

CARBON FARMING

AN OPP EXPLAINER



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INTRODUCTION: CARBON FARMING

The EU carbon farming initiative was announced in the Farm to Fork Strategy and noted as a key financial incentive for forest owners and managers within the EU Forest Strategy.

This explainer seeks to provide an overview of what carbon farming is, an analysis of the Commission's intentions, and an explanation of how such practices may be implemented.

This explainer comes ahead of the publication of the Commission's **Carbon removal certification** in November 2022, in which carbon farming will be a central tenet.



THE POLICY CONTEXT

The 2021 EU Climate Law upholds Europe's goal to become the first climate-neutral continent by 2050 with the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.

These legally binding targets are “net” goals, meaning they balance greenhouse gas emissions and removals, and require all parts of the economy to (1) **reduce emissions** by improving energy efficiency and replacing carbon-intensive materials and carbon-based fossil fuels with bio-based materials and bioenergy, and (2) **remove remaining unavoidable greenhouse gases** by sequestering them either in natural sinks (nature-based solutions) or in geological sites or products through industrial processes (technology-based solutions).

In July and December 2021, the Commission adopted two batches of proposals to revise all relevant policy instruments to deliver the 55% emissions reduction by 2030, also known as the 'Fit for 55' Package. This includes measures to reduce the emission of carbon in buildings, transport, industry and energy sectors, and to enhance removals through the use of natural sinks in the land use and forestry sectors.

Complementing the EU's effort to reduce emissions and strive for a better net balance, the Commission adopted a [Communication on Sustainable Carbon Cycles](#) in December 2021, an initial step towards regulating carbon dioxide removals (CDR) at the EU level. Outlining the EU's carbon removal objectives and principles, this new EU strategy acknowledges that climate neutrality will require both nature-based and technological solutions by separately exploring the two work streams:

- 1 Increasing nature-based carbon sequestration and scaling up carbon farming as a business model
- 2 Fostering industrial approaches that capture carbon dioxide directly from the atmosphere or recycle it from waste to store it in geological sites or use it as feedstock for industrial production

These industrial approaches cover a broad range of CDR methods and technological solutions usually referred to as Carbon Capture, Utilisation, and Storage (CCUS), including:

Carbon Capture and Storage (CCS): capturing carbon dioxide as a by-product of industrial processes, and then storing it permanently in geological reservoirs.

Carbon Capture and Use (CCU): using the captured carbon dioxide as feedstock in production processes. Essential CCU products could include polymers such as plastics and rubbers, building materials, chemicals and synthetic fuels.

Direct Air Capture with Carbon Storage (DACCS): using chemical processes to capture and separate carbon dioxide directly from the atmosphere to store it permanently in geological reservoirs.

Bioenergy with Carbon Capture and Storage (BECCS): capturing carbon dioxide when growing biomass to be used as fuel and using post-combustion carbon capture and storage processes.

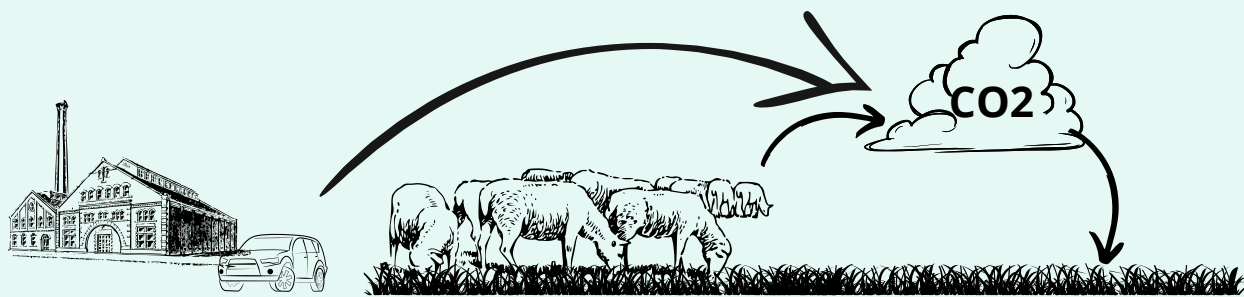


As underlined in the Communication, several CDR solutions are envisaged by the Commission. While the development and commercialisation of technology-based solutions are met with important barriers, notably due to the high costs of carbon capture and the absence of a business model, such technologies are nonetheless considered crucial to complement reduction efforts and mitigate unavoidable emissions in the electricity generation, transport, building and industry sectors - 4 of the 5 sectors that emit the bulk of greenhouse gases in the EU.



