CARBON MARKET WATCH

Overview of the Carbon Removals and Carbon Farming Certification process

In December 2024, the EU launched its certification framework for permanent carbon removals, carbon farming and carbon storage in products, commonly known as the Carbon Removals and Carbon Farming (CRCF) certification Framework.

As its name suggests, the CRCF aims to certify a variety of practices or processes, namely: permanent carbon removals, carbon farming, and carbon storage in products. Each practice involves specific activities for which tailored methodologies are currently being developed. The methodologies will be published as Delegated Acts, taking on the force of law. Note that the Regulation only offers guidance on the basic rules for developing the methodologies (Articles 4 till 8) and the elements they should contain (Annex I).

Overall, the activities involve:

1. **Permanent removals:** direct air capture and storage (DACCS), biomass with carbon capture and storage (BioCCS) and biochar. Biochar is currently classified as a permanent removal activity - yet uncertainty persists on its storage length. Therefore, a key aspect of the methodology is determining how much of a given biochar batch will be stored for at least several centuries.
2. **Carbon farming (emissions reductions and carbon sequestration):** peatland rewetting and restoration, agriculture and agroforestry on mineral soils, and planting of trees.
3. **Carbon storage in products**, mainly wooden construction elements.

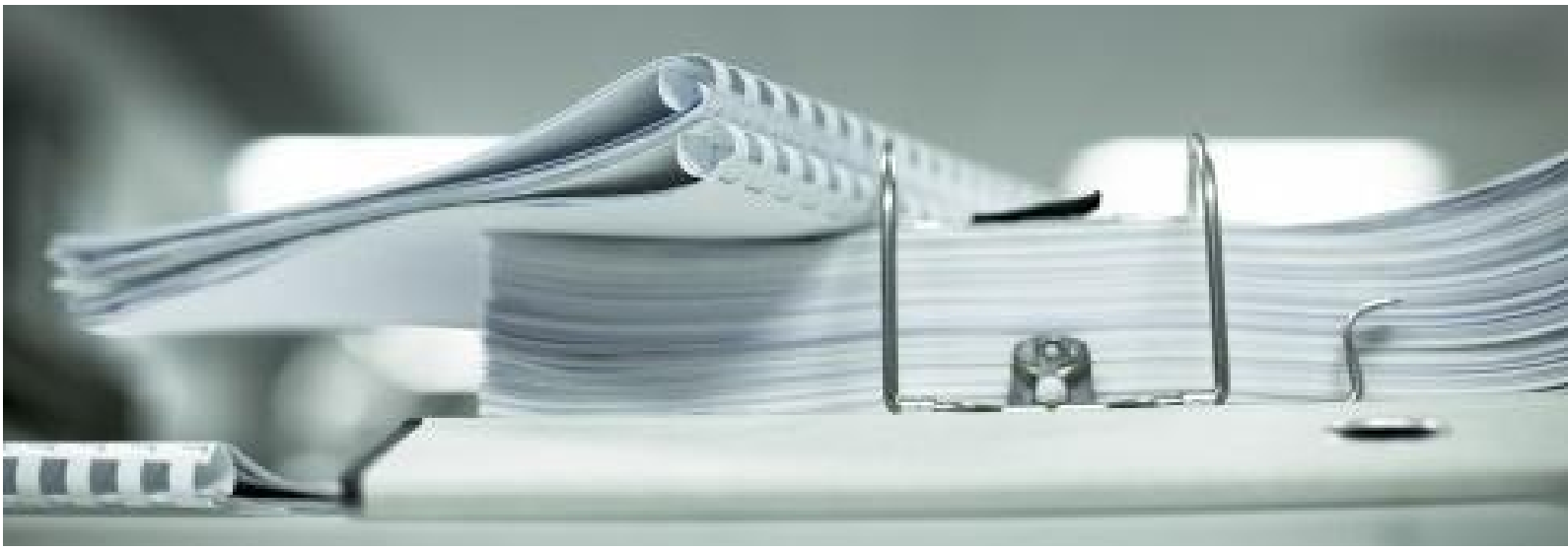
Note that the list of activities is likely to expand.

As established in Articles 4 to 7 of the CRCF, the methodologies will follow the so-called QU.A.L.ITY criteria. These are the quantification of climate impacts (against a baseline), the additionality of the activity, its long-term storage and liability for early release into the atmosphere, and sustainability. The methodologies should set out robust conditions, tests and safeguards that eligible activities need to comply with to be certified under the scheme. However, as a voluntary framework, the decision on whether to participate in the scheme or not rests with the operators and certification schemes.

