CARBON FARMING SCHEME

LIFE Preparatory Project

Review of risk assessment and policy aspects for best practices

LIFE19 PRE FI001 – SI2.828588
The Life Carbon Farming project has received funding from the LIFE Programme of the European Union

LIFE CarbonFarmingScheme

Expanding carbon sequestration activities by providing best practices and guidance for future farming schemes

The goal of the project is to identify and accelerate the development and adoption of novel incentives for carbon sequestration and the increase and maintenance of the organic carbon stock in soil and biomass in Europe. With the aim of promoting a well-functioning voluntary carbon market the project will uncover the key factors in supply and demand measures to invite the private sector to accelerate climate action. The results of the project will be fed into the development of the EU agricultural and climate policies.

Read more: www.st1.com/st1-life

Coordinator: **Partners:**

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Definitions

Carbon farming and carbon forestry
Nature-based practices performed in agriculture or forestry in order to sequester greenhouse gases from the atmosphere.

CAP
Common Agricultural Policy

Compliance carbon market
System where a company can use carbon credits as a mechanism that contributes to reaching legally binding climate targets

CRC
Carbon removal credit. A credit covering one ton of CO_2e removed from the atmosphere and stored.

GHG
Greenhouse Gas

EU ETS
European Union Emission Trading System

LIFE
EU funding instrument for the environment and climate action

LULUCF
Land Use, Land Use Change and Forestry

MRV
Monitoring, Reporting and Verification

Voluntary carbon market
Market where parties such as companies and private persons can voluntarily offset their emissions by buying carbon credits. In a voluntary market, carbon credits cannot be used to fulfil legally binding climate targets.

1. Introduction

The motive behind the LIFE Carbon Farming Scheme Project is, above-all, the mitigation of climate change and to create new practical mechanisms to reach negative carbon-emission cycle. The project identifies and accelerates the development and adoption of novel incentives for carbon sequestration and the increase and maintenance of the organic carbon stock in soil and biomass in Europe.

This report is part of the LIFE CarbonFarmingScheme project. It is based on the project's studies and current policy developments in carbon farming, forestry and carbon removals in the European Union. The project analyses legal, policy and governance barriers and risks for implementing an innovative incentive scheme for carbon farming and forestry. The project studies the scheme model where farmers and foresters are financially encouraged to broadly adopt climate-friendly actions partly financed by the demand from companies to fulfil their GHG obligations by carbon sequestration.

2. Addressing the risks for building the innovative carbon farming scheme

The purpose of this risk assessment is to provide a big picture view of the policy and regulatory framework at the EU, Member State and regional levels to support policy, regulation and legal work to enable innovation and management of carbon farming scheme building for the European market. Most importantly, this assessment integrates the risk assessment work of the whole carbon farming and forestry value chain.

The project contributes this assessment work to ease the dialogue between regulators, policymakers, farmers, and foresters for sustainable carbon farming and forestry business development, and to better understand carbon farming and forestry for stakeholders across the whole value chain, business and industry associations for cross-sectional dialogue. This work also promotes the awareness of the legal and policy framework of carbon farming and forestry and its complexity.

2.1. Strategy and coordination - The policy implementation and compliance assessment approach

The strategy and coordination perspective in this context aims to support the dialogue around sustainable development by providing questions to be raised and views at the policy level that the LIFE CarbonFarmingScheme project has identified.

The international climate and sustainable commitments and agreements provide a powerful context for the policy framework. The carbon removal credits are recognized as a climate mitigation tool in the Paris Agreement on Climate Change. New innovative sustainable business models also take their cues from the internationally ratified 2030 Agenda for the Sustainable Development and its Sustainable Development Goals.

LIFE Carbon Farming Scheme attaches itself to various initiatives at the EU level. The raised climate target has fostered several policy processes in the EU. The European Green Deal aims to form an umbrella to connect all sectoral policies towards a common target. Under the Green Deal umbrella, the following initiatives influence and enable nature-based carbon

sequestration to form sustainable business for farmers and foresters:

- The New EU Forest strategy and The EU's biodiversity strategy for 2030 will draw the use of land and forest in the EU.
- The Circular Economy Action Plan - the Commission will develop a regulatory framework for certifying carbon removals based on robust and transparent carbon accounting to monitor and verify the authenticity of carbon removals.
- Farm to Fork strategy includes the Carbon farming initiative.
- The Common Agricultural Policy also gives a unique perspective for carbon farming, and its significant role should be recognized both in the use of natural resources and in the budget expenditures in agriculture.

The Member States also strongly influence the development of national strategies to mitigate greenhouse gas emissions and adapt to climate change, such as the agriculture strategy plans (CAP eco-schemes) and forest policies to fulfil LULUCF national inventory level with the support of national state aid incentives impact the development of the carbon farming scheme.

The voluntary carbon markets have a role in policy development. The market players' best practices, pilot schemes and governance examples give experience and models to adapt.

2.2. Regulation - The legal and regulatory risk assessment approach

The regulatory perspective in this context aims at contributing to the complexity of the legal framework to support entities' dialogue around sustainable development by providing assessment of the EU and national legislation the LIFE CarbonFarmingScheme project has identified.

Carbon sequestration can have a significant role in the EU climate policy, and in the new, more ambitious target agreed in the Climate Law trialogues. The potential amount of the needed carbon removal is an estimated 225 Mt of CO_2. The greatest challenge when building a carbon farming scheme is understanding how the carbon removals will communicate with the Land use, land-use change & forestry (LULUCF) sectors, the national inventory and the definition of carbon removals; how will LULUCF revision set accounting measures for emission removals from carbon farming and forestry. The Fit for 55 EU climate legislation package, which was published on 14 July 2021, set the climate target plan of 55 % net reduction target of CO_2 emissions.