Whilst waiting for technology-based solutions to hit the market, the idea of incentivising practices known to enhance nature-based carbon sequestration is seen by many as a timely intervention. Carbon farming will not only contribute to the Union's objective of climate neutrality but also enable the agricultural, forestry and land use sectors to contribute to the EU-wide effort. This is especially relevant for agriculture, the 5th largest greenhouse gas emitter, which represents a particular challenge to the EU's targets given its limited reduction capacity.

Carbon cycle (noun): the movement of carbon between the atmosphere, plants, animals, soil, oceans, microbes and minerals; A circular pattern with biomass taking in carbon dioxide through photosynthesis from the atmosphere. Plants are then consumed by living organisms, who return carbon to the atmosphere via breathing and other processes. Human activities such as the burning of fossil fuels add carbon to the atmosphere, thus altering the carbon cycle.



WHAT IS CARBON FARMING?

Nature's ability to sequester carbon can take many forms, which, in the agriculture, forestry and land use sectors, have been grouped under the concept of **carbon farming**.

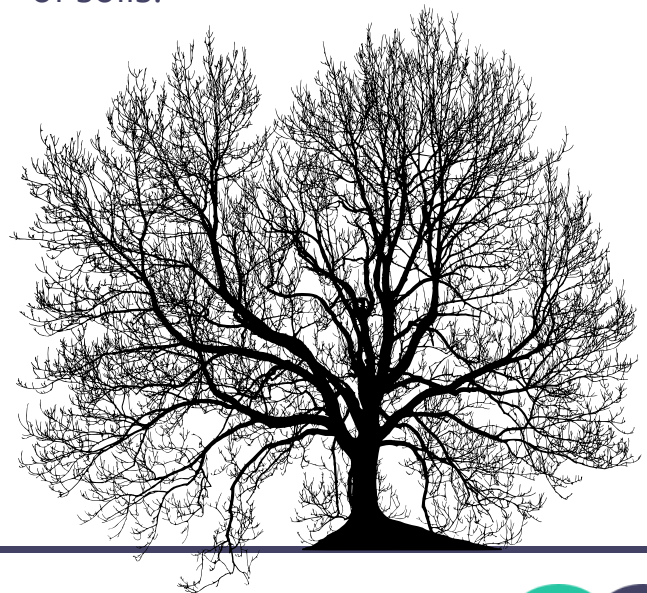
Carbon farming thus covers all land management and agricultural practices enhancing the sequestration of carbon dioxide in natural carbon sinks, i.e. biomass and soil, and reducing the release of carbon dioxide into the atmosphere. The concept of carbon farming is also used to describe the new business model for land managers and owners which consists of incentives (public, private or a combination of the two) for the implementation of such practices.

How is carbon farming done?

The sequestering of carbon through nature-based solutions can be achieved through a variety of practical methods, but these need to be tailored to the landscape in which the practices are to be implemented.

The topography, soil type, and use of the land, i.e. for farming or forestry, all have implications for the methods of carbon farming that can be introduced.

It is well known that forests are carbon sinks, and thus the planting of trees through both afforestation and reforestation can be a suitable method for removing atmospheric carbon. Additionally, agroforestry, a land use management system that incorporates the growth of woody perennials within the same landscape as farmed land, can equally increase a given landscape's carbon sequestration whilst minimising the economic impact on agri-businesses. Planting trees can also reduce soil erosion and improve the quality of soils.



