Interreg
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Smart Carbon Farming

State of Carbon Farming in North-West Europe

Current status of the NWE carbon market, including market demand, farmer revenue models, verification methods adopted, governance, farmer perceptions and rewarding scope

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Definitions and abbreviations list

ACRES	Agri-Climate Rural Environment Scheme
ASBL	Association Sans But Lucratif (FR)
BECCS	Bioenergy with Carbon Capture and Storage
BVCM	Beyond Value Chain Mitigation
CAA	Climate Agriculture Alliance
CAP	Common Agricultural Policy
CDR	Carbon Dioxide Removal
CF	Carbon Farming
CO_2	Carbon Dioxide
CRCF	Carbon Removal Certification Framework
CS	Carbon Sequestration
CSDDD	Corporate Sustainability Due Diligence Directive
CSRD	Corporate Sustainability Reporting Directive
DACCS	Direct Air Carbon Capture and Storage
EAC	Environmental Attribute Certificate
EIP	European Innovation Partnership
EJP	European Joint Programme
ESG	Environmental, Social and Governance
EU	European Union
EUDR	EU Deforestation Regulation
ETS	Emissions Trading System

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Definitions and abbreviations list

GHG	Green House Gas Schemes
IPCC	Intergovernmental Panel on Climate Change
LIGP	Low Input Peat Grassland
LULUCF	Land Use, Land Use Change and Forestry
MRV	Measuring, Reporting, Verification
NBS	Nature-Based Solutions
NGO	Non-Governmental Organisation
NSR	North Sea Region
PFI	Peatland Finance Ireland
SBTi	Science Based Targets initiative
SCF	Smart Carbon Farming
SDG	Sustainable Development Goals
SOC	Soil Organic Carbon
SNK	Stichting Nationale Koolstofmarkt (NL)
SPA	Special Protection Area
tCO_2e	Tonne CO_2 equivalent
TSVCM	Task Force on Scaling Voluntary Carbon Markets
USP	Unique Selling Points
VCM	Voluntary Carbon Market
WUR	Wageningen University & Research

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1. Summary

This Carbon Market State report presents an in-depth assessment of the state of the North-West European carbon market between 2021 and 2025, with a focus on Carbon Farming as a central pillar of climate mitigation and sustainable agricultural transformation. It situates Carbon Farming within the broader evolution of European climate policy, from the publication of the NSR Carbon Farming White Paper (2021) to the adoption of the Carbon Removal Certification Framework (CRCF) by the European Council in 2024. The report focuses on market demand and supply, farmer revenue models, verification methods, governance, farmer perceptions, and reward mechanisms. It is intended as a reference for professionals working at the intersection of agriculture, climate, and sustainable entrepreneurship.

Carbon Farming encompasses agricultural practices that sequester carbon in the soil or reduce greenhouse gas emissions from soils. These practices, ranging from peatland restoration and agroforestry to soil protection measures and more efficient fertiliser use, offer benefits for climate, soil health, biodiversity, and water management. The demand for carbon credits is growing rapidly, driven by corporate sustainability goals (such as SBTi and CSRD) and societal pressure. However, supply lags behind due to fragmentation, lack of standardisation, and high requirements for monitoring and verification (MRV). Prices for agricultural carbon credits are higher than international averages, mainly due to complexity and costs on the farmer's side.

Farmers are primarily intrinsically motivated by soil health and business continuity, with financial incentives being essential for scaling up. Key barriers include low prices, uncertainty about market access, complexity of certification, and administrative burdens. There is a need for more practical guidance, standardisation, and fair reward systems. Various revenue models exist, including action-based payments, result-based payments, and hybrid forms. Reliable MRV systems are crucial for credibility and market functioning, and intermediaries such as certification bodies and standards organisations play a key role in quality assurance and transparency.

The report compares leading schemes in Belgium (Claire CO_2, Farming for Climate), France (Label Bas Carbone), Germany (MoorFutures), Ireland (ACRES, PFI), and the Netherlands (Go2Positive, Valuta voor Veen). Each scheme has its own strengths, challenges, and future plans, but common success factors include scientific underpinning, transparency, local anchoring, and stakeholder collaboration.

The report concludes that policymakers must provide clear frameworks, and there should be financial incentives and technical support. Standardisation and robust MRV are essential for scaling and trust. Collaboration between government, the sector, and farmers is necessary to unlock the full climate and biodiversity potential of Carbon Farming. With coordinated action, Carbon Farming can become a cornerstone of Europe's climate transition.

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2. Introduction

2.1 Introduction to the Smart Carbon Farming project and the objective and scope of this paper

In the last decade, much has been said and written on the topic of Carbon Farming. Yet, in Europe, it is only quite recently that a lot has been moving around and only since November 2024 that the Council of the European Union gave a green light for a certification framework for permanent carbon removals, Carbon Farming and soil emission reductions, as well as carbon storage in long-lasting products.

Carbon Farming is increasingly prominent on the agenda of the European Commission as a promising strategy for tackling climate change while contributing to resilient agriculture. Interest in Carbon Farming is growing not only among farmers, but also among policymakers, businesses and civil society organisations. However, the playing field is complex and constantly evolving. Technical insights, policy frameworks and market mechanisms converge in a domain that is promising, but also requires careful consideration and up-to-date knowledge.

2.1.1 The Smart Carbon Farming project

Smart Carbon Farming (SCF) unlocks Carbon Farming as a revenue model to modernise the NWE agricultural sector and increase its competitiveness. SCF validates carbon monitoring solutions and accompanies farmers to uptake them in 5 different NWE regions. The project trains 50 farmers to adopt Carbon Farming practices, enabling them to access new sources of revenue and comply with latest EU/national regulations, altogether promoting sustainable farming and contributing to making the agricultural sector future-proof.

2.1.2 Objective and scope of this report

This report aims to contribute to a realistic, up-to-date and useful reference for **professionals** working at the intersection of agriculture, climate and sustainable entrepreneurship. Only with well-informed guidance can farmers and other stakeholders find their way in a landscape that offers plenty of opportunities but is also rapidly evolving and therefore requires constant awareness and adaptability.

The report has the title ‘Market State’, which entails some insights on the current market evolutions in regard to Carbon Farming. Due to the fact that we are in the middle of new policy making (EU Carbon Removals and Carbon Farming Certification - CRCF - Regulation), it is challenging to produce a report that will be of use after 2025/2026 due to big shifts that are expected once CRCF is in execution phase. Therefore, we limit our scope to the period between 2021 and 2025. We can learn a lot about what has happened during these 5 years and what can be expected and recommended based on these learnings. Why 2021? In 2021 the ‘Carbon Farming White Paper’ was published by the NSR Carbon Farming project. Both Boerenbond Projects as ZLTO played an essential role in producing this report and we will use this as a starting point for this report.

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We recommend to read the previous 'NSR Carbon Farming White Paper – Policy recommendations' first, as it gives a good starting point and basic information on carbon farming and its drivers.

The EU defines Carbon Farming as follows: Carbon Farming involves practices that enhance carbon sequestration (CS) and storage in forests and soils, or that reduce greenhouse gas emissions from soils.

These practices include:

- Rewetting and restoring peatlands and wetlands to reduce carbon oxidation and increase carbon sequestration;
- Agroforestry and mixed farming, integrating trees or shrubs with crop and/or livestock management;
- Implementing soil protection measures like catch crops, cover crops, conservation tillage, and hedgerows;
- Reforestation respecting ecological principles for biodiversity and sustainable forest management;
- Improving fertiliser use efficiency to cut nitrous oxide emissions.
- In this report we will focus on 'Carbon Farming and soil emission reductions', excluding reforestation.

In summary, Carbon Farming is the process of changing agricultural practices on all soil types (mineral and organic) to increase the amount of carbon (C) stored in the soil, or to reduce greenhouse gas (GHG) emissions. The explicit objective of Carbon Farming is to remove carbon from the air and store it in the soil, whereas sustainable soil management has the explicit objective to improve your soil. Farmers' interest may apply to both.

Keep in mind that Carbon Farming is a language between policy makers, compensators and scientists. For a farmer, working on the soil is part of good practice for running a healthy business.

2.2 Carbon Farming in short

Carbon Farming has a lot to offer. Through context-specific interventions, farmers can remove carbon dioxide (CO_2) from the atmosphere and store it sustainably in the soil in the form of soil organic carbon (SOC). With this, farmers can make a major contribution to our climate challenges and climate objectives. Moreover Carbon Farming is a sustainable way of agriculture that increases soil organic matter content, which also has a positive effect on soil life and thus biodiversity, on soil water retention capacity and thus on resilience to climate extremes and on soil fertility and production capacity and thus on a sustainable food supply.

Soils are both a sink and source of CO_2. The decomposition of SOC is necessary for microorganisms as an energy source and for the nutrient availability for crop production. Thus, landowners should conduct smart agricultural management practices to decompose only the necessary amount of SOC to avoid the CO_2-emission and the pollution of groundwater by unnecessary nutrient mobilisation and thereby to save the soils from degradation. It is also possible not only to maintain, but also to enrich the SOC and to reach a new elevated SOC equilibrium in soils by using adequate production methods. Intensive agricultural practices on drained soils, characterised by substantial chemical fertiliser inputs, have caused severe depletion of soil organic carbon reserves. Regional and management-specific losses of soil organic matter vary considerably, with documented reductions reaching 70% under cropping systems (UN Environment Programme). Globally, billions of tonnes of soil organic matter have been lost through anthropogenic land degradation processes, including overgrazing, deforestation, and agricultural intensification. Lal (2002) estimates that such improved management could restore 60 to 70 % of the C lost from soils since the industrial revolution.

Carbon Farming means farming to sequester carbon in the soil. Carbon that otherwise stays or ends up as CO_2 in our atmosphere, contributing to climate change. By applying specific measures more carbon can be stored in the soil than is released back into the atmosphere as CO_2. There are many ways to do this: from small adjustments on farm level - like applying organic fertilisers rich in carbon, reduced or no-tillage, or planting cover crops - to changes in the entire farming system - like enriched crop rotation or agroforestry.

The SOC content results from the ratio of supply and mineralisation of organic matter in the soil. Mineralisation is promoted by heat and aeration (e.g. during ploughing). A permanent plant cover consisting of a variety of plants is of special importance to reduce this mineralisation (by shadowing) and the losses by erosion and to maximise the production of roots in different depths. Some woody plants offer considerable additional effects, and at the same time, deep-rooted crops bring leached nutrients from deeper soil layers back into the system.

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Increasing SOC content on agricultural land has four main positive environmental effects:

1. CO_2 is removed from the atmosphere
2. Greenhouse gas emissions associated with agriculture can be reduced, since an increase in SOC through better management can save on energy-intensive artificial fertiliser.
3. Agricultural production becomes more resilient to the consequences of climate change in the form of droughts and heavy rainfall with erosion.
4. Positive influence on soil health, soil life and biodiversity.

Carbon Farming creates unique opportunities for sustainable partnerships across different types of markets. These can be broadly grouped into three categories: governments, actors within the food supply chain, and companies outside the food sector. Each plays a distinct but complementary role in supporting carbon-smart agriculture and fostering resilient local economies:

1. **Governments** are key players in providing policy frameworks, subsidies, and certification systems that encourage farmers to adopt Carbon Farming practices. Public funding (e.g., ecoschemes) and regulatory support create incentives for emission reductions and soil health improvements, while ensuring transparency and trust through independent verification. Governments can also facilitate collaboration by bringing together stakeholders from various sectors and regions.
2. **Actors within the food supply chain** — including farmers, processors, retailers, and distributors — have a direct interest in sustainable sourcing. Many food companies are increasingly investing in Carbon Farming projects on their suppliers' lands, seeing this as a way to reduce their overall carbon footprint and meet growing consumer demand for climate-friendly products. These investments often take the form of long-term contracts, technical support, or shared innovation initiatives, creating stable and transparent supply chains.
3. **Companies outside the food sector** are emerging as important partners and financiers. This group includes all kinds of businesses such as technology providers, logistics firms, financial institutions, and companies not directly involved in agriculture but committed to sustainability goals or looking to compensate for their impact. Their involvement can bring additional resources, expertise, and innovative financing models, such as green bonds or impact investing, which help scale up Carbon Farming efforts. Cross-sector partnerships also enable integrated solutions that reduce emissions across entire value chains and regional economies.

Together, these three market and financing channels form a diverse and complementary ecosystem that supports Carbon Farming's environmental and economic potential. By fostering cooperation between governments, food chain actors, and wider local businesses, Carbon Farming initiatives can build strong, transparent, and resilient local partnerships that benefit farmers, companies, and communities alike.

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3. Context

3.1 Climate change - Green Deal

Following the global commitment made under the Paris Agreement to combat climate change and limit global warming to no more than 1.5 °C, the European Union stepped forward as a global leader. In response, it launched an ambitious and far-reaching initiative: the *European Green Deal*. With the aim of transforming the EU into the world's first climate-neutral continent by 2050, this comprehensive strategy spans a wide range of policy areas, from greenhouse gas emission reductions and renewable energy promotion to biodiversity protection. To reach these goals, Europe has organised different regulations and systems, based on the sector you are operating in and/or the amount of pollution you cause.

In Europe, carbon pricing operates through both the regulated **European Union Emissions Trading System (EU ETS)** and **the voluntary carbon market (VCM)**. The EU ETS was launched in 2005 and initially covered a limited set of sectors. Over time, its scope has expanded significantly.

The EU Green Taxonomy constitutes a comprehensive framework integrating multiple policy instruments and reporting mechanisms across distinct value chains within the agricultural and land use sectors. Figure 1 illustrates the architecture which encompasses four primary domains:

1. National greenhouse gas and climate reporting under LULUCF regulations
2. Farm support mechanisms through the Common Agricultural Policy (CAP)
3. Product value chains governed by the EU Deforestation Regulation (EUDR) and Corporate Sustainability Reporting Directive (CSRD/CSDDD)
4. Financial value chains subject to the Non-Financial Reporting Directive and Sustainable Finance Disclosure Regulation.

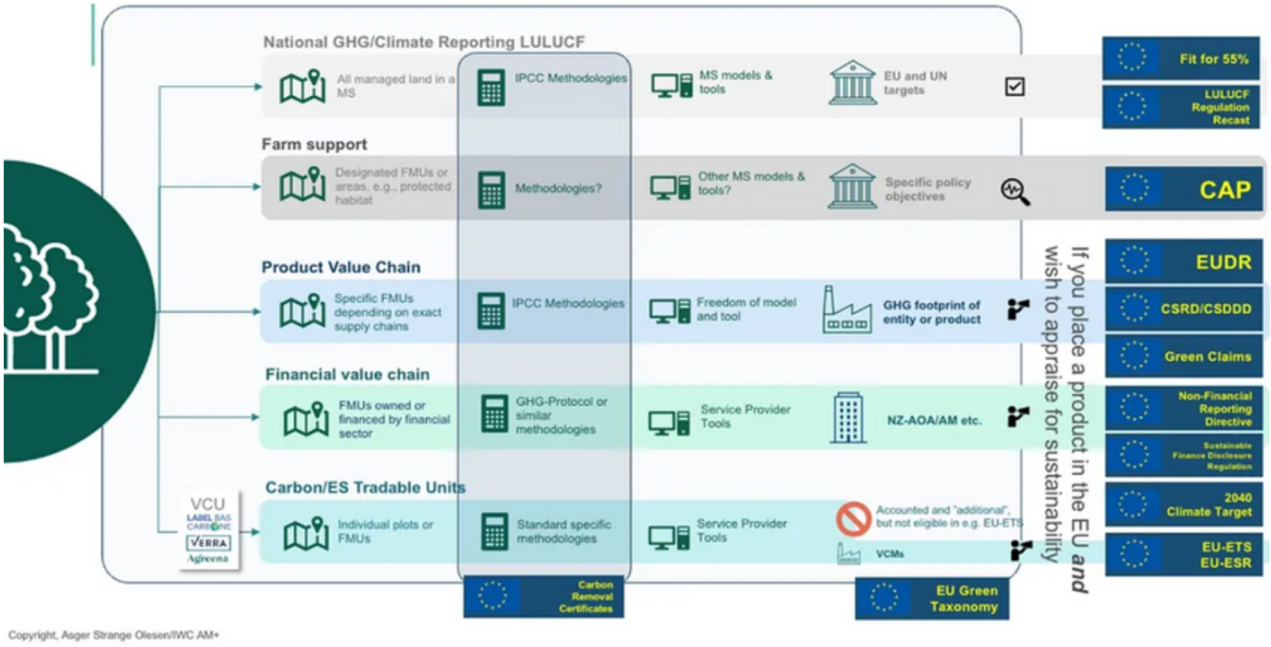

Figure 1: A comprehensive framework integrating multiple policy instruments and reporting mechanisms across distinct value chains within the agricultural and land use sectors (source; Asger Strange Olesen/IWC AM+)

Each domain employs differentiated methodologies, ranging from IPCC standardised approaches for national inventories to sector-specific protocols for carbon accounting in VCMs, while maintaining alignment with overarching EU and UN climate targets. This multi-layered regulatory structure establishes a **"Fit for 55 %"** compliance pathway, wherein managed lands are monitored through member state reporting systems, designated farmland units receive support contingent on environmental objectives, supply chain emissions are quantified at product level, and financial sector investments are evaluated against sustainability criteria. The framework also integrates EU-ETS/EU-ESR with carbon removal certificates and green claims regulation to operationalise carbon accounting.

