Interreg

Co-funded by the European Union

Italy – Croatia

GECO 2.2

WP1 – COMPARATIVE AND SURVEY STUDIES

D.1.1.1 Comparative analysis

Activity 1.1 Compliance/Differentiation Study between GECO2 model and the proposal for a Regulation presented by the EU (November 2022)

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Introduction

The project Green Economy and CO2-GECO2 was successfully completed at the end of 2022. EU Commission issued in November 2022 an important document "Proposal for a regulation of the European Parliament and of the Council establishing a Union certification framework for carbon removals" (further in the text "the First Document"). In November 2024 the EU Parliament and the Council passed the important legislation that is a finalized version of the mentioned document from November 2022. The aforementioned document has the full title "Regulation of the European parliament and of the Council establishing a Union certification framework for permanent carbon removals, carbon farming and carbon storage in products". Further in the text it will be "the Second Document" which is issued at the end of November 2024. The Second Document i.e. 2024 EU Regulation 2024/3012, provides a significant evolution on the voluntary carbon market management approaches. This Regulation builds upon the initial Proposal and incorporates lessons learned and gathered feedback from various stakeholders.
The improvements in the Second Document reflect the EU's commitment to developing a comprehensive and robust framework for permanent carbon removals, carbon farming and carbon storage in products, addressing previous limitations and incorporating a deeper understanding of the complexities associated with different carbon management strategies/projects that are similar with GECO2.2. These improvements aim to enhance the effectiveness, credibility, and environmental integrity of the aforementioned framework.

The main drivers of interest are:

- Scope and categorization
  Three main categories for carbon management activities have been outlined in the 2022 European Commission proposal:
  - Carbon sequestration in soils and forests ('carbon farming'): This category encompasses activities that enhance the capacity of soils and forests to absorb and store carbon dioxide from the atmosphere. Examples include afforestation, reforestation, agroforestry, and practices that improve soil health and increase soil organic carbon.
  - Technological measures for carbon capture and storage ('permanent carbon removal'): This category includes technologies that capture carbon dioxide from the atmosphere or from emission sources and store it permanently. Examples include

Direct Air Carbon Capture and Storage (DACCS) and Bioenergy with Carbon Capture and Storage (BECCS).

- Carbon storage in products: This category involves incorporating captured carbon into durable products and materials, such as building materials, providing long-term storage and reducing the need for raw materials.

The EU Proposal of 2022 uses terms Certified Carbon Removal Unit, Carbon Removal Unit and Verified Carbon Removal Unit while the EU Regulation uses only term Certified Unit.

The EU Regulation of 2024 maintained the three main categories for carbon management activities that can yield Certified Units. However, the EU Regulation distinguishes between: permanent carbon removal units, carbon farming sequestration units, carbon storage in product units and soil emission reduction units. For the GECO 2.2.project are relevant Certified Units issued by the Certification registries.

- Differentiation of certified units i.e. certified carbon removal units
  The European Commission's 2022 proposal did not distinguish units for each category of carbon management activity. This meant that all certified carbon removal units were treated similarly, regardless of the method used or the permanence of the storage.

  The Regulation EU 2024/3012 established distinction for each type of activity, recognizing their unique characteristics and potential climate impacts. This differentiation allows for more tailored policies and market mechanisms to support different types of carbon removal activities. It also provides greater transparency and clarity for buyers of carbon credits, enabling them to choose credits that align with their specific goals and priorities.

- Inclusion of emission reduction activities
  The European Commission's 2022 proposal focused primarily on activities that remove CO_2 from the atmosphere, with limited inclusion of emission reduction activities, such as rewetting of peatlands and wetlands. While carbon removal is crucial, reducing emissions at the source is also essential for achieving climate neutrality.
  The Regulation slightly expanded the scope[1] to include a broader range of emission reduction activities in the agricultural sector, in particular those aimed at reducing greenhouse gas emissions from soils through improved management practices. This

[1] Mentioned only in the art. 25 in the Regulation

expanded scope recognizes the interconnectedness of carbon removal and emission reduction and promotes integrated approaches to climate change mitigation in the agricultural sector.

- Permanence and reversibility

  The European Commission's 2022 proposal emphasized carbon removals without broad differentiation in the permanence of storage. This approach did not fully acknowledge the differences in the long-term security of carbon storage achieved by different methods.
  The Regulation (EU) 2024/3012 of 2024 has recognized the different degrees of permanence between different carbon removal methods, distinguishing between technological solutions that offer long-term storage and nature-based solutions that are susceptible to reversibility due to environmental factors. This distinction is important for ensuring the long-term effectiveness of carbon removal efforts and for guiding investment towards solutions that provide the greatest climate benefit. The Regulation introduces detailed liability mechanisms, such as "collective buffers and up-front insurance schemes," to address potential carbon release or failure in carbon storage activities. The document also requires operators to implement preventive measures and establish monitoring systems to mitigate relevant risks.