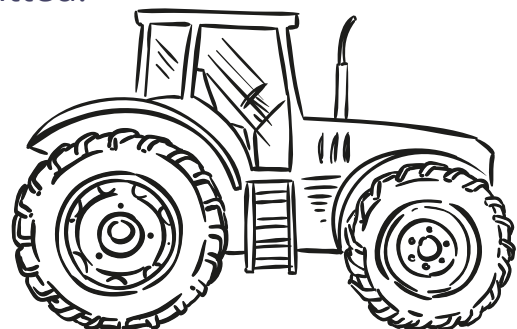
Further, farmers have many options available to them to improve the overall quality and carbon sequestering ability of their soils. For example, they may make use of catch crops: fast-growing crops, such as lettuce and radishes, that can be planted in-between the plantings of a field's main crop and harvested before the main crop requires more space as it reaches full maturity. These plants also nourish soil-improving microorganisms, such as earthworms. Likewise, cover crops can be grown specifically for the protection of soil. In a practice known as conservation tillage, farmers can leave crop residues from the previous year's production which has been shown to improve the health of soils. When preparing land for cultivation carbon leakage can occur, and thus conserving residues avoids this. Notably, this method also requires less machinery use, therefore reducing fuel-based emissions.

catch crops (noun): fast-growing crops, such as lettuce and radishes, that can be planted in between the plantings of a field's main crop and harvested before the main crop requires more space as it reaches full maturity

Another grouping of options available for nature-based carbon sequestration is the restoration of natural landscapes. Croplands can be converted to lay fallow and set-aside farmlands can be transformed into permanent grasslands.



Similar to tillage avoidance, leaving land uncultivated increases the natural carbon store in the soil. In addition, the rewetting of peatlands and wetlands can increase the potential for carbon sequestration. Beyond increasing carbon removals, restoring these lands significantly reduces carbon leakage, meaning that less carbon is emitted.



WHY IS CARBON FARMING IMPORTANT?

Currently, EU emissions are covered by three legislative pillars, all of which are currently under revision. The Emissions Trading System (ETS) Directive and the Effort Sharing Regulation (ESR) predominantly aim to harbour reductions of emissions in the Union, with the Land Use, Land Use Change and Forestry (LULUCF) Regulation proposing a target for removals. In the agriculture, forestry and land-use sectors, net emissions are covered by the LULUCF, except for agricultural non-CO₂ emissions which fall under the remit of ESR.

Despite this framework, **a Commission impact assessment from 2020 concluded that “left without a revised policy framework, the net removal of CO₂ from the atmosphere by the LULUCF sector in the EU will at best remain stable - or even decrease in the EU due to structural evolution of forest ”.**

Problem: the current legislative framework fails to provide the necessary incentives for the sectors to reduce their emissions and increase their removals.



While existing rules do not provide appropriate incentives to the sectors to reduce their emissions, nor prevent the decrease of the EU's carbon sink, the Commission has recognised their essential role in the transition toward a climate-neutral EU.

To set the direction of travel, **the Commission's Fit for 55 package included proposals to revise two key pieces of legislation, the Effort Sharing and LULUCF Regulations**, to enable the sectors to contribute to the EU-wide 55% emission reduction goal. These proposals indicate an increasing role for the agriculture, forestry and land-use sectors in delivering on climate mitigation objectives, notably by **increasing the EU-wide annual target for net removals in the LULUCF sector to 310Mt of carbon dioxide in 2030 (of which 42 Mt should come from carbon farming initiatives)** - with binding targets allocated to each Member State.

This signifies a 15% increase compared to contextual targets and does not signal carbon removals taking priority over emissions reductions, as the European Climate Law only allows 225Mt to count towards the 2030 net target.



This is equally true for the agriculture sector: while the Commission proposes keeping the flexibility between ESR and LULUCF, which enables Member States to compensate for hard-to-abate agricultural emissions with excess removals in the land sector, this possibility would be impacted by both the increased ambition targets in the LULUCF sector for the period 2026 - 2030 and the 225Mt overall limit set by the European Climate Law.





Institutional Disagreement?

