www.oeko.de

Öko-Institut

Is the CRCF Carbon Farming Delegated Act fit for purpose? Analysis of requirements and comparison with the PACM

Berlin, 07.05.2026

Study by Oeko-Institut Consult GmbH

Authors

Anne Siemons
Felix Fallasch
Dr. Lambert Schneider
Dr. Hannes Böttcher

Oeko-Institut Consult GmbH

Oeko-Institut Consult GmbH
info@oeko-consult.de
oeko-consult.de

Office Freiburg
Merzhauser Straße 173
79100 Freiburg
Phone +49 761 45295-0

Office Berlin
Borkumstraße 2
13189 Berlin
Phone +49 30 405085-0

Office Darmstadt
Rheinstraße 95
64295 Darmstadt
Phone +49 6151 8191-0

Acknowledgments

The preparation of this study brief was funded by Carbon Market Watch. The views expressed in this document are solely those of the authors and do not necessarily represent the views of the funder.

Table of Contents

List of Tables

List of Abbreviations

Abbreviation	Explanation
ASE	Agriculture Soil Emissions
BAU	Business-as-usual
BEFs	Biomass expansion factors
CAP	Common Agricultural Policy
CAPEX	Capital Expenditures
CDM	Clean Development Mechanism
CH_4	Methane
CO_2	Carbon dioxide
CO_2e	Carbon Dioxide Equivalent
COM	Commission
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CR	Carbon Removal
CRCF	Carbon Removal and Carbon Farming Regulation
DA	Delegated Act
DACCS	Direct Air Carbon Capture and Storage
EIA	Environmental Impact Assessments
EU	European Union
NDC	Nationally Determined Contribution
GHG	Greenhouse gas
GWP	Global Warming Potential
IC-VCM	Integrity Council for the Voluntary Carbon Market
ILUC	Indirect land-use change
IPCC	Intergovernmental Panel on Climate Change
JRC	Joint Research Centre
LSE	LULUCF soil emissions
LULUCF	Land Use, Land-Use Change and Forestry
MEP	Methodological Expert Panel

Abbreviation	Explanation
N_2O	Nitrous oxide
OPEX	Operational Expenditures
PACM	Paris Agreement Crediting Mechanism
SOC	Soil Organic Carbon
VCS	Verified Carbon Standard
UNFCCC	United Nations Framework Convention on Climate Change

Summary

This study assesses the draft certification methodologies proposed by the European Commission under the Carbon Removal and Carbon Farming Regulation (CRCF) for carbon farming activities[1]. The evaluation is based on the draft delegated regulation for carbon farming activities and its Annex (referred to as 'draft methodology' in the following), shared by the European Commission with the CRCF Expert Group in April 2026. It analyses the draft methodology with regard to whether it adheres to key integrity principles of the voluntary carbon market[2], and compares it to the requirements of the Article 6.4 Paris Agreement Crediting Mechanism (PACM). As PACM methodologies for carbon farming are not yet available, we compare the CRCF methodology against key overarching PACM standards which set requirements for crediting under the PACM in general, including carbon farming activities.

According to our assessment, the proposed CRCF certification methodology for carbon farming does not adhere to key integrity principles in the voluntary carbon market and sets a lower standard than the PACM. It includes several shortcomings that risk to undermine the integrity of units issued under the CRCF. Particularly, flexibility in choosing monitoring approaches, insufficient consideration of uncertainty, omission of leakage sources such as ILUC, as well as insufficient additionality and permanence requirements are likely to lead to many CRCF units that are not backed by actual emission reductions or removals. Several issues we identified contradict principles set in the CRCF Regulation itself, including unclear requirements for updating baselines, omission of leakage sources, missing incentives for maintaining carbon stocks over several decades and missing liability mechanisms to address reversals for soil emission reduction activities.

More specifically, the main weaknesses in the draft methodology include:

Structure of the document

- **One methodology document for very different activity types.** The draft combines requirements for agriculture on mineral soils, agroforestry, peatland rewetting/restoration, and afforestation in one document. This makes the methodology document convoluted and hard to interpret, increasing transaction costs and potentially leading to inconsistent implementation and monitoring.

    ➔ Consistent with best practice in the voluntary carbon market and the PACM, we recommend developing separate documents for each activity type which specify the requirements in a step-by-step approach.

Use cases of temporary units not defined

- **Use cases of temporary units are not defined.** CRCF sequestration units expire at the end of the monitoring period unless monitoring is prolonged. It is a severe gap that eligible use cases for these units are not defined. If temporary units were to be used for offsetting of

[1] Carbon removals and soil emission reductions in agriculture and agroforestry on mineral soils, soil emission reductions resulting from the rewetting and restoration of peatlands and of other organic soils, carbon removals and soils emission reductions from afforestation.

[2] This analysis builds on Oeko-Institut's assessment of previous draft versions of the certification methodologies, available here: https://www.oeko.de/en/projects/detail/assessment-of-draft-methodologies-under-the-eu-carbon-removal-certification-framework-crcf-ii/.

permanent emissions, this would undermine integrity and may eventually result in higher emissions than without the use of the CRCF.

➔ We strongly recommend excluding the use of CRCF units from carbon farming activities for offsetting purposes.

Quantification requirements

- **Monitoring requirements are not operationalised.** Monitoring plans must describe pools, sources, approaches, and frequency. Yet, there are no specific requirements on monitoring frequency or approach. Data source requirements are insufficient which is highly problematic for soil carbon measures because calculated outcomes could differ strongly from actual outcomes.

  ➔ Consistent with best practice in the voluntary carbon market[3] and the PACM, we recommend to clearly specify reliable and robust monitoring requirements for each parameter.

- **High flexibility to select quantification approaches.** Operators can choose models, measurements, proxies, or default emission factors (with some restrictions). It is well documented in the literature that such flexibility has led to inflated estimates due to adverse selection, i.e. participants selecting favourable values.[4]

  ➔ We recommend that the methodology systematically avoids adverse selection risks by prioritising more accurate approaches or choosing conservative options.

- **Key uncertainties are not fully accounted for.** The methodology does not consider key sources of uncertainty, including uncertainty related to BAU assumptions, leakage, estimation of associated GHG emissions, the use of proxies, the use of emission factors and the use of allometric equations. Additionally, the methodology uses lower confidence levels for uncertainty (70% for SOC stock changes and N_2O emissions and 90% for biomass) than prescribed under the PACM (95%).

  ➔ We recommend enhancing the CRCF requirements to account for all sources of uncertainty and use the same confidence level as required under the PACM.

- **Leakage is not addressed.** The methodology does not identify any leakage sources, does not require prevention or minimisation of leakage, and does not require quantification of remaining leakage. Particularly, **ILUC risks are not accounted for** based on the assumption that ILUC impacts would only be triggered in the event that revenues from CRCF units are equal or higher compared to revenues generated under previous land use. This is inappropriate as displacement of agricultural activities can occur through global commodity markets even with small shifts and without high revenues from CRCF units.

[3] See e.g. monitoring requirements in Verra's Blue Carbon Methodology VM0033, pp. 65ff., https://verra.org/wp-content/uploads/2023/09/VM0033-Methodology-for-Tidal-Wetland-and-Seagrass-Rest…

[4] See e.g. Haya et al. (2023); Badgley et al. (2022).

➔ We strongly recommend adding requirements to address leakage risks, including accounting for ILUC risks.

- **Baseline-setting is not ambitious enough**: Downward adjustments of baselines are only required for agricultural activities and only from the second crediting period onwards. The term 'downward adjustment' is used in the context of updating the baseline for agricultural activities which is not aligned with the concept of strengthening the ambition of baselines under the PACM. Updating of baselines is only required for "agricultural and agroforestry practices that reduce direct and indirect N2O emissions from managed agricultural soils". In contrast to the PACM, the proposed CRCF methodology thus does not ensure that baselines become more ambitious over time.

  ➔ Provisions to mandate downward adjustments as well as baseline updates should be added for all activity types and relevant parameters and assumptions.

- **Carbon pools and emission sources are defined imprecisely and incompletely.** The methodology uses imprecise terms such as 'living biomass' to determine the activity boundary. These terms are not defined and leave room for interpretation. Additionally, key emission sources relevant for carbon farming activities are missing, including fires and soil disruption.

  ➔ We recommend adding precise definitions of emission sources and carbon pools that must be considered.

Additionality requirements

- **Additionality requirements are partially insufficient:** Operators can register activities under the CRCF which have been operating for several years. This means that **retroactive crediting of activities is allowed.** As these activities have been implemented successfully without the additional incentive from selling CRCF units, certification of these activities does not generate any additional removals or emission reductions. Additionally, the methodology **lacks explicit provisions for what happens if an activity becomes legally mandated after certification**. Furthermore, funding from public and private sources may be combined without separate attribution of units to these sources.

  ➔ We recommend making the incentive effect test mandatory for all operators, adding provisions for excluding activities that are legally required and proportionally attributing CRCF units to different funding sources if these are combined.

Permanence requirements

- **Short monitoring durations.** Monitoring is required for only 5 years after the end of the activity period for agricultural/agroforestry activities and for afforestation. For agricultural activities, this means that achieved carbon removals might only be guaranteed for 10 years. While longer monitoring requirements might not be aligned with farmer's planning horizons, ensuring mitigation impacts for such a short timeframe is not consistent with the objective stated in the CRCF Regulation to store CO_2 "for at least several decades". Furthermore, for afforestation, high reversal risks remain after the end of the monitoring period but are not accounted for in the draft methodology. Additionally, the methodology lacks incentives for maintaining carbon stocks over longer time periods.

➔ We recommend making monitoring mandatory for several decades for afforestation activities.

- **Peatland rewetting is treated as permanent.** The methodology states that no liability mechanism to address reversals is needed for peatland rewetting because the emission reductions are considered irreversible. There is broad scientific consensus that emissions from peatland rewetting are subject to non-permanence risks.[5] Accordingly, all major carbon crediting programmes and the PACM treat peatland rewetting as carrying non-permanence risks. We note, however, that the risk for reversing avoided emissions from peatland rewetting are considerably lower than for some other activities, such as emission reductions from reduced deforestation. One reason for this is that the practical and administrative efforts to implement rewetting activities are comparatively high and are unlikely to be quickly reversed. Nevertheless, non-permanence risks remain and should be addressed, for example, through respective legal requirements. Furthermore, the approach in the methodology fails to address the CRCF Regulation requirement for monitoring rules and liability mechanisms for soil emission reduction activities.

  ➔ We recommend revising the permanence requirements for peatland rewetting and adding appropriate liability mechanisms for such activities.

- **The proposed risk assessment for agricultural activities and agroforestry and liability mechanisms to address reversals are insufficient:** Operators are given flexibility to use different data sources to estimate the reversal risk of agricultural activities including agroforestry. This is problematic as the draft methodology does not require the prioritisation of more conservative data sources and approaches. For instance, the overall risk rate for agricultural activities results in a value between 2% and 15% which is very likely to be too low to account for reversal risks of such activities and does not take into account accelerated climate change impacts, nor avoidable reversals. Additionally, provisions are missing in the draft methodology itself on how operators will be held liable for replenishing the buffer pool in case of avoidable reversals. It is also not clear how reversals that exceed the amount of credits in the buffer pool would be covered.

  ➔ We recommend accounting for identified risks more comprehensively and strengthening the proposed liability mechanisms in line with best practices on the voluntary carbon market.

Sustainability requirements

- **The proposed CRCF methodology has no systematic approach to safeguards.** It does not include a definition of the assessment procedure and specific criteria per impact category. It is unclear how the compliance with the broad requirements should be ensured and operationalised, and how monitoring should be implemented. It remains unclear how any potential risks are addressed and what actions need to be taken in case of identified negative impacts.

  ➔ We recommend providing guidance on how compliance with sustainability requirements shall be provided by operators.

[5] See e.g. Schneider et al. 2024; Leifeld et al. 2025.

We also find that the proposed CRCF methodology for carbon farming activities is not aligned with the PACM in many aspects. The table below provides an overview of our findings for comparing methodological requirements of the draft CRCF methodology to the requirements established by the PACM. For most aspects that are key for ensuring unit integrity, the proposed CRCF methodology sets a lower standard than the PACM requirements. Only the additionality requirements under the proposed carbon farming methodology partially meet the requirements of the PACM. For a few matters, a comparison is not yet possible, as the PACM rules have not been fully elaborated.

The rules on the PACM are generally more ambitious and build on the lessons learned under the CDM as well as other carbon crediting programmes and aim to avoid past mistakes. The proposed CRCF methodology does not seem to build on the wealth of experience that is available and fails to ensure alignment with Article 6 of the Paris Agreement as intended by Article 18(4) of the CRCF Regulation. Given that carbon farming projects within the EU will be able to choose between different crediting programmes, including options that will be aligned with the PACM requirements, it is key to ensure that the EU crediting framework does not fall behind international integrity benchmarks and remains attractive to buyers.

Overall, the lack of alignment with PACM requirements and best practice in the VCM results particularly in over-crediting and non-additionality risks. These risks apply to all carbon farming activities. With the proposed CRCF methodology, the EU would fail to set a standard that delivers high quality carbon removals and soil emission reductions as proclaimed by the CRCF Regulation. If such units were used for compliance with EU climate targets, the CRCF could pose significant risks, potentially undermining the ability of the EU to achieve these targets. Additionally, the CRCF rules do not exclude that voluntary buyers use CRCF units for offsetting purposes. Yet, using low quality units for offsetting implies severe greenwashing risks. If, as a result of the weaknesses in the certification methodologies, demand for CRCF carbon farming sequestration and soil emission reduction credits was low, this could limit the extent to which the CRCF can contribute to the stated goal of helping to achieve the EU's climate neutrality target.

We recommend revising the proposed CRCF methodology in many areas before its adoption as well as prohibiting the use of CRCF carbon farming units for offsetting purposes. In revising the methodology, we recommend considering the requirements set under the PACM as well as well-established best practices in other carbon crediting programmes.