These preliminary considerations allow us to assume that Regulation (EU) 2024/3012 will support the implementation of an efficient, structured, and transparent system for setting up, through certification schemes, organised and structured carbon removal activities within the EU. This robust framework will foster greater confidence in carbon removal projects and facilitate the development of a thriving voluntary carbon market.

In order to analyse the compliance of the GECO2.2 project with the relevant EU legislation it is important to examine similarities and differences between GECO2.0 model/procedures and the First and Second Document i.e. Regulation presented by the EU Commission, Parliament and Council (November 2022 and November 2024) emphasising the specific areas of interest related to GECO2.2[2].

1.1 General analysis

[2] The Second Document deals with certification framework for permanent carbon removals, carbon farming and carbon storage in products; the project GECO 2.2. is only referring to carbon farming.

The Carbon Removals and Carbon Farming (CRCF) Regulation (EU/2024/3012) was published in the Official Journal of the EU on 6 December 2024, creating the first EU-wide voluntary framework for certifying carbon removals, carbon farming and carbon storage in products across Europe. By establishing EU quality criteria and laying down monitoring and reporting processes, the CRCF Regulation will facilitate investment in innovative carbon removal technologies, as well as sustainable carbon farming solutions, while addressing greenwashing.

The framework presented in the Second Document aims to achieve several key objectives:

1. Scale up carbon removal solutions to meet EU climate goals: Recognizing the critical role of carbon removals in achieving climate neutrality, the EU seeks to encourage the development and deployment of various carbon removal methods. This scaling-up is essential for balancing on-going emissions and ultimately achieving net-zero emissions.

2. Enhance the quantification, monitoring, and verification of carbon removals: Ensuring the integrity and reliability of carbon removal claims is paramount. The framework aims to establish robust rules and procedures for accurately quantifying the amount of carbon removed, monitoring its long-term storage, and verifying the entire process through independent third parties.

3. Improve transparency to boost stakeholder trust and prevent greenwashing: Transparency is crucial for building trust among stakeholders, including investors, consumers, and the general public. By setting clear rules and making information publicly available, the framework seeks to prevent false or misleading claims about carbon removals, ensuring that environmental efforts are genuine and effective.

4. Enable innovative financing through public and private investment: Mobilizing sufficient financial resources is essential for supporting the development and deployment of carbon removal technologies and practices. The framework aims to create a conducive environment for both public and private investment by providing clear rules, reducing risks, and fostering confidence in carbon removal projects.

The regulation covers a range of carbon removal solutions, including: Nature-based solutions (e.g., carbon farming), Technology-driven storage (e.g., DACCS and BECCS) and Carbon storage in durable products and materials. As stated in the Introduction, only Nature-based solutions i.e. carbon farming is within the scope of the GECO2.2 project. Carbon farming related solutions involves leveraging natural processes to remove carbon dioxide from the atmosphere and store it in natural reservoirs such as soils and forests. Carbon farming practices, for example, can enhance carbon sequestration in agricultural land.

To achieve its objectives, the Second Document is structured in the following chapters:

- General Provisions The objective of the Second Document is to facilitate and encourage the deployment of carbon farming by operators or groups of operators, as a complement to sustained emission reductions to meet the objectives and targets laid down in Regulation (EU) 2021/1119. To that end, the Second Document establishes a voluntary Union framework for the certification of soil emission reductions.
- Verification and certification of soil emission reductions generated by carbon farming activities does not apply to emissions falling within the scope of Directive 2003/87/EC (the EU ETS scope) with exception of emissions from biofuels, bioliquids and biomass fuels that meet the sustainability and greenhouse gas emissions saving criteria.

- Quality Criteria
  The Second Document in five articles introduces four key quality criteria that carbon removal activities must meet to be certified:

  1) Quantification: Carbon removals must deliver net benefits, calculated against baselines that reflect standard or project-specific performance, with periodic updates. This criterion ensures that carbon removal activities result in a genuine reduction of atmospheric greenhouse gases, taking into account any potential emissions associated with the activity itself. The use of baselines[3] provides a benchmark for assessing the additionality of the removal activity.

  2) Additionality[4]: Any carbon farming activity shall be additional. This means, it shall meet both of the following criteria: (a) it goes beyond Union and national statutory requirements at the level of an individual operator and (b) the incentive effect of the certification under this Regulation is needed for the activity to become financially viable.

  3) Long-term Storage: Activities must ensure storage of carbon over the long term, mitigate the risk of reversal occurring during the monitoring period, and include appropriate liability

[3] "The certification methodologies should establish standardised baselines which should be highly representative of the standard performance of comparable practices and processes in similar social, economic, environmental, regulatory and technological circumstances and take into account the geographical context, including local pedoclimatic and regulatory conditions." The baseline will differ according to specific features of each region and farm in Italy and Croatia.
[4] "Any activity shall be additional. To that end, it shall meet both of the following criteria: (a) it goes beyond Union and national statutory requirements at the level of an individual operator; (b) the incentive effect of the certification under this Regulation is needed for the activity to become financially viable"; The issue of additionality for the farmers that are already applying ecological practices might be a problem due to overlapping of the practices and potentially very moderate additionality.

mechanisms during the monitoring period.

