Temporary carbon units from carbon farming and EU agri-food climate policy

Assessment of risks, opportunities, and alternatives for promoting carbon farming

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Summary for policymakers

This report examines the risks and opportunities of different proposed EU policies to mitigate climate change using carbon farming measures. The proposed policies include an Agricultural Emissions Trading System (AgETS), Mandatory Climate Standards (MCS), and public procurement programme, all building on the EU Carbon Removals and Carbon Farming Regulation**.** Our analysis focuses on the implications of integrating ***temporary CRCF units from carbon farming*** **into the policies; that is, the integration of certified CRCF units generated through carbon farming activities that increase the amount of carbon sequestered in natural sinks or reduce CO_2 emissions from soils and are subject to significant non-permanence risks**.[1] If done well, carbon farming activities can contribute to climate change mitigation, and can also help achieve other EU environmental policy objectives, such as biodiversity enhancement and climate adaptation. Further, they can promote soil health, farm resilience, and generate new sources of income for farmers.

The use of the Carbon Removals and Carbon Farming (CRCF) Regulation to promote carbon farming poses risks and challenges. The CRCF promotes carbon farming based on a result-based crediting approach, where farmers receive CRCF units in return for generating certified mitigation. This regulation aims to create financial incentives for mitigation action at the level of the individual farmer. However, this approach comes with important drawbacks. The characteristics of carbon farming, such as the impermanence of the resulting carbon storage, pose challenges for using crediting as a policy instrument to promote mitigation action. Moreover, weaknesses in the proposed CRCF carbon farming certification methodologies could be expected to result in CRCF units of low-quality, due to inadequately addressing non-permanence risks, non-additionality, and other issues.

In particular, the risk of non-permanence and non-additionality are currently insufficiently managed by the CRCF. The CRCF lacks liability and replacement requirements to account for the temporary nature of the mitigation and does not fully account for non-permanence risks of peatland rewetting. The mitigation is also at risk of being non-additional, due to insufficient additionality assessments and double funding from the Common Agricultural Policy (CAP). This would result in significant overestimations of emission reductions or removals. These risks are higher for measures involving management changes (e.g. crop rotations and the resulting soil carbon sequestration) than those based on land-use changes (e.g. peatland rewetting or agroforestry systems).

To address these shortcomings, CRCF certification methodologies should be improved through stringent additionality and quantification requirements, as well as strengthened liability provisions to manage non-permanence risk. **Given the low expected quality of temporary CRCF units, they are inappropriate to use for offsetting emission elsewhere; their use as offsets risks environmental integrity.** The planned review of the CRCF Regulation by July 2026 (Article 18(4) of the CRCF Regulation) to align it with Article 6 of the Paris Agreement and best practice in the voluntary carbon market should be taken as an opportunity to strengthen the requirements which CRCF units must adhere to.

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[1] *Examples include measures that mitigate via enhanced sequestration (e.g. afforestation, soil carbon sequestration in mineral soils) and reduced CO_2 emissions from soils (e.g. peatland rewetting), both which carry non-permanence risks. We do not consider other types of temporary CRCF units, e.g., those arising from carbon capture and utilisation. We also exclude CRCF carbon farming units that do not carry reversal risks, e.g. those from reduced fertiliser application or reduced livestock emissions, should a certification methodology be approved for these measures.*

Promising new agri-food climate policies that establish price-based incentives for agri-food emission reductions are under consideration by the European Commission. The proposed compliance policies – an **agricultural emissions trading scheme (AgETS) or mandatory climate standard (MCS)** – could establish incentives for reducing emissions in the agri-food sector in a cost-effective manner. **The draft policy designs leave, however, critical details undefined: effective agricultural compliance policies require ambitious targets, and practical approaches to ensure low participation costs for farmers and cost-effectiveness.**

In this study, we consider the specific question of whether temporary CRCF units should be integrated into the proposed agri-food climate policies. We conclude that allowing farmers or other obligated agri-food actors to use temporary CRCF units of low expected quality as offsets to meet their climate obligations would undermine the proposed agri-food policies. Accordingly, **we recommend that the agri-food climate policies should exclude low-quality temporary CRCF units**.

An alternative policy under consideration, a **public procurement programme for CRCF units**, would be likely to offer weaker incentives for agri-food emission reductions than the compliance policies due to its voluntary nature and potentially limited public funding. However, **this public procurement scheme has some advantages, if exclusively publicly funded, it would exclude offset uses and therefore - even in the case of low-quality CRCF units – avoid any environmental integrity risk. Yet, the quality of temporary CRCF units would remain important to ensure cost-effectiveness.** Further, considering the climate, environmental, and social benefits of carbon farming measures, such a scheme would be well aligned with the principle of public money for public good. **While a purchasing programme that blends public and private financing could enable a larger budget due to multiple sources of funding, it would be important that such a programme should limit claims to exclude offsetting and only permit contribution claims to avoid environmental integrity risks arising from the low expected quality of CRCF units.**

We also consider coherency of the CRCF and agri-food policies with the Common Agricultural Policy. The CRCF and agri-food policies overlap considerably with the CAP. We identify three models for how the CAP and carbon farming under the CRCF could interact: as separate systems; as combined systems with CAP supporting farmers with CRCF activities; or as nested systems where CRCF units are generated via the CAP. Under all models, **overlaps in the measures funded under the CAP and the CRCF create problems, as they pose significant risk of double funding.** While the CRCF and CAP funding could be structured to make this double funding generally permissible under EU law, it would make the resulting temporary CRCF units non-additional, posing environmental integrity and cost-effectiveness risks. **The additionality requirements of CRCF certification methodologies should be strengthened to address this, including considering only awarding units equivalent to the fraction of mitigation resulting from CRCF funding.**

Targeted activity-based payments, where farmers are paid for implementing measures (rather than the results of those measures), offer an alternative way to promote carbon farming. Because they do not give rise to the environmental integrity concerns of carbon crediting approaches, these approaches are well-suited to carbon farming measures with high risks of non-permanence, non-additionality, or disproportionately high monitoring, reporting and verification costs relative to expected benefits (such as soil carbon sequestration on mineral soils). Importantly, activity-based payments also reduce cost, complexity, and risk for farmers. The current implementation of activity-based payments within the Common Agricultural Policy (CAP) has been criticised as relatively ineffective at mitigating climate change due to weak environmental ambition. The revision of the CAP after 2027 offers potential to implement more effective targeted activity-based payments for climate and environment outcomes, building on some positive examples from National CAP Strategic Plans.

Given the uncertain scale and shape of the CAP for the period 2028 to 2034, this report also identifies other potential funding sources for activity-based payments to promote carbon farming measures. Promising options exist at the EU, Member State, and private actor level, including building on existing Member State examples, utilising AgETS auction revenues for activity-based funding, a just transition fund for agriculture, and a revision of the CRCF into an activity-based scheme, among others. **These alternatives illustrate that there are opportunities to promote carbon farming beyond a result-based CRCF or the CAP.**

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Abbreviations

AECM	Agri-environmental-climate measures
AgETS	Agriculture Emissions Trading System
ANK	Aktionsprogramm Natürlicher Klimaschutz (Action programme for natural climate protection)
CAP	Common Agricultural Policy
CCQI	Carbon Credit Quality Initiative
CDM	Clean Development Mechanism
CRCF	Carbon Removals and Carbon Farming Regulation
CRF	Common Reporting Format
CSRD	Corporate Sustainability Reporting Directive
ESABCC	European Scientific Advisory Board on Climate Change
ETS	Emissions Trading System
FLAG	Forest, Land and Agriculture
GAEC	Good Agricultural and Environmental Conditions
GBER	General Block Exemption Regulation
GCD	Green Claims Directive
IACS	Integrated Administration and Control System
IC-VCM	Integrity Council for Voluntary Carbon Markets
LULUCF	Land Use, Land Use Change, and Forestry
MCS	Mandatory Climate Standard
MFF	Multiannual Financial Framework
MRV	Monitoring, Reporting and Verification
NDC	Nationally Determined Contribution
NSP	National Strategic Plan
SBTi	Science Based Target initiative
SOC	Soil Organic Carbon
UAA	Utilised agricultural area
VCMI	Voluntary Carbon Markets Integrity Initiative

1 Introduction

Net greenhouse gas (GHG) emissions in the EU's agriculture and land-use, land-use change, and forestry (LULUCF) sectors are inconsistent with the EU's climate objectives, despite holding significant mitigation potential (ESABCC, 2024). The EU's agriculture emissions declined by only 7% from 2005 to 2023 (EEA, 2025a), and between 2014 and 2023, the EU's average annual carbon sink in the LULUCF sector declined by 30% relative to the decade before, with Europe's forests and land sequestering less carbon than expected (EEA, 2025b).

Limited progress in these sectors has been attributed in part to weak or ineffective policy support for land-based carbon sequestration and emission reductions ('carbon farming'), primarily through the Common Agricultural Policy (ESABCC, 2024; EU Court of Auditors, 2024; IPCC, 2022b). As a partial response, the EU has introduced the Carbon Removals and Carbon Farming Regulation (CRCF), which alongside other removals approaches, aims to promote temporary carbon sequestration through carbon farming (EC, 2025c). According to the CRCF Regulation, 'carbon farming' refers to any practice or process carried out over an activity period of at least five years, related to the management of a terrestrial or coastal environment and resulting in the capture and temporary storage of atmospheric or biogenic carbon in biogenic carbon pools, or in the reduction of soil emissions' (Article 2(10), (EC, 2025c)). This covers measures that increase soil carbon sequestration, such as cover cropping, decrease soil emissions, such as peatland rewetting, and those that increase carbon in biomass, such as agroforestry and afforestation.

The CRCF aims to increase trust in carbon farming certification and generate financial incentives for individuals, who receive certified tradeable units in return for implementing carbon farming. However, crediting temporary carbon sequestration poses fundamental challenges, particularly because of the non-permanence of mitigation impacts (Cullenward, 2023), but also due to costly and uncertain monitoring, reporting, and verification (MRV), quantification, and non-additionality (Siemons et al., 2025; Oldfield et al., 2022; Paul et al., 2023). The CRCF has been criticised for failing to establish a high quality standard, posing concerns due to the potential use of temporary CRCF units to offset other emission reductions (Öko-Institut, 2024).

Previous and ongoing work by the European Commission's Directorate-General for Climate Action (DG CLIMA) has investigated promising policy options for pricing agricultural GHG emissions to achieve mitigation in the agri-food value chain. Considered options include various agricultural emissions trading systems, mandatory climate standards, and public procurement of carbon farming units (Bognar et al., 2023; EC, 2025a). While the primary objective of agri-food climate policies is to reduce agri-food GHG emissions, the draft policy designs also consider integrating temporary CRCF units from carbon farming[2], e.g. by allowing agri-food value chain actors to meet their mitigation objectives by purchasing temporary CRCF units as offsets for their own emissions. This integration could enhance incentives for carbon farming and boost its uptake. However, the challenges associated with crediting temporary carbon sequestration and the quality of temporary CRCF units pose significant risks to the integrity of the agri-food climate policies.

In this study, we examine the risks and opportunities of EU policies to mitigate climate change using carbon farming. Based upon literature and policy review, this study:

1. Introduces carbon farming and identifies the difficulty of promoting temporary carbon sequestration using crediting approaches, as illustrated by the specific weaknesses of the CRCF.

[2] *Throughout this report we use the term '**temporary CRCF units**' to refer to certified CRCF units generated through carbon farming activities that increase the amount of carbon sequestered in natural sinks or reduce CO_2 emissions from soils and are subject to significant non-permanence risks. This includes both mitigation through enhanced sequestration (e.g. afforestation) and reduced emissions (e.g. from peatlands).*

2. Assesses the EU Commission's proposed agri-food climate policies and the specific question of whether temporary CRCF units should be permitted to meet climate targets within the proposed policies.
3. Identifies alternative approaches and policy options to promote temporary carbon sequestration, including via the Common Agricultural Policy or other activity-based funding instruments.

The report proceeds as follows: In Chapter 2, we assess the challenges, risks and opportunities of promoting carbon farming sequestration through crediting approaches, with a critical assessment of the CRCF and its implications. In Chapter 3, we introduce the proposed agri-food climate policies and assess the risks and opportunities of integrating temporary CRCF units. Chapter 4 considers alternative policy options to promote carbon farming, including through the Common Agricultural Policy or via other activity-based funding policy options. Chapter 5 concludes, highlighting key policy implications for the CRCF, the agri-food climate policy options, and the wider role of temporary carbon sequestration in meeting the EU's climate objectives.

2 Crediting temporary carbon farming sequestration: Key aspects and challenges

The CRCF was established as a crediting mechanism to promote carbon removals, including carbon sequestration in natural ecosystems, and reducing soil emissions. It seeks to facilitate investment in sustainable carbon farming solutions (among other carbon removal activities) by establishing EU wide quality criteria and requirements for monitoring and reporting processes for the certification of carbon removal activities (EC, 2025a). The CRCF will deliver certified removal units that are intended to represent one tonne of CO_2e mitigation impact. While the CRCF Regulation does not regulate the end-use of the certified units, they will presumably be available to public and private organisations to back their voluntary claims on carbon removals or soil emission reductions (EC, 2024b), and potentially might be integrated into compliance policies in the agri-food sector, as outlined in chapter 3.

Promoting carbon sequestration in natural ecosystems through crediting approaches like the CRCF bears significant risks, which are discussed in this chapter. A major challenge results from the fact that carbon removals achieved by storing carbon in soils or forests may quickly be reversed (section 2.2). Existing carbon crediting programmes have implemented different approaches for dealing with these challenges (section 2.2.1 and Annex 7.1). The CRCF Regulation and the proposed certification methodologies also include provisions which intend to address non-permanence challenges; yet these remain insufficient (section 2.2.2 and Annex 7.2). Next to the issue of non-permanence, other characteristics of carbon farming activities pose additional challenges for crediting, including monitoring and quantifying soil carbon sequestration or emissions reductions, making the use case of associated units under the CRCF critical (section 2.3).

2.1 Carbon farming: Activities to enhance removals and reduce emissions from natural ecosystems under the CRCF

Carbon sequestration in natural ecosystems can play a key role in near-term climate mitigation. Enhancing or preserving carbon stocks can delay climate damages and thus slow down the rate of warming and "buy time" for developing permanent options to reduce emissions and enhance carbon removals (Herzog et al., 2003; Marshall and Kelly, 2010; Murray and Kasibhatla, 2013; Parisa et al., 2022). Such mitigation activities, which

are currently available at comparably low cost[3], can thus serve as a time buffer and contribute to staying within a carbon budget that is aligned within the long-term temperature goals of the Paris Agreement until other, permanent mitigation options become available (IPCC, 2022a, 2022b). Additionally, protecting or preserving natural ecosystems imply a number of other environmental and social benefits, such as enhancing resilience to climate change impacts, protecting biodiversity, soil health and enhancing water retention capacities (Bossio et al., 2020; Griscom et al., 2017; Roe et al., 2021). Nevertheless, it is key to ensure that temporary carbon sequestration does not delay or replace decarbonisation efforts. Land use change or management practices that can enhance carbon sequestration in the land sector include afforestation and reforestation, improved forest management, agroforestry, practices to promote soil carbon sequestration and restoration of terrestrial wetlands and peatlands (ESABCC, 2025).

The proposed methodologies for enhancing carbon sequestration in the land sector under the CRCF break these practices down into three types of "carbon farming" activities:[4]

- (1) carbon removals and soil emission reductions resulting from the **management of agricultural soils and agroforestry** including practices like e.g. improved crop management, improved grassland management or using organic soil amendments as well as the planting of trees inside parcels. Agricultural practices that reduce direct and indirect N_2O emissions from agricultural soils (through e.g. precision fertilization or use of nitrification inhibitors) are also covered by the proposed draft methodology even though they deliver permanent mitigation impacts and therefore differ from activities related to carbon sequestration in soils or biomass which carry reversal risks. This is because changing fertilising practices is not related to a GHG reservoir, so that reducing the formation of N_2O emissions does not result in the increased storage of these gases. Consequently, the emission reductions achieved by such activities are not reversible (FAO, 2024). This paper focuses only on carbon farming sequestration activities as well as peatland rewetting.
- (2) carbon removals and soil emission reductions resulting from the **planting of trees** on grassland (without agricultural use), croplands, settlements or degraded forest land.
- (3) soil emission reductions resulting from **peatland rewetting and restoration** by e.g. stopping the drainage of natural water flows or increasing water levels. Such activities which may be complemented by re-establishing peat-forming vegetation or the application of paludiculture.

The draft methodologies each list specific types of activities eligible for certification under the CRCF and define further eligibility rules.

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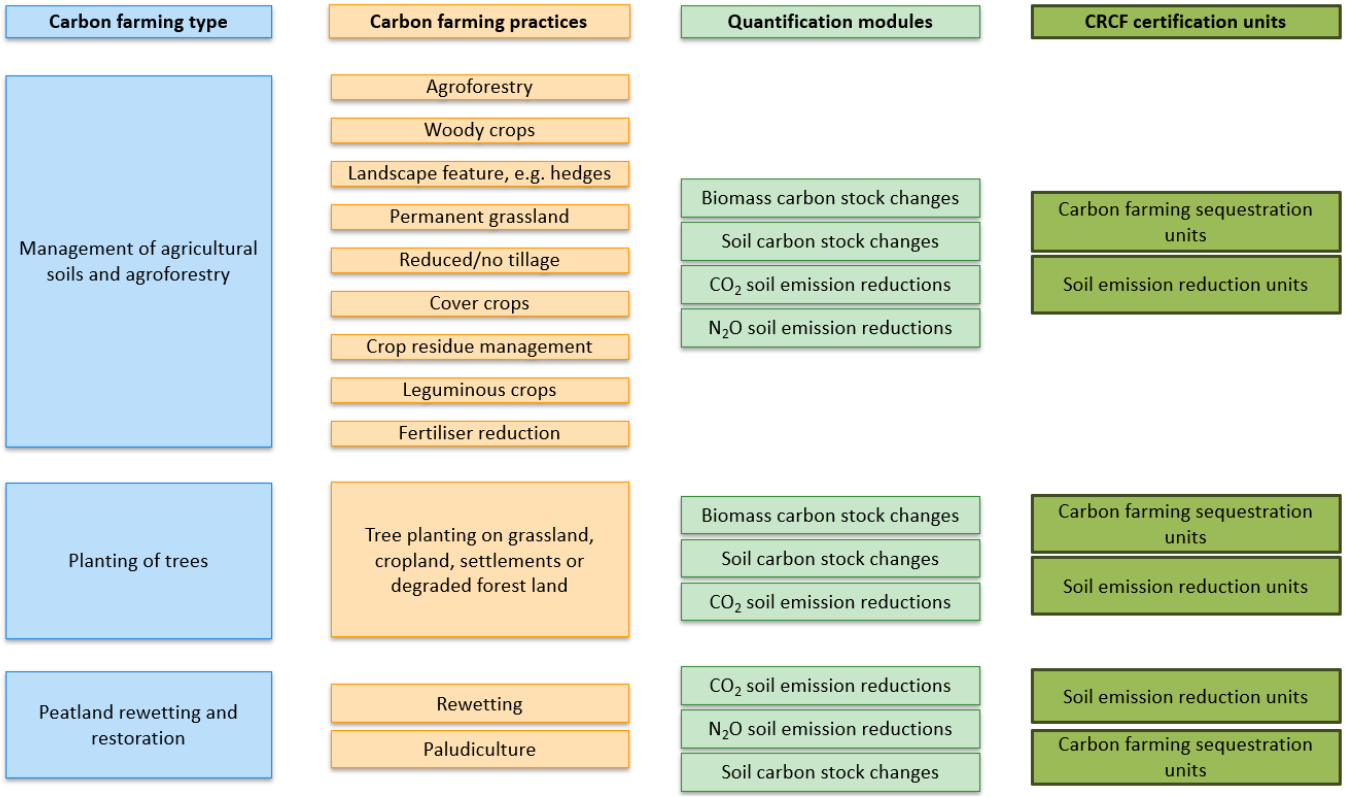
[3] *European Scientific Advisory Board on Climate Change (2025) reports costs of temporary removals through carbon farming between € 0-100/tCO_2 while costs for permanent removals amount up to € 100-1000/tCO_2, depending on the technology. Similarly, GHG price scenarios for EU agriculture assume a reduction potential of 16 to 23% at a GHG price of €100/t CO_2e (e.g. Perez et al., 2016; Stepanyan et al., 2023). Bognar et al. (2023) mention, that some forest management, agriculture, and afforestation removals could be delivered at prices below €25 per tonne CO2e. EcAMPA4 (Perez Dominguez et al., 2025) assume in the context of the LULUCF sector an even lower carbon price of 1.5 and 2.5 euros per metric tonne of CO_2e to in case of separate carbon pricing mechanisms for this sector.*

[4] *The Commission has proposed draft methodologies for three different types of activities to enhance carbon storage in the land sector as of July 2025. The draft certification methodologies for carbon farming are not publicly available yet. Additionally, work is ongoing on planned on developing certification methodologies for other types of carbon removal activities. Draft certification methodologies for permanent removals from DACCS/BioCCS as well as biochar have been published on the European Commission's website and a public consultation on the corresponding draft delegated act was open to public consultation between July and September 2025 (EC, 2025a, 2025e). Discussions on further methodologies for enhanced rock weathering and ocean alkalinity enhancement have started in September 2025. By July 2026, the European Commission will additionally prepare a report assessing the feasibility of certifying activities that reduce agricultural emissions from the management of livestock (i.e. emissions from enteric fermentation and manure management) and develop a pilot methodology on how to certify livestock emission reductions (Art. 18(3) of the CRCF Regulation).*

Figure 1: Overview of carbon farming activities eligible under the CRCF



Source: own compilation

Box 1: Contribution of CRCF units to meeting national mitigation targets

According to the CRCF Regulation, all (temporary) carbon removals and soil emission reductions certified under the CRCF should contribute to achieving climate neutrality in the EU and the EU's NDC (Article 1.2). However, CRCF units cannot be directly counted towards reaching the EU's and Member States' domestic climate targets. There is no direct link between the units certified under the CRCF, which are based on a life-cycle assessment methodology, and the accounting of carbon removals and soil emission reductions towards the EU climate objectives to achieve climate neutrality which are based on the relevant EU legislation and IPCC rules (EC, 2024b).