The Commission is preparing a proposal for regulation for Certification of carbon removals by 2022, which should include, in our view, the EU regulation/standard and criteria for carbon removals and scheme governance. The new business opportunities of carbon removals and

possible co-benefits of carbon farming and forestry should also comply with an evaluation of environmental impact, e.g., biodiversity and social criteria for do-no-harm Due Diligence and context-specific risks and saliency analysis. The new EU Mandatory Human Rights and Environmental Due Diligence Directive lays down rules to ensure companies carry out effective due diligence concerning potential and actual impacts on human rights, the environment, and good governance in companies' operations and business relationships.

The business financing model has involved great discussions wherein financial legislation over traditional public state aid rules are under evaluation. The Common Agriculture Policy period legal framework has been agreed, and CAP strategic plans are being implemented in all EU countries from 1 January 2023. A common classification system for sustainable activities, 'EU taxonomy', has been recently published to guide investments and activities in the Union.

Carbon removals usage depends on demand from the voluntary carbon market. In the LIFE CarbonFarmingScheme project, we have evaluated the market and strongly argue on behalf of the compliance markets. The project has built a case example – CRCs in transport sector[1].

The certificate system itself needs to adopt legislation for governance for its tasks and avoid fraud, money laundering, financial sector legislation for trading.

The LIFE CarbonFarmingScheme project has evaluated the Common Agricultural Policy[2] and socio-economic impact regulation[3] in depth for a more profound knowledge of the possibilities of building a sustainable business involving carbon farming and forestry.

2.3. Tools and Instruments for the scheme development - The scheme governance risk and compliance assessment approach

The scheme level in this context aims to contribute a more practical and technical understanding of carbon farming and forestry to support entities' dialogue LIFE CarbonFarmingScheme project has identified.

The assessment has gathered information from the study by the Commission titled "Technical Guidance Handbook – setting up and implementing result-based carbon farming mechanisms in the EU" (Technical Guidance Handbook). This has been carefully analyzed and referred to. The work includes input from LIFE CarbonFarmingScheme project's actions and deliverables, which has been referred to in a relevant way and through shared knowledge from voluntary market schemes to understand the scheme's development needs.

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[1] Read the case example Carbon Farming Scheme. 2021. Chapter 6.2.
[2] Carbon Farming Scheme. 2021. Chapter 5.
[3] Carbon Farming Scheme. 2021. Chapter 7.2 and 7.3.

3. Initial screening for aspects to built carbon farming scheme

The project has undertaken an initial screening of policy, regulation and governance aspects with the following starting position;

- Carbon sequestration will be looked at as result-based actions where the farmers and foresters are rewarded from carbon sinks[4]. The scheme is European-wide, having EU regulation/standards and sustainability criteria for different nature-based carbon sequestration methodologies.
- Carbon farming and forestry would be a sustainable business for foresters and farmers instead of, or alongside, food production, where farmers and foresters could sell carbon removal certificates.
- CRC demand is viewed from two different aspects, e. g., the voluntary market demand and visualizing the idea of the European compliance market where the demand comes from sectors obligated to reduce emissions.

The project has initiated the format of understanding carbon farming and forestry, and how to carry out good sustainable business by viewing and analyzing the value chain of carbon sequestration standard in the voluntary market, understanding different actors and actions in the whole value chain, and viewing other actors' responsibilities and rights, and legal and scheme level linkage between various parties. Also, the value chain approach provides understanding for a business model, the costs of different actions and different revenue sharing models in the innovative business opportunities.

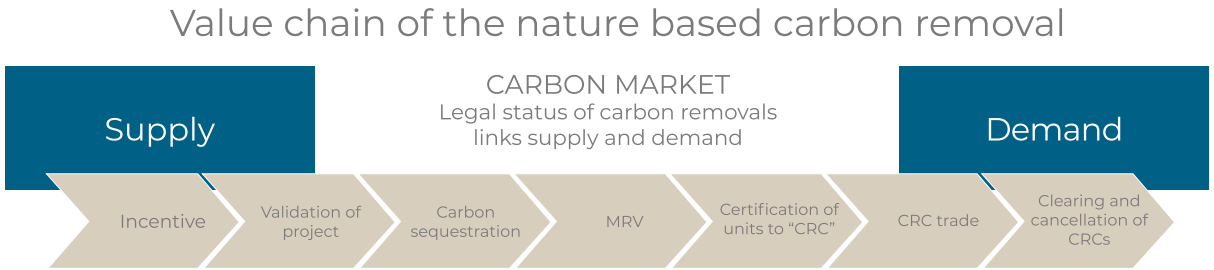

Figure 1. Value chain of nature-based carbon removals

[4] A scheme where a farmer or landowner receives payment for reducing net GHG fluxes from their land, whether by reducing their GHG emissions or by sequestering and storing carbon. A result-based approach requires a direct and explicit link between the results delivered (e.g. GHG emissions avoided or carbon sequestered) and the land manager's payments. It differs from the more familiar action-based schemes, where the farmer is paid for complying with very specific farming practices or technologies, which have been selected by the managing authority for the assumed climate mitigation benefits." (Technical Guidance Handbook p. 11)

3.1. Carbon Farming and forestry value chain - Action and Actors

We need to look at the carbon removals value chain closer to understand 1) how to incentivise scaling carbon sequestration actions across the EU and also 2) to understand costs and incomes in a business model where individual farmers / foresters could participate in the carbon markets.