Table 1: Comparison of PACM and CRCF requirements

PACM requirement	CRCF alignment	Risk for CRCF unit integrity
Additionality		
No retroactive crediting	Partially	Likely low
Consideration of legal requirements	Partially	Medium
Investment analysis	Largely	Likely low
Consideration of public funding	Largely	Low
Quantification of emission reductions and removals		
Conservativeness and consideration of uncertainty	Partially	High

PACM requirement	CRCF alignment	Risk for CRCF unit integrity
Baselines to be set below business-as-usual (BAU)	Partially	Medium
Enhancing the ambition of baselines over time	Partially	Medium
Rules for updates of standardised baselines	Partially	High
Consideration of leakage and indirect land-use change	No	Very high
Definition of activity boundary (selection of carbon pools and emission sources)	Partially	Medium
Non-permanence		
Clear definition of reversal	No	Medium
Accounting for reversal risks of peatland rewetting	No	Medium
Monitoring duration not yet specified	Cannot be assessed	
Risk assessment not yet specified	Cannot be assessed	
Robust liability mechanism, particularly implementation of buffer pool	Partially	High
Safeguards and sustainable development impacts	No, pursues different approach	Unclear[6]

Source: Own compilation.

[6] The integrity risk following from the social and environmental safeguards in the draft methodology will depend on the effectiveness of the respective EU legislation that the draft methodology refers to. With regard to the requirements to generate co-benefits for the protection and restoration of biodiversity and ecosystems, the draft methodology makes it possible to demonstrate compliance with this criterion with reference to peer-reviewed scientific literature only.

1 Introduction

This document assesses the requirements included in the certification methodologies for carbon farming activities proposed by the European Commission under the Carbon Removal and Carbon Farming Regulation (CRCF) with regard to their robustness and integrity. Additionally, it assesses to what extent the provisions of the proposed methodology are aligned with the requirements of the Article 6.4 Paris Agreement Crediting Mechanism (PACM). The evaluation is based on the draft delegated regulation for carbon farming activities, including carbon farming activities in agriculture and agroforestry on mineral soils, rewetting and restoration of peatlands and of other organic soils, and afforestation (referred to as 'DA' in the following), and its Annex (referred to as 'draft methodology' in the following), shared by the European Commission with the CRCF Expert Group in April 2026. This policy brief does not cover an analysis of the other proposed CRCF methodologies.

The evaluation of rules under the PACM is based on the following documents[7]:

Table 2: Overview of relevant documents of the Article 6.4 Paris Agreement Crediting Mechanism (PACM)

Topics covered	PACM document
General requirements for methodologies	Application of the requirements of Chapter V.B (Methodologies) for the development and assessment of Article 6.4 mechanism methodologies (A6.4-STAN-METH-001, ver.01.1) Referred to as 'Methodologies Standard'
General requirements for activities generating removals including requirements for addressing non-permanence risks	Requirements for activities involving removals under the Article 6.4 mechanism (A6.4-STAN-METH-002, ver.01.0) Referred to as 'Removals Standard'
Additionality requirements	Demonstration of additionality in mechanism methodologies (A6.4-STAN-METH-003, ver.01.2) Referred to as 'Additionality Standard'
Requirements for baseline setting, including an Annex with general methodological requirements regarding key quantification elements (activity boundary, calculation of mitigation impact, conservativeness and uncertainty, monitoring)	Setting the baseline in mechanism methodologies (A6.4-STAN-METH-004, ver.01.0) Referred to as 'Baseline Standard'
Requirements for addressing leakage	Addressing leakage in mechanism methodologies (A6.4-STAN-METH-005, ver.01.0) Referred to as 'Leakage Standard'

[7] https://unfccc.int/process-and-meetings/bodies/constituted-bodies/article-64-supervisory-body/rules-and-regulations

Topics covered	PACM document
Requirements for addressing non-permanence risks, calculating reversals, contribution to buffer pools and monitoring requirements	Addressing non-permanence and reversals in mechanism methodologies (A6.4-STAN-METH-007, ver.01.0) Referred to as 'Non-Permanence Standard'
Information note including elements related to non-permanence and reversals for inclusion in relevant regulatory document	Elements related to non-permanence and reversals for inclusion in relevant regulatory documents (A6.4-INFO-METH-002, ver.01.0) Referred to as 'Information note non-permanence and reversals'
Tool to demonstrate compliance with environmental and social safeguards	Article 6.4 sustainable development tool (A6.4-TOOL-AC-001, ver.01.1) Referred to as 'Sustainable Development Tool'
Administrative requirements for activity participants for registration, requesting approval of post-registration change, requesting issuance of credits, renewal of crediting period, deregistration from Article 6.4 mechanism	Article 6.4 activity standard for projects (A6.4-STAN-AC-002, ver.03.0) Referred to as 'Activity Standard for Projects'
Administrative procedures for registration, post-registration changes, renewal of crediting period and deregistration of an A6.4 project	Article 6.4 Activity Cycle Procedure for Projects (A6.4-PROC-AC-002, ver.03.0) Referred to as 'Activity Cycle Procedure'

Source: Own compilation.

1.1 Why integrity of temporary carbon farming sequestration and soil emission reduction units matters for CRCF policy objectives

The EU CRCF generates carbon farming sequestration units and soil emission reduction units from carbon farming activities that can be used by voluntary buyers (use cases are currently under discussion).[8,9] At the same time, the CRCF aims to support the achievement of the EU's climate neutrality objective. This happens indirectly as measuring progress towards EU climate targets is based on the relevant EU legislation – particularly the LULUCF Regulation in the context of carbon

[8] By contrast, carbon credits generated under the PACM can be used for different purposes. First, they can be used by buyer countries to achieve their NDC if they are authorised for such use and corresponding adjustments are applied. Authorised carbon credits can also be used by airlines under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and by buyers in the voluntary carbon market. In addition, the mechanism issues mitigation contribution units that are not subject to corresponding adjustments. These can be used by voluntary buyers of countries or used by countries as voluntary or compliance instrument to reduce domestic emissions.

[9] See call for evidence by the European Commission on the discussion about the use of CRCF units by Member States to reach climate targets https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/16692-National-targets-and-flexibilities-in-the-EU-climate-policy-framework-after-2030-review_en.

farming – and inventory reporting according to IPCC rules and does not account for CRCF units directly (see box 1 below).

A lack of stringent requirements in the CRCF certification methodology can lead to overestimation of removals and emission reductions. As there is no direct link between CRCF units and GHG inventory reporting and accounting, such an overestimation is not reflected in the EU's GHG inventory. Overestimating the removals and emission reductions caused by CRCF activities therefore will not necessarily directly result in inaccurate accounting of removals towards the EU NDC.

Nevertheless, integrity issues with CRCF methodologies remain essential. The weaknesses in the draft methodology for carbon farming activities outlined below result in over-crediting and non-additionality risks. If such units were used for compliance with EU climate targets, the CRCF could pose significant risks, potentially undermining the ability of the EU to achieve these targets. Secondly, integrity is also important if units are used by private actors for voluntary purposes. If a buyer of CRCF units makes a climate neutrality claim based on the use of these units, this claim would not be backed by corresponding climate mitigation if the associated removals are overestimated. Thereby, the lack of robust certification methodologies can lead to greenwashing.

Box 1: CRCF carbon farming activities and GHG inventory reporting

Whether carbon removals or emission reductions achieved through the CRCF are visible in the EU's national GHG inventories depends on the inventory methodologies applied. Emissions and removals in the LULUCF sector are reported in GHG inventories using gain-loss or stock change methods for seven carbon pools that include living biomass, dead organic matter (including litter and dead wood), mineral soils, organic soils, and harvested wood products. Emissions (CO_2, CH_4 and N_2O) and removals for the different pools are determined by using default values or more specific emission factors according to the rules of relevant IPCC reporting guidelines.

There is no direct link between the units certified under the CRCF and the accounting of carbon removals and soil emissions under the LULUCF Regulation and towards EU or national climate mitigation targets. Compliance with climate targets should always be based on GHG inventory reporting only. Nevertheless, the CRCF can contribute indirectly to EU mitigation targets by upscaling and financing measures which impact the level of emissions and removals in relevant carbon pools. National reporting methodologies must be sufficiently granular in order to capture this impact though, e.g. by relying on advanced soil models that reflect national climatic conditions, specific management systems used and annual variability in order to make the impact of agricultural practices to enhance soil carbon stocks on mineral soils visible.[1] This includes for example, that land parcels participating in a SOC certification scheme would need to be integrated into existing national soil monitoring for reporting in the LULUCF sector (Jacobs et al., 2020).

Currently, most EU and national GHG inventories do not adequately reflect soil carbon changes, as losses and gains are not captured by current monitoring systems. More specifically, carbon losses in croplands and gains in grasslands and forests are likely not reflected (Bellassen et al., 2022; ESABCC, 2025); and additionally data from peatlands is incomplete (Evans et al., 2022). Still, many inventories already reflect some measures included under the CRCF, such as hectares of planted trees and agroforestry systems, which are easy to monitor. The European Commission has emphasised that one of the aims of the CRCF is to contribute to improving monitoring methodologies for carbon farming activities. Measuring and monitoring soil carbon stocks of activities that seek certification under the CRCF will generate project-specific data on emissions and removals which could be used to develop updated and improved emission factors, feeding into national soil models. This way, the CRCF could potentially help improving the quality of national GHG inventories over time. Improved national GHG inventories may thus eventually better capture national activities to enhance carbon sequestration in ecosystems, thereby reinforcing the incentive for Member States to finance these projects (EEA, 2024).

1.2 Why the PACM requirements are a useful benchmark to assess the quality of the CRCF methodology

Both – the PACM and the CRCF – are carbon crediting mechanisms which define a set of rules and requirements seeking to certify that project proponents have implemented a mitigation activity which results in additional GHG emission reductions or removals. Both mechanisms are designed to generate tradable carbon credits or units, accounted in one metric tonne of CO_2e. At their core, the PACM and CRCF are therefore the same type of policy instrument. Hence, the robustness of their

provisions and methodologies and their integrity in terms of their effectiveness to mitigate GHG emissions hinge on the same methodological aspects which can be compared well with each other.[10]

There are different reasons why the CRCF should (at least) be aligned with the integrity standards defined by the PACM:

- **The PACM can be considered as a new benchmark for carbon crediting**: Carbon crediting has come under increasing criticism in recent years, as numerous studies have raised concerns about the environmental integrity of many carbon credits (e.g. Probst et al. 2024; Badgley et al. 2022; Schneider und La Hoz Theuer 2019; Fischer and Knuth 2023; Haya et al. 2023; West et al. 2023). Against this backdrop, the PACM – as it stands today - can be considered as a significant evolution in international carbon markets, as it has set more stringent methodological standards than other carbon crediting programmes (Kovács et al. 2025). Even though detailed methodological requirements for individual mitigation activities are still being developed, general requirements for crediting methodologies and requirements regarding additionality, baseline-setting, consideration of leakage, addressing non-permanence, and ensuring sustainability have been agreed under the PACM. In several aspects, in particular with regard to quantification of emission reductions and removals these requirements go beyond the requirements of other carbon crediting programmes or are based on best practice/highest ambition in voluntary carbon markets.
- **Alignment with PACM required by CRCF Regulation**: By 31 July 2026, the Commission must assess additional requirements needed to align the CRCF Regulation with Article 6 of the Paris Agreement and best practices, including corresponding adjustments, host party authorisation and methodologies (Art. 18(4) of the CRCF Regulation). This analysis can support the identification of aspects that should be revised as part of the review.
- **Potential competition between PACM and CRCF**: It is conceivable that the PACM and the CRCF will be perceived as alternatives to each other and that project developers will be able to choose between one or the other. Due to this potential competition, the CRCF should at least be aligned with the PACM in order to ensure that the EU crediting framework as well as crediting programmes that seek accreditation under the CRCF do not fall behind international integrity benchmarks and remain attractive to buyers.

Against this background, we compare CRCF requirements against PACM standards in our analysis. We also highlight where the PACM sets particularly ambitious benchmarks. Furthermore, shortcomings of the PACM requirements are outlined where relevant. These shortcomings include:

- The specific methodologies under the PACM regulate whether crediting of activities is terminated in the case that legal requirements mandating the activity are adopted during the crediting period. While the first adopted methodology requires annual checks whether new

[10] Yet, the PACM and the CRCF differ in terms of their policy objective, governance and degree of integration into existing policy frameworks. The PACM is a stand-alone crediting mechanism with global scope and participation as well as a centralised, multilateral governance structure. Its main policy objective is to increase global climate ambition through voluntary cooperation among signatories to the Paris Agreement. Countries may use the PACM for transferring mitigation outcomes among themselves and account them for their NDC achievement. In addition, the PACM explicitly allows countries to use it as a mechanism to reduce domestic emissions without international transfers. The CRCF on the other hand is a crediting mechanism integrated into the wider EU climate policy framework, with the specific objective to incentivise removals required to achieve climate neutrality by 2050 as enshrined in the European Climate Law and thus to support reaching the EU NDC. Participation is restricted to projects implemented in the EU and units cannot be transferred to other countries.

legal requirements have entered into force, the Additionality Standard also allows specific methodologies to assess this less frequently.

- The PACM allows blending revenues from PACM credits with public funding. Even though this is common practice in the voluntary carbon market, the integrity of the PACM could be strengthened by requiring attribution of credits to different funding streams if activities receive both public subsidies and CRCF units. Otherwise, like under the CRCF, public subsidies would artificially lower credit prices under the PACM and subsidise the users of the credits, leading to economic inefficiencies and potentially supporting continued fossil fuel use by the users of the units such as voluntary carbon market buyers.

- The PACM addresses non-permanence by monitoring and compensating for reversals during the crediting periods and for a defined time period after the end of the last crediting period. With this approach – and unless the use cases for credits from permanent and temporary mitigation activities are differentiated in the future – it sticks to the widespread approach in the voluntary carbon market to treat temporary mitigation impacts equivalent to permanent mitigation. This implies integrity risks if credits from carbon farming activities were used for offsetting permanent emissions. Moreover, the duration of the post-crediting monitoring period for which reversals must be compensated for has not yet been defined under the PACM. However, a decision on this duration, however long it may be, will not address the concern of treating permanent and temporary mitigation alike.

1.3 Overarching issues with the requirements in the CRCF draft methodology for carbon farming activities

The methodology covers very different project types. It combines methodological requirements for very different activity types, making the document hard to comprehend and impractical to use for project development. It is unclear why the EU Commission decided to develop one single methodology document for all carbon farming activities instead of separate ones for each activity type. While there are elements that apply to all activity types, it would make the jobs of project developers, auditors and certification programmes much easier if they could apply a single document which outlines the requirements for each activity type in a step-by-step approach. Combining different activity types into one methodology is inconsistent with common practice in carbon crediting approaches, including the PACM, where each methodology applies to a clearly defined project type. This facilitates clear and easy to understand guidance on emission boundaries and baseline setting, amongst others. Carbon crediting programmes, such as Verra, usually streamline elements that apply across several project types by outsourcing these provisions into specific methodological tools which are then applicable under several methodologies. We strongly recommend that the EU Commission follows this practice by issuing a separate methodological document for each activity type, including established methodological tools. In its present form, the document is convoluted and difficult to interpret, risking high transaction cost in project development and monitoring.