4) Sustainability: Activities must meet minimum sustainability standards and support climate action, resource management, pollution control, and biodiversity. This criterion ensures that carbon removal activities are not only effective in removing carbon but also contribute to broader environmental and sustainability goals. It promotes holistic approaches that consider the interconnectedness of climate change, resource depletion, pollution, and biodiversity loss.

- Certification

This chapter has two articles that describe Certification of compliance procedure, role of Certification scheme and Certification body. Certification procedure involves independent third-party accredited body that conducts certification audit that should verify that the information submitted by the Certification scheme about the carbon farming is accurate and reliable.
Aforementioned process ensures the credibility and reliability of result of the carbon farming and previews several steps:
1. Operator, or groups of operators, set up a certification scheme or send an application to an existing Certification scheme; ”certification scheme’ means an organisation that certifies the compliance of activities and operators with the quality criteria and certification rules set out in this Regulation;

2. Once that the Certification scheme is created or upon acceptance of the application by a Certification scheme, the Certification scheme have to submit an activity plan to a Certification body. “Certification body” means an accredited or recognised independent conformity assessment body that has concluded an agreement with a certification scheme to carry out certification audits and issue certificates of compliance. The activity plan includes evidence of compliance with Articles 4 to 7 of the EU Regulation (Quantification, Additionality, Storage, monitoring, and liability and Sustainability).

3. Once completed the certification audit to confirm the conformity of the Certification scheme with the EU Regulation, a certificate of compliance will be issued by the Certification body.
4. Publicly accessible certification registry keeps record about the project and achieved results: Certification scheme keeps public registry that provides information about certified carbon farming activities, enhancing transparency and allowing stakeholders to track progress.
5. Issuing of certified units: The certification registry of the certification scheme or, once established, the Union registry shall issue certified units based on the updated certificate of compliance.
6. Recognition of the Certification scheme: once that a certificate of compliance has been issued

Certification schemes must be recognized by the EU Commission. Recognition of the Certification scheme by means of a decision will be valid for a period of no more than five years and shall be made publicly available in the Union registry up to five years. This recognition process ensures that certification schemes meet the required standards and that they are competent to assess and certify carbon farming activities.
Applications are submitted by Member States or legal representatives, depending on whether the scheme is publicly or privately managed. This reflects the different governance structures of certification schemes.
Detailed rules will be specified in future implementing acts. These implementing acts will provide further details on the procedures and requirements for the recognition of certification schemes, ensuring a harmonized approach across the EU.

In general, for initiatives such as the project GECO2.2, which aim to create voluntary regional carbon markets[5] for carbon units derived from carbon farming by promoting practices that improve carbon sequestration in soil and biomass, this Regulation could offer several significant implications:

- Market integration and expansion: The EU framework can provide a standardized set of rules and criteria that can be adopted by regional VCM initiatives like GECO2.2. This can facilitate the integration of Geco2.2 regional VCM into a broader EU-wide carbon removal market, increasing their scale and impact.
- Developing certification methodologies: The EU framework provides guidance and requirements for the development of robust certification methodologies. This can help GECO2.2 to develop and implement effective methodologies for quantifying, monitoring, and verifying carbon removals achieved through the applied agricultural practices.
- Increased credibility and trust: Alignment with the EU framework can enhance the credibility and trustworthiness of VCM like GECO2.2. This can attract more participants, including farmers, buyers of carbon credits, and investors, leading to greater market growth and effectiveness.

The aim of this Regulation is to develop a voluntary Union certification framework for permanent carbon removals, carbon farming and carbon storage in products (the 'Union certification framework'), with a view to facilitating and encouraging the uptake of high-quality carbon removals and soil emission reductions, in full respect of the Union's biodiversity and the zero-pollution objectives, as a complement to sustained emission reductions across all sectors.

The Union certification framework will thus be a tool to support the achievement of the Union

[5] Voluntary Carbon Market acronym is VCM

objectives under the Paris Agreement, in particular the collective achievement by 2050 of the climate-neutrality objective laid down in Regulation (EU) 2021/1119 of the European Parliament and of the Council (5). All carbon removals and soil emission reductions certified under the Union certification framework should contribute to the achievement of the Union's nationally determined contribution (NDC) and its climate objectives. Therefore, in order to avoid double-counting, those carbon removals and soil emission reductions should not contribute to third-party NDCs or international compliance schemes. The Union also committed to generating negative emissions after 2050. An important instrument to enhance carbon removals in terrestrial ecosystems is Regulation (EU) 2018/841 of the European Parliament and of the Council (6) on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry (LULUCF) in the 2030 climate and energy framework, which sets out a Union target for net removals of 310 million tonnes of CO2 equivalent by 2030 and allocates targets to each Member State.

