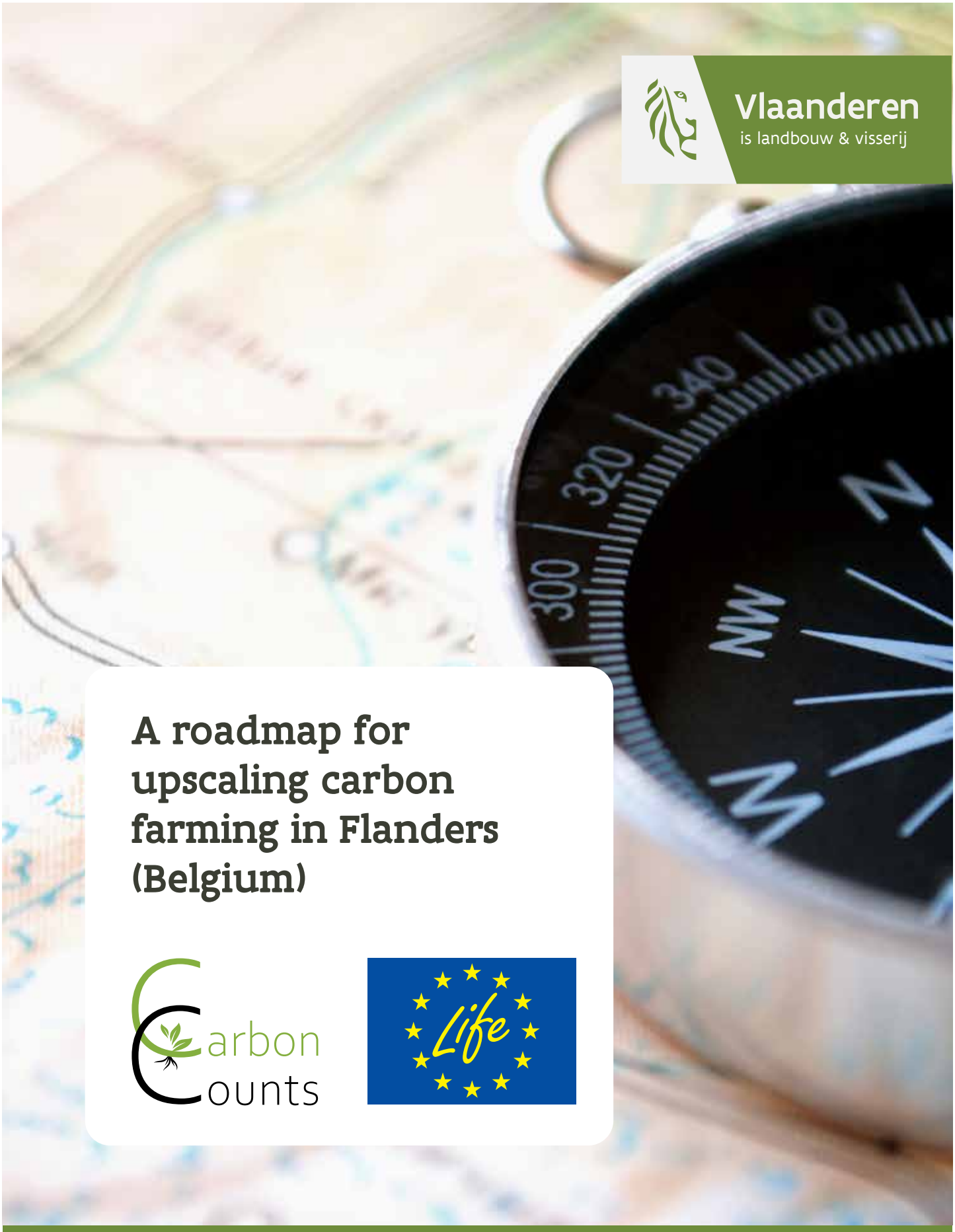

Vlaanderen
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A roadmap for upscaling carbon farming in Flanders (Belgium)

Carbon Counts

Life

ILVO
Instituut voor Landbouw-, Visserij- en Voedingsonderzoek

DEPARTEMENT
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ABSTRACT (ENGLISH)

This roadmap is an end product of the **LIFE CarbonCounts project**, in which **ILVO** together with the **Department of Agriculture & Fisheries** has been setting the tone for scaling up effective and viable carbon farming in Flanders since September 2021. Within this trajectory, the starting point was a broad study of what is already known about carbon farming in Flanders, and also who is already working on it. Information from literature, in-depth interviews, workshops with policy makers and knowledge available to both partners was compiled and published in the form of a **system analysis** (ILVO communication D/2022/08). This analysis was used as a basis to develop tracks towards future, resistant systems for carbon farming together with the actors involved. This roadmap is the result of that process. From the field surveyed, the project partners distilled the widely supported desirability of focusing on **three networks**, each with its functions and tasks. The consensus is that the three proposed networks should be complementary. In order for carbon farming in Flanders to achieve its goal, there must be (1) a clear goal **(navigation network)**, (2) measurements and models must be sufficiently reliable **(MRV network for measuring, reporting and verifying carbon farming)** and (3) profits and risks must be fairly distributed in sustainable revenue model **(financing network)**.

The **navigation network** can be initiated by policy makers who are given a clear mandate and set up a governance structure to create a **narrative for carbon farming** in Flanders. As we strive for a supported vision, this network involves farmers (organizations), researchers, private organizations, government agencies and civil society organizations. Some important agenda items for this network are agreements on additionality, long-term carbon storage and fair distribution of risks and revenues among the different parties.

The **MRV network** should work on a knowledge base for monitoring, reporting and verification of the impact of carbon farming practices on carbon stocks, in a way that is sufficiently accurate for the different stakeholders, yet cost-effective and with minimum administrative burden. The MRV network will establish a collaboration structure to further improve the MRV knowledge base throughout time for the farming context in Flanders.

Finally, the **financing Network** provides in-depth consideration of decisions from the navigation network and the MRV network. Agricultural organizations and private actors consider whether the risks, revenues and potential claims around climate neutrality are fairly shared between farmers and private actors. Consideration should also be given to new, innovative ways to shape **fair, sustainable financing for carbon farming** in Flanders.

With this roadmap, we provide the tools for a public-private partnership and regulatory framework at the Flemish level. The project partners are convinced that this will sow the seeds for successful carbon farming in Flanders. This roadmap is **only a starting point**, and in the coming years Flemish agriculture will have to seize the opportunities of carbon farming to achieve a **win-win between all parties involved**.

ABSTRACT (NEDERLANDS)

Deze roadmap is een eindproduct van het **LIFE CarbonCounts project**, waarin **ILVO** samen met **Departement Landbouw & Visserij** sedert september 2021 de toon zet voor het opschalen van effectieve en leefbare koolstoflandbouw in Vlaanderen. Binnen dit traject werd er vertrokken van een brede studie over wat er al is geweten over koolstoflandbouw in Vlaanderen, en ook wie er al mee bezig is. Informatie uit literatuur, diepte-interviews, workshops met beleidsmakers en kennis die beide partners zelf in huis hebben werd gebundeld en gepubliceerd onder de vorm van een **systeemanalyse** (ILVO mededeling D/2022/08). Deze situatieschets werd als basis gebruikt om samen met de betrokken actoren te komen tot het ontwikkelen van sporen richting toekomstige, bestendige systemen voor koolstoflandbouw. Deze roadmap is daar het resultaat van. Uit het bevraagde werkveld destilleren de projectpartners de breed gedragen wenselijkheid om in te zetten op **drie netwerken** die elk hun functies en taken hebben. De consensus heerst dat de drie voorgestelde netwerken complementair moeten zijn. Opdat koolstoflandbouw in Vlaanderen zijn doel bereikt, moet er (1) een duidelijk doel zijn **(navigatie-netwerk)**, moet (2) de manier van monitoren tegelijk accuraat maar ook kostenefficiënt zijn **(MRV-netwerk voor meten, rapporteren en verifiëren van koolstoflandbouw)** en moeten (3) de winsten en risico's eerlijk verdeeld zijn in een duurzaam verdienmodel **(financieringsnetwerk)**.

Het **navigatie-netwerk** kan geïnitieerd worden door beleidsmakers die een duidelijk mandaat krijgen en een bestuursstructuur opzetten om een **narratief** te creëren voor **Vlaamse koolstoflandbouw**. Aangezien we streven naar een gedragen visie worden in dit netwerk landbouwers(organisaties), onderzoekers, private organisaties, overheidsinstellingen en middenveldorganisaties betrokken. Een aantal belangrijke agendapunten voor dit netwerk zijn afspraken over additionaliteit, lange termijn opslag van koolstof en eerlijke verdeling van risico's en inkomsten onder de verschillende partijen.