LANDOWNER
Strategy and coordination
• Addressing the landowners' (here: forest and farm owners) role in the policy to onboard them to carbon sequestration actions. • Carbon farming and forestry is the long-term easement for farmer or forester where the term is dependent on the project lifetime and permanence criteria. The owner will choose the land-use action depending on the expected return of the action. • Transferring land ownership to non-commercial entities may lower the non-permanence risk in some instances.[5]
Regulation and rules
• Member states' national laws and registries regulate land ownership. National registries are well-functioning systems providing reliable and public information about land ownership. • Long-term contracts bind landowners to commit to the project throughout its lifetime, and it increases the permanence management if the project's longevity can be considered in the contracts.[6] • Some national jurisdictions recognize permanent restrictions on future land use. Moor Futures carbon farming scheme recommends using an entry in the Land Register that operates in Germany.[7] • Risks of fraud and non-compliance of landowners can be managed with contracts and governance. • The scheme needs to ensure sustainable land use in the projects i.e., social and environmental impacts should not do harm.[8]
Tools and instruments for the scheme
• Landowners' importance as carbon farming and forestry value chain actors should be recognised, and their rights and responsibilities should be clear for successful project management regarding freedom of contract. • Impact assessment models should ensure sustainable land use and ownership.
Market
• The scheme rules need to cover the role and rights of the landowner for sharing (if applicable) the income or rent of the land. • Land use rights should be assessed in the local context-specific risks and saliency analysis.[9]

[5] Read more in Technical Guidance Handbook p. 97
[6] Technical Guidance Handbook p. 97
[7] Technical Guidance Handbook p. 97
[8] Carbon Farming Scheme. 2021. Chapter 7.3
[9] Carbon Farming Scheme. 2021. Chapter 7.3

PROJECT OWNER & DEVELOPER
Strategy and coordination
• Climate policy gives direction for the scheme and its detailed planning such as origin, size, duration, income opportunities and approved sectors, and carbon farming and forestry methods. Depending on the scheme, it attracts a particular type of project owner and developer to invest in the scheme.[10]
Regulation and rules
• The scheme's rules or regulations and eligibility criteria define strongly with incentive rules if farmers and foresters participate in the scheme or project, and eventually define the investment money flow and share the income and risk level of the action for farmers and foresters. • On the other hand, the scheme's rules and criteria act as gate holder selecting committed parties to the scheme preventing the risk of a project of fraud and non-compliance, and, from a climate perspective, protects the permanence of the carbon sinks.
Tools and instruments for the scheme
• The scheme's governance can build contract management for carbon farming and forestry parties and request parties to agree with rights, responsibilities and share of the income in the project management.
Market
• The project owner will issue sequestrated carbon units to the market, and therefore market insight will be the critical indicator for investment decisions regarding carbon farming and forestry projects.

[10] Read more about cost break-down of carbon farming Carbon Farming Scheme. 2021. Chapter 7.

KEY INFORMATION FOR THE OPERATION
Strategy and coordination
• The carbon sequestration activities and quantifying the enhanced sink and its permanence need a certain amount of data. A policy can redirect to gather the national data and farm data necessary for monitoring, reviewing and verifying the carbon removals. It requires investments in innovative climate technologies and the development of data-based services • The knowledge level of sufficient farm and forest data needs to engage in carbon farming and forestry action and be communicated through relevant policy channels. Technical Guidance Handbook concludes that indicators about carbon sequestration or GHG reductions should be dependent on the management, easy to measure and understandable by the farmer.
Regulation and rules
• The project boundaries for different methodologies and LCA analysis[11] can be directed through regulation. • The risks of fraud and non-compliance of project data can be managed with third-party project validation. According to the EU Commission proposal, Member States should implement Farm Sustainability Tool for nutrients (FaST) at the latest in 2024[12]. The FaST is a digital advisory service, which should help individual farmers to improve agronomic and environmental status of their farms by supporting the nutrient planning. It also provides concrete information about legislation and regulation regarding fertilization, increases cooperation and collaboration and increases knowledge of own data.
Tools and instruments for the scheme
• Standard information for designing carbon farming and forestry practices include climatic region, soil type, and overall growth capacity. The critical information also considers plant carbon allocation, residual management/ litter input, added soil amendments and fertilization. Data requirements vary depending on what carbon pools the scheme includes.[13] • For Monitoring, reporting and verification (MRV), essential information is under development, and there are different approaches available. Several research bodies are also developing new approaches which combine different methods. How much data is needed about a particular region/soil type/management practice so that a specific monitoring method can be upscaled? • Science-based CO_2 reduction indicators are the same for all participants or indicators that will result in comparable units if different indicators for different actions are needed. A robust monitoring system for set indicators is the following instrument to be developed.[14] • Additionally, data collection and management for sustainability indicators should be developed in the scheme, e.g., for the Due Diligence process, context-specific social risk assessment, human rights, the environment and good governance impact evaluation. This would also serve to address the co-benefits of the CRCs and to improve quality. • The FaST digital advisory service will help the data collection of sustainability indicators in the future.
Market
• For ensuring the transparency of CRCs actions and cost-effective MRV, data management plays an essential role for CRC market price.

[11] According to European Environmental Agency Life-cycle assessment (LCA) is "a process of evaluating the effects that a product has on the environment over the entire period of its life. LCA is commonly referred to as a "cradle-to-grave" analysis. LCA's key elements are: (1) identify and quantify the environmental loads involved; e.g. the energy and raw materials consumed, the emissions and wastes generated; (2) evaluate the potential environmental impacts of these loads; and (3) assess the options available for reducing these environmental impacts."