The Parliament and the Council adopted their positions on the ESR and LULUCF on 8 June and 29 June respectively, confirming the 310Mt target. While the Council agreed to consider the integration of agricultural non-CO2 emissions within the LULUCF, the Parliament did not support the idea, expressing concern that this could negatively impact efforts to ensure direct emission reductions in the agricultural sector.



Ville Niinistö
Greens, FI

"I see no benefit for bringing non-CO2 emissions of agriculture into LULUCF and the so-called AFOLU as proposed by the Commission. On the contrary, by doing so, a risk of hiding emissions from the agricultural sector behind forest sinks would be established without incentives for the agricultural sector to decrease emissions."

The Commission also suggested the merging of non-CO2 emissions from the agriculture sector with the LULUCF sector in a new land pillar for climate action beyond 2030 (a more integrated framework covering activities related to agriculture, forestry and land use (AFOLU), to achieve climate neutrality by 2035.

However, prior to interinstitutional negotiations, there are other barriers the initiative will have to overcome.



DON'T FORGET ABOUT BIODIVERSITY!

Whilst the Union's overarching net emissions reduction goals are those predominantly targeted by the Carbon Farming initiative, on the environmental side, biodiversity will be central to the actions.

A key consideration is to ensure that carbon farming is biodiversity-friendly, meaning it must be precisely planned - this too will avoid potential carbon leakage. Restoration and preservation practices such as **afforestation**, **reforestation**, and the **rewetting of peatlands** all have co-benefits for biodiversity.



These actions support the goals of protecting and restoring many carbon-rich natural and semi-natural ecosystems as set out within the **Commission's EU Biodiversity Strategy for 2030**. Further, any action focused on improving the quality of soils in the Union upholds the Commission's 2021 Communication **EU Soil Strategy for 2030**.

Nature Restoration Law Objectives

20%
of EU land to be covered by restoration measures

Ecosystems with greatest potential for removing and storing carbon to be prioritised

BARRIERS TO CARBON FARMING

Several barriers can prevent land owners and managers from implementing carbon farming practices. The Communication on Sustainable Carbon Cycles acknowledges the **financial burden**, **uncertainty about revenue opportunities** and **insufficient knowledge** as challenges to the uptake of carbon farming as a green business model that rewards farmers and foresters for taking up practices leading to carbon sequestration. This new model will require:

Knowledge of the benefits linked to the practices and experts' **guidance**

A scheme with financial **rewards**

A **framework** to measure the commodity being traded





The Financial Barriers

From a business point of view, carbon farming benefits must outweigh the costs related to the new practices. In that context, the Commission sees carbon farming as a potential new source of income for land owners and managers on top of the side benefits stemming from the practices.

To develop carbon farming as a successful and attractive business model, the Commission requested that a study be carried out on the *Operationalisation of an EU Carbon Farming Initiative* aimed at assessing existing international and EU payment schemes and projects rewarding the delivery of carbon sequestration and mapping out potential implementation modalities in the EU. As part of the study, a *Technical Guidance Handbook Setting up and Implementing result-based carbon farming mechanisms in the EU* mapping out the key issues, challenges, trade-offs and design options of carbon farming as a green business model was published.

The Commission assessed and compared different ways to incentivise carbon farming as a successful and attractive business model which could be distinguished by the focus of the incentive (action or result) and payment modalities (before or after).

- 1 Action-based:** beneficiaries receive payments for implementing predefined management actions, independently of the resulting impact on those actions. They reduce essential barriers to the uptake of such practices: uncertainty for farmers and land managers and the delay between expenditure and reward.
- 2 Result-based:** the payment is directly linked to measurable indicators of the climate benefits provided, irrespective of the precise farming practices that are applied. They ensure a more targeted use of the relevant funds towards the intended climate objective and greater flexibility for land managers who are able to choose their management strategies to achieve the desired results. However, there is the risk of non-delivery of the expected results could mean not getting the revenue needed to cover the additional costs.

There are also several possible ways to mix action and results-based elements and/or ex-ante and ex-post payments to alleviate the financial burden of upfront investment but also revenue uncertainty.