3.1.1 European Union Emissions Trading System

The European Union Emissions Trading System (EU ETS) is the world's largest carbon market and functions on a cap-and-trade basis, setting a limit on the total amount of greenhouse gases that can be emitted by the following sectors: power and heat generation, energy-intensive industry, aviation and maritime transport (phased from 2024). Starting from 2027, ETS 2 will be launched, which will include the road transport and buildings sector and possibly a part of the small industrial installations. The waste sector and agriculture are under discussion, but there is no certainty and clarity at the moment of writing this report. The EU continues to evolve the ETS to align with its climate targets under the European Green Deal.

Companies receive or buy emission allowances and can trade them, creating a financial incentive to reduce emissions. In parallel, the voluntary carbon market allows businesses and individuals to offset their carbon footprint by purchasing carbon credits from certified projects, such as reforestation or Carbon Farming initiatives. While participation in the EU ETS is mandatory for regulated sectors, the voluntary market is driven by corporate sustainability goals and public expectations. Together, these systems create complementary pathways for reducing emissions and supporting climate action across different parts of the economy. At this moment Carbon Farming is not possible to be included in the ETS. Yet, there are signals that there might be a potential integration of Carbon Dioxide Removal (CDR) into the Emission Trading Scheme (ETS) post-2030.

3.1.2 The voluntary carbon market

Many companies are not (yet) obligated to the ETS. For them, the EU has also set climate goals, which have led to a **voluntary carbon market (VCM)**. In addition, Europe has also set a n**ew regulatory framework called the Corporate Sustainability Reporting Directive (CSRD)**, to ensure that companies excluded from ETS are now required to disclose detailed information about their environmental and social impacts.

Within this ambitious framework, Carbon Farming has emerged as a key solution. By encouraging land-based practices that sequester carbon and reduce emissions, Carbon Farming bridges climate policy and agricultural reform. Given that agriculture accounts for no less than **37.8% of total land use in Europe** (Eurostat, 2024), the sector holds enormous potential for climate mitigation. To turn vision into action, the EU introduced a legislative package under the banner of **Fit for 55**, a set of proposals designed to implement the Green Deal and bind all member states to its objectives.

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Agricultural soils are also a contributor to emissions in the sector: around **17% of all agricultural greenhouse gas emissions** originate from soil management, especially in the form of carbon dioxide and nitrous oxide, equivalent to approximately **1,284 million tonnes of CO_2-eq**. Achieving true negative emissions means that carbon sequestration must exceed these soil-based losses. Therefore, reducing soil emissions and increasing soil carbon storage must go hand in hand (ILVO, Beleidsadvies Carbon Farming in Vlaanderen 2025).

To address this, the Land Use, Land Use Change and Forestry (LULUCF) Regulation sets specific targets for land use and its transformation. While debate continues over the degree to which agricultural emissions should be fully incorporated into the LULUCF framework, international climate agreements already require national governments to:

- Monitor GHG emissions from soil and biomass
- Prevent further emissions
- Preserve C stocks in soils and biomass
- Commit to achieving negative emissions

As emission reductions in some sectors become increasingly costly or technically difficult, **negative emissions**, especially those achieved through Carbon Farming, are gaining popularity as a practical path toward net-zero goals. Policymakers view Carbon Farming as a scalable and accessible climate solution. Yet, it is vital that these negative emissions **do not become a substitute** for long-term systemic efforts to reduce emissions across all sectors.

Currently, the CDR certification landscape is fragmented with dozens of schemes and varying definitions, methodologies, and verification processes. This fragmentation means there is not one accepted standard for the accurate measurement, reporting, and verification of carbon removal activities, giving rise to issues like **double counting** and **greenwashing**, undermining markets' trust of carbon removal credits quality, and ultimately roadblocking climate policy goals (Senken, 2025).

To ensure transparency, credibility, and harmonisation of CDR actions across the EU, **another new regulatory framework** is taking shape: the **Carbon Removal Certification Framework (CRCF)**. Together with CSRD, these instruments will play a key role in embedding climate accountability into the business world and establishing robust standards for carbon removals in the VCM, including those achieved through Carbon Farming.

The CRCF is providing a quality assurance mechanism for CDR credits, and is set to significantly influence EU climate policy, as different countries can adopt the standard into their own national policies. **This could be creating momentum and positive market conditions for CDR and thus Carbon Farming**. Even more, there are signals that there might be a potential integration of CDR into the Emission Trading Scheme (ETS) post-2030.

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When talking of a VCM, we should start talking about carbon credit pricing. In the NSR White paper (2021), it was already clearly mentioned that applying measures to sequester carbon often demands extra efforts and costs for the farmers, therefore necessitating a fair 'carbon credit price'. At that time **a cost price per ton of captured CO_2 was ranging from €30 to €600**, depending on the measure applied. However, in the NSR Carbon Farming project they discovered that farmers faced extra costs for the application of measures ranging between €200 and €600 per hectare and even more for agroforestry. In carbon credit pricing, often reference is made to ETS-prices.

However, it is incorrect to use the ETS prices as a basis for the voluntary carbon removal credits for different reasons:

- ETS caps the total levels of carbon and other GHG emissions. It works as a system where caps are increasingly reduced every year and where businesses with low emissions can sell the allowances they didn't spend to others who spend more than they were allowed to. This creates the supply and demand of the carbon market.
- Offsetting locally in the EU is more expensive due to different currencies, standards of living and lifespans.
- The local voluntary carbon removal credits offer additional positive benefits: For example, they empower local farmers, protect ecosystems, restore forests or reduce reliance on fossil fuels. This is not necessarily the case for the ETS credits.

In addition we would like to endorse a conclusion from the EJP Soil project (EJP Soil, ILVO, 2025). In this report it is stated that, as also indicated by Criscuoli et al, (2024), research is needed on the **interactions between these initiatives and European regulations such as CRCF, CSRD and the Soil Monitoring Act**. Specifically, clarity is required regarding the scope and scale of these initiatives: what changes in farming practices are targeted, and across what potential acreage can these practices realistically be implemented? Furthermore, it remains unclear how value chain-based reward systems (**insetting** schemes) will address fundamental farmer concerns identified in the Road4Schemes project, particularly regarding production autonomy and power imbalances within supply chains. Insetting mechanisms risk further eroding farmers' bargaining positions and constraining their operational freedom to determine what crops to produce and when.

The following chapters will delve deeper into how the CSRD and CRCF create the structural and financial conditions for scaling up Carbon Farming and what this means for farmers, companies, and climate policy at large.

3.2 Corporate Sustainability Reporting Directive

With the introduction of the Corporate Sustainability Reporting Directive (CSRD), the EU has taken a decisive step towards greater transparency in corporate sustainability. Under this directive, companies across the EU are now required to disclose detailed information about their environmental and social impacts. This shift goes beyond simply reporting emissions; it demands insight into how businesses are influencing the world around them. It requires large companies, and eventually small and medium-sized enterprises, to disclose detailed information on their environmental, social, and governance (ESG) impacts. A key goal of CSRD is to improve transparency and accountability, ensuring that businesses provide reliable data on their contributions to climate change, biodiversity, and resource use, among other areas.

An important component of the CSRD is the requirement to report so-called Scope 3 emissions. These are indirect GHG-emissions that occur throughout a company's value chain, such as those generated by suppliers or through the use of products by customers. For companies in the agriculture, food, and retail sectors, Scope 3 emissions often represent the largest share of their total climate impact. This is where Carbon Farming could offer a practical solution. By partnering with farmers who implement C sequestration methods, companies can contribute to the reduction of their Scope 3 emissions. This could not only help them meet CSRD compliance requirements but also supports the development of a more climate-resilient and sustainable value chain.

Carbon Farming within the agrifood chain, is an insetting strategy. Unlike offsetting, which compensates for emissions through projects outside a company's operations, insetting involves direct investment in emission reduction initiatives within a company's own supply chain. For example, food companies may choose to support farmers in adopting Carbon Farming practices. This not only contributes to climate goals but also strengthens the resilience of the entire supply chain.

For food processors and distributors, this approach to supporting Carbon Farming can be seen as a form of strategic investment. It influences how funding is allocated, how initiatives are financed, and the type of guidance provided. However, because insetting takes place within existing business relationships, it doesn't always operate within the dynamics of a free market. While this is not necessarily a cause for concern, it does call for attention. It is essential to ensure that Carbon Farming schemes do not unintentionally worsen existing power imbalances within agricultural supply chains, particularly by increasing retailer control over farmers. A critical concern is that retailers and food processors may require farmers to adopt Carbon Farming practices without covering the additional costs involved, effectively making these practices a mandatory 'license-to-operate' condition. This risk is heightened by the lack of clear and aligned regulatory frameworks, which increases the potential for greenwashing. Therefore, strong verification systems are needed to ensure that sustainability claims are supported by measurable and verifiable environmental improvements, rather than serving primarily as marketing tools that impose costs on farmers while generating reputational benefits for companies further down the supply chain.

The path forward is clear: insetting holds significant promise, but its success will depend on fair governance and rewards for farmers, clear standards, and the ability to measure real climate progress —transparently and equitably.

3.3 Carbon Removal Certification Framework

In November 2024, the EU Council approved the Carbon Removal Certification Framework (CRCF), establishing the first EU-level certification system for carbon removals, Carbon Farming, and carbon storage in products. This voluntary framework aims to facilitate and encourage high-quality carbon removal and soil emission reduction activities across the EU, complementing sustained emission reductions. The regulation covers activities such as permanent carbon removals, carbon storage in long-lasting products, and Carbon Farming practices that enhance carbon sequestration in forests and soils.

The regulation is the first step in the introduction of a comprehensive certification framework. It will help Europe achieve its goal of climate neutrality by 2050.

Carbon removal activities will have to meet **four overarching criteria** in order to be certified:

1. they must involve additional C storage,
2. they must deliver a net benefit,
3. the C must be stored long-term,
4. and the activities must not cause any damage to the environment or lead to additional benefits for sustainability objectives.

In addition, activities eligible for certification must be independently verified by external certification bodies.

The details still need to be worked out, and approved methodologies must be drawn up for all activities. This autumn, 2025, the first methodology for C storage on mineral soils, among other things, should be ready.

One of the most important points currently under discussion will definitely determine the chances of success of a European carbon market for Carbon Farming. This concerns the baseline value that will be used to compare additional C storage. Should this be a specific C content or rather a set of standard management practices? And at what level should this be established? At the European level, at the Member State level or at the regional level?

The answers to these questions will help determine whether the CRCF can truly form a solid foundation for a functioning European carbon market, a market in which Carbon Farming is rewarded, trust is central, and climate gains are truly measurable.

3.4 Monitoring, Reporting and Verification

The Monitoring, Reporting, and Verification (MRV) component is a cornerstone of the Carbon Removal Certification Framework (CRCF), providing the foundation for credible carbon removal certification. MRV ensures that carbon removal activities—ranging from soil carbon sequestration and forest-based removals to carbon stored in bio-based products—are measurable, transparently reported, and independently verified before certification.

Monitoring involves the systematic collection of data on the amount of CO_2 removed, the stability of its storage, and the environmental conditions in which removal occurs. Accurate measurement is essential: small errors can significantly distort carbon accounting and undermine trust in the market. Advanced techniques, such as remote sensing, are increasingly used to improve both the precision and efficiency of monitoring, particularly over large or complex landscapes.

Reporting requires that this data be documented clearly and consistently, in alignment with EU standards. This ensures traceability and transparency, allowing regulators, investors, and carbon market participants to assess the outcomes reliably. The settings chosen for baseline carbon levels can strongly influence the perceived effectiveness of removal projects and, consequently, the valuation of carbon credits in the market.

Verification is conducted by independent, accredited bodies that review the monitoring and reporting data to confirm compliance with CRCF criteria. Only activities that pass verification can receive certification, safeguarding the quality of carbon credits and preventing misleading claims. The economic feasibility of MRV systems depends on the complexity of the project, as extensive sampling, sophisticated measurement techniques, and certification processes can be costly. Nonetheless, robust MRV is critical to ensure that certified removals are additional, quantifiable, and consistent with broader sustainability goals.

Specific MRV methodologies are being developed and approved for different types of carbon removal activities, such as mineral soil storage, forest management, or carbon embedded in construction materials. These methodologies define how monitoring, reporting, and verification should be carried out in practice, balancing accuracy with cost-effectiveness. By providing a rigorous technical basis, MRV under the CRCF supports credible climate impact assessment, facilitates investment in carbon removal, and ensures that only high-quality removals are rewarded in the carbon market.

Effective MRV systems are essential for the credibility of Carbon Farming projects. The EU's CRCF regulation mandates third-party verification and the establishment of an EU-wide registry to ensure transparency and traceability of certified carbon removals. Advances in remote sensing and digital technologies are improving MRV processes, making them more cost-effective and accessible for farmers.

For further detail and technical substantiation of these MRV principles and their implementation in Smart Carbon Farming, you can reach out to Matthieu Duval (Multitel) to receive access to our internal State of the Art and Parameter Selection Report on MRV and carbon farming technologies. An updated version of this SOTA report will be published in 2027.

3.5 The evolution: 2021 as starting point

Mid 2021, the Interreg NSR Carbon Farming consortium published its White paper on Carbon Farming policy recommendations. This report provides us with some insight into the voluntary carbon market at that moment. A lot of things were changing rapidly, as well on the policy level as on the market level. Many different initiatives and platforms started to organise themselves to provide companies with Carbon Farming project opportunities.

At that time, there was no mention of developing the CRCF. It was first introduced by the European Commission in 2022. This makes the end recommendations of this white paper even more interesting. It focused on three pillars:

1. Bridging the knowledge gap
2. Providing economic incentives
3. Eliminating contradictory and restrictive policy

It seems that all those recommendations still matter, even though the CRCF has been launched and is becoming more concrete every day. Yet, CRCF will potentially contribute to the economic incentive as well as to eliminating contradictory policy, but many concerns remain. Looking on the bright side, since 2021, all actors working in the field of Carbon Farming now finally have a common framework to closely follow and to interact with. In 2021 there was no regulation at all.

In 2021 another interesting trend took place, as can be seen in Figure 2. We notice a sudden decline in the annual volume after 2021.