[12] Commission proposal for a Regulation on the new CAP post-2020 COM(2018) 392

[13] The farm/forest preliminary data needed for carbon farming and carbon forestry actions (Preliminary result from Action 1 in LIFE CarbonFarmingScheme -project): Main production type, Area, Methods; Cultivation history, Crop rotation, Yield levels; Estimation ages of the fields (When was the forest or swamp cleared into field use) and Crop production, Crop type, yield level, cultivation area and time of each crop; Fertilization, Type, amount and area; Animal husbandry (number of animals per year) and location-specific information, Coordinates, Altitude, Marine or lake index; Main soil type, Seeding method and Fertilization, Type, amount and area; Forest stand types (main group or subgroup), Tree species, Estimation age of the forest, Area, Forest growth capacity, Previous measures. And Technical Guidance Handbook p. 31

[14] Technical Guidance Handbook p. 31

QUALITY EXPERTISE GUIDANCE FOR CARBON FARMING AND FORESTRY
Strategy and coordination
• The new innovative climate actions require qualified experts in different fields of the value chain.[15] • The EU's and the Member States' governance requires carbon farming and forestry expertise as a pre-requisite for rules and scheme management. • The governance systems of the scheme require the formation of a multidisciplinary team of experts & developing training/education materials for the development of a scheme and its successful operation.
Regulation and rules
• Legal requirements for trained human resources in the governance body should be in place. Otherwise, there is a greater chance of failure of the carbon farming and forestry project and loss of investment money and income opportunity.
Tools and instruments for the scheme
• Necessary expertise in the scheme: technical knowledge of the scheme development, project and methodology selection, scheme managements and governance, technical tutoring as one-to-one advice to farmers to participate in the scheme. • Availability of suitable qualified independent auditors for the effective operation of the MRV. • High business risk to carry with a project without trained human resources. • Stakeholders buy-in for scheme participation[16]
Market
• Marketing, sales, market, trading, and technical knowledge for trading activities. • Market knowledge for farmers and foresters to become familiar with the different terms and conditions

THIRD PARTY VERIFICATION
Strategy and coordination
• The EU climate policy needs to define the level of required verification for environmentally robust but cost-effective CRCs to set up suitable MRV mechanism. • MRV development and management is the most significant single cost for the scheme development.[17]
Regulation and rules
• Verification is a standard policy in different fields of business. Regulation and standards should follow the business-as-usual models used in the voluntary market, and the EU ETS and renewable energies compliance. • MRV mechanism is the critical tool to prevent fraud and non-compliance, to ensure environmentally robust carbon actions.
Tools and instruments for the scheme
• Verification plans should be set up in the project scheme plan. • External third parties carry out verification in existing carbon farming schemes.
Market
• Transparent and independent third-party verifier is an essential requirement for carbon market products. • How to make sure the cost of the MRV does not exceed the market price of the CRCs?

[15] Read more in Technical Guidance Handbook p. 36
[16] Technical Guidance Handbook p. 97
[17] Technical Guidance Handbook p. 42 and Carbon Farming Scheme. 2021. Chapter 4.

THE METHODOLOGY EVALUATION FOR CARBON FARMING AND FORESTRY
Strategy and coordination
• Risk of policy conflict between carbon farming scheme methodologies and other policies (CAP and forestry policies) implementation; for example, Farm to Fork strategy directs carbon farming and forestry to be an additional income instead of, or alongside, food production in the agricultural sector. • Risk of carbon leakage where policy changes land use practices. • The methodologies of carbon sequestration are local and may not meet in the national/European level. How to ensure suitable and equivalent methodologies under the EU carbon criteria and certification scheme?
Regulation and rules
• A precise description of the carbon removal certificate would enable the development of carbon farming and forestry methodologies. • Carbon farming and forestry methodologies are usually used in other ways, but the legislation should ensure no legislative conflict for usage, for example, in the state aid rules. • Regulation can be used to prevent land-use changes (carbon leakage).
Tools and instruments for the scheme
• Carbon leakage prevention should be considered in the suitable methodologies and take the risk account of baseline, project boundaries and actions design. • Transparency of the scheme can be increased by publishing the methodologies used in the scheme.[18] • Does methodology include robust human rights, the environment and good governance impact evaluation for do-no-harm Due Diligence[19]?
Market
• The project plan must adopt an appropriate methodology which meets the demand in the voluntary market or offsetting program and, most importantly, gains measurable carbon sinks.

PROJECT VALIDATION
Strategy and coordination
• Project validation is the most critical process for the project implementation of the scheme and estimation of the carbon sink potential. Transparent scheme governance enables private finance engagement for long-term nature-based climate actions. • Conflict or unclear policies for carbon removals and other related actions increase the financial risk for the supply.
Regulation and rules
• The project plan should follow the regulation/standard and carbon criteria[20] requirements of the scheme to be verified to deliver CRCs in the future. • The validation process is crucial to prevent risk of fraud and non-compliance.
Tools and instruments for the scheme
• The validation should meet the scheme requirements and carbon, environmental and social criteria[21] with caution and accuracy of implementing actions. • The scheme should have accurate processes for transparent reporting of the verification process and for the issuance of the credits to avoid non-compliance.
Market
• The project validation estimates the future CRCs in the market and documents the transparency of CRC production.

[18] Technical Guidance Handbook p. 99
[19] Carbon Farming Scheme. 2021. Chapter 7.2 and 7.3.
[20] See more in Carbon Farming Scheme. 2021. Chapter 7.
[21] Carbon Farming Scheme. 2021. Chapter 7.

ENHANCE CARBON SINKS
Strategy and coordination
• The climate, financial and sectoral policies can direct and incentivize the level of required nature-based carbon sinks for both the short and long-term.
Regulation and rules
• The definition of carbon removal and the scheme level baseline would explain the real and the additional carbon sink. • The scheme rules should consider what we have learnt historically to avoid, for example, carbon leakage at the regional/national level as occurred in the New Zealand's forestry scheme.[22]
Tools and instruments for the scheme
• The projects need to follow the scheme level baseline and approved carbon farming and forestry methodologies to gain additional carbon sinks for the certification.
Market
• The policy guidance and possible pre-purchases can guide supply to carbon farming and forestry actions, lowering the financial risks.