Progress towards reaching the EU climate objectives is measured based on the information reported in Member States' and the EU's GHG inventories. For managing and funding temporary carbon sequestration units, it is therefore a key question how the mitigation they represent will be captured in national GHG inventories and thus contribute to reaching EU LULUCF targets[5].

Activities under the CRCF methodologies on agriculture/agroforestry, tree planting and rewetting of peatlands will impact emissions and removals in the agricultural and LULUCF sector[6] which are reported in

[5] *EU mitigation targets for the LULUCF sector are laid down in the LULUCF Regulation that requires that in the period 2021 to 2025 GHG emissions from the sector are balanced by at least an equivalent amount of CO_2 removals (no-debit-rule). For the period 2026 to 2030 national targets for 2030 and a budget for the time 2026-2030 need to be fulfilled (see EEA, 2024).*

[6] *The LULUCF sector consists of six land categories, namely Forest land, Cropland, Grassland, Wetlands, Settlements, Other land, and the reporting category Harvested Wood Products (HWP).*

two different sections of national GHG inventories. Emissions and removals in the LULUCF sector are reported 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 guidelines. Under the CRCF, different methods and models may be used to calculate carbon sequestration from various measures. National inventory methodologies are typically designed for broad-scale reporting rather than project-level quantification.

There is thus also no direct link between the units certified under CRCF and the accounting of carbon removals and soil emissions under the LULUCF Regulation and towards EU or national mitigation targets. 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.[7] This includes that fields 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 can be used to develop updated and improved emission factors, feeding into national soil models. This way, the CRCF can help improving the quality of national GHG inventories over time.[8] 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).

2.2 Reversal risks of carbon storage in natural ecosystems

The storage of carbon in natural systems like forests, soils, wetlands or biomass or the reduction of CO_2 emissions from these natural systems may only be temporary, as the carbon may quickly be released, whether through natural disturbances like wildfires, diseases, or human interference (see e.g. Anderegg et al., 2020; ESABCC, 2025). Carbon farming activities relate to reducing emissions from or enhancing the flow of removals into carbon reservoirs which are susceptible to natural or human-caused depletion (except for changing fertilising practices which are also covered by the draft certification methodology and deliver permanent emission reductions). For example, a tree planting activity will remove CO_2 from the atmosphere and result in the storage of carbon in trees, vegetation and soils. A reversal occurs if – at any point in time – the cumulative quantity of additional CO_2 stored in these reservoirs is reduced. In the case of peatland rewetting, carbon stocks in the

[7] *Use of Tier 3 models according to the IPCC guidelines.*

[8] *Such improvements are required by the LULUCF Regulation that requires that Member States report all land use categories with national emission factor data (Tier 2) from the year 2028 onwards.*

peatland reservoir are enhanced compared to the baseline. Here, a reversal occurs in if rewetting stops so that peatland dries out. The resulting emissions reduce the quantity of carbon stored in the peatland relative to the level of storage achieved through the carbon farming activity (FAO, 2024; see Leifeld et al. (2025) for a discussion of reversal risks of peatland rewetting). Reducing emissions from carbon reservoirs is thus different from activities that destroy or avoid the formation of non-CO_2 greenhouse gases because these activities "do not result in increased storage of these gases. As such, the emission reductions achieved by these activities are not reversible" (FAO, 2024). In case of reversals, the mitigation benefit achieved would be undone such that emissions were delayed but no permanent net mitigation effect would be achieved.

The *relative* reversal risk of such mitigation activities depends on both internal factors like inadequate project management and external factors including technical, legal or financial capacity. Additionally, the size of the affected carbon reservoir impacts the scale of the reversal risk: for smaller project-based activities, there is a higher risk that natural disturbances will reverse large parts of the mitigation achieved than for larger activities (FAO, 2024). All of the activities that protect or enhance carbon storage in natural ecosystems must be maintained in order to keep the carbon stored and thus to preserve the achieved mitigation impact; this means that stopping the activity can already be sufficient to trigger reversals (Böttcher et al., 2022).

Thus, all activities that aim to protect or enhance carbon storage in natural ecosystems or reduce emissions from peatlands imply reversal risks. The specific reversal risk for different carbon farming activities varies, depending on their characteristics (see Siemons et al., 2025):

- **Management changes**:
  Activities that relate to changes in agricultural management which require regular management decisions within short time intervals have a high potential for reversals. Management practices that increase soil carbon (e.g. crop rotation, catch crops, low tillage, organic fertilisers) do not require significant upfront investment. Instead, they rely on consistent, ongoing implementation and decision making. These practices are sensitive to external influences like market dynamics and weather variability, which can affect their adoption and continuity. For example, crop rotation plans can be revised on an annual basis, allowing farmers to respond to these influences at short notice. This flexibility raises the risk of reverting to former management practices that can reduce soil carbon levels. Consequently, the long-term effectiveness of these practices with carbon sequestration depends on sustained commitment and incentive frameworks.
  Additionally, there are carbon reversal risks due to increased weather variability, including heavy rainfall, flooding, and higher temperatures, which can accelerate organic matter decomposition and increase soil carbon turnover. These dynamics reduce the permanence of carbon stored in soils and thus particularly affect management changes at smaller geographical scale.

- **Land use changes**:
  Activities to change land uses, which include peatland rewetting, establishment of agroforestry systems and planting trees generally involve lower risks of reversals. They require longer planning processes and advisory services, are more complex to implement and monitor and might involve larger upfront costs, so that there are higher barriers to reverse them. Additionally, such measures often face legal restrictions for reversal (Paul et al., 2023). For example, rewetting of peatlands requires participation of actors over large geographic areas who share the same drainage system as well as approval from local authorities. These activities are likely to face medium to high barriers to reversals, but are still vulnerable to significant carbon reversal risks, as they remain exposed to extreme weather events, including droughts, wildfires, storms or pest breakouts. Such disturbances can trigger the release of stored carbon back into the atmosphere (Siemons et al., 2025).

2.2.1 Approaches to manage non-permanence risks of temporary carbon sequestration

The non-permanence of temporary carbon sequestration poses significant challenges for carbon crediting. There is a fundamental mismatch between temporary storage of carbon in natural ecosystems and the permanent impact of CO_2 emissions on the climate (Cullenward, 2023). To meet the goal of the Paris Agreement to limit global warming to 1.5°C, CO_2 emissions must stay within a cumulative "carbon budget". If global temperature rise exceeds this limit ("temporary overshoot"), this would need to be compensated for by additional removals in the future. Thus, to meet the Paris Agreement's temperature goals, emission reductions or removals must be effectively permanent (Allen et al., 2022). Additionally, relying on temporary mitigation could imply the risk of distracting and delaying decarbonisation efforts (Cullenward, 2023).

Crediting mechanisms have taken different approaches to address these challenges and to integrate temporary carbon sequestration activities in carbon crediting programmes. These include (see Annex 7.1 for further details):

- **Temporary crediting** based on issuing credits that expire after a defined time period, and which need to be replaced by permanent mitigation or other/renewed temporary credits.
- **Monitoring and compensating for reversals** which can be done through various design options like e.g. a buffer pool.
- **Issuance deductions** meaning that less credits are issued than the amount that would correspond to the quantified mitigation impact of an activity to compensate for potential reversals.
- **Tonne-year accounting** under which only a fraction of credits is issued which increases over time.
- **Monitoring until the risk is negligible or remediation is in place**: An alternative, stringent approach to manage non-permanence risk was considered but ultimately rejected for the Paris Agreement Crediting Mechanism (PACM), the Removal Standard adopted in 2024 (UNFCCC, 2024). The draft standard on approaches to manage non-permanence risks (v02.2) (UNFCCC, 2025) proposed that activities with non-permanence risks must continue monitoring after the crediting period until the risk of reversals is remediated through the replacement of all previously issued units or until the residual reversal risk is demonstrated to be negligible. For carbon farming activities for which reversal risks remain, this means that monitoring would need to be continued until the residual risk of future reversal is very low, as assessed by a risk assessment tool, which is still to be developed. or previously issued units would need to be replaced. This unprecedented approach would have set a new benchmark for addressing non-permanence risks, though it was ultimately rejected.

2.2.2 Temporary carbon sequestration units under the CRCF: Overview and issues

To manage risks of reversal, the CRCF aims to use **temporary crediting**. However, significant issues related to the implementation of temporary crediting as currently proposed mean that it will be ineffective at managing reversal risks.

The CRCF generally acknowledges the non-permanence challenges associated with carbon sequestration in natural ecosystems. The CRCF regulation stipulates that carbon farming sequestration units should be temporary units subject to an expiry date (Art. 12(5)). According to the draft certification methodologies for carbon farming activities, they can be issued for carbon removals resulting from the management of agricultural soils and agroforestry as well as from tree planting.

However, the approach of temporary crediting is not implemented in a robust way in the draft methodologies for temporary carbon sequestration units. **The provisions in the draft methodologies fail to address potential reversals after the expiry of the carbon farming sequestration units**, i.e. *beyond* the validity/monitoring period. They do not specify any consequences for the expiry of temporary carbon farming sequestration

units, such as provisions regarding liability for replacing expired units. **This is particularly concerning given that no restrictions regarding eligible use cases of these units are included in the draft certification methodologies, so that temporary units can in principle used for (permanent) offsetting purposes**. Additionally, the proposed provisions suggest monitoring and compensation for reversals as an approach to address reversal risks *during* the validity/monitoring period of the units. Yet, **the storage and liability provisions that apply during the validity period in the three draft methodologies for carbon farming activities lack clarity**, potentially leaving reversals during the monitoring period unaddressed. Furthermore, the provisions on storage and liability do not acknowledge the reversal risks associated with peatland rewetting and do not appropriately differentiate between temporary and permanent soil emission reductions. Specific shortcomings of the draft certification methodologies are outlined in Annex 7.2.

2.3 Further challenges for crediting carbon sequestration in the land sector

Even if the challenges related to non-permanence outlined above were addressed by improving the provisions in the draft methodologies, risks related to crediting carbon sequestration in the land sector under the CRCF would remain. This is because crediting carbon sequestration in the land sector is associated with further challenges that apply to different types of measures to varying extents. These challenges, posing significant environmental integrity risks, include:

Quantification/Monitoring

- Determining the SOC content of soils is inherently challenging. Due to high soil heterogeneity within and across areas, carbon stock measurements may vary and it can be difficult to distinguish the impact of a measure from other factors (i.e., a low signal-to-noise ratio, see West and Six, 2007). Thus, monitoring and verification of soil carbon measures can be quite costly, primarily due to the need for detailed, on-ground sampling and the establishment of appropriate reference areas. These reference areas are essential for accurately assessing changes in soil carbon levels by providing baseline against which developments in the treatment can be compared. The process often involves repeated soil sampling over time, laboratory analysis and sometimes the use of remote sensing or modelling tools to complement field data. This complexity and the labour-intensive nature of the work entail high costs, making robust monitoring a significant challenge for scaling initiatives to enhance soil carbon.
- The quantification and monitoring of mitigation impacts for peatland rewetting and agroforestry (carbon stored by trees in above-ground biomass) is often more straightforward, and cost effective compared to soil carbon measures. These measures can be tracked using observable indicators like tree cover or tree size or water table levels in rewetted peatland. In combination with country-specific emission factors, these measurable parameters can provide reliable proxies for estimating carbon sequestration and emission reductions.
- As a result of the challenges related to monitoring, the quantification of mitigation impacts of measures to enhance soil carbon is associated with high uncertainties. Unless crediting methodologies use conservative approaches to account for these uncertainties, there is a risk that mitigation impacts resulting from such activities are overrated. This poses risks to the integrity of corresponding carbon credits that might actually represent less than one tonne of carbon removals or reduced carbon emissions.

Additionality

- Crediting mechanisms must also ensure that the credited mitigation activities are additional. This means that the activities they certify are not legally required as well as that the action would not have taken place without the financial incentives from the sale of certificates. **Assessing additionality is**

particularly challenging in the agriculture/land use sector with complex private and public drivers (e.g. CAP or other national agricultural policy requirements), making it hard to isolate causality (Böttcher et al., 2022).

- **The EU Common Agricultural Policy (CAP), exerts significant influence on farming decisions and shapes what is considered standard agricultural practice.** Particularly, the conditionalities under the CAP (the Good Agricultural and Environmental Conditions, GAECs) affect the additionality of carbon sequestration measures in the EU. The GAECs set compulsory minimum standards for agricultural activities that are further operationalised in national legislation in Member States (e.g. ratio to permanent grassland relative to agricultural area to be maintained, obligation to keep buffer strips, requirements regarding minimum soil cover to prevent erosions) and should influence the definition of additionality under the CRCF. Voluntary measures like eco-schemes and agri-environmental-climate measures (AECM) can create additional carbon sequestration or emissions reductions to these minimum requirements. Thus, in principle, all carbon farming measures supported under the CRCF methodologies can also be funded by the CAP, either through conditionality requirements or voluntary measures. This means that the activities should not be considered additional under the CRCF. Yet, for large-scale implementation of measures with high mitigation impact and high implementation costs (like agroforestry, peatland rewetting) support under the eco-schemes and AECMs are currently not sufficient. For such measures, CRCF funding can provide an important additional funding source. Additionally, the CAP is periodically reformed to align with new economic, environmental and social priorities. Such a revision takes place generally every seven years and also includes a review of the GAEC standards. When the GAECs are changed, this implies changes to the minimum requirements for environmental practices under the CAP. These changes can alter the baseline conditions against which additionality under the CRCF is evaluated. In addtion, the latest European Commission's proposals for the Common Agricultural Policy (CAP) for the 2028-34 period indicates potential changes to the conditionality requirements which would lower the standards with respect to environmental and climate objectives, further weakening these requierments, which have already been weakened by changes introduced in 2024 and 2025 (Hart and Baldock, 2025). This could drastically change the baseline conditions under CAP against which additionality will be evaluated in future.[9]

- Even if a measure could be considered additional to what is required under CAP, it still is highly challenging to ensure and assess additionality. Firstly, **assessing additionality is challenging due to the evolving nature of agricultural practices over time**. The adoption of soil-conserving techniques, such as reduced tillage or humus enrichment, is likely to increase as these practices demonstrate economic benefits under changing climatic conditions — particularly in terms of erosion control and improved soil water retention. Similarly, the use of cover crops and organic fertilisers may become more widespread, due to stricter environmental regulations on fertiliser use, rising fertiliser costs and their routine application in organic farming systems. Also, some farmers currently implement reduced tillage practices, primarily to save fuel or mitigate soil erosion. Measures such as the use of cover crops, inclusion of forage and grain legumes in crop rotations and buffer strips are thus often common practice and financially viable.What is common practice and financially viable without the incentive of CRCF funding is therefore subject to changes over time. Secondly, **comprehensive data on the prevalence of carbon farming activities remains limited which makes it challenging to assess additionality, particularly for measures to increase soil carbon**. Relying on farm-specific baselines risks overestimating mitigation effects, as it could incentivise farmers to temporarily discontinue and then reinstate practices like reduced tillage solely to qualify for CRCF units. On the other hand, defining a historical baseline year at regional level is complicated by the temporal variability in vegetative cover on arable land throughout the year. As a result, multiple satellite images

[9] *Conversely, there is a risk that CRCF additionality requirements could act as a barrier to raising baselines requirements under CAP, due to the concern that this would lead to CRCF-certified activities no longer being additional and therefore certifiable.*

across different time points would be required to accurately detect and verify changes in land management practices.

Thus, there are significant challenges associated with monitoring and quantifying soil carbon sequestration and emissions reductions and ensuring that measures are additional. The draft certification methodologies for carbon farming activities fail to adequately address these challenges. Quantification provisions do not ensure that mitigation impacts are quantified in a conservative way and additionality requirements are weak (see also section 4.1).[10] They thus pose risks to environmental integrity and undermine the CRCF's claims to high credit quality. Due to the reversal risks implied in carbon farming sequestration activities as well as the challenges associated with robust quantification and ensuring additionality, temporary CRCF units should not be used for offsetting purposes (see box below).

Box 2: Use cases of temporary CRCF units

Against the background of the different challenges associated with crediting temporary carbon farming mitigation, the use of resulting carbon units is key. The units may either be used to achieve the buyer's mitigation targets (**offsetting**) or they may be used to **channel targeted funding to mitigation activities in the land sector** (**contribution**) without accounting the mitigation outcomes towards a mitigation target. Different use cases and the way in which units will be integrated into EU climate policy instruments may have different impacts on overall mitigation outcomes.

Offsetting claims: If temporary units are used for **offsetting**, i.e. to achieve mitigation targets, this may entail significant environmental integrity risks, in addition to mitigation deterrence. In the context of carbon markets, **environmental integrity** is used to refer to the aim that a crediting mechanism must not lead to aggregated GHG emissions that are higher than they would have been without the use of the mechanism (Siemons et al., 2025; Schneider and La Hoz Theuer, 2019). Under offsetting approaches, buyers purchase carbon farming sequestration units to compensate for their (residual) emissions. Buyers could be public authorities, including national or sub-national governments that buy units for compliance use under specific policies (e.g. EU ETS or Fuel Quality Directive (Böttcher and Fallasch, 2024)), or private actors, including businesses along the agri-food chain with the intention to reduce their scope 3 emissions or other private actors who want to contribute to achieving mitigation in the agricultural or land-use sector. When temporary carbon farming sequestration units are used to offset CO_2 emissions that remain in the atmosphere for thousands of years and temporary mitigation outcomes are subsequently reversed but the reversals are not compensated for, aggregate emissions may ultimately increase because of using the crediting mechanism. This will undermine efforts to meet long-term climate objectives. Recent research states that experts are increasingly arguing that the permanence of carbon removals needs to be considerably longer than 100 years and concludes that temporary CO_2 storage in the biosphere and oceans should not be used to offset fossil fuel emissions (Romm et al., 2025). Similarly, crediting mechanisms must ensure that credited activities are additional, i.e. that they would not have occurred without the incentive of the crediting mechanism. If a farmer was going to enhance soil carbon even without the incentives of the CRCF and the resulting unit was used by a corporate actor to offset their emissions (instead of reducing them or purchasing units that are additional), the total amount of emissions in the atmosphere would be higher because of using the crediting mechanism. Furthermore, crediting mechanisms must ensure that mitigation outcomes are robustly quantified. If the mitigation impact of a carbon farming sequestration activity is overestimated, using the corresponding unit to offset a tonne of CO_2e would lead to an increase in aggregate emissions as well.

Due to the risks for environmental integrity that are associated with the non-permanence, quantification and additionality challenges of crediting temporary carbon farming sequestration, carbon farming

[10] *See https://www.oeko.de/blog/revised-methodologies-under-the-eu-carbon-certification-removal-framework-continue-to-lack-integrity/.*

sequestration units must adhere to the highest quality standards (which are unlikely to be achieved) if they were to be used for offsetting and should not replace decarbonisation efforts.

Contribution claims: As an alternative to offsetting, temporary carbon farming sequestration units may be **used to channel targeted funding to mitigation activities in the land sector**. Public authorities might fund carbon farming sequestration activities through the CRCF by public result-based finance, for example in the form of public procurement of temporary carbon farming sequestration units. Private buyers could also purchase carbon farming sequestration units to provide financial support to carbon farming activities. Instead of accounting the mitigation impact towards their own targets and supporting climate neutrality claims for a product or an organisation, a private buyer could publicly announce the financial contribution made (**contribution claim**). The idea behind climate contribution claims is to contribute towards the efforts to reach climate neutrality on a global level. Buyers can pursue different approaches to determine the size of their contribution: (a) Under **tonne-for-tonne approaches**, an organisation determines the amount of the mitigation to be funded outside of its value chain based on the size of its remaining emissions in a given year. The idea behind this approach is similar to the idea of offsetting. (b) Under a **money-for-tonne approach**, an organisation sets itself an internal carbon price and determines the size of its financial contribution by multiplying this price with its remaining emissions. This money is used to fund mitigation activities outside of the value chain of the organisation. (c) Under a **money-for-money approach**, an organisation uses a financial metric to determine the financial contribution to mitigation it wants to make. This metric could be a percentage of its revenue for example, so that this approach does not link the financial contribution to an organisation's emissions but to its economic capacity. The latter two approaches are referred to as *financial* contribution claims which depart from the idea to balance out internal emissions with mitigation achieved elsewhere (see VCMI, 2023; Fearnehough et al., 2023; SBTi, 2024). Any kind of contribution claim should be supplemental to mitigation efforts within the value chain of a buyer (Cullenward, 2023; SBTi, 2025).

Use cases of temporary carbon farming sequestration units for public result-based finance or private financial contribution claims carry significantly lower risks for environmental integrity than offsetting. For that reason, less stringent standards relating to addressing reversals, robust quantification and additionality could apply for such units under these use cases.