Action-based approaches already exist, for example within the second pillar of the CAP where land managers can benefit if they implement farming practices that tackle environmental, climate and societal challenges. In addition, carbon farming practices can be supported through approved eco-schemes under the first-pillar. These include:

- Conservation agriculture
- Rewetting wetlands/peatlands
- Paludiculture
- Minimum water table level during winter
- Appropriate management of residues (i.e. burying of agricultural residues)
- Establishment and maintenance of permanent grassland
- Extensive use of permanent grassland

While the Commission sees the potential of the reformed CAP to incentivise carbon farming practices as a crucial element for the initial uptake, it also acknowledges the intrinsic long-term limitations of CAP support, such as the lack of monitoring tools necessary in the result-based approach. The Communication notes other potential revenue sources to address this. These include state aid and the mobilisation of private funding to support carbon farming initiatives. In that regard, the Commission developed a result-based framework, suggesting that the generated **carbon removals, could be turned into carbon credits that could be sold via a trading system similar to the ETS - but for removals instead of emissions.**

In that framework, while the Commission stresses the crucial role of public funding to kick-start the roll-out of carbon farming, thereby reducing the financial burden and financial risk, it only sees it as a complement to revenue possibilities from private markets.

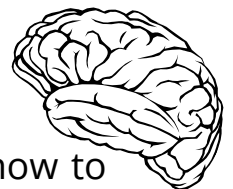


A scheme in which generated carbon credits would be additional “products” that could be sold to others in order to offset their emissions requires establishing a standardised framework to monitor, report and verify (MRV) the commodity to be traded. This is especially challenging for carbon farming credits given the complexity of monitoring the sequestration of carbon in lands and forests.

Acknowledging that measuring and monitoring carbon removals represents one of the major challenges to such a scheme, the Commission announced that it will come up with a legislative proposal to develop a regulatory framework for the certification and accounting of these carbon credits by the end of 2022.

This legal framework establishing robust and transparent rules to monitor and verify the authenticity and environmental integrity of the removals would provide certainty to the market, enabling the deployment of CRD (carbon farming and industrial solutions).

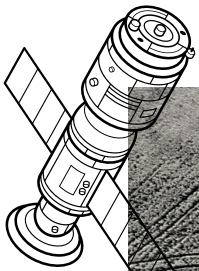
The Knowledge Barrier



The other barrier that the Commission faces with its proposal is how to improve the knowledge of land managers, whether they be farmers or foresters, regarding carbon farming practices and their implementation. Without appropriate training and tools, the initiative will not be able to deliver on its goals.

The CAP Strategic Plans will rely on the Agricultural Knowledge and Innovation System (AKIS) to advise and train farmers and foresters on innovative projects. Due to the CAP’s renewed focus on greening, the Commission notes there is potential for the AKIS to play a role in facilitating carbon farming projects.

The ability to educate land managers on these practices relies heavily on the availability of data in order to better understand the necessary goals and to interpret results. For farmers, there are tools available, again through the CAP. Geospatial and satellite data exists in the area of monitoring land used for agricultural purposes, and this data will be further extended and improved through the latest iteration of the CAP. Remote sensing methods in wetlands and peatlands have been exponentially rolled out with the focus of preventing further drainage of these lands for agricultural cultivation.