MAINTAINING CARBON STOCKS
Strategy and coordination
• Policy guidance for permanence criteria for carbon removals direct requirements for carbon sink maintenance. • Planned and incentivized maintenance of carbon stocks lowers the risk of reversals and prevents unwanted change in the management practices. • The farmers and foresters face the financial risk with possible policy changes in long-term projects. The Member States can use of the proposed GAEC standards for the financing in 2021-27 CAP period.[23]
Regulation and rules
• The scheme needs to define permanence requirement based on the climate policy or voluntary market demand depending on the scheme.[24] • The scheme can manage non-permanence risks with scheme-wide buffer accounts, where the project owners bear the risk of low maintenance with buffers throughout the project duration.[25] • The non-permanence of emissions reductions offset with carbon removals is a significant legal issue.
Tools and instruments for the scheme
• Maintaining stocks is an action for reducing the non-permanence risk of carbon removals, among other activities. • Basic risk assessment for nature catastrophes helps the landowner to prepare for force majeure situations. • Monitoring and modelling of the uncertainties assists in identifying project-specific non-permanence risks and points out where reversals may occur and addresses them in full. The scheme should develop tools for handling the risk of carbon reversals, primarily if carbon removals are used to offset climate targets.
Market
• The permanence criteria relates strongly to market interest for CRCs. Does the scheme permanence criteria meet the market standard? • Market demand for carbon farming and forestry co-benefits and side-products can help to ensure that sequestered carbon is maintained.[26]

[22] Carbon Farming Scheme. 2020a. Chapter 3.4.3.
[23] Technical Guidance Handbook p. 98, In proposed legislative text COM (2018) 392 final Annexes 1 to 12.
[24] Carbon Farming Scheme. 2021. Chapter 7.1.1.
[25] Technical Guidance Handbook p. 97
[26] Technical Guidance Handbook p. 97

MONITORING, REPORTING AND VERIFICATION (MRV)
Strategy and coordination
• High standard CRCs require robust monitoring, reporting, and verification system to ensure sustainable and permanent carbon sequestration. • The development of cost-effective climate technologies can lower the high MRV costs in general. The high cost of the MRV is a risk in directing the carbon farming and forestry projects towards more considerable project development and ownership. • MRV should also comply with carbon farming and forestry co-benefits (go beyond the principle - contributing positively to the environmental and social impacts).[27]
Regulation and rules
• The MRV process is the critical tool for risk assessment of the projects, avoiding fraud and non-compliance of the supply. The MRV also addresses how the project actualizes compared to the baseline, i.e., answers how the environmental additionality can come true. • The scheme needs a standard MRV criteria that defines the accepted approaches, and accuracy and precision requirements are required.
Tools and instruments for the scheme
• Development of the whole MRV process such as in the EU ETS can, for the scheme, control and predict the generation of CRCs and ensure transparency. Assumptions, methods, and data must be commonly accepted (scientific consensus) and should provide meaningful and valid results between different climate areas. • To reduce the MRV costs, new technological developments that have the potential to reduce some of the expenses of MRV and increase the certainty in assessments are available and should be utilized.[28] • Carbon farming and forestry impacts can be modelled to some extent. The modelling method should be based on science, good quality data should be available, and there should be evidence that the simulations result in the actual carbon stock with an acceptable accuracy. Increasing knowledge of soil processes and data collected from different sources helps to develop models further and decreases the uncertainty of the results. • How can the scheme ensure the monitoring process fits different carbon farming and forestry practices? Are the monitoring standards equal to small- and large-scale projects?
Market
• The third-party accredited independent verification and reliable MRV process increases the market demand for CRC credits. • The high price of the MRV can overprice the CRCs. MRV process should be fully transparent to estimate the quality of carbon credits in the market.

[27] Carbon Farming Scheme. 2021. Chapter 7.2. Definition for do no harm and go beyond principles for carbon farming and forestry actions and its assessment.
[28] Technical Guidance Handbook p. 138

CRC ISSUANCE TO THE CARBON MARKET
Strategy and coordination
• The risk of double issuance arises if more than one CRC can potentially be issued for the same carbon sink. The policy needs to identify occurrence for double counting in the certificate issuance process. A robust registry system or reliable scheme governance which communicates with public authorities (national inventories) can control the risk of double issuance.[29]
Regulation and rules
• Farmers and foresters may face regulatory and financial risks if there will be changes in legislation before the result-based project gains the CRCs (and profit) because of the long-term project lifetime. • The risk of double issuance can be controlled with scheme governance and transparent registry function.
Tools and instruments for the scheme
• Schemes wishing to produce and sell the offset credits need an independent and transparent registry system to avoid any double issuance or counting.
Market
• The liability risk of the issuer in the market; risk of legal claims due to misleading or incomplete insurance advice related to climate change or failure to assess climate change adequately. How can the issuer minimize claims for environmental risk?[30] • Credit issuance and its provision to the market is the critical part to connect the supply and demand. Well-functioning listing and trading services support efficient carbon market growth. • A robust and publicly accessible registry system is crucial for minimizing counterparty liability claims by providing public information for the project identification. • Market provider's data infrastructure has the potential to provide centralized market data for carbon market development.