3 Current proposals for integrating temporary CRCF units in EU agri-food policies

The European Commission is currently considering policy options to promote climate mitigation in the agri-food value chain through the pricing of agricultural emissions and sequestration. An initial study (Bognar et al., 2023) assessed five agricultural emissions trading system (AgETS) policy options. In line with the 2024 Strategic Dialogue on the Future of EU Agriculture and European Scientific Advisory Board on Climate Change (ESABCC) recommendations, DG CLIMA commissioned a follow-up study to enhance understanding of potential post-2030 agri-food climate policies. This follow-up has included expert and stakeholder workshops to evaluate the strengths and weaknesses of various policy options. From an initial list of twelve, five policy options were shortlisted and detailed in background papers presented at the workshops (EC, 2025a). This includes a set of compliance policies - two designs for an Agricultural Emissions Trading Scheme covering agricultural processors or farmers (AgETS) and two designs for a Mandatory Climate Standard (MCS) for retailers or processors -, all of which consider permitting obligated entities to (partially) fulfil their emission reduction obligations by purchasing temporary CRCF units. The EU Commission is also considering

a third policy instrument, a public procurement programme, which aims to promote carbon farming by purchasing CRCF carbon farming units.

The primary aim of these policies is to effectively and cost-efficiently promote agri-food value chain mitigation. In addition to emissions reductions within the agri-food value chain, an additional means to achieve this is to promote temporary carbon sequestration by generating demand for temporary CRCF units. For the AgETS and MCS policy options, demand for CRCF units is created by allowing operators to use these units to cover a proportion of their net emission reduction targets (through offsetting). In the public procurement policies, the CRCF units will be purchased either through public funding or a mix of public and private funding, where the use case can be contribution claims or offsetting.

Allowing temporary CRCF units under these policy options has some advantages. In the case of the compliance policies (AgETS and MCS), this could be motivated by a wish to provide flexibilities for covered entities to meet their emissions reduction obligations by different means, which may reduce overall cost of mitigation where buying removal units is more cost-effective than implementing mitigation activities by covered entities. Allowing temporary CRCF units under these policies could boost demand, likely resulting in higher and more stable prices and thus increased incentives for implementing these carbon farming activities for certification under the CRCF. **However, given the challenges identified with applying crediting approaches to promote carbon farming activities and the quality issues with the CRCF (chapter 2), the integration of temporary CRCF units into these policies poses significant risks.** Indeed, creating demand for CRCF units and reducing costs for obligated entities should not be the driving objective for implementing flexibility mechanisms in the AgETS and MCS in the form of carbon farming crediting approaches. Rather, effectiveness and, to a lesser extent, acceptability (for farmers and other affected actors) are more relevant criteria when assessing whether integrating CRCF units is appropriate from a climate perspective.

The proposed policy instruments pose different risks and opportunities in relation to their primary objective of mitigating climate change and supporting attainment of EU climate goals. In this chapter, we first characterise the proposed AgETS, MCS, and public procurement policy options, with a focus on how they propose integrating temporary CRCF units and the use case this implies, as well as introducing the proposed policy designs for the public procurement programme, drawing on ongoing and published European Commission work (EC, 2025a; EC and Deloitte, 2025). For each option we also assess how CRCF units are proposed to be included within the policy options, and the implications in terms of implied use cases. To understand the risks and opportunities posed by these policies, we develop a framework for assessing the different policy options. Given the primary objective of mitigating climate change, the assessment framework considers their ability to drive emissions reductions in the agri-food sector and secondarily to promote temporary carbon sequestration through carbon farming; as well as their broader societal, environmental, and cost-effectiveness concerns. Given the risks and challenges associated with temporary CRCF units described in section 2 and the Annex, a focus is assessing how the different policies' integration of temporary CRCF units exacerbates or manages the environmental integrity risks posed by those units.

In Box 2, we also introduce and assess the set of policies that may impact voluntary demand for temporary carbon sequestration units. These policies include the Corporate Sustainability Reporting Directive (CSRD) and the Green Claims Directive (GCD) and non-governmental initiatives like the SBTi.

3.1 Proposed policies: Agri-food climate policy options proposed by DG CLIMA

3.1.1 AgETS (on-farm, processor)

An agricultural emissions trading system (AgETS) would set a cap on the total amount of emissions that are permitted in the sector, which are translated into tradable allowances—each typically equivalent to one tCO_2-

e. Actors covered by the ETS must return sufficient allowances to cover their emissions and are thus incentivised to reduce emissions and/or trade allowances to meet their obligations. Those actors can obtain allowances through free allocation or by purchasing them through auction or from other actors.[11] An AgETS would be a standalone ETS and not integrated into the existing EU ETSs (ETS1 or ETS2). If implemented and designed well, an AgETS could be an effective and efficient way to pass on price incentives to those who generate emissions and can take actions to reduce emissions in the agri-food value chain, particularly farmers and consumers.

Two AgETS policy options are considered:[12]

- **AgETS Processor,** with the point of obligation on meat and dairy processors.
- **AgETS On-farm,** with the point of obligation on farmers.

Both policy options are assumed to have the same ambition level, where the cap decreases progressively over time, aligning with the EU's goal of achieving climate neutrality by 2050 as well as other targets and planned trajectories.[13] It is important to note the cap is not explicitly determined in the policy proposals and there is no discussion of free allocation or auctioning of allowances; the ambition of any ETS is fundamentally determined by the cap, and distribution of costs and benefits by allocation of allowances.[14] The compliance in an AgETS would be mandatory for covered farmers/landowners. However, voluntary participation in the system would also be possible, for example by farmers not covered by the scheme selling CRCF units to obligated entities.

Under the **AgETS Processor** option, processors[15] must surrender sufficient allowances to cover each unit of their scope 3 emissions[16] and can meet their obligations by changing their product portfolio (shifting to lower emissions products or selling fewer emissions-intensive products, e.g. beef), by purchasing eligible CRCF units from a centralised pool or by trading allowances. Default emissions factors would be used to calculate the company baseline.

The **AgETS on-farm** option diverges in two main areas. First, the point of obligation shifts to farmers, directly reducing scope 1 emissions from on-farm GHG emitting activities—stemming from the production of meat, dairy, and potentially feed inputs, while excluding downstream emissions (e.g. from processing and transport). Thresholds should be used to reduce the number of ('small') farmers covered by the policy.[17] Secondly, while MRV in the initial phase would also rely on default emissions factors, it may transition towards more complex modelling of on-farm emissions. To facilitate fast implementation, this option proposes accepting a lower degree of accuracy in the initial phase, avoiding new monitoring obligations and basing estimates on existing data points.[18] For the certified method (second phase), the obligated entity collects farm-level data, which can

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[11] The draft policy proposals do not specify whether or to what extent free allocation or auctioning will be used to distribute allowances.

[12] It is also theoretically conceivable to have an AgETS applied upstream or at the retailer level. However, these are unlikely options.

[13] For example, the European Commission's 2040 Impact Assessment projects a 26% reduction in agricultural emissions by 2040 relative to 2015 levels (EC, 2024a).

[14] Auctioning revenues can be used to generate additional benefits and/or reducing costs for particular groups. For example, revenues can fund farm advisory and mitigation support, to reduce costs for low-income consumers, or to fund mitigation in other sectors, such as temporary carbon sequestration.

[15] The scope of processors covered could be limited to e.g., companies covered under the CSRD.

[16] Scope 1 (direct on-site emissions) and scope 2 (purchased energy and heat) are not included in the AgETS policy design, as they are expected to be relatively minor compared to scope 3 emissions (from agricultural production). Moreover, these emissions are partially addressed under other frameworks, such as the EU ETS (ETS1).

[17] Given that there are approximately 9 million farms in the EU, thresholds are needed to limit the amount of covered entities (Eurostat, 2022). These thresholds could be based on turnover and/or farm size. Forestier and Dekker-Hufler (2025) propose exempting farms below a turnover of €250k p/a, or farm size of 150 LSU and/or 50 ha.

[18] Existing data collected under the Integrated Administration and Control System to determine CAP payments could be used.

then be used to quantify emissions, potentially by using CRCF certification methodologies[19]. Although this results in higher MRV costs due to the large number of farms involved, it would allow for a higher degree of accuracy and stronger incentives for emission reductions due to its quantification and rewarding of a wider range of mitigation measures.

CRCF unit inclusion: Both the **AgETS Processor** and **AgETS on-farm** options allow for (limited) use of temporary CRCF units: "CRCF units that can be used for compliance would be related to emission reductions in livestock[20] and feed production **or (within certain limits in terms of scope and volume) other carbon farming activities**, while avoiding double-counting" (Forestier and Dekker-Hufler, 2025). Hence, while the focus is on integrating CRCF emission reduction units, it is possible that temporary carbon sequestration units can also be used. This implies direct or indirect integration of temporary carbon sequestration into the AgETS, i.e. instead of reducing own emissions, obligated entities can use temporary CRCF units; this poses risks of emission reduction deterrence (Bognar et al., 2023).[21]

In terms of participation, for the AgETS *processor* option, participation in the CRCF is fully voluntary for *farmers*. Processors can purchase CRCF units up to (yet to be) specified limits[22] posing a risk of emission reduction deterrence. In the AgETS *On-farm* option, 'large' farms would be obligatory participants; thresholds could exclude 'small' farms from obligatory participation. Both 'large' and 'small' farms could voluntarily generate and temporary CRCF units and either use them to meet their own emissions obligations targets or sell them.

Temporary CRCF unit use case implied:

- **AgETS Processor**: Offset
- **AgETS On-farm**: Offset

3.1.2 Mandatory Climate Standards (processor, retailer)

A **Mandatory Climate Standard (MCS) obliges downstream agri-food actors** (food processors or retailers) **to reduce the agricultural emissions associated with the products they sell** (i.e. scope 3 emissions). Emission reduction targets are expressed in terms of tCO_2-e per unit of product, based upon industry-wide emissions factors (e.g. average tCO_2-e per kg of beef product), and become more stringent over time as the EU's climate neutrality goal by 2050 approaches[23]. Downstream actors can meet their targets either by changing their product portfolio to reduce the average emissions intensity, or by purchasing CRCF carbon farming units from a centralised pool; unlike the AgETS, the obligated entities cannot trade allowances amongst themselves (Springer, 2024). The CRCF units are procured by a public authority before being sold to the agri-food processors from a centralised pool. If implemented well, an MCS could be an effective way to pass on price incentives to those who generate emissions in the agri-food value chain, particularly farmers and consumers.

Two downstream MCS policy options are considered:

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[19] *Note: measures for reducing livestock emissions (e.g. methane from enteric fermentation or manure) are not currently included in the CRCF methodologies; rather the feasibility of developing CRCF methodologies and extending the scope of CRCF to encompass these measures is being assessed.*

[20] *See previous footnote.*

[21] *An alternative design would be to have no link between agri-food emitters and temporary carbon sequestration providers and instead use AgETS auction revenue to fund temporary carbon sequestration without affecting the AgETS cap. This could raise funds for supporting temporary carbon sequestration without affecting the AgETS cap or reducing emission reduction incentives for obligated entities in the AgETS. We explore this option in more detail in 4.2.2.*

[22] *This poses a risk of agricultural emission reduction deterrence, see 3.2.2.1.*

[23] *The target for the MCS would presumably be set in the same way as the AgETS (based on some combination of existing targets, past and predicted emissions, and political negotiation). While the AgETS cap would be a cumulative limit, for the MCS the reductions would be set for each individual agri-food actor (if the ambition and scope of the policies were equal, the sum of individual MCS targets would equal the cumulative cap).*

- **MCS Processor,** with a point of obligation on meat and dairy processors
- **MCS Retailer,** with the point of obligation on retailers

The **MCS Processor** option imposes the obligation on first-stage processors of meat and dairy products, such as slaughterhouses and pasteurisation facilities. To limit administrative burden, thresholds could be applied to exempt smaller processors whose operations contribute only marginally to overall EU agricultural emissions.[24] This MCS Processor option covers GHGs associated with on-farm production of **meat and dairy products** processed by EU processors.[25] Emissions are quantified based on default emissions factors and the amount of product processed. It is also possible that frontrunner processors with lower-than-average emissions could apply for individual emissions factors and have these certified, creating greater incentives to switch to cleaner agri-food products.

The **MCS Retailer** policy option shares several key features with the MCS Processor option. Both effectively assign emission reduction obligations to downstream agri-food actors; use default emissions factors to quantify scope 3 emissions; and both could apply thresholds to exclude smaller, less significant actors (e.g. based on employee count). Moreover, for both options, entities can meet their obligations by either modifying their product portfolio or purchasing CRCF units. The key difference is that the **MCS Retailer policy covers emissions from a much wider array of products sold – not only meat and dairy, but also additional products as well as imported products from abroad.** As a consequence of covering more products, the MRV is more complicated as it requires a wider range of emissions factors for wider range of projects (e.g. for all products containing animal products sold in the supermarket).[26]

CRCF unit inclusion: For both the MCS Retailer and MCS Processor options, covered entities (i.e., agri-food companies) could purchase a (yet to be) specified limited quantity of CRCF units to comply with their set targets. The CRCF activities eligible for use in the MCS policy options would be the same as for the AgETS: mostly emission reductions as well as a limited quantity of temporary farming sequestration units. The key difference with the MCS options compared to the AgETS is that CRCF units could be purchased not only from a centralised pool built up by a public authority (offsetting), but also from within their supply chain (insetting). Insetting refers to a company or organisation investing within its value chain to achieve emission reductions. In the agri-food context, this can involve an agri-food corporate paying encouraging its suppliers (e.g. farmers) to reduce their emissions. The risks and opportunities posed by insetting are similar to offsetting and depend on the form of insetting and the use case. In the form described in this policy, an offset use case is implied, the same as the AgETS policy but with the limit that the offsets arise in the obligated entities supply chain, rather than anywhere in the sector. Allowing insetting may help to assign liability of covered entities for reversals.[27] However, care must be taken to avoid complications arising when simultaneously operating a centralised pool (based on certificates) and within value chain purchases (reliant on value-chain inventory reporting), given the risk of double counting.

Temporary CRCF unit use case implied:

- **MCS Processor**: Offset
- **MCS Retailer**: Offset

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[24] Bognar et al.(2023) estimate that excluding processors with fewer than 50 employees would still capture around 1,600 processors, accounting for approximately 82-91% of total revenues in the sector.

[25] This encompasses all emissions generated during production, including those from livestock and feed production, grasslands and soil management, and fertiliser application—all of which are attributed to the final processed products.

[26] To enable similar coverage to the processor option and avoid perverse incentives, the retailer option would need to cover processed goods such as frozen pizzas, yoghurts etc. This option effectively requires emissions factors to be set for most emissions-intensive products on shelves. Some (or many) products could be excluded from this policy to reduce administrative burden, but this would reduce the coverage of the policy and its ability to incentivise mitigation.

[27] However, many challenges related to supply chain accounting are likely to remain, especially where farmers sell to multiple companies (Scherger, 2025)

3.1.3 Public procurement: Public purchasing programme for temporary CRCF units (public funding, blended financing)

Two models of public procurement are considered:

- Public procurement using public funding
- Public procurement using blended finance (mix of public and private)

These options share many characteristics. In both, the EU would operate a public procurement programme for CRCF carbon farming units.[28] Farmers and landowners could voluntarily participate by implementing carbon farming practices that generate temporary carbon sequestration, seeking certification under the CRCF framework, with the resulting CRCF units then purchased by the public procurement programme. The funding would come either from public sources (EU and/or Member States, MS[29]), in which case this option would effectively generate a result-based subsidy for carbon farming,[30] or from a mix of public and private (blended) finance.[31]

Under the **public procurement using public funding** model, new sources of public money are used to fund the public procurement programme, enabling public entities to purchase CRCF carbon farming units to boost temporary sequestration in the agriculture and land sectors. If CRCF units would not be used to compensate for emissions under this option (i.e. there is no offset case), it does not pose environmental integrity risks, unlike the AgETS and MCS options.

Under the **public procurement using blended finance** model, the proposal suggests that public actors would purchase CRCF units, which would then be collected in a centralised pool from which private actors could purchase units (and thereby at least partially reimburse the public actor who initially purchased the CRCF units). The risks associated with this policy model depend on the use case for the CRCF units; if the full ownership of CRCF units transfers to the private buyers and they use these as offsets, then the policy poses equivalent environmental integrity risks to the AgETS and MCS. If the full ownership of the CRCF units and associated claims transfers to the private buyer, this policy option should not be referred to as “public” procurement. If the use case is limited to contribution claims, then this environmental integrity risk is contained. However, the use of blended finance can create additional legal issues, inefficiencies, and risks of double counting due to the potential overlap with CAP subsidies.[32]

CRCF unit inclusion: The CRCF activities eligible for use in the MCS policy options would be the same as for the AgETS: a mix of emission reductions and temporary CRCF units. No indication of the size of this purchase programme has been provided in the documentation of the proposed policy option.

Temporary CRCF unit use-case implied with public procurement:

- **Public Procurement: Public funding**: Contribution

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[28] Like the AgETS and MCS policies, the policy proposals consider purchasing both temporary CRCF sequestration and other carbon farming units.

[29] The incentives for Member States to fund the purchase programme will depend in part on the extent it contributes to attainment of their national climate targets, which is likely to be limited as discussed in Box 1 in section 2.1.

[30] In section 4.1.3, we consider a similar alternative policy approach, where CAP funding is used to purchase temporary CRCF units.

[31] A recent workshop hosted by Deloitte and DG CLIMA, along with its supporting input paper, explores possible design options for a carbon farming public procurement scheme. This workshop is part of an ongoing project for DG CLIMA that is considering carbon farming public procurement in greater detail, including whether to introduce Advanced Market Commitments (AMCs) for CRCF units which guarantee a future purchase or subsidy (or a blend of both) after the implementation of the CRCF activity (Deloitte, 2025).

[32] In section 4.1, we explore the potential overlaps with CAP and their implications, including the difficulty of ensuring additionality given CAP and CRCF coverage of the same measures and risks of double-funding, which may be in violation of state aid rules.

- **Public Procurement: Blended finance**: Offset or contribution

Box 2 Policies and initiatives shaping use cases of temporary CRCF units

Beyond the policy options discussed in this section, there are a number of EU policies and non-governmental initiatives that can determine the use cases for temporary carbon sequestration units and therefore voluntary demand for them. These policies or initiatives can determine what claims can be made or targets can be met using temporary CRCF units or otherwise affect demand for temporary CRCF units.

- **Green Claims Directive**[33]: In 2023, the EU Commission proposed a Directive on Green Claims, which aims to increase consistency and reliability of green claims across the EU and thereby increase consumer trust. This proposal included specific criteria on how companies must **substantiate and communicate** their environmental claims and how these could be verified. This included proposals for limiting the climate claims that companies could make based upon offsetting their emissions, including the separation of offsets from emissions reporting and a requirement to differentiate between emission reductions and removals. It also sets requirements for the types of credits that can be used to make a claim, which must be of high integrity. This could potentially lower demand for such credits in the voluntary carbon market. Following resistance to the proposal from some in the EU Parliament and the EU Council in trilogue discussions, the Green Claims Directive's future is currently unclear.

- **The Corporate Sustainability Reporting Directive** (**CSRD**) obliges large companies to report on their greenhouse gas emissions and removals. This increases transparency and encourages firms to understand and manage the GHG emissions associated with their own operations and their supply chains. If the company chooses to fund reductions or removals (such as purchasing temporary CRCF units), they can report this separately. As a disclosure tool, the Directive does not oblige large companies to mitigate or to offset their emissions – just to report them.[34] While there is currently no direct link between the CRCF and the CSRD, future revisions could feasibly require alignment with the CRCF for reporting under the CSRD (e.g. only allow CRCF-certified units to be reported within the CSRD), which could influence demand for CRCF units.

- **Non-governmental actors and initiatives** such as the **Science Based Targets Initiative (SBTi)** also play a role in guiding private sector climate change mitigation. By setting guidelines for companies to follow, they can influence demand for specific types of mitigation, including implementing temporary sequestration activities or purchasing temporary carbon sequestration units (SBTi, 2025). SBTi provides a framework for corporates to take voluntary climate mitigation action. The SBTi's Forest, Land and Agriculture (FLAG) guidance requires companies with significant land-based emissions and removals to account for these when setting targets, creating a framework for integrating temporary sequestration into corporate target setting (although they cannot be used to meet emission reduction targets). SBTi also encourages corporates to pursue beyond value chain mitigation, i.e. financing mitigation (including temporary carbon sequestration) externally to their own value chain. This mitigation should not be used to reach their SBTi targets but rather should be carried out in addition. An exception is the neutralization of residual emissions once a company has reached its long-term emission reduction targets. Thus, beyond value chain mitigation could promote voluntary demand for temporary CRCF units, though the extent of demand in particular for temporary sequestration units will depend in part on open

[33] *(EC, 2023)*

[34] *Evidence suggests that disclosure can promote mitigation action, though this may occur through own emission reductions rather than purchasing offsets (Downar et al., 2021).*

questions yet to be resolved in revisions to SBTi requirements, including whether like-for-like requirements for the neutralization of residual emissions are established (SBTi, 2025). Other private initiatives are also important. For example, the Integrity Council for Voluntary Carbon Markets (IC-VCM), the Voluntary Carbon Markets Integrity (VCMI) initiative, and the Carbon Credit Quality Initiative (CCQI), among others, aim to ensure carbon market integrity. These help to build trust in the market, yet, they can also propose additional quality standards and requirements that limit voluntary demand for temporary CRCF units.

3.2 Assessment of agri-food climate policy options

3.2.1 Assessment framework

To understand the risks and opportunities of promoting temporary carbon farming by integrating CRCF units into other policies, in this section we consider the objectives that these policies aim to achieve; based on these, we develop an assessment framework.

Our assessment framework assesses the effectiveness with which the agri-food policy options should **mitigate climate change in the agri-food sector** in line with the EU's 2050 climate neutrality and interim targets.[35] These agri-food policies can achieve this overarching objective through two pathways: first, by reducing emissions from the agri-food value chain, next by increasing temporary carbon sequestration.[36] While policies that generate significant additional incentives for increasing temporary carbon sequestration are useful, however, this mitigation should not occur at the expense of emission reductions within the agri-food value chain (i.e. emission reduction deterrence). Given the risks and challenges associated with CRCF temporary carbon farming sequestration units identified in section 2, it is important to consider the extent that the policy approaches pose risks to environmental integrity – that is, the risk that the use of crediting approaches ultimately results in higher emissions that without the use of these approaches.