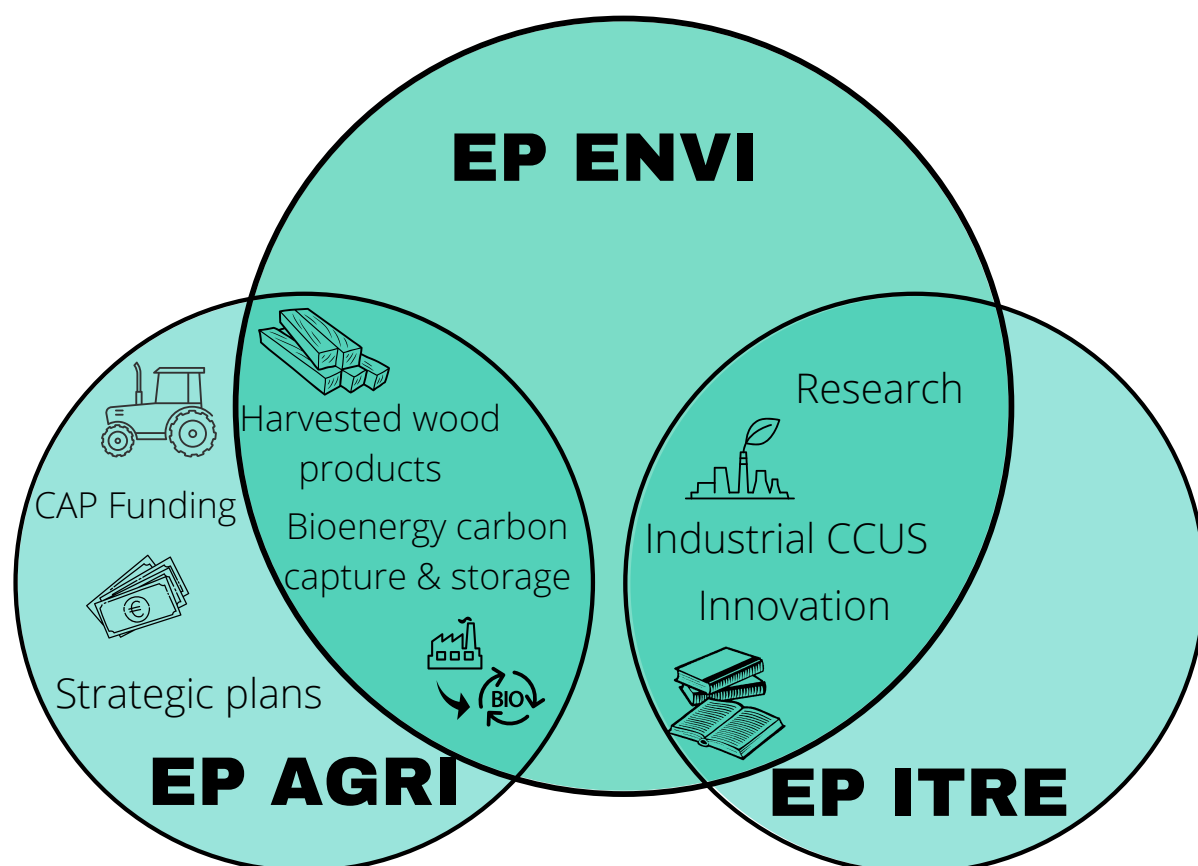
The Commission proposes to continue exploring options to further enhance the use of these tools in these areas, thus holding potential for improved data collection for carbon sequestration projects. Additionally, farm-based assessments on individual farms will better allow for assessments of a given piece of land's ability to store carbon and offer advice on how best to implement such schemes.

As for foresters, the Commission notes that widespread data collection through Earth observation methods is not yet in place in the Union, despite some local initiatives. However, **the New EU Forest Strategy for 2030 noted that, in 2023, the Commission will propose legislation for EU Forest Observation, Reporting and Data Collection.**

EP INI - SUSTAINABLE CARBON CYCLES

In response to the Commission's Communication on Sustainable Carbon Cycles, the European Parliament announced it would work on an own-initiative report to establish the EP's position. The file is being led by the Committee on the Environment, Public Health and Food Safety (EP ENVI).

The Committee on Agriculture and Rural Development (EP AGRI) reached an agreement with EP ENVI that they would be an associated committee on the report, recognising all EP AGRI competencies under CAP funding, Strategic Plan programming and implementation, governance control, report and audit. EP ENVI also agreed to share competencies on harvested wood products and with regard to bioenergy carbon capture and storage. Similarly, the Committee on Industry, Research and Energy (EP ITRE) have shared competencies with EP ENVI on fostering research and innovation and on industrial capture, use and storage of carbon, and thus will also provide an opinion on the file as an associated committee.