[29] CORSIA Emissions Unit Eligibility Criteria, 2019
[30] A practical guide by The Institute and Faculty of Actuaries
https://www.unepfi.org/psi/wp-content/uploads/2021/01/PSI-TCFD-final-report.pdf p. 78

3.2. Scheme governance

The discussion of the carbon farming scheme has started value chain picturing and financing discussions. It is very clear that carbon removal certificates need a robust scheme governance. The Technical Guidance Handbook introduces the essential components of the scheme development in chapter 4. The design of the scheme is likely to be the most important factor in securing and retaining farmers participation. Based on the research, the early recognition of the efforts, simple plans and agreements, simple reporting requirements, flexibility of the methodology changes, free advice and supportive governmental bodies, trustworthy and reliable system, are all essential.[31]

THE SCHEME FOR CARBON REMOVAL CERTIFICATES
Strategy and coordination
• Clear climate policy towards the EU carbon regulation/standard and criteria for carbon removals can provide more efficient and higher liquidity of the market where suppliers and buyers would meet to support the EU climate target.[32] • The EU carbon regulation/standard and criteria for carbon removals will build on the upcoming legislation of carbon removal certificates. How does the certification scheme divide emission reductions and carbon removals? • How will the carbon removal certificates be handled with Member States national inventories to avoid double accounting? • Standardization of co-benefits may also help to meet the demand and supply in the market for sustainable action needs. The maintenance of carbon farming and forestry co-benefits are recognized as promoting and maintaining carbon sinks. Does the market recognize additional reward programs/credits for co-benefits? • An EU scheme would minimize the risk for double-counting carbon sequestration actions across the European territory, while the same monitoring and accounting rules would apply to the sequestered carbon. • Minimize the risk of carbon leakage on the EU land-use change and leakage outside of the EU borders by learning lessons from other schemes, e.g. carbon leakage at the regional/national level in the New Zealand's forestry scheme.[33]
Regulation and rules
• The EU standard/regulation and criteria for carbon removal certificates would define carbon removals and make a distinction, for example, of carbon reduction as a climate action. • The EU carbon standard/regulation and criteria and an EU-wide scheme which scales and manages the rules, criteria, and methodologies under the same scheme would ensure high-quality CRCs. • Minimum regulation/standard for human rights, the environment and good governance impact evaluation, would set the baseline for the do-no-harm Due Diligence process for carbon removal certificates.
Tools and instruments for the scheme
• The EU carbon regulation/standard and criteria for carbon removals would guide more specific carbon farming and forestry methodology, governance and digitalization development, which would incentivise the supply and investors of carbon sequestration in the agriculture and forestry sector.
Market
• An EU carbon standard for the carbon removal supply would increase the market's efficiency and liquidity.[34] • A functioning voluntary market is claimed to show inefficient and unpredictable market price. The market efficiency, liquidity, and predictability positively impact the demand for CRCs and investments for carbon farming and forestry.

[31] Technical Guidance Handbook. p. 114
[32] A blueprint for scaling voluntary carbon markets to meet the climate challenge. 2021.
[33] (Carbon Farming Scheme. 2020a. Chapter 3.4.3.
[34] A blueprint for scaling voluntary carbon markets to meet the climate challenge. 2021.

SCHEME GOVERNANCE
Strategy and coordination
• The definition of the carbon removal in the European climate policy would frame the scheme, carbon sequestration origin, size, timing, carbon farming and forestry methods, investment potential and income opportunities, which are needed to define the scheme's governance building. • With which other regional, national or EU policies does the scheme need to be coordinated to avoid policy conflict?[35]
Regulation and rules
• Regulated authority of the scheme governance with clear rights and responsibilities, and a well-functioning governance system can help to reach the climate targets and minimize double-counting risk. • The scheme governance and its well-functioning operation are critical to avoid fraud and non-compliance of all actors in the scheme. The functions can include, for example, the implementation of anti-money-laundering and know-your-customer guidelines to stop fraud and the creation of a governance body to ensure the eligibility of market participants, supervise their conduct, and oversee the market's functioning.[36] • Suppose the carbon farming scheme is linked to national inventories. In that case, the accounting rules need to be developed to distinguish between national inventories and tradable CRCs. • The scheme needs the competence to coordinate with suitable authorities, e.g. national inventory. • The definition of the carbon removal and an EU carbon criteria plays key role for the acceptance of a suitable methodology, where the EU carbon criteria works as a system level tool for evaluating how to commensurate different methodologies. Risk of varying and inaccurate results of methodology can have impact on acceptance. • The scheme needs competence for essential governance sanctions.
Tools and instruments for the scheme
• The scheme should have at minimum the registry, credit issuance and managing rules to avoid double counting and frauds. • The scheme governance should be aligned with, and have competence for, governance tools to prevent harm and recognize human rights, the environment and good governance impact, as a result of a carbon farming and forestry project implementations. • The projects should introduce an overall project plan to apply scheme rules by identifying tasks, timescale, key milestones, decision points, responsibilities, and resource requirements for assessment and risk management for the carbon farming and forestry projects.[37] • Third-party assessment of process for CRC buyers: schemes wanting to produce fungible offset credits through enhancement of carbon sinks need systems of governance that include independent approval of the methodology, certification of the scheme, independent verification, period re-verification and an independent registry.[38]
Market
• To minimize the risks of fraud and non-compliance, the EU market needs a common scheme governance and EU-wide carbon standards to commit private capital to invest, supply and to engage long-term projects.

[35] Technical Guidance Handbook p. 69
[36] A blueprint for scaling voluntary carbon markets to meet the climate challenge. 2021.
[37] Technical Guidance Handbook p. 31
[38] Technical Guidance Handbook p. 51

BASELINE DEFINITION
Strategy and coordination
• A baseline can be used as a reference scenario when setting additionality requirements[39]. A baseline is set according to the additionality requirements, and the proposed activity is then compared with the baseline. The decision will impact what kind of role carbon removal has in EU climate policy and national climate targets.
Regulation and rules
• The baseline setting in the scheme and project level is an essential measure for all sequestrated carbon. It should manage information well to avoid risks of fraud and non-compliance of the project developer.[40]
Tools and instruments for the scheme
• The risk of inaccurate carbon sequestration will occur if a common scheme baseline is used at the project level. The scheme should also set following the scheme baseline to local projects with regional climate, weather, and inventory information. How can the project baselines be equal when the information in the local level information levels differ?[41]
Market
• The baseline and additionality will give information about the potential amount of CRCs, their predictability, and timeframe of deliveries to the market.