The assessment framework also considers the ability of these policies to achieve mitigation at the lowest cost. This includes their ability to promote efficient mitigation where it is most cost-effective, minimise administrative costs, and minimise transaction costs for farmers/landowners, as well as other stakeholders affected by policies (e.g. those paying for CRCF units). The assessment framework also considers the cost to the government (i.e. fiscal burden), which is important in regard to affordability and the EU's commitment to implementing the polluter pays principle.[37] These cost-effectiveness aspects are important, as they can enable more ambitious policy; however, it is crucial that policy is effective – cost-effectiveness cannot undermine the robustness of mitigation policies.

Table 1:1 Assessment framework (own compilation)

Environmental effectiveness	The degree to which the options ensure that global GHG emissions are reduced, considering: • **Potential to promote temporary carbon farming sequestration activities:** how ambitious is the policy and to what extent will it promote additional temporary carbon sequestration?

[35] *Of particular importance are the LULUCF targets (net -310 Mt by 2030) and proposed revisions to the EU Climate Law to establish binding 2040 targets.*

[36] *These policies could feasibly be used to promote permanent CDR; however, such proposals have not been included in the current proposed policy descriptions.*

[37] *The 2007 Treaty on the Functioning of the European Union states that, "that environmental damage should as a priority be rectified at source and that the polluter should pay" (Art. 191(2)).*

	• **Avoid agri-food emission reduction deterrence**: to what degree does the policy avoid deterring emission reductions by the agri-food sector? • **Minimise environmental integrity risks:** does the policy option avoid the risk of non-equivalent temporary units offsetting emission reductions (e.g. use of units with non-permanence, leakage, additionality risks)?
Efficiency and cost effectiveness	The degree to which the policy meets its objectives cost-effectively, considering: • **Ability to align mitigation incentives across agri-food and LULUCF sectors:** does the policy generate cross-sector incentives to equivalise incentives across agri-food and LULUCF sectors (to support incentivisation of least-cost mitigation and lower the overall costs of meeting EU climate goals)? • **Minimise fiscal burden:** how low will the cost of implementing the policy be for the government? • **Minimise farmer/landowner transaction costs,** including MRV: does the policy option minimise participation costs faced by farmers/landowners, with implications for attractiveness of policy options to farmer/landowners and degree of uptake? • **Minimise administrative costs and complexity:** to what extent does the option minimise the costs to the regulator of administering the policy?
Social/environmental impacts	The degree to which the policy supports the green transition of the agri-food sector, considering: • **Positive environmental impacts:** does the policy option generate environmental co-benefits (e.g. for biodiversity, adaptation, water)? • **Positive farmer socio-economic impacts:** does the policy support farmer/rural incomes?

The assessment framework also considers the ancillary impacts of the policies on other social concerns. Given the significant impact carbon farming actions can have on broader environmental outcomes such as soil health, biodiversity, and adaptation – as described in chapter 2 – the assessment framework highlights potential sustainability impacts.[38] Policies that have positive socio-economic impacts, such as supporting farmer and rural incomes, will also be preferred.[39]

Based on these considerations, Table 1:1 presents an assessment framework. We categorise the policy objectives into three groupings: environmental effectiveness, efficiency and cost-effectiveness, and social/environmental impacts. We utilise this framework to understand the relative risks and opportunities posed by integrating temporary units into the agri-food policies and alternative policy approaches, supporting our comparison of the different policy options.

[38] *This builds upon the 2024 Strategic Dialogue on the Future of EU Agriculture's "urgently" calls for the agri-food sector to operate, "within planetary boundaries and contributes to the protection and restoration of the climate, ecosystems, and natural resources, including water, soil, air, biodiversity, and landscapes" (EC, 2024d).*

[39] *The Political Guidelines for the next EU Commission 2024-29 states that it is "vital that farmers have a fair and sufficient income (von der Leyen, 2024). This echoes the 2024 Strategic Dialogue on the Future of EU Agriculture's call for EU policy to support "vibrant rural areas" (EC, 2024d).*

3.2.2 Assessment of proposed policy options

To understand the risks, opportunities and challenges posed by the proposed agri-food policy options, and their integration of temporary CRCF units, in this section we assess each policy option using the assessment framework. The assessment is based on expert judgement, drawing on relevant literature as well as expert input from report authors. A summary of the assessment is provided in Table 2, which is followed by an explanation and justification of assessments. The key messages and implications of the assessment are presented in section 3.3.

Table 2: Assessment of policy options: own assessment of proposed policy options (own compilation)

Assessment element	Potential to/for…	AgETS processor	AgETS on-farm	MCS processor	MCS Retailer	Public procurement: public	Public procurement: blended
CRCF use case		Offset	Offset	Offset	Offset	Contribution	Offset or contribution
Environmental effectiveness	Promote temporary carbon farming sequestration activities	High	High	High	High	Medium	Medium
	Avoid agri-food emission reduction deterrence	Low	Low	Low	Low	High	Medium
	Minimise environmental integrity risks	Low	Low	Low	Low	High	Medium-High
Efficiency and cost-effectiveness	Economic efficiency	High	High	High	High	Low	Low
	Minimise fiscal burden	High	High	High	High	Low	Low-Medium
	Minimise transaction costs	Medium	Low	Medium	Medium	Medium	Medium
	Minimise administrative costs and complexity	Medium	Low	Medium	Low	High	Medium-High
Social/environmental impacts	Positive environmental impacts	Depends on specifics of policy design, particularly stringency of CRCF sustainability certifications, and on types of agri-food emission reduction activities.					
	Positive farmer socio-economic impacts	Low	Low	Low	Low	High	High

3.2.2.1 Environmental effectiveness

Of primary importance is the environmental effectiveness of the proposed policies: to what extent will they deliver mitigation impacts and support attainment of the EU's climate goals. The policy options can promote mitigation via two paths: by incentivising agri-food emission reductions within the agri-food value chain (and by prompting consumer demand shifts) or by promoting temporary carbon sequestration actions. Given our focus on temporary CRCF units, our focus in this assessment is on the potential opportunities (i.e. their ability to boost temporary sequestration activities) but also the risk of lowering incentives to reduce agri-food emissions due to emission reduction deterrence, and the resulting risks to the environmental integrity of EU climate policy if the policies rely on temporary CRCF units to offset covered agri-food emissions.

Potential to promote temporary carbon farming sequestration activities

The integration of CRCF temporary carbon farming sequestration units into the proposed policies can generate demand for these units, boosting prices and quantity demanded and thereby generating incentives for increased implementation of carbon farming actions. The policies' ability to boost temporary carbon farming sequestration will depend primarily on the overall scale of incentives, which determines how much demand the policy will generate. This depends on the ambition of the policy: in the case of AgETS and MCS, how demanding are the caps or climate standards for obligated entities, and conversely how generous is free allocation of allowances? For Public Procurement options, how ambitious (and well-funded) is the purchasing programme? The incentives provided will also be affected by any limits on the integration of temporary CRCF units, e.g. if the AgETS or MCS only allows x% of obligations to be met in this way.[40]. It is important to note that the policies' ability to promote temporary carbon farming sequestration activities is not sufficient to deliver real mitigation, due to the non-permanence and quality concerns of temporary CRCF units identified in chapter 2.

- **Assessment**: The **AgETS** and **MCS** models are likely to generate the most additional funding for CRCF temporary carbon farming sequestration units, due to their wide scope (and therefore large potential demand); the extent of this demand could be limited by restrictions on the amount and type of units that obligated entities can use to meet objectives.[41] The draft AgETS and MCS policies do mention that there should be some limits on the scope and volume of carbon farming activities. However, they do not provide greater detail on specific limits such as volumes (or % of total obligation) that can be offset the emissions obligation of operators. It is therefore possible that the integration of temporary sequestration units could lower the ambition of the policy and delay climate change mitigation. If we assume relatively similar policy scopes and CRCF integration rules, and equal ambition, the AgETS and MCS policy options will likely offer similar potential to promote temporary carbon farming activities, with the MCS policy likely to offer slightly lower potential if it restricted CRCF purchases to within the obligated entity's value chain.[42] The **public procurement options'** potential to promote carbon farming activities is uncertain, as it depends on the size of its budget. We would expect the exclusively **public**-funded programme to have a lower budget and therefore smaller potential to promote carbon farming activity than the **blended** option, the extent of this difference depends on how much voluntary private demand for the units exists. The environmental effectiveness of all

[40] *It will also depend on the relative marginal costs of mitigation; see discussion in section 3.2.2.2.*

[41] *As an illustrative example of potential scale of funding for temporary carbon farming sequestration activities, if we assume an AgETS covers 50% of EU agricultural emissions (185 MtCO2e), aims for a 30% reduction in emissions by 2040, allows 6% of emission reduction obligations to be met by CRCF units (e.g. matching California Air Resource Board limits for offsets), then then agri-food actors could demand 11 Mt of units annually. If AgETS allowances traded at the current EU ETS allowance price of €72, this would represent up to €800 million annually for CRCF carbon farming activities (a mixture of temporary sequestration activities and non-temporary). While considerably lower than CAP funding streams, which are currently €50-60billion in total per year, even at significantly lower prices these are not insubstantial additional funding for temporary carbon farming activities.*

[42] *Given the MCS policies limit*

policies is questionable, given the non-permanence and quality concerns with temporary CRCF units.

Avoid agri-food emission reduction deterrence

The proposed agri-food policies should reduce emissions from the agri-food sector. **Allowing obligated entities from the agri-food sector to meet their obligations by purchasing temporary CRCF carbon farming sequestration units poses a risk of agricultural emission reduction deterrence**: instead of needing to reduce their own emissions, the agri-food sector can instead purchase CRCF units linked to temporary carbon farming sequestration. The impacts of emission reduction deterrence can be seen in examples like the EU ETS and the New Zealand ETS. In the NZ ETS, ETS operators are allowed to meet obligations using allowances generated through temporary carbon sequestration in the form of afforestation. This reduces incentives for emission reductions: in 2020, 75% of mitigation under the NZ ETS occurred through afforestation (Carver et al. 2020). Moreover, during the second and third phases of the EU ETS (2008-2020), obligated entities could meet their obligation using international mitigation credits, with some limits.[43] These external credits had an equivalent effect to the NZ ETS example, suppressing EU ETS prices and decreasing incentives for ETS operator mitigation (Verde and Borghesi, 2022). By reducing incentives for agri-food actors to reduce their own emissions, integrating temporary CRCF units into agri-food policies can thus make the policy less effective at promoting a climate-aligned transition in the agri-food sector.[44] **Two factors are decisive in the issue of emission reduction deterrence. Firstly, the use case** of the proposed policies for temporary CRCF units: policies with offset use cases pose risks of agricultural emission reductions deterrence; those based on contribution instead of compensation do not allow replacement of agri-food emission reductions with temporary CRCF units, so this risk is much lower. **Secondly, emission reduction deterrence depends on the volume of emission reductions that are replaced by temporary CRCF units** through the policy. An additional path for emission reduction deterrence is so-called “imagined offsets” (or moral hazard), where due to expectations about the promise of future temporary sequestration, agri-food actors fail to otherwise economically rationally invest into emission reduction measures today (McLaren, 2020). As a result of the integration, incentives for agriculture emission reductions are lowered—creating a long-run inefficiency that potentially delays the transition by exacerbating existing path dependencies.

Additionally, given the quality issues of CRCF units identified in chapter 2**, the replacement of agri-food sector emission reductions with temporary CRCF units poses risks to environmental integrity.** Environmental integrity refers to the aim that, “a crediting mechanism must not lead to aggregated GHG emissions that are higher than they would have been without the use of the mechanism” (Siemons et al., 2025). This is a risk for the policies we assess, as they allow the substituting of agri-food emission reductions with temporary carbon farming sequestration units, which pose significant risk of not representing additional and permanent mitigation and overestimating mitigation impact. This means that the attainment of the agri-food policy targets may be illusory, as the mitigation claimed by the units may not have fully occurred.

- **Assessment:** The **Public Procurement (Public)** policy option does not involve offsetting according to current proposals, so poses no risk of agricultural emission reduction deterrence, or environmental integrity risks. Conversely, **AgETS** and **MCS** policy options explicitly allow offsetting, so pose a significant risk of emission reduction deterrence. As identified under the criterion *Potential to promote temporary carbon farming sequestration activities*, both are expected to involve similar volumes of CRCF units, so they involve similar risks to mitigation deterrence and environmental integrity. The

[43] *In phase 3 (2012-2020), international credits had to be exchanged for EU ETS units and could not be used directly to meet obligations.*

[44] *As discussed in Bognar et al. (2023), the risk of emission reduction deterrence can be managed through limits that affect the quantity of CRCF units entering the AgETS or MCS policy, through quantitative limits such as maximum percentages, or qualitative limits such as more stringent quality controls. Regulators could also set more ambitious AgETS or MCS caps or targets, to ensure that incentives for emission reductions remain, accounting for the expected influx of CRCF units. The proposed AgETS and MCS policies mention the potential of some quantitative limits on use of CRCF units, but these are not explicitly determined.*

risk posed by **Public Procurement (blended)** policy option is less clear, as the use case for privately funded CRCF units is not clearly defined; assuming that the use case matches common voluntary carbon market practice then we would expected private buyers to purchase these certificates as part of the procurement programme and use these units as offsets to meet their own targets, thus posing medium risks of emission reduction deterrence and to environmental integrity.

3.2.2.2 Efficiency and cost effectiveness

Our assessment considers whether policies are likely to achieve objectives efficiently, promote low-cost mitigation and managing costs for administrators and those affected by the policies. Cost considerations can come at the expense of effectiveness and uncertainty; for example, loose integration requirements can reduce participant transaction costs but might entail high risks to environmental integrity. We assess economic efficiency, fiscal burden, transaction costs and administrative costs of the different policy options in this light.

Ability to align mitigation incentives across agri-food and LULUCF sectors

Efficient policies will encourage mitigation to occur where it is cheapest, lowering the overall costs of achieving any climate objective. Any cost savings should be used to support more ambitious climate action**.** Different conceptions of efficiency are relevant: static efficiency reflects a policy's capacity to incentivise cost-effective action, directing effort first toward the lowest-cost mitigation options, then progressively to the next most affordable, and so forth. Dynamic efficiency considers whether the policy delivers incentives that will deliver lowest cost mitigation over time, considering impact on long-term investment decisions and their implications. Particularly relevant for consideration in light of our assessment is **cross-sectoral efficiency**, i.e. whether marginal mitigation costs are equalised across the agri-food and LULUCF sectors. Integrating additional sectors can generate efficiency gains by increasing liquidity due to an increase in market participants, increasing the range and number of mitigation options, and reducing distortions created by differentiated incentives across sectors (Tänzler et al., 2018).[45] Policies that equalise mitigation incentives across sectors can encourage mitigation to occur in the sector where it is most cost-effective. The ability of the policy to equalise mitigation costs across different sectors can depend on the extent of cross-sector trading allowed by the policy option, i.e., the extent that temporary carbon sequestration is integrated into the agri-food policies (via integration of temporary CRCF units). Accordingly, this cross-sectoral efficiency is directly linked and inverse to the previous criterion, on avoiding agri-food emission reduction deterrence: policies (like AgETS and MCS) that allow agri-food emission reductions targets to be met through temporary CRCF sequestration, have the advantage of equalising incentives across the sectors, encouraging mitigation where it is cheapest. However, this comes at the cost of reducing incentives for agri-food emission reductions. As previously noted, this is complicated by the low expected quality of the temporary CRCF units: economic efficiency gains are illusory if the temporary carbon sequestration offsetting agri-food emission reductions are not matched by real mitigation. It is also possible to set equivalent incentives in different sectors without linking policies through trading, for example, a separate and unlinked fund could be established to purchase temporary CRCF carbon farming sequestration units, and the price paid could be related to AgETS prices. Equivalisation of price incentives across sectors may also not be optimal if other societal objectives are considered, e.g. the biodiversity benefits associated with temporary sequestration could justify higher prices.

An important consideration is whether integrating temporary CRCF carbon farming sequestration units is likely to reduce overall costs of meeting climate targets. This depends on the relative marginal costs of mitigation, with the agri-food policies only generating demand for CRCF temporary carbon farming sequestration units when it is more affordable for obligated entities to meet their obligations by purchasing (some) CRCF units, rather than reducing their own emissions. Evidence suggests that some carbon farming sequestration may be available at lower costs than some agricultural emission reductions: Bognar et al (2023) assess that some temporary carbon sequestration could likely be supplied at prices below €25, below the likely

[45] *Tänzler et al. (2018) explicitly consider the linking of different emissions trading schemes; the general economic principles can be extrapolated to the case of integrating additional sectors into an ETS.*

marginal abatement costs of other mitigation options. Moreover, Perez Dominguez et al. (2025) find that cost-effective EU mitigation in the land sector involves a mix of temporary carbon sequestration and agricultural mitigation. However, the cost of temporary CRCF units will also depend on the final certification methodology requirements. In particular, the rules regarding their temporary status, as adequate liability and replacement requirements will increase their cost significantly. The cost of agricultural emission reductions will also depend significantly on the design of agri-food emission policy, especially the ambition and MRV.

- **Assessment:** The highest cross-sectoral efficiency will be achieved by **AgETS** and **MCS** policy options. Differences between these policy options will depend on any limits to the integration of CRCF units, which are not defined.[46]The **Public Procurement: public** policy options do not allow offsetting of agri-food emissions with temporary CRCF units, a disadvantage under this criterion. The **Public procurement: blended** policy offers potential for this cross-sectoral equivalence, if privately funded purchases are used as offsets for agri-food sector targets. However, it is important to note that because of the CRCF quality concerns, this criterion should be interpreted with care, as the cross-sector mitigation in the form of temporary CRCF units may not represent real mitigation. In terms of other definition of efficiency, within sector **static efficiency** is equal across all proposed policy options, as they will all effectively incentivise the lowest cost temporary sequestration to be implemented, up until the marginal cost of mitigation is equal the CRCF unit price. It is challenging to assess **dynamic efficiency**; there may be some concerns that the **AgETS**, **MCS**, **Public Procurement: Blended** policy options, which allow agri-food sector actors to meet their climate targets via temporary CRCF units rather than their own emission reductions, delays or decreases incentives needed to prompt immediate action transitioning the agri-food sector.

Minimise fiscal burden

The different policy options place costs on different actors. A key issue for regulators will be the direct costs to be borne by the public budget, i.e. the fiscal burden. As discussed under the environmental effectiveness section, this is also likely to influence the scale of incentives for temporary carbon sequestration via the CRCF: given the competition for public funds—policies funded only by public funds may have less funding than policies where funding comes from public and private actors.

- **Assessment**: The **AgETS and MCS** policy options generate no public fiscal burden, as all costs associated with funding carbon farming actions leading to temporary sequestration fall upon the private buyers of CRCF units. While those costs will be passed along the agri-food value chain from the points of obligations – depending on the policy option, either processors, retailers or farmers –may therefore have some flow-on effects on overall economic activity and tax revenue, there will be no direct costs for the public (though we would expect cost pass through and increases in the price of high-emissions foods). Conversely, the **Public Procurement: Public** option has a high fiscal burden, with all direct costs of purchasing CRCF units falling on the regulator. **Public Procurement: Blended** will also pose a significant though slightly lower fiscal burden, with the difference from the Public Procurement: Public option dependent on the scale of voluntary private purchases.

Minimise transaction costs

The costs borne by farmers and landowners due to the agri-food policies would include the costs of monitoring, reporting and verifying emissions (MRV), learning the new system, searching and trading units, among others. These are important, as they not only represent an economic inefficiency but also create barriers to participation and broader uptake (Stavins, 1995; Baudry et al., 2021). Significant differences exist between the policy options, which entail different requirements for farmers. The transaction costs for fulfilling these requirements are likely to be more difficult to bear for smaller farmers; to avoid placing these costs on small farms that generate relatively small amounts of GHGs, thresholds should be used to exclude them from obligatory

[46] *The fewer the quantitative or qualitative limits on trade, the higher the expected efficiency.*

participation (Bognar et al., 2023). The costs faced by other agri-food actors affected by some of the policy options, such as retailers and processors who are points of obligation under the AgETS and MCS policies, are also relevant and affected by the choice of policy option. If the purchase of temporary carbon farming sequestration units is centralised, e.g. via a central pool for CRCF units, this will reduce the efforts for agri-food actors compared to purchasing units from suppliers individually.

- **Assessment**: The **AgETS: Farm** policy option entails high transaction costs for farmers, as all farms covered by the policy must carry out MRV and report on emissions and mitigation actions, which can pose significant costs, especially to meet higher MRV accuracy requirements (Bognar et al., 2023). **AgETS Processor**, **MCS**, and **Public Procurement** policy options generate medium transaction costs for farmers: only those famers who voluntarily carry out carbon farming actions to generate CRCF units will be required to carry out MRV to have their temporary carbon sequestration certified. The costs for processors and retailers depend on which policy option is selected (i.e. whether they are the point of obligation). They also depend on the ease of trading CRCF units; all policies offer the potential for a centralised pool, so score similarly here. The proposed **AgETS** and **MCS** policies generate transaction costs for farmers and other participants with or without integration of temporary CRCF units, with the additional costs of integrating CRCF units will be relatively small compared to the other costs for participants.

Minimise administrative costs

The administrative costs borne by the regulator vary widely across the policy designs, stemming primarily from differences in the policy option designs (and their MRV approaches), and not due to integration of temporary carbon farming sequestration units. Generally, the more complex the policy and the more participants, the higher the administrative costs.