Figure 2. Voluntary Carbon Market Size, by Volume of Traded Carbon Credits, pre-2005 to 2023

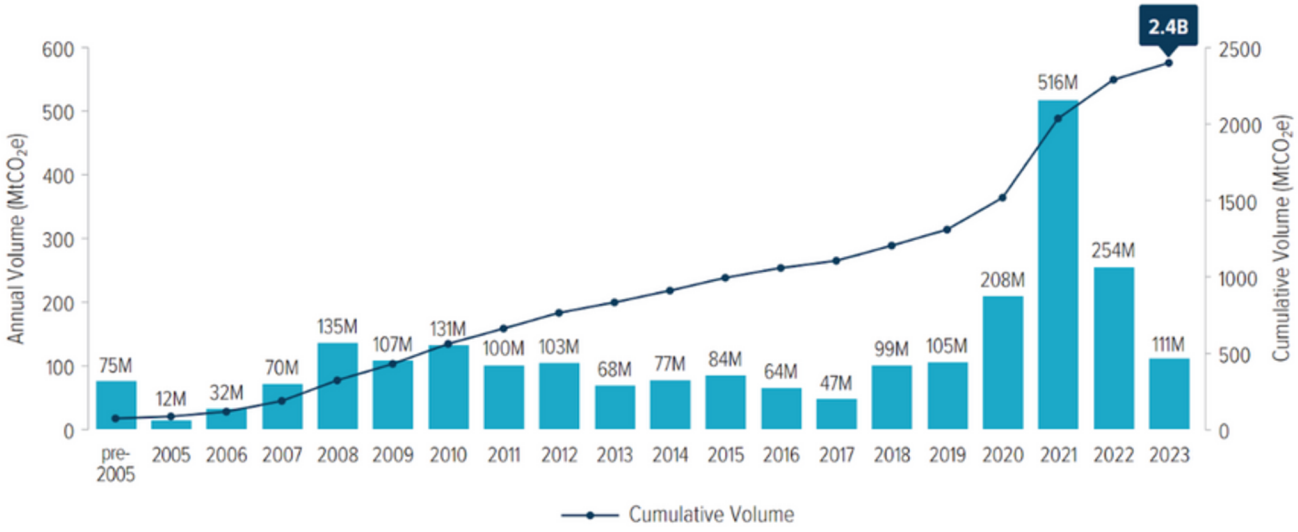

Figure 2: Graph showing the VCM size by volume of traded carbon credits, pre-2005 to 2023 (Source: Ecosystem Marketplace: State of the Voluntary Carbon Market 2024)

The sudden decline in traded carbon credit volumes after 2021 can be explained by a combination of market uncertainty and integrity concerns, as well as shifting corporate behaviour. Several high-profile investigations questioned the credibility of large segments of the voluntary carbon market, particularly avoidance and nature-based projects, which undermined buyer confidence. At the same time, companies grew increasingly cautious about reputational risks linked to offsetting and redirecting part of their budgets toward internal emission reductions. The anticipation of new regulatory and integrity frameworks also encouraged both buyers and project developers to delay transactions until the future rules of the market became clearer. Added to this, broader economic pressures, including inflation and geopolitical instability, further reduced voluntary spending. Together, these factors contributed to a notable and sudden drop in annual traded volumes after 2021.

4. Market Research

4.1 Market supply and demand on the Voluntary Carbon Market

4.1.1 Predictions

Before stating anything about the market demand for carbon credits from Carbon Farming, some in-depth information on the general market demand in the Voluntary Carbon Market (VCM) is required. In January 2021, Blaufelder et al. (2021) from McKinsey & Company published an interesting study called 'A blueprint for scaling voluntary carbon markets to meet the climate challenge'. Here, they predict a growth of the demand for carbon credits on the VCM by a factor of 100 by 2050 (see Figure 3) and an overall market worth upward of $50 billion in 2030. In addition, it is mentioned that in less than a year, the number of companies with net-zero pledges doubled, from 500 in 2019 to more than 1,000 in 2020.

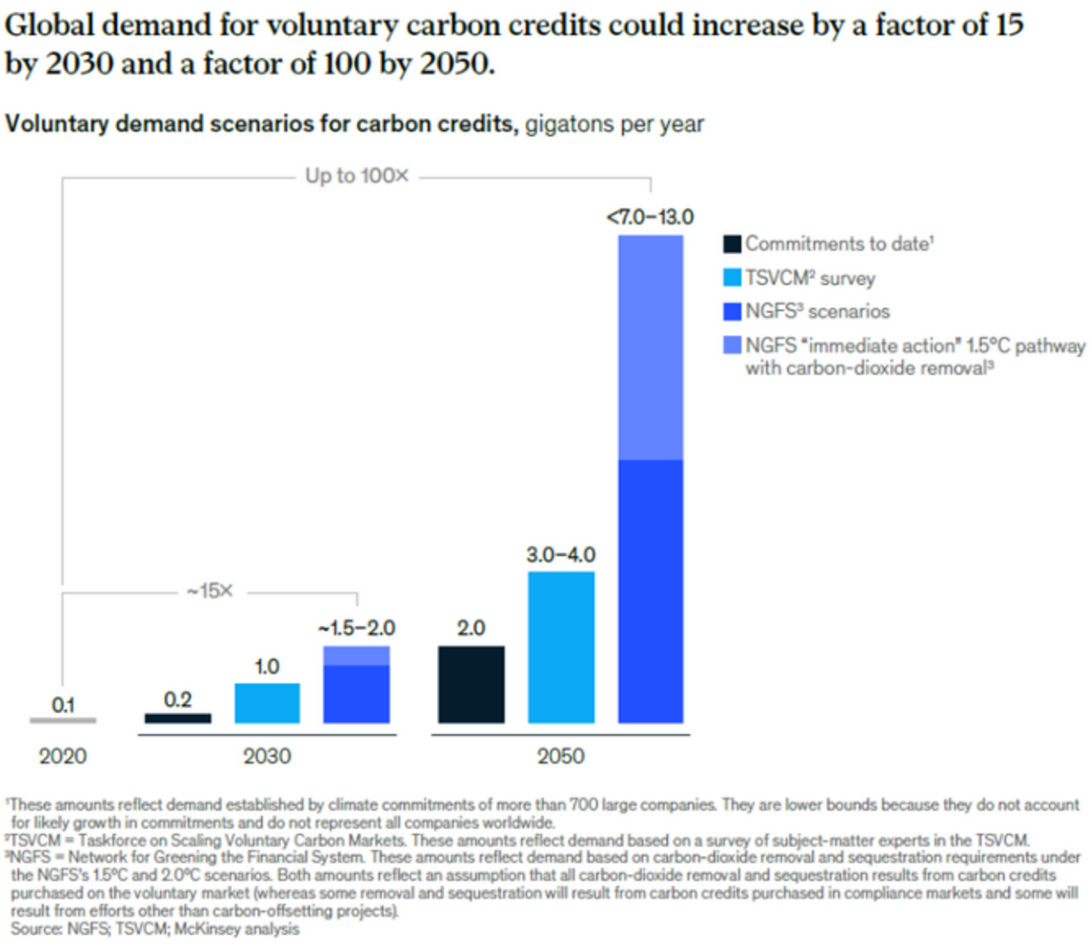

Figure 3: Graph forecasting the global demand for voluntary carbon credits by 2050 (Blaufelder et al., 2021)

Next to the demand for carbon credits, there should also be a supply in order to have a well-functioning market. Blaufelder et al. (2021) focused on four categories where carbon credits can be derived: avoided nature loss (including deforestation); nature-based sequestration, such as reforestation; avoidance or reduction of emissions such as methane from landfills; and technology-based removal of carbon dioxide from the atmosphere. For those, they estimated that the global supply potential is 8–12 $GtCO_2$/year by 2030, but realistic supply may be as low as 1–5 $GtCO_2$/year due to project-development constraints, concentrated geographic potential, financing delays, and quality issues. Furthermore, high-quality credits are scarce because:

- Accounting and verification methodologies vary
- Credit's co-benefits (e.g., community economic development and biodiversity protection) are seldom well defined
- Unpredictable demand

In its study, Blaufelder et al. (2021) does not specifically mention carbon credits from Carbon Farming practices, but those can be considered under the category 'nature-based sequestration'.

Overall, the market is characterised by low liquidity, scarce financing, inadequate risk-management services, and limited data availability (Blaufelder et al., 2021).

4.1.2 Challenges

As explained in section 3.5, the VCM is facing different challenges, especially since the recent scandals and increasing methodological requirements. The Climate Agriculture Alliance (CAA) and Greenflex highlight in their 'Barometre Carbon Farming Voluntary Market' that the VCM is gradually favouring high-quality projects, which can demonstrate more clearly their additionality and co-benefits.

From the buyer's point of view, Carbon Farming faces additional challenges to the general VCM ones, among which:

- **Unknown, unloved:** unfortunately, many potential buyers are still unaware of the existence of carbon credits by (local) farmers.
- **Double counting:** e.g., how to make sure one plot is counted once within all the existing mechanisms? (CAA)
- **Permanence:** Carbon Farming happens on land that is used for food production and is managed. Often this will lead to shorter-term credits, which seem to be less attractive to potential buyers.
- **Lack of harmonised EU rules:** each country interprets Carbon Farming differently; there is no clear legal framework (yet), but CRCF will change this.
- **Higher price range:** compared to other types of carbon credits, those from agriculture are often in a higher price range due to complexity and costs for the farmers, as well as the geographical origin. Carbon Farming projects in Europe are very different from carbon credits from the Global South, where there is a different living standard.

4.1.3 Motivations and unique selling points of Carbon Farming

Currently, the VCM is driven by different motivations, as we can see in Figure 4. Analysis of the survey shared with members of the Climate Alliance Agriculture highlights the fact that the main drivers for the purchase are carbon corporate climate actions and targets (SBTi or other). The new European disclosure requirement (CSRD) and companies' CSR strategies also seem to be an important driver, ahead of marketing or philanthropic reasons.

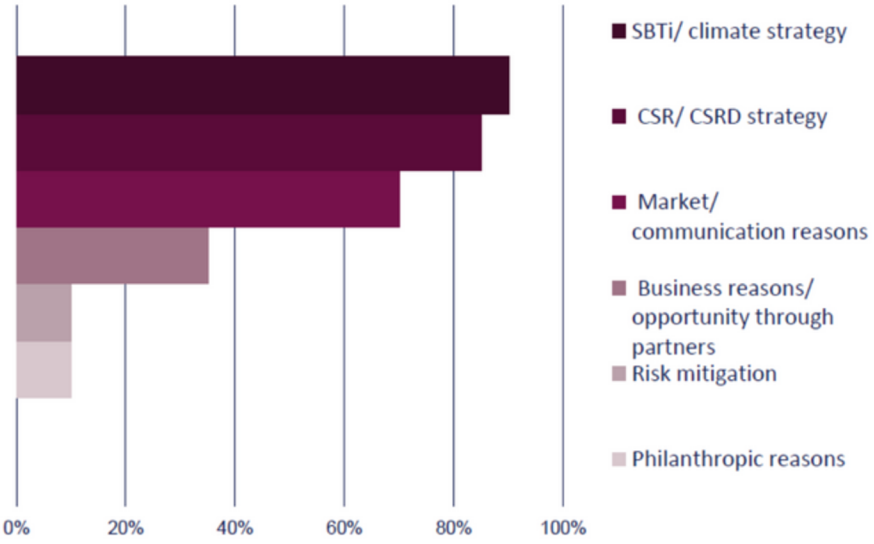

Figure 4: Hierarchy of motivations for purchasing voluntary carbon credits. Keep in mind that this ranking is based on the perception of the marketers themselves and not on a survey of purchasers. Source: Barometer of the voluntary carbon market in agriculture (Greenflex & CAA)

It is important to mention that the SBTi is revising its Standard to enable broader and deeper corporate climate action. The updated draft sets out a science-based, innovative and pragmatic framework designed to accelerate emissions reduction from 2026 and beyond. This revised Standard is called 'Corporate Net-Zero Standard V2' and is currently in the phase of piloting at some selected companies. We mention this revision, as it has opened up some possibilities for environmental attribute certificates (EACs), which include carbon credits. This updated standard emphasises action and offers more flexible pathways for companies to reduce emissions by 2050. It acknowledges the role of carbon credits, but emphasises that they should not be used to substitute direct emissions reductions within a company's value chain. **Carbon credits are permitted for "beyond value chain mitigation" (BVCM; a mechanism through which companies can accelerate the global net-zero transformation by going above and beyond their science-based targets) and for neutralising residual emissions at the net-zero target year, but not for achieving the initial emission reduction targets.**

In addition to the market and policy drivers shaping the VCM, it is essential to emphasise the unique selling points (USPs) and broader co-benefits of Carbon Farming credits. Carbon Farming experiences many challenges, as explained, but these should be assessed alongside the significant added value it can generate.

Based on the experience of the project partners, the following USPs deserve particular attention:

- **Local, tangible and personal:** Carbon Farming projects are often located close to the credit buyer, making their impact visible and relatable. For example, a company purchasing credits from a farm within its own region can directly visit the site, meet the farmer, and observe the implemented practices.
- **Clear contribution to the Sustainable Development Goals (SDGs):** Carbon Farming can contribute to several SDGs simultaneously.
  - *SDG 15 Life on land:* By promoting practices such as agroforestry or hedgerow planting, farms enhance habitat structure and support native species.
  - *SDG 13 Climate action:* Carbon sequestration in soils and biomass directly reduces atmospheric CO_2 levels.
  - *SDG 12 Responsible consumption and production:* Encouraging circular use of on-farm resources (e.g., composting crop residues) fosters more sustainable production systems.
  - *SDG 2 Zero hunger* (implicitly relevant): Improved soil management can lead to more resilient and productive food systems.
- **Local social and economic development:** Carbon Farming can strengthen rural communities by supporting local employment, enabling new services (e.g., advisory roles, monitoring), and improving farm viability. For example, a cooperative may create new jobs related to carbon project administration or soil monitoring.
- **Nature-Based Solution (NBS):** Carbon Farming practices rely on natural processes—such as photosynthesis, root development, and soil biology—offering a low-tech, scalable, and climate-resilient solution.
- **Stakeholder engagement and communication potential:** The relatable and visual nature of farm practices creates strong opportunities for storytelling. Companies can share real-life examples, farmer interviews, and field images to engage employees, customers, and partners.
- **Attractive for potential employees:** Organisations supporting or financing Carbon Farming projects often find that the visible environmental impact enhances their employer brand, appealing to talent seeking purpose-driven work environments.

As the Carbon Action Alliance (CAA) correctly observes, carbon credits generated in agriculture tend to be relatively expensive for buyers while still offering limited financial return for farmers. Bridging this economic imbalance is crucial to enabling large-scale adoption. The USPs and co-benefits described above provide a strong foundation for closing this gap, increasing both the perceived and actual value of agricultural carbon credits for all stakeholders involved.

4.2 Farmers' opinion

4.2.1 Drivers for farmers

It should be clear that farmers who are currently actively working on their soil carbon are all doing so in their own way, with different emphasis, and that this is always a process of trial and error, with the general conclusion being that carbon accumulation is unfortunately slow but does lead to healthier soils that need lower external inputs. In the long term (at least 5-10 years), this is confirmed by better yields. Working on carbon in your soil requires time and is tailored to the company and soil-specific situation.

In addition, farmers have to think about many things at once: do I need to adjust my fertilisation, will I be able to obtain compost, which green manures can I sow, what is my potential risk of nitrate residue, when should I apply what, what about weed pressure, which machines do I need, do and can I invest in the necessary means, can I be sure of access to water for irrigation etc.

Nevertheless, carbon farmers are all convinced of the added value for their businesses. Ultimately, it leads to fewer inputs such as artificial fertilisers and field operations and greater harvest security, especially in changing climate conditions. But it requires perseverance and no expectation that the efforts will pay off overnight. For them, the pioneering carbon farmers, the extra potential revenue from carbon credits has never been the driving force, but it can be a way to build bridges with less obvious partners.

At the Carbon Farming Summit in Dublin (March 2025), participating farmers consistently emphasised that any meaningful transition in agriculture requires a comprehensive system-based approach. An approach that recognises the diversity of farming models across Europe. As Sheila Darmos, a farmer from Greece, pointed out, Europe must critically evaluate the type of supporting ecosystem that innovative farmers need and ensure that this ecosystem is actively facilitated.

Several experienced carbon farmers noted that, throughout their journey, they encountered a significant shortage of system-level advisors. As a result, they often had to navigate complex decisions independently and many still do. They also stressed that their individual experiences do not represent a universal truth: farming remains inherently challenging, and every farmer must determine their own path, often amid uncertainty. In this context, knowledge exchange, peer learning, and community consultation were highlighted as essential sources of support.

Fundamentally, every farmer interacts with the carbon cycle, as agricultural activity is deeply embedded in natural systems. The central question becomes: How do I want to influence this cycle, and what benefits can this bring to my farm and the surrounding environment? Farmers produce food while simultaneously managing an ecosystem. These two responsibilities must reinforce, rather than contradict, one another. After all, Carbon Farming offers one of the practical pathways towards more sustainable, climate-adaptive agricultural systems.

On the other hand, the term ‘Carbon Farming’ is used far more frequently by policymakers and researchers than by farmers themselves. It is important to ensure that discussions do not focus solely on “Carbon Farming” as a concept, but rather on soil health as a whole—of which organic carbon is only one component. In practice, the terminology reflects a policy-oriented vocabulary rather than the everyday language of farmers.

