.

[1] https://www.negemproject.eu/wp-content/uploads/2022/05/NEGEM-Briefing-on-role-of-CDR-in-IPCC-AR6-WGIII.pdf

With this in mind, Article 6.4 (and other climate governance frameworks) should ensure that removals are deployed on top of emission reductions and are not used to balance out emissions which could otherwise have been abated.

Question 3(a) - Monitoring period

This should recognise that carbon dioxide removed from the atmosphere will need to be monitored in perpetuity, as emissions to the atmosphere from reversals are harmful at any time. The monitoring period may nevertheless in practice end when there are adequate assurances that the CO2 has been physically and permanently isolated from the atmosphere, but liability should remain to address any unforeseen risk of reversal.

If the permanence of a removal activity is dependent on human intervention or management (e.g. the perpetual maintenance of a particular practice), the monitoring period should run at least as long as these activities—and the removals they provide—are required. If monitoring stops, the removed CO2 should be assumed to be re-emitted to the atmosphere and treated in the same way as a reversal.

Question 3(b) - Crediting period

The crediting period will need to run in perpetuity. Credits should be issued when there is a physical removal from the atmosphere and not before. For example, reforestation projects should generate credits as the forest grows once there is a consequent and observable net removal. The credit accompanying the removal will then need to be monitored and, where necessary, replaced. This monitoring will need to continue in perpetuity (see previous question), even for a fully mature forest.

Question 3(c) – Timeframe for addressing reversals

The timeframe for addressing reversals should take account of the damage caused by reversals. In the event of a reversal, regardless of the cause for that reversal, the removal credits should immediately be cancelled along with any claims associated with those removals. There should be a corresponding obligation to remediate the reversal. Once the reversal has been remediated with an equivalent replacement, the removal credits, and associated claims, may be restored. The reversal should be remediated in as short a timeframe as possible and should also remediate any climate impact resulting from the delay between reversal and remediation.

Questions on specific elements

Question A - Definitions

Removals need more precise definition. This should include a recognition of the need for permanence, and accounting for net removals that takes account of associated lifecycle emissions.

The intended role of CDR in climate mitigation is to reduce the concentrations of CO2 in the atmosphere. With this in mind, the definition of carbon dioxide removal should incorporate the following four key principles collectively[2]:

1- The CO2 is physically removed from the atmosphere;
2- The removed CO2 is permanently stored away from the atmosphere;
3- All greenhouse gas emissions associated with the removal process are comprehensively estimated and included in the emission balance;
4- The total quantity of atmospheric CO2 removed and permanently stored is greater than the total quantity of greenhouse gases emitted to the atmosphere.

A key point to note relates to the fact that only the removal of CO2 should be included, since the removal of other GHGs is not currently anticipated at relevant scales. Furthermore, the removal of CH4 or N2O is particularly challenging given the highly diluted concentrations of these gases in the atmosphere. Added to this, there are further complications relating to the differences in climate effect of removing 1 tonne of CH4 versus the removal of 1 tonne of CO2. Therefore, introducing fungibility between the removal of different GHGs should not be envisaged.

Question B – Monitoring and Reporting

Monitoring Reporting and Verification (MRV) systems have the potential to improve over time as new scientific knowledge becomes available and administrative capacity is developed. There should be a defined process for incorporating such improvements. This may include scheduled reviews and revisions requiring updates to procedures, for example every five years. Measurement methods should be the subject of continuing research in the interim with the ambition to reduce the margin of uncertainty. This will be especially relevant where uncertainties are largest. This includes biogenic sinks, biochar, enhanced weathering and marine sinks.

It may be possible in some cases to create financial incentives to enhance measurement. This may be done by adopting conservative default parameters (that tend to underestimate actual removals), which can be over-ridden by measured values for an individual sink – although some uncertainty will inevitably remain.