- **Assessment:** Two policy options pose significantly high costs and complexity for administrators: **AgETS: Farm** would have many (100,000s-millions) of obligated entities) and **MCS: Retailer** has a complex MRV system (with emissions factors of uncertain accuracy likely required for at least hundreds of products), which would pose significant development and ongoing administration costs. **AgETS Processor** and **MCS Processor** pose medium admin costs and complexity, due to their simpler MRV approach and lower number of participants. **Public Procurement** policy options have the advantage of low complexity and administrative cost, with the **Blended** policy offering slightly higher administrative requirements due to integration of private actors.

3.2.2.3 Social and environmental impacts

As explored in chapter 2, temporary carbon sequestration has positive environmental effects beyond climate mitigation. As a nature-based solution, when implemented mindfully, it can generate significant biodiversity, climate adaptation, and other benefits, delivering on multiple societal and farmer goals. In terms of environmental impacts, the choice of policy option has only minor impacts. However, in terms of socio-economic impacts on farmers and rural areas, the policy option impact can be considerable. In this section, we consider these broader impacts of the policy options, and more generally their ability to support the green transition of the agri-food sector.

Environmental impacts

The integration of temporary CRCF carbon sequestration units into the different proposed agri-food policy options has the potential to generate positive environmental impacts, though these are difficult to evaluate and differentiate at the level of the policy option. This arises because actions reducing agricultural emissions can also generate positive environmental impacts, depending on how these emission reductions are achieved

(Leip et al., 2015).[47] Accordingly, it is difficult to assess whether policies that promote temporary carbon sequestration or agri-food emission reductions are preferable when considering the impact on wider environmental objectives (e.g. biodiversity impacts).[48] To promote these positive environmental impacts, it will be important to focus attention on more specific design elements of the policies. For example, the sustainability conditions in the CRCF should be made more ambitious and/or more effectively empower farmers to deliver sustainability benefits (Project Credible, 2024), and the agri-food policies should require incentivised emission reduction actions to deliver environmental benefits and avoid environmental harms. CREDIBLE (2024) proposes that farmers should be obliged to complete a "farm environment plan" with the subsidised support of an advisor. This farm environment plan would increase farmer knowledge of potential sustainability impacts of their carbon farming measures, empowering them to shift farm management towards options that generate multiple environmental benefits.

Positive socio-economic impacts

Negative financial impacts on farmers and the agri-food sector pose practical and political barriers to ambitious climate policy in the agri-food sector. Practically, farmers identified costs as the most pressing barrier hindering climate-friendly investments on farm, pointing to the issue of high costs without sufficient returns, and high upfront costs with slow payback periods as the most important obstacles (EC and EIB, 2023). The costs associated with meeting environmental objectives is also a source of political resistance to policies from some actors in the agri-food sector (see e.g. EC and EIB, 2023). Klenert et al. (2018) argue that considering and enhancing the public acceptability of policies enables more ambitious climate policy. Policies that involve the purchase of temporary carbon sequestration units can create new revenue flows for some farmers, who may be able to implement carbon farming actions and sell the resulting temporary CRCF units at an adequate price. Conversely, the policies that price agri-food emissions or otherwise require emission reductions will generate costs for agri-food actors, which will likely be distributed across different agri-food actors depending on their relative negotiating power. These costs will depend on the stringency of the agri-food policies and their design, and will be felt in the form of direct costs linked to emissions obligations, transaction costs associated with e.g. MRV obligations, and other changes in costs and revenues, including changes in output prices due to the incorporation of emissions costs. Flow on effects on the cost and availability of land and other input prices would also be expected, with uncertain impacts that depend on farmer characteristics and policy design, and significant variation across different farmers, depending on their context. The practical and political barriers posed by the proposed policy instruments can be to some degree managed by policy design and accompanying policies, e.g. via targeted use of auction revenue, farmer support policies, or limited free allocation of allowances (see e.g. Klenert et al., 2018). In the use of these accompanying policies and policy design, it is important to consider the potential trade-offs with other policy objectives, selecting those options that promote environmental effectiveness (e.g. use of auction revenue to promote environmental action and farmer capacities) and minimising the use of options that reduce effectiveness. It is also important to consider differences between affected groups, e.g. target support policies to small farmers who may have lower capacities, and transfers to worst affected households (e.g. low-income households). To enable our assessment, we assume that the AgETS and MCS policies establish equivalent sector-wide emission reductions targets for the agri-food sector. As an indicator, we consider the expected net income effect on average farmers.

- **Assessment:** Given that the key details of the policies are left undefined, such as any potential free allocation or rebates associated with AgETS or MCS policies, our assessment is preliminary. The **Public Procurement policies** will increase farmer incomes, with different impacts for different farmers; larger and more sophisticated farms with the ability to manage CRCF MRV would stand to

[47] *For example, if mitigation is achieved by reducing fertiliser use or production, this can promote biodiversity and reduce e.g. nitrogen and phosphorus pollution. However, if mitigation is achieved through intensification of land-use, this can increase environmental pressures.*

[48] *If we consider just climate mitigation, then permanent emission reductions would be preferred over potentially reversible sequestration but here we consider broader, non-mitigation impacts.*

benefit more than those without those capacities. The scale of the benefits depends on the amount of finance, with higher impact expected for the **Blended** option, to the extent that sufficient private money complements public budgets. The impacts of the **AgETS and MCS** policies are uncertain, as they generate both costs (due to their emission reduction requirements for the agri-food value chain) and benefits (for those farmers who can cost-effectively implement carbon farming actions and sell temporary CRCF units. Limits on the quantity of temporary CRCF units decrease potential income. Assuming that the policies aim to significantly reduce emission reductions, the net impact on average farmers is likely to be negative (i.e. costs will outweigh incomes). The impact will differ across different types of farms. Farms that have lower emissions and/or affordable emission reduction or carbon sequestration options will be more likely to see income benefits than those farms that face high emission reductions requirements and limited emission reduction or sequestration options.

3.3 Conclusions regarding crediting approaches to promote temporary carbon sequestration

Our assessment shows that policies that aim to promote crediting approaches to temporary carbon sequestration by integrating temporary CRCF units into compliance agri-food policies pose risks and opportunities for climate mitigation. The proposed agri-food policies offer much needed potential to significantly and cost-effectively promote emission reductions in the agri-food sector. In this section we focus specifically on whether temporary CRCF units should be integrated into these proposed policies.

Policies that exclude offsetting do not pose environmental integrity risks, **regardless of the quality of temporary CRCF units,** as there is zero compensating of agri-food emissions with potentially illusory temporary mitigation. **The only policy assessed that excludes offsetting is the Public Procurement: Public funding policy.** This policy would be an appropriate approaches for promoting 'risky' carbon farming actions, i.e. those with a relatively high risk for reversals, non-additionality or uncertainties around quantification (e.g. soil carbon sequestration based on easily reversible management changes or weather impacts, see section 2.2 and Annex). Such a policy is also attractive as a first step for policy development, enabling stakeholder and administrator learning to occur without posing environmental integrity risks. However, even where there is no risk to environmental integrity, ensuring the cost-effective use of public (or private) funds requires that purchased temporary sequestration units are generally underpinned by real mitigation; in this regard, the quality criticisms of the CRCF remain important concerns on efficiency grounds.

Policies (e.g. AgETS and MCS) that permit offsetting through temporary CRCF units pose risks to environmental integrity. These policies run the risk that illusory temporary sequestration occurs in place of agri-food emission reductions, which would result in higher overall atmospheric GHG levels than if no offsetting occurred. This environmental integrity risk undermines EU efforts to meet long-term climate objectives. Such environmental integrity risks are only avoided if temporary CRCF units are equivalent to the agri-food emission reductions they would replace. However, as established in chapter 2, due to the characteristics of temporary sequestration and quality concerns with the proposed CRCF methodologies, this is unlikely to be achieved on several grounds.

A key source of non-equivalence takes the form of the non-permanence risks of temporary CRCF units due to incomplete implementation of temporary crediting. As outlined in chapter 2, most carbon farming activities (all of those based on carbon storage) pose significant risks of reversal and non-permanence. The CRCF proposes temporary crediting as a solution to this challenge. Temporary crediting could be an effective solution only if appropriate liability mechanisms were in place to handle reversals and for replacing temporary units upon their expiry. However, the details of how temporary crediting would be implemented via CRCF is

largely uncertain.[49] This could alternatively be managed within the agri-food policies. Adequately implementing temporary crediting to address non-permanence risks from integrating temporary CRCF units into the AgETS and MCS policies demands changes to either CRCF methodologies or in AgETS and MCS design:

1. **Further clarification is needed on liability measures to protect against reversals *during* the monitoring period.**[50] No measures are specified in the draft AgETS or MCS policies. However, reversal risks during the monitoring period could potentially be addressed through the CRCF regulation that require operators (AgETS or MCS compliance entities) to either participate in buffer pools or take out an insurance policy to cover potential reversals. Still, provisions are lacking on how such liability will be implemented, for example, by including a provision that forbids further units to be issued before the buffer pool has been replenished.
2. **Liability measures to protect against reversals *after* the monitoring period ends are not specified** in the draft AgETS or MCS policies nor in the draft carbon farming certification methodologies. Consequently, the inclusion of temporary sequestration units in an AgETS or MCS could potentially lead to higher overall emissions because the CRCF draft methodologies as currently defined do not require the buyer to replace the unit after expiry (and current policy proposals for AgETS and MCS do not specify this either). This means that if temporary units had been used to meet emission reduction targets before their expiry, after their expiry the carbon sequestered by these activities may have already been released into the atmosphere again.

It is important to note that in addition to insufficient implementation of the concept of temporary crediting, the draft carbon farming certification methodologies pose other quality concerns that mean temporary CRCF units may not represent real mitigation. Current CRCF safeguards for additionality, quantification, and related integrity criteria are not yet sufficient to ensure that temporary units represent real mitigation, as established in chapter 2.

Further, even in the case of high quality temporary CRCF units, permitting their integration into agri-food policies risks causing agricultural emission reduction deterrence, decreasing incentives for reducing agricultural emission reductions. **This risk of emission reduction deterrence would need to additionally be managed through the design of the AgETS and MCS policies.** For example, the ambition of agri-food emissions reduction targets can be boosted to account for expected temporary sequestration, ensuring that even after integration, sufficient incentives remain for reducing agricultural emissions. Additionally, limits on the use of sequestration units can reduce mitigation deterrence risks.

4 Additional policy options to promote temporary carbon sequestration

Considering the challenges identified with the proposed agri-food policy options, in this chapter we consider alternative policies to promote temporary sequestration. We also explore the extent to which there are interactions between promoting carbon sequestration under the CRCF and the CAP.

The Common Agricultural Policy (CAP), with its budget of €387 billion over 2021-2027, is the dominant agri-food policy in the EU. Given its central role, we consider how the CRCF (and crediting approaches more generally – including the agri-food climate policy options in chapter 3) could work as part of or alongside CAP,

[49] *It is also unclear how much demand temporary crediting could generate, as uptake in voluntary carbon markets has until now been very limited.*

[50] *The proposed AgETS and MCS policy options do not specify monitoring periods for the different activities. These are defined in the CRCF regulation.*

identifying possible models for linking CRCF and CAP, and their risks and opportunities (section 4.1). Two of these models do not represent alternative models for promoting temporary carbon sequestration but rather explore the potential complications of operating the CRCF alongside the CAP. However, the third model we present – integrating carbon farming under the CRCF into CAP – represents an alternative to the proposed agri-food policies; yet while this approach would avoid the risks of offsetting (option 3b) identified in chapter 3, it poses its own practical and political challenges, which we explore.

Given the challenges with crediting approaches to temporary carbon sequestration outlined in chapters 2 and 3, we also consider the potential for activity-based payments as an alternative to results-based payments through crediting. We consider how these can be implemented effectively both within and beyond the CAP (section 4.2).

4.1 CRCF crediting approaches and the CAP: Policy options

How can the interaction between the promotion of carbon sequestration under the CRCF and CAP be managed to maximize climate benefits while ensuring fairness, efficiency, and farmer participation?

The EU's Common Agricultural Policy (CAP) provides financing for agriculture and measures to enhance carbon sequestration in the land sector primarily in form of activity-based payments tied to specific practices or subsidies paid per land area, without necessarily quantifying carbon outcomes. The performance of both individual interventions and national strategic plans is mainly assessed through result[51] and output indicators[52] (Hart, 2024b). While this approach provides predictability for farmers and ease of administration, it may not fully incentivise longer term carbon storage, among other weaknesses (see chapter 4.2 for more information on activity-based funding characteristics). Despite the CAP performance framework, simply counting hectares, livestock, and expenditure is insufficient to comprehensively evaluate how effectively CAP interventions and national strategic plans address environmental or socio-economic challenges (Mal, 2025; Röder et al., 2024; Pe'er et al., 2019). Additionally, the CAP in its current form has been criticised as ineffective at delivering climate mitigation outcomes (EU Court of Auditors, 2021, 2024). As explored in earlier chapters, crediting-based (or other result-based) payments can in some cases offer a range of benefits that could enhance both temporary carbon sequestration and farmers engagement while also opening additional funding streams for climate and environmental measures (Siemons et al., 2025). **In this section, we consider how crediting-based approaches can be implemented within or alongside the CAP.**

The first indications from the EU's financial framework for the post-2028 budget suggest a reduction in funding for the agricultural sector (European Parliamentary Research Service, 2025). It is expected that an emphasis will be put on stabilisation of farm income and attracting a new generation of farmers, meaning that funding for rural development and environmental measures will largely depend on national allocations (EC, 2025a). **Thus, there is growing concern that environmental and climate related measures may receive less financial support under the CAP in the near future.** Environmental and climate objectives are not part of the five objectives of the new so called "European Fund for economic, social and territorial cohesion, agriculture and rural, fisheries and maritime, prosperity and security" of which CAP is part of in the current policy proposals.

[51] *Result indicators are designed to link CAP measures with their objectives, providing insight into whether the CAP is progressing toward achieving its goals. Each Member State establishes milestones and targets for these indicators i.e. values expected to be reached over the programming period (European Commission, 2024c) which are reported annually. In total, 44 result indicators are used to connect CAP interventions to broader policy objectives, such as "climate change action" and "environmental care".*

[52] *Output indicators, capture the tangible outputs produced by CAP interventions (e.g., hectares supported, projects funded, or beneficiaries reached). They follow an accounting-based logic in which each expenditure associated with an intervention generates and counts one measurable output. There are 37 output indicators overall, 35 of which are employed for performance clearance, monitoring, communication, and evaluation purposes (European Commission, 2024c).*

Also, the new proposals eliminate the environmental ring-fencing requirement,[53] leaving Member States with no incentive to uphold current spending levels on environmental measures and providing the Commission with no means to compel them to do so (Hart and Baldock, 2025).

As described in previous chapters, there is the potential to source additional revenue for farmers via the sale of CRCF units either on the voluntary market, public procurement programmes, or integration into compliance markets such as the proposed AgETS or MCS. Against the background of potentially even more scarce funding for environmental purposes under the future CAP, such funding from the sale of CRCF units could become a more important funding source in the near future. However, funding carbon sequestration activities through the CRCF alongside CAP risks overlaps of measures to be funded, double-counting or rewarding, and other potential complications.

Various models are conceivable for how the interaction between CAP and carbon farming under the CRCF could work. In this section we discuss three policy options linking CRCF crediting of carbon farming activities with the CAP: Option 1: CAP and CRCF as two separate systems; Option 2: Combined approach with the CAP as a support mechanism for the CRCF; and Option 3: Generating carbon units via the CAP. Options 1 and 2 set out opportunities and challenges associated with simultaneous operation of the CAP and CRCF crediting of carbon farming; Option 3 represents an alternative approach to promoting carbon farming measures that generate temporary carbon sequestration. **In the sections below, we characterise how these policy options could work, and identify potential risks, opportunities, and challenges.**

For all options discussed, overlaps between measures funded under the CAP and the crediting of related temporary carbon sequestration activities under the CRCF can create problems. Firstly, agricultural measures under the CRCF methodologies already fall within the scope of the current CAP framework and its minimum standards for good agricultural and environmental condition of land (GAECs) such as crop rotation and diversification (GAEC 7) and retention of landscape features (GAEC 8).[54] In addition, the CAP strategic plans by the Member States offer a range of voluntary measures which can be identical or similar to CRCF methodologies. The measures' offered under CAP strategic plans range from measures that are relatively easy to implement and widespread (e.g. catch crops) to complex (e.g. peatland rewetting). As explored in chapter 2.3, this could lead to **concerns around additionality**, i.e. the fact that activities are already part of CAP conditionality requirements or already receive CAP funding makes it less likely that the financial incentive effect of selling CRCF units alone makes their implementation economically viable. In order to combine CAP and CRCF funding, the additionality rules of the CRCF would need to be complied with. According to additionality requirements defined in the CRCF Regulation, any activity funded by the CRCF shall be additional (Article 5). Thus, in theory, the CAP and the CRCF would need to fund different incremental parts of an activity, i.e. CRCF units must pay for an additional climate impact that would not have been achieved with CAP money alone (e.g. establishment of agroforestry systems that would not have been funded otherwise through the current CAP design).

However, the April 2025 draft CRCF certification methodologies for carbon farming include various exemptions from the obligation for operators to demonstrate additionality, which risk allowing double-funding with the CAP – and raise questions regarding additionality. One issue is that the methodologies assume an activity remains additional during the entire activity period, failing to manage the potential situation where regulatory requirements (or CAP compliance requirements) become more stringent: in this case, farmers would continue to receive CRCF certificates as if their activity was additional, even though it has become mandatory.

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[53] Under the current CAP, Member States are required to allocate a share of their funding in both pillars to schemes that broadly fall under the "environmental" and related categories. In Pillar I, 25% of expenditure must go to eco-schemes, which receive full EU funding, while in Pillar II, a minimum of 35% of resources must be set aside for a range of measures including agri-environment-climate schemes, green investments, and 50% of the allocation for Areas facing Natural Constraints (ANC), which are not primarily environmental. This ring-fencing approach has channeled significant levels of funding into environmental schemes.

[54] Since the beginning of the CAP 2023-2027 legislation, there have been several amendments and derogations to several GAEC requirements.

Furthermore, the draft methodology exempts specific activities from having to demonstrate that they require CRCF incentives to become financially viable (i.e., that they are additional). These exemptions apply to activities that receive state aid or public subsidies that have a "claw-back mechanism" (i.e. they must be repaid once CRCF revenues become available) or if the subsidies do not cover the same aspects as the activity proposed for CRCF funding (e.g. smaller area, different eligible costs, smaller number of practices). The second exemption allows farmers to claim both CAP payments and CRCF additionality even when implementing just one agricultural practice, as long as the CRCF incentives finance 'other' benefits (e.g. CRCF generates mitigation benefits, while CAP funding generates adaptation benefits). These proposed provisions entail a competitive advantage for activities that already receive public subsidies. As a result, CRCF revenues might merely replace or augment public subsidies for already on-going activities instead of incentivising new activities. Additional climate action would only be achieved if these subsidies would be withdrawn and made available for additional activities. **This means, that in practice the currently proposed rules would allow double funding through CRCF revenues and CAP and create high risks that many activities registered under the CRCF are not additional** (Siemons and Schneider, 2025). If the provisions in the current draft methodologies were adopted, the risk of funding non-additional activities through the CRCF would materialise and apply to any of the options discussed in the following sections. The additionality provisions of the certification methodologies should be strengthened to address this, including only awarding units equivalent to the fraction of mitigation resulting from CRCF funding if this is combined with other funding sources. This would be necessary to avoid publicly subsidising the users of CRCF units (see e.g. rules proposed in the Oxford Principles for Responsible Engagement with Article 6 (Johnstone et al., 2025) as well as Spalding-Fecher et al. (2021).

Yet, other EU legal requirements are in place that limit double funding. These may pose certain limits to combining CAP funds with private or public funding of CRCF units to support activities certified under the CRCF. Double funding of measures from several EU programmes under the CAP is prohibited (Article 194 of Regulation 2024/2509, Article 36 of Regulation 2021/2116), with some exceptions. Additionally, EU rules set limits on combining different national public funding sources or combining national public funding sources with EU funding sources. Accordingly, combining different public funding sources is only possible as long as the different sources of funding support different identifiable eligible costs, i.e. different elements of an activity that is supported (Article 8(1) GBER).[55] Additionally, such aid may be cumulated to support the same cost/activity only if the total support does not exceed the highest aid intensity (the amount of eligible costs) permitted by EU law (Article 8(2) and (3) GBER). This means that funding for agri-environmental/climate measures from two public sources must not exceed the maximum eligible costs permitted by EU law or that the two sources need to fund different elements or parts of such a measure to comply with the GBER. These regulations aim to ensure that public funding is used efficiently and targeted effectively, and that overcompensation is avoided.[56] These EU rules limiting double funding from public sources would be applicable to the CRCF under the public procurement policy option discussed in chapter 3.1.3. Thus, **an activity implemented under the CRCF could only receive funding through public procurement of CRCF units and through the CAP if the maximum level of state aid is not exceeded or if the different sources funded different parts of the activity.**

However, extra funds can be obtained for the implementation of environmental services in other ways, provided these are not state payments. Eligible sources of such additional funding include private funds or regional programmes from private initiatives and foundations (e.g. non-profit environmental organisations), or premium payments from the value chain itself and can be understood to also comprise revenues from the sale

[55] *Regulation (EU) 651/2014 General Block Exemption Regulation (GBER) defines categories of State aid that are compatible with the EU internal market. This includes aid for environmental protection and energy, aid for research, development and innovation, training aid and aid for SMEs in agriculture and forestry.*

[56] *If Member States want to exceed these limitations, e.g. by allowing cumulation of two public payments covering more than 100% of the eligible costs, they would need to notify the European Commission of the aid they provide. The Commission can then decide if the aid is still compatible under State Aid rules laid down in Article 107(3) of the TFEU. In practice, the Commission is cautious about overcompensation as the Agricultural State Aid Guidelines (2022/C 485/01) also state that compensation should not exceed 100% of additional costs or income foregone.*

of temporary CRCF units. Using private funds to compensate for insufficient state funding for environmental measures thus does not violate the EU rules on double funding. This is because the funds do not originate from EU programmes under the CAP or other public money. Furthermore, the draft carbon farming certification methodologies under the CRCF explicitly allow CRCF activities to also receive public funding. This means that in principle, carbon farming measures eligible under the corresponding CRCF certification methodologies can also be funded by the CAP. The 2022 Impact Assessment accompanying the proposal for the CRCF Regulation states that, to avoid the risk of double funding, private financing and public support (e.g. CAP, state aid) should fund different aspects of carbon removals, e.g. CAP payments rewarding certain practices where the actual carbon sequestration does not constitute the basis for the payment, with private payments for the linked to sequestration (EC, 2022).[57] To make this requirement legally binding, national legislation may need to be in place in Member States, restricting the combination of public and private funding for the same activity. This would include rules to avoid overcompensation of a measure as well as requirements to disclose all sources of funding and clearly separate them. Additional private funding might also entail a reduction of a public payment. Such legislation would prevent double-funding of a measure from public (CAP) funding and private CRCF funding and enhance the additionality of measures. Further research would be required to assess this for different Member States in further detail.