Het **MRV-netwerk** werkt aan een kennisbasis voor het monitoren, rapporteren en verifiëren, van de impact van koolstoflandbouw-praktijken op koolstofvoorraden op een manier die voldoende accuraat is voor verschillende belanghebbenden, maar tegelijk ook geen excessieve hoge monitoring kosten of administratieve overlast vergt. Het MRV netwerk zet een samenwerkingsstructuur op die de kennisbasis voor MRV doorheen de tijd verder kan verfijnen voor de Vlaamse landbouwcontext.

Tot slot zorgt het **financieringsnetwerk** voor een grondige doorrekening van de beslissingen uit het navigatie-netwerk en het MRV-netwerk. Landbouworganisaties en private actoren bekijken of de risico's, inkomsten en mogelijke claims rond klimaatneutraliteit eerlijk verdeeld zijn tussen landbouwers en private actoren. Er dient ook nagedacht te worden over nieuwe, innovatieve mogelijkheden om **eerlijke, duurzame financiering voor koolstoflandbouw** vorm te geven in Vlaanderen.

We geven met deze roadmap de handvaten mee voor een publiek-private samenwerking en regelgevend kader op Vlaams niveau. De projectpartners zijn ervan overtuigd dat hiermee het zaadje voor een succesvolle koolstoflandbouw in Vlaanderen gezaaid is. Deze **roadmap is slechts een beginpunt**, en de komende jaren zal de Vlaamse landbouw de kansen van koolstoflandbouw moeten aangrijpen om een **win-win** te bekomen tussen **alle betrokken partijen**.

1 WHY A ROADMAP FOR CARBON FARMING?

The goal of the LIFE CarbonCounts research project is to support the upscaling of carbon farming in Flanders (Belgium). Simply put, the aim is to enable **widespread adoption of carbon farming practices by farmers**, leading to a win-win situation in terms of agricultural profitability, improved soil health and the agricultural sector's contribution to climate change mitigation, adaptation and other co-benefits.

This project has identified the conditions to be created to achieve that win-win situation, taking into account **the needs and concerns of all stakeholders** involved in the carbon farming ecosystem (**Figure 1**).

This roadmap explains how local stakeholders, starting from their own needs and concerns, can work together in **three networks** to create those conditions together, by suggesting the **main functions** of those networks and the **first actions to be taken**. We explain what types of collaboration are needed, why they are needed and how the networks should interact.

STAKEHOLDER	STAKEHOLDER DESCRIPTION
Farmers	Farmers with different perspectives towards carbon farming (pioneers, interested, critical, ...) and from different farm types (arable, animal husbandry, horticulture, ...)
Farmer organisations	Organisations which represent interests of farmers and represent the broader interests and challenges of the agricultural sector
Agricultural advisory services	Public and private advisory services which can both disseminate information about carbon farming to farmers but also provide feedback from farmers back to the navigation- and MRV networks
Governmental organisations	Policy makers and governmental agencies which develop and/or implement policy for various relevant domains (agriculture, environment, climate) and policy levels (national, regional, provincial, local)
Research institutes	Organisations which conduct research activities in support of and relevant (but not limited) to carbon farming (e.g. MRV development, socio-ecolomic factors, impact of practices).
Civil society	Organisations which represent societal interests (sustainability, environment, climate, biodiversity, food, ...)
Private organisations involved in the VCM	Organisations which are interested in buying and claiming project outcomes, as well as stakeholders who are active in the carbon farming ecosystem (e.g. carbon brokers, auditors, carbon farming scheme developers, ...)

Figure 1: **List and description of stakeholder types relevant to this roadmap for upscaling carbon farming in Flanders. Unless otherwise noted, the term "stakeholders" used in this roadmap refers to these stakeholder types.**

In this roadmap, we use a variety of terms necessary to discuss the future of carbon farming. In parallel with the preparation of this roadmap, the European Commission published a proposal for the certification of carbon removals (the CRC Regulation). For uniformity, we adopt the glossary used in the EU's proposal where possible, but because the scope of the CRC Regulation is wider than carbon farming, we provide **additional terminology** with focus to carbon farming. Terms in the roadmap that are further defined in the glossary are underlined when used the first time in this document and can be found in **Annex I**.

2 RESEARCH LEADING UP TO THE ROADMAP

At the start of the LIFE CarbonCounts project (September 2021) we conducted an **exploratory literature study** to get a grasp of the main concepts of carbon farming, the voluntary carbon market (VCM) and the functioning of carbon farming schemes. At the same time, we **identified and contacted stakeholders** who wanted to engage or were already committed to carbon farming in Flanders. We then conducted a **series of 22 interviews** on carbon farming, starting with these previously identified stakeholders and including new stakeholders by using snowball sampling. The interviews were processed through qualitative analysis with NVivo 12 software, resulting in an **overview of key themes** relevant for stakeholders to consider when addressing carbon farming in Flanders.

Based on this overview, we organised **two workshops with policymakers** to inform them about our initial findings and to begin to define the possible role that public administrations could play in enabling carbon farming in the region of Flanders (Belgium). In addition, a **workshop on monitoring, reporting and verification (MRV)** methodologies for carbon farming was conducted at ILVO to gather technical knowledge and expertise on this topic.

In the next phase, we compiled all the information from previous research steps and analysed a number of national (CLAIRE, Soil Capital, Koolstofboeren Beernem, Koolstofboeren-Koolstofbouwers) and international carbon farming schemes (e.g. Label Bas Carbone in France and Stichting Nationale Koolstofmarkt in the Netherlands) **in a system analysis**[1] (ILVO mededeling D/2022/08). The system analysis was sent to all interviewees, who were invited to provide their input and reflections. Additional to this round of feedback, we presented the system analysis of carbon farming to various audiences (such as national and international researchers, practitioners, agroecological movement), which resulted in a **constructive dialogue on the approach to carbon farming**.

In continuing preparation for this roadmap, we conducted a **survey and organised a concluding workshop** where all previously involved stakeholders were invited to discuss possible approaches and needs for governance, guiding principles, design of MRV methodologies, revenue streams and climate-related claims for carbon farming. Stakeholders were informed in detail about the Proposal for a Carbon Removal Certification (CRC) Regulation by the European Commission, launched just before the workshop (November 30 2022). The trajectory of the LIFE CarbonCounts is summarised in Figure 2.

Although the roadmap is one of the final deliverables of the LIFE CarbonCounts project, it is merely **the starting point for effective collaborative action** to further develop and upscale carbon farming in Flanders.

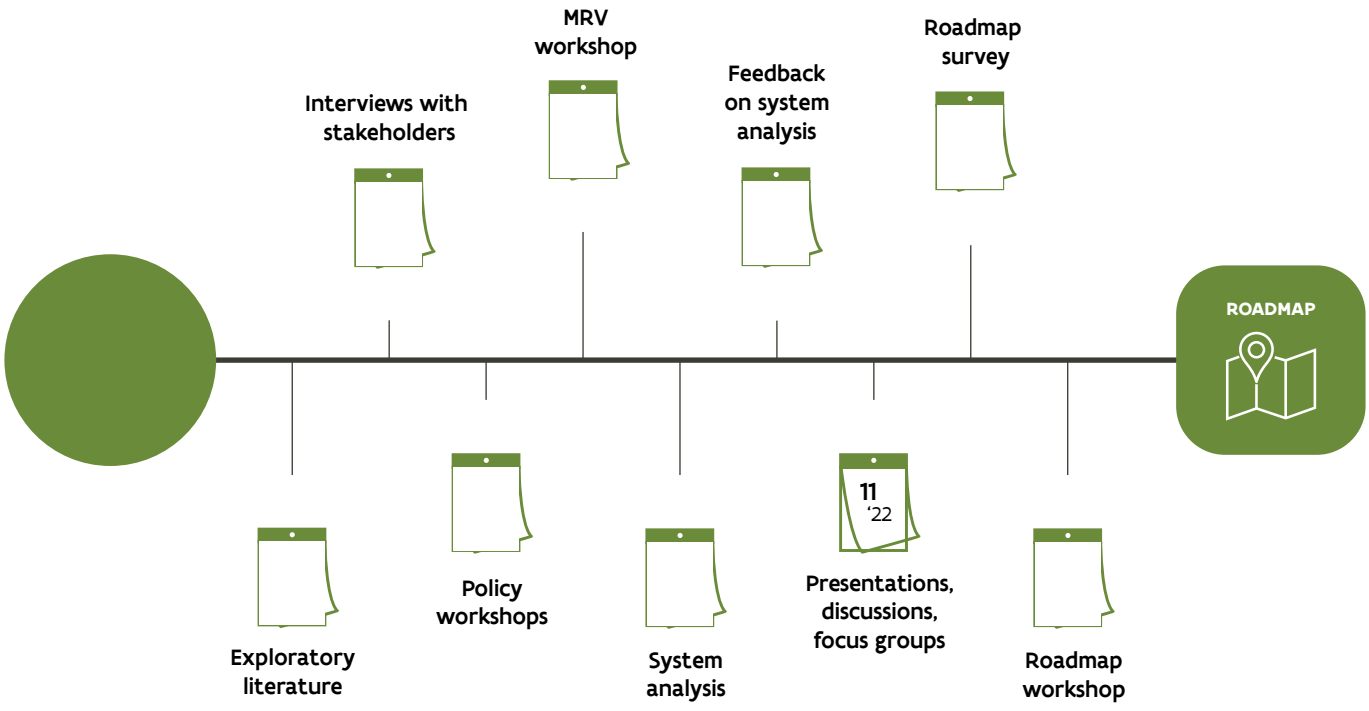


Figure 2: **Trajectory of the LIFE CarbonCounts project that led to this roadmap.**