Where actual values result in higher estimates of removals than implied by default parameters there will be a direct financial incentive for measurement. For example, in the earlier Australian Carbon Pricing Mechanism[3], high default parameters were used for assumed emissions of methane from coal mines. In many cases emitters could benefit from

[2] Adapted from Tanzer and Ramirez 2019: 'When are negative emissions negative emissions'. https://doi.org/10.1039/C8EE03338B

[3] Australia's Carbon Pricing Mechanism (CPM) passed into law as part of the Clean Energy Futures Package (CEF) in 2011, and became effective on 1 July 2012. However, after the 2013 Federal Election there was a change in government, and the incoming government repealed the CEF package on 17 July 2014.

measuring actual emissions and being charged on this basis, rather than the default. This led to more widespread measurement of methane emissions.

Even with improved measurement systems in place, there will be remaining uncertainties. Different types of removals create different types and degrees of uncertainty. For example, for DACCS accurate measurement of tonnes of CO_2 placed into storage will be relatively straightforward. In contrast, weathering is difficult to measure and verify. Above ground biomass will be easier to measure accurately than biochar or below ground biomass, even though all natural sinks remain difficult to accurately quantify. Biochar stored in heaps will be easier to monitor than that distributed over farmland.

Given these inevitable uncertainties, **conservative parameter values should always be used** to reduce the risk of removals being overestimated, and thus give greater confidence that certified removals have actually occurred. For example, it may be prudent to estimate a probability distribution of the amount of carbon held in a sink, then assume a percentile of the distribution rather than the mean or median value.

In each case, application of MRV and subsequent choice of parameters will need to recognise:
a) **intrinsic variability**: the difference in net removals in apparently similar cases. Variations might arise between sinks of similar type and circumstances, or in the same sink from year to year due to, for example, weather conditions, microclimatic conditions, or management practices. In some cases, this may lead to estimates that are systematically biased. In other cases, estimates may not be biased but there may still be substantial variance around the mean.

b) **measurement limitations**, the limits in precision and accuracy with which actual net flows can be measured, even if the sink characteristics (e.g., soil chemistry, tree species, prevailing weather) are well understood.

c) **modelling limitations**, the limits in precision and accuracy that can be achieved by projecting from existing and/or generalized data. (e.g., using historical data to predict wildfire risk becomes increasingly inaccurate as the climate changes; using lab data to predict storage times of biochar may exclude chemical interactions in real-world storage conditions; using generalized data for soil carbon storage may not reflect difference in soil capacity due to microclimatic conditions)

Question C: Accounting for removals

It should be recognised that not all removals are suitable for results-based incentives or market-based mechanisms such as Article 6.4. Notably, removals in the land sink are particularly challenging to reliably quantify and to reliably trust that those removals will not reverse in future. Further global temperature increases are likely to exacerbate these risks.

Therefore, only removals which can reliably meet the four defining principles of carbon dioxide removal (as set out in the above question on definitions) may be included in market-based mechanisms such as Article 6.4. Safeguards must be put in place to prevent the use of removals to balance out emissions which could otherwise have been abated.

Regarding potential emission reductions resulting from removal activities, those may not be used to artificially inflate the quantity of CO2 that is deemed to have been removed from the atmosphere. These numbers must be reported and quantified separately[4].

Put simply, accounting for removals should take account of the following principles:

Principle 1: Removals are permanent net outflows from the atmosphere. They are fundamentally different from emissions reductions and should be quantified and reported separately.

Principle 2: Removals are certified as they occur. They cannot be certified before there has been a corresponding physical net outflow from the atmosphere.

Principle 3: Certified removals can only be generated by using specified sinks. Each tonne removed is matched to a specific sink. Each sink generates a certain type of removal, for example from storage in a geological formation, biogenic sink or buildings.

Principle 4: MRV systems should adopt conservative assumptions where there is uncertainty, to give greater confidence that the certified quantity has actually been removed. MRV systems should be designed to improve over time.

Principle 5: Removals should only be credited from projects which meet wider standards on environmental impacts and effects on local communities.

Question D: Crediting Period

As noted, credits need to be monitored in perpetuity to remain valid because they need to be permanent. However, this requirement may not be as onerous in the case of geological storage or where the CO2 is demonstrated to have been physically and permanently isolated from the atmosphere with minimal future human intervention. This will necessarily be more onerous for biogenic sinks.