While the European Commission and its consultants are developing the methodologies, these are also being discussed within the EU Carbon Removals Expert Group (CREG) of which CMW is a member. Note that, in addition to CREG meetings, numerous online workshops, discussing particular sections of (at times specific) methodologies, e.g. quantification in forestry, are held throughout the year.

Unfortunately, the CREG is largely dominated by industry lobbyists, which skews the balance during discussions and diminishes vital voices from independent experts, researchers, and civil society. As an active member of the CREG and the CRCF process in general, CMW has sought to rectify this imbalance by hiring its own consultants to thoroughly review the methodologies and flag pertinent issues.

This document sets out the feedback received for the planting of trees draft methodology (published in April 2025) by Öko-Institut, Greenhouse Gas Management Institute, and Carbon Plan. Carbon Market Watch submitted its written feedback to the European Commission through the CRCF EU survey. By sharing this information, we hope to contribute to the debate and shed further light on the numerous issues affecting the methodologies.



Second assessment of the draft technical specifications for certification under the EU CRCF

Planting of trees

// Hannes Böttcher, Felix Fallasch, Anne Siemons and Lambert Schneider

Summary of key findings and recommendations

This document provides an assessment of the proposed draft for an EU certification methodology for planting of trees (referred to as “draft methodology”), provided on 15 April 2025.

Overall, the draft methodology, in its current form, ignores fundamental principles of carbon crediting and does not comply with the quality criteria established under the CRCF. Applying the methodology would result in the issuance of units that do not represent any actual emission reductions or removals. Key issues identified include:

- **Overall, the draft methodology lacks details on how the requirements shall be operationalised and implemented.** In many sections, requirements are formulated as general principles, but it remains unclear how compliance with these requirements must be demonstrated and will be checked. Further elaboration of the methodology is therefore necessary.
- **Switch to an activity baseline welcome improvement:** In the previous version, the methodology applied a standardised baseline. Planting trees on degraded areas as one eligible activity under the methodology may also happen for reasons other than the incentives from CRCF units. Using standardised baselines in this case is associated with high over-crediting risks. The new version switches to an activity-specific baseline. This is a welcome improvement.
- **Unclear approach for determining activity-specific baselines**: The methodology is unclear on the approach for quantifying the activity-specific baseline for quantifying the temporary net carbon removal benefit from newly planted trees (section 2.3.1). The draft methodology states that an activity-specific baseline equal to zero shall apply. At the same time it is stated that the reference period to establish the baseline shall bet at least

five years, consisting of the years immediately preceding the start of the activity period, or, for activities started after 1st January 2023 of the years immediately preceding the implementation of the activity. The carbon stock at the beginning of the activity period shall be determined using one of the quantification approaches for above-and below-ground biomass and the baseline shall be based on the counterfactual change in carbon stock that would occur under previous land management practices in the absence of the activity (p. 23). The latter provisions seem inconsistent with the use of a baseline of zero. It is important and established best practice in carbon crediting that the baseline reflects that some degree of afforestation or natural succession may occur in the baseline scenario (e.g. by using a control group approaches). This is important to account for uncertainties and variation in climate stocks due to climate change impacts and weather conditions. Additionally, data gained via monitoring of control sites can be used to improve GHG inventory reporting over time.