Farmers are recognising the potential of Carbon Farming as a supplementary income stream and a means to enhance soil health and soil fertility. However, challenges such as the complexity of certification processes, upfront costs, and the need for technical knowledge can deter participation. Addressing these barriers through education, financial incentives, and streamlined procedures is crucial to increasing farmer engagement in Carbon Farming initiatives.

Be aware that farmers who are currently active in business cases for Carbon Farming are in it for different reasons:

1. Foremost, due to the **intrinsic motivation of the benefits** for their soils and thus for their farms.
2. Next to this, farmers who participate in local small-scale collaborations value **the one-on-one connection** with their buyer(s), which creates a better mutual understanding and also a **social appreciation**.
3. The **financial incentive** for Carbon Farming is nonetheless crucial in order to be able to take their actions to the next level and in order to feel supported in their efforts.

Scaling up these small cases and engaging a broader group of local farmers will almost certainly require stronger financial incentives. A key question, however, remains unresolved: should the focus shift toward insetting or continue with offsetting approaches (see section 5.1.1)? Insetting is particularly challenging, as many farmers fear that such incentives will be short-lived and may offer lower compensation than what is achievable through offsetting schemes.

4.2.2 Challenges and barriers for farmers

No farmer or farm business is the same, so generic challenges for one group called 'farmers' should always be taken with a pinch of salt. The challenges that active carbon farmers experience are very different from non-participating and sceptical farmers. Yet, there are significant concerns and barriers present that all advisors, policy makers and scientists should be very aware of. We highlight a non-exhaustive list below, based on the experience from the partners involved in this project, as well as collected from some recent publications, such as the reports from the Credible project, called 'How is the European farmer community receiving Carbon Farming strategies so far?' and 'Developing fit-for-region Carbon Farming approaches'. We defined four categories for barriers and challenges: Financial, Practical, Policy and Human/cultural.

Financial

1. **In general low price level:** The price of CO_2 certificates from agriculture is often too low to make investments attractive.
2. **Frustration and incomprehension** amongst front runnersabout the difficulties in considering their previous and current efforts. It concerns the necessity to ensure "Additionality" in terms of new efforts for payments under Carbon Farming schemes as described for the Credible project by Mal et al (2025).
3. **Scepticism** grows over time as early expectations—often exaggerated in initial communications—remain unfulfilled. How to make sure farmers get their share of the created value? (Credible)
4. **Uncertainties** around the markets for trading certificates, ensuring reliable payments, and the high upfront costs of equipment or complex certification procedures.
5. **Market access:** Many farmers do not have direct access to voluntary carbon markets or do not know how to participate.

State of Carbon Farming in North-West Europe

Practical and administrational

1. **Lack of certainty about specific techniques** and how these can maintain high productivity while integrating a new revenue stream through carbon certificates.
2. **Lack of holistic advice** that supports them with qualified, tailormade advice, experimentation and provides practical integration of Carbon Farming on their farms - Credible Project (2025).
3. **Not all sectors can participate alike:** e.g., the livestock sector struggles to participate in Carbon Farming directly with grassland and pasture management or providing raw material for organic-based fertilisers.
4. **Fear** of more (administrational) work, challenges and risks.
5. **Lack of standardisation**. Different certification systems apply different standards and rules, which leads to uncertainty (or lack of clarity) for farmers.

Policy

1. **Frustrations** about current excessive regulation and too many changes in a short period for a sector that makes investments on a very long term (even for a generation). This impacts Carbon Farming, even though it is a voluntary initiative. (Credible)
2. Standards and certificates are needed at **European scale** to connect the value chain and investors.
3. **Fear** about how Carbon Farming (might) interact with other policy goals (such as climate goals, LULUCF, etc.) and expectations within their value chain. This results in a lack of progress rather than a forward transition.

Human/cultural

1. **Fear of the unknown.** Farmers are used to seeing economic results tied to the yields of their main crops, and it feels unfamiliar to think they could receive market benefits for producing something as intangible as carbon (Credible).
2. The **lack of concrete examples** at a local level and within the same sectors as individual farmers undermines their confidence in these activities (Credible).
3. **Concerns about large corporations** dominating agriculture and taking over the land (Credible).
4. **Principles**: Some farmers simply don't want to be involved in the VCM, even though they do work on CS.

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4.3 Intermediaries

Farmers and compensating companies will not be the only involved parties in order to make the Carbon Farming market run. The CRCF Regulation mandates **third-party verification** and the publication of certification-related information in an **EU-wide registry** and aims to streamline certification processes, making them cost-effective yet robust. It also introduces group certification, easing the burden for small farmers and foresters.

To ensure synergies with existing EU schemes, the certification process is largely based on the bioenergy certification rules under the Renewable Energy Directive since 2009, and includes the following steps:

1. **Participation in a certification scheme:** Operators apply to an EU-recognised scheme, submitting activity and monitoring plans.
2. **Certification audit:** A certification body verifies the activity's compliance with EU criteria and methodologies, issuing a certificate of compliance.
3. **Recertification audit:** Regular audits ensure the correct implementation of the activity and/or the generation of carbon removals or soil emission reductions.
4. **Certification registry:** All certification information, including the quantity of certified units, is published in the CRCF registry (established by 2028). Until then, certification schemes will maintain their own registries.

Intermediaries, including certifiers and standard-setting organisations, will play a vital role in the Carbon Farming market by ensuring the credibility and transparency of carbon credits. It will result in maintaining registries, thereby facilitating trust between buyers and sellers in the carbon market.

To summarise, as an overview following actors will play a role in the EU Carbon Farming market:

1. **Operators / Project Developers:** These include Carbon Farming practitioners (e.g., farmers, foresters), and industrial carbon removers (e.g., DACCS, BECCS, biochar). Operators initiate carbon removal or soil emission reduction activities.
2. **Certification Schemes (Public & Private):** CRCF allows both existing certification schemes (such as Verra, Gold Standard) and newly accredited ones to participate, provided they meet EU quality criteria—thus acting as intermediaries between operators and the CRCF framework.These schemes handle the certification process, manage registries (until the EU-wide registry is operational), and maintain audit documentation.
3. **Third-Party Verification / Independent Auditors:** Certified audits (initial and periodic recertification) must be carried out by independent third parties: auditors ensuring that projects satisfy CRCF criteria (QU.A.L.ITY—quantification, additionality, long-term storage, sustainability).
4. **EU / National Authorities:** The European Commission, supported by **Expert Groups**, will develop detailed certification methodologies via delegated and implementing acts.National bodies may advise farmers on CRCF procedures and facilitate synergies with the Common Agricultural Policy's systems.
5. **Registry Operators:** In the interim, certification schemes operate public, interoperable registries.
6. An EU-wide registry is mandated to be fully functional within approximately 4 years of regulation adoption (i.e., by ~2028) for transparency and unit tracking.
7. **Credit Buyers / Market Actors:** Corporations, public institutions, and financial institutions will purchase CRCF-certified removal credits.

4.4 How to scale the market?

As already mentioned multiple times in this report, the CRCF launch is expected to be crucial to boost and scale the Carbon Farming market in Europe. It will show to both project developers (farmers) and credit buyers that the EU Commission and Science believe and support Carbon Farming and that the voluntary carbon credits also meet certain QUALITY criteria.

Nonetheless, the other actors will have to follow in order to deliver a well-functioning system that is economically feasible. For this, member states and regional governments will have to follow and facilitate the CRCF implementation on a national and local level.

We would like to emphasise two studies:

1 - A study on a global level from McKinsey & Company where six core priorities to scale the market are highlighted (Blaufelder et al., 2021).
McKinsey and the Task Force on Scaling Voluntary Carbon Markets (TSVCM) defined an integrated blueprint across the full carbon credit value chain with 6 crucial steps:

1. **Develop shared principles and attribute taxonomy:** Today's voluntary carbon market lacks the liquidity necessary for efficient trading, in part because carbon credits are highly heterogeneous. In Europe, this step has been taken care of by developing and launching the CRCF.
2. **Develop contracts with standardised terms:** Reference contracts would combine a core contract, based on the core carbon principles, with additional attributes that are defined according to a standard taxonomy and priced separately. Core contracts would make it easier for companies to do things such as purchasing large quantities of carbon credits at once: they could make bids for credits that meet certain criteria, and the market would aggregate smaller quantities of credits to match their bids.
3. **Market infrastructure:** A resilient, flexible infrastructure would enable the voluntary carbon market to function effectively: to accommodate high-volume listing and trading of reference contracts, as well as contracts reflecting a limited, consistently defined set of additional attributes. This, in turn, would support the creation of structured finance products for project developers. In addition, an advanced data infrastructure would promote the transparency of reference and market data. Sophisticated and timely data are essential for all environmental and capital markets. In Europe, this step has been taken care of by developing and launching the CRCF and including the set-up of an EU-wide registry.
4. **Guidance on offset legitimacy:** Some observers question whether companies will extensively reduce their own emissions if they have the option to offset emissions instead. Principles for the use of carbon credits would help ensure that carbon offsetting does not preclude other efforts to mitigate emissions and does result in more carbon reductions than would take place otherwise.
5. **Market integrity assurance:** One corrective measure would be establishing a digital process by which projects are registered and credits are verified, and issued. Verification entities should be able to track a project's impact at regular intervals, not just at the end. A digital process could lower issuance costs, shorten payment terms, accelerate credit issuance and cash flow for project developers, allow credits to be traced, and improve the credibility of corporate claims related to the use of offsets.
6. **Clear demand signals:** Finding effective ways for buyers of carbon credits to signal their future demand would help encourage project developers to increase the supply of carbon credits.

2 - A European study by the Road4Schemes Project, where a conceptual framework was developed to analyse the development of Carbon Farming systems by Gerits et al., (2023)

The conceptual framework consists of five steps that guide the way towards effective carbon farming systems (Figure 5). Improvement in all five steps is necessary and each step is indispensable for an effective and successful implementation of carbon farming. In the framework, certain steps are depicted sequentially, while others are portrayed in parallel. Additionally, some steps follow a one-way path, while others incorporate feedback loops. For instance, start-ups and piloting carbon farming schemes build on awareness from various stakeholders and necessary conditions provided by a supporting narrative, regulations, guiding principles and data infrastructure. Feedback from these piloting carbon farming schemes could in their turn increase awareness and provide feedback to improve the necessary conditions. In short, the trajectory towards fully-fledged carbon farming systems is not set in stone, yet there is a more or less common series of steps to take.

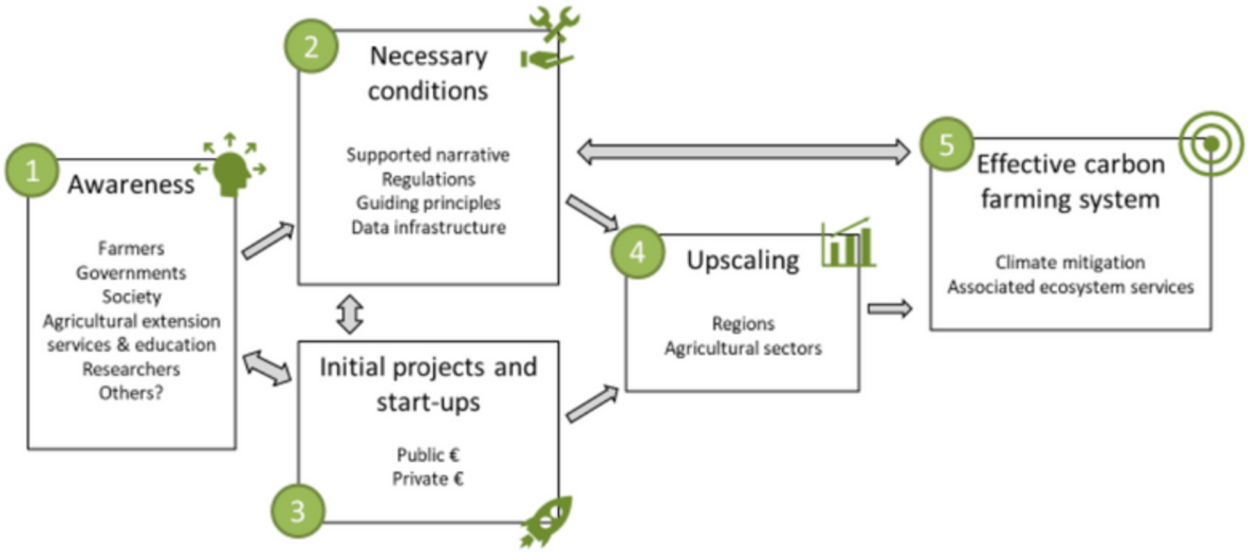

Figure 5: Conceptual framework for the exploratory analysis of developing Carbon Farming systems.

5. Available revenue models

5.1 Types of models

5.1.1 Types of value chains

Carbon Farming can be woven into agricultural value chains through a variety of market mechanisms that reward climate-positive practices. Two dominant strategies—insetting and offsetting—offer distinct pathways for addressing agricultural emissions and compensating farmers for their role in carbon sequestration. While offsetting allows companies to neutralise emissions by investing in external projects, insetting focuses on internal transformation within the supply chain. Beyond these mechanisms, the rise of the bio-economy and the cultivation of novel crops present additional opportunities for farmers to engage in carbon markets. These emerging value chains not only diversify income sources but also contribute to the resilience and sustainability of agricultural systems.

5.1.1.1 Insetting

Insetting refers to a company's direct investment in greenhouse gas (GHG) reduction projects within its own supply chain. Rather than purchasing external carbon credits, companies opt to reduce emissions from within—typically targeting scope 3 emissions, which are generated by suppliers, logistics, and other indirect operations. Examples include switching to biofuels for transport or implementing Carbon Farming practices on supplier farms. These actions result in verified emission reductions that can be credited to the company's carbon footprint, reinforcing accountability and transparency.

The strength of insetting lies in its internal focus. By integrating low-carbon practices directly into sourcing, production, and distribution, companies can align climate goals with operational realities. Verified carbon credits generated through insetting are registered with third-party standards, ensuring credibility and preventing double-counting. Moreover, insetting projects often yield co-benefits such as improved soil health, enhanced biodiversity, and stronger community livelihoods—making them attractive from both environmental and social perspectives.

However, insetting is not without its challenges. One concern is the potential for limited scalability, especially for smaller companies with less influence over their supply chains. There is also a risk of overstating impact, where companies may claim reductions without robust verification or fail to account for rebound effects. Additionally, the complexity of implementation—from monitoring to certification—can be a barrier, particularly in fragmented agricultural systems. These concerns underscore the need for clear standards, transparent reporting, and inclusive governance to ensure that insetting delivers genuine climate benefits.

In this way, Carbon Farming becomes a value-adding component of the food chain. Yet, the central challenge remains: how to fairly and consistently reward farmers for the climate services they provide. Without proper valuation mechanisms, the risk is that farmers' contributions will be overlooked or undercompensated, undermining the long-term viability of Carbon Farming initiatives.

5.1.1.2 Offsetting

Offsetting, by contrast, allows entities—whether companies or individuals—to compensate for their emissions by investing in external projects that reduce or remove carbon from the atmosphere. These projects range from reforestation and renewable energy to energy-efficient technologies and Carbon Farming initiatives. Each tonne of carbon dioxide equivalent (tCO_2e) reduced or removed generates a carbon credit, which can be purchased to offset the buyer's own emissions. This mechanism enables organisations to take responsibility for unavoidable emissions while supporting global climate action.

The offsetting process typically begins with an emissions audit, followed by investment in certified projects. Once credits are issued, they are retired against the emitter's footprint, with the aim of achieving net-zero emissions. Offsetting offers environmental benefits by reducing overall greenhouse gases and supporting sustainable development. Socially, it can create jobs, improve community well-being—especially in developing regions—and foster local engagement in Carbon Farming. Economically, it provides a flexible and cost-effective tool for meeting climate targets, while enhancing brand reputation among eco-conscious consumers and investors.

Nonetheless, offsetting has faced criticism. Some argue it enables "greenwashing", allowing companies to maintain unsustainable practices while appearing climate-responsible. Others point to the issue of additionality—whether the emissions reductions would have occurred without the offset project. Verifying the true impact of offsetting initiatives remains a challenge, with calls for higher-quality standards and more rigorous oversight.

In response to these concerns, the European Union is developing the Carbon Removal Certification Framework (CRCF). This initiative aims to establish robust criteria for certifying carbon removals, ensuring transparency, environmental integrity, and alignment with EU climate goals. The CRCF represents a step toward harmonising offsetting practices and restoring trust in carbon markets.