Requirements not clear/detailed enough: Many sections include only vague guidance that lacks clarity how the requirements shall be operationalised and verified. For example:

- Regarding the guidance for insurance policies or a comparable guarantee product, the draft methodology only requires that they “fulfil the relevant financial market rules” (draft methodology, section 4.2.). This guidance is rather vague and it is unclear how it should be demonstrated that the requirements are fulfilled.

- The guidance for how to quantify reversals is vague and insufficient: “If a reversal has occurred, the monitoring report shall […] quantify the amount of the reversal by using the quantification rules laid down in Section 2, or, where this is not possible due to the nature of the reversal event, produce a conservative estimate of the reversal and evidence why the estimate is conservative.” (section 1.3.4.2.). Particularly, it is not clear, how a conservative estimate should be determined.

- The guidance for factors reducing the risk rating is unclear: “Where risk mitigation practices beyond the eligibility and minimum sustainability requirements are put in place, such as use of deep-rooted crops and diversified crop sequences, the risk rate may be reduced by multiplying it by a factor ranging between 0.8 and 1” (section 4.1.1.). Further specification is delegated to certification schemes so that it is likely that different requirements will be in place under different schemes.

- Section 5.1 includes minimum sustainability requirements related to the protection and restoration of biodiversity and ecosystems for which clear guidance for proving compliance is lacking: “The activity shall not result in the conversion or, for afforestation, in the deterioration of the conservation status of habitats and species specifically sensitive to biodiversity loss or with high conservation value” (section 5.1.).

Use of nitrification, denitrification or urease inhibitors are defined as eligible activities: According to section 1.1.1.1. of the draft methodology, the use of nitrification, denitrification or urease inhibitors are eligible agricultural activities under the certification methodology. Nitrification inhibitors can have negative effects on water quality and soil biodiversity and further research on their impacts is required, particularly if applied at large scale (Kösler et al. 2019). Given the involved risks, the use of nitrification inhibitors is unlikely to comply with the sustainability requirements of the CRCF Regulation and of section 5 of the draft methodology. The use of nitrification inhibitors should only be eligible for certification if comprehensive environmental impact assessments are available at national level.

Terminology unclear: The terms used in the methodology are not aligned with common practice in carbon markets which might create confusion. Particularly, the methodology does not use or define the term ‘crediting period’, referring to the period in which verified emission reductions or removals attributable to a mitigation activity can result in the issuance of carbon credits (e.g. ICVCM 2024). The draft methodology uses the term ‘activity period’ which likely corresponds to the crediting period, as it is defined as “a period during which the activity generates a net carbon removal benefit or a net soil emission reduction benefit, and which is determined in the applicable certification methodology” (CRCF Regulation, Art. 2(7)). Activity periods are divided into certification periods, defined as “the period between a re-certification audit and the certification audit or the most recent preceding re-certification” (Definitions in the draft methodology). A re-certification audit, which presumably refers to instances of verification, is defined as an audit carried out in the process of renewing a certificate of compliance issued by a certification body (CRCF Regulation Art. 2(17)). It shall take place at least every five years in order to reassess mitigation impacts, compliance with additionality and sustainability requirements, and whether reversals occurred (CRCF Regulation Article 9(3)). It would be advisable to take opportunity of the upcoming review of the CRCF Regulation to harmonise the wording in the CRCF methodology with the terms commonly used in the context of carbon crediting.

Table 3 Comparison of terms used in CRCF documents with terms commonly used by other crediting programmes

Concept	Common terms used in carbon crediting	Terms used in CRCF Regulation	Comment
The time period over which project activities are implemented.	Project lifetime Operational lifetime	No term defined	It is standard practice in carbon crediting that project proponents must define the total project lifetime. It is unclear if such requirement exists in the CRCF as no such term is defined.
The time period for which GHG emission reductions or carbon dioxide removals generated by the project are eligible for issuance of carbon credits.	Crediting period	Activity period	While it is unclear why the CRCF deviates from standard terminology, using the term 'activity period' is not problematic per se. It is however not well chosen because the activity might run much longer than the period during which a project receives credits.
The time period within a crediting period during which a project activity's GHG emission reductions or removals are tracked, measured, and recorded to calculate carbon credits.	Monitoring period	No term defined	The CRCF uses the term 'monitoring period' but in a different way than what is common practice. It is used to refer to the entire period for which monitoring of emissions and removals shall take place, starting at the same time as the activity period. E.g. for afforestation, the monitoring period shall be "at least 40 years" (section 1.2.3.2.). Usually, the monitoring period refers to the time period for a monitoring report, which project owners must submit to verification bodies in order to get credits. Typically, monitoring reports are submitted every 1-5 years depending on the project type and methodology, i.e. monitoring periods are usually between 1-5 years.
The time period specified in a verification report during which the GHG emission reductions or carbon removals were generated and have been verified by a validation/verification body.	Verification period	No term defined	The CRCF-Regulation does not define a verification period. However, both, the delegated act containing the methodologies for permanent removals and the draft delegated act containing the methodologies for carbon farming activities define a new term 'certification period' as "the period between a re-certification audit and the certification audit or the most recent preceding re-certification"(Definitions in the draft methodology). This definition is not useful as it is not specific enough and should instead be aligned with common practice. Further, it is not common practice that methodologies define new terms. In the revision of the CRCF Regulation in 2026 the CRCF terminology should be clarified, aligned

Concept	Common terms used in carbon crediting	Terms used in CRCF Regulation	Comment
			with common practice in carbon crediting and definitions should be included in the CRCF Regulation itself.
The time period for which project proponents must continue monitoring the project after the last active crediting period.	Post-crediting monitoring	Monitoring period	The CRCF uses an unspecific definition of the term 'monitoring period' that is not clearly aligned with any of the terms commonly used in carbon crediting (see above). It would be useful to define a specific term that relates to the monitoring of the project after the crediting period and that is distinct from the term used to describe monitoring during the crediting period.
The independent assessment of the project by a validation/verification body that determines whether the project conforms to programme rules and evaluates the reasonableness of assumptions, limitations, and methods that support a claim about the outcome of future activities.	Validation	Certification audit	It is unclear why the CRCF uses a different term than what is commonly used in carbon crediting, but this is not problematic per se.
The formal acceptance of a validated project by the governing body of a carbon crediting programme.	Registration	No term defined	The CRCF Regulation does not specify any conditions that are required for a project to register with a certification scheme or a process that must be followed.
The periodic ex-post independent assessment by a validation/verification body of the GHG emission reductions and carbon removals that have occurred as a result of the project during the monitoring period.	Verification	Re-certification audit	The term 're-certification audit' is not well chosen because it suggests that this event is linked to the 'certification audit' (i.e. validation). However, the verification that emission reductions and carbon dioxide removals have occurred as a result of the project is not linked to project validation. Verification does not only 're-certify' that a project is implemented in accordance with the rules of the carbon crediting programme but attests the project owner that it has achieved emission reductions and removals.

Source: Own compilation.

2 Quantification of emission reductions or removals

2.1 General issues

Flexibility regarding values for calculating GWPs: Regarding GWPs to be used in calculating the mitigation impact of activities, operators can either use values included in COM Delegated Regulation 2020/1044 or values from last IPCC assessment report (AR6) according to the draft methodology (section 2.2.). This poses risks of adverse selection of values. By contrast, the PACM Article 6.4 Activity Standard for projects explicitly requires activity participants to use 100-year time-horizon GWPs from the fifth Assessment Report of the IPCC or GWP values from subsequent IPCC reports as agreed upon under the UNFCCC (p. 8).

Monitoring requirements: A description of carbon pools and emission sources used for quantification as well as the chosen quantification or monitoring approach and the frequency of monitoring shall be included in monitoring plans (draft methodology, section 1.3.2.). Yet, there are no specific requirements as to the frequency of monitoring or the monitoring approach defined. The draft methodology only requires operators to "obtain, record, compile, analyse, document and archive monitoring data, including assumptions, references, activity data and calculation factors in a transparent manner that enables the checking of performance achieved during the certification period" (section 1.3.4.). Furthermore, information about the use of the relevant quantification and monitoring approaches shall be provided in monitoring reports (section 1.3.4.1.(b)). These requirements are insufficient and need specification regarding the data sources for quantifying emission reductions and removals. This is highly problematic, in particular for soil carbon measures. The calculated outcomes could differ strongly from the actual emission reductions and/or removals. Moreover, the lack of specific requirements poses high risks for adverse selection of favourable parameter values. Consistent with the Baseline Standard under the PACM[11], the methodology should prescribe specific methods and data sources.

The draft methodology includes the concept of a crediting deficit, which shall be recorded if the result of the equations to calculate the temporary net carbon removal benefit or the net soil emission reduction benefit is negative in a certification period. This deficit shall be subtracted from the net carbon removal or soil emission reduction benefit in the next certification period (draft methodology, section 2.1.). This concept is taken over from the PACM which defines it in section 6.4 of the Non-permanence Standard. While it strengthens the draft methodology to explicitly define the treatment of such deficits, the methodology does not clearly differentiate this deficit from reversals (unlike the PACM). Additionally, like under the PACM, the deficit will remain unaddressed if it persists at the end of the last activity period.

Lack of clarity in equations and requirements for quantifying mitigation impacts: Section 2 of the draft methodology **lacks guidance for quantifying total carbon stock changes of a mitigation activity**. The draft methodology states in section 2.1 that changes in soil carbon stock, in mineral and organic soil emissions and in N_2O emissions shall be quantified separately for each stratum of land and summed up across all strata of land to obtain the total carbon stock changes and changes in soil emissions in the activity area. Yet, there is no explicit guidance on how to aggregate changes in carbon pools on the basis of equations 3 (changes in carbon stocks) and 4 (changes in mineral and organic soil as well as N_2O emissions). This is not aligned with the detailed

[11] https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-004.pdf

guidance of the PACM on estimating net removals or emission reduction (see Activity Standard for Projects[12], section 6.6.8 and Removals Standard[13], section 4.4).

2.2 Conservativeness and consideration of uncertainty

2.2.1 Requirements in the CRCF draft carbon farming methodology

High flexibility to choose between different models, methods, approaches: The draft methodology provides flexibility for operators to choose between different approaches to quantify and monitor carbon pools and emission sources of an activity (approach 1: models, approach 2: measurements, approach 3: proxies, and approach 4: default emission factors). For the estimation of carbon removals (CR) and LULUCF soil emissions (LSE) only approaches 1 and 2 are allowed (Table 4 in section 2.4.). However, the draft methodology does not require operators to prioritise more accurate sources for quantifying carbon stocks or to choose the approach that results in the most conservative values. Research has shown that when participants are given this degree of flexibility, they tend to select values that favour their interests, leading to inflated estimates of removals/emission reductions. As a result, the reductions attributed to a credited activity may be overstated (see Haya et al. 2023; Badgley et al. 2022).

The draft methodology lays down requirements for each approach towards quantification and monitoring. Yet, particularly for models and remote sensing approaches, more specific guidance is yet to be developed. Accordingly, recital 6 of the DA stipulates that "*it is necessary to develop a protocol for the validation of credible, accurate, transparently designed and suitable models and proximal sensing technologies*".

For $GHG_{associated}$ the draft methodology allows the use of models (approach 1) or default emission factors (approach 4) to quantify direct and indirect N_2O emissions from managed agricultural soils as well as for liming and urea application (Table 4 in section 2.4. of the draft methodology). Approach 4 of the draft methodology requires the use of Tier 2 emission factors unless such factors are not available. EU Member States report these emission sources in their GHG inventories, often supported by national data, long-term monitoring and country-specific emission factors. Therefore, these emission sources should be quantified at least on the level of the respective GHG inventory.

Uncertainty is not fully and conservatively accounted for: According to section 2.5 of the draft methodology, the uncertainty deduction factor shall be 8% or equal to the estimated uncertainty, whichever is higher. Where emission factors are used to quantify N_2O emissions from managed soils, the uncertainty deduction factor shall be 15% where Tier 1 emission factors are used, or 10% where Tier 2 emission factors are used. For determining the uncertainty deduction factor, the model prediction error (reflecting both the parameter uncertainty and structural uncertainty), the measurement error of input data and the sampling error related to the sampling design shall be estimated as applicable.

However, uncertainty related to assumptions about the BAU scenario, leakage, the estimation of $GHG_{associated}$, the use of proxies (approach 3) and the use of emission factors (approach 4) is not considered in the draft methodology. Additionally, uncertainty related to use of allometric equations is not explicitly mentioned. Such equations are listed as eligible measurements under approach 2 and imply high uncertainty (Vorster et al. 2020). Yet, the draft methodology does not consider such

[12] https://unfccc.int/sites/default/files/resource/A6.4-STAN-AC-002.pdf.
[13] https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-002.pdf.

uncertainty, but only refers to uncertainty of biomass expansion factors (BEFs) in section 2.5. which can be used as an alternative to allometric equations if a measurement approach is pursued.

Additionally, for equation 2, resulting in the net soil emission reduction benefit (section 2.1), it is not clear how one aggregate value for uncertainty shall be determined. This equation calculates the sum of changes in emissions from managed agricultural soils (direct and indirect N_2O emissions, ASE) and changes in emissions from SOC changes in mineral soils (net LULUCF soil emissions, LSE) to which *one* uncertainty value is applied (as opposed to two values). Section 2.5 of the draft methodology includes guidance for N_2O emissions from managed soils, resulting in an uncertainty value for agriculture soil emissions (ASE). Yet, the uncertainty value for LSE is calculated differently (presumably on the basis of equations 11 or 12, yet this is not explicitly stated), but guidance is missing on how to apply or aggregate these two different uncertainty values.

For SOC stock changes and N_2O emissions, the methodology requires using one-sided student's t-values[14] to estimate relative uncertainty, set at 70% confidence (90% for biomass). This choice is not conservative, because a 70% one-sided confidence level implies a smaller t-multiplier (and thus a smaller deduction) than standard practice (e.g., 90–95%), posing larger risks of overstating emission reductions/removals.

Furthermore, the draft methodology allows to quantify uncertainty cumulatively over several certification periods for soil and biomass stock changes, presumably to reduce costs of MRV (draft methodology, section 2.5). This provision is unclear and not aligned with the requirements of the PACM.