- **No attribution of units incentivised by public funding:** The eligible mitigation activities may also be funded through public funding. If mitigation activities receive both public subsidies and CRCF units, this could artificially lower CRCF unit prices and implicitly subsidise continued fossil fuel use by the buyers of the units. The methodology should either exclude mitigation activities that receive public funding or proportionally attribute the emission reductions to the financial support provided.
- **Expected overestimation of removals due to inclusion of biomass on the site before start of activity**: All removals, including from an existing biomass stock covering at maximum 10% of the area, are accounted for. This can lead to overestimation of removals, especially in the beginning of the monitoring period. Biomass stocks that existed before the start of the activity should not be counted as removals achieved through the eligible activity.
- **Leakage effects expected but currently not accounted for**: Compared to an earlier version of the methodology that constrained eligible activities to tree planting on unused land, the scope of eligible activities in the current draft methodology includes planting of trees on cropland, grassland, and settlements. This can lead to very large leakage effects, including from indirect land use change (ILUC) due to the shifting of agricultural production to other lands, which could even exceed the removals achieved through planting trees. The draft methodology does not include any provisions to account for such leakage. This is a severe gap. The draft states that the Commission is currently in the process of investigating the options to address ILUC in the methodology, but no details on accounting for ILUC are currently included. Under the CDM, tree planting activities were only eligible on degraded land as a response to high ILUC risks.
- **High flexibility to choose between different models, methods and approaches is not a robust approach to quantification:** The draft methodology provides different options that operators can chose from to quantify the mitigation impact of tree planting activities (section 2.2). These options include tier 3 models (eligible for quantifying carbon removals in above- and below-ground biomass, carbon removals in soils and soil emission reductions), ground-based measurements (eligible for quantifying carbon removals in above- and below-ground biomass, carbon removals in soils and soil emission reductions), data acquisition through remote sensing (eligible for quantifying carbon removals in above- and below-ground biomass), and tier 1 and tier 2 emission factors (eligible for quantifying carbon removals in soils, soil emission reductions and GHG associated emissions). Experience from improved forest management and avoided deforestation projects in the voluntary carbon markets have shown that flexibility

to choose between different quantification approaches makes methodologies vulnerable to adverse selection as operators will likely apply those models that result in highest emission levels in baseline scenarios. This has led to considerable overestimation of emission reductions.

- **Provisions on accounting for uncertainty of quantification approaches are not appropriate:** The provisions for accounting for uncertainty in section 2.6 lack specification as it is not clear how the uncertainty deduction factor is to be calculated and applied. Additionally, uncertainty regarding the *assumptions* and the tier 3 models (quantification approach 1) do not seem to be accounted for.
- **Long activity periods without updating the baseline can lead to over-issuance of units**: The activity is 30 years according to the draft methodology. No updates to the baseline are foreseen in this time period. This can lead to over-issuance of credits, e.g. if an eligible activity became mandatory in the meantime. Shorter activity periods should be applied and operators should be eligible to apply for multiple renewals of these activity periods provided that the activity meets the requirements of the most current version of the crediting methodology at the time of each application. At each renewal of the activity period, the validity of the original baseline shall be demonstrated, or where invalid, a new baseline scenario shall be determined when renewing the crediting period.
- **Multi-layered exemptions for demonstrating additionality create high risks to register projects that do not need CRCF funding to become viable (section 3)**: There are many exemptions that the methodology provides for project operators to demonstrate additionality of their tree planting activities. Operators must demonstrate that the activity is not legally imposed on them. However any activity remains additional during the entire activity period, even if it became obligatory for the operator under national legislation. An activity period for a tree planting activity shall be 30 years according to the draft methodology. This means that if an activity e.g., becomes legally imposed after 5 years, operators would be entitled to up to 25 years of non-additional carbon farming sequestration units and soil emission reduction units under the methodology. Such an approach creates unfairness and arbitrariness in treating different operators. An operator who did not register an activity with the CRCF before it became obligatory under national legislation would have to bear the full cost to fund the necessary activities for complying with such a law. An operator who did register with the CRCF would be subsidised with up to 25 or more years' worth of CRCF units to fulfil the same legal obligations as the other operator.

  Operators must further demonstrate that the activity is not financially viable without the incentives created by the CRCF. For this they must conduct either a simple cost analysis or an investment comparison analysis. However, under the methodology activities are exempt from conducting these financial viability tests if they already receive state aid or public subsidies. Automatic exemption only applies if public subsidies have a "claw-back" mechanism (i.e. must be repaid once CRCF revenues become available) or do not cover the same aspects as the activity proposed for CRCF funding (e.g., smaller area, different eligible costs, smaller number of practices). For the latter it is however sufficient to demonstrate that incentives through the CRCF create more sustainability co-benefits while the type of practice can be the same. **These multi-layered exceptions create an enabling environment for adverse selection in the type of activities that will apply for registration under the CRCF.** Not having to conduct a financial viability test provides a competitive advantage for activities that already receive public subsidies. This bears substantial risks that CRCF revenues replace public

subsidies in already on-going activities instead of incentivising new activities. This will only result in additional climate action if these subsidies in turn are appropriated to additional tree planting activities. If they are returned to state budgets and appropriated for other purposes, CRCF funding will not lead to any additional tree planting activities.