1 Annys S., Facq E., Beirinckx S., Lemeire E., Ruysschaert G., 2022. A system analysis of carbon farming schemes in support of the wider implementation of carbon farming in Flanders (Belgium). Within the roadmap we will refer to this publication as ILVO mededeling D/2022/08.

3 CURRENT STATE OF CARBON FARMING IN FLANDERS

Carbon farming is not a uniquely revolutionary approach to farming. On the contrary, **most practices compatible with carbon farming** (e.g. agroforestry) **are already known to regional stakeholders** and are often promoted in organic or agroecological farming with the aim of erosion control, to improve soil quality, soil fertility, increase biodiversity, etc. Farmers show interest in making a positive contribution to climate change mitigation and co-benefits and wish to get rewarded for these efforts. On the other hand, because of established climate change mitigation and sustainability goals at the EU-level, there are interested stakeholders inside and outside the agri-food chain who are willing to purchase carbon certificates generated by certified carbon farming practices performed by farmers.

Although interest in carbon farming is high among various stakeholders in Flanders, and many practices are known, **knowledge on how to get started with carbon farming as a robust business model is limited in Flanders**. This is evidenced by the many questions on this subject received by ILVO and the Department of Agriculture and Fisheries over the past 2 years. Farmers, farmer organisations, private actors and civil society have many questions on what **guiding principles** to adhere to (e.g. regarding additionality of carbon farming practices and permanence of carbon stocks), how to accurately **monitor results of their projects, how to arrange carbon finance**. Farmers and farmer organisations also point out that they have little time to engage with carbon farming due to various current challenges they are facing within the agricultural sector, such as low food prices, the nitrogen crisis and access to agricultural land.

Despite this organisational knowledge gap and a lack of clear a regulatory framework to address a number of these questions, a small number of public and private carbon farming schemes are present and developing in Flanders. These organisations put significant effort in drafting carbon farming schemes in order to get started with the concept. At the same time, they request support to improve these schemes according to the latest scientific insights.

Meanwhile, policy makers at different levels are positioning **carbon farming as a strategic tool for the agricultural sector to contribute to climate change mitigation targets** (e.g. the Carbon Farming Initiative which is embedded in the EU's FitFor55 ambitions). Also in the Flemish Energy and Climate Plan 2021-2030, the Flemish coalition agreement 2019-2024 and accompanying policy notes, the potential of carbon farming is mentioned but no regulatory framework has yet been proposed. The recent EU proposal for CRC Regulation is a first step to organise the potential of carbon farming (and other carbon removal activities) to contribute to climate mitigation targets and create a win-win situation for farmers who want to be rewarded for accumulated or remained carbon stocks and stakeholders who aim to claim climate neutrality, while facilitating the transition to sustainable agriculture through improved soil health.

The current uncertainty of carbon farming (scheme) pioneers on governance structure and necessary rules proves the need for regulation to align the needs of different stakeholders. Governments aim for methods to achieve climate mitigation targets, companies are willing to buy carbon credits or certificates to make neutrality claims while farmers search for additional benefits and transition budget to improve soil health. To summarise, although there is high interest in carbon farming from different stakeholder groups, the motivations to engage with carbon farming varies greatly between them. These diverging motivations for carbon farming make it clear that we will have to take all these different needs and expectations into account in order to enable large uptake of carbon farming in Flanders.

4 DEFINING WAYS FORWARD FOR CARBON FARMING IN FLANDERS

To reach a common understanding of carbon farming among different stakeholders, we first defined the components of carbon farming and how these interact with each other in our system analysis (ILVO mededeling D/2022/08). We then used these components in communicating with stakeholders to understand their needs and concerns.

These needs and motivations raised by stakeholders define what approach could work best for enabling carbon farming in Flanders. The research done during LIFE CarbonCounts has captured essential input from stakeholders in a 'snapshot', meaning we have obtained perspectives and priorities on how stakeholders would like to approach carbon farming at this time. This initial 'snapshot' is valuable and has shaped this roadmap, but stakeholders might change their stance according to ongoing developments regarding carbon farming, such as the EU CRC regulation. Because of these dynamic processes going on in the carbon farming ecosystem, there is **need for continuous engagement** with stakeholders on this topic to frequently capture and discuss changing opinions and motivations. Different stakeholder groups need to be heard continuously and can be involved in various ways that they see fit:

Farmers representing different farm types (e.g. dairy or arable farming) can voice varying opinions and expectations towards carbon farming. They might be consulted or involved via focus groups, interviews or direct participation. **Farmer organisations** could structurally represent the interests of their members and translate the vision of the agricultural sector from a broader perspective. **Agricultural advisory services** can transfer (new) insights on carbon farming to farmers and in the other direction providing feedback on barriers and lessons learnt from practice towards the other stakeholders. **Governmental organisations** have a vested interest in enabling the success of carbon farming in order to reach a set of policy goals related to climate change mitigation, and could play a vital role in facilitating and coordinating other stakeholders. In addition, they can create new policies, adapt existing policies and ensure synergy with related policies of other domains. **Research institutions** can improve their efficiency by coordinating research while also providing scientific integrity in the regional approach to carbon farming. **Civil society** organisations can point out opportunities and concerns regarding the intersection of carbon farming and various societal interests. **Private organisations involved in the voluntary carbon market (VCM)** can share their conditions for providing (more) carbon finance, provide feedback from farmers participating in carbon farming schemes, and voice their needs for improving carbon farming schemes and the carbon farming regulation.

5 HOW TO USE THE ROADMAP

The purpose of this roadmap is to show how stakeholders can proceed with joint efforts to upscale carbon farming in Flanders. Based on the stakeholders' needs, concerns and expectations, as well as research insights from the system analysis an various workshops, we have compiled a list of **actions** and **functions** to be performed:

1. By **functions**, we refer to **continuous role** that has to be fulfilled (e.g. continuously function as a central point of contact for carbon farming related questions)

2. By **actions**, we refer to **specific to do's with clear outputs** (e.g. set up a governance structure)

These actions and functions can be **grouped in three areas of collaboration on the topic of carbon farming**:

1. A **navigation network**, to act as ambassador for Flemish carbon farming, to coordinate and connect stakeholders and the other networks, to discuss the questions and needs of the different stakeholders and decide on the steps to be taken (and by whom), to address these, to monitor, communicate and discuss developments on the EU CRC regulation and on climate-related claims using carbon farming.

2. An **MRV network**, to function as a knowledge hub on the impacts of carbon farming practices (carbon sequestration, co-benefits and trade-offs), the feasibility for adoption and on the building blocks for developing MRV systems (a.o. models, data infrastructure, tools, measuring protocols, quantification methods) while also collaboratively and continuously improving the local knowledge base for MRV methodologies.

3. A **financing network** to evaluate the impact of design choices in carbon farming schemes on the distribution of risk and revenue between farmers, carbon farming scheme developers and financing parties, to create innovative financial solutions in support of the voluntary carbon market and to monitor developments within the voluntary carbon market to provide feedback to the navigation network.

These networks are complementary, meaning that all three are needed to successfully upscale carbon farming in Flanders. Establishing only one or two networks will lead to undesirable results and fail to realize the many positive benefits that carbon farming could bring to the Flemish agricultural sector.

These networks are to some extent interdependent, meaning that the decisions made in one network will affect the others and multiple aspect will need to be addressed simultaneously in the individual networks. For example, a strategic decision in the navigation network may affect some decisions to be made in the MRV- and financing networks.