As well as concerns related to additionality/double funding, the risks related to using CRCF units for offsetting purposes apply to three out of the four options discussed below. As long as use cases for CRCF units are not defined or limited, the weaknesses in the requirements of the draft carbon farming certification methodologies imply significant risks for environmental integrity (see section 2.3) in addition to potential mitigation deterrence. These risks are inherent to the current design of the CRCF and exist independently of how the CRCF will be interlinked with the CAP.

4.1.1 Option 1: CAP and CRCF crediting approaches as two separate systems (No direct link)

This option describes a situation in which two separate systems, the CAP and the CRCF crediting approaches operate simultaneously and independently, both incentivising farmers to implement temporary carbon sequestration measures. Farmers could decide if they want to fund the carbon farming activities through the CAP or through the sale of CRCF units.

Assessment: This approach could reduce barriers to participating in the CRCF for a broader range of participants, including farmers, farmer groups but also other potential beneficiaries, such as landowners (e.g. municipalities) outside the CAP. Yet, due to the insufficient additionality provisions included in the current draft methodologies of the CRCF (see section 4.1), this approach risks double funding and inefficient use of funds (e.g. a farmer finances the same implementation of cover crops through the CAP and through the sale of CRCF units). Additionally, this option poses administrative complexity, especially if farmers switch between systems, for example based on fluctuating carbon prices (e.g. a farmer finances cover crops through the CAP in one year and through the sale of temporary CRCF units in the years after). The approach is also unlikely to deliver significant administrative savings, as both systems would need to know about each other to rule out additionality concerns and to ensure cost-effective, compatible administration and monitoring systems. Furthermore, the risks related to using CRCF units for offsetting purposes remain (see above).

[57] *According to the assessment, payment under the eco-schemes and rural development interventions under CAP support land managers to undertake certain practices, but "are part of the whole farming management of the holding and the production of food and other ecosystem services so the relevant payments are intended to finance such practices and not directly aimed at rewarding carbon removals, so that double funding is excluded" (EC, 2022, p. 85).*

4.1.2 Option 2: Combined approach with the CAP as a support mechanism for CRCF crediting approaches

Alternatively, CAP measures could explicitly support the implementation of temporary carbon sequestration measures under CRCF methodologies. In this way, farmers could receive financial support for implementing carbon farming measures from two sources, CAP and CRCF crediting. Yet, to avoid overcompensation of a measure and to make sure that funding is used effectively to create additional climate benefits, it would be essential to define rules under the CRCF and CAP framework to require a clear definition of the distinct purpose of each payment and to separate the cash flows. Options for linking the CAP and the CRCF include:

- **2a: A 'soft link' could permit beneficiaries who fulfil CAP minimum requirements (e.g. conditionality) to use CAP interventions for related (but not direct) costs of carbon farming activities, e.g. to finance advisory services or farmer MRV costs in a manner that indirectly supports the activity financed via CRCF crediting.** An example could be carbon sequestration by agroforestry systems, where the CAP could support farmers in planning processes, such as selection of tree species and covering the cost of planning or surveying and verifying plant growth. These would be activity-based measures, where payment would be based upon implementation of the activity (e.g. completing the planning process or planting trees). Farmers could then additionally receive results-based payments by certifying the resulting temporary sequestration and selling temporary CRCF units.
- **2b: A "stronger link" between both systems could be established by an effective co-finance mechanism to leverage the benefits of both funding models.** For instance, the CAP could offer action-based payments (unrelated to results), to cover upfront costs of initial implementation (e.g. for tree planting or rewetting of organic soils), reducing farmer risk and encouraging their uptake of carbon farming measures. The farmer could then receive additional "top up" income over time in the form of result-based payments generated by certifying the carbon farming measures and selling temporary CRCF units. Such an approach could be particularly relevant for high-impact but high-cost measures such as the implementation of agroforestry systems and peatland rewetting and its wet use (e.g. paludiculture) keeping the land in agricultural use. Currently, complex, high-impact but high-cost measures can lack the necessary funding under the CAP to incentivise the action (BirdLife Europe and EEB, 2022), a barrier that would be overcome by this approach. Furthermore, this approach could enhance achieving broader environmental goals. For example, measures could incorporate upfront payments for biodiversity-friendly tree species or agroforestry systems to enhance habitat connectivity and support pollinator populations.

Assessment: Explicitly linking the CRCF and the CAP offers some advantages. This approach could strengthen the use of advisory services under the CAP, co-finance high-impact, high-cost measures and help cover high MRV costs, increasing the attractiveness of the activities eligible for crediting under the CRCF. Furthermore, prefinancing through the CAP could be used to achieve broader environmental goals besides carbon sequestration. These integrated approaches would strengthen outcomes for both climate and biodiversity. Thus, the co-financing between CAP and CRCF crediting could make scarce funding more targeted to achieving climate mitigation results, as linking ongoing payments to results may improve targeting and efficiency relative to action-based approaches.

However, subsidising temporary carbon sequestration measures through government support in the form of upfront payments or MRV support reduces the cost of measures and thus represents a government subsidy for CRCF units. Depending on how the CRCF units are integrated within the policies, this could prevent actual emission reductions, distorting carbon markets by artificially lowering unit prices and compromising environmental integrity. Also, linking CRCF and the CAP could establish a bias toward climate action activities that can generate carbon credits and neglect other activities with positive environmental effects (e.g. biodiversity, water, soil). Additionally, such a combined approach could introduce administrative complexity, as farmers

would need to navigate two systems for a single measure. Furthermore, the risks related to using CRCF units for offsetting purposes remain (see above).

Box 3 provides two examples illustrating how action- and result-based payments could co-finance the implementation of temporary carbon sequestration under CRCF crediting approaches.

Box 3 – Examples of CAP co-financing

Example 1 - Establishment and maintenance of agroforestry systems under the German NSP

The German National Strategic Plan (NSP) supports the establishment of agroforestry systems with up to 80% of eligible costs, while ongoing maintenance is funded through an eco-scheme. Replacing the maintenance support with revenues from CRCF units (while continuing payment of establishment costs under the CAP) could maintain similar income levels for farmers (depending on the carbon price) while offering result-based implementation using the CRCF methodology. Such an approach could ultimately increase the funding volume for the establishment and maintenance of agroforestry systems.

Example 2 "Transition of practice" CAP intervention in France: a hybrid agri-environmental-climate scheme[58]

Intervention 70.27 is a broad-based hybrid agri-environmental measure available in mainland France aimed at supporting farms in transitioning toward more sustainable practices including a farm carbon balance over a five-year period. This intervention is a good example of a hybrid approach linking action and result-based elements. The carbon pathway includes practices to maintain and sequester carbon as well as reduce emissions. The intervention design requires measurable improvements over five years, with a 15% improvement in the carbon balance over the five years being required to receive the full payment under the carbon pathway. Full payment consists of a flat-rate payment of € 18,000 per farm, in most regions. The payment is typically disbursed either as an annual payment or as split payments with one or two advances followed by a final balance. The final balance may be a reduced amount if the target has not been fully achieved. The total public expenditure for the whole intervention is around € 135 million. The target uptake for the intervention is set at 5.2% of French agricultural holdings to be participating in the scheme by the end of the programming period, with the output indicator identifying that over the 2023-29 period, there would be 7,902 farms signed up to the intervention. However, data show that uptake to date is limited. A key barrier to adoption seems to be farmers' reluctance to risk non-compliance with the 15% carbon improvement target and the potential need to pay back part of the payment if the 15% target is not met. Additionally, the flat-rate payment of €18,000 over five years is seen as relatively low by beneficiaries, especially when weighed against the risk of potentially not receiving the full payment if the targets are not met. Moreover, the scheme does not allow double funding with similar agri-environmental schemes, which further narrows its appeal.

4.1.3 Option 3: Generating CRCF units via the CAP

This option would involve a fundamental policy change of the current CAP framework. In this option, farmers would implement the measures and receive funding via the CAP solely. It resembles a public purchasing system, where public authorities fund measurable environmental services using the CAP money (in this way, it is similar to the public procurement policy options presented in section 3.1.3 and assessed in section 0).The competent CAP authority would be the owner of all resulting carbon units. Option 3 includes two sub-options, which differ in the role of national authorities:

[58] *For more detailed information, see (Scheid et al., 2025).*

- **3a Jurisdictional crediting**: Under this sub-option, farmers would receive an activity-based payment for implementing carbon farming measures paid through the CAP (as it is in the current CAP). Once the intervention is completed, the competent CAP authorities assess the climate impact resulting from all carbon farming measures by applying the relevant CRCF certification methodology. Based on the quantified mitigation, the CAP authorities would receive an equivalent number of certified temporary CRCF units and sell them on voluntary carbon markets. The revenue could be used by national authorities in addition to their own CAP funding. The payment farmers receive for implementing carbon farming actions would be independent of the quantified carbon removals (i.e. it would be activity-based not result-based).

  Assessment: This model offers several advantages: it increases the national (or regional, depending on scale of implementation) CAP budget. By acting as an intermediary, the state takes over the liability for the risks involved (e.g. carbon losses, low sequestration rates, fluctuating carbon prices), which would be reduced due to the high number of individual farmers covered, relative to the risks faced by individual farmers. Furthermore, it removes upfront costs and MRV burdens for farmers by prefinancing measures through the CAP (similar to option 2) and builds on existing CAP structures, eliminating the need for parallel systems. Challenges are related to complex implementation, requiring alignment of CAP and CRCF timelines and MRV systems, financial and performance risks for public authorities and relatedly insufficient incentives for farmers to maintain measures due to not personally owning the CRCF units. Furthermore, the risks related to using CRCF units for offsetting purposes remain.

- **3b Public purchasing through CAP funding:** A further sub-option would be to use CAP money to purchase temporary CRCF units, without selling them on voluntary carbon markets. This would shift CAP payments from activity-based payments to public purchases of CRCF units (i.e. result-based). Farmers that fulfil the CAP minimum requirements would be able to generate and sell CRCF units to the CAP authorities, based on the amount of carbon sequestered by their measures, as certified under the CRCF. The costs and risks associated with carbon sequestration levels lie with the farmers. The national authorities could choose to reward farmers for carbon sequestration at market prices or at higher carbon prices. The units would not be sold on a voluntary carbon market (no offsetting).

  Assessment: Option 3b overlaps significantly with the section 3.1.3 public procurement: public funding, which is assessed in detail in section 0. This option bears potential advantages: it does not involve offsetting, so poses no emission reduction deterrence or environmental integrity risks. If CAP authorities chose to set prices for CRCF units, farmers would not depend on fluctuating carbon prices and could rely on public funding through the CAP. This option would not generate additional funding for CAP. This option would be only available for farmers that meet the CAP minimum requirements, limiting participation.

4.1.4 Overview and discussion

The previous sections examined how CRCF crediting approaches can be linked and aligned with the CAP to enhance climate mitigation and support farmer participation. Three sets of policy options are presented, ranging from maintaining separate systems to integrating CAP as a co-financing mechanism or generating CRCF units via the CAP. The different options show that aligning CRCF with CAP requires careful policy design, robust monitoring and clear financial separation if private and public money is used. Both Option 1 and option 2 would be possible without significant policy change, given the current CAP and CRCF frameworks; options 3a and 3b would require a fundamental change in the policy design of the CAP. Option 3a is the only approach with the potential to expand the overall funding volume of the CAP (or CAP authorities), while all options (except option 3b) would imply that CRCF funding complements CAP funds. Figure 2 summarises the potential policy options for aligning CRCF crediting approaches and CAP.

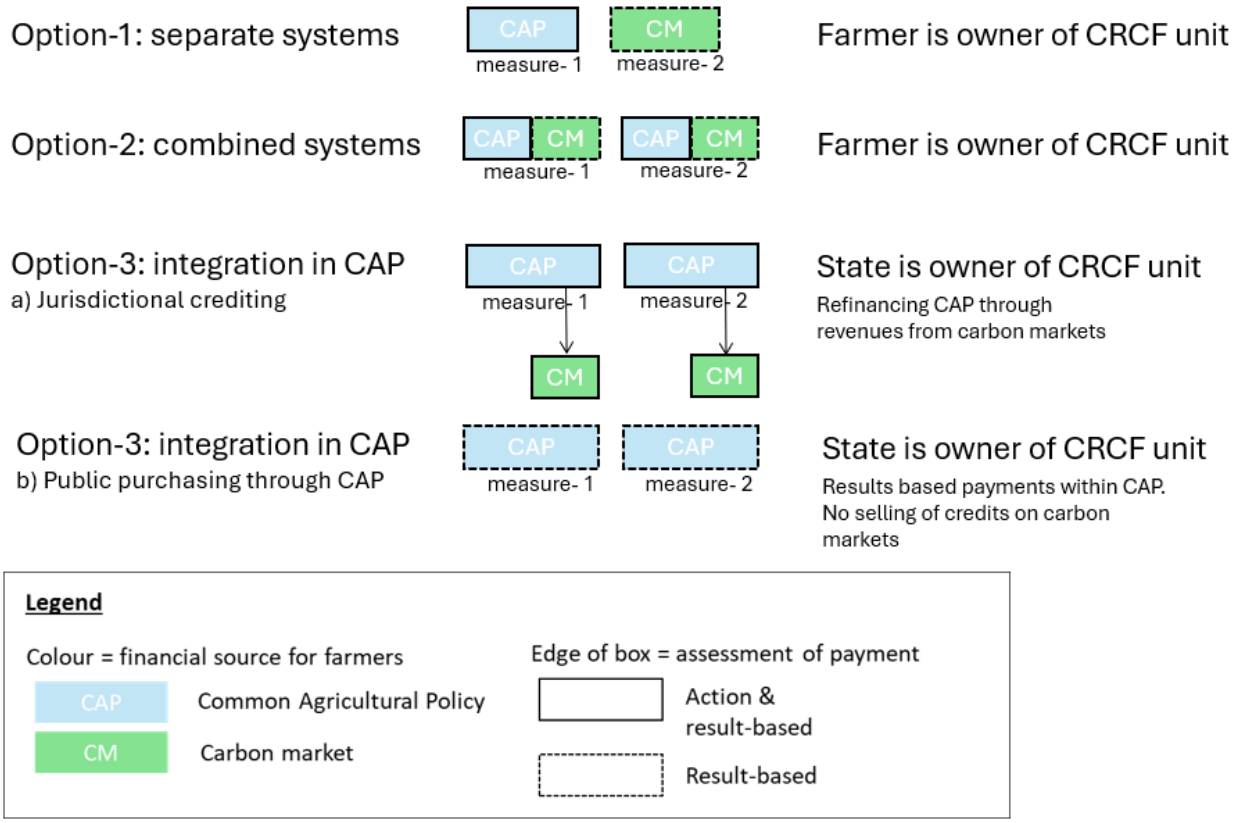

Figure 2: Policy options linking the CRCF with the CAP

While various models for integrating or running CRCF crediting approaches alongside CAP present both opportunities and challenges, a mixed system may offer a balanced solution – though it poses risks to additionality that could be difficult to manage. Combining the predictability and accessibility of activity-based CAP support with the performance driven incentives of results-based CRCF finance could enhance both farmers participation and environmental effectiveness. However, it poses significant risks of double funding and non-additionality of temporary CRCF units. Our assessment shows that in most cases, double funding through CAP and private CRCF money would generally be permitted by EU law. To avoid that multiple sources of money fund the exact same activity, national legislation is needed to ensure that the two funding sources support different parts of an activity and total funding does not exceed the costs of the activity (we did not assess whether such national legislation is in place in all Member States within the scope of this report). Separating funding to different parts of an activity would be relatively easy to achieve, e.g. with CAP funding some upfront costs (e.g. MRV support) or co-benefits (e.g. biodiversity enhancement) and CRCF funding ongoing costs or climate mitigation impacts, even when these payments are all for the same action. While permitted under EU law, this would be problematic for the resulting temporary CRCF units, as the public CAP support would effectively subsidise the CRCF activities, undermining their additionality; as explored in 2.3, the draft CRCF certification methodology additionality provisions are too weak to manage this effectively. When both funding sources are public (e.g. in the case of the public procurement programme), EU state aid rules limit the maximum level of total state aid and also require two funding sources to support different elements of an activity. The additionality requirements of CRCF certification methodologies should be strengthened to address this, including only awarding units equivalent to the fraction of mitigation resulting from CRCF funding if this is combined with other funding sources.

Additionally, the risks related to using CRCF units for offsetting purposes apply to three out of four options discussed (see above). These could only be addressed through limiting use cases of CRCF units and by significantly enhancing the stringency of the requirements in the certification methodologies, as discussed in section 2.3.

Additional policy changes and impacts offer opportunities to help manage existing overlaps between the CAP and the crediting of temporary carbon sequestration under the CRCF. The CAP and the CRCF systems generally require some overlapping data (e.g. land parcel identification, positional information and remotely sensed data), however, for some methodologies, the CRCF certification methodologies requires extra detail (e.g. demonstrating measure implementation). A common administration and control system – building on the existing Integrated Administration and Control System (IACS)[59] - could ensure that comprehensive and comparable data is available throughout the EU, to avoid double funding and accounting issues and to reduce farmer administrative costs. The more integrated the two systems are, the more integrated administration and control systems should be, with potential implications for CAP reforms. Furthermore, this system could support advances in measuring and monitoring changes in carbon stocks resulting from carbon farming activities, supporting remote sensing and new modelling techniques. Additionally, these activities will generate climate relevant data that can contribute to improving the quality of national GHG inventories for the LULUCF sector over time (EC, 2024b).

4.2 Activity-based funding: Alternative policy options

Activity-based funding for temporary sequestration offers an alternative to the result-based approaches of CRCF crediting explored so far in this report. With activity-based funding, farmers receive payment "in return for certain actions being taken or practices being avoided," in comparison to result-based payments (such as crediting approaches), "where the payment is made upon the achievement and verification of a mitigation outcome (or other environmental result)" (Siemons et al., 2025). For activity-based payments, the types of activities that are rewarded include, for example, payment per hectare of legumes or catch crops, or per animal for measures such as grassland-based feeding, rather than being based on quantified environmental outcomes.

As explored in previous chapters, well-designed **result-based payment approaches** offer some advantages, including higher effectiveness of meeting set targets due to quantitative monitoring (Sidemo-Holm et al., 2018; Simpson et al., 2023), and offering greater flexibility to farmers (Burton and Schwarz, 2013). However, even ignoring the specific problems of the CRCF's implementation of result-based payments for carbon farming activities (see chapter 2.3), result-based payments have major disadvantages, including high costs for farmers and administrators (Henderson et al., 2022), high uncertainty for farmers and accordingly low acceptability. These disadvantages are particularly pressing in the case of some carbon farming measures (e.g. soil carbon sequestration on mineral soils), where MRV costs are high relative to the potential mitigation (Siemons et al., 2025).

Conversely, activity-based approaches offer significant advantages in the context of temporary carbon sequestration. By focusing on the activity itself rather than its outcome, they enable a broader uptake of practices by avoiding the administrative burden and cost of complex MRV systems (such as those required by the CRCF) (O'Rourke and Finn, 2020). Activity-based approaches are well-suited for measures like soil carbon management, which involve high uncertainty regarding long-term carbon permanence, risk of rapid reversal, and significant administrative burden due to complex MRV requirements[60]. In addition, such approaches are attractive for farmers as they offer certain payments and relatively low complexity. In the context of nature-based solutions such as carbon farming, which deliver multiple environmental benefits, the broad nature of activity-based

[59] *The IACS, ensures that CAP area and animal-based interventions are managed, checked and monitored in a consistent way in all EU countries. Typically, IACS covers an annual process, which starts with farmers lodging their online aid application for CAP payments. In order to support farmers in this process, national administrations have to provide them with pre-filled information that they can confirm, correct or complete (EC, 2025f).*

[60] *A report by the German Scientific Advisory Board for Natural Climate Protection also concludes that a certification system for determining CO2 sequestration in mineral arable soils is associated with high costs and uncertainties and is therefore hardly suitable for the CRCF (Wissenschaftlicher Beirat für Natürlichen Klimaschutz, 2025).*

funding makes it possible it support multiple outcomes, rather than narrowly focussing on climate mitigation (Siemons et al., 2025).

In the following sections, we consider how activity-based funding could be designed as an effective alternative approach to promote temporary carbon sequestration. We consider opportunities to implement activity-based funding both within and beyond CAP.