1.2 Agricultural practices able to increase absorption of CO2eq

General overview of agricultural practices relevant for GECO2.2. and EU Proposal and Regulation

The agricultural sector plays a crucial role in both emitting and sequestering greenhouse gases. Agricultural practices can significantly influence the balance between emissions and removals, and there is a growing focus on promoting practices that enhance carbon sequestration in agricultural soils and biomass.

The EU framework and initiatives like GECO2.2 recognize the potential of various agricultural practices to increase carbon absorption/sequestration. These practices often focus on improving soil health, enhancing carbon inputs to the soil, and reducing carbon losses.

Some key agricultural practices that can contribute to increased carbon sequestration include[6]:

- Conservation tillage: This involves minimizing soil disturbance through reduced or no-till farming

[6] The EU Regulation mentioned as Sustainable Carbon Cycles: **afforestation, reforestation and sustainable forest management activities; agroforestry and other forms of mixed farming; use of catch crops, cover crops, conservation tillage and increasing landscape features; conversion of cropland to fallow or of set-aside areas to permanent grassland; and restoration of peatlands and wetlands.** The Regulation also mentined „relevant greenhouse gas emissions that should be taken into consideration include direct emissions, such as those resulting from the **use of fertilisers, chemicals, fuel or energy, other material inputs and transportation, or indirect emissions, such as those resulting from land use change** with consequent risks for food security due to displacement of agricultural production, or displacement effects due to competing demand for energy or waste heat."

practices. Conservation tillage helps to protect soil organic matter, reduce erosion, and improve soil structure, leading to increased carbon sequestration.

- Cover cropping: Planting cover crops between main crops helps to protect the soil, prevent erosion, and increase soil organic matter. Cover crops can also improve nutrient cycling and reduce the need for synthetic fertilizers.
- Agroforestry: Integrating trees into agricultural systems can significantly increase carbon sequestration. Trees store large amounts of carbon in their biomass, and agroforestry systems can also improve soil health, enhance biodiversity, and provide other environmental and economic benefits.
- Improved grassland management: Implementing practices that improve the productivity and health of grasslands can enhance carbon sequestration in soil and biomass. This can include optimizing grazing management, using appropriate fertilization, and introducing diverse plant species.
- Enhanced nutrient management: Optimizing the use of fertilizers can reduce greenhouse gas emissions, such as nitrous oxide, and improve the efficiency of nutrient use. This can involve using precision agriculture techniques, applying fertilizers at the right time and rate, and using slow-release fertilizers.
- Organic farming: Organic farming practices often promote soil health and biodiversity, leading to increased carbon sequestration. Organic farming typically avoids the use of synthetic fertilizers and pesticides, which can have negative impacts on soil health.
- Other practices: Activities should include one or more practices or processes that remove carbon from the atmosphere. Certain activities, such as those based on the use of biochar, can result in different types of net carbon removal benefits and durations of carbon storage, depending on the specific conditions under which the activities take place. Accordingly, appropriate monitoring and liability rules should be set out in the applicable certification methodologies to be established at Union level pursuant to this Regulation.

The GECO2.2 project specifically focuses on promoting agricultural practices that enhance carbon sequestration in soil. It emphasizes the importance of soil organic carbon (SOC) as a key indicator of soil health and its role in climate change mitigation.

Within GECO2.2, each farm is required to provide existing data or an analysis of soil organic carbon (SOC), defined as a measurable component of soil organic matter (SOM). SOM supports key soil functions, being a critical factor for the stabilization of soil structure. Furthermore, it favours retention and release of plant nutrients, allowing water infiltration and storage in soil. Soils' potential role in the mitigation of climate change, through carbon sequestration in soil organic matter, is seen as an important element to reduce atmospheric carbon dioxide. The quantity of soil organic matter

(SOM) was estimated through the determination of soil organic carbon (SOC), which can be assumed as 58% of the SOM.[7]

Geco2 set up a specific framework to assess soil carbon[8]and also Geco2.2, exploiting the past experience, has to build up a new improved evaluation and calculation system.

Comments related to the First and Second document and implications for GECO2.2.

Both the EU framework and initiatives like GECO2.2 recognize the importance of promoting agricultural practices that enhance carbon sequestration. By encouraging the adoption of the cited practices, it is possible to transform the agricultural sector from a source of greenhouse gas emissions to a sink, contributing to climate change mitigation and improving the sustainability of agricultural production.

The First Document recommended and covered agricultural practices to increase absorption or sequestration of CO2 equivalent (CO2eq) include:

- Enhancing carbon capture in soil and biomass through sustainable land management practices.
- Certain conditions are relevant for sequestration and carbon protection in soil and in grassland.
- Rewetting of peat lands to prevent carbon release and increase storage capacity.

[7] Soil organic carbon (SOC) refers only to the carbon component of organic compounds. Soil organic matter (SOM) is difficult to measure directly, so laboratories tend to measure and report mainly SOC.