5.1.1.3 New value chains: Bio-economy and new crops

The European bioeconomy is undergoing a transformation, with carbon farming playing a central role in the development of new agricultural value chains. This shift is driven by the need to achieve climate neutrality, enhance soil health, and create new economic opportunities for farmers. The integration of carbon farming into the bioeconomy is enabling the adoption of innovative crops and practices that go beyond traditional food and feed production (Fritsche et al., 2021; EC JRC, 2021).

A key trend is the cultivation of perennial and multi-purpose crops, such as miscanthus, switchgrass, hemp, willow, and poplar. These crops are well-suited to marginal or degraded land and are valued for their ability to sequester carbon both above and below ground. Their deep root systems and perennial growth contribute to increased soil organic carbon, improved soil structure, and greater resilience to drought and extreme weather. Recent European research confirms that perennial systems can significantly increase soil carbon stocks and support biodiversity (Ahammad Siddique et al., 2023; Ferchaud et al., 2025).

Paludiculture, the productive use of wet or rewetted peatlands, is emerging as a promising value chain for climate mitigation and rural diversification in Europe. Raising the water table on previously drained peat soils can cut greenhouse gas emissions by 3–40 tons of CO_2e per hectare per year, with 7–20 tons being more common. These avoided emissions can generate carbon credits using schemes such as the UK peatland code, the Irish Peatland Standard, and Moor Futures (Germany). Raising the water table also generally implies a shift from conventional agriculture to cultivation of crops which are suited to the wetter condition. The type of crop is highly dependent on the post-rewetting water table and the properties (fertility and acidity) of the peat soil.

Traditional wetland crops such as reed, cattails and sedges have been leading the charge, and have received widespread attention from academia and general media. The cultivation of reed and sedges has the advantage that these crops can be used with little processing as a building material for thatched roofs, for which the value-chain has already been established. However, pioneering entrepreneurs have developed novel products such as insulation blocks and reusable straws.

Cattails are a promising crop, which can be turned into a fire-retardant biobased insulation material through low tech processing and high-tech processing techniques are under development for turning cattail biomass into high-value, carbon-neutral waterproof panelling.

Other emerging paludiculture cultivation systems include the management of wet meadows for hay production or summer grazing, the cultivation of willow or alder for biomass or construction materials, and the production of Sphagnum moss as a general horticultural substrate or for niche applications such as orchid propagation, vivarium design, and hobby gardening. In addition, cranberries, blueberries, and other soft fruits are being trialled in various countries for direct cultivation on wet peat.

For these crops, the European market is well-established and demand is high. However, the development of cultivation practices and specialised equipment for rewetted peatlands is still in its early stages, which limits large-scale adoption. Nevertheless, horticulture on wet peat is already being trialled extensively in the UK, and the first products have reached the market.

Where construction materials are being produced, paludiculture not only generates carbon credits by reducing emissions, but also contributes to carbon sequestration through integrating with the bio-based economy.

Except for horticulture, paludiculture systems require a low input of fertiliser or even none at all, and either allow for diverse vegetation (cranberries and wet meadows) or use the water table to minimise noxious weeds (cattails, reed, sedges) thus eliminating herbicide requirements. This supports pollinators and other insects by introducing a greater variety of food sources, and reducing the use of harmful chemicals. Moreover, healthy wet peatlands regulate water supply by slowing flow, improving infiltration, and storing and releasing water. Finally, paludiculture in slowly moving water bodies (reeds, cattails, alder and willow) absorb nutrients and thereby improve downstream water quality.

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Thus, aside from the substantial reductions in GHG emissions when raising the water table, paludiculture has the potential of producing a wide variety of crops for use as construction material, animal fodder, human food, and more. Paludiculture, furthermore, can sequester carbon, contributes to biodiversity and water management, and provides raw materials for the bio-based economy, including traditional and novel bio-based material, as well as stimulating the development of the bio-based materials of the future. European research and pilot projects are demonstrating the feasibility and benefits of paludiculture as part of integrated carbon farming strategies (Wichtmann, 2021; European Commission, 2022).

Agroforestry is another cornerstone of the new bioeconomy. By integrating trees or shrubs with crops and/or livestock, agroforestry systems provide additional carbon sinks, enhance soil health, and deliver a wide range of ecosystem services. These systems are increasingly recognised in European policy and research as effective tools for both climate mitigation and adaptation. Agroforestry can increase total carbon storage on farms, improve resilience to climate extremes, and diversify farm income through the production of timber, fruits, nuts, and non-timber forest products. The REFOREST project and other EU initiatives are supporting the development of robust monitoring and verification frameworks for agroforestry, enabling its integration into carbon markets and sustainable value chains (REFOREST, 2023; European Commission, 2022).

Biochar is also emerging as an important innovation within carbon farming and the bioeconomy. Produced by pyrolyzing plant biomass under low-oxygen conditions, biochar is a stable, carbon-rich material that can be applied to soils. This process locks atmospheric carbon in a solid form for centuries, making biochar a truly carbon-negative product. In addition to its climate benefits, biochar improves soil fertility, water retention, and nutrient cycling, and can reduce the need for synthetic fertilisers. European projects such as MRV4SOC and the C-SINK Horizon project are developing robust monitoring and verification frameworks to support the integration of biochar into carbon markets and regulatory systems (MRV4SOC, 2025; C-SINK, 2024).

The bioeconomy is creating new markets for carbon farmers. Biomass from dedicated energy crops and innovative plant species is increasingly used in the production of advanced biofuels, biochemicals, and high-performance materials. For example, miscanthus and hemp are being processed into biocomposites for the automotive and construction industries, while short-rotation coppice is used for renewable heat and power. The development of bio-based plastics and biodegradable materials from agricultural feedstocks is also gaining momentum, supported by EU policy frameworks such as the Bioeconomy Strategy and the Carbon Removal Certification Framework (European Commission, 2018; Regulation (EU) 2024/3012).

Scaling up these new value chains requires robust monitoring and verification systems to quantify carbon benefits, the development of regionally adapted crop varieties, and the establishment of stable markets for bio-based products and biochar. Collaboration between farmers, research institutions, industry, and policymakers is essential to address these challenges and unlock the full potential of the bioeconomy as a driver of climate-smart agriculture (Smit et al., 2024; CREDIBLE Project, 2023–2026).

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5.1.1 Forms of payment

Carbon farming revenue models can be categorised into:

- **Action-Based Payments:** Farmers receive compensation for implementing specific practices, such as cover cropping or reduced tillage, regardless of the measured outcome. These payments are straightforward but may not directly correlate with actual carbon sequestration.
- **Results-Based Payments:** Compensation is tied to the quantifiable amount of carbon sequestered or emissions reduced. This model ensures environmental benefits but requires robust measurement, reporting, and verification (MRV) systems, which can be complex and costly.
- **Hybrid Models:** Combine elements of both action-based and results-based payments, offering initial support for practice adoption followed by rewards for measurable outcomes. This approach balances incentivising adoption and ensuring environmental integrity.

There is much debate about which payment system works best. Action-based payments seem more suitable for paying farmers for their efforts. However, critics point out that this doesn't guarantee that the intended results will be achieved. Therefore, many advocate for results-based payments. The advantage of result-based payments is that they clearly prioritise results. A major concern with Carbon Farming is how these results should be demonstrated. Carbon sequestration in the soil is a very slow process, and carbon gains are difficult to determine. As a result, it can take several years before results can be demonstrated, forcing farmers to wait a long time for their return on investment. For this reason, hybrid models are often discussed in the case of carbon sequestration through Carbon Farming, so that farmers receive initial compensation for their investments and an additional reward after demonstrating results.

5.2 Analysis of Carbon Farming Schemes in Europe

The set-up of CRCF didn't just happen out of nowhere. In the past decade, a lot of small and big new collaborations and businesses have started developing Carbon Farming projects. Due to the quick proliferation of these voluntary schemes, there has been a lack of clarity for both potential carbon credit buyers as well as for the farmers. There was a clear call around 2020-2021 for more clarity and support from the European Commission to boost this market by setting the scene and helping to ensure the quality of carbon credits.

To know about the current Carbon Farming market, an overview of existing Carbon Farming schemes in Europe is valuable and instructive. Very recently, such an overview and analysis was already made by the Road4Schemes project by Smit et al (2024). This project involved a qualitative analysis of Carbon Farming schemes, examining the strengths and weaknesses of different designs. The objectives were:

- Assessing the strengths and weaknesses of existing and planned Carbon Farming schemes, including tools for MRV;
- Evaluating stakeholders' perceptions and preferences regarding strategies for designing these Carbon Farming schemes and related policies;
- Developing a roadmap for context-specific Carbon Farming schemes.

The consortium consisted of EU member states Denmark, the Netherlands, Belgium, France, Germany, Austria, the Czech Republic, and Italy, as well as non-members, e.g., Switzerland and Turkey.

In an initial round, Smit et al. (2024) identified 162 schemes from the EU, Turkey, the United States of America, and Australia. Of these, 45 schemes were selected based on the available information about their operation and payment system, their MRV methodology, and their emphasis on additional environmental and social benefits. The selection aimed to achieve a good balance in terms of scope (which member states), project phase (conceptual, discontinued, or active), and measures applied (such as rewetting, modified crop rotation, etc.). The administrators of the selected schemes were then approached with a questionnaire and interviews to gather additional information, such as the method of certification (e.g., carbon credits, labels, or carbon certificates) and the land use and perimeter of the Carbon Farming scheme (e.g., arable land, the entire farm, or agroforestry). The results were collected in an interactive web tool ('Carbon Schemes Inventories', see Figure 6).

The selection of schemes was then assigned a (subjective) score per theme by the researchers themselves, based on six main themes: general information about the scheme, information about payments and financing actors, MRV, guarantees for society and the environment, transparency, and attractiveness for participation. Each theme contained several specific aspects that were assessed, f.e.:
General information about the scheme:

- Availability of documentation
- Clear delineation of farmers' responsibilities
- Type and extent of land use
- Duration of the contract
- Expected results (including climate mitigation)

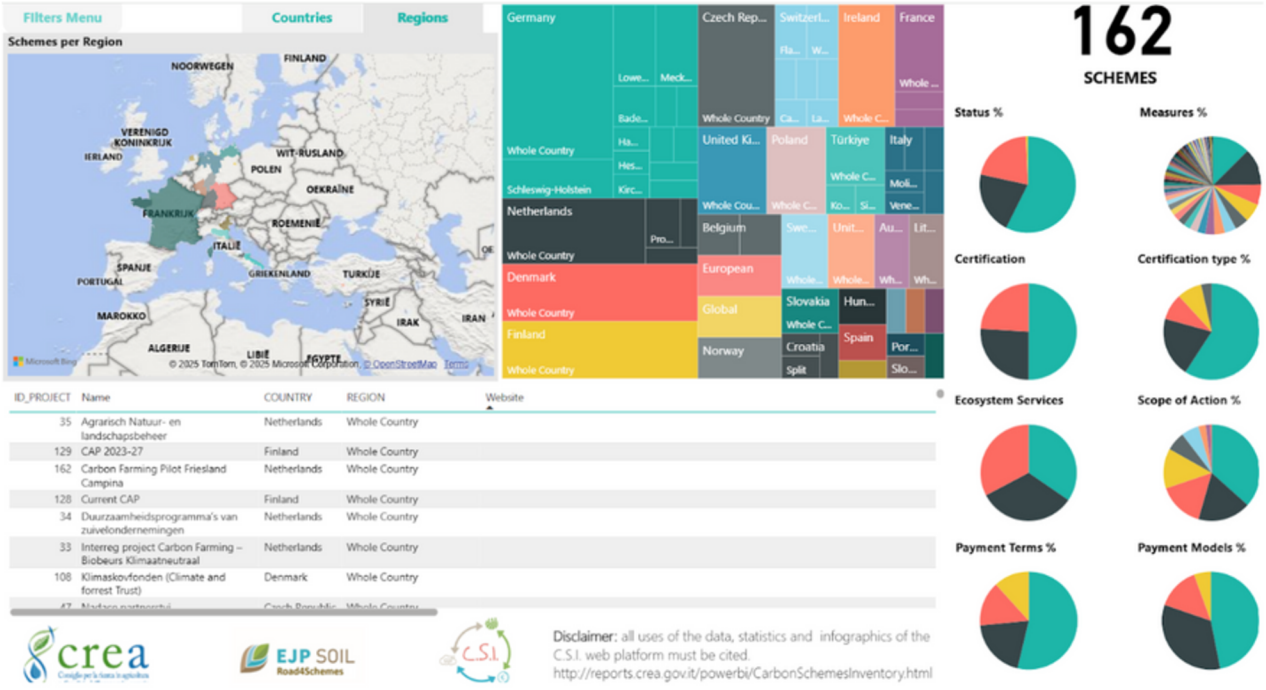

Figure 6: Screenshot of the Carbon Schemes Inventories web platform, an international dashboard for Carbon Farming schemes, designed to support governments and administrators of Carbon Farming schemes. Source: http://reports.crea.gov.it/powerbi/CarbonSchemesInventory.html

The highest-scoring schemes were mainly private initiatives that tend to base payments on the results actually achieved (result-based), with a good quantity and quality of publicly available documentation. They took an above-average account of the effects of trade-offs (balancing the carbon storage achieved with other (indirect) effects of a project) and leakage (displacement effects of emissions). The Carbon Farming schemes with the best scores were considered to distribute the benefits and risks well among farmers, financiers, and policymakers.

5.3 Detailed comparison of selected schemes by consortium

This chapter provides insight into existing Carbon Farming schemes across the five participating countries of this project. Each partner organisation selected one or two regional schemes for in-depth analysis, offering concrete examples of how Carbon Farming is being implemented in practice across different European contexts.

Given the rapidly evolving policy landscape and ongoing development of national schemes, readers should be mindful of the publication date of this report when interpreting the findings. Additionally, for a comprehensive European perspective, the reader should also look at a recent paper by Thorsøe et al. (November 2025), which examined 160 Carbon Farming schemes across the EU and provides valuable insights into design principles, governance structures, and lessons learned from existing initiatives.

Below, this report provides an overview of all the selected schemes for this Carbon Market State Report, summarised across several key parameters:

Types of CS measures
Not all active schemes offer the same types of carbon sequestration measures. Differences arise depending on the region, available methodologies, and the robustness of long-term scientific data supporting them.

Specific conditions and principles
As no standardised framework or certification currently exists, many schemes have established their own conditions and principles, typically in good faith and in collaboration with scientists or research institutes. All schemes acknowledge the three fundamental pillars of a well-functioning voluntary carbon market: additionality, permanence, and transparency.

Measuring, modelling, and reporting
Each Carbon Farming business model must demonstrate that it is effectively sequestering carbon. Approaches vary, and often multiple methods are combined to ensure robust verification.

Payment structure
The Carbon Farming market is highly heterogeneous—not only in terms of measures and regions, but also in the pricing of carbon credits and the way schemes compensate farmers or project developers. The following overview highlights how each scheme structures its rewards.

5.3.1 Belgium

5.3.1.1 Claire CO_2

History and Background

The Claire CO_2 platform was established in Belgium in 2021 as a local carbon offset marketplace designed to connect organisations seeking to compensate their greenhouse gas emissions with local projects that actively reduce or sequester carbon. Its early success was driven by a growing demand for transparent and locally impactful climate action. From the beginning, both Boerenbond and the Belgian Soil Association joined as strategic collaboration partners, marking the platform's integration into the agricultural sector through Carbon Farming initiatives. Claire is scientifically grounded and operates an ISO 14064-certified platform. Today, Claire is recognised as a pioneering model for regional climate financing and aims to become a European reference platform by 2030.

Eligible Measures

Claire CO_2 supports a wide range of carbon sequestration measures in agricultural systems, including: cover crops, trees, hedgerows and agroforestry systems, compost application, stable manure, leaving crop residues on fields, grass-clover mixtures, alfalfa, miscanthus, permanent grassland, wood chips, and intercropping with leguminous plants. Projects span three main domains: nature and agriculture (including reforestation, soil carbon sequestration, and agroecological practices), innovation and technology (emission-reducing techniques and carbon capture methods), and energy (building renovations, renewable energy, and energy-saving measures).