REGISTRY AND CREDIT MANAGEMENT
Strategy and coordination
• Double use occurs if the same issued CRC is used twice or is duplicated in registries. Double counting of carbon removals is a risk for environmental integrity when emissions increase due to CRC transfers instead of decreasing. The registry should prevent double counting by avoiding the same unit usage twice under different accounting systems for emission reduction or national inventory.
Regulation and rules
• The scheme needs a reliable transparent registry[42] that is publicly accessible and where the credits can be tracked efficiently on the carbon market to avoid any irregularities.
Tools and instruments for the scheme
• Reliable transparency of the registry and credit management prevents fraud and double counting. Technical Guidance Handbook mentions a common registry connected to the national inventory officials in the design process, accounting and fraud prevention measures built in the registry.[43]
Market
• The markets use wide selection of different registry and credit management tools like contracts, trade platforms and registries (most well-known registry is the EU ETS).

[39] The last reveal of challenging baseline setting and failing additionality is found in California. Read more: https://carbonplan.org/research/forest-offsets-explainer
[40] Read more about different baseline models in Carbon Farming Scheme. 2021. Chapter 7.1.3.
[41] More information about local carbon farming projects will be gained in on-going European wide carbon farming pilot and communicated in LIFE CarbonFarmingScheme report in November 2021.
[42] In our market analysis (Carbon Farming Scheme 2020a), the ETS sector was seen technically well suited for introducing CRCs, as credits of 1 ton of CO2e are already traded in the ETS. The EU ETS already has the structure
[43] Technical Guidance Handbook p. 100

3.3. Incentive and finance for carbon farming and forestry – A Sustainable Business Model

The aim of the whole LIFE CarbonFarmingScheme is to introduce a model where carbon sequestration becomes not only a climate policy tool but, more importantly, a sustainable business for farmers and foresters. When the potential of economic gain and incentive is introduced, the production of carbon removals by increasing soil carbon and biomass is increased.

To be able to introduce a business model for carbon farming and forestry:

- The carbon sequestration methods and actors in the value chain differ in the projects. LIFE CarbonFarmingScheme has analyzed the different parts of costs of the carbon farming and carbon forestry.[44]
- Dialogue with carbon farmers / foresters (supply) to understand their onboarding and incentive needs is also part of the LIFE CarbonFarmingScheme. The survey is ongoing, and interviews will be held during the autumn of 2021.
- At the same time the Commission is preparing a regulatory framework for certifying carbon removals.
- Suitable reward models have been evaluated in the Technical Guidance Handbook chapter 5.5. Also, LIFE CarbonFarmingScheme studied the different combinations used in carbon market schemes. As a result, the project introduced Carbon Contracts for Difference incentive model for both carbon farming and forestry, which represents the public-private funding model.[45]
- Additionality is the process of assessing whether a proposed activity is different than its baseline. Presenting convincing additionality in carbon sequestration project is crucial factor for achieving true climate impact and GHG reduction in the atmosphere and minimize the risk of carbon leakage.
- External pricing mechanism would lead to an improved policy effectiveness. The potential demand of CRCs in the EU sectors outside LULUCF is 599.1 MtCO2e during 2020-2030 if only the tightening emission reduction target is considered as available to be fulfilled with CRCs. This divided by 10 years gives 59.9 MtCO2e annual demand.[46]

[44] Carbon Farming Scheme. 2021. Chapter 7.
[45] Read more in Carbon Farming Scheme. 2021. Chapter 5.3.2.
[46] Carbon Farming Scheme. 2020a. Chapter 8.6.

A NEW GREEN BUSINESS MODEL FOR CARBON FARMING AND FORESTRY
Strategy and coordination
• The Commission is developing a regulatory framework for certifying carbon removals based on robust and transparent carbon accounting to monitor and verify the authenticity of carbon removals. • There are lessons learned from already existing carbon market mechanisms[47], national schemes and pilots. • A new green business model should be built where land managers will be rewarded to practice climate-friendly actions whereas the outcome provides climate benefits. • The business models of carbon farming and forestry where the parties, and sharing of costs and incomes can differ among parties and carbon farming and forestry methodologies.[48] • Outcome of the Climate Law trilogues: a limit of 225 Mt of CO_2 equivalent to the contribution of removals to the net target was introduced to ensure sufficient efforts to reduce and prevent emissions by 2030. Could 225 Mt provide the potential for additional CRCs?
Regulation and rules
• The EU regulation or standard and criteria for carbon removals certificates: when considering the carbon criteria, the aim should be the desirable climate effect and net change in GHG emissions and removals. Permanence, additionality, carbon leakage and double counting are criteria that define the definitive outcome of the carbon sequestering projects and net change in GHG emissions and removals.[49] • Do-no-harm principle forms the baseline for all activities and means that there are the right tools in place to prevent negative social and environmental impacts as a result of a project or business activity.
Tools and instruments for the scheme
• Scheme governance regulation/rules for accounts and fraud prevention measures and competence for sanctions. The registry should connect to national inventory officials during the design process.
Market
• **Private market:** A market price for carbon removals that would comply with European sustainability standards does not exist. Overall, the current carbon market is characterized by low liquidity, scarce financing, inadequate risk-management services, lack of transparency, and limited availability of pricing data.[50] Clear demand signals would give suppliers more confidence in their project plans and encourage investors.[51] Demand for the voluntary market can be read, for example, from company commitments to reduce GHG emissions, pre-contracts with project developments and commitments to purchase carbon credits. Also, industry level guidelines for usage of carbon removals for offsetting promote demand.[52] • **Compliance market:** A regulated market would create demand for European sustainable CRCs with impacts on cost-efficiency, higher compensation for farmers and foresters, possibility for fast scale up and effectively secure private capital flow to carbon sequestration actions.[53] Enabling a cost-effective climate change mitigation system, especially if operators in other sectors could be allowed to meet their GHG obligations also by increasing nature-based carbon sinks.[54]

[47] Carbon Farming Scheme. 2020a. Part I.
[48] Carbon Farming Scheme. 2021. Chapter 4.
[49] Carbon Farming Scheme. 2021. Chapter 7.
[50] A blueprint for scaling voluntary carbon markets to meet the climate challenge. 2021.
[51] A blueprint for scaling voluntary carbon markets to meet the climate challenge. 2021.
[52] A blueprint for scaling voluntary carbon markets to meet the climate challenge. 2021.
[53] Read more in Carbon Farming Scheme. 2021. Chapter 6.
[54] Read more in Carbon Farming Scheme. 2021. Chapter 6.2. Case example – CRCs in transport sector.