2.2.2 PACM requirements

Section 4 of Appendix 1 to the Baseline Standard of the PACM[15] requires that methodologies must apply a conservative approach to ensure that emission reductions or net removals are very unlikely to be overestimated. It further stipulates that the degree of conservativeness in making assumptions, selecting parameters and applying discounts to estimated amounts must be based on the level of uncertainty associated with the calculations. Further, all causes of uncertainty must be considered, including in data (e.g. measurements), parameters (e.g. representativeness of default values), assumptions (e.g. in the baseline scenario) and methods (e.g. models to quantify emission reductions).

2.2.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

The provisions of the draft methodology deviate in two ways from the PACM. First, not all sources of uncertainty are considered, whereas the PACM requires to systematically assess all sources of uncertainty, including with regard to assumptions and models. Secondly, the PACM requires to determine uncertainty at a 95% confidence level, whereas the draft methodology uses 70% and 90%

[14] The Student's *t* distribution is a bell-shaped probability distribution commonly used when sample sizes are small or when the variability of the underlying population is not clearly defined. A *t*-value represents a critical point on this distribution corresponding to a chosen confidence level; it is used as a statistical multiplier that translates the estimated variability of the data into a conservative downward adjustment. Using a one-sided *t*-value ensures that the adjustment is applied only in the direction that reduces the credited result. A confidence level of 70% implies that the adjustment is set so there is only a 30% chance the true value still falls below that adjusted boundary.

[15] https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-004.pdf

confidence levels. This leads to lower estimates of the uncertainty. A good element is the proposed minimum deduction of 8%, even though this deduction factor has been reduced from 10% in the previous draft of the methodology. Overall, the provisions of the CRCF provide a lower degree of conservativeness than the PACM.

2.3 Baselines to be set below business-as-usual (BAU)

2.3.1 Requirements in the CRCF draft carbon farming methodology

Rules for setting baselines are insufficient to ensure that baselines are below business-as-usual: The draft methodology defines requirements for two baselines – one for soils, and one for living biomass. These requirements are applicable to all activity types. For the two baselines, different rules apply:

Baseline for mineral soils: The baseline for soil must be an activity-specific baseline (i.e. not a standardised baseline). Section 2.3.1 of the draft methodology specifies that the baseline scenario should reflect the continuation of the soil or crop management carried out during a reference period considering, where applicable, crop rotation cycles. It further specifies that the length of the reference period should consist of at least the three calendar years immediately prior to the start of the activity period. Where applicable it must be extended to the length of the relevant crop rotation cycle. This formulation in the draft methodology to use a reference period of “at least” three years is highly problematic. This is because it is open ended and allows activity proponents to strategically select a period that maximises baseline emissions or minimising baseline removals. Open ended reference periods have been a key element causing the massive problems observed with baseline setting in REDD+ projects. Voluntary carbon crediting programmes have since then moved away from this concept to avoid quality concerns. Setting a fixed duration for the reference period which must uniformly be applied by all CRCF carbon farming activities should be a key priority for improving the methodology.

Additionally, in case the activity period is renewed, the draft methodology stipulates that the reference period prior to the start of the first activity period shall be used. This can lead to overestimation as there might be changes in carbon stocks in the meantime.

Further, if project developers select the measurement approach (approach 2, see section 2.2.1) to quantify and monitor the temporary net carbon removal benefit, the baseline must either be measured in control plots or set to zero. This is not a conservative approach for removals in mineral soils. Project developers can also use historical data to establish the baseline without any adjustments, meaning that baselines may reflect business-as-usual. This is not a conservative assumption in the context of the Paris Agreement, which requires increased ambition over time.

Baseline for living biomass: Additionally, a baseline equal to zero shall apply to carbon removals in living biomass from newly planted trees, woody elements, or orchards (draft methodology, section 2.3.2.). While the text says that “the growth in carbon stock from such pre-existing vegetation shall not be included in the quantification of the temporary net carbon removal benefit”, this does not fix the baseline issue as, to avoid overestimation, it is important to account for trees or shrubs that could have grown in the absence of a project.

2.3.2 PACM requirements

The PACM Baseline Standard[16], as a general principle and requirement, establishes that all baselines must be set below a conservatively determined BAU emissions level. It operationalises this principle by requiring methodologies to include provisions for project developers to demonstrate that the selected baseline is below BAU. It furthers restricts eligible alternatives for determining the BAU scenario to (a) a continuation of the historical situation (with downward adjustments – see next section), (b) establishment of an economically viable technology and/or practice, and (c) a combination of the first two. Only when it is justified that these alternatives are not suitable, another relevant scenario can be used. However, also these must be in line with the principles and requirements of the Baseline Standard, which includes the requirement for baselines to be below BAU. Regardless which alternative is chosen, project developers must justify the choice and detail how it ensures conservativeness.

2.3.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

The PACM requirements are more stringent than those of the CRCF draft methodology for carbon farming as it includes a general principle and requirement to set baselines below a conservatively determined BAU level. For CRCF soil baselines, the open-ended formulation in the draft methodology regarding the reference period does not adhere to such requirements. Additionally, project proponents can use historical data for establishing the baseline which can result in baselines that reflect BAU levels, failing to increase ambition over time. For the living biomass baseline, the CRCF's requirement to set it equal to zero may result in overestimation risks as it ignores the possibility that in the absence of the project vegetation would regrow (even if to a lesser extent) in the project area. Additionally, the reference period should always immediately precede the activity period to avoid overestimation of mitigation impacts.

2.4 Enhancing the ambition of baselines over time

2.4.1 Requirements in the CRCF draft carbon farming methodology

No downward adjustment of baselines: The draft methodology does not require downward adjustments for any of the carbon farming activities.

The methodology uses the term, but in a different context: When updating the baseline for ASE activities; starting with the second activity period, activity proponents must apply a downward adjustment of 1% of the initial baseline for every year that has passed since the start of the first activity period.

The way the CRCF uses the term 'downward adjustment' in the context of baseline updating is further misleading, because it creates the impression that downward adjustments apply for ASE activities, while in fact this applies only with the beginning of the second crediting period. Any project that terminates after the first crediting period therefore will never have to apply any downward adjustments.

[16] https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-004.pdf

2.4.2 PACM requirements

The PACM Baseline Standard[17] establishes that crediting baselines must decrease over time to encourage ambition of activities. Methodologies therefore must include factors or quantitative methods for downward adjustment appropriate to the sector as well as activity type and scale. Downward adjustments should be operationalised as an annual change or stepwise change implemented not less frequently than every three years. The PACM further sets 1% of the baseline emissions in the calendar year of the first crediting period as the minimum annual downward adjustment that all projects must apply. The objective of the downward adjustments under the PACM is to ensure that baseline emissions are lower than historical and projected emissions. It serves as a tool to avoid over-crediting and for ensuring that crediting under the mechanism reflects the ambition of the Paris Agreement.

The PACM allows for exemptions from downward adjustments in specific circumstances, if these are approved by the Supervisory Body. It is still unclear in which instances such exemptions may be warranted. The Baseline Standard however specifies that economic viability of the mitigation technologies could be a reason for exemptions, for example, where the application of a downward adjustment may result in no calculated emission reductions or net removals (section 7 of the Baseline Standard).

2.4.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

The draft methodology includes provisions on downward adjustments only for ASE activities. The EU Commission argues in recital (7) of the draft delegated act that this would be appropriate because technological innovation would likely reduce the intensity of GHG emissions from food production in the future. No such effects would apply to peatland rewetting, agroforestry and afforestation where no climate benefit would be generated in the absence of the activity. This statement however misses a key aspect of the concept for downward adjustment: increasing ambition in climate policy might also extend to afforestation and peatland rewetting efforts, so the argument that no climate benefit would be generated in the absence of the activity might not always hold.

Further, the “downward adjustment” only applies in the context of updating the baseline. This means that no “downward adjustment” applies during the first crediting period, which is 5 years for ASE activities. Yet, PACM rules specify that downward adjustments should apply to all activity periods and not only after activity period renewal.

As is further explored below, downward adjustments and updating baselines are two separate issues that should not be mixed. A downward adjustment does not replace the need to periodically update the baseline.

2.5 Updating of baselines

2.5.1 Requirements in the CRCF draft carbon farming methodology

Unclear and insufficient rules for updating of baselines: The draft methodology includes different baseline requirements for soils and living biomass. The methodology specifies that “an activity-

[17] https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-004.pdf

specific baseline shall apply to carbon removals in mineral soils, LSE and ASE", while "a baseline equal to zero shall apply to carbon removals in living biomass".

The following differentiated rules apply for baseline updating:

For the soil baseline, the draft methodology requires that projects implementing "agricultural and agroforestry practices that reduce direct and indirect N_2O emissions from managed agricultural soils" must update the baseline every five years by applying a downward adjustment to the baseline starting with the second activity period (see section above). For all other activity types, the draft methodology does not contain rules on updating the soil baseline, despite the CRCF Regulation clearly mandating the EU Commission to include such rules in every quantification methodology, in particular activity-specific baselines (see Annex I, (h) of the CRCF Regulation).

The draft methodology should therefore be changed to require a periodic reassessment of all parameters and assumptions used in establishing the soil baseline and reflect any changes in the updated baseline.

For the living biomass baseline, the draft methodology includes no rules for updating the baseline. This is another violation of the CRCF Regulation which requires that such rules be included in methodologies.

2.5.2 PACM requirements

The PACM Activity Standard for Projects[18] requires that any request for crediting period renewal must be supported by an updated baseline (section 9). It further specifies that this must include the BAU scenario and emission, and the difference between the baseline emissions and BAU emissions as annual and total amounts with respect to the crediting period to be renewed.

2.5.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

The PACM requirements for baseline update are substantially stronger than those of the CRCF carbon farming methodology. The lack of requirements to update the baseline at activity period renewal is a major shortcoming. Further, the approach to use downward adjustments as a tool to update the baseline is inappropriate. Downward adjustments under the PACM were never meant to replace periodic updates of the baselines which are always necessary to reflect changes in parameters and assumptions made for establishing the baseline. In fact, the PACM Activity Standard requires that the downward adjustment itself must be updated during crediting period renewal (see paragraph 162 (a) of the Activity Standard for Projects[19]).

2.6 Consideration of leakage and indirect land-use change (iLUC)

2.6.1 Requirements in the CRCF draft carbon farming methodology

Leakage risks are not addressed appropriately and can lead to large overestimation of removals or emission reductions: The draft methodology does not account for the risk that carbon removals or soil emission reductions on certified parcels are compensated by an increase in

[18] https://unfccc.int/sites/default/files/resource/A6.4-STAN-AC-002.pdf.
[19] https://unfccc.int/sites/default/files/resource/A6.4-STAN-AC-002.pdf

emissions on other land (under the operational control of the operator or elsewhere). Leakage is not mentioned by the draft methodology. This omission is not appropriate as the proposed activities impact the agricultural product range produced from a specific land parcel. For example, improving crop rotations or converting arable land for fodder crops to permanent grassland imply that the amount of a specific agricultural product produced from this land is reduced (i.e. a specific crop that is cultivated less frequently; fodder crops) so that activity shifting to other land could occur to meet the demand for this product.

Particularly, ILUC effects are not accounted for: According to recital 9 of the draft delegated act, "the assessment of existing literature shows that carbon farming activities that are carried out in degraded, marginal or low-yield areas are not expected to be associated with significant ILUC emissions as there would not be any or little re-/displacement of food and feed production". The recital states that ILUC impacts would only be triggered in the event that revenues from CRCF units are equal or higher compared to revenues generated under previous land use. Consequently, there is currently no need to quantify ILUC emissions until experience has been gained with applying the methodologies and further information is available on prices for certified units. Yet, the idea that ILUC can be ignored for carbon farming on "degraded" or "marginal" land, or deferred until CRCF revenues exceed former land-use income, is not supported by scientific evidence. ILUC effects are triggered through dynamics on global agricultural commodity markets and even small shifts in land use can trigger displacement of food and feed production elsewhere, regardless of the local profitability or condition of the initial plot. Price signals are only one of various triggers of displacement so that ILUC effects can occur even when revenues from the new activity are modest (Fuglie et al. 2023; Arvanitopoulos et al. 2021; Haseeb et al. 2024).

Not accounting for such leakage effects may lead to significant overestimation of removals or emission reductions. Additionally, not accounting for leakage effects violates Article 4(2)(a)(iii) of the CRCF Regulation which defines $GHG_{associated}$ as "the increase in direct and indirect greenhouse gas emissions over the entire lifecycle of the activity which are attributable to its implementation, including indirect land use change, calculated, where applicable, in accordance with the protocols set forth in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and any further refinement to these 2006 IPCC Guidelines", thus including leakage. Guidance must be added to the draft methodology on how leakage to other parcels is to be identified and what would be the consequences of leakage for quantifying carbon removals and emission reductions achieved through the respective activity. We recommend addressing leakage risks by applying default factors in the quantification of achieved emission reductions or removals. Tools and methodologies to account for leakage effects are available from other carbon crediting programmes (see e.g. Oldfield et al. 2021) and should be used.

2.6.2 PACM requirements

The Leakage Standard of the PACM[20] requires activity proponents to identify all potential sources of leakage, seek to prevent any kind of leakage by changing the design of the activity and – where this is not possible – minimise any leakage and subsequently account for any remaining leakage in the calculation of net emission reductions or removals (unless the exclusion of leakage sources from the calculative is conservative, i.e. the exclusion of a source of positive leakage where the implementation of an activity results in a decrease in emissions or in an increase in removals). The Leakage Standard explicitly mentions competition for resource use as a source of leakage where an increase in the consumption of a limited resource by the mitigation activity could lead to an increase

[20] https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-005.pdf.

in GHG emissions or decrease of removals outside of the activity boundary. It also explicitly requires that indirect land-use change (ILUC) to be considered. This means that *any* emissions from ILUC must be accounted for.

2.6.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

The draft methodology does not satisfy the PACM requirements. It does not account for all sources of leakage as required by the PACM, particularly not accounting emissions through ILUC. The draft methodology should be amended to address leakage risks, including to explicitly require that any emissions from ILUC must be considered.

2.7 Approach to selection of carbon pools and emission sources for calculating emission reductions or removals

2.7.1 Requirements in the CRCF draft carbon farming methodology

Unclear definition of carbon pools and emission sources to be considered: The draft methodology defines carbon pools and emissions sources in a complicated, imprecise and incomplete manner that opens the door for activity developers to selectively include and exclude certain pools and emission sources (section 2). It is common practice in carbon crediting that methodologies contain two tables which define a) the relevant carbon pools and b) emission sources that must be considered in the baseline and the activity scenario as well as for considering leakage emissions.[21] These tables further contain instructions to activity developers explaining when they must include certain pools and sources and when it is deemed conservative to exclude them.