These networks can build on existing cooperation structures between stakeholders, which means that we are not necessarily proposing to create completely new networks, but rather to strengthen and connect existing networks in Flanders with a clear governance structure. As previously mentioned, carbon farming as a business model is a novel approach, yet not using a completely new set of practices. Many private and public stakeholders are working on relevant topics. **The key challenge is to pool together this ongoing work and to establish new initiatives in order to seize the promising momentum of carbon farming**. Drawing from the raised needs and concerns we propose the following assignment of stakeholder types to the navigation-, MRV- and financing networks (Figure 3). This proposal is not conclusive. For instance, pilot farmers can also provide monitoring plots to validate the MRV-system and researchers might be interested to study the financial system in carbon farming schemes.

STAKEHOLDER	NAVIGATION	MRV	FINANCING
Farmers	✓		
Farmer organisations	✓	✓	✓
Agricultural advisory services	✓	✓	
Governmental organisations	✓	✓	✓
Research institutes	✓	✓	
Civil society	✓		
Private organisations involved in the VCM	✓		✓

Figure 3: **List of stakeholder types relevant to this roadmap for upscaling carbon farming in Flanders and assignment of stakeholder types to the proposed networks.**

Below we describe, in detail, why each network should be maintained and what actions and functions are necessary. In order to illustrate how the proper and improper functioning of the networks would affect the stakeholder types involved. we define the **ideal outcomes and possible pitfalls** associated with each network:

1. **Ideal outcomes** illustrate what stakeholders might say when the functions and actions are being performed to expectations.

2. **Possible pitfalls** illustrate what stakeholders might say when the functions and actions are not being performed to expectations.

6 NAVIGATION NETWORK

WHY

In the early stages of the research process, stakeholders (especially private actors, farmer organisations and farmers) have communicated their need for organisations with a clear mandate (government or other) to **level the playing field by ensuring that common rules for carbon farming** are applied to all stakeholders, while simultaneously respecting the autonomy of private actors and the voluntary nature of the carbon market. During the LIFE CarbonCounts project, we have engaged policy makers and other stakeholders to formulate what rules would be needed, and how they could be implemented.

In the meantime, on 30 November 2022, the European Commission has launched a **number of principles and criteria in a proposal for a Carbon Removal Certification (CRC) Regulation** which also aims to achieve this level playing field. There is a need to harmonize our regional efforts and the efforts of the European Commission by representing the Flemish perspective and priorities regarding carbon farming towards the European Commission and by communicating the developments at the European level to local stakeholders.

During interviews and workshops, stakeholders have expressed their need to **co-create a clear and robust long term vision (or narrative) on carbon farming**. For example, farmers and farmer organisations express mistrust towards the Flemish government because historical and current agricultural policy decisions failed to provide legal certainty. The willingness of farmers to engage with carbon farming will hinge on whether the proposed Flemish approach to carbon farming is clearly advantageous to farmers and provide legal certainty on the long term. Civil society organisations such as agroecological movements raise concerns regarding the limitations of the voluntary carbon market to address complex issues about sustainability in the agricultural sector. Private actors such as carbon farming scheme developers are concerned about how policy decisions might influence their revenue model in developing a carbon farming ecosystem.

We propose the creation of a **'navigation network'**. The idea is to give a **clear mandate for one or more (governmental) organisations to coordinate regional decisions, inspire policy preparation on carbon farming and function as a facilitator** for upscaling carbon farming in Flanders. In summary, the navigation network is asked to address those issues which would be difficult or impossible for private actors and farmers to handle individually, because this would be too expensive, or the solutions required can only be drafted at the policy level. Examples include: i) formulating clear rules for the guiding principles of carbon farming in Flanders, ii) tackling current laws and policies which hinder the goals of carbon farming, iii) coordinating sources of public funding (e.g. CAP) and private financing mechanisms for carbon farming. In the "What"-section below we give a more elaborate list of functions and actions for the navigation network.

WHAT

As a **1st** function - **Connecting with the EU level**

The navigation network should be ambassador for carbon farming and make a bridge between regional stakeholders and the national and European levels, conveying regional expectations and concerns and support the translation of European regulations to the national and regional level.

As a **2nd** function - **Coordinating and connecting stakeholders within the region**

The navigation network keeps an **overview of the different carbon farming initiatives in Flanders and connects all local stakeholder groups**. The network leader is responsible for collecting all questions, concerns, experienced barriers and lessons learnt and **translating these into actions** to be collectively addressed by a subset of stakeholders and/or the right policy level. By coordinating and combining knowledge from all networks, the navigation network can become a **practical knowledge hub**. The network will also connect with ongoing initiatives and project based funding (e.g. eco-schemes on carbon farming in the common agricultural policy, Soil Mission projects such as MaRViC, SOILVALUES and CREDIBLE) that can feed the network with new knowledge and insights and can assist in some identified tasks when matching the scope of these projects.

As a **3rd** function - **Connecting with carbon farming in practice through advisory services**

Farmers who engage with carbon farming will need regular advice on the implementation of various practices in diverse circumstances. **The navigation network needs to collaborate with organisations and initiatives providing advisory services (on carbon farming practices) and inform them on relevant developments regarding carbon farming**. Also in the other direction advisory services can bring practical experiences and concerns to the network. Stakeholders involved in LIFE CarbonCounts have indicated their appreciation for different advisory services, but have expressed concerns about whether or not involved organisations have secure financing in the long-term. Additionally, there are opportunities for linking with initiatives providing advisory services related to carbon farming practices, such as the Climate Farm Demo project which includes Climate Farm Advisors.

As a **4th** function - **Tracking developments on climate-related claims and public registries**

The **demand for carbon removals and avoided emissions** is directly related to the benefit these provide to financing parties. These financing parties indicate they are mostly interested in making climate-related claims (e.g. climate neutrality) by purchasing project outcomes. Because of their capacity to shape the voluntary carbon market, **the navigation network needs to monitor developments affecting these claims**, such as the upcoming Green Claims Initiative and the Corporate Sustainability Reporting Directive (CSRD). The navigation network should furthermore investigate the characteristics of **insetting schemes**, where carbon farming outcomes are purchased within the agri-food chain, to investigate its compatibility with the voluntary carbon market. A more elaborate strategic consideration on the matter of insetting is provided in Annex II.

Closely tied to developments on climate-related claims are the arrangements to be made regarding public registries. These databases will be used to register and track carbon removal units (and potentially other project outcomes such as co-benefits) from various carbon farming schemes. The CRC Regulation has put forward some guidelines on how a **public registry** should function (automated and inter-operable), but questions remain on which design choices will be required. For example, how will we indicate which project outcomes are sold and used in a climate-related claim? How will financing parties be informed when their carbon removal units expire? **The navigation network needs to monitor developments regarding public registries and advise regional stakeholders on how to proceed on this topic.** Options include building a single interoperable public registry at the Flemish level, asking the European Commission to provide a registry, leaving things up to the private actors (carbon farming scheme developers). Another aspect of importance is the possibility of linking such a public registry with the regional (or national) climate accounting.

As a **1st** action - **Establishing a governance structure and structural financing**

The navigation network needs to establish **a governance structure to determine their own functioning**, as well as the **coordination with the MRV- and financial networks**. This structure should have a coordination body (existing organisation or new body) which is recognised, has a clear mandate, receives structural funding for this task and will facilitate the network's functioning. The governance structure should include a vision and mission statement, a documented process by which decisions will be made and by which decisions will be communicated to all relevant stakeholders, the process by which the navigation network will coordinate with the MRV- and financial networks, the initial list of stakeholders who will participate in the navigation network, and how to on-board new stakeholders.

As a **2nd** action - **Building a narrative**

The navigation network needs to co-create a narrative on carbon farming in Flanders which is shared by stakeholders and in line with the vision and mission statement. Based on the input from stakeholders, insights from the system analysis and our take regarding ongoing developments at the European level, we propose the following foundational principles: i) Carbon farming as an instrument for the compensation of GHG emissions by financing parties is always secondary to those financing parties achieving emission reductions in their activities; ii) The success of carbon farming is typically expressed as the climate mitigation impact. However, the importance of achieving various co-benefits, including soil health and climate adaptation, should be underlined whenever possible; iii) Financial resources generated by carbon farming should serve primarily to support transition processes at the farm level which the farmer would be interested in regardless of the carbon finance. It should not be used as temporary financial support for practices in which the farmer has no interest in continuing after the carbon financing has ended. Because in that case, long-term benefits won't be reached and previously sold project outcomes will be lost.