The Rapporteurs



Alexander Bernhuber
EPP, AT
EP ENVI Rapp.

EP ENVI's report is headed by Rapporteur, Alexander Bernhuber (EPP, Austria). In his draft, he welcomed the Commission's Communication and noted that a voluntary system should be made available for producers both in the agricultural and forestry sectors. In addition, the draft report focused on avoiding potential greenwashing in the system, stressing that certificates should only be offered out to businesses that have already showcased that they have contributed to mitigating climate change. Further, the EP ENVI rapporteur emphasised the need for the system to be simple for producers and avoid any excessive administrative burdens.



Martin Hlaváček
RE, CZ
EP AGRI Rapp.

EP AGRI's draft opinion, written by Rapporteur, Martin Hlaváček (RE, Czechia) stressed the need to seek a credible, fair, efficient and simple system. Welcoming the EP ENVI draft report, he supported Bernhuber's need for the system to justly benefit those who contribute to climate change mitigation. He further urged that both public and private contributors should be able to benefit from the system and avoid the mistakes of the Emissions Trading System (ETS). Similarly, EP ITRE's draft opinion, written by Rapporteur, Sean Kelly (EPP, IE), was overall supportive of the EP ENVI draft report, calling on a business model approach, allowing for the inclusion of new technologies, that is based on carbon life-cycle considerations.



Sean Kelly,
EPP, IE
EP ITRE Rapp.

Funding

Where there is more divergence between the Parliament and the Commission is in the view of how the model should be funded. The Commissioner for Agriculture, Janusz Wojciechowski, has suggested that the CAP could be used in the initial phase to help farmers transition to the carbon farming system.

Alexander Bernhuber, a farmer himself, has argued that funding should not come from the CAP but that the system should be market-based. This is to ensure that the system has added value for farmers. EP AGRI MEPs came out in support of this notion, particularly from Members of Alexander Bernhuber's EPP Group. It has been argued by EP AGRI MEPs that CAP funding is drawn on for too many initiatives outside of agricultural production and that climate mitigating tasks should be funded elsewhere.

Nonetheless, as mentioned above, carbon farming is a practice eligible for funds under the newly negotiated CAP, via eco-schemes, rural development support in the second pillar, and through State aid. However, with not all CAP Strategic Plans yet finalised and published, how this will work on the ground remains to be seen.

The CAP Strategic Plans will contribute to climate change mitigation by enhancing carbon sequestration. The range of targets for carbon storage in soils ranges from 2% to 86% between Member States, with half of them being below 31% and only 5 being above 50%. Only 8 Member States aimed to implement carbon farming through eco-schemes in their draft plans.



CONCLUSION & NEXT STEPS

2021

14 JULY

- Fit for 55 - The proposals on LULUCF and ESR are adopted

15 DECEMBER

- Communication on Sustainable Carbon Cycles

2022

2 FEBRUARY

- The Call for Evidence on the Carbon Removals Certification is launched

2 MAY

- Deadline for the Call for Evidence on the Carbon Removals Certification

6 JULY

- The Call for Applications for the Expert Group on Carbon Removals is launched

1 SEPTEMBER

- Trilogue on ESR

5 SEPTEMBER

- Trilogue on LULUCF

15 SEPTEMBER

- Deadline for the Call for Applications for the Expert Group on Carbon Removals

30 NOVEMBER

- Publication of the Commission's Carbon Removals Certification

2023

- The Commission will propose legislation for EU Forest Observation, Reporting, & Data Collection
- Planned implementation of the CAP

Carbon farming schemes will play a crucial role in the EU's ambition to reach its net reduction targets. A regulatory framework for the certification and accounting of carbon credits will better allow land owners and managers to implement actions and be financially rewarded for them.

The upcoming legislation will be the next step toward regulating carbon removals in the EU. However, the Commission will need to rely on public and private funding, practical training, data collection, and new technologies for a successful implementation of a carbon farming initiative.

This handbook has sought to provide an overview of the potential practices, barriers and institutional positions that will influence the proposed legislation. We hope you enjoyed reading.

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