The draft methodology does not include a robust approach for defining carbon pools and emission sources to be considered:

- It breaks with the common practice described above to define carbon pools and emission sources which must be considered in the baseline and the activity scenario as well as for considering leakage emissions. The methodology it only defines the 'scope of the certification methodology' for each activity (sections 2.1.1. to 2.1.3.), using a simple list containing imprecise terms such as 'living biomass' which are not defined in the definition section. This particular term is problematic, because it leaves room for interpretation whether this includes both above- and below-ground biomass, non-tree biomass, litter or other relevant pools and sources.
- Table 3 in section 2.1. of the draft methodology shows how the terms used in the quantification equations relate to LULUCF carbon pools and emission sources defined in the 2006 IPCC guidelines. This table suggests that '$GHG_{associated}$' encompasses "living biomass in trees and shrubs (stems, branches and roots)". Yet, the lists defining the scope for agricultural activities and afforestation do not include any emission source of living biomass

[21] For example, Verra defines aboveground biomass as "biomass above the soil, including the stem, stump, branches, bark, seeds and foliage" and below-ground biomass as "Living biomass of live roots, sometimes excluding fine roots of less than 2 mm diameter because these often cannot be distinguished empirically from soil organic matter or litter"; see https://verra.org/wp-content/uploads/2025/12/VCS-Program-Definitions-v5.0.pdf and https://verra.org/wp-content/uploads/2023/11/VM0048-Reducing-Emissions-from-Deforestation-and-Fores….

as part of '$GHG_{associated}$' (sections 2.1.1. and 2.1.3.). For rewetting of peatland, "CO_2 emissions from living biomass, if applicable" are included under '$GHG_{associated}$' without further specification. This is inconsistent and confusing.

- Some key emission sources relevant for carbon farming activities such as fires and soil disruption as well as livestock are missing in the lists defining the scope of the certification methodology for each activity.
- The draft methodology does not define the emission sources that must be considered to estimate leakage, including leakage occurring from indirect land use change.
- The carbon pools and emission sources listed in sections 2.1.1. to 2.1.3 are not aligned with those included in tables 1 and 2 which define what must be included in the monitoring report. Section 2.1.2. on rewetting of peatlands does not include 'direct and indirect N_2O emissions from managed non-agricultural soils' which are included in Tables 1 and 2. Additionally, 'living biomass' is not further specified in Tables 1 and 2. This is inconsistent and clear guidance is required in order to make sure that all relevant carbon pools and emission sources are covered in monitoring reports.

2.7.2 PACM requirements

The PACM Baseline Standard in its Annex I[22] contain comprehensive requirements on the definition of the activity boundary. Proponents of a PACM methodology must identify all emission sources, sinks or reservoirs that could be altered by PACM activities that are eligible under the methodology. They must differentiate whether each source is controlled by, related to, or otherwise affected by the planned activity providing adequate justification for the classification. Based on this analysis, mechanism methodologies must define the activity boundary of the applicable activities, including which emission sources, sinks or reservoirs and GHGs are included. The activity boundary must be presented in a table, covering both the activity scenario and the baseline scenario. The activity boundary must include all emission sources, sinks or reservoirs that are identified as controlled or related. The activity boundary also may include sources, sinks or reservoirs that are identified as otherwise affected by the activities. Changes in anthropogenic emissions and/or removals of GHGs that occur outside the activity boundary and that are attributable to the activity must be considered as leakage.

The PACM allows to omit sources, sinks or GHGs from the activity boundary, provided that the omission leads to a more conservative quantification of emission reductions or net removals. The mechanism methodology may also specify conditions under which certain sources, sinks, reservoirs or GHGs shall be considered or may be omitted. The proponent of the mechanism methodology must demonstrate and provide appropriate justifications for any such omissions, including that the omission is conservative for the range activities that may apply the methodology

2.7.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

The way in which the draft methodology approach setting the activity boundary is inconsistent with the PACM – both in terms of stringency and form.

[22] https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-004.pdf.

The use of imprecise terminology such as ‘living biomass’ does not sufficiently clarify which exact carbon pools and emission sources must be included.

We therefore strongly recommend revising the methodologies to include for each activity a table of all emission sources, sinks or reservoirs that could be altered by the CRCF activity. Pools and emission sources should be broken down as far as possible, e.g. differentiating between above- and below-ground biomass to provide unambiguous instructions. Further, the tables should clearly specify which pools, sources and reservoirs must be considered in the baseline and which in the activity scenario.

3 Additionality

The CRCF methodology for carbon farming uses a three-pronged approach for activity developers to demonstrate additionality of their activities. It includes:

- An incentive effect test to avoid retroactive crediting
- A regulatory test to avoid crediting activities mandated by legal requirements
- A financial viability test to avoid crediting activities that are financially viable without the revenues from CRCF units.

3.1 No retroactive crediting

An important approach of filtering out non-additional activities is a requirement for project proponents to demonstrate that the incentives from carbon credits were considered in the decision to proceed with the activity (often referred to as prior consideration requirement). Such provisions are a well-established and effective approach in carbon markets for minimising the risk that credits are claimed for activities when carbon finance was neither considered nor needed for the activities to proceed.

3.1.1 Requirements in the CRCF draft carbon farming methodology

Retroactive crediting allowed: The draft methodology includes a requirement to perform an 'incentive effect' test (section 3.2.1.). The provisions stipulate that the test "shall demonstrate that the certification has an incentive effect" in the sense that the operator "would not carry it out without certification or in a restricted or different manner". They further stipulate that this condition is satisfied wherever "work on the relevant activity has not yet started at the time of submission of the application to the certification scheme". "Start of work" here is defined as either "the start of the activity" or "the first legally binding commitment to order equipment or employ services or any other commitment that makes the activity irreversible". Preparatory work such as obtaining permits and conducting feasibility studies is deemed to not consider start of work or activity.

By way of derogation, operators must not pass the incentive effect test in the following two cases:

- Operators who started their activities between 1 January 2023 and 31 December 2027 and apply to a certification scheme after the start of the activity
- Operators who started the activity under a certification scheme before its recognition under Implementing Regulation (EU) 2025/2358. In this case, only carbon removals or soil emission reductions generated after the adoption of the recognition decision shall be eligible for certification.

3.1.2 PACM requirements

The Methodologies Standard of the PACM requires activity participants to demonstrate prior consideration of the benefits of the mechanism. This applies to all approaches to demonstrate additionality, including standardised approaches (paragraph 73). This is implemented by requiring

activity participants to submit a prior consideration notice to the PACM secretariat at the latest 180 days after the decision to implement the activity.[23]

3.1.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

The provisions of the draft methodology for carbon farming activities are less stringent than those of the PACM. Due to the far-reaching derogations, operators can register activities under the CRCF which have been operating for several years. This can be illustrated by an activity which started on 01 January 2023 and is submitted for registration on 01 January 2028. In this case the activity has been implemented successfully without the additional incentive from selling CRCF units for five years. For such activities it appears highly doubtful that CRCF revenues were truly needed for the project to go ahead, especially as for soil carbon sequestration in mineral soils, the activity can cease after five years. Yet, due to the derogations such activities do not need to demonstrate that they need the incentive from the CRCF.

We strongly recommend revising the provisions of the methodology to include clear evidence of prior considerations for all activities without any derogations, as under the PACM. Considering that the derogation applies to the period of 1 January 2023 and 31 December 2027 – which coincides with the current period of the Common Agricultural Policy (CAP) there appears to be a high risk that activities receive double funding through the CAP and the CRCF. This would imply that public funds effectively subsidise the price of CRCF units, which undermines the efficiency of markets and can lead to higher global emissions, thus violating the principle of environmental integrity (Spalding-Fecher et al. 2021). Further, the draft delegated act is less stringent than earlier versions of the draft methodology, which included a provision stipulating that only units generated after the certification audit are eligible for certification. This provision has been removed, allowing project proponents claiming credits for past action to be issued.

3.2 Consideration of legal requirements

3.2.1 Requirements in the CRCF draft carbon farming methodology

No provisions on emergence of legal requirements during the project's lifetime: The draft methodology contains a requirement to demonstrating that the net climate benefit of an activity does not occur as a result of any legal requirement on the operator stemming from Union or national legislation. The provisions define national legislation to include laws, statutes and regulations as well as court order, mandatory environmental management agreements, planning decisions or other legally binding agreements (section 3.1.).

A derogation contained in previous versions stipulating that an activity may generate units even if it became mandatory for the operator under national legislation after the certification audit has been deleted. There are however no provisions that regulate which will happen in such situations which is a clear shortcoming and potential loophole. This is particularly risky for afforestation activities for which the methodology prescribes a single activity period of 35 years. This means that if, for instance, an activity becomes legally imposed after 5 years, operators would be entitled to up to 25 years of non-additional CRCF units under the methodology. In the voluntary carbon market, the best practice

[23] See paragraph 14 of the Activity Standard for Projects (A6.4-STAN-AC-002) and paragraph 13 of the Article 6.4 activity cycle procedure for projects (A6.4-PROC-AC-002)

is to assess legal requirements at each issuance and only allow for issuing units until relevant laws or regulations enter into force, in particular for developed countries (see for example the rules by the American Carbon Registry and the Climate Action Reserve).

Further, it appears that the regulatory test must not be reconfirmed during renewal of the activity period. While the draft methodology includes a list of elements the revised activity plan shall contain, the need to perform a regulatory test does not feature (section 1.3.3.). The methodology should clearly require to reassess regulatory surplus during the renewal of the activity period.

3.2.2 PACM requirements

The PACM Additionality Standard in its paragraphs 24-27 defines the requirements for "regulatory analysis" in methodologies.[24] They stipulate that methodologies must include provisions to demonstrate that the emission reductions or net removals resulting from a PACM activity would not occur because of any law or regulation. Further, the analysis must be conducted at the latest at each renewal of the crediting period.

As the CRCF, the PACM rules do not contain a general requirement to terminate an activity in case legal requirements mandating the activity are adopted during the crediting period. However, the first methodology (project type: landfill gas utilisation) adopted under the PACM, includes a requirement to update the regulatory analysis on an annual basis and reflect any changes in legal requirements.[25]

3.2.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

The requirements of the methodologies for carbon farming activities largely meet those of the PACM. The main deviation is the missing requirement to conduct the regulatory surplus test at each renewal of the crediting period.

The provisions of the first methodology adopted under the PACM provide a best-practice example how to robustly ensure that projects meet the legal requirement test at any time during project implementation. However, the Additionality Standard allows specific other methodologies to assess legal additionality less frequently, which is a weakness of the PACM rules.

3.3 Financial viability

3.3.1 Requirements in the CRCF draft carbon farming methodology

Rules on financial viability have been strengthened: The requirements for demonstrating that the activities are not financially viable without the revenues from the CRCF have been strengthened compared to the previous versions of the draft methodology. Now all activities must comply with these requirements and previous exemptions for activities receiving state aid or public subsidies have been deleted.

The current provisions stipulate that operators must demonstrate that the activity is not financially viable without the incentives created by the CRCF (draft methodology, section 3.2.). For this they

[24] https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-003.pdf
[25] https://unfccc.int/process-and-meetings/the-paris-agreement/article-6/article-64-pacm/mechanism-process/methodologies/a64-amm-001

must conduct either a simple cost analysis or an investment comparison analysis. The latter is most comprehensive but not always possible for all activities where the decision to proceed with an activity is more dependent on comparing the cost between two scenarios instead of a decision between two investment opportunities. In the simple cost analysis operators must demonstrate that the implementation with the activity is associated with costs and does not generate any cost savings or revenues other than revenues from certification. In the investment comparison test, operators must compare the financial attractiveness of the activity with alternative investment scenarios using net present value as the financial indicator (section 3.2.2.2.). In addition, the financial viability test must be updated if the activity is renewed (section 1.3.3.).

The methodology stipulates that for both tests operators must include all relevant costs, including CAPEX and OPEX and all revenues and cost savings, including any public funding received. If public funding is received, operators must document this and demonstrate that it would not have filled funding of the activity in the absence of revenues from certification. The tests may also include the costs associated with any barriers faced by the proposed activity where they can be monetised and quantified as additional costs. Further, all parameters and assumptions must be internally consistent, and data and conclusions must be transparently documented and appropriately justified and substantiated by evidence. Finally, the test must be implemented in a conservative manner.

3.3.2 PACM requirements

For activity-specific approaches under the PACM, project proponents must demonstrate that the activity is not viable in the absence of the incentives provided by the PACM (Additionality Standard[26]). The default approach to demonstrate this is an investment analysis combined with a common practice analysis. In some specific cases, mechanism methodologies may use a barrier analysis instead of the investment analysis. For the investment analysis mechanism methodologies may choose between a simple cost analysis, a benchmark analysis and an investment comparison analysis. They must justify the choice of analysis.

The analysis must include all relevant costs, including CAPEX and OPEX, including any barriers that can be monetised and quantified as an additional cost, and all revenues and cost savings, including any public funding such as subsidies.

Further, all parameters and assumptions used in the analysis must be internally consistent. For example, cash flows shall be expressed in either real or nominal terms consistently and be determined consistent with the financial indicator used. The assumptions, data and conclusions in the investment analysis must be transparently documented, appropriately justified and substantiated by evidence.

Also, the analysis must be implemented in a conservative manner. To ensure conservativeness, the analysis must include a sensitivity analysis to demonstrate that the conclusion of the analysis is robust to reasonable variations in the critical parameters and assumptions, including CAPEX, OPEX, revenues and cost savings, as applicable.

Further, the analysis shall be based on data and information that is consistent with information presented to the entity's decision-making management and investors/lenders at the start date of the activity.

[26] https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-003.pdf

Where public funding for an activity, expressed in grant equivalents, is larger than the expected revenues from credits issued under the PACM[27], mechanism methodologies shall require demonstration that public funding would not have filled the funding gap in the absence of revenues from the PACM.

Finally, the PACM Additionality Standard requires that the investment analysis must be complemented by a common practice analysis which demonstrates that the relevant technology or practice is not common practice (e.g. it has a low market penetration).