[8] In the framework of the project, each farm must provide a soil analysis to define the baseline of the assessment per each project selected field (patch). In order to have the data of the current quantity of organic carbon in the soil, farmers can provide an analysis [8]of the organic matter of the soil already available or proceed to an ad hoc measurement. In this last case, a sampling project to define the soil organic carbon values will be implemented. The method proposed in GeCO2 is based on: Soil sampling; Bulk density definition; Soil organic carbon (SOC) analysis. In case of failing of the above-mentioned soil measures systems the project defined other alternative solutions (European Soil carbon geo data, rapid soil carbon assessment) supervised by the project experts.

- Adoption of agroforestry systems and other sustainable agricultural practices that foster biodiversity.

These recommendations are tied to the principles of ensuring sustainability, long-term storage, and adherence to Regulation principles and methodologies.

Carbon farming encompassing carbon sequestration and storage in agricultural, forest, or coastal ecosystems, or soil emission reductions, for a minimum duration of five years (e.g., through forest restoration or sustainable carbon management of soil);

The Regulation methodologies is based on the competitiveness of EU farmers, (especially small operators); promotion of a sustainable use of biomass; sustainable management of agricultural lands and soils are considered priorities to the aim to improve carbon farming activities.

According to the EU Regulation, operators should

- quantify the net carbon removal benefit or the net soil emission reduction benefit,

and the amount of additional carbon removals or soil emission reductions that an activity has generated in comparison to a baseline. In the case of carbon farming, the manner of quantification of carbon removals or soil emission reductions should ensure that any carbon release occurring in a carbon pool is taken into account in an appropriate way in quantifying the net benefit of the activity. The certification methodologies should establish standardised baselines which should be highly representative of the standard performance of comparable practices and processes in similar social, economic, environmental, regulatory and technological circumstances and take into account the geographical context, including local pedoclimatic and regulatory conditions. This approach to establishing the standardised baselines should be preferred because it ensures objectivity, minimises compliance and other administrative costs, and recognises positively the action of first movers who have already engaged in eligible activities. In the context of carbon farming, only practices and processes that go beyond the common practice should be certified. Therefore, a specific carbon farming activity should not be rewarded if it is already widely adopted within a region with similar pedoclimatic and regulatory conditions. The standardised baselines should ensure that, once an activity becomes the common practice, such activity can no longer be certified. To that end, the Commission should review at least every five years and update, where appropriate, the standardised baselines in light of evolving regulatory circumstances and of the latest available scientific evidence, to reflect social, economic, environmental, regulatory and technological developments and to encourage increased ambition over time in line with the Paris Agreement. In addition, the use of available digital technologies, including electronic databases and geographic information systems, remote sensing, novel on-

site carbon quantification systems, artificial intelligence and machine learning, and of electronic maps should be promoted to decrease the costs of establishing standardised baselines and ensure the robustness of the monitoring of the activities. However, where it is not possible to set such standardised baselines, a specific baseline based on the operator's individual performance should be used. The activity-specific baselines should be updated by the operator at the beginning of each activity period, unless otherwise stated in the applicable certification methodologies.

The "Farm Cultivation" protocol elaborated by Geco2, aligns closely with European positions and regulations, particularly those focused on sustainability, environmental protection, and climate action. Its core objective—to enhance carbon sequestration in agricultural systems—resonates strongly with the European Union's Green Deal and its "Farm to Fork" strategy, which prioritizes sustainable farming practices and significant reductions in greenhouse gas emissions. The protocol promotes methods such as reduced tillage, the use of organic amendments, and other agroecological practices that align with the EU's Common Agricultural Policy (CAP) goals of improving soil health, fostering biodiversity, and promoting sustainability. Additionally, the protocol adopts internationally recognized carbon evaluation methodologies, such as ISO 14064 and IPCC guidelines, which are in line with the new EU legislative framework. As previously mentioned, these standards ensure compatibility with the Union's carbon credit markets and support its climate goals. Furthermore, the focus on reducing synthetic fertilizers and pesticides, along with incorporating agroforestry and increasing soil organic carbon, aligns with key EU directives, such as those governing pesticide use and biodiversity conservation. Integrating these elements, the protocol reflects EU policy priorities, including sustainable soil management and responsible land use practices.
In the analysis carried out on compliance and differentiation between the European framework and the farm cultivation protocol, the first analysis element was the farm baseline. In many cases, soil complexity and large deviations in carbon storage within a single plot of land make it extremely difficult to establish reliable baselines. The EU proposal and regulation emphasize the establishment of clear, standardized, and transparent baselines. They require that baselines reflect the pre-existing conditions and likely future developments in the absence of the carbon removal project. To "simplify certification", it is required the establishment of standardized baselines to represent the performance of comparable practices in a similar context, rather than the actual situation on individual plots of land. These standardized baselines will be updated. However, given the large variation in storage levels, this approach risks miscalculating the actual benefit (if any).
The definition and use of an agricultural baseline are essential to ensure the credibility of voluntary carbon credit markets. In both the 2022 Proposal and EU Regulation 2024/3012, the baseline is a key element to determine additionality, quantify carbon credits, and ensure that emission reductions or removals exceed the "business-as-usual" scenario. The GECO2 protocol establishes a baseline by analysing the pre-project conditions of farm fields, including soil organic carbon (SOC) levels,

management practices, and land-use data. While this approach generally aligns with the EU frameworks, some aspects require refinement to fully meet the regulatory standards. The GECO2 model adheres to the principles of the EU Framework by requiring farms to:

- Analyse soil organic carbon levels.
- Consider land use practices.
- Develop a carbon roadmap.