4.2.1 Incentivising temporary carbon sequestration through activity-based CAP interventions

The CAP is predominantly built on activity-based payments that are tied to the implementation of specific measures. The CAP has been criticised as ineffective at delivering climate mitigation (EU Court of Auditors, 2021, 2024). However, opportunities exist for improving the effectiveness of activity-based interventions within CAP. In this section, we identify approaches that build on existing successful activity-based interventions within CAP, as well as new proposals, **to identify how CAP can effectively incentivise temporary carbon sequestration through targeted, and impact driven activity-based payments based on scientific evidence.**

Existing agri-environmental-climate measures (AECM) and the eco-schemes offer numerous financing options for temporary carbon sequestration, with differing degrees of attractiveness. Many existing agri-environmental-climate measures and eco-schemes are, in principle, suitable for enhancing carbon sequestration. The EU committed to reduce emissions or to maintain or enhance carbon storage (R.14[61]) on 35% of utilised agricultural area (UAA) under commitments to (EU Court of Auditors, 2024). Many interventions linked to this target bear a potential to enhance carbon sequestration. In particular, cropland measures demonstrate a high sequestration potential. Emissions from cropland are categorised under category 4.B (LULUCF-Cropland) of the Common Reporting Format (CRF) for GHG inventory reporting. However, the mapping of mitigation measures on cropland in most EU GHG inventories has so far been inadequate. According to the European Commission (2025d), 79% of the total estimated mitigation potential of the CAP (30 Mt. CO_2 removals per year) is associated with the storage of carbon in cropland soils. However, result indicators and assessed potentials do not provide information on the mitigation impact of the actions implemented (EU Court of Auditors, 2024) (also see chapter 4.1. for more information on result indicators). For example, an assessment of the National CAP Strategic Plans of Central Eastern European countries confirms that interventions in these Member States deliver limited mitigation impacts, and these come primarily from carbon sequestration (Frelih-Larsen et al., 2024). In other words, the measures outlined in national CAP Strategic Plans in principle offer high potential for temporary carbon sequestration, but the effectiveness and impact of these measures may be more limited and remain to be assessed. To deliver effective carbon sequestration, targeted and impact driven CAP funding is essential. Determining funding criteria should be based on relevant and practice oriented scientific evidence that proves the positive effect of the implementation of specific measures.

There are different CAP policy design options discussed in literature to ensure that targeted payments deliver public goods (value-for-money), which are described below. The options could possibly be combined.

- **Linking output and impact through weighted output indicators reflecting the environmental or socio-economic impact.** Röder et al. (2024) propose linking outputs and impacts by using weighted output indicators that capture environmental or socio-economic effects. In this approach, the outputs of a CAP intervention (e.g. number of hectares) would be directly associated with specific impacts achieved (e.g. the volume of carbon sequestered). The system could operate in two stages: first, through minimum targets for output indicators, defined and approved by the European Commission and implemented by Member States in their national strategic plans (Agora Agriculture, 2024); and second, by providing additional incentives for exceeding these minimum benchmarks. However, establishing a clear causal connection between farmers' actions under CAP payments and their

[61] *The result indicator (R.14) Carbon storage in soils and biomass is defined as share of utilised agricultural area (UAA) under supported commitments to reduce emissions or to maintain or enhance carbon storage (including permanent grassland, permanent crops with permanent green cover, agricultural land in wetland and peatland).*

resulting impacts is often challenging. Moreover, there can be considerable delays between policy implementation, farmers' responses, and measurable environmental outcomes (Hart, 2024a), such as observable increases in soil organic carbon.

- **A point-based system could make action-based payments more differentiated, rewarding measures according to their value in delivering public goods (e.g. climate, biodiversity, water, and soil protection), without the challenges of a full crediting approach**. Under such an approach, national governments could score individual farming practices based on their contribution to environmental and climate objectives. For example, in the Netherlands, a menu-points system was designed for implementing voluntary eco-schemes. This menu included 22 activities from which farmers could choose annually, all contributing to one of the five objectives set by the Dutch government in line with EU regulations. For instance, the practice of 'grass/clover' received 4 out of 5 points for both climate and soil targets but scored 0 for water objectives (Jongeneel and Gonzalez-Martinez, 2023). The total contributions of a given practice are acknowledged by summing up the points and linking them to remuneration. Additionally, a bonus mechanism could be introduced to promote the uptake of diverse measures (DVL, 2020).
- **Increasing payment rates over time** would reflect the long-term nature of measures and incentivise the delivery of public goods. Many agricultural practices generate environmental and climate benefits gradually, especially those related to carbon sequestration. Introducing payment rates that increase with each year of continued implementation would encourage farmers to maintain such measures and enhance the provision of public goods over time, while still preserving their entrepreneurial freedom. Farmers would retain the option to reassess annually and discontinue measures if opportunity costs became too high (Agora Agriculture, 2024). An indicator system would be needed to determine the impact of the measure over time. For instance, a farmer adopting an agroforestry system could receive progressively higher payments over time to reflect the long-term nature of the practice, while retaining all financial support already received should they decide to end the measure under activity-based schemes.

4.2.2 Activity-based funding options beyond CAP

Activity-based funding options can be and are already being implemented outside of CAP. In this section, we identify potential avenues for promoting carbon farming through activity-based funding beyond both the CAP and the crediting approaches assessed in chapter 3. We identify a wide range of seven policies, approaches, or funding streams, at the level of the EU, Member State, or private actors. For each, we list inspirational examples where such approaches have already been implemented. **These additional options offer a wide range of alternative approaches and funding sources to support carbon farming, beyond the result-based approach of the CRCF, or existing approaches in the CAP**.

4.2.2.1 EU-level options

- **Utilising AgETS auction revenues for activity-based funding:** The AgETS policy explored in section 3.1.1 could be adapted to generate finance for activity-based funding of carbon farming. An option explored in Bognar et al. (2023) is a "no-link: disconnected markets" model to manage the link between LULUCF removals (i.e. temporary carbon farming mitigation) and an AgETS. In this model, the regulator (or other intermediary[62]) auctions AgETS allowances to obligated entities (e.g. agri-food processors or retailers) and then uses the revenue to pay for LULUCF removals, i.e. carbon farming measures. Aside from generating funding, there is no link between removals and the AgETS, i.e. the supply of AgETS allowances (i.e. the cap) is unaffected by the quantity of carbon removals achieved

[62] *Such an intermediary could take the form of an independent "carbon central bank," as proposed in e.g. Edenhofer et al. (2024).*

or the amount of financing for carbon farming. This avoids any risk of emission reduction deterrence within the AgETS, unlike the models in section 3.1.1. Carbon farming could be promoted using a result-based approach such as the CRCF, however, the lack of a link between the AgETS and temporary carbon farming mitigation also creates flexibility as it avoids the need to quantify temporary carbon farming mitigation. Accordingly, the funds could be used for activity-based funding of carbon farming measures, without the MRV, additionality, and other requirements that would be required if temporary CRCF units were linked, i.e., integrated into the AgETS (as is proposed in 3.1.1).

- **Nature Restoration Fund**: The Nature Restoration Law (NRL) requires Member States to restore ecosystems (EC, 2024c). To support implementation, some actors have called for the establishment of a new, standalone fund with annual funding of €15-25 billion, managed at Member State level, targeted to deliver on the NRL targets (World Wildlife Fund et al., 2024). These targets significantly overlap with carbon farming, including restoration of agricultural land, planting an additional three billion trees, peatland rewetting, among others. Accordingly, such a fund could be used to provide targeted, activity-based payments for nature-based measures that deliver nature restoration, as well as other benefits including climate mitigation.

- **Repurpose existing EU funding sources**: The European Rural Development and Cohesion Funds have historically funded projects that deliver climate as well as biodiversity benefits, in addition to other social objectives. Increased targeting of these funds towards climate and carbon farming could provide significant funding (Aubert et al., 2022). This could include funding for activity-based payments. Opportunities include increasing the climate earmarking requirements for these funds, or for increased focus on nature-based solutions as means for delivering on objectives (Winkler and Biewald, 2025). Examples of the use of existing EU-funding for activity-based funding of carbon farming measures include:

  - **Lithuania's Recovery and Resilience Plan** (submitted under the EU Recovery and Resilience Facility, RRF) includes a targeted measure to restore agriculturally used drained peatlands, with an earmarked allocation of approximately **€16 million** to restore about **8,000 hectares** by 2026. The funding is implemented through national authorities under the RRF governance structure and finances activity-level interventions (ditch filling/blocking, rewetting works, revegetation and post-establishment management), together with complementary measures to promote climate-smart farming on restored soils (EC, 2025b).

  - In Slovakia, the "**Ecohydrological Restoration of Peatlands in the Carpathians**" project (2022-2024) was implemented under Slovakia's Programme on Climate Change Mitigation and Adaptation (EEA/Norway Grants programme) and is administered by the Slovak Ministry of the Environment. The project finances site-level, activity-based restoration at twelve pilot peatland sites (hydrological restoration such as ditch-blocking and dam construction, removal of encroaching vegetation, establishment of monitoring plots, stakeholder engagement and preparation of restoration plans), together with methodological guideline development and demonstration activities for forest and peatland managers (Republic of Slovakia, 2025).

- **Just transition fund for agriculture:** The EU Strategic Dialogue on the Future of Agriculture (2024) proposed a just transition fund to support – in a time-limited manner – farmers and the wider EU agriculture sector transition towards Europe's net zero future. Such an approach has received widespread support, including from the European and Economic Social Committee (2024), who emphasised the need to centre social objectives including young people, women, human rights, and sustainability, as well as the wider civil society (CAN Europe, 2025). Proposals for the implementation of such a fund have been developed including by IEEP and Concito (Baldock et al., 2025). Sommer et al (2024) propose reframing the agricultural transition along the lines of the German coal phase-out, to support arguments for additional funding and to create space for alternative approaches. They

suggest, following the example of the German coal phase-out, that a budget of €13.8-16 billion could be justified for rewetting peatlands in Germany, and that these funds could be distributed in an activity-based manner (i.e. for land retirement), in addition to other transition funding. The use of targeted, activity-based funding to support the agricultural transition is also visible in the Danish Tripartite Agreement, which includes a €5.4 billion Green Land Fund that aims to fund the land use change, providing funding to shift approximately 15% of Denmark's agricultural land to forestry, rewet peatlands, or extensive agriculture (Fraas et al., 2024). This funding could be distributed based upon time-limited (e.g. one-off or set number of annual payments) activity-based funding to incentivise land-use change and cover losses associated with the transition.

- **Redesign CRCF to be an activity-based scheme**: While the CRCF has been designed as a crediting scheme, it could be redesigned to certify the implementation of activities. Rather than certifying units with quantitative measures of emission reductions or sequestration, farmers could instead report on the measure that had been implemented, and for example the cost of these measures. Designing support for carbon farming through an activity-based approach could increase uptake, lower farmer transaction cost, would be simpler to implement and more accessible to smallholder farmers (Raina et al., 2024). The EU could adopt a bounded catalogue of eligible activities (for example: peatland rewetting and paludiculture establishment with defined hydrological works; establishment of mixed-species native afforestation with planting and protection standards; agroforestry / silvoarable and silvopastoral establishment with minimum design rules; and specific soil-building practices such as cover crops, reduced tillage and organic amendment protocols). For each activity, the EU could specify minimum technical prescriptions including environmental safeguards (engineering specifications, species mixes, planting densities, management timelines) to clarify eligible activities.

  Payments could be made upon the implementation of verifiable actions that are known from experience to deliver sequestration and co-benefits when implemented according to standards. Payments could use a three-part payment architecture: (1) an **upfront capital payment** to cover fixed establishment costs (hydrology works, planting, fencing, infrastructure); (2) **annual management payments** for a fixed contract period (e.g. 10–20 years) to cover continuing stewardship and reduce risk to land managers; and (3) **performance top-up benefits** tied to simple, low-cost indicators (e.g. area successfully established after one year or a water-table proxy) rather than full CRCF methodology MRV. The third element would introduce a hybrid approach between activity-based and results-based payments, balancing result-based incentives with administrative feasibility (low-cost MRV). Routine compliance may be checked via a combination of (i) remote sensing for large-scale indicators (e.g. canopy cover), (ii) photographic and geotagged evidence, and (iii) targeted field spot checks. Cost-intensive, CRCF-style MRV would be reserved for a representative sample of projects in order to evaluate the programme and to refine payment rates, rather than requiring this for all individual farmers. Randomised third-party audits could detect systemic non-compliance while keeping per-farmer MRV costs low. This way, the CRCF could build on lessons learnt regarding representative measurement and sampling approaches from REDD+, which show that such measurement and audit samples can provide programme-level confidence without prohibitive per-parcel measurement costs (Wong et al., 2016).

  If redesigned in this way, the CRCF would not generate result-based units. Still, to ensure transparency and documentation of funds provided and activities implemented, a registry could record each funded activity. Funders could receive non-fungible certified units that document the financed action and would be issued per standardised activity unit (e.g. per ha rewetted). These units could be sold to private buyers and used for contribution claims (but not offsetting).

4.2.2.2 Member State-level options

- **Member State activity-based funding:** Member States also have the ability to promote carbon farming actions through their own activity-based funding mechanisms. Examples include:
  - Germany established the **Federal Action Plan on Nature-based Solutions for Climate and Biodiversity** (Aktionsprogramm Natürlicher Klimaschutz, ANK) in March 2023. The plan bundles measures for forests, peatlands, coastal ecosystems and agricultural landscapes to strengthen ecosystem carbon uptake, restore degraded habitats and increase resilience. A headline budget of €4.0 billion from the Climate and Transformation Fund (Klima- und Transformationsfonds) was allocated for ANK measures through 2026 (BMUV, 2023). The German Federal Environment Ministry also announced in that it will publish a new funding guideline for wet agriculture ("Palu-Richtlinie") in 2025 to enable and scale paludiculture and large-scale rewetting of agriculturally used peat soils. The guideline is presented as a targeted complement to existing peatland restoration support and is intended to fund the hydrological works, infrastructure adjustments and management changes needed to operate rewetted peatlands under agricultural use (paludiculture). The measure is framed as a funding instrument under the broader ANK architecture (BMUKN, 2025).
  - Finland established a **Government peatland rewetting & climate wetland programme**: The Ministry of Agriculture and Forestry allocated €30 million for 2023–2025 for converting targeted peat fields to climate wetlands and indicated a planned €20 million per year from 2026 onwards. This "climate wetland on peatland field" initiative is funded through the CAP. It targets the voluntary withdrawal and rewetting of up to 30,000 ha of low-yield peat fields by 2035 and includes annual payments for implementing specific activities (e.g. hydrological works, ditch-blocking, establishment payments). Additionally, Finland funds the re-wetting of low-yield thick-peat fields and cut cover peatlands to establish climate wetlands directly through the government budget. It aims to take 30,000 hectares of corresponding areas out of production and rewet them by 2035 (PUB, 2025).
  - Sweden provides **state-administered wetland and peatland restoration grants**: Under the Local Nature Conservation Initiative (LONA), the Swedish state provides national government funding to landowners who voluntarily rewet previously drained wetlands, especially peat soils, since 2020. The scheme is administered via the Swedish Environmental Protection Agency and other agencies such as the Forest Agency. Funding is typically provided as grants covering restoration capital costs and covers planning, hydrological restoration works (e.g. ditch blocking), maintenance, and compensation for losses when land is withdrawn from production. The support is not CAP-funded though CAP-Rural Development Programmes may provide complementary support for related wetland/water management actions (Naturvardsverket, 2023).
  - The Netherlands implement **public pilot and regional funding for carbon-farming and peatland measures** to test carbon-farming methods and peatland water management, operating alongside CAP instruments. The public-private **Carbon Farming Netherlands** pilots (PPP) and regional ANLb (Agricultural Nature & Landscape Management) schemes support activity-based measures (cover crops, reduced tillage, water-table management on peat meadows, group contracts for peatland management); pilot budgets vary by region, and water boards and provinces routinely co-finance capital works (e.g. ditch-blocking, water control infrastructure) (Carbon Farming, 2025).
  - Austria established a **federal peatland strategy and targeted restoration support**: Austria's Peatland Strategy 2030+ coordinates federal ministries and provincial governments to finance peatland protection and selective restoration works (ditch closure, bog ponds, grazing management changes). Funding is deployed via federal climate/environment budget lines and co-

financed with activity-based grants administered at federal and provincial levels (ALFAWetlands, 2025).

4.2.2.3 Private options

- **Private funding for temporary carbon sequestration activities beyond the CRCF**: Private actors could fund temporary sequestration measures outside of the CRCF framework, as part of their contribution claims or beyond-value chain mitigation to demonstrate engagement for climate mitigation. These can take the form of activity-based payments to farmers for implementing carbon farming measures, or other actions. Existing examples show that private funders are motivated by a mix of strategic and ethical drivers including enhancing corporate reputation demonstrating environmental leadership; stakeholder pressure; and securing non-carbon co-benefits (biodiversity, water regulation, local livelihoods). Examples include:
  - Silvocultura receives voluntary financial contributions from local businesses to financially support farmers implementing agro-forestry in Switzerland (Silvocultura, 2025).
  - Inter IKEA Group and Ingka Group have allocated ~16,000 ha of Latvian forestland for research and are funding a multi-partner research programme to test alternative forest-management practices (climate-resilient silviculture, biodiversity measures) while also developing long-term monitoring frameworks. The funding is structured as research and operational support for applied management trials and monitoring (IKEA, 2025).
  - The fashion corporation Kering established a Regenerative Fund for Nature (managed with Conservation International) that channels corporate contributions and co-investments into multi-year grants to farmer groups, NGOs and project operators to test and scale regenerative practices across supply chains. This includes funding for farmers for changing practices.
  - The Esmée Fairbairn Foundation has disbursed competitive grants for peatland restoration and for other nature projects across the UK that fund planning, landowner engagement, rewetting works and long-term stewardship. Payments cover capital and transaction costs (hydrology works, community engagement) and are not contingent on measured carbon removal (Esmée Fairbairn Foundation, 2025).

5 Conclusions

This report has examined the opportunities and challenges posed by carbon farming and its promotion through CRCF crediting approaches, the risks of integrating of temporary CRCF units into existing and proposed agri-food policies, and alternative policy approaches to promote temporary sequestration. In this conclusion, we synthesise main findings and highlight their implications for the development of EU climate and agricultural policy. We also identify key considerations for designing policy instruments that safeguard environmental integrity while providing effective and practicable pathways for mitigation in the agri-food sector.

5.1 Considering carbon farming and the CRCF

Carbon farming can positively contribute to multiple EU policy objectives. As a nature-based solution, in addition to mitigation it also delivers multiple, crucial co-benefits. Most carbon sequestration measures such as enhancing soil carbon, agroforestry and tree planting, offer strong synergies with other environmental goals, including enhanced biodiversity, improved soil fertility, and reduced nitrogen run-off. It also offers promise as a source of additional income for farmers, supporting the agricultural transition.

However, carbon farming measures and the temporary nature of the carbon sequestration they generate pose significant risks and challenges for crediting approaches, including the EU's Carbon Removals and Carbon Farming Certification Framework (CRCF). The characteristics of carbon farming make it challenging to confidently and cost-effectively promote sequestration and emission reduction measures using result-based carbon crediting approaches. The CRCF's draft certification methodologies are inadequate to address these challenges, **meaning that the resulting temporary CRCF sequestration units pose significant risk of not representing real mitigation.** Particularly pressing is the inadequate implementation of the temporary crediting approach for managing non-permanence risks, with a lack of clear liability rules regarding replacement of non-permanent sequestration units upon their expiry as well as treating reduced emissions through peatland rewetting as permanent. The CRCF also risks generating units from non-additional mitigation, due to insufficient additionality requirements and the overlap of eligible CRCF carbon farming measures with the scope of existing Common Agricultural Policy subsidies. Alongside concerns regarding the quantification of mitigation, these quality concerns mean that there is high risk that temporary CRCF units will not be backed by equivalent mitigation. CRCF certification methodologies should be improved through stringent additionality and quantification, as well as strengthened liability requirements to manage non-permanence risk. The expected low quality of these temporary CRCF units means they are inappropriate for offsetting emission reductions. Such offsetting poses risks for environmental integrity, such that atmospheric emissions could be higher due to the use of offsets than without. In addition to the environmental integrity risks, cost-effectiveness implications must also be considered: to ensure cost-effective use of mitigation funding, it should be targeted towards actions that generate real, additional mitigation –the low expected quality of draft carbon farming CRCF methodologies raises concerns that even if use is limited to contribution claims, it would not represent an efficient use of funds. The foreseen review of the CRCF Regulation by July 2026 (Article 18(4) of the CRCF Regulation to align it with Article 6 of the Paris Agreement and best practice in the voluntary carbon market should be taken as an opportunity to strengthen the requirements which CRCF units must adhere to.

Different types of carbon farming measures pose different risks for carbon crediting. In particular, the non-permanence risk differs across different carbon farming measures: those based upon easily reversible management changes, such as most soil carbon sequestration measures, pose larger risks than those based on land-use changes, such as peatland rewetting or agro-forestry. Carbon farming measures also differ in terms of their likelihood of additionality, potential co-benefits, the accuracy and costs of quantifying emission reductions or removals (Siemons et al., 2025). Accordingly, the resulting temporary sequestration units should not be treated equally. We do not consider permanent carbon farming units in depth in this study, such as units related to nitrous oxide emission reductions; however, these could potentially be considered as less "risky" or complex, due to the permanent nature of their mitigation.

CRCF quality concerns are particularly severe as there are currently no limits on the use case for temporary CRCF units. Offset use cases risk environmental integrity and reduce mitigation incentives in other sectors and should be excluded due to the expected low quality of temporary CRCF units. Using CRCF units towards financial contributions, such as targeting public or private funding to support carbon farming mitigation without accounting the outcomes toward specific targets, poses fewer risks, though the expected low quality raises cost-effectiveness concerns. The purposes for which CRCF units are allowed to be used should be limited, which could be implemented in the draft CRCF methodologies or in a revised CRCF regulation, in cross-cutting EU legislation such as the Green Claims Directive, or in policies in which CRCF units may be integrated, such as the Commission's proposed agri-food climate policies.