3.3.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

The provisions of the methodologies for carbon farming activities are clearly modelled upon the PACM requirements, using verbatim language in most places. Hence, they meet most of the PACM requirements. A key exception is the that the CRCF methodology does not provide further specifics how the requirement to implement the analysis in a conservative manner must be operationalised. There is no requirement for a sensitivity analysis to demonstrate that the conclusion of the analysis is robust to reasonable variations in the critical parameters and assumptions. We strongly recommend including such a provision to ensure that operators use conservative approaches when performing the simple cost and investment comparison test.

Further, although the CRCF Regulation in recital (14) clearly stipulates that in the context of carbon farming, only practices and processes that go beyond the common practice should be certified, the draft methodology does not include any provisions for activity proponents to demonstrate that they are not common practice. This contradicts the CRCF Regulation and is at odds with the PACM. Relevant provisions should be introduced in the final version of the methodology.

3.4 Consideration of public funding

3.4.1 Requirements in the CRCF draft carbon farming methodology

Funding from different sources may be combined without separate attribution of units: The methodology for carbon farming activities stipulates that operators must document any public funding provided to the activity as part of the financial viability test. Further, they must demonstrate that public funding would not have filled the funding gap of the activity in the absence of the revenues from certification, considering CAPEX, OPEX and any revenues other than revenues generated from certification (draft methodology, section 3.2.2.). Yet, the draft methodology does not require CRCF units to be attributed to different funding streams.

3.4.2 PACM requirements

Under the PACM, blending revenues from PACM credits with public funding is possible (Additionality Standard, section 6.3.2.). However, where public funding for a PACM activity, expressed in grant equivalents, is larger than the expected revenues from PACM credits, participants must demonstrate that public funding would not have filled the funding gap in the absence of revenues from PACM credits. In addition, the PACM Supervisory Body mandated its Methodological Expert Panel (MEP) to conduct further work on this matter.

[27] Emission reductions under Article 6.4, or “A6.4ERs”.

3.4.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

The provisions of the draft methodology for carbon farming activities use similar language as those form the PACM and therefore have the same degree of stringency.

It would be important however to add specific provisions that deal with the attribution of CRCF units to different funding streams in case activities receive both public subsidies and CRCF units.

If all mitigation or removals will be attributed to the CRCF, public subsidies would artificially lower CRCF unit prices and subsidise the users of the CRCF units. This would lead to economic inefficiencies and could implicitly subsidise continued use of fossil fuels by the users of the units, such as voluntary carbon market buyers (Spalding-Fecher et al. 2021). To avoid such unintended outcomes, the methodologies should proportionally attribute the removals and emission reductions to the financial support provided. This could be done by drawing on approaches developed for the Swedish Energy Agency and the World Bank Group (ibid).

4 Non-permanence

4.1 General issues

4.1.1 Requirements in the CRCF draft carbon farming methodology

It is a **severe gap that eligible use cases for temporary CRCF units are not set** by the CRCF Regulation nor the Delegated Act. This leaves the door open to using temporary CRCF units for offsetting, which poses strong risks to the environmental integrity of the CRCF. Temporary units are not equivalent to permanent mitigation and offsetting permanent CO_2 emissions with temporary carbon storage in soils or biomass can lead to higher levels of emissions in the atmosphere than without the use of the CRCF.

Offsetting is particularly problematic since the monitoring rules under the methodology mean that reversals of sequestered carbon after the end of the monitoring period would not be accounted for. To illustrate, the minimum duration of an activity period may be as short as 5 years for agricultural activities that enhance soil carbon removals, renewable up to three times, and 15 years for agroforestry, renewable once (draft methodology, section 1.2.1.1.(a)). Monitoring is obligatory for only 5 years after the end of the activity period for agricultural activities and afforestation. This means that temporary mitigation impacts might only be guaranteed for comparatively short timeframes, for example 10 years in the case of agricultural activities that enhance soil carbon removals. Additionally, for afforestation, high reversal risks remain after the end of the monitoring period but are not accounted for in the draft methodology. For those activities, monitoring should be required for several decades after the end of the activity period. Furthermore, for practices that reduce CO_2 emissions from soils or that reduce direct and indirect N_2O emissions from managed agricultural soils, no monitoring beyond the activity period is required in order to ensure consistency for all activities generating soil emission reductions (draft methodology, section 1.2.1.2). This provision does not account for reversal risk associated with reducing CO_2 emissions from soils and implies that temporary mitigation impacts for related agricultural activities might only be guaranteed from 5 years.

On the one hand, shorter monitoring periods may align with farmers' interests and typical planning horizons, which often favour commitments with limited duration and lower administrative burden. On the other hand, the CRCF Regulation stipulates that certification methodologies should promote the prolongation of the monitoring period of carbon farming activities and promote financial incentives over the long term in order to ensure that CO_2 captured is stored "for at least several decades" (recital 22). The minimum time periods for which monitoring is required for agricultural and agroforestry activities according to the draft methodology do not adhere to this principle. Additionally, the draft methodology lacks incentives for maintaining mitigation impacts over longer time periods.

On a related note, carbon farming sequestration units generated under the CRCF expire at the end of the monitoring period of the relevant activity (CRCF Regulation Articles 6.5 and, Article 12.5). Following expiry, units will be cancelled from the certification or Union registry (expected to come online in 2028) unless the operator commits to prolonging the monitoring period according to the rules set out in the applicable certification methodology (CRCF Regulation, Articles 6.5 and, 12.5). Yet, since units might have been claimed by buyers for offsetting purposes at the time they expire, cancelling expired units from the registry cannot safeguard environmental integrity because it entails no consequences on the offsetting claim that has been made.

In light of the above, either the CRCF Regulation or the draft methodology should clarify for which limited purposes temporary units may be used, excluding meeting emission reduction obligations by public and private actors.

Reduced CO_2 emissions resulting from rewetting of peatlands are considered permanent: According to recital 11 of the delegated act, emission reductions achieved through the rewetting and restoration of peatlands are considered irreversible (equivalent to reduced N_2O emissions from improved fertiliser use) so that no liability mechanism is needed for the resulting soil emission reduction units. Section 4.2. of the draft methodology confirms this by stating that a liability mechanism shall be used for activities that generate a temporary net carbon removal benefit, thus excluding peatland rewetting.[28]

There is broad scientific consensus that emissions from peatland rewetting are subject to non-permanence risks, though the risk may be lower than for other activities (Schneider et al. 2024; Leifeld et al. 2025). Accordingly, major existing carbon crediting programmes such as the UK peatland code and the Verified Carbon Standard (VCS) acknowledge that peatland rewetting has non-permanence risks and require project developers to monitor these and account for any reversal events. We note however, that the risk for reversing avoided emissions from peatland rewetting are considerably lower than for some other activities, such as emission reductions from reduced deforestation. One reason for this is that the practical and administrative efforts to implement rewetting activities are comparatively high and are unlikely to be quickly reversed. Nevertheless, non-permanence risks remain and should be addressed, for example, through respective legal requirements. The magnitude of such risks could be determined through a dedicated risk assessment, possibly resulting in lower contributions to a buffer pool than contributions from other types of activities to acknowledge the lower risk of reversals. Would the European Union adopt this methodology it would unilaterally decide to ignore common practice on carbon markets. Worse, it would lower the bar for other carbon crediting programmes and send a signal that the EU is willing to undercut industry-wide accepted standards for minimising non-permanence risks.

In Article 6, the CRCF Regulation further stipulates that soil emission reduction activities shall be subject to appropriate monitoring rules and liability mechanisms. The draft methodology's approach to simply declare that peatland rewetting will result in permanent emission reductions fails to address this requirement of the CRCF Regulation.

Lastly, the minimum activity period duration for peatland rewetting may be as short as 10 years; because monitoring is required only until the end of the activity period, any reversals occurring thereafter would not be accounted for, implying that the temporary mitigation effect could, in the worst case, be limited to a decade (draft methodology, sections 1.2.2.1. and 1.2.2.2.).

Mixing permanent and non-permanent soil emission reductions: Reduced/avoided CO_2 emissions from mineral soils (i.e. a carbon reservoir) are associated with non-permanent risks and can be reversed (e.g. avoided emissions from reduced tillage could be released at a later point in time when tillage practices change again). Reduced N_2O and CH_4 emissions on the other hand can be considered permanent. They are not related to a GHG reservoir and do not result in increased storage of these gases so that emission reductions achieved are not reversible (Schneider et al.

[28] Yet, a risk assessment is required for all carbon farming activities (draft methodology, section 4.1.2). For rewetting and restoration of peatlands, activities qualifying as high-risk as a result of this risk assessment shall not be eligible for certification (section 1.1.2.1). For those activities, the risk assessment serves to ensure that appropriate resilience practices are put in place in areas prone to reversal risks (recital 11 of the delegated act).

2024). The equations for calculating the net soil emission reduction included in the draft methodology benefit mix permanent N_2O and CH_4 emission reductions and temporary CO_2 emission reductions from soils (draft methodology, section 2.1.). At the same time, neither the draft methodology nor the CRCF Regulation specify whether soil emission reduction units are considered permanent or temporary. This creates a lack of clarity regarding the validity of these units. Units issued for reduced CO_2 emissions should be clearly separated from units issued for avoided N_2O or CH_4 emissions. Additionally, for avoided CO_2 emissions appropriate liability mechanisms are missing and must be added.

Missing rules for when monitoring ceases: The draft methodology states in section 1.3.4.2. that monitoring shall be done at least every 5 years and within one year of becoming aware of an event resulting in a reversal. Rules are missing for the event no monitoring report is provided, yet in the latest draft of the methodology, it has been added that certification schemes "may" provide additional guidance on late or incomplete submissions of monitoring reports (draft methodology, section 1.3.4). Still, this provision remains non-mandatory and thus insufficient. It should be clarified that in case no monitoring report is submitted, this would correspond to an early termination of a carbon farming activity, that shall be treated equally to a full avoidable reversal (as stipulated in section 4.1), so that units issued for the activity would expire and would need to be compensated for.

The draft methodology does not provide a definition and guidance for quantifying and identifying reversals. While Section 4.1 defines avoidable and unavoidable reversals, section 1.3.4.2.(d) merely states that the monitoring report shall "*quantify the amount of the reversal by using the quantification rules laid down in section 2, or where this is not possible due to the nature of the reversal event, produce a conservative estimate of the reversal*". No further guidance is provided how a reversal is defined and quantified. Related to this, it is not clear, how reversals are to be identified. According to the draft methodology, "the absence of an avoidable reversal shall be demonstrated through evidence of continuation of the activity" for agricultural mineral soils (draft methodology, section 1.3.4.1).

4.1.2 PACM requirements

Under the PACM, non-permanence risks are addressed by monitoring and compensating for reversals for a defined time period after the end of the last crediting period (post-crediting monitoring period).[29] Through this approach, temporary mitigation impacts are considered and treated equivalent to permanent mitigation. This fails to acknowledge that land-based mitigation cannot guarantee permanent carbon storage. Overall, the non-permanence requirements under the PACM remain insufficient.

The duration of the period for which monitoring is required after the end of the last crediting period will be determined in individual crediting methodologies for specific activities. According to the Non-permanence Standard, the minimum period for post-crediting monitoring i.a. depends on the mitigation activity type and its associated reversal risks (Non-permanence Standard, section 7.4.[30]). It thus remains to be defined whether the PACM will set a more ambitious standard than other crediting programmes on the voluntary carbon market.

[29] The PACM Non-Permanence Standard defines activities increasing carbon stocks or avoiding the loss of carbon stocks, relative to the baseline, in any of the greenhouse gas reservoirs of the biosphere to carry reversal risks. This includes agricultural practices to enhance soil organic carbon, afforestation as well as peatland rewetting (Non-Permanence Standard, paragraph 6).

[30] https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-007.pdf.

A key difference to existing examples[31] is the concept of a post-crediting monitoring period, meaning that monitoring will in any case exceed the duration of the overall crediting period under the PACM.

Under the PACM, post-crediting monitoring by activity participants may be terminated before the end of the defined monitoring period if:

a) the risk of reversal is negligible calculated over at least a 100 year timeframe starting from no earlier than the end of the last crediting period[32] (which does not apply to carbon farming activities) (Non-permanence Standard, paragraph 3(g)[33]; Information note, paragraph 50[34]).

b) it can be proven that potential future reversals are remediated (Removals Standard, paragraph 28[35]).

- This is done by cancelling credits corresponding to the amount of potential reversals for all credits issued to the activity to a dedicated cancellation account (Information note, paragraph 44[36]).
- Alternatively, participants can demonstrate sufficient insurance policy, or comparable guarantee products or third-party guarantee to cover the risk of reversals, including a plan for detecting future reversals for a minimum time period (Information note, paragraph 46[37]).[38]

The PACM also provides the possibility for a third party nominated by the activity participant to take over formal responsibility to perform post-crediting monitoring instead of the activity participant itself (Information note, paragraph 41[39]).

If no monitoring report is provided by a participant, the total number of Article 6.4 credits issued will be treated as reversals and must be compensated for (Information note, paragraphs 35-36[40]).

4.1.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

Overall, both the CRCF's and the PACM's approach to addressing non-permanence have weaknesses:

While rewetting of peatlands is not considered to imply reversal risks in the draft methodology, it is explicitly mentioned as an activity carrying reversal risks in the PACM Non-permanence Standard. In addition, the CRCF draft carbon farming methodology mixes permanent and non-permanent soil emission reductions, while the PACM Non-permanence Standard does not cover emission reductions which are not associated with non-permanence risks like reduced fertiliser application. It therefore provides greater clarity regarding applicability of liability mechanisms.

31 E.g. Carbon farming methodologies under American Carbon Registry.
32 Details regarding the permissible level of remaining reversal risks yet remain to be defined under the PACM.
33 https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-007.pdf
34 https://unfccc.int/sites/default/files/resource/A6.4-INFO-METH-002.pdf
35 https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-002.pdf
36 https://unfccc.int/sites/default/files/resource/A6.4-INFO-METH-002.pdf
37 https://unfccc.int/sites/default/files/resource/A6.4-INFO-METH-002.pdf
38 Further guidance on requirements for third party liability yet remains to be developed under the PACM.
39 https://unfccc.int/sites/default/files/resource/A6.4-INFO-METH-002.pdf
40 https://unfccc.int/sites/default/files/resource/A6.4-INFO-METH-002.pdf

Both, the CRCF draft carbon farming methodology and the PACM require monitoring to continue beyond the end of the crediting period for agricultural activities/agroforestry and afforestation. The time periods in the draft methodology for which monitoring is required are rather short and should be extended to several decades for afforestation. Under the PACM, the time period yet remains to be defined, so that no comparison is possible.