INCENTIVE FOR CARBON FARMING AND FORESTRY

Strategy and coordination

- The supply for a new green business model for carbon farming and forestry can be scaled up with up-front funding and rewards from delivered climate actions and possible co-benefits of the carbon markets. The incentive for carbon farming and forestry can combine different funding methods and sources[55], which comply with additionality criteria and engage the stakeholders.[56]
- **Public funding source:** Publicly funded nature-based carbon removals support the EU and national climate targets and land-use sector climate action by providing nature-based carbon sinks for national inventories. With the slowness of finding schemes, limited sources of public money, the current support schemes are mainly action-based, which doesn't reward and measure carbon sequestration. Public money incentives should comply with double-counting and additionality criteria.
- **Private funding source:** Chance to flow private capital to innovative carbon actions to benefit the common climate target with clear policy towards carbon removals. Double counting rules with the EU inventory need clear rules to invite private investors to develop carbon farming and forestry projects. How should additional sinks be counted in the national GHG inventories and companies' climate goals? The research has assessed that markets alone are unlikely to generate sufficient returns to fully reward farmers and cover the cost of project development.[57] Seems that public-private funding model is needed instead of ex ante up-front payments, where reward is only paid up-front.
- **Stakeholder engagement[58] :** The time difference between the realization of the costs of carbon capture measures and the actual carbon sequestration and the revenue from it, is a significant factor to farmers, foresters, and investors, especially in situations where carbon sink is realized over several years and even decades. Therefore, incentives should be designed to reduce and minimize this risk. And to develop an understanding of what kind of incentive and business model would benefit farmers and foresters who get involved in carbon farming and forestry.[59]
- **Public-Private funding:** Combining funding sources and models to lower the uncertainty and delay of the reward from the market: Common Agricultural Policy's eco-schemes, private funding hybrid-model[60] and Carbon Contracts for Difference finance model[61]. On the other hand, result-based incentives and long-term finance securement to prevent non-permanence.[62]

Regulation and rules

- Nature-based carbon sinks have environmental limitations, and the additionality criteria[63] narrows tradable CRC potential from the projects that would not otherwise have happened. **Environmental additionality** frames carbon farming schemes to produce an actual net reduction in GHG emissions that would not have otherwise occurred and avoid land-use changes caused by the scheme (carbon leakage). **Financial additionality** ensures efficient emission reductions that limit actions to those that would have otherwise occurred (could be paid from other sources or be profitable without the scheme). **Regulatory Additionality** is achieved when credits are not earned from actions that are mandated by law or achieve compliance with policy requirements. Additionality criteria has an essential role in securing actual and effective carbon reduction and avoiding double payment from other sources than the scheme. The public funding has similar legal limitations with national state aid rules, which must be in line with EU State Aid rules.
- The double funding and additionality criteria risk endangering a complex business model, especially where CRC combines carbon sink with other co-benefits. How to combine public support and private funding in projects so that the combination meets, e.g., EU State Aid rules and additionality criteria in the CRC scheme[64]?

[55] Read more Carbon Farming Scheme. 2021. Chapter 5.
[56] Dialogue with carbon farmers / foresters (supply) to understand their onboarding and incentive needs is also part of the LIFE Carbon Farming Scheme. The survey is on-going, and interviews will be held on autumn 2021.
[57] Technical Guidance Handbook p. 89 and 92.
[58] Technical Guidance Handbook p. 110
[59] Attitude of carbon farmers handbook p. 37 and Carbon Farming Scheme. 2021. Chapter 4. Cost of carbon farming and carbon forestry
[60] Technical Guidance Handbook p. 140.
[61] and Carbon Farming Scheme. 2021. Chapter 5.3.1.
[62] Technical Guidance Handbook p. 97
[63] Technical Guidance Handbook p. 65
[64] Technical Guidance Handbook p. 63

Tools and instruments for the scheme
• If the incentive is targeted for shorter period than project duration (CAP period 5 years), does it affect the feasibility or governance of the project? • Scheme development and management costs are among the costliest necessary actions in CRC production. With public funding, the costs won't burden the supply income risk.[65] Public money makes it possible to tailor the incentive system to support certain scheme functions, measures, or co-benefits and to target amounts of support according to needs.
Market
• The market will pay ex-post reward for additional and permanent carbon removals.

4. Conclusion

Clear climate policy towards land use sector and definition of carbon removals with incentives for farmers and foresters would scale carbon farming and forestry acts wider and faster, and increase the interest of private investors to invest in carbon sequestration actions. The sustainable carbon criteria, especially the additionality and permanence, need to be set up.

LIFE CarbonFarmingScheme project is halfway home. The work on the project will continue onwards from this assessment, with stakeholder discussions, a survey and interviews to understand the farmers and foresters onboarding carbon farming and forestry and, in the end, will end up as the “Guidance of regulatory and policy aspects towards implementation of incentive scheme” as the final report of the project.

[65] See Carbon Farming Scheme. 2021. Chapter 4.

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