Conditions and Principles

Participating farmers must commit to a project duration of 2 × 3 years (total 6 years) with a 10-year engagement. Present permanent grassland cannot be removed, and at least two measures must be implemented that are new to the farm. Claire emphasises three core principles for voluntary carbon markets: additionality (ensuring practices are genuinely new), permanence (long-term carbon storage), and transparency (external auditing and public reporting). Only completed projects are eligible for certification, as Claire does not allow upfront crediting to ensure integrity.

Monitoring, Reporting, and Verification

Baseline soil samples are taken for each parcel at project start. After six years, farmers can request additional soil sampling if they want to claim a bonus for exceeding predicted sequestration. The platform uses a CO_2 plan based on an ISO-certified methodology co-developed with the Belgian Soil Association and Boerenbond. Yearly monitoring of practices and certification ensures compliance. The methodology is supported by a comprehensive handbook reviewed annually by a scientific advisory board to align with the latest climate science. Claire maintains a closed CO_2 balance, which is externally audited each year to guarantee transparency and credibility.

Payment Structure

Carbon credits are priced at €75 per tonne CO_2. Of this amount, €55 per tonne goes to the farmer, while €20 per tonne covers administration, communication, sales, and MRV costs. Farmers receive 100% annual payment after control by the Belgian Soil Association. After six years, a bonus is possible if the farmer has stored more carbon than predicted at the project start, verified through soil sampling.

Advantages

Claire's emphasis on local impact allows compensators to see tangible results in their communities, fostering trust and stakeholder engagement. The platform's scientific basis, backed by large datasets and expert review, ensures each certificate represents real and measurable climate benefits. External audits and public reporting enhance credibility. Claire offers flexibility to compensators in selecting projects aligned with their corporate values, while participation signals climate leadership and enhances brand value. The long-term monitoring and bonus system incentivises farmers to exceed baseline expectations.

Disadvantages

As a voluntary scheme, Claire does not cover all emissions or sectors, potentially limiting overall impact. The verification process for innovative projects can be complex and resource-intensive, requiring extensive documentation and third-party validation. The policy of no upfront crediting—while ensuring integrity—restricts scalability, as only completed projects are eligible for certification. Annual methodology revisions require ongoing engagement and adaptation from participants. The 10-year engagement period may deter some farmers from participating.

Future Developments

Claire aims to expand internationally into neighbouring countries such as France, Germany, and the Netherlands, supported by strengthened scientific governance and enhanced ISO auditing procedures. The platform is working to integrate its certificates into Corporate Sustainability Reporting Directive (CSRD) compliance frameworks, making them usable for corporate sustainability reporting. This alignment with emerging European climate regulations is expected to attract more institutional compensators. In the agricultural domain, Claire plans to scale Carbon Farming methodologies with updated emission factors and scientific validation. The platform is also launching the "1% for tomorrow" campaign, encouraging companies to commit 1% of their net profit to local climate projects to mobilise significant private investment.

5.3.1.2 Farming for Climate

History and Background

Farming for Climate is a Belgian non-profit organisation (ASBL) founded in 2019 with the mission to accelerate the agroecological transition of farmers. The initiative emerged from growing awareness that agriculture can be a powerful source of climate solutions. Since its inception, Farming for Climate has focused on empowering farmers to move away from conventional agricultural models and adopt practices that restore soil health, enhance biodiversity, and build climate resilience. The organisation has built a network of partner farms across Belgium and forged alliances with companies and individuals who support sustainable agriculture.

Eligible Measures

Farming for Climate promotes comprehensive agroecological practices, including eliminating or reducing ploughing and synthetic fertilisers, introducing cover crops and crop diversification, enhancing soil organic matter and fertility, and creating biodiversity-friendly habitats such as hedgerows and buffer zones. These practices are tailored to each farm's context and aim to improve long-term soil health, water retention, and ecosystem services. Unlike carbon credit marketplaces, the scheme allows farmers significant autonomy in designing their transition pathways.

Conditions and Principles

The organisation operates as a transition accelerator rather than a carbon credit marketplace. Farmers submit proposals for three-year transition projects, which are evaluated and selected by the organisation. Once accepted, farmers receive funding and guidance to shift away from conventional methods. The fixed three-year project horizon provides a practical timeframe for initiating agroecological transitions, though it may not suit all farms or allow for extended follow-up beyond the initial phase.

Monitoring, Reporting, and Verification

Farming for Climate monitors farmer progress and shares learnings across its network, working closely with farmers throughout the transition period. However, the organisation does not yet employ standardised MRV systems aligned with carbon credit certification requirements. While progress is tracked, the focus is on qualitative improvements in soil health, biodiversity, and farm resilience rather than quantified carbon sequestration verified through independent auditing.

Payment Structure

Funding comes from both corporate sponsors and individual donors who invest directly in tangible, local climate solutions rather than purchasing carbon credits. The organisation does not issue formal carbon certificates or tradable credits. Financial contributions are channeled directly into transition projects, with sponsors invited to engage with farmers and witness the impact firsthand. The absence of a standardised payment-per-tonne structure reflects the scheme's focus on holistic transition support rather than carbon accounting.

Advantages

Farming for Climate's deeply local and farmer-centred approach creates tangible impact that companies and individuals can directly witness, fostering trust and strengthening connections between food production and climate action. The scheme empowers farmers by allowing them to design their own transition paths tailored to their specific context and challenges, ensuring relevance and sustainability. The focus on agroecology delivers multiple environmental benefits including improved soil health, increased biodiversity, and greater resilience to climate extremes. Socially, the initiative builds a collaborative ecosystem including farmers, sponsors, consumers, and civil society actors. By avoiding carbon credit markets, the scheme sidesteps complexity and controversy, channeling support directly into long-term climate solutions.

Disadvantages

Because Farming for Climate does not issue formal carbon certificates, it may be less attractive to companies seeking quantifiable offsets for regulatory or reporting purposes. The reliance on voluntary contributions means financial stability can fluctuate, potentially affecting the number of farmers supported. The absence of standardised MRV systems limits the ability to quantify climate impact in ways that align with emerging EU frameworks like the CRCF. The fixed three-year project horizon, while practical, may not allow sufficient time for all farms to complete their transitions or demonstrate long-term permanence of changes.

Future Developments

Farming for Climate aims to expand its network of partner farms across Belgium, enabling more farmers to embark on agroecological transitions. This expansion will be supported by increased engagement with corporate sponsors and individual donors who are invited to connect with farmers and learn from their experiences. Collaborations with research institutions and agroecological experts will help refine promoted practices and ensure alignment with the latest environmental science. The organisation intends to boost public visibility through storytelling, media outreach, and educational initiatives highlighting farmers' roles in climate mitigation. In the longer term, Farming for Climate may explore hybrid models combining transition support with measurable climate benefits, potentially paving the way for integration with formal carbon accounting systems. The ultimate goal is to make sustainable agriculture mainstream by mobilising broader societal engagement, including consumers, retailers, and policymakers.

5.3.2 France

5.3.2.1 Label Bas-Carbone

History and Background

The Label Bas-Carbone (LBC) was established in 2018 by the French Ministry of Ecological Transition as France's first national carbon certification framework. It arose from two key observations: first, the limited financial recognition available to farmers and foresters for their contributions to climate change mitigation; and second, the increasing demand from French companies to invest in carbon reduction projects within national borders rather than abroad. The creation of the label was driven by a collaborative process that brought together researchers, technical institutes, practitioners, and certification experts within the I4CE Climate Clubs. Drawing on lessons from international carbon standards such as Verra and Gold Standard, as well as insights from scientific research and on-the-ground experimentation, the LBC was designed as a publicly endorsed, scientifically grounded, and locally relevant standard. Its public backing distinguished it from the largely private international landscape of carbon certification, ensuring credibility and trust within the French context.

Eligible Measures

Within the Label Bas-Carbone framework, eligible measures are those agricultural or forestry practices that demonstrably reduce greenhouse gas emissions or enhance carbon sequestration compared to a defined baseline. In agriculture, this typically includes actions such as optimising fertilisation management, introducing cover crops and nitrogen-fixing legumes, reducing soil tillage, diversifying crop rotations, and integrating agroforestry or permanent grassland management. In livestock systems, eligible interventions may involve improving manure management or adjusting feeding strategies to lower methane emissions. Each measure must be part of an approved methodology (for instance, "Grandes Cultures" for arable systems or "Carbon Agri" for livestock) and must demonstrate additionality—that is, the emission reductions would not occur without the project. Only activities implemented on French territory and verified under an approved methodology can generate certified carbon credits under the LBC.

Conditions and Principles

The operation of the LBC is guided by a set of core principles that ensure environmental integrity, transparency, and credibility. Projects must establish a reference scenario describing business-as-usual practices and a project scenario detailing the improved management actions. The difference in emissions or carbon storage between these two scenarios defines the project's certified carbon benefit. To be approved, each project must meet criteria for additionality, permanence, and the avoidance of double counting. Non-permanence risks—particularly relevant to soil carbon projects—are addressed through standardised deduction rates or buffer reserves. Importantly, the label functions under public governance by the French Ministry of Ecological Transition, which validates methodologies and oversees project registration. All projects must be transparent, with published summaries and verification reports available to the public, ensuring traceability of both carbon credits and financial flows.

Monitoring, Reporting and Verification

The LBC employs a structured Monitoring, Reporting, and Verification (MRV) system designed to balance scientific rigour with practical feasibility for farmers. Rather than relying solely on field measurements—which are costly and time-consuming—the system uses validated simulation models such as AMG and STICS to estimate changes in soil carbon stocks and nitrogen fluxes over time. Farmers and project developers must collect and report detailed management data, including crop rotations, fertiliser applications, and yields, which serve as inputs for model calculations. Independent third-party verifiers then review the data, model outputs, and project documentation before certification. Verification occurs at least twice: once at project validation (to confirm methodology and baseline assumptions) and again at the end of each crediting period, typically five years. This approach ensures consistency across regions while allowing site-specific parameters to reflect local conditions and management intensity.

Payment Structure

The payment system of the Label Bas-Carbone is primarily based on the sale of voluntary carbon credits to private or public buyers seeking to compensate or contribute to their greenhouse gas emissions. Farmers usually participate through intermediary organisations—such as cooperatives, technical institutes, or private project developers—that aggregate multiple farms into a single certified project. Credits are generally issued and paid ex post, after verification of results, although partial advance payments may be made based on progress milestones. The average price of an LBC carbon certificate is significantly higher, at €35/tCO_2, compared to an international voluntary carbon market average of approximately €6.5/tCO_2 ($6.5/$tCO_2$). For forestry projects, prices are largely determined by practice costs, while agricultural LBC prices (between €40-60/tCO_2) are more disconnected from their generally higher theoretical abatement costs (€55-250/tCO_2). Revenue distribution is negotiated contractually between the farmer and the project developer, with most funds directed to the implementing farmer. Some projects may also attract co-financing from regional governments or corporate sponsors, enhancing the financial viability of early adopters.

Advantages

It provides a scientifically robust and government-endorsed framework that gives credibility to domestic carbon projects and helps mobilise private investment toward climate-positive agriculture. By monetising environmental services, it creates a new income stream for farmers while encouraging adoption of sustainable practices that also improve soil fertility, water retention, and biodiversity. The label's integration into France's broader low-carbon strategy ensures alignment with national climate goals, while its methodological diversity allows adaptation to different production systems and regional contexts. The transparent governance structure and open publication of methodologies further enhance trust among participants and buyers. As a result, the LBC has become a model for linking agricultural innovation, climate policy, and rural economic development in a coherent national framework.

Disadvantages

The administrative complexity of project registration and verification can be burdensome, particularly for small farmers with limited technical support. The reliance on simulation models, while practical, introduces uncertainty and potential discrepancies between modelled and actual carbon changes. Questions around additionality and permanence remain contentious, as some practices rewarded under the label may already be common or may not guarantee long-term carbon storage. Furthermore, transaction and verification costs can consume a significant portion of total credit revenues, leaving modest net financial gains for individual farmers. Another weakness lies in the heterogeneity of project implementation and the limited harmonisation of methodologies across sectors, which can hinder comparability. Finally, the voluntary nature of the credit market means that demand and prices remain dependent on corporate interest and reputation-driven climate commitments rather than guaranteed public support.

Future Developments

Looking ahead, the Label Bas-Carbone is expected to evolve in response to the new CRCF and growing demand for transparent, high-quality carbon credits. The integration or mutual recognition between LBC and CRCF schemes would harmonise methodologies across Europe and facilitate participation in a broader, standardised carbon market. To achieve this, France will likely need to shift from ex-ante to ex-post certification for certain methodologies and strengthen requirements for permanence and traceability. Digitalisation and precision-agriculture data streams are also expected to enhance MRV efficiency, reducing costs and improving accuracy. In addition, efforts are underway to link LBC projects with emerging national and EU incentive programs for soil health and Carbon Farming, expanding both their scale and financial sustainability. Ultimately, the label's long-term relevance will depend on its ability to maintain scientific credibility, ensure fair returns for farmers, and align with European climate governance frameworks without losing its national flexibility and farmer-centred approach.

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5.3.3 Germany

5.3.3.1 MoorFutures

History and Background

Carbon Farming in Germany has developed through a distinct trajectory compared to its North-West European counterparts. Rather than a single national certification scheme, Germany's approach evolved through a mosaic of regional pilots, scientific initiatives, and private actors. As early as 2011, the *MoorFutures* programme demonstrated that avoided emissions from peatland rewetting could be translated into credible, high-quality carbon credits. Parallel to this, "humus-building" soil carbon projects and agroforestry pilots gained recognition, supported by research institutions, federal agencies, and non-governmental organisations. The federal governance structure and strong scientific oversight initially discouraged a centralised label, reflecting Germany's cautious stance on issues of additionality, permanence, and the scientific robustness of soil organic carbon measurement.

A decisive shift occurred with the CRCF adopted in 2024. In response, Germany launched a new national funding and governance framework. The 2026 federal budget allocated €111 million for negative emissions, including €98 million for project development and €11.5 million for direct purchases of certified removals, with long-term commitments extending to €320 million by 2033. New institutions, such as the Federal Ministry for the Environment's Department for Negative Emissions, have been established, while reforms to the Carbon Storage Act now enable CO_2 transport and offshore geological storage. Complementing these measures, the National Peatland Protection Strategy places peatland restoration at the heart of Germany's land-based mitigation agenda. Collectively, these initiatives mark Germany's transition from fragmented experimentation to a structured, CRCF-aligned scaling phase for Carbon Farming.

Eligible Measures

The ecosystem focuses on four primary mitigation pathways: Soil Organic Carbon (SOC) enhancement, agroforestry, biochar, and peatland rewetting. SOC projects are the foundation of the German approach, emphasising crop diversification, cover cropping, reduced tillage, the use of organic amendments, and permanent grassland preservation. These measures both sequester carbon and enhance soil fertility, drought resilience, and nutrient efficiency. Agroforestry systems—such as alley cropping, silvopastoral systems, and hedgerows—integrate woody biomass into cropland or pasture, providing additional carbon sinks and ecological services. Biochar represents a durable sequestration pathway, where biomass residues are converted via pyrolysis into stable carbon forms applied to soil, locking carbon for centuries while improving soil properties. Finally, peatland rewetting, pioneered by MoorFutures, addresses one of Germany's most significant land-based emission sources by restoring hydrology and halting peat oxidation..

Conditions and Principles

The Carbon Farming projects operate under a set of guiding principles emphasising environmental integrity, scientific transparency, and regulatory compliance. Projects must establish a conservative baseline that reflects realistic land management without intervention, followed by a project scenario that quantifies additional carbon sequestration or avoided emissions. Each activity must satisfy the CRCF's four quality pillars: additionality, long-term permanence, sustainability co-benefits, and ex-post verification. In practice, permanence risks are managed through conservative modelling, buffer reserves, and tonne-year accounting, while sustainability is ensured through biodiversity and soil health safeguards. Unlike France's centralised governance, Germany's model allows for regional and private standards to coexist, provided they adhere to CRCF-aligned methodologies. This pluralistic but regulated environment encourages innovation while ensuring scientific rigour. Importantly, the federal government's involvement through funding programmes and monitoring infrastructure guarantees alignment with national climate targets and the EU's Green Deal objectives.

Monitoring, Reporting and Verification

The German MRV system for Carbon Farming combines field-based measurements, process-based simulation models, and digital data streams to balance accuracy and cost-efficiency. In SOC projects, initial soil samples establish the baseline, complemented by models such as Roth-C, AMG, or STICS that simulate soil organic carbon dynamics under different management practices. Farmers provide detailed management data—including crop rotations, fertilisation, and tillage intensity—through digital platforms. Verification relies increasingly on remote sensing, satellite imagery, and AI-based monitoring tools, improving temporal resolution and transparency.