Finally, the methodology requires that activities must not start before the time of submission of the activity plan to the certification scheme for the certification audit. This would be a very robust rule for ensuring that only those activities will receive CRCF funding that need its incentive effect (prior consideration). The methodology allows however an exemption for any activities that started between 1 January 2023 and 31 December 2027. These "early movers" would be eligible to apply for certification under the CRCF until 2030. Considering that the CRCF regulation only entered into force on 26 December 2024, **this exemption would allow registration of legacy actions that already successfully operated before the CRCF has been adopted.**

Overall, the additionality rules should be further revised and more closely aligned with best practices of existing carbon crediting programmes.

- **References to "onboarding" of existing certification schemes should be deleted from the methodology:** In its additionality provisions, the methodology stipulates that activities carried out under other certification schemes than the CRCF automatically meet the prior consideration requirements discussed in the above bullet (section 3.2.1). However, only units issued after an official recognition of that scheme by the Commission will be eligible for certification. We recommend deleting these provisions from the methodology. There should be a separate delegated act, which will outline the detailed rules for transferring an activity from another certification scheme to the CRCF. These rules should be the same for all project types and there is no need to have such rules included in a methodology for an individual project type. Further, assuming that these activities automatically meet the prior consideration (or incentive effect) provisions of the methodology might be misguided. If the other certification scheme did not require operators to demonstrate that they meet these requirements, this might not be the case.
- **Provisions on storage, monitoring and liability (section 4) are underdeveloped and miss critical provisions:**

The CRCF Regulation defines that carbon farming sequestration units are temporary and expire at the end of the monitoring period of the relevant activity. However, there are no provisions on the consequences of the expiry of units that were already used. Provisions are needed to clarify that buyers bear the responsibility for replacing temporary units upon their expiry. If the temporary units had been used by a buyer before their expiry, after the expiry the carbon removals associated with these units may not be stored in soils or biomass anymore. This would undermine the environmental integrity of the CRCF because it would lead to higher levels of emissions in the atmosphere than without the use of the mechanism. Alternatively, the methodology should clarify for which limited purposes temporary units may be used, excluding meeting emission reduction obligations by public and private actors.

Carbon removals and reduced CO_2 emissions achieved through tree planting activities are of temporary nature and can be reversed quickly. As a consequence, the activities need to be continuously maintained in order to ensure a longer-term mitigation benefit. **Incentives to maintain carbon farming activities that enhance carbon removals or reduce emissions from soils and extend the monitoring period as required by recital 13 of the CRCF Regulation are missing in the draft methodology.** Temporary

carbon farming sequestration units generated from eligible tree planting activities expire with the end of the monitoring period (which may terminate 10 years after the end of the activity period at the earliest) according to the draft methodology. If monitoring is continued, the validity of the temporary units is extended for the duration of monitoring. Yet, no further incentives are available to maintain achieved carbon removals beyond the end of the monitoring period. Under the CDM, temporary certificates also expired after a certain time period. Yet, they could be renewed and upon renewal, credits were issued for the cumulative mitigation impact achieved in previous crediting periods. This would be an option to account for efforts to maintain achieved carbon removals that could otherwise be reversed. If such an approach was followed, a maximum time period for renewing the certification period would need to be defined.

Furthermore, **it is not specified for soil emission reduction units whether they are considered permanent or temporary**. Avoided CO_2 emissions from mineral soils are associated with non-permanence risks and can be reversed. **For avoided CO_2 emissions appropriate liability mechanisms are missing and must be added.**

Also, the consequences of no submission of monitoring reports during the monitoring period should be defined in the methodology.

Furthermore, **clarification is needed regarding the provisions on risk assessment** (section 4.1)**.** Provisions should be added to exclude activities from eligibility for which the assessed risk of reversal is very high. Also, the proposed risk assessment does not include an assessment of avoidable risks which should be added. Additionally, operators should be required to undertake measures to mitigate the risk of reversals.

Regarding the implementation of liability (section 4.2), **provisions are missing on how operators will be held liable for replenishing the buffer pool in case of avoidable reversals** (e.g. that no further units will be issued to an operator before the buffer pool has been replenished and that units issued will be cancelled if such replenishment is not implemented).