Another focus point is the cultivation practices and farm management strategies. The GECO2 model complies with the European Union's proposals and regulations for carbon removals. By meeting the criteria for MRV, additionality, permanence, and market integrity, GECO2 establishes itself as a robust model for sustainable carbon farming in line with EU standards. The EU frameworks establish criteria for certification of carbon removals, emphasizing robust monitoring, additionality, permanence, and market integrity. GECO2's methodology reflects these principles across its various components. The project's practices prioritize carbon sequestration and emission reductions through methods consistent with EU goals. Key measures include reduced tillage, cover cropping, and the integration of organic amendments. These practices contribute directly to the requirements for measurable and verifiable carbon removals. For instance, reduced tillage decreases soil disturbance, preventing carbon release, while cover crops enhance soil organic carbon (SOC) stocks.
Also, as previously stated, GECO2 demonstrates compliance with additionality criteria by mandating that farms implement at least three new carbon-focused practices. These measures exceed conventional farming methods and are critical for demonstrating that carbon removals under the project are incremental rather than part of baseline activities. Moreover, the baseline establishment process, which involves soil organic carbon analysis, ensures an accurate comparison of pre-and post-intervention conditions.
This approach aligns with the EU's emphasis on credible baselines as a foundation for carbon removal certifications. In this context, the European framework stresses the importance of permanence in carbon removals, addressing risks of reversals due to changing practices or external factors.
GECO2 mitigates such risks through conservative accounting methods, including prudential buffers that account for potential carbon losses. Additionally, by promoting long-term practices such as agroforestry and soil amendments, the project enhances both aboveground and belowground carbon storage, thus aligning with the EU's definition of permanent removals. In terms of market integrity, GECO2 integrates transparent systems for trading carbon credits derived from its practices. Verified credits are issued based on rigorous data collection and validation processes, ensuring that they reflect genuine carbon sequestration. The EU's emphasis on traceability and transparency is addressed through the project's structured inventory and audit mechanisms.

Furthermore, practices such as optimal recycling of organic residues and minimizing synthetic inputs reduce emissions across farm operations, complementing the project's sequestration efforts and enhancing its compliance with lifecycle analysis principles. The GECO2 model also aligns with the EU framework's call for co-benefits. Practices like biodiversity conservation, reduced pesticide use, and soil health improvements deliver ecosystem services beyond carbon sequestration. These contributions meet the EU's goals of integrating carbon farming within broader environmental sustainability objectives.

As stated, the GECO2 project incorporates a wide range of carbon stock farming practices into its carbon calculator, aiming to increase soil organic carbon (SOC) while reducing emissions. These practices include organic farming, reducing tillage, using cover crops, integrating hedges or trees within fields, reusing farm residues like wood and green biomass, and applying organic amendments such as compost and biochar. It also encourages avoiding synthetic fertilizers, reducing pesticide use, and recycling organic matter effectively. Each of these practices is modelled to show how they impact carbon sequestration and emissions, often with specific thresholds, like limiting pesticide use to less than 1 kg per hectare or demonstrating erosion reduction through cover crops. When it comes to evaluating impacts and assigning carbon credits, several factors are considered. These include the amount and age of biomass (such as trees or orchard crops), how waste from the farm (like woody residues) is recycled, direct emissions from fuel use, and even indirect emissions from electricity consumption. Soil erosion is also considered, using a model based on the Revised Universal Soil Loss Equation (RUSLE). The model emphasizes caution to avoid overestimating carbon sequestration, introducing buffers in the crediting process to ensure results are reliable.

1.3 Features related to calculators and methodology for calculating CO2 absorption/sequestration

General overview of features related to calculators and methodology for calculating CO2 absorption/sequestration

Accurate and reliable calculation methodologies are essential for quantifying the amount of CO2 absorbed/sequestered through applied agricultural practices. These methodologies provide the

basis for correct accounting of the soil emission reduction units, reporting, and certification, ensuring the integrity and credibility of carbon removal claims.

Both the EU framework and initiatives like GECO2.2 emphasize the importance of robust calculation methodologies. The EU framework sets out general principles and requirements for quantification, while initiatives like GECO2.2 develop and implement specific methodologies tailored to the context of their projects.