For agroforestry and biochar systems, MRV integrates both biomass tracking and carbon accounting. Biomass harvested from agroforestry systems is traced through pyrolysis plants, where feedstock origin, conversion efficiency, and biochar application rates are documented to ensure a verifiable carbon mass balance. Peatland projects, such as those certified under MoorFutures, rely on hydrological monitoring through water-level sensors, vegetation surveys, and established emission factors to quantify avoided emissions over 30–50 years. Together, these MRV practices enable Germany to move toward CRCF-compliant, high-integrity carbon accounting across multiple land-use sectors.

Payment Structure

The projects employ flexible payment models tailored to the diversity of practices and actors involved. Three principal systems coexist: action-based, result-based, and hybrid mechanisms. Action-based schemes provide annual per-hectare payments for adopting specific practices, commonly used in supply-chain insetting programmes financed by corporations. Result-based systems remunerate verified emission reductions or removals, typically expressed in tonnes of CO_2 equivalent, as seen in SOC and peatland projects. Hybrid models combine upfront transition support with performance-based bonuses once verified MRV results are available. Credit prices vary considerably depending on permanence, co-benefits, and MRV robustness. SOC credits generally range from €40 to €140 per tonne of CO_2, while biochar and peatland credits achieve higher prices due to their durability and traceability. Farmers or project developers typically receive 70–80% of the revenues, with the remainder covering verification, administration, and intermediary costs. Public co-financing and regional support schemes often complement private revenue streams, enhancing the economic feasibility for early adopters. This diversified payment architecture allows both smallholders and larger farms to participate, bridging environmental objectives with economic incentives.

Advantages

Germany's Carbon Farming model presents a series of notable advantages. The alignment with the European CRCF ensures international credibility and compliance with forthcoming EU-wide reporting standards such as the Corporate Sustainability Reporting Directive (CSRD). The strong scientific foundation and involvement of universities and research institutes underpin methodological rigor and trust. Additionally, projects deliver multiple co-benefits—improved biodiversity, enhanced soil structure, water retention, and nutrient cycling—that strengthen rural resilience beyond carbon sequestration alone. Federal and regional funding commitments provide policy stability and a clear long-term vision, while private actors such as tgo AG, Klim, and CarboCert inject innovation, digitalisation, and market access. The country's experience with MoorFutures demonstrates that regional, state-supported schemes can deliver durable credits with ecological credibility. Overall, Germany's pluralistic and evidence-driven approach allows for adaptive scaling and a strong link between science, policy, and practice.

Disadvantages

Despite the growing momentum, several challenges persist in Germany's Carbon Farming landscape. The lack of a single national label leads to fragmentation across regions and methodologies, complicating investor understanding and limiting economies of scale. The costs of soil sampling, verification, and MRV can be prohibitive, especially for small farms, and may erode the financial attractiveness of projects. Ensuring permanence in agricultural soils remains scientifically uncertain, as carbon gains can be reversed under changing management or climate conditions. Additionally, certificate prices often lag behind the true costs of implementation, creating a gap between climate ambition and economic reality. Coordination between federal and state authorities, while improving, still faces administrative complexity. Finally, as the CRCF imposes stricter requirements for ex-post certification, existing standards such as MoorFutures will need significant adaptation, potentially creating transitional uncertainty for project developers and buyers alike.

Future Development

The sector stands on the threshold of large-scale consolidation and integration with the CRCF. Over the coming years, the federal government aims to streamline methodologies across regions, develop a national Carbon Farming registry linked to the EU system, and enhance digital MRV infrastructure through partnerships with research institutions and technology providers. Companies like tgo AG will play a pivotal role in operationalising this transition by offering end-to-end value chains—from soil carbon measurement and agroforestry design to biochar production and third-party verification. Meanwhile, digital platforms such as Klim will continue lowering participation barriers for farmers, and CarboCert will advance the market for scientifically verified soil carbon credits. The future also points toward greater integration with public policies on soil health, biodiversity, and water protection, ensuring that Carbon Farming contributes to multiple sustainability goals. If these elements converge successfully, Germany could emerge as a European leader in high-integrity, science-based Carbon Farming—combining durable carbon removals with ecological restoration and resilient rural economies.

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5.3.4 Ireland

5.3.4.1 Peatland Finance Ireland

History and Background

Peatland Finance Ireland (PFI) commenced in May 2021 with a technical scoping project and was then established in 2022 as a not-for-profit limited company with the goal to create and manage a national and catchment scale financing system for peatland restoration in Ireland. PFI is supported by the National Parks and Wildlife Service of the Department of Housing, Local Government and Heritage, the European Investment Advisory Hub of the European Investment Bank, the Department of Agriculture, Food and the Marine, the Department of the Environment, Climate and Communications, and Amazon's Right Now Climate Fund. Peatland Finance Ireland aims to align the carbon, water and biodiversity agendas with opportunities for communities and regional development by engaging a range of stakeholders, including public bodies, NGOs, local communities, and businesses.

In March 2025, PFI developed and launched the Peatland Standard of Ireland, establishing a robust long-term framework to recognise the value of ecosystem services through verified and reportable ecosystem certificates. The Standard is designed to enable blended investment in voluntary peatland restoration and management projects. The Standard will certify ecosystem improvements in up to five broad categories for projects, namely Carbon, Water, Biodiversity, Community and Wildfire Impact and Risk Reduction to recognise multiple landscape restoration benefits. This reflects the unique mixed, scale, ownership, range, usage and aims for peatlands and their communities in Ireland. In 2025, the first pilot restoration project contract was signed for 200 hectares, and several more are actively moving through the private finance acquisition and contract discussion phase.

Eligible Measures

All peatland areas >50cm depth, in unfavourable condition and that can avail of the appropriate Peatland Standard methodologies will be eligible. This includes semi-natural raised and blanket bogs, peat grassland, historically cut over and extracted sites and appropriate forest to bog. Shallow areas >30cm depth may be included where they are actively eroding or a minority part (<10% or isolated pockets) of a wider deeper peat area and where there is an enhanced prospect of maintaining good hydrological conditions, for the wider catchment area of the project. Eligible peatland restoration and resilience activities are ground works, design, monitoring, and management activities to create and maintain appropriate hydrological and vegetation conditions to achieve ecosystem services improvements.

Conditions and Principles

The Standard follows international environmental and voluntary market principles to ensure compliance with global standards, accounting and reporting including the EU Carbon Removals & Carbon Farming Certification Framework (CRCF). Full list of principles at Peatland Standard for Ireland — Peatland Finance Ireland.

Following the Field Protocol, the locations and areas of baseline data or categories are identified. Emissions Reduction and Ecosystem Services Calculators predict and later quantify ecosystem improvements. A conservative approach to quantification is adopted and assumes that the baseline condition of the peatland would not have deteriorated further if the project had not occurred.

The Standard uses results-based methodologies to assess the impact from baseline to restoration including reference sites. The baseline ground survey includes peat depth, drainage or damage factors, vegetation and scorecard assessments and is combined with hydrological monitoring. Post restoration surveys allow modelling of ecosystem improvements. Pilot projects, reference sites and dynamic research will allow an increasing future use of proxies such as habitat scorecards for assessment.

Monitoring, Reporting and Verification

As habitats, locations and project resources vary greatly, some projects will only certify one or some of the potential ecosystem improvements. (A simplified field protocol version with lower cost quantifies GHG emission reduction, water retention, wildfire and carbon storage only.) In line with the EU Carbon Removal Certification Framework (CRCF), the certificates are based on 1 t CO_2 emission reduction and co-benefits. Metrics of biodiversity, water services, community, and wildfire reduction are listed in their relevant metrics both as a total and on a per landowner basis. These metrics are relevant to the EU Corporate Sustainability Reporting Directive (CSRD). Quantification for emissions reduction and volumetric water benefit for most sites is site-specific, primarily based on water level change from baseline to restoration, rather than one-size-fits-all emission factors. Project validation and verification of ecosystem improvements will be undertaken by an independent third party working to ISO standards. The Standard will work towards accreditation with ICROA.

Payment Structure

Only verified certificates can be sold or used (retired). Landowners may enter a contract with an investor or end user for the supply of a specified percentage for a specified period of verified certificates achieved in return for a fee to cover elements of capital, MRV, maintenance and management. Investors and end users are publicly listed on the registry along with their net zero, water and biodiversity stewardship strategies and actions. For farmers this is results based with the higher performance of the maintenance and restoration achievements resulting in higher income from their % share of the certificates verified which are then purchased by the end user. PFI's role as an organisation is to secure investment via private/public/blended finance to fund restoration projects and provide landowner income, via contracts with landowners, and project liaison between funders, landowners and other project partners.

Advantages

Certificates are based on results achieved, not the actions to produce intended results. Post restoration management and innovation are key to achieving results. Quantification for emissions reduction and volumetric water benefit for most sites is site specific, primarily based on the water level model for GHG, rather than a one size fits all emission factor. The PS is aligned with the EU CRCF and the international carbon protocols. Shallow peat sites can be quantified for non-carbon ecosystem services.

Disadvantages

In line with the CRCF temporary emissions reductions for shallow peat sites are not included. There is debate over the definition of permanence in emission reductions. 100 years is taken as a common approach, so peat exhaustion time is relevant. Shallow peats could be restored, then decline and any reductions could be lost within the 100-year timeframe. The EU CRCF considered temporary emissions reductions projects for shallow peat but has not included this yet (Jan 2025). The Peatland Standard is only in the pilot phase and some metrics may be amended as a high volume of Irish peatland research is due to be reported over the next few years.

5.3.4.1 ACRES

History and Background

ACRES (Agri-Climate Rural Environment Scheme) is Ireland's agri-environment climate scheme under Ireland's CAP Strategic Plan. The scheme is funded by the European Union in partnership with the Irish Department of Agriculture, Food and the Marine (DAFM) and is designed to help address biodiversity decline on farmland habitats while delivering income support for up to 50,000 farm families in Ireland. The Low Input Peat Grassland (LIGP) (2023) scorecard is one of ten specialised assessment tools (2025) developed as part of this scheme to reward and incentivise ecosystem services delivered by different farmland habitats. The scorecards were derived from those developed under the Hen Harrier and Pearl Mussel EIPs. The LIGP scorecard addresses agricultural practices that directly impact peatland conservation and carbon storage, both within the field and within adjacent areas of raised bog and cutover bog habitats. The scheme pays income support for low-intensity agricultural practices in these grasslands to support peatland hydrology, biodiversity conservation, and maintaining carbon storage in the peat.

Eligible Measures

The LIGP scorecards pay higher rates for environmentally-friendly management based on the following key management areas:

- Ecological Integrity: Management to promote positive wetland indicator species including wetland species such as Yellow Flag Iris, Meadowsweet, Devil's Bit Scabious, Marsh Marigold, Purple Loosestrife, Sharp-flowered Rush, and various wetland mosses
- Vegetation Structure: Maintaining diverse sward heights through appropriate grazing pressure, including short, medium, and tall vegetation throughout the field to support biodiversity
- Hydrological Integrity: Management of artificial drainage systems to maintain high water tables, including blocking or allowing natural infilling of drains to support avoided carbon emissions and create wetland conditions
- Low Input Management: Restricting chemical fertiliser application, avoiding reseeding, and maintaining semi-natural grassland characteristics
- Minimising Negative Indicators: Controlling agricultural weeds including docks, thistles, nettles, and perennial rye-grass

Conditions and Principles

Core Management Principles:

- Eligible Land: Any forage, Low Input Permanent Pasture (LIPP), or Traditional Hay Meadow parcel designated as peatland which is on the Basic Income Support for Sustainability Scheme
- Drainage Management: Drains should be non-functional or predominantly non-functional, with water levels ideally less than 30cm below the drain surface, supporting wetland conditions and carbon storage
- Species Cover: A minimum 20% combined cover of positive indicator species is targeted, with high-quality sites achieving 20-30% cover
- Wetland Species: The objective is to achieve greater than 20% cover of wetland indicator species across the sward
- Grazing Pressure: Appropriate grazing intensity must be maintained to create structural diversity - avoiding both overgrazing (75% short vegetation) and undergrazing (rush dominance above 70%)
- Damage Prevention: Measures must be implemented to minimise poaching, supplementary feeding damage, and other damaging activities, particularly around water sources, gates, and feeders

Monitoring, Reporting and Verification

ACRES employs a comprehensive results-based monitoring system and uses the LIGP scorecard to assess peat grasslands:

- Field Assessment: Trained farm advisors conduct field walks using a standardised qualitative scorecard methodology following a W-pattern to ensure representative coverage
- Digital Recording: Assessments are recorded using the AgriSnap mobile application or GLAM system, with photographic documentation of field conditions and any issues identified (such as e.g. deep drainage)
- Scorecard Components: Assessments cover Ecological Integrity (positive and negative indicators, vegetation structure), Hydrological Integrity (drainage functionality, water table depth), and Threats & Future Prospects (damaging activities, invasive species). Hydrological integrity, which is a proxy for avoided carbon emissions and carbon storage, accounts for 50% of the total score and hence payment received by the farmer
- Verification Process: Individual field scores are available through the GLAM mapping system once scorecards are submitted and verified by DAFM
- Advisor Requirements: Advisors carry out pre-assessment desk studies using aerial photography, prepare walking routes, and also provide detailed management advice to farmers following field visits
- Non-Productive Investments: Based on the assessment findings, advisors can recommend targeted NPIs for habitat protection, enhancement measures, and infrastructure improvements to address identified threats and improve scores

Payment Structure

The LIGP scorecards represent a results-based payment model for peat grasslands within the ACRES framework:

- Results-Based Approach: Payment levels are directly linked to the field score achieved, incentivising improved management outcomes rather than prescriptive activities
- Score Calculation: Field scores are calculated based on the weighted assessment of ecological integrity, hydrological integrity, and threats/pressures sections of the scorecard with 50% of the total assigned to hydrological integrity
- Performance Tiers: Higher scores reflecting better environmental outcomes receive proportionally higher payments per hectare
- Additional Funding: Farmers may receive additional support through Non-Productive Investment funding for infrastructure and enhancement measures identified during assessments
- EU Co-Financing: The program is funded by the European Union in partnership with the Irish Department of Agriculture, Food and the Marine

Advantages

- Environmental Benefits: Supports avoided carbon emissions and carbon storage in peatland soils by promoting high water tables needed to conserve peat and protect adjacent peatland habitats
- Biodiversity Conservation: The focus is on promoting species-rich semi-natural grasslands to support wetland species diversity and habitat for ground-nesting birds, small mammals, and rare invertebrates including the Marsh Fritillary butterfly
- Flexibility: The results-based approach allows farmers to adapt management practices to site-specific conditions while achieving environmental objectives
- Water Quality: Reduced fertiliser inputs and wetland conditions reduce release of nitrates so helping to achieve improved water quality and natural filtration
- Climate Action: Supports Ireland's climate commitments through peatland conservation and reduced greenhouse gas emissions from wet grasslands
- Economic Viability: Provides financial support for less intensive farming systems, compensating for the reduced agricultural productivity that these measures result in while maintaining farm income levels
- Knowledge Transfer: Regular advisor visits facilitate learning and best practice sharing, building farmer capacity in environmental management

Disadvantages

- Low-input management and wet conditions limit stocking rates and the number of grazing days and forage production so reducing productivity compared to improved grasslands. Maintaining wetland conditions while preventing excessive rush dominance (above 70% cover) is also challenging.
- Achieving optimal sward structure and species balance requires careful grazing management and ongoing monitoring, demanding higher management skill and effort. It is also difficult to achieve high scores for fields that were previously intensively managed and drained so are more suited to marginal grazing lands with lower carbon emissions.
- Participation requires detailed field assessments, scorecard completion, and compliance with scheme deadlines, creating an administrative burden while participation in the Scheme requires multi-year commitments, so limiting land use flexibility.
- Another drawback is that the LIGP scorecards promote a single management approach of reducing the management intensity of these grasslands. This reduces farmer options and choices like those proposed and developed by the Farm Carbon EIP (2025):
  - a graduated approach to increasing water table level
  - a new ‘win-win’ agricultural practice like Paludiculture
  - opportunities for cutover peatlands which form part of many peatland farm holdings.
- In particular, this one-track approach will not suit more intensive dairy and beef farmers.
- Lastly, assessment of drainage is qualitative only and does not give precise estimates of water level which is critical for determining the level of greenhouse gas emissions from drained peat fields.