- **Assumption of zero associated emissions on cropland not appropriate:** The draft methodology states that no increase in GHG associated emissions is expected if the activity takes place on cropland (section 2.5). Therefore, GHG associated emissions for activities on cropland shall be equal to zero. This is not appropriate as tree planting on cropland may also involve an increase in fossil fuel use e.g. for planting, mowing or thinning as well as an increase in fertiliser use (accounting for the eligibility criterion according to which the use of fertiliser is only allowed in areas where nitrogen is a limiting factor for tree growth) which must be accounted for.
- **It remains unclear how fulfilment with sustainability requirements (section 5) will be ensured**: Provisions are lacking on how compliance with safeguard criteria should be ensured and how monitoring of environmental impacts should be implemented. There is no systematic definition of specific sustainability aspects that need to be considered. In addition the methodology lacks a systematic approach to environmental and social safeguards, which would require operators to identify potential negative impacts of their activities, make subsequent adjustments to their activities to avoid these impacts and adopt environmental and social management plans aiming to minimise and mitigate impacts for cases where they cannot be fully avoided. It is unclear how the broad requirements that are listed will be operationalised as there is no standardised process prescribed for monitoring environmental impacts (i.e. an environmental and social impact assessment or similar) nor specific indicators (e.g. for soil biodiversity) to be

used. Neither does the methodology include any definition of a process for action to be taken if negative impacts are identified. According to the draft methodology, the activity plan must include a description of how the activity is aligned with the minimum sustainability requirements and delivers the mandatory co-benefits for the protection and restoration of biodiversity and ecosystems defined in the draft methodology (section 6.1), but this is not further specified. The reference to other EU legislation with relevance for sustainability aspects is also too vague as e.g. the Habitat or Birds Directive have been developed for different purposes and it is not clear how compliance with the requirements therein shall be demonstrated for activities certified under the EU CRCF.

- **Use of non-native species allowed**: The methodology states that used tree species should be local native species. The term "local" is not defined. Moreover, some non-native species adapted to the local soil, climatic and ecological conditions may be used where it is demonstrated that they increase resilience to climate change without defining what "some" means. Further clarification is needed to specify and limit which kind of species are allowed and to which extent non-native species are allowed.
- **Clear differentiation between agroforestry activities and planting of trees required**: The methodology does not clarify how planting of trees on cropland is to be differentiated from agroforestry activities (eligible under the draft methodology on agriculture and agroforestry on mineral soils) to avoid that an activity could seek to obtain CRCF units under both methodologies.

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This assessment was commissioned by Carbon Market Watch. It represents the views of the authors only and not necessarily the views of Carbon Market Watch.

Talking Points for: Draft elements for an EU certification methodology on carbon removals and emission reductions through carbon farming under the CRCF

Type of Activity: planting of trees

Response by Tani Colbert-Sangree, Greenhouse Gas Management Institute

Reviewed by Katie Goldman, Greenhouse Gas Management Institute

General issues:

The methodology focuses considerable attention on an optional carbon pool – soil carbon, at the cost of rigorous attention to biomass carbon, which is the most significant GHG category in tree planting projects. It seems like many of the soil carbon methodology provisions have been repeated (without changes) and used in this methodology. One of many examples is that tillage is not a common term for tree planting. Suggest to replace with broadforking, ripping, chisel plow, etc. Also, I would recommend that soil disruption technologies like tillage should not be permitted in order to reduce emissions from tree planting activities through the project. Also, the provisions in 2.4.1 Baseline are less relevant to tree planting.

Additionality

- More flexibility could be considered for projects that start activities expecting to receive revenue via the certification scheme but do not apply before beginning the activities. Proof can be established through investor/loan agreements or communication that explicitly identify carbon credit revenue in order to receive financing to adopt new practices. Other forms of proof could also be considered to establish the expectation of receiving credit revenue. Typically, crediting programs allow activities to be implemented 6-12 months prior to the application/registration of a project activity provided the expectation of credit revenue existed prior to the decision to implement the project and can be established. This flexibility could be extended beyond early movers without adding significant environmental integrity risk.
- “Overcompensation” is not a relevant risk, the risk here is that the credit revenue is not what overcomes the project’s barriers to implementation. The amount of compensation from credits is irrelevant so long as the anticipated credit revenue is sufficient to have caused the project to occur.