As a **3rd** action - **Developing a positive list**

Building on this narrative for carbon farming, the navigation network needs to clarify how to deal with **additionality, long-term carbon storage, avoided emissions, carbon leakage and sustainability criteria** within Flanders. The CRC Regulation is a good first step towards a harmonized approach, but stakeholders expect a pragmatic approach to these principles. We recommend publishing a **positive list of carbon farming practices** combined with considerations on regional baselines used to define project outcomes. This list should be based on the combination of the climate mitigation potential as well as the potential for co-benefits, e.g. contributing to other regional sustainability challenges such as water storage, nitrate leaching, biodiversity and soil erosion. **This action will require close collaboration with the MRV network.**

In a first iteration, the positive list can be enhanced with feedback from stakeholders (e.g., farmers, advisors and researchers) on practical difficulties in implementing these carbon farming practices and suggestions for adding more practices. Once sufficient data are available, **the financing network can be engaged to conduct a cost-benefit analysis of the included carbon farming practices**.

An issue of utmost important to address by the navigation network is to **foster collaboration with pioneer farmers and tackle the first mover disadvantage**. These issues are discussed in detail in Annex II.

As a **4th** action - **Providing clarity on combing public funding with private carbon finance**

Stakeholders have requested clarity on the possible combination of public funding and private carbon farming schemes. The navigation network needs to formulate a clear statement on this issue. We recommend the following rule-of-thumb: "If the public funding source does not directly finance the climate mitigation effect of the carbon farming practice, it can be combined with private financing from a carbon farming scheme because the mitigation impact is only sold once." More considerations on this matter are provided in Annex II.

The navigation network is led by an organisation with a clear mandate, is known and trusted by stakeholders, and acts as a knowledge hub and communication platform for carbon farming. The shared vision and positive list are published, and are the starting point for the effective upscaling of carbon farming in Flanders. Continuity in facilitation between networks and provision of advisory services on carbon farming practices and policies is ensured in the long term.

The navigation network is incomplete and does not function effectively due to lack of mandate or an unclear governance structure. The narrative, vision and initiatives on carbon farming are fragmented and non-transparent, leading to mistrust and misunderstanding. Stakeholders don't find common ground between their own goals and the ongoing initiatives supporting carbon farming. Knowledge is developed without coordination, causing all networks to waste their efforts. The lack of clarity leads to a lack of action by private sector entrepreneurs and cause Flanders to lag behind international developments within Europe.

7 MRV NETWORK (MONITORING, REPORTING AND VERIFICATION)

WHY

In order to create trust in the carbon farming ecosystem, all stakeholders involved in the roadmap process have communicated a need to have sufficient certainty that **project outcomes** are **quantified accurately and are comparable between carbon farming schemes**. However, the idea of what constitutes sufficiently accurate monitoring differs among stakeholders. Farmers have indicated that a basic level of accuracy is sufficient in order to reduce costs and administrative burden, while policy makers, civil society, developers of carbon farming scheme and financing parties request a higher level of accuracy to avoid greenwashing or to be able to report project outcomes in greenhouse gas emission inventories.

The CRC Regulation proposal has put forward conceptual **criteria on quantification, additionality, long-term storage and sustainability of carbon farming**. These criteria will be further elaborated over the coming years at the European level. However, as pedoclimatic and farming conditions, as well as digital solutions and data-infrastructure, vary greatly across Europe, specific methodologies will have to rely on a local knowledge base derived from local experiments and monitoring infrastructure and will have to be adapted to the local context of farming and data availability.

In order to develop context-specific MRV methodologies that are scientifically sound, have an optimal cost-accuracy balance and cause a minimum of administrative burden, **different building blocks** need to be put in place that also need to be connected in smart way to form a regional knowledge base. These building blocks include: 1) **controlled field experiments** on research stations and at pilot farms to understand the impact of carbon farming practices on soil carbon, biomass carbon, co-benefits and trade-offs (such as N_2O emissions) , 2) calibrated and validated **carbon models**, 3) the necessary **inputs to feed (carbon) models** such as information on soil type, initial carbon contents and soil management, 4) **remote sensing products** with support of ground truthing data that can serve several purposes such as more accurate carbon inputs by crops when combined with crop growth models, 5) a **regional validation network of plots** to verify the accuracies of the used monitoring methodologies and check if modification to models or assumptions are needed. For example, the effects of climate change might over time cause an over- or underestimation of carbon sequestration if models are not updated.

When it comes to costs we need to distinguish between costs to develop a MRV system (development costs) and costs to conduct the MRV for a specific project (implementation costs). **Collaboration to develop the regional knowledge base** (see building blocks above) and regularly update and improve this, when new knowledge comes in or farmers want to include new practices, **will reduce costs for MRV methodology development**. A **data-infrastructure** that connects already existing data and the use of remote sensing solutions **will reduce administrative burden for farmers as well as MRV implementation cost for a carbon farming project**.

Apart from the need for accurate monitoring in support of the voluntary carbon farming market, authorities also need to monitor at the regional level whether the **targets set in the LULUCF sector** (Land Use, Land Use Change and Forestry) are met. There is need to integrate the LULUCF target monitoring efforts with the efforts concerning carbon farming upscaling.

When it comes to **reporting and verification**, financing parties and policy makers have expressed their need for reliable reporting of project outcomes to **avoid double-counting and -financing**, as well as their need for **clarity on** how **third party verification** might occur. At the Flemish level, there is a need to determine how we will **design and operate public registries**, as proposed by the CRC Regulation.

Addressing these issues will require an **MRV network**, i.e. a **collaboration between researchers, policy makers, carbon farming scheme developers and advisors which should develop and organize the regional knowledge system for MRV methodologies**. These methodologies should balance costs of implementation with the desired level of accuracy while minimizing administrative burdens for farmers. While researchers and policy makers develop a scientifically sound knowledge base and a system for continuous improvements, carbon farming scheme developers and advisors can provide input on the feasibility for application in practice.

WHAT

As a **1st** function - **Creating a knowledge hub**

The MRV network needs to serve as a **knowledge hub** on the technical aspect of carbon farming, such as the impact of practices on carbon sequestration, co-benefits, trade-offs, models, data infrastructure, tools, measuring protocols, quantification methods and regional baselines. This knowledge can be disseminated to stakeholders through reports, dedicated courses and/or webinars in order to **support new and ongoing initiatives in the Flemish carbon farming ecosystem**. In addition, the MRV network needs to keep track of the development of certification methodologies under the CRC Regulation and **make recommendations on how to adapt local methodologies (public or private) towards compliance with the EU requirements, while also communicating local experiences towards the European policy level**.

As a **2nd** function - **Developing and continuously improving the knowledge base**

The MRV network needs to **establish a collaborative system to develop and facilitate the continuous improvement of the MRV building blocks and develop ways to connect them**. This includes harmonising data collection, making data interoperable and reusable for knowledge development, creating data connections (APIs) and a data infrastructure (in respect with GDPR principles) and providing access to models and tools (using open access or an appropriate license) to any public and private schemes. The network should guarantee the **scientific robustness of the developed MRV building blocks by organising a transparent review and documentation process**.

As a **1st** action - **Creating a positive list and regional baseline**

The MRV network needs to deliver the necessary scientific evidence to define, together with the navigation network, a **positive list of carbon farming practices** taking into account the impact of these practices on carbon sequestration, co-benefits, trade-offs and current adoption rates. The MRV network should also help to develop a **sound methodology to set reference values for a regional baseline**.

As a **2nd** action - **Identifying knowledge gaps**

The MRV network needs to **identify knowledge gaps which are hindering the development of robust MRV methodologies**. For example, uncertainty regarding the impact of promising practices with limited field evidence, the improvement of input data for models (e.g. data on carbon input by crops), the accuracy of models and sampling strategies, the potential for valorisation of avoided emissions within Flanders, etc.

As a **3rd** action - **Harmonizing protocols and formulating a collective approach to gathering experimental data in support of carbon farming**

The MRV network needs to **harmonise protocols** for collecting and storing evidence from experiments and on-farm monitoring networks in support of developing and validating the MRV building blocks and to jointly improve open source models. This includes guidance for establishing experiments and monitoring plots, soil and crop sampling protocols, data templates and databases to collect management practices on these sites. **The goal is to have a collective approach between all interested parties** (researchers, private actors, farmers, farm advisors, etc) **in gathering experimental data in support of carbon farming**.