The EU Regulation framework's requirements (par. 2) for quantification include:

- Net carbon removal benefit: The net carbon removal benefit of each activity is quantified using a formula that takes into account carbon removals under the baseline, total carbon removals of the activity, and any increase in greenhouse gas emissions due to the activity. This ensures that the calculation considers all relevant factors and provides a comprehensive assessment of the net impact of the carbon removal activity.
  The net carbon removal benefit of each activity is quantified using the following formula:
  Net carbon removal benefit = CRbaseline – CRtotal – GHGincrease > 0
  where:
  (a)CRbaseline is the carbon removals under the baseline;
  (b)CRtotal is the total carbon removals of the carbon removal activity;
  (c)GHGincrease is the increase in direct and indirect greenhouse gas emissions, other than those from biogenic carbon dioxide, as a result of the implementation of the carbon removal activity;

- Monitoring and reporting: Carbon removal activities must be monitored and reported regularly to ensure that they are achieving the expected carbon removals. Monitoring and reporting must be based on reliable data and methods, and they must be subject to verification by independent third parties.

Initiatives like GECO2.2 develop and implement specific calculation methodologies that are tailored to the context of their projects. These methodologies involve the use of calculators and models that integrate data on agricultural practices, soil characteristics, and other relevant factors.

Within GECO2.2, a calculator is used to define the quantity of carbon sequestered (offset) from the starting baseline in the fields for each farm that has signed the related offset agreement with the buyer. Each farm is required to provide existing data or an analysis of soil organic carbon (SOC) and to define the farm baseline. In other words, GECO2 has developed an open-source calculation system that can be used everywhere in orchards, vineyards and olive culture to calculate co2eq impacts..

The calculation method proposed in GECO2 is based on:

- Soil sampling;
- Bulk density definition;
- Soil organic carbon (SOC) analysis;
- Data collection of agricultural practices;
- Climate data;
- Field data (localization, patch, size).

The calculation will consider the soil depth of 30 cm and it will be updated every 5 years with new soil samples and SOC lab tests. With the data of the soil baseline, each farm is allowed to apply the agricultural practices considered as useful to increase the carbon storage in the soil, such as reduced tillage, cover crops, crop rotation. The quantity of the carbon storage will be evaluated using the calculator of the GECO2.2 project. The tool will provide the number of certified units during the project period.

With reference to the calculation system, the algorithms used in the calculator of GECO2 model are sophisticated and draw on internationally recognized protocols, like IPCC guidelines. They focus on carbon storage in soil and biomass, modelling factors such as soil texture, rainfall, and the effects of tillage. While the model is robust, it does make certain assumptions—for example, standard SOC increase rates for specific climates— that might not perfectly match every real-world scenario. As for the contributions of specific practices, their impact varies but is generally positive. Organic management can add about 700 kg of CO2-equivalent per hectare per year, while no-tillage practices can increase SOC by 0.8% annually in temperate moist climates. Similarly, using cover crops improves SOC by around 0.49% per year under similar conditions. Practices like incorporating green residues also help, storing about 36% of carbon if managed correctly. However, these contributions depend on environmental factors like soil type and climate, which can influence results significantly.

Taking into account the compliance of the GECO2 calculator with the Regulation (EU) 2024/3012 is important to note that GECO2's approach is tailored to localized pilot projects, setting thresholds and practices specific to these experiments. The EU regulation, on the other hand, likely applies broader and more standardized criteria suitable for implementation across all member states. It may also impose stricter rules for monitoring, verification, and credit issuance to ensure consistency across the EU. GECO2 focuses on small-scale, localized experimentation, setting specific thresholds for practices.

GECO2's has cautious crediting approach, which includes buffers and adjustments to reduce overestimations, might differ slightly from the Regulation's methodology[9], which could focus more on scalability and uniformity across diverse agricultural landscapes.

The calculator of the GECO2 project also includes the data collection of the agricultural practices that each farm applies in the fields (crops, crop rotation, soil tillage, fertilization, other practices that are considered appropriate). The tool will use the data of the fields and the climate, the data of the soil SOC and the agricultural practices to provide an evaluation of the certified units (t CO2 eq) by the soil in the fields during the project period.

Both the EU framework and initiatives like GECO2.2 recognize the importance of robust calculation methodologies for ensuring the accuracy and credibility of carbon removal claims. By developing and implementing appropriate methodologies, it is possible to provide a solid foundation for carbon accounting, reporting, and certification, fostering trust and transparency in carbon removal activities.

Comments related to the First and Second document and implications for GECO2.2.

The First Document in recital 18-19 concluded that the Commission will supplement the First Document by adopting delegated acts establishing detailed certification methodologies for the different carbon removal activities.

The Second Document is more precise and specific about the key points tackled in the First Document.
To the equation for calculation of the Net carbon removal benefit is added an equation for calculation of the Net soil emission reduction benefit. The improved version of the Calculator for GECO 2.2 should take into account modification of the input interface and calculation in order to apply this additional formula.

The baseline is also commented in the Second Document: "The Commission shall review at least every five years and update, where appropriate, the standardised baseline in light of evolving regulatory circumstances and of the latest available scientific evidence. The updated standardised

[9] For the time being, there is no prefered methodology by the EU Commission- it will be formulated over time

baseline shall apply only to an activity for which the activity period starts after the entry into force of the applicable certification methodology ".
The possible change of baseline that occurred or will occur in the future should be implemented in the calculator, too.
The Second Document also stated the need for using results of certificated methodology that is accepted.