1.1 Eligibility

- If projects are permissible on grassland, cropland, settlements, and degraded forestland, then the quantification methods that are appropriate to use in each setting must be explicitly identified. A quantification model for evaluating tree growth in forestland is not appropriate to apply to assess tree growth in settlements, cropland, or grasslands. Similarly, peatlands restoration is a distinct project type that would require a different quantification approach that incorporates the organic soil carbon dynamics of those complex ecosystems (e.g., planting preparation emissions may be more significant).
    - Settlement tree plantings e.g., urban forestry brings trees under stress from distinct forces and substantially increases their maintenance costs. Growth models would need to be adjusted accordingly.
- The methodology incorrectly states in Table 1 that organic soils can be accounted as “CR removals in soils” or “LULUCF soil emissions”. Unlike CO_2 emissions and removals in mineral soils, CO_2 and CH_4 emissions can occur from organic soils due to enhanced microbial decomposition caused by drainage and associated management activity. Organic soils can be excluded from the methodology because, as stated, “Activities on

organic soils shall not result in the lowering of the water table or in any form of soil degradation." If it remains in the methodology, it belongs in Table 2 for emission sources.

1.2 Duration of the activity, monitoring and certification periods

- Tree planting is a long-term investment in carbon. Trees do not reach maturity until 40-80 years of growth (depending on the species). Therefore 30 years is a short activity period and a longer activity period could be considered.
- The monitoring period should have a longer minimum period associated with it, given that monitoring is the mechanism used to confirm the permanence of enhanced removals accomplished through the project. It is best practice among carbon crediting programs to monitor a project for at least 100 years from the start of the initial crediting period.[1] Perhaps the requirements for monitoring frequency after the crediting period could be reduced to lower the burden or could be required to be more rigorous for certain activities with higher risk of reversal (e.g., fire, harvest)? Also, it should be noted that 100 years is already a substantial compromise compared to a truly "permanent" removal of emissions (meaning one that lasts forever). While this is the best practice among carbon crediting programs, if the intention of the CRCF Regulation of the European Parliament and of the Council is to ensure permanence as stated in provision (13) "***Permanent*** carbon ***removals*** provide enough certainties on the very long-term duration of several centuries" then the monitoring period should be aligned with this objective and extend beyond 100 years to ensure very long-term storage of carbon over several centuries.

Robust Quantification

- The methodology omits two potentially significant GHG categories for tree planting; specifically, carbon emissions and removals from wood products and GHG emissions from biomass burning. These should at least be considered and if excluded this should be justified.
- The methodology includes a few irrelevant GHG categories associated with agriculture management. Tree planting on cropland or rangeland should not materially affect enteric fermentation or manure management. These GHG categories may be relevant under an agroforestry project type but not a tree planting project type.
- There is generally too much flexibility in the quantification options, including with the GHG accounting boundary and choice of quantification approach. Recognizing there will be a need for some flexibility, the number of options and the range in rigor, leaves too much room for extreme inconsistency across projects with regard to rigor and accuracy.
- Given the number of different eligible land categories where tree planting can occur, there are effectively several eligible project types in the methodology, each with potentially different significant GHG categories. It would strengthen the methodology to develop a matrix of pools and emission sources for projects occurring on different land types (e.g., baseline emission sources for a grassland planting project or an agricultural planting project different from that of degraded forestland project). The matrix/table could identify which of the pools and sources are significant and therefore required for each of

[1] See page 77 of the CCQI Assessment Methodology: https://carboncreditquality.org/download/Methodology/CCQI%20Methodology%20-%20Version%203.0.pdf

the land/project types permitted by the methodology. Similar types of projects could be defined to have the same pools and sources if appropriate.

2.3 Quantification of carbon removals in above- and below-ground biomass

- A standard baseline of zero is not appropriately substantiated. Recognizing the real need to balance practicality with rigor, there needs to be more justification for a baseline of zero, which is proposed for enhanced removals. Establishing a standardized baseline can ease project reporting and documentation, but the determination of the standard baseline must be justified to be conservative.
- The baseline should include carbon stored in any existing trees on the project site. If up to 10% of crown cover may be forested at the start of a project, the carbon in those trees must be calculated conservatively and included to ensure they are not counted as impact of the project. It is not sufficient to generically say, “ensure that the growth in carbon stock from the pre-existing trees is not included in the quantification of the temporary net carbon removal”.