! As a **4th** action - **Coordinating practical research in support of carbon farming**

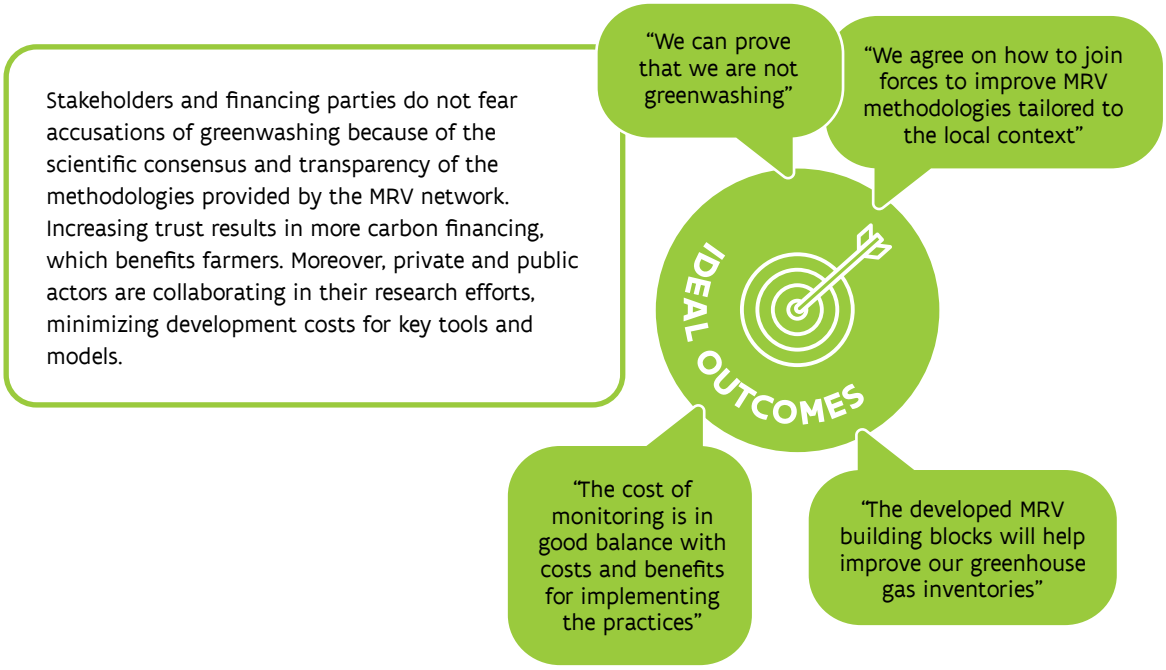
The MRV network needs to **coordinate research on the cost-effective implementation of known carbon farming practices and the potential of experimental and promising carbon farming practices**. We do not propose the members of the MRV network single-handedly design and implement all required research efforts, rather that the members of the MRV network are likely involved in a diversity of research projects and carbon farming schemes which enables them to coordinate and synergise their efforts. For example, a research project is engaging with 10 farmers in order to investigate the impact of a certain crop rotation in soils with low initial soil organic carbon (SOC). Another research project might be interested in calibrating their model for the calculation of SOC by using the measurement data generated. A carbon farming scheme developer might be interested in the cost of implementation for this crop rotation, or the opinion of farmers regarding the carbon finance they are receiving.

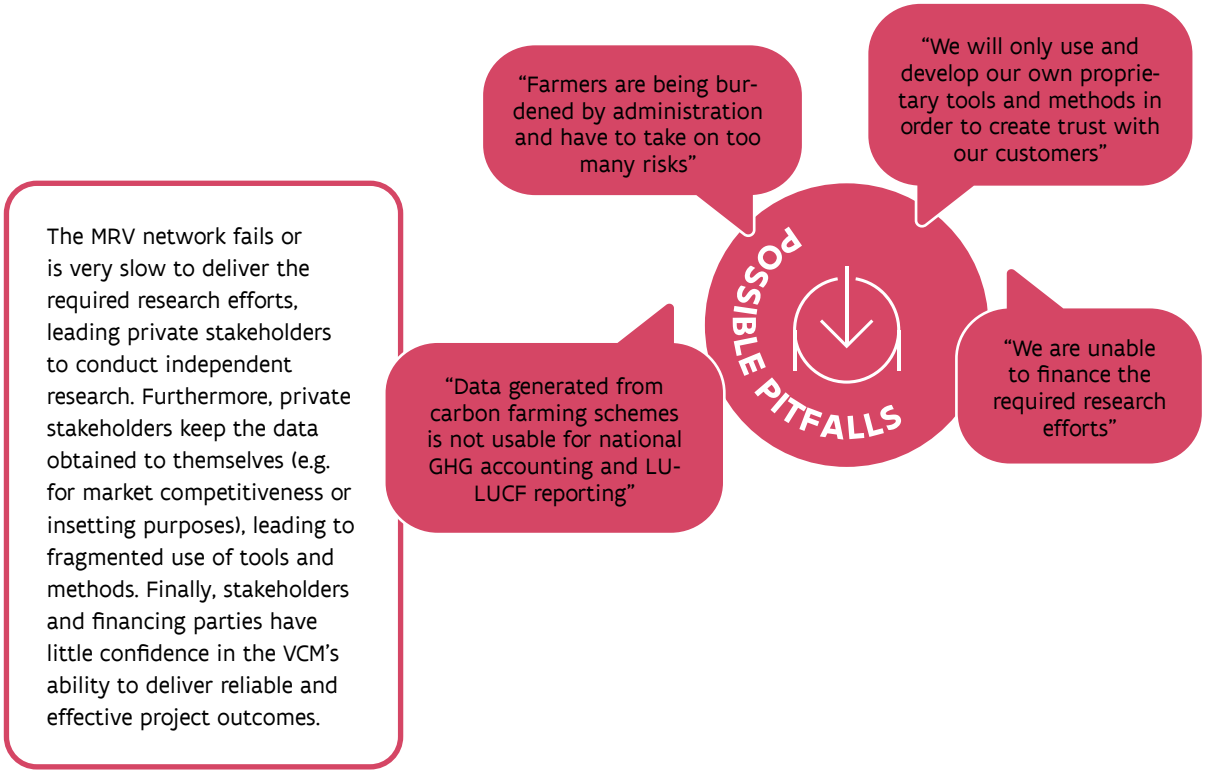
We propose combining research efforts to simultaneously investigate the practical, technical and financial aspects which would occur in a fully functioning carbon farming scheme. The practical aspect includes how to implement the carbon farming practice and how the farmer experiences this change with regard to their farm operation. The technical aspect includes how and when to take measurements in the field, optimizing and calibrating models, the application of remote sensing technology, etc. The financial aspect includes the potential revenue from carbon finance, costs of implementing the practice, cost of monitoring and the farmer's perspective on the potential revenue and costs. Additionally, efforts could be made for knowledge sharing of preliminary results during the research project itself (e.g. using the concept of Living Labs).

The advantage of this approach is the fact that **the feasibility for application of the proposed MRV methodology within a carbon farming scheme is tested in real-world conditions**. This way any incompatibilities between the various aspects of carbon farming (practical, technical, financial) might be identified and corrected during or after the testing phase. For example, monitoring costs could be too high relatively to potential revenues, practical knowledge for efficient implementation of farming techniques could be lacking, the timing of costs for farmers and receiving the carbon finance could be mismatched, etc.

While the main goal for this coordination is improving the efficiency of research efforts, there is also a concern that too many stakeholders would be "fishing in the same pond". As researchers and policy makers are putting significant effort in upscaling carbon farming, demands on farmers to engage with research and experiments will be increased. In a smaller regions such as Flanders, the amount of willing farmers will be limited, increasing the importance of coordination and combining efforts on the same farms. At the same time, farmers are often not rewarded (properly) for their engagements with research. The MRV network needs to make agreements on how to improve this situation, such as incorporating monitoring costs in research budgets, while allowing carbon finance to go to the participating farmers.

The MRV network needs to prioritize which MRV methodologies and associated carbon farming practices will be tested under what range of conditions within Flanders (e.g. soil type, land use type). This can be based on the knowledge gaps which will be identified by this network, the climate mitigation potential of carbon farming practices, the potential for quick adoption within Flanders, the potential of carbon farming practices to address local issues through co-benefits (e.g. erosion, water quality, climate adaptation, ….) and/or the intentions of the European Commission and the expert group on carbon removals on how to develop and publish their certification methodologies.