Whereas the CRCF draft methodology lacks mandatory provisions for when monitoring ceases, the PACM treats missing monitoring reports as avoidable reversals of the total mitigation impact for which credits have been issued. This is a more robust approach and should be added to the CRCF requirements.

Lastly, the guidance in the draft methodology regarding the definition of reversals and approaches to identify them is insufficient and not aligned with the PACM. The PACM defines reversals in section 4.4 of the Removals Standard as well as in the Non-Permanence Standard (section 2(j)) as a negative net change in GHG storage over the monitoring period. The Non-Permanence Standard also includes requirements for identifying and quantifying reversals in sections 6 and 7.

4.2 Risk assessment

4.2.1 Requirements in the CRCF draft carbon farming methodology

The risk assessment for agricultural activities including agroforestry as proposed in the draft methodology includes several weaknesses:

- **The risk assessment only covers unavoidable risks**: The risk assessment for agricultural activities on mineral soils shall take into account *hazard*, i.e. climatic conditions and land management that drive changes in SOC, and *vulnerability*, i.e. characteristics of soil that make it prone to losing carbon in the case of hazard according to the draft methodology (draft methodology, section 4.1.1.). Yet, in our understanding, 'hazard' includes unavoidable as well as avoidable reversals resulting from human wilful intent. In addition, the result of the risk assessment shall determine the contribution of a project to a certification scheme's buffer pool. This buffer pool shall be used to compensate for avoidable as well as unavoidable reversals (section 4.2.). However, the first paragraph of section 4.1 states that the risk rate resulting from the risk assessment shall account only for unavoidable events. This approach does not comprehensively address reversal risks.
- **Flexibility regarding data sources to estimate risk**: To determine the risk indicators, operators need to identify changes in carbon stocks in the activity area for agricultural activities on mineral soils in the recent past (section 4.1.1.). Operators are given flexibility to use different data sources for this purpose (e.g. own data, national survey data or the most recent data made available by the Commission for activities on agricultural land, section 4.1.1.). This flexibility is problematic since the methodology does not include a requirement to prioritise more conservative data sources. As a result, operators could choose the most favourable (i.e. low) estimate of risk.
- **Risk rates for agricultural activities on mineral soil too low**: The overall risk rate is a fixed value between 2% (for areas which are classified as having a low risk of hazard and a low risk of vulnerability) and 10% (for areas which are classified as having a high risk of hazard

and a high risk of vulnerability), unless extensive risk mitigation practices are put in place.[41] The rules in the most recent draft of the methodology have been strengthened by adding that the risk rates shall be increased if the activity area is subject to a flooding risk or to a high or very high landslide susceptibility (section 4.1.1). Yet, the maximum resulting risk rate of 15% is still comparatively low, given that it determines the buffer contribution (which is also meant to account for avoidable reversals) and thus implies that reversals greater than 15% of the mitigation impact would not be covered by this contribution. This suggests that the buffer pool risks to be undercapitalised. Major crediting programmes on the voluntary carbon market do not set such a limit for the risk rating that determines the contribution to the buffer pool (e.g., VCS). Alternatively, they exclude activities with very high risk rates from eligibility (e.g., Gold Standard), which is not the case in the draft methodology.

- **For peatland rewetting, no risk assessment is required**: In the most recent draft of the methodology, the obligation to carry out a formal risk assessment for peatland rewetting activities has been removed. This obligation has been replaced by a requirement to include practices to mitigate any risks to an activity's "viability" in accordance with national or sub-national requirements, "where applicable". The previously included requirement for a formal risk assessment should be reinstated in order to account for non-permanence risks to peatland rewetting activities (section 1.1.2.2 on eligibility requirements for peatland rewetting).

- Additionally, **the risk assessment does not take into account accelerating impacts of climate change in the future**, but is based on past SOC dynamics. The level of carbon saturation in the activity area shall be used as a proxy for the risk indicator vulnerability. While relative saturation can be a useful proxy for mineral soils under stable conditions, it ignores that climate change can make soils more prone to loosing carbon (section 4.1.1.).

- **Requirements insufficiently detailed and clear:** The draft methodology states that groups of operators may use the weighted average of the risk rate across the activity area for agricultural activities and afforestation/agroforestry (sections 4.1.1. and 4.1.3.). Yet, it is not specified how such an average should be calculated and how the different risk rates should be weighted. Additionally, the draft methodology refers to additional risk mitigation factors that may lower the overall risk rate. Yet, insufficient guidance is provided on how such risk mitigation practices are to be demonstrated and how they can lower the risk rating (sections 4.1.1. and 4.1.3.). This could lead to participants underrating the actual reversal risks. Since the overall risk rates for agricultural activities on mineral soils are low anyway, this implies that the buffer may be undercapitalised. Additionally, while the methodology provides incentives to participants who undertake risk mitigation practices, they are not actually *required* to do so.

4.2.2 PACM requirements

The PACM requires a reversal risk assessment covering avoidable and unavoidable risks and including a risk mitigation plan. The risk assessment shall result in an overall percentage-based risk rating that determines the amount of credits to be placed into the Reversal Risk Buffer Pool Account which is used to compensate for reversals. A tool for the reversal risk assessment is currently under

[41] For agroforestry and afforestation fixed risk rates, based on datasets provided by the Commission's Joint Research Centre (JRC), apply (section 4.1.1.).

development, including further guidance on upper limits to the risk rating above which activities would be excluded from crediting (Removals Standard, section 4.6.1.[42]).

4.2.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

While, under the PACM, reversal risk assessments remain yet to be developed, both avoidable and unavoidable risks must be included and high risk activities will presumably be excluded from crediting. This is more ambitious than current provisions under the carbon farming methodology.

4.3 Liability mechanisms

4.3.1 Requirements in the CRCF draft carbon farming methodology

According to the draft methodology, “operators shall either participate in a buffer pool managed by a certification scheme or obtain and maintain sufficient coverage under an insurance policy or comparable guarantee products” to cover the risks of reversals (section 4.2.).

The rules on liability mechanisms included in the draft methodology include several weaknesses, raising doubts that reversals can be effectively compensated for:

- Regarding the implementation of liability (section 4.2), **provisions are missing in the draft methodology on how operators will be held liable for replenishing the buffer pool in case of avoidable reversals.** According to the draft methodology, such liability mechanisms shall be established by certification schemes. Yet, it would be better to regulate this in the methodology itself to ensure harmonised rules. These should include a provision 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. It should also be clarified in the methodology that avoidable reversals are compensated through the pool if the operator does not or cannot fulfil their contractual arrangements so that they cannot be held liable.
- Section 4.2. of the draft methodology does not specify **how reversals exceeding the number of credits in the buffer pool would be covered**. In the worst case, this gap could imply that such reversals would not be accounted for.
- **Capitalisation of the buffer pool is not fully clear**: The draft methodology does not specify which activities shall be pooled in a buffer reserve. It is therefore unclear from which sources a buffer pool will be capitalised. Additionally, if units in the buffer pool were not sufficient to cover losses from a large-scale reversal, it is not specified how a large-scale reversal would be compensated for.
- **Legal agreements that restrict land management practices that would result in reversals:** Provisions should be added to require legal agreements with project operators that restrict or prevent land management practices that would result in reversals (by the operators themselves or by third parties).

[42] https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-002.pdf

4.3.2 PACM requirements

As mentioned above, the PACM requires a reversal risk assessment covering avoidable and unavoidable risks and including a risk mitigation plan. The risk assessment shall result in an overall percentage-based risk rating that determines the amount of credits to be placed into the Reversal Risk Buffer Pool Account which is used to compensate for reversals.

The buffer pool serves to remediate avoidable and unavoidable reversals. Compensation shall be implemented through cancelling credits from the activity that experienced the reversal until no such credits are available in the buffer pool (Information note, section 5[43]).[44] In the event of an avoidable reversal, participants are liable for replenishing the buffer pool (Removals Standard, paragraph 53[45]). There are no specific provisions where participants do not/are not able to fulfil this liability. In practice, reversals will be compensated through the buffer pool with credits equal to the amount of reversals being cancelled from the buffer pool upon a reversal (paragraph 57).

4.3.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

The liability provisions of the CRCF draft methodology lacks provisions how operators will be held liable for replenishing the buffer pool (it is deferred to certification schemes to develop corresponding rules). The PACM's approach is more robust by generally clarifying that no further credits related to the activity can be issued, transferred or cancelled before the reversal has been compensated. While the rules for the risk assessment under the CRCF could lead to an undercapitalisation of the buffer pool, the details regarding the risk rating which determines the contribution to the buffer pool under the PACM yet remains to be developed.

Neither the CRCF draft methodology nor the PACM require legal agreements restricting land management practices which could result in reversals.

[43] https://unfccc.int/sites/default/files/resource/A6.4-INFO-METH-002.pdf
[44] Guidance yet remains to be developed how compensation will be implemented if credits in the buffer pool from the activity that experienced the reversal are not sufficient.
[45] https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-002.pdf

5 Safeguards and sustainable development impacts

Emission reduction and removal projects, particularly those that fall in the category of so-called 'nature-based solutions' are often situated in areas that host ecosystems which are rich in biodiversity and are therefore particularly vulnerable to any human interventions. Often these areas also provide important cultural and livelihood functions for local communities or host Indigenous Peoples who hold customary land access rights.

Ensuring that carbon farming activities do not negatively impact such areas and the communities that depend on them should therefore be an utmost priority for any certification mechanism. The CRCF-Regulation in Article 7 specifies that activities shall do no significant harm to the environment and that certification methodologies must define minimum sustainability requirements that are consistent with the technical screening criteria for the 'do no significant harm' principle of the Taxonomy Regulation.

An important shortcoming in the CRCF architecture is that it ties sustainability only to the environmental dimension of sustainability. The Regulation itself in Article 7.1 only specifies that no significant harm shall be done to the environment. Similarly, the technical screening criteria only apply to environmental objectives.

This means that the many social dimensions that are potentially affected by CRCF activities are not covered by the CRCF sustainability requirements. Considering that carbon farming activities may contribute to exacerbating existing issues such as land speculation or the concentration of agricultural activities in the hand of a few large-scale actors, this omission leaves an important gap in the safeguard system of the CRCF.

While the CRCF-Regulation in Article 8 explicitly specifies that certification methodologies shall contribute to ensuring the Union's food security and avoiding land speculation and consider the competitiveness of farmers and forest owners and managers in the EU, there is no mandate for methodologies to develop specific safeguards in that regard.

The following sections assess how the draft methodology has transposed the requirements of the CRCF Regulation and compares it with the approach chosen by the PACM.

5.1 Requirements in the CRCF draft carbon farming methodology

Eligibility requirements not stringently set: The draft methodology sets a list of examples of eligible practices for each of the three carbon farming activity types that can apply for certification (section 1.1.) Such lists can help practitioners assess whether their activities would fall under the scope of the methodology. However, since the lists are not exhaustive, they leave room for interpretation, weaken legal certainty and make outcomes dependent on how individual project developers, certification schemes and auditors who interpret the methodology.

In addition, some of the eligibility criteria lack stringency. While certain requirements ban certain practices (like agroforestry activities on areas where agroforestry systems have recently been removed), others are less strict and remain vague. To illustrate, the draft methodology states that "management practices shall be carried out in a way that minimises negative impacts on soil quality and soil health" (section 1.1.1.2). It is not defined which negative impacts are to be considered, nor is it clear how compliance with this requirement shall be documented. Moreover " tree species qualifying as unsuitable for current and future climate conditions as a result of the risk assessment […] shall not be eligible" (ibid). Here the requirements remain vague as well, leave room for too much interpretation and lack specific requirements for how to provide evidence of compliance.

Unusual approach to safeguards: The draft methodology approaches safeguards differently to other carbon crediting programmes, e.g. the Gold Standard or VCS. Instead of setting out a CRCF specific environmental and social safeguard architecture, the sustainability section of the methodologies essentially outsources safeguards to existing EU law (draft methodology, section 5).

The instruments referenced in the methodology are legally binding, have enforcement mechanisms and in many cases require the avoidance and mitigation of environmental harm (see Table 4). They directly cover key environmental goods potentially affected by carbon farming activities, such as water, biodiversity, soil quality and chemical pollution. Other environmental goods potentially affected by carbon farming activities, most notably air quality, landscape integrity, ecosystem services, genetic diversity are only indirectly addressed or not explicitly covered.

Table 4: Sustainability instruments referenced in the methodology

EU Directive/ Regulation	Environmental goods protected	Legally binding	Enforcement mechanism	Requires avoidance and or mitigation of environmental harm?
Directive 2000/60/EC (Water Framework Directive)	Surface water, groundwater, aquatic ecosystems	Yes	River Basin Management Plans; permitting conditions; compliance monitoring by competent authorities; infringement procedures	Yes, requires prevention of deterioration, achievement of 'good status', and mitigation through programmes of measures
Directive 2008/56/EC (Marine Strategy Framework Directive	Marine waters, marine ecosystems, biodiversity	Yes	Marine strategies and monitoring programmes; national reporting; infringement procedures	Yes, requires avoidance of deterioration and measures to achieve or maintain good environmental status
Directive 2011/92/EU (Environmental Impact Directive)	Cross-cutting	Yes	Mandatory EIA procedures linked to development consent; judicial review; infringement procedures	Yes, requires identification, avoidance, prevention, reduction and, where possible, offsetting of significant adverse effects
Council Directive 91/676/EEC (Nitrates Directive)	Water (groundwater and surface water), indirectly soil	Yes	National Action Programmes; mandatory farm-level measures; inspections and penalties under national law	Yes, requires preventive and mitigation measures to reduce nutrient pollution
Directive 2009/128/EC (Sustainable Use of Pesticides Directive)	Soil, water, air, biodiversity, human health	Yes	National Action Plans; restrictions on pesticide use; inspections and penalties	Yes, explicitly prioritises risk reduction, non-chemical alternatives, and mitigation of adverse impacts

EU Directive/ Regulation	Environmental goods protected	Legally binding	Enforcement mechanism	Requires avoidance and or mitigation of environmental harm?
Directive 2009/147/EC (Birds Directive)	Fauna	Yes	General System of protection of species of birds covered by the directive.	Yes, mandates the preservation of habitats
Directive (EU) 2025/2360 (Soil Monitoring Law)	Soil	Yes	Soil districts and units, monitoring framework for soil health	Yes, mandates prevention of soil degradation
Regulation (EU) 2019/1009 (Fertilising Products Regulation)	Soil quality, water quality, indirectly biodiversity	Yes (directly applicable)	Market surveillance authorities; conformity assessment; product compliance controls	Indirectly, prevents harm by setting quality, safety and contaminant thresholds rather than site-level mitigation
Regulation (EU) 1143/2014 (Invasive Alien Species Regulation)	Biodiversity, ecosystems, ecosystem services	Yes (directly applicable)	Prohibitions, eradication and management measures; enforcement by national authorities	Yes, requires prevention, early detection, eradication and mitigation of impacts
Regulation (EU) 2024/1991 (Nature Restoration Regulation)	Biodiversity, ecosystems, water, forests,	Yes (directly applicable)	National restoration plans	Indirectly, through restoration measures
National conservation designations and conservation objectives	Biodiversity, habitats, ecosystems, soils	Yes (via national law)	Site-specific management rules; permitting conditions; enforcement by competent authorities	Yes, typically prioritise avoidance of harm and prescribe mitigation where activities are allowed

Source: Directives and regulations listed in column 1.