2.5 GHG associated emissions

- The provision allowing tree planting on cropland to apply a zero rate for project emissions (GHG associated) is not evidenced and should be removed. Tree planting in a cropping system does not necessarily mean there will be no further crop production from the project area. Trees can be planted as wind blocks, to augment fences, to provide shade, for aesthetics, or for added recreational value. Many of these other rationales for planting trees on cropland would not disturb or change the land use or crop production, and agriculture-related emissions would continue in the project scenario – and be important to quantify. Excluding these project emissions would lead to significant overestimation for projects with these characteristics. If the intention is to exclude these emissions because they are unlikely to be impacted by the project, then the unaffected pools and sources should be excluded from the project boundary. But if the project changes the area of crop production or agricultural practices then it would be important to track these crop production-related emissions in the baseline and the project scenarios.
- GHG associated emissions: no leakage considerations are identified in this section yet tree planting on grassland or cropland could displace these activities which would need to be accounted for.
- The permanence requirements must extend to the full quantity of enhanced removals to appropriately accommodate this risk. The provisions for allocating GHG associated to (in part) enhanced removals appear to reduce the quantity of enhanced removals that would then be subject to the permanence requirements (by the amount of project scenario GHG emissions that are allocated). So, this “allocational” has the potential to undermine the integrity of quantification of enhanced removals.

4. Permanence

- The provision “replenishing the buffer pool by replacing the equivalent amount and type of units” should be clarified. What does it mean to be the equivalent amount and type of unit? Same project activity? Same vintage? This will be an important definition.
- Insurance products for carbon crediting would benefit from contingencies in case the companies go bankrupt. Also, the “same conditions specified in this methodology apply

to the pool" should be clarified and clearly defined. Does this mean that the insurance company must buy credits generated from the same methodology and within some timeframe of proximity (e.g., within 5 years)?

4.3: Rules for operationalising the requirement referred to in article 6(3) of the CRCF Regulation

- The risk of non-permanence lies in the potential for a full or partial project reversal, which may exceed the amount contributed to the buffer pool. Since monitoring only lasts 40 years, any reversal after this period—such as a total reversal—would go unaddressed. This reveals a key flaw in the methodology: buffer pool contributions, expiring with the monitoring period, offer insufficient protection against post-period project failures that could invalidate issued credits.

(carbon)plan

Carbon Market Watch CRCF Review — Tree Planting

This is a summary of questions and observations from a preliminary analysis of the revised draft elements for a EU certification methodology on carbon removals and soil emission reductions through carbon farming under the CRCF Regulation resulting from planting trees (hereinafter, “Draft Elements”).

This memo has two parts. First, we highlight our most significant concern about the Draft Elements’ lack of on-the-ground measurements. Second, we provide a more holistic discussion of outstanding issues, all of which we feel are important. Two of these items — marked with an asterisk (*) — are duplicated from the comments we provided on soil carbon + agro-forestry.

Lack of on-the-ground biomass measurements

The Draft Elements have no requirement that operators make on-the-ground measurements of forest biomass. Instead, the Draft Elements offer a pathway for awarding credits solely on the basis of modeled outcomes. On-the-ground measurements provide a critical guardrail against over-crediting and should be included as a mandatory part of both the quantification and auditing processes envisioned under the Draft Elements.

It appears that Quantification Approach 1 — use of a Tier 3 model — does not require any kind of on-the-ground monitoring. Specifically, the Draft Elements specify that “[t]he data that the model processes may be obtained through ground measurements or remote sensing.”[1] The use of the word “may” indicates that ground measurements are, in fact, optional. Nor does the Draft Elements’ approach for quantifying model uncertainty appear to require on-the-ground measurement. Operators are given two choices for quantifying model prediction error, either i) a statistical validation approach “that includes ground-truth measurements” or ii) “a Monte Carlo simulation.”[2] Thus, operators that decline to make ground measurements when initialising their

[1] Draft Elements at page 19.
[2] Draft Elements at page 30.

model and use the Monte Carlo method for assessing prediction error do not appear to be required to make ground measurements of any kind. This raises the serious concern that the Draft Elements could credit carbon savings that only exist in theory and have little relationship to actual carbon accumulation in reality.

It is worth emphasising that the lack of ground measurements is anomalous within the carbon market today. For example, California's forest offset protocol allows some crediting to occur using model outputs, but still requires regular remeasurements.[3] Use of modeled data lowers costs, but those results must always be "trued up" against on-the-ground measurements. Critically, there have been instances in California's forest offset program where models have overestimated carbon accumulation.[4] Those errors were discovered because the program requires that modeled outcomes be compared to real, measured outcomes.

In fact, it is not even clear if the Draft Elements would require audits to include site visits. Imagine a project that plants hundreds of trees per hectare only to experience severe drought conditions over the following years. On the ground, 60 percent of the newly planted trees die. However, the modeled results indicate that only 20 percent of the trees have died. As written, the Draft Elements do not appear to have a mechanism to ensure that such a discrepancy is identified and resolved.