Stakeholders and financing parties do not fear accusations of greenwashing because of the scientific consensus and transparency of the methodologies provided by the MRV network. Increasing trust results in more carbon financing, which benefits farmers. Moreover, private and public actors are collaborating in their research efforts, minimizing development costs for key tools and models.
"We can prove that we are not greenwashing"
"We agree on how to join forces to improve MRV methodologies tailored to the local context"
IDEAL OUTCOMES
"The cost of monitoring is in good balance with costs and benefits for implementing the practices"
"The developed MRV building blocks will help improve our greenhouse gas inventories"


The MRV network fails or is very slow to deliver the required research efforts, leading private stakeholders to conduct independent research. Furthermore, private stakeholders keep the data obtained to themselves (e.g. for market competitiveness or insetting purposes), leading to fragmented use of tools and methods. Finally, stakeholders and financing parties have little confidence in the VCM's ability to deliver reliable and effective project outcomes.
"Farmers are being burdened by administration and have to take on too many risks"
"We will only use and develop our own proprietary tools and methods in order to create trust with our customers"
POSSIBLE PITFALLS
"Data generated from carbon farming schemes is not usable for national GHG accounting and LU-LUCF reporting"
"We are unable to finance the required research efforts"


MRV

8 FINANCING NETWORK

WHY

The upscaling of carbon farming ultimately depends on farmers wanting to engage with carbon farming schemes and implement carbon farming practices. In the research process leading up to this roadmap, we learned that it is essential to **develop carbon farming schemes with a fair balance of costs, benefits and risks** shared between financing parties and farmers. If farmers feel like they are achieving enough benefits while not taking on too much risk and costs, they are more likely to engage with carbon farming schemes in the long term. Despite its importance, this issue is often overshadowed by other challenges within carbon farming, which is why we propose a separate financing network. **The main function** is to **review decisions in the navigation- and MRV networks** regarding the financial aspect of carbon farming schemes, and, where necessary, to formulate recommendations and solutions to **ensure these schemes remain profitable and interesting for farmers**.

In addition, the research process revealed that pilot projects and developing carbon farming schemes within Flanders currently make experimental and pragmatic decisions on how to: i) **pay for monitoring** (e.g. sampling costs), **reporting** (e.g. management of a database) and **verification** (e.g. third party audit); ii) **distribute carbon financing over the project lifetime**, iii) **design and operate liability mechanisms** and iv) **set an appropriate price** for carbon financing per specific carbon farming practice. Private actors are asking for data and research to improve these early design decisions.

Furthermore, we have identified a **preference from financing parties and the European Commission** for carbon farming schemes that arrange **payments based on obtained results** in order to minimize possible greenwashing accusations. In contrast, **farmers** have indicated a **preference for schemes offering guaranteed and up-front payments** because this gives them clarity and certainty. There is a need for **financial innovations** that **help to bridge the time gap** between when farmers could be paid and when costs are incurred.

In the system analysis report, we show that **different types of private actors can work side by side to fill niches in the regional voluntary carbon market** (e.g. carbon brokers, developers of carbon farming schemes, third party auditors, advisory services,). Because diverse knowledge is needed to manage the various aspects of carbon farming, we can assume that a **diversity of organizations will improve the efficiency of the entire carbon farming ecosystem**. For example, one carbon farming scheme could specialize in crop rotations and soil amendments, whilst another might specialize in paludiculture and agroforestry. Likewise, third-party auditors could specialize in auditing certain types of carbon farming schemes. To achieve this, the **financing network should support developing start-ups within Flanders, and enable new start-ups**.

Addressing these issues will require a **financing network**, i.e. **a collaboration between stakeholders with knowledge of and/or influence on the profitability of farming activities and carbon farming schemes**, such as governmental organisations, farmer organisations and private actors involved in the voluntary carbon market, possibly assisted by economic experts.

WHAT

As a **1st** function - **Evaluating design choices in carbon farming schemes**

The financing network needs to evaluate design choices in carbon farming schemes with the aim of covering all running costs (e.g. implementation costs and hidden costs such as time spent for farmers to learn new practices) and still **make carbon farming schemes as attractive as possible for both farmers, carbon farming scheme developers and financing parties.**

As a **2nd** function - **Develop innovative financial solutions**

There are opportunities to address the shortcomings of the revenue model for carbon farming by creating innovative financial solutions that remove risks away from farmers (e.g. self-repaying loans to finance up-front costs in result-based carbon farming schemes). **The financing network should explore these opportunities and connect interested parties while supporting start-ups that step into the carbon farming ecosystem.**

As a **3rd** function - **Monitor developments relevant to the voluntary carbon market**

The financing network should continuously monitor developments in the voluntary carbon market and periodically advise the navigation network on relevant issues. To this end, we propose the following topics to focus on:

Impact of liability mechanisms on carbon farming scheme revenue

All liability mechanisms imply a reduction in farmers' income (e.g. by withholding carbon certificates in buffer pools). It is expected that the European Commission Expert group will propose liability mechanisms in the upcoming certification methodologies. **The financing network should express its views on these proposals to the navigation network, which can then incorporate this feedback.**

Obligations for financing parties

Farmers and other stakeholders have expressed a strong preference for financing parties to reduce their own emissions before compensating emissions through carbon farming. **The financing network should decide whether rules in this regard are desirable. If so, the network should negotiate the minimal ambition for a reduction pathway** with financing parties (e.g. in line with the Science Based Target Initiative).

Costs of advisory services and auditors

The revenue model for advisors and audit services in carbon farming is straightforward. They perform support services and are paid for them. However, farmers are essential to the success of the entire system, and the cost of advisory and audit services can put pressure on their carbon farming revenues. **Thus, the financing network must ensure that carbon farming doesn't benefit consultants and auditors to the disadvantage of farmers.**

Financial incentives in insetting schemes

The main method of carbon financing in the voluntary carbon market is through carbon certificates, carbon removal units, etc. However, insetting schemes do not need to go to the voluntary carbon market because they are directly linked to farmers. This allows insetting schemes to create their own methods of rewarding farmers for project outcomes, such as paying a premium for their food products or offering free advisory services. **The financing network should examine the financing systems of insetting schemes and take action if and where farmers might be disadvantaged as a result.**


We are confident in telling farmers they will be properly rewarded for their efforts
The financing network provides all stakeholders with essential data and advice on the economic dimension of carbon farming, refining the design of carbon farming scheme to ensure that costs, benefits and risks are fairly distributed among participants. This leads to positive experiences for farmers, making them more likely to participate in carbon farming schemes in the long term.
IDEAL OUTCOMES
We are happy to finetune our scheme designs according to the insights delivered
We are happy to reach our policy goals while also helping to make carbon farming an interesting and fair opportunity for farmers
Profits from carbon farming go primarily to advisors, auditors and other carbon farming service providers rather than to farmers. The true costs of implementing carbon farming practices are not accurately assessed and the risks (e.g. loss of carbon storage due to extreme weather events) are placed disproportionally on farmers' shoulders, leading to disappointing outcomes for them. These negative experiences propagate among farmers, making them uninterested in carbon farming schemes.
We are accused of supporting a system which locks farmer in long term engagements which are not profitable for them
POSSIBLE PITFALLS
We are unable to create a good revenue model, and can't continue our carbon farming scheme
Because we were too focussed on our own priorities, we forgot that farmers are the drivers for carbon farming.


FINANCING

9 LET'S GET STARTED

Stakeholders agree that a clear mandate for one or more organisations to lead and facilitate the regional approach to carbon farming would be highly beneficial. Using this mandate, this organisation can take up their role in establishing and driving the navigation network by setting up a governance structure which clarifies how stakeholders will participate in making decisions.

Next, the navigation network should draft a brief and clear mission statement which clarifies the narrative for carbon farming in Flanders. This can build on insights gained through LIFE CarbonCounts and the growing knowledge of stakeholders on this topic.

After that, the navigation network needs to enable stakeholders to get started with carbon farming by providing a practical approach to quantification, additionality, long-term carbon storage and sustainability criteria. This will require the establishment and coordination (using the governance structure) of the MRV and financing networks in order to develop the positive list and improve the coordination of (research) efforts in support of carbon farming.