The proposed EU agri-food compliance policy options generally allow agri-food actors to meet emission reduction targets by purchasing temporary CRCF units – an offsetting use case – and accordingly face significant environmental integrity risks. These risks could be reduced by avoiding, or at least limiting, the integration of temporary CRCF units into the proposed agri-food policy options. While their exclusion would decrease flexibilities for agri-food actors, it would avoid the environmental integrity risks as well as concerns regarding the deterrence of emission reductions in the agri-food sector. From the perspective of risks posed by temporary CRCF units, a purchasing programme with exclusively public funding would avoid these

environmental integrity risks, though concerns regarding cost-effectiveness remain. However, it would not set broader and mandatory emission reduction incentives on the agri-food sector and will therefore be less likely to meet climate objectives than the other policy options. In assessing the proposed policy options, we have focused on the issue of integrating temporary CRCF units. While it is important to consider their associated risks, when choosing between policies these should be considered alongside other criteria, in particular the policies' likely overall impact on total climate mitigation, which will also depend on the policies' impact on agri-food sector emission reductions beyond temporary sequestration.

5.2 Assessing the proposed agri-food climate policies and their integration of temporary CRCF units

The proposed agri-food climate policies pose significant potential to reduce agri-food emissions. While critical design decisions would determine their ultimate effectiveness, the compliance policies – the AgETS and MCS – with their binding targets would represent a necessary step-change in the EU's approach to agriculture emissions, given agriculture's unique position within EU climate policy as a sector without binding targets or GHG price incentives. The AgETS and MCS policies with a processor-based point of obligation offer practical advantages, due to the relatively limited number of obligated entities and simpler MRV. The AgETS with farmers as the point of obligation offers farmers greater flexibility and MRV that enables more mitigation options but the high number of participants and associated complexity and administrative costs would pose barriers. The MCS retailer option appears impractical, due to the highly complex MRV. Regardless of the policy option selected, achieving the environmental effectiveness and cost-effectiveness promises of these policies would demand ambitious targets, limited and targeted free allocation, and practical approaches to ensure low participation costs for farmers, as well as supporting policies to upskill farmers and manage transition costs, and safeguards to promote additional environmental outcomes beyond climate mitigation.

Temporary CRCF units should not be permitted as offsets within the proposed agri-food climate policies, due to their expected low quality. Their use as offsets would pose risks to environmental integrity, and they therefore should be excluded. Including them would require, at least, strengthened liability requirements to replace expired units to manage non-permanence risk, but also enhanced quantification and additionality requirements. It is to be seen if such high standards could be achieved by the CRCF, and whether this can be achieved without prohibitively expensive MRV costs for farmers generating CRCF units. Agri-food climate policies would also need to manage emission reduction deterrence, for example through quantitative limits and more ambitious compliance policy targets in the case of any integration of temporary CRCF units.

The alternative policy proposal – a public procurement programme for CRCF units – would be likely to offer weaker overall incentives for agri-food emission reductions than the compliance policies but can be designed to avoid environmental integrity risks. If fully publicly funded, the impacts of any environmental integrity issues with CRCF units would be less detrimental: while they would make the scheme less environmentally effective, they would not directly lead to an increase in emissions. However, relying exclusively on competitive public budgets and voluntary action may limit the expected scale of funding and impact. While a "blended" finance approach mixing public and private funding could enable a larger budget and therefore positive impact on carbon farming mitigation, such a programme should limit claims to exclude offsetting and only permit contribution claims to avoid environmental integrity risks.

5.3 The Common Agricultural Policy and other approaches to promote carbon farming

A key challenge for the proposed agri-food climate policies is overlap with the Common Agricultural Policy. We consider different models for the alignment of the CRCF and crediting approaches to carbon farming with the CAP. Of the policy options we considered, a mixed system may offer a balanced solution. For

example, land use change measures, such as rewetting peatlands or establishing agroforestry systems, often require substantial upfront investment, like financing technical infrastructure to raise water tables or purchasing trees and planting material. However, when these measures are rewarded solely through results-based carbon credit payments, the necessary initial funding is typically not available at farm level. This lack of upfront financial support can reduce the attractiveness and feasibility of implementing such measures.[63] By combining the predictability and accessibility of activity-based CAP support with the performance driven incentives of results-based CRCF finance, such a combined approach could enhance both farmers participation and environmental effectiveness. However, careful design is essential to manage legal compatibility and ensure administrative feasibility, alongside limits on CRCF use cases discussed above. This should avoid situations where the combination of funding sources effectively results in public funding subsidising the users of CRCF units.

We also consider coherency of the CRCF and agri-food policies with the Common Agricultural Policy. The CRCF and agri-food policies overlap considerably with the CAP. We identify three models for how the CAP and carbon farming under the CRCF could interact: as separate systems; as combined systems with CAP supporting farmers with CRCF activities; or as nested systems where CRCF units are generated via the CAP. Under all models, overlaps in the measures funded under the CAP and the CRCF create problems, as they pose significant risk of double funding. While the CRCF and CAP funding could be structured to make this double funding generally permissible under EU law, it would make the resulting temporary CRCF units non-additional, posing environmental integrity and cost-effectiveness risks. The additionality requirements of CRCF certification methodologies should be strengthened to address this, including considering only awarding units equivalent to the fraction of mitigation resulting from CRCF funding.

Targeted activity-based payments offer an alternative way to promote carbon farming sequestration. Because they do not give rise to the environmental integrity concerns of carbon crediting approaches, these approaches are especially suitable for "risky" carbon farming measures with high risks of non-permanence, non-additionality, or disproportionately high MRV costs relative to expected benefits (such as soil carbon sequestration). Importantly, activity-based payments also reduce cost, complexity, and risk for farmers. Together, the reduced farmer financial risk, lower administrative burdens, and certain rewards means activity-based payments can be more attractive to farmers, boosting voluntary participation. With their reduced MRV requirements and complexity, they can also offer a more cost-effective option to promote these "risky" carbon farming measures for administrators.

The revision of the Common Agricultural Policy (CAP) after 2027 offers potential to implement targeted activity-based payments for climate and environment outcomes. While the CAP has been criticised for failing to sufficiently deliver on climate and other environmental objective, there are examples within the current CAP and some Member State CAP Strategic Plans that illustrate how targeted activity-based payments and innovative funding schemes can boost outcomes, including in examples such as weighted output indicators and points systems to increase targeting.

Given the uncertain scale and shape of the CAP for the period 2028-2034, this report also identifies other potential funding sources for activity-based payments to promote carbon farming mitigation measures. Promising options that deserve further investigation include building on existing Member State examples, utilising AgETS auction revenues for activity-based funding, a just transition fund for agriculture, and a revision of the CRCF into an activity-based scheme, among others.

[63] *By contrast, changes in agricultural management to increase soil carbon do not require similar upfront investment.*

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7 Annex

7.1 Approaches to manage non-permanence risks of temporary carbon sequestration

The non-permanence of temporary carbon sequestration poses significant challenges for carbon crediting. Crediting mechanisms have taken different approaches to address these challenges and to integrate temporary carbon sequestration activities in carbon crediting programmes. These include:

- **Temporary crediting**: One approach based on the idea of compensating for reversals is to issue credits that expire after a defined time period to activities that involve reversal risks. After the expiration date, such temporary credits are replaced by permanent mitigation or by newly issued temporary credits (unless the operator decides to abandon the activity). The obligation to replace credits is usually placed upon buyers who are ultimately held liable for reversals. By renewing temporarily stored carbon consecutively, this approach makes it possible to balance emissions with a certain level of carbon storage that is preserved over time ("horizontal stacking") (Cabiyo, 2022; FAO, 2024). Yet, it is challenging to implement this approach in practice since it requires an institutional framework to manage replacements of credits as well as fallback options if buyers do not fulfil their obligations to replace credits. Similar issues are arising in the EU CRCF's implementation of temporary crediting, as explored in detail in section 2.2.2 and 7.2. While liability for reversals during the monitoring period are placed on the operator in the CRCF draft methodologies for carbon farming, no rules are in place for handling expired temporary credits upon their expiry at the end of the monitoring period. Further, experience with temporary credits issued under the CDM for afforestation and reforestation activities showed that there was limited interest from buyers (FAO, 2024). This was due to the fact that the temporary credits were not fungible with credits from other sectors under the CDM (and thus available at very low prices) and because they could not be used to meet emission reduction obligations under the European Emissions Trading Scheme (Galik et al., 2012; Gillenwater and Seres, 2011).
- **Monitoring and compensating for reversals**: The most commonly used approach is to monitor and compensate for reversals when they occur by using mitigation impacts achieved by other mitigation activities to cover reversals from temporary carbon sequestration. There are various design options for implementing such approaches. Many crediting programmes use buffer pools to which activities that carry reversal risks contribute a defined number of credits that are then used to compensate for reversals through natural disturbances.[64] Activity proponents are mostly held liable for intentional reversals that result from wilful intent. This approach aims to make temporary mitigation equal to permanent mitigation by monitoring and compensating for reversals and thus to "buy time" until permanent mitigation options are available at larger scale and lower cost. However, it is not feasible to monitor and compensate for reversals forever. Crediting programmes usually set defined time horizons for which potential reversals must be addressed by participants (up to 100 years under current practices). This means that compensation-based approaches ultimately shift the obligation to ensure that global CO_2 emissions stay within a Paris-compatible carbon budget upon future generations (FAO, 2024).
- **Issuance deductions**: An alternative approach based on the idea of compensating for reversals is to issue less credits than the amount that would correspond to the quantified mitigation impact of an activity. The uncredited fraction of the mitigation impact would then compensate for potential future

[64] *Yet, experiences with existing buffer pools have shown that they are often not sufficiently capitalised to cover for large-scale reversals (Badgley et al., 2022) and might not adequately reflect the reversal risks emerging from enhanced climate change impacts (Anderegg et al., 2024).*

reversals. This approach is easy to implement as it does not require further regulations on monitoring for reversals, implementing compensation or enforcing liability. Yet, it does not create incentives to preserve carbon stored and it may not be guaranteed that the amount of deducted credits will be sufficient to cover potential future reversals (FAO, 2024).

- **Tonne-year accounting**: Under this approach, initially only a fraction of credits are issued for the achieved mitigation. This fraction increases with each year that the carbon storage is maintained. A full credit for each tonne of mitigation impact will only be issued at the end of a predefined period (up to 100 years under current practices). This approach is based on the idea of delaying climate damages and contributing to reducing peak warming. Yet, corresponding credits for temporary carbon storage would not be interchangeable with credits issued for permanent mitigation so that this approach has not been widely adopted (FAO, 2024; Matthews et al., 2022).

7.2 Quality issues related to addressing non-permanence risks by proposed certification methodologies for carbon farming under the CRCF

To manage risks of reversal, the CRCF aims to use temporary crediting. However, significant issues related to the implementation of temporary crediting as currently proposed mean that it will be ineffective at managing reversal risks.

The CRCF generally acknowledges the non-permanence challenges associated with carbon sequestration in natural ecosystems. The CRCF regulation stipulates that carbon farming sequestration units should be temporary units subject to an expiry date (Art. 12(5)). A carbon farming sequestration unit refers to one metric tonne of CO_2e of certified temporary net carbon removal benefit generated by a carbon farming activity (Art. 2(22)). According to the draft certification methodologies for carbon farming activities, they can be issued for carbon removals resulting from the management of agricultural soils and agroforestry as well as from tree planting. The CRCF Regulation differentiates between temporary carbon farming sequestration units and soil emission reduction units which are presumably permanent (yet this is not made explicit in the CRCF Regulation) (Art. 12(4)). A soil emission reduction unit refers to one metric tonne of CO_2e of certified net soil emission reduction benefit generated by a carbon farming activity and can be issued for reduced CO_2 or N_2O emissions from managed agricultural soils, for reduced CO_2 and N_2O emissions from tree planting or from reduced CO_2, N_2O, CH_4 emissions from peatland rewetting.

However, the approach of temporary crediting is not implemented in a robust way in the draft methodologies for temporary carbon sequestration units. The provisions in the draft methodologies fail to address potential reversals after the expiry of the carbon farming sequestration units, i.e. *beyond* the validity/monitoring period. Additionally, the provisions suggest monitoring and compensation for reversals as an approach to address reversal risks *during* the validity/monitoring period of the units. Yet, the storage and liability provisions that apply during the validity period in the three draft methodologies for carbon farming activities lack clarity, potentially leaving reversals during the monitoring period unaddressed. Furthermore, the provisions on storage and liability do not acknowledge the reversal risks associated with peatland rewetting and do not appropriately differentiate between temporary and permanent soil emission reductions.

Specifically, we note the following shortcomings:

- **Acknowledging reversal risks for all soil emission reduction units:** The draft methodology on peatland rewetting simply declares that peatland rewetting results in permanent soil emission

reductions and that units issued under this methodology therefore "shall" be considered permanent[65] (section 4). There is however no uncontested scientific evidence that substantiates this claim. Major existing carbon crediting programmes acknowledge that peatland rewetting has significant non-permanence risks and require project developers to monitor these and account for any reversal events. Should 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 safety standards for minimising non-permanence risks. In its Article 6, the CRCF Regulation further stipulates that soil emission reduction activities shall be subject to appropriate monitoring rules and liability mechanisms. The methodology's approach to simply declare that peatland rewetting will result in permanent emission reductions fails to address this requirement of the CRCF. ***Peatland rewetting must not be treated as a project type with no non-permanence risks.***

- **Assessing and reducing reversal risks prior to implementation of the activity**: **Clarification is needed regarding the provisions on risk assessment** (section 4.1 and Annex I of the draft methodologies on agriculture/agroforestry and tree planting). The draft methodologies on agriculture/agroforestry currently propose to exclude high-risk activities from certification as a measure to enhance the resilience, sufficiency and solvency of the buffer in case of negative results of the proposed biennial stress-test of the buffer. ***Provisions should be added to exclude activities from eligibility for which the assessed risk of reversal is very high*** *(for the methodologies on agricultural/agroforestry activities as well as tree planting)***.** Additionally, the draft methodology currently only requires operators to describe the extent to which the carbon farming activity reduces the risks of reversals. ***Instead, operators should be <u>required</u> to undertake measures to mitigate the risk of reversals.***

- **Addressing reversals during the monitoring period:**

  - For carbon farming sequestration units, it is clarified that these units are temporary (Article 2 (22) CRCF Regulation) and shall expire at the end of the monitoring period for the relevant activity unless the long-term storage of the removed carbon is proved through continued monitoring (Articles 6.5 and 12.5). Yet, **for soil emission reduction units, rules regarding the validity period of the units are lacking:** Neither the CRCF Regulation nor the draft certification methodologies on agriculture/agroforestry and on tree planting specify whether they are considered permanent or temporary.

  - According to the CRCF Regulation, soil emission reduction activities shall be subject to appropriate monitoring rules and liability mechanisms that are to be defined in the certification methodologies (Article 6.6). Yet, **the draft methodologies on agriculture/agroforestry and on tree planting do not specify any liability and monitoring rules for reduced CO_2 emissions**. For reduced CO_2 emissions, appropriate liability mechanisms must be in place like for carbon removals in mineral soils. ***Such liability mechanisms (e.g. buffer pools) need to be added.*** For reduced N_2O emissions no liability mechanisms are needed as these can be considered to be permanent.

  - **Clarification needed for proposed liability mechanisms for carbon farming sequestration units:** The draft methodologies on agriculture/agroforestry and tree planting provide two options for operators for addressing reversals that occur during the monitoring period: operators can either participate in a buffer pool from which units are cancelled in the event of a reversal or conclude an insurance policy or comparable guarantee product. In the Annex of these methodologies, it is proposed that contributions to the buffer pool depend on a specific risk index developed

[65] *Section 4 of the draft certification methodology made available in April 2025.*

by the JRC.[66] According to the draft methodologies, operators shall be fully liable for replenishing the buffer pool in case of avoidable reversals. Specific provisions are missing on how such liability will be implemented, including 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 that intentional reversals are compensated through the pool if the operator does not or cannot fulfil their contractual arrangements*** (e.g. due to bankruptcy). Furthermore, it should be clarified that ***in the case of unintentional reversals, a corresponding amount of units will be cancelled from the buffer pool***. The draft methodologies state that information on the composition of the buffer pool should be published annually. This information should be publicly available on a regular basis. For the option to use an insurance policy or comparable guarantee product (section 4.2 b) ***it should be clarified that such liability mechanism covers intentional as well as unintentional reversals***. Additionally, ***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).

- **Missing rules if monitoring ceases to address reversals during the crediting period (activity period)**: The draft methodologies on agriculture/agroforestry and on tree planting state that monitoring shall be done at least every 5 years. Monitoring shall continue for at least 10 more years after the end of the activity period[67] for agroforestry practices (activity period of 30 years), for at least 5 more years after the end of the activity period for practices that increase carbon removals in soils or reduce soil emissions (activity period of 10 years) and for at least 40 years for tree planting (activity period of 30 years). Rules are missing in the draft methodologies for the event that monitoring of reversals is not undertaken. ***It should be clarified that in such cases units issued for the activity would expire and would need to be compensated for.***

Addressing potential reversals beyond the monitoring period:

- **Lacking consequences of expiry of temporary units from carbon farming activities**: Carbon farming sequestration units generated under the CRCF from carbon farming activities expire at the end of the monitoring period of the relevant activity (CRCF Regulation Article 6.5, Article 12.5). Consequently, they will then be cancelled from the certification registry or from the Union registry unless the operator commits to prolonging the monitoring period according to the rules set out in the applicable certification methodology (CRCF Regulation, Article 6.5, and 12.5). However, neither the CRCF Regulation itself nor the draft methodologies on agriculture and agroforestry as well as tree planting contains any provisions on the consequences of the expiry of units that have already been used. **There are no rules on how temporary units should be dealt with after the end of their validity period and who would be responsible for retiring or replacing them.** This is a severe gap. If the temporary units had been used by a buyer to meet emission reduction targets before their expiry, after the expiry the carbon removals associated with these units may not be stored in soils or biomass anymore. This would undermine the environmental integrity of the CRCF because it would lead to higher levels of emissions in the atmosphere than without the use of the mechanism. For that reason, provisions are needed to clarify that buyers bear the responsibility for replacing temporary units upon their expiry. ***Provisions***

[66] *For agriculture/agroforestry activities, the methodology proposes pre-defining buffer sizes depending on four classes of risk for carbon losses from soils, based on a JRC report. The index distinguishes four classes, which are then translated into a score to determine the buffer size of the carbon farming activity (see Breure et al., 2025; Panagos et al., 2022). For tree planting, a risk indicator comprising indicators of historical frequency of disturbances and tree species suitability maps is under development by the JRC.*

[67] *The activity period is defined as the period during which the activity can generate certified units in the draft methodologies, presumably consisting of different certification periods of a maximum of five years for agricultural activities.*

***should be developed to ensure that registries inform buyers of units about the expiry of these units so that buyers can fulfil this responsibility. Alternatively, the methodologies should clarify for which purposes temporary units may be used*.** Provisions to address this should be specified in the delegated act(s) that are to be adopted on the requirements concerning the Union registry (Article 12.2 CRCF Regulation) and the implementing acts on the structure, format and technical details of the certification registries, of the recording, holding or use of certified units (Article 12.3 CRCF Regulation).

- **Lacking incentives to maintain carbon farming activities beyond the crediting period**: Carbon removals and reduced CO_2 emissions achieved through carbon farming activities on mineral soils and through tree planting are of temporary nature and can be reversed quickly. Consequently, the activities need to be continuously maintained in order to ensure a longer-term mitigation benefit. Yet, the number of additional removals that can be generated through maintaining an activity that increases carbon removals in soils beyond the proposed activity period is limited as soils reach a level of saturation at some point at which they can no longer store additional carbon.[68] Incentives to maintain carbon farming activities that enhance carbon removals or reduce emissions from soils and extend the monitoring period as required by recital 13 of the CRCF Regulation are missing in the draft methodologies on agriculture/agroforestry and on tree planting. If monitoring is continued, the validity of the temporary units is extended for the duration of monitoring. Yet, no further incentives are available to maintain achieved carbon removals beyond the end of the monitoring period. Under the CDM, temporary units expired after a specified time period. Yet, they could be renewed and upon renewal, credits were issued for the cumulative mitigation impact achieved in previous crediting periods. ***This would be an option to account for efforts to maintain achieved carbon removals that would otherwise be reversed by continuing an eligible agricultural activity.*** If such an approach was followed, a maximum time period for renewing the certification period would need to be defined.

- Furthermore, in the quantification approach proposed by the draft methodology on agriculture/agroforestry, the temporary net carbon removal benefit and the net soil emission reduction benefit are quantified separately (equations 1 and 2). The net soil emission reduction benefit considers carbon emissions and direct and indirect N_2O emissions from mineral soils (see section 2.1 of the draft methodology). According to the definitions in the draft methodology, the calculated net soil emission reductions are issued as soil emission reduction units. Yet, **this approach mixes two types of emission reductions that should not be treated in the same way**: Reduced CO_2 emissions from mineral soils (i.e. a carbon reservoir) are associated with non-permanent risks and can be reversed; reduced N_2O emissions on the other hand can be considered permanent (see above). ***It is therefore crucial to separate units issued for reduced CO_2 emissions which should not be considered permanent from units issued for reduced N_2O emissions in the methodology which may be considered permanent.*** This is of key importance for differentiating how the different types of units are used and for enforcing liability in case of reversals.

- **Eligible use cases not defined**: Neither the CRCF Regulation nor the draft certification methodologies include any provisions on the use of temporary CRCF units. This is a severe gap, considering that the methodologies do not include robust provisions to address the non-permanence risks of carbon farming sequestration units.

[68] *This is not an issue for activities leading to emission reductions, like reduced application of synthetic fertiliser.*

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