The Draft Elements should require that all models used under Quantification Approach 1 are initialised using measurements from the project area itself. Similarly, there should be a remeasurement requirement at regular intervals. This would mirror the requirements the Draft Elements impose on SOC measurements. Absent these safeguards, there are insufficient guardrails to ensure that the Draft Elements credit real carbon removal. Unchecked by measured outcomes, operators would have significant incentive to make modeling choices that maximize carbon accumulation rates, as that would generate the most credits. It would be nearly impossible to mitigate against this sort of behavior if model outputs do not need to be compared against actual measurements.

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3 Cal. Code Regs., title 17, § 95977(c).

4 *See*, *e.g.,* Green Diamond Resource Company, CAR1140 Offset Project Data Report — Reporting Period 3 (Aug. 14, 2024) (explaining that prolonged drought conditions resulted in "the approved growth model [overestimating] the actual carbon growth. Therefore, 698,774 MgCO2e of the reversal will be compensated with compliance instruments provided by the OPO to ARB to be placed in the Retirement Account.").

Other notable observations

01 — Draft elements still do not consider the albedo effects of planting trees

Planting trees can help cool the plant by increasing the amount of carbon stored within tree biomass. However, trees can affect global temperatures independent of their carbon storage capacity. Specifically, planting trees in arid regions and in areas that experience significant winter snow cover can change the reflective properties of the Earth, an attribute known as albedo. These albedo effects can be so strong that they entirely counteract the carbon benefits of planting trees. Furthermore, these dynamics are relevant to the CRCF regulation, as several areas covered by the regulation include regions where planting trees can result in net warming of the world.[5] The Draft Elements could account for these albedo dynamics by introducing an eligibility criterion requiring that projects demonstrate that they provide *net cooling* or *net climate* benefits, as opposed to merely *net carbon* benefits.

02 — Draft elements should limit project activity to degraded and unused land.

Including agricultural land as eligible for afforestation significantly complicates the successful implementation of the carbon farming activities envisioned by the Draft Elements. That's because the Draft Elements now must account for indirect land use change — cases where tree planting on farmland in one place spurs the conversion of non-agricultural land to farmland somewhere else. These types of land conversion problems have a long history of undermining policy efforts that attempt to use land management to bring about positive climate outcomes.[6] The inclusion of agricultural land within the program also raises questions about food security — whereby carbon projects potentially drive up food prices. The Draft Elements assert that this is a minor risk.[7] But what happens as the value of carbon removals continues to climb in the future? If the value of carbon grows faster than the value of land and its agricultural outputs, it is not impossible to imagine harmful land use competition dynamics emerging in the future. The Draft Elements can avoid these problems entirely by limiting eligibility to degraded and unused lands.

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5 *See, e.g.,* Natalia Hasler et al., Accounting for albedo change to identify climate-positive tree cover restoration, *Nature Communications* 15, 2275 (Mar. 26, 2024) at Figure 1b (showing, for example, that the planting trees in parts of Spain can warm the Earth, even after taking into account additional carbon storage).

6 *See, e.g.,* Timothy Searchinger et al., Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change, *Science* 319, 5867 (Feb. 29, 2008) (quantifying land use change spurred by biofuel policies in the United States).

7 Draft Elements at page 8.

03 — Draft Elements still do not account for regional common practice*

The revised Draft Elements nominally require consideration of regional common practice.[8] However, the Draft Elements seem to assert that all carbon farming activities automatically satisfy its proposed common practice test. Specifically, the Draft Elements assert that: “In the light of the financial constraints affecting uptake of carbon farming activities [...] the common practice test is considered complied with under the current market conditions.”[9] Such language should be removed. Instead, operators should be required to demonstrate how their project activity goes above and beyond current market trends to promote the adoption of carbon-friendly tree planting practices.

04 — Provide details about how the Draft Elements will handle insolvency of carbon insurance products*

The Draft Elements allow operators to use private, third-party insurance products to ensure the durability of project activities.[10] It is worth noting that such insurance products are a relatively new phenomenon and have not found widespread usage within the global carbon market. Given their newness, the Draft Elements should spell out what will happen in the event that an insurance provider goes bankrupt or is otherwise unable to replace lost carbon units. Furthermore, if the replacement credits offered by an insurer rely on the functioning of a buffer pool, the insurer should be required to produce the results of stress-tests on those buffer pools, as described in section 4.2 a) of the Draft Elements.

8 Draft Elements at page 32.
9 *Ibid.*
10 Draft Elements at page 35.