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ANNEX I: GLOSSARY

ENG	NL	Definition
Additionality	**Additionaliteit**	Practices that lead to carbon removals should go beyond the standard practice and should thus be additional. These practices would not have occurred under the regional baseline, that reflects the statutory and market conditions in which the carbon farming activity takes place. If a carbon removal activity is imposed upon operators by the applicable law, or it does not need any incentives to take place, its performance will be reflected in the baseline. For this reason, a carbon removal activity that generates carbon removals in excess of such a baseline should be presumed to be additional.
Carbon farming	**Koolstoflandbouw**	The implementation of practices related to agricultural land management that result in the increase of carbon storage in living (woody) biomass, dead organic matter and soils by enhancing carbon capture (= carbon removals) and/or reducing the release of carbon to the atmosphere (= avoided emissions), as well as achieving co-benefits (CRC Regulation, with modifications by the authors on avoided emissions).
Carbon farming practice	**Koolstoflandbouw-praktijk**	Practices related to agricultural land management that comply with the intentions of carbon farming (see definition of carbon farming above). These include 'carbon removal activities' as defined by the CRC Regulation, but also includes practices that achieve avoided emissions.
Carbon farming scheme	**Koolstoflandbouw-systeem**	A carbon farming scheme sets out the rules and requirements for carbon farming projects, enabling the valorisation of implemented carbon farming practices. Central to carbon farming schemes are the governance system and carbon farming methodologies. A carbon farming scheme might operate several carbon farming projects using several carbon farming methodologies.
Carbon leakage	**Koolstofverlies**	Carbon leakage are the (unintended) GHG emissions due to trade-offs (e.g. increased fertilisation/tillage/erosion). These carbon leakages can occur within as well as outside the action area of the carbon farming project. As a result, the climate mitigation effect of the project is reduced. In extreme cases, the project even may cause a net increase in GHG emissions due to local or non-local forms of carbon leakage.
Co-benefits	**Geassocieerde voordelen**	In the context of carbon farming, performance is usually measured by climate mitigation. However, carbon farming can contribute to provisioning, regulating, supporting and cultural ecosystem services, which are thus denoted as co-benefits of carbon farming.
CRC Regulation	**CRC Regulatie**	The proposal for a Carbon Removal Certification (CRC) regulation establishes a certification framework for carbon removals within the European Union. The proposal for framework and regulation was published on 30.11.2022 by the European Commission and has not yet been ratified at the time of publication of this roadmap.
Insetting	**Insetting**	Insetting occurs when project outcomes are purchased by agri-food companies (partners within the value chain), which aim to reduce their scope 3 emissions and/or to increase the climate adaptability of their supply chain. This mostly occurs through the payment of price premiums to farmers (a higher price per production unit), rather than through the payment for carbon certificates/ credits.

Liability mechanisms	**Systemen voor risicobeheer**	Liability mechanisms are arrangements which ensure that climate-related claims made by financing parties are still valid when the financed project outcomes are lost (e.g. loss of stored carbon and associated co-benefits). Most mechanisms do so by maintaining a steady reserve of unsold and unclaimed carbon certificates/carbon units. at the level of the carbon farming scheme (buffer pool of projects within the scheme) or above that (e.g. carbon brokers managing a buffer pool of projects from multiple carbon farming schemes).
Net Carbon Removal benefit & Net Avoided Emission benefit	**Netto koolstofverwijdering & Netto vermeden emissies**	A carbon farming practice delivers a net carbon removal benefit when the carbon removals above the regional baseline outweigh any carbon leakage. For carbon farming, avoided emissions are also considered. Thus a net avoided emission benefit is obtained when the reduction in emissions of carbon from agricultural carbon pools to the atmosphere outweighs any increase in GHG emissions due to the implementation of the carbon farming practice (CRC regulation, with modifications by the authors on avoided emissions).
Pioneer farmer	**Pionierlandbouwer**	Pioneer farmers or 'first-movers' are defined as land managers who have been implementing carbon farming practices for some time and can demonstrate the results, but are not yet engaged in carbon farming schemes. 'Early-adopters', on the other hand, are land managers who have already made one or more commitments to a carbon farming certification scheme.
Positive list of carbon farming practices	**Positieve lijst van koolstoflandbouw-praktijken**	A positive list of carbon farming practices that are automatically considered additional for use in carbon farming schemes within a certain region. Practices may be included on such a list because they have been proven to deliver positive project outcomes and have low levels of adoption in that specific region. As implementation rates may evolve over time, it is necessary to periodically reassess and update positive lists.
Project outcomes	**Projectuitkomsten**	Project outcomes are the result of comparing an indicator to its regional baseline in a qualitative or quantitative manner. For carbon farming, the main indicator is climate mitigation, but co-benefits or negative effects are also be considered as project outcomes.
Public registry	**Openbaar register**	The CRC Regulation dictates that a certification scheme must establish and duly maintain a public registry to make publicly accessible the information related to the certification process, including the certificates and updated certificates, and the quantity of carbon removal units certified. Such registries are asked to use automated systems, including electronic templates, and need to be interoperable.
Regional baseline	**Regionale uitgangssituatie**	A regional baseline is a reference point which can be used to quantify the project outcomes by comparing realised carbon removals to the defined regional baseline. The regional baseline can be defined in different manners (e.g. CRC proposal: "baseline should reflect the standard performance of comparable farming activities in similar social, economic, environmental and technological circumstances and geographical locations"). The precise implementation of regional baselines is open for discussion in the navigation- and MRV-network and impacts the matter of additionality and disadvantage of first movers.

ANNEX II: ADDITIONAL STRATEGIC CONSIDERATIONS FOR THE NAVIGATION NETWORK

By combining research insights from LIFE CarbonCounts with in-house knowledge from ILVO, we have pinpointed several strategic considerations for the long-term success of carbon farming which the navigation network should address:

The navigation network should balance the complementary roles of public and private financing at the regional level. For example, if the choice is made to support the voluntary carbon market and private actors, the government should not design and implement public carbon farming schemes which are in direct competition with carbon farming schemes ran by private actors. Instead, **public funding should supplement the shortcomings of the market mechanism which is currently skewed towards rewarding climate mitigation effects in large-scale farms**. This could be done by rewarding co-benefits or by supporting access to agricultural land for young farmers willing to engage with carbon farming in the long-term.

The navigation network should investigate the characteristics of insetting schemes to identify when and where a private, customized approach is warranted. In the system analysis report, we have shown insetting schemes do not necessarily follow the rest of the voluntary carbon market due to the direct relationship between farmers and agro-food companies. Therefore, policies and solutions designed for offsetting with carbon farming might not create the desired effects in the insetting part of carbon farming. At the same time, large agro-food companies are becoming involved with carbon farming (or with related concepts such as regenerative agriculture) and insetting schemes might become the norm for thousands of farmers. Policy makers need to understand where offsetting and insetting schemes differ, and protect farmer's interests when and where needed. The navigation network can do this at the regional level and communicate findings to both the regional and European level.

The navigation network should foster collaboration with pioneer farmers. Policy makers, farmers and agro-ecological organisations have expressed their concern on how the principle of additionality conflicts with rewarding the historical efforts of pioneer farmers. This conflict boils down to: "The farmer has taken these actions without a (financial) incentive, so the incentive is not necessary". At the same time, historically poor performing farmers would benefit most from carbon farming because the application of carbon farming practices would, for example, result in a larger increase of carbon removals and thus a larger amount of carbon finance. The CRC Regulation proposal partially addresses this issue through the application of a regional baseline for the demonstration of additionality. Put simply: "It doesn't matter how long a farmer has been doing a certain carbon farming practice, it is still considered additional because of low adoption rates in the region and because the practice removes more carbon than the practices that are used under similar farming conditions."

However, the quantification proposed by the CRC Regulation consists of comparing the periodic (e.g. yearly) carbon removals to the baseline carbon removals. This means pioneer farmers can participate, but their potential carbon finance will still be limited, as they already have and maintain high levels of stored soil organic carbon in soils (e.g. in cropland) and/or biomass (e.g. agroforestry system, managed grassland). There are several reasons for this: i) impactful land use changes have already been implemented (e.g. from temporary grassland to permanent grassland); ii) avoided emissions have been realized but not valorised (e.g. rewetting peatland without carbon finance) and iii) carbon farming practices yield diminishing carbon removals over time.

We propose a possible solution to the "first mover disadvantage": Offer a respectable amount of public funding to pioneer farmers in exchange for sharing their knowledge with other farmers on what carbon farming practices they apply, why and how they apply these practices and what results (co-benefits) they can demonstrate at the farm level. The paid amounts could be based on their historical efforts, or there can be fixed fees per knowledge sharing event organised in a year. The advantages of this approach are: i) Farmers can learn from farmers. Practical concerns are addressed, and carbon farming as a concept becomes less abstract; ii) Pioneer farmers are recognized without violating the additionality principle; iii) There is a potential synergy in engaging pioneer farmers with the upcoming initiatives for Living Labs and Light Houses within the European Soil Mission; iv) By engaging and linking pioneer farmers with various specialisations (eg. dairy farmers, arable farmers) under diverse conditions (e.g. different soil types, initial SOC, sloped parcels, soil moisture, etc), a supportive learning network for conventional farmers and pilot projects can be constructed within Flanders and v) the required investment for engaging pioneer farmers is likely much lower than the time and cost of recreating the practical research required to advise farmers on long-term application of carbon farming practices.

There can also be other solutions designed to tackle the first mover disadvantage. For example, public funding (CAP) can be used in an eco-scheme to reward farmers with high carbon stocks in their soils. The key message is that a creative solution is needed to circumvent possible conflicts with the additionality principle.