5.3.5 The Netherlands

5.3.5.1 Go2Positive

History and Background

Go2Positive is a farmer-led Carbon Farming initiative developed by ZLTO (Southern Agriculture and Horticulture Organisation) within the framework of the Interreg North Sea Region Carbon Farming project. The concept originated in 2019, a period when no officially certified carbon methodologies were yet available in the Netherlands. To address this gap, ZLTO created its own practical and scientifically substantiated methodology for quantifying and rewarding soil carbon sequestration. This methodology was based on research from Wageningen University & Research (WUR) and the Louis Bolk Institute, and included clear guidelines on calculating sequestration, defining additionality, verifying results through soil samples, and managing project risk and payment structures.

The first partnerships were established in 2019 with Zeeuwind, a cooperative operating solar and wind farms in Zeeland, and later with Deltawind, another renewable energy cooperative. Both organisations committed to purchasing carbon certificates generated by local farmers to offset their own emissions. Together, they initiated projects targeting an annual sequestration of 525 tonnes of CO_2 over at least five years, involving 15 farmers located near Windpark Krammer — a large wind farm jointly operated by Zeeuwind and Deltawind. The agreed carbon price was €140 per tonne of CO_2, of which €100 was allocated to farmers and €40 to cover support services such as soil sampling, monitoring, and reporting. Within the farmer share, €70 was paid annually for effort, and €30 after verification of results at project completion, resulting in a hybrid payment model combining effort- and result-based incentives.

Following this successful pilot, Go2Positive was formally launched in 2020. The initiative quickly attracted additional buyers such as DKG Group (in 2021) and Sivomatic (in 2022), each supporting new Carbon Farming projects near their facilities. By 2025, Go2Positive had grown to include around 40 participating farmers and 13 certificate buyers, demonstrating that regional, farmer-led carbon markets can mobilise both local climate action and private-sector participation.

Eligible Measures

Go2Positive focuses on practical, field-level measures that enhance soil organic carbon content while maintaining or improving agricultural productivity. Participating farmers develop a carbon sequestration plan for each plot using WUR's carbon calculator, which models the potential carbon storage based on management practices and soil data. Measures typically include extending crop rotations, adding green manures or cover crops, reducing soil disturbance, incorporating crop residues, and applying compost or organic fertilisers. Each plan covers a minimum of five years, during which farmers can adapt their management as needed. The carbon calculator takes into account local soil characteristics such as organic matter and clay content, ensuring site-specific estimates. The focus is on incremental soil carbon gains achieved through improved management rather than land-use change, making the scheme especially suitable for arable and mixed farms typical of the Zeeland region.

Conditions and Principles

Participation in Go2Positive is based on a set of clear, farmer-oriented principles. Each farmer's carbon plan outlines the expected sequestration potential over at least five years, verified by baseline soil sampling at project start and measured again upon completion. The additionality criterion is flexible, allowing both pioneering and conventional farmers to join — although those already implementing regenerative practices earn fewer credits. This inclusivity ensures that early adopters are not excluded from participation. ZLTO manages the methodology, farmer support, and monitoring, ensuring scientific consistency and transparency. Carbon certificates are calculated based on modelled sequestration verified by field-level monitoring and final soil analyses. Farmers retain full control over their management choices, and the methodology allows annual updates to the carbon plan in case of crop or practice changes, ensuring adaptability and continued relevance.

Monitoring, Reporting and Verification

Go2Positive employs a hybrid MRV system combining model-based estimation with physical verification. Each year, ZLTO checks whether farmers have implemented their planned practices, updating the carbon calculator accordingly. The resulting adjusted sequestration estimates are used to issue preliminary certificates and guide annual payments. Final verification occurs through soil sampling at the beginning and end of the project period, following the standards set by the National Carbon Market Foundation (Stichting Nationale Koolstofmarkt, SNK). The methodology requires that at least 50% of the modelled sequestration be confirmed through sampling for the full payment to be issued. This two-step verification structure ensures that real, measurable results are achieved while maintaining flexibility for farmers.

Although ZLTO's methodology is not yet officially certified under SNK or EU standards, it aligns closely with the 2023 SNK methodology for mineral soils, which itself draws on WUR's carbon calculator. ZLTO continues to refine its MRV approach in collaboration with research institutions to balance scientific rigour with practical feasibility.

Payment Structure

Payments within Go2Positive follow a hybrid model that combines effort-based and result-based components. Farmers receive €100 per tonne of CO_2 sequestered, paid in two stages: 70% annually, based on monitoring of implemented practices, and 30% at project completion, contingent on verification through soil sampling. This structure provides farmers with regular income stability during the project while maintaining accountability for final results. Buyers, typically local companies such as wind energy cooperatives and manufacturing firms, purchase the generated carbon certificates to offset their regional emissions. The payment price was established collectively by farmers and buyers during the first project phase, ensuring fairness and transparency. The model also supports the broader regional economy by linking local emission sources with local sequestration efforts, thus promoting a circular, place-based climate strategy.

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Advantages

Go2Positive offers several key advantages that make it both practically viable and socially embedded. Its methodology was designed by farmers for farmers, ensuring alignment with real-world agricultural practices. The system's flexibility — particularly the ability to adjust carbon plans annually — makes it compatible with the dynamic nature of arable farming, where rotations and market conditions frequently change. This adaptability has proven crucial to farmer engagement and long-term commitment. The initiative also strengthens regional collaboration between agriculture and renewable energy sectors, linking farmers directly with local buyers who share climate goals. The hybrid payment system provides predictable income flows, reducing the financial risk of participation. Furthermore, by basing verification on measurable soil carbon increases, Go2Positive ensures that environmental integrity is maintained even in a non-certified context. The early results from participating farms show higher-than-expected carbon gains, suggesting that farmers are often exceeding their initial commitments.

Disadvantages

Despite its success, Go2Positive faces certain limitations. The primary drawback is that its methodology is not yet independently certified, which limits its recognition on international carbon markets and can make it harder to attract new buyers. As a result, the initiative currently relies on regional partnerships rather than broader market mechanisms. Moreover, while flexibility is a major strength, it also introduces uncertainty in carbon accounting, as annual recalculations may complicate long-term verification. The reliance on soil sampling at the end of multi-year projects delays the final confirmation of sequestration outcomes, which can challenge investor confidence. Finally, additionality requirements — particularly those defined in the newer SNK methodology — remain a contentious issue, as they can discourage innovative farmers who already apply sustainable practices. Balancing credibility with inclusivity thus remains an ongoing challenge for Go2Positive.

Future Development

Looking ahead, ZLTO is actively working with the National Carbon Market Foundation (SNK) and the Louis Bolk Institute to make carbon methodologies more compatible with farming realities. Based on pilot experiences with over 80 farmers, ZLTO has recommended the adoption of standardised baselines and more flexible project durations, rather than the rigid 10-year requirement currently prescribed by SNK. The goal is to align the methodology with both practical agricultural management and the forthcoming EU Carbon Removal Certification Framework (CRCF). Until an improved SNK methodology becomes available, ZLTO continues to apply its own adjusted version, maintaining a minimum 5-year project duration and annual recalculation of carbon plans. Future iterations of Go2Positive aim to expand the range of eligible measures to include agroforestry, hedgerows, and other landscape features that contribute to both carbon storage and biodiversity.

In the long term, ZLTO envisions an integrated approach that combines carbon sequestration with broader ecosystem services, such as soil health, water retention, and biodiversity enhancement. The organisation also promotes the concept of insetting — enabling farmers and supply chain actors to account for emission reductions within their own production systems.

5.3.5.1 Valuta voor Veen

History and Background

Valuta voor Veen ("Currency for Peatland") is the Dutch flagship carbon credit initiative for peatland rewetting and emission reduction. Developed as a collaborative effort between provincial authorities, water boards, and nature organisations, it represents one of the most mature examples of a result-based climate programme in Dutch agriculture. The project emerged as part of the broader Dutch Climate Agreement (Klimaatakkoord), which identified peat oxidation in drained agricultural areas as a major national source of greenhouse gas emissions. Drained peat soils in the Netherlands emit approximately six megatonnes of CO_2-equivalents annually — roughly 3% of national emissions — largely due to oxidation from low groundwater tables maintained for dairy farming.

Valuta voor Veen was established to demonstrate that raising groundwater levels, even partially, can drastically reduce CO_2 emissions while maintaining the agricultural use and economic value of peatlands. Through this scheme, farmers and land managers receive carbon credits for verified emission reductions, which can be sold on voluntary carbon markets. The initiative thus links climate mitigation directly with local water management, land-use planning, and agricultural transition strategies.

Eligible Measures

Participating landowners implement measures designed to raise and stabilise the groundwater table on drained peat soils. The core practices include elevating ditch water levels, preventing seasonal drawdown, and using pump-driven infiltration systems to maintain moisture in the root zone. These measures are implemented under formal agreements with the regional water board, ensuring hydrological coordination across landscapes.

Valuta voor Veen accommodates three distinct land-use categories:

- Conventional agricultural grasslands where pasture functions are maintained
- Hybrid systems integrating wetland crops such as reed or cattail (paludiculture)
- Areas transitioning toward nature restoration.

Each category has specific rules for additionality, ensuring that only emission reductions beyond standard management practices are credited. By offering this flexibility, the programme allows both farmers and conservation organisations to participate under tailored conditions.

Conditions and Principles

The scheme operates on a result-based framework grounded in verifiable emission reductions. Each project defines a baseline corresponding to the current or reference groundwater level, representing the "business-as-usual" condition under existing drainage management. Carbon credits can only be issued for measurable increases above this baseline. Project duration depends on land use: at least ten years for agricultural areas, and up to fifty years for natural or semi-natural areas. Emission factors are derived from scientific datasets that link groundwater depth to annual CO_2 release from peat oxidation. The emission reduction for each site is calculated as the difference between baseline and post-measurement CO_2 fluxes, expressed in tonnes of CO_2-equivalents. All assumptions and calculations are documented and validated by the project team, ensuring methodological transparency and scientific credibility.

Monitoring, Reporting and Verification

Monitoring focuses primarily on groundwater level measurements, which serve as a reliable proxy for CO_2 emissions in drained peat soils. Each site is equipped with water-level sensors or manual monitoring wells that record fluctuations throughout the year. Data from participating plots are compared with reference or control sites to isolate the impact of management changes. Where groundwater levels exceed the soil surface, visual inspections are conducted to verify inundation and assess vegetation dynamics. For nature-oriented areas, additional monitoring of carbon sequestration in biomass (e.g., sedges, reeds) complements the emission-avoidance data. The project's MRV framework thus combines direct hydrological monitoring with ecological assessment, ensuring both accuracy and environmental integrity. Annual reporting consolidates all measurements, which form the basis for credit issuance after third-party verification.

Payment Structure

Valuta voor Veen applies a result-based payment model directly tied to verified emission reductions. Participants receive annual compensation based on the number of tonnes of CO_2-equivalent avoided, with credit prices typically ranging between €70 and €100 per tonne. Revenues are distributed after verification of the yearly monitoring results. This approach provides both financial incentives for sustainable water management and a market signal for high-quality, measurable climate benefits. The result-based model encourages long-term commitment, as stable high groundwater levels yield consistent credits over time. It also creates a pathway for private-sector engagement, where companies can purchase certified credits to offset emissions or meet corporate climate goals, thereby integrating agricultural mitigation into broader climate finance systems.

Advantages

Valuta voor Veen offers several compelling advantages. It provides a scientifically robust and transparent mechanism for quantifying and rewarding avoided CO_2 emissions, grounded in empirical relationships between groundwater depth and peat oxidation. The scheme demonstrates how climate policy, water management, and agriculture can be effectively integrated, aligning the goals of carbon reduction with flood resilience, biodiversity, and sustainable land use. Farmers benefit from financial compensation while maintaining productive pastures or transitioning gradually toward wetter, low-emission systems.

Moreover, the project's close collaboration with regional water boards ensures coordinated hydrological management across entire peatland landscapes, avoiding isolated or counterproductive measures. Its flexibility across land-use categories — from dairy pastures to nature reserves — enhances inclusivity and scalability. Finally, Valuta voor Veen contributes to the voluntary carbon market's credibility, as its emission calculations and monitoring are scientifically verified and regionally contextualised.

Disadvantages

Despite its innovative design, Valuta voor Veen also faces important limitations. The scheme's dependence on continuous water-level monitoring introduces technical and administrative complexity, particularly for small landholders without digital infrastructure. Raising groundwater tables may conflict with existing agricultural drainage systems, potentially reducing pasture productivity or machinery access, which can limit farmer participation. The high cost of implementation — including hydrological engineering, monitoring equipment, and verification — can also constrain scalability, especially in fragmented landscapes.

Moreover, because credits are issued ex post based on measured results, there is a delay in revenue generation, which can discourage early adopters. Finally, the system's reliance on voluntary carbon markets exposes it to price volatility and uncertain long-term demand, posing financial risks for both project developers and farmers. Ensuring durable policy support and integration with the EU's Carbon Removal Certification Framework (CRCF) will be key to addressing these challenges.

Future Development

Looking forward, Valuta voor Veen is expected to play a central role in the Netherlands' national peatland emission reduction strategy, contributing directly to the 2030 climate targets. Efforts are underway to align the methodology with the EU CRCF, which will enhance transparency and facilitate international recognition of its credits. Expansion to additional provinces and integration with wetland crop (paludiculture) production chains will strengthen both economic and ecological sustainability.

The initiative also serves as a model for result-based peatland restoration across Europe, illustrating how measurable hydrological improvements can generate high-integrity carbon removals. Continued investment in digital MRV, water management innovation, and long-term contracts between farmers and water boards will be essential to consolidate its success and scale its impact across the Dutch peat landscape

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6. Call to action

To accelerate the impact of Carbon Farming, policymakers and advisors play a central role in creating an enabling environment. Based on this report's findings, the following actions are recommended to support high-quality carbon markets and drive measurable emission reductions across European agriculture:

1. Policymakers and governments should provide clear policies and incentives to encourage Carbon Farming practices. This includes subsidies, tax benefits, and integration into national and regional climate strategies, aligned with EU frameworks like the CRCF, ensuring long-term stability for farmers and investors.
2. Agricultural advisors and knowledge centres should offer training, guidance, and resources to help farmers adopt and maintain carbon sequestration practices effectively. Peer-learning platforms and collaboration with scientists, advisors, and local stakeholders can improve adoption and tailor solutions to regional contexts.
3. Governments and financial institutions should develop accessible financing options to cover initial implementation costs and bridge the gap until carbon credit revenues are realised. This makes early adoption more attractive, particularly for smallholders.
4. Certification bodies and regulatory authorities should implement standardised methodologies and certification processes to ensure consistency, credibility, and market confidence. This includes robust Monitoring, Reporting, and Verification (MRV) systems to track, report, and independently verify carbon removals accurately. Accurate measurement is essential to maintain trust and market credibility.
5. Market actors and project developers should facilitate platforms for buyers and sellers to interact, enhancing liquidity, price discovery, and transparency. Aggregation models, such as cooperatives or project developers, can enable smaller landholders to participate and scale impact.

These measures can unlock the full potential of Carbon Farming as a climate solution, empower farmers to access credible carbon markets, and support Europe in reaching its climate and biodiversity targets.

For further guidance, please consult the project website and the projects' policy report.

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7. Conclusion

The voluntary Carbon Farming market in Europe is poised for significant growth, driven by evolving EU regulatory frameworks and increasing demand from businesses aiming to meet sustainability commitments. Growing awareness of climate change is stimulating innovation and interest among stakeholders, but long-term success depends on aligning market expansion with credible standards and regulatory clarity.

Engaging farmers remains a critical hurdle, requiring clear incentives and accessible guidance to encourage adoption of Carbon Farming practices. Standardised methodologies and certification are essential to build trust and credibility in the market. Financial support and technical assistance must be strengthened, particularly to overcome initial barriers faced by smallholders.

Robust governance, transparent market platforms, and reliable Monitoring, Reporting, and Verification (MRV) systems are crucial to ensure market integrity and scale impact. Collaboration between policymakers, industry actors, and the farming community is needed to fully realise the climate and biodiversity potential of Carbon Farming. With coordinated action and continued support, Carbon Farming can become a cornerstone of Europe's transition to climate neutrality.

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