Procedurally, a key difference to other carbon crediting programmes is that the draft methodology does not require a stand-alone safeguards assessment, including a systematic identification of risks associated with the activity and a mitigation hierarchy. Instead, it assumes that such assessments may be triggered by the directives and regulations referenced in the methodologies such as Environmental Impact Assessments (EIAs), river basin management plans, permitting or national programmes. This can only be robust, if these assessments are indeed triggered by the respective carbon farming activity and if project developers, certification schemes and auditors have a clear

understanding of which assessments apply. However, most carbon farming activities, will likely not trigger an EIA due to their small scale, incremental nature and treatment as normal agricultural practice. As a result, several safeguard mechanisms included in EU legislation and referenced in the draft methodology may not be operationalised in practice, leaving potential environmental and social impacts to be addressed only through general regulatory compliance rather than through systematic ex-ante impact assessment and mitigation.

In other words, the provisions in the draft methodology appear to follow a regulatory, not market-standard, approach. This means that the CRCF appears to be less concerned whether project developers follow a predefined safeguards process but instead aims to ensure that activities are legally in conformity with EU environmental law. This is coherent with the stated objective of the EU Commission to prevent double regulation and avoid administrative burden on farmers, but it is less transparent for carbon market actors which are used to procedural safeguards. The Gold Standard for example – which has one of the most comprehensive safeguard requirements in the voluntary carbon market – requires project developers to conduct an ex-ante environmental and social impact assessment and apply a clearly articulated mitigation hierarchy (avoid, minimise, compensate) and to document stakeholder consultation and grievance mechanisms irrespective of whether national permitting or impact assessment procedures are triggered by the activity.[46]

Additionally, the draft methodology does not provide guidance on how operators shall demonstrate compliance with the minimum sustainability requirements laid down in section 5, including compliance with the EU laws referred to in this section. For example, it is unclear how operators shall demonstrate that an afforestation activity does not “result in the deterioration of the conservation status of habitats specifically sensitive to biodiversity loss or with high conservation value” and “not result in the deterioration of areas designated for the restoration of those habitats and species in accordance with national and EU law, nor result in the deterioration of deadwood or in significant soil degradation” (section 5.1) without further operationalising these requirements. A further gap in the methodologies is the absence of a requirement to describe the approach to monitor compliance with the minimum sustainability requirements in the monitoring plan (see section 1.3.2 of the draft methodology – this is only required for other sustainability co-benefits). This means that there will be no validation of the monitoring approach, i.e. no external validation whether the chosen approach and systems deployed in the project are robust and likely effective. In addition, some issues that are particularly referenced in the CRCF-Regulation such as the avoidance of land speculation (Article 8.3 (c)) and considering the competitiveness of farmers and forest owners and managers (Article 8.3 (d)) are not further detailed in the methodology. This lack of further provisions leaves it entirely to existing directives and regulations as well as national laws to ensure that implementation of carbon farming activities will not exacerbate land speculation. This appears not sufficient to operationalise the general principles and requirements contained in Article 8.3 (c) and (d) of the CRCF-Regulation and it is recommended to amend the methodology in this regard.

As to the demonstration of compliance of the activity with the obligation to generate co-benefits, this has been made mandatory (shall instead of may), **yet the provisions regarding co-benefits have been substantially weakened** as operators must demonstrate this only for “at least” one practice and not “the practice” as a whole (section 5.2).

[46] https://globalgoals.goldstandard.org/103-par-safeguarding-principles-requirements/.

5.2 PACM requirements

Environmental and social safeguards and sustainable development requirements are mandatory for all projects under PACM and provided in several standard documents, including the Sustainable Development Tool[47]. The latter provides a systemic approach to assess potential negative environmental and social impacts and follows a hierarchy of avoiding, minimising and mitigating clearly defined negative impacts. Both safeguards and sustainable development impacts are required to be monitored and reported under PACM based on activity-level indicators. Validation and verification as well as local and global stakeholder consultations are also mandatory.

The tool provides a step-by-step procedure that project proponents must follow. In step 1 a risk assessment must be conducted using eleven defined elements and criteria. In step 2, project proponents must, based on the outcome of the risk assessment, develop an environmental and social management plan that contains actions to avoid, minimise and mitigate potential negative environmental and social impacts and risks. They must further establish activity-level environmental and social indicators, which need to be tracked during project implementation to demonstrate that activities do not cause harm to the environment and society. This step-by-step approach and the clear definition of elements and criteria that must be met constitute a very systematic approach with a high degree of formalisation.

The above findings are the result of a limited assessment of the PACM Sustainable Development tool focused on the PACM's general approach to environmental and social safeguards. The report did not further evaluate the robustness and comprehensiveness of the requirements and criteria included in the Sustainable Development tool. Research by Carbon Market Watch has provided further insights on these impacts.[48]

5.3 Comparison of requirements in the CRCF draft carbon farming methodology with those under the PACM

In contrast to the PACM, the draft methodology has no systematic approach to safeguards, i.e. no definition of the assessment procedure and specific criteria per impact category. It is unclear how the compliance with the broad requirements should be ensured and operationalised, and how monitoring should be implemented. Guidance is missing on how to address any potential risks and what actions need to be taken, should negative impacts be identified. Although the activity and monitoring plan shall include a proof of compliance with the sustainability requirements, it is not clear what level of detail must be provided.

47 https://unfccc.int/sites/default/files/resource/A6.4-TOOL-AC-001.pdf
48 https://carbonmarketwatch.org/publications/trading-carbon-credits-for-human-rights/

6 Conclusions

According to our assessment, the proposed CRCF methodology for carbon farming includes several weaknesses that risk undermining the quality and integrity of units issued under the CRCF. Particularly, flexibility in choosing monitoring approaches, insufficient consideration of uncertainty, omission of leakage/ILUC risks, as well as insufficient additionality and permanence requirements are likely to lead to many CRCF units that are not backed by actual emission reductions or removals.

In addition, several issues we identified contradict principles of the CRCF Regulation itself, including unclear requirements for updating baselines, omission of leakage effects, missing incentives for maintenance of mitigation impacts over several decades and missing liability mechanisms for soil emission reduction activities.

Crucially, the draft methodology is not aligned with the PACM in many aspects and sets a considerably lower integrity standard. The rules on the PACM are more ambitious and build on the lessons learned under other carbon crediting programmes and aim to avoid past mistakes. Meanwhile, the draft methodology does not seem to build on the wealth of experience that is available and fails to ensure alignment with Article 6 of the Paris Agreement as intended in Article 18(4) of the CRCF Regulation. Given that carbon farming projects within the EU will be able to choose between different crediting programmes, including options that will be aligned with the PACM requirements, it is key to ensure that the EU crediting framework does not fall behind international integrity benchmarks and remains attractive to buyers.

With the proposed CRCF carbon farming methodology, the EU fails to set a standard that will deliver high quality carbon removals and soil emission reductions as proclaimed by the CRCF Regulation. If such units were used for compliance with EU climate targets, the CRCF could pose significant risks, potentially undermining the ability of the EU to achieve these targets. Additionally, the CRCF rules do not exclude that voluntary buyers use CRCF units for offsetting purposes. Yet, using low quality units for offsetting implies severe greenwashing risks. If, as a result of the weaknesses in the certification methodologies, demand for CRCF carbon farming sequestration and soil emission reduction credits was low, this could limit the extent to which the CRCF can contribute to the stated goal of helping to achieve the EU's climate neutrality target.

We recommend revising the proposed CRCF methodology in many areas before its adoption as well as prohibiting the use of CRCF carbon farming units for offsetting purposes. In revising the methodology, we recommend considering the requirements set under the PACM as well as well-established best practices in carbon crediting programmes on the voluntary carbon market.

7 List of References

Arvanitopoulos, T.; Garsous, G.; Agnolucci, P. (2021): Carbon leakage and agriculture: A literature review on emissions mitigation policies (OECD Food, Agriculture and Fisheries Papers). OECD, 2021. Online available at https://www.oecd.org/en/publications/carbon-leakage-and-agriculture_9247f1e7-en.html.

Badgley, G.; Freeman, J.; Hamman, J. J.; Haya, B.; Trugman. A. T.; Anderegg, W. R. L.; Cullenward, D. (2022): Systematic over-crediting in California's forest carbon offsets program. In: *Global Change Biology* 28 (4), pp. 1433–1445. DOI: 10.1111/gcb.15943.

Fischer, T.; Knuth, H. (2023): Grün getarnt. Die Zeit (ed.). Online available at https://www.zeit.de/2023/04/co2-zertifikate-betrug-emissionshandel-klimaschutz, last updated on 18 Jan 2023, last accessed on 20 Jan 2026.

Fuglie, K.; Lewandrowski, J.; Marshall, E. (2023): Addressing 'leaks' in climate-smart agriculture. In: *Nat Sustain* 6 (8), pp. 885–886. DOI: 10.1038/s41893-023-01162-0.

Haseeb, M.; Tahir, Z.; Mehmood, S. A.; Gill, S. A.; Farooq, N.; Butt, H.; Iftikhar, A.; Maqsood, A.; Abdullah-Al-Wadud, M.; Tariq, A. (2024): Enhancing Carbon Sequestration through Afforestation: Evaluating the Impact of Land Use and Cover Changes on Carbon Storage Dynamics. In: *Earth Syst Environ* 8 (4), pp. 1563–1582. DOI: 10.1007/s41748-024-00414-z.

Haya, B. K.; Alford-Jones, K.; Anderegg, W. R. L.; Beymer-Farris, B.; Blanchard, L.; Bomfim, B.; Chin, D.; Evans, S.; Hogan, M.; Holm, J. A.; McAfee, K.; So, I. S.; West, T. A. P. et al. (2023): Quality assessment of REDD+ carbon credit projects. Berkeley Carbon Trading Project (ed.), 2023. Online available at https://gspp.berkeley.edu/research-and-impact/centers/cepp/projects/berkeley-carbon-trading-project/REDD+, last accessed on 20 Oct 2023.

ICVCM (2024): Section 5: Definitions, Version 2, 2024. Online available at https://icvcm.org/wp-content/uploads/2024/02/CCP-Section-5-V2-FINAL-6Feb24.pdf, last accessed on 16 Feb 2026.

Kösler, J. E.; Calvo, O. C.; Franzaring, J.; Fangmeier, A. (2019): Evaluating the ecotoxicity of nitrification inhibitors using terrestrial and aquatic test organisms. In: *Environ Sci Eur* 31 (91). DOI: 10.1186/s12302-019-0272-3.

Kovács, A.; Georges-Picot, B.; Rodezno Ayestas, M. J.; Greiner, S. (2025): The Paris Agreement Crediting Mechanism after COP29: Fundaments in place, substance in progress. Climate Focus; Perspectives Climate Research, 2025. Online available at https://climatefocus.com/wp-content/uploads/2025/05/The-Paris-Agreement-Crediting-Mechanism-After-COP29_FINAL.pdf, last accessed on 16 Feb 2026.

Leifeld, J.; Paul, S. M.; Gross-Schmölders, M.; Wang, Y.; Wüst-Galley, C. (2025): Crediting peatland rewetting for carbon farming: some considerations amidst optimism. In: *Mitig Adapt Strateg Glob Change* 30 (2), p. 13. DOI: 10.1007/s11027-025-10203-2.

Oldfield, E. E.; Eagle, A. J.; Rubin, R. L.; Rudek, J.; Sanderman, J.; Gordon, D. R. (2021): Agricultural soil carbon credits, Making sense of protocols for carbon sequestration and net greenhouse gas removals. Environmental Defence Fund. New York, New York, 2021. Online

available at https://www.edf.org/sites/default/files/content/agricultural-soil-carbon-credits-protocol-synthesis.pdf, last accessed on 24 Aug 2023.

Probst, B. S.; Toetzke, M.; Kontoleon, A.; Anadón, L. A.; Minx, J. C.; Haya, B. K.; Schneider, L.; Trotter, P. A.; West, T. A. P.; Gill-Wiehl, A.; Hoffmann, V. A. (2024): Systematic assessment of the achieved emission reductions of carbon crediting projects. In: *Nature communications*.

Schneider, L.; Haase, I.; Broekhoff, D.; Neeff, T. (2024): Options for addressing the risk of non-permanence for land-based mitigation in carbon crediting programmes. FAO, 2024. Online available at https://doi.org/10.4060/cd3083en, last accessed on 22.07.25.

Schneider, L.; La Hoz Theuer, S. (2019): Environmental integrity of international carbon market mechanisms under the Paris Agreement. In: *Climate Policy* 19 (3), pp. 386–400. DOI: 10.1080/14693062.2018.1521332.

Spalding-Fecher, R.; Kohli, A.; Fallasch, F.; Brown, P.; Fuessler, J.; Broekhoff, D.; Schneider, L. (2021): Attribution: A practical guide to navigating the blending of climate finance and carbon markets. Carbon Limits (ed.), 2021. Online available at https://www.oeko.de/fileadmin/oekodoc/Attribution-Report.pdf.

Vorster, A. G.; Evangelista, P. H.; Stovall, A. E. L.; Ex, S. (2020): Variability and uncertainty in forest biomass estimates from the tree to landscape scale: the role of allometric equations. In: *Carbon Balance and Management* 15 (1), p. 8. DOI: 10.1186/s13021-020-00143-6.

West, T. A. P.; Wunder, S.; Sills, E. O.; Börner, J.; Rifai, S. W.; Neidermeier, A. N.; Frey, G. P.; Kontoleon, A. (2023): Action needed to make carbon offsets from forest conservation work for climate change mitigation. In: *Science (New York, N.Y.)* 381 (6660), pp. 873–877. DOI: 10.1126/science.ade3535.