Question E: Addressing reversals

[4] See the Annex to 'Carbon Credits Conundrum':
https://network.bellona.org/content/uploads/sites/3/2022/08/THE-CARBON-CREDITS-CONUNDRUM.pdf

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Approaches to reversals were described in a publication by Bellona last year, which discussed many of the relevant issues, in particular looking at Question 1. The work identified three main approaches (which are not mutually exclusive). These are:

- separation of different types of removal sinks with separate frameworks and targets,
- administrative management of risk typified by buffer stocks or exchange rates benchmarked to geological timelines of storage, and
- perpetual obligations on certificate holders, which may require insurance.

The first approach could be an underlying approach, relevant to all 3 questions. The second is relevant to question E1(a). The third is relevant to question E1(b).

It must be noted that the preferred approach is to keep different removal types separate based on the permanence of their carbon sink. As such, activities without robust assurances as to their permanence would not be suitable for a market-based mechanism such as Article 6.4. Further to this point, the underlying assumption to the above approaches is that there are robust and accurate measurement systems in place. In the absence of these, it is not possible to viably quantify nor certify a removal activity.

We also highlight the following points.

Question 2: The timeframe should be sufficient for the necessary MRV and liability frameworks to be established. This is likely to take some years, so starting the process is urgent.

Question 3. All risks of non-permanence need to be minimised to the extent feasible. This can best be incentivised by obligations on holders of the certified removals. If the risk of non-permanence cannot be sufficiently reduced, these activities should not be included in this mechanism. The activities which can be certified as removals in this mechanism should meet robust and scientifically stringent criteria to ensure that all removals certified have equivalent climate impact. The criteria for removals must not be designed in such a way as to accommodate activities which may, in a narrow sense, be understood as removing carbon from the atmosphere but do not achieve a permanent net removal of CO2 from the atmosphere.

Question 4. Centralised risk assessment will mainly be required on a buffer approach. Other approaches based on guarantees and insurance effectively require parties to carry out their own risk assessment.

Question 5: Methods for determining the level and composition of any buffer pool need to take account of both uncorrelated risks applying to a single project or small groups of projects, for example local legislative changes, and correlated or systemic risks, for example large scale forest dieback or widespread increases in forest fires, including as those risk change over time. Risk assessment must account for climate change and not be based only on historical data. Buffers also need to take account of uncertainties in MRV (see above).

We consider the implications of Question 5d to be misdirected. It implies that there might be a cessation of obligations as the end of the last crediting period. This should not be the case. Any uncancelled buffer should be retained against the risk of future reversals. Indeed, as climate change becomes more severe it may be necessary to add to buffers as opposed to reducing them.

Question G: Avoidance of other negative environmental, social impacts

Projects for removing carbon dioxide from the atmosphere must take account of other goals. These include:

- creating co-benefits for greenhouse gas emissions mitigation beyond those taken account of in calculating the net removal;
- enhancing adaptation and resilience to climate change, for example increasing resilience against flooding;
- protecting and enhancing biodiversity;
- promoting other environmental goals, including safeguarding water quality, and avoiding excess burden on the nitrogen cycle; and
- improving the wellbeing of local communities, including by providing leisure, employment and educational opportunities, as part of a just transition.

As a condition for removals being certified, projects should be required to meet the specified standards and to follow the required procedures relevant to these goals. This does not imply there will always be a benefit in all areas. For example, there may not be climate adaptation benefits for some enhanced weathering or DACS projects. However, projects should at least be required to implement best practice and avoid negative impacts on the above. Furthermore, the co-benefits provided by a removals project must not reduce the stringency of the carbon removal activity itself—any quantified removal must be held to the same high standards, particularly for permanence of storage.

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Mark Preston Aragonès	Policy Manager Carbon Accounting	mark@bellona.org
Dr. Samantha Eleonor Tanzer	CDR Research and Technology Manager	tanzer@bellona.org
Adam Whitmore	Principal Advisor Climate Change Policy	adam@bellona.org