The GECO2 Carbon Calculation System (CCS) is an innovative tool that quantifies carbon credits and footprints in agricultural contexts. It is worth highlighting that the GeCO2 system is designed to calculate carbon stocks and emissions in agricultural settings, focusing on creating a balance between carbon credits (sequestration) and carbon debts (emissions). This dual focus on carbon credits and footprints is consistent with the EU regulatory emphasis on creating robust systems to quantify and certify carbon removals. By integrating elements such as additionality, permanence, and verification, it aligns with international protocols like ISO 14064-1, 14064-2 and IPCC guidelines. These rules allow to:

- Demonstrate that the documentation is reliable, without errors, omissions, or inaccuracies.
- Validate the established baseline scenario for the emission reduction.
- Demonstrate the significance of the avoided emissions in a specific period.

By applying these protocols, the GECO2 model also ensures credibility, legitimacy and transparency. In this context, it is useful to highlight that the GeCO2 methodology, which uses ISO standards and conservative calculations, aligns with EU requirements. However, Regulation (EU) 2024/3012 also focuses on the need for broader life cycle assessments (LCAs). While GeCO2 integrates some LCA aspects, further expansion could strengthen alignment with the EU Framework. Also, GeCO2's approach to using farm-specific data and baselines ensures adherence to EU standards for establishing carbon budgets.
The first element for comparative analysis is additionality. Additionality ensures that no carbon removal or emission reduction would have occurred without the specific activities supported by the program. In general, additionality is assessed using standard-approved methodological tools to identify the main barriers that would prevent the implementation of project activities that deliver GHG emission reductions. This can be combined with an investment analysis that compares the economics of alternative land uses with the project activity without carbon credits. GeCO2 adheres to this principle by designing its system to assess the assumed impact of specific agricultural practices, using a predictive model to predict carbon sequestration outcomes.
From this perspective, the GeCO2 model aligns well with a predictive model and presumptive criteria, which meet the EU requirements to demonstrate additionality. The 2022 Proposal and EU Regulation

2024/3012 focus on additionality as a cornerstone for the certification of carbon removals, highlighting measurable and verifiable results not achieved in business-as-usual scenarios. Furthermore, the GeCO2 system integrates the concept of experimental fields, where farmers can test and apply new carbon sequestration practices. GeCO2 demonstrates a practical application of additionality by calculating carbon balances for these fields. This experimental approach is also in line with the EU's vision to incentivize innovative and science-based approaches to carbon farming and removal practices. In this way, the GECO2 Protocol reinforces the principle of additionality by requiring that carbon sequestration or emission reductions only occur through project-based interventions. This is certified by the system that ensures this through predictive models and conservative baselines.

Also, the permanence principle in GeCO2 matches EU standards, particularly the emphasis on buffers to mitigate uncertainty. For carbon farming to have a positive impact on the climate, mitigation must be permanent (GHG levels must be lower than they would otherwise have been in the long term). Given the long-term nature of the climate challenge, it makes little sense to store carbon for short periods if it is likely to be released again, making it essential that carbon farming mitigation be permanent. As noted, permanence is a particular challenge for agricultural carbon mitigation because sequestered carbon is unstable and can be released intentionally or unintentionally: for example, carbon stored in soil can be released rapidly through intentional actions, such as changing cropping patterns or reintroducing tillage, carbon can also be released unintentionally if drought or fires cause the loss of agroforestry trees, releasing their stored carbon. GeCO2 protocol incorporates permanence by evaluating practices' long-term impacts on soil and biomass carbon storage.

Credits are valid only if carbon stocks are maintained throughout the certification period. Regulation EU 2024/3012 stresses permanence through mechanisms like monitoring, reporting, and potential penalties for reversals. At the same time, the European frameworks demand stringent measures to ensure the long-term stability of carbon removals. While GECO2 incorporates regenerative practices like reduced tillage and cover cropping, it does not provide comprehensive long-term monitoring plans. This is critical for meeting EU requirements, as carbon stored in soils and biomass is susceptible to reversal due to changes in land use or management. Additionality and permanence were elements explored in the comparative research also in the following paragraphs dedicated to the other protocols of the GECO2 model.

At this stage of the study, a further factor of interest was relative to the monitoring, reporting, and verification (MRV) process. In this context, there is synergy between the Geco2 model and the EU Framework. GeCO2's verification mechanism aligns with EU requirements by integrating ISO-based methodologies and detailed input data for calculations because the EU Frameworks demand high MRV standards, requiring accurate, independent verification of carbon removals. GeCO2 protocol includes robust MRV protocols via its online tools (CAFÉ for farmers and COFFEE for buyers), ensuring transparency in carbon credit generation and use.

The EU regulatory framework places particular importance on additionality and permanence, both of which are integrated into the CAFÉ tool. The CAFÉ tool calculates the carbon balance for farmers, allowing them to estimate their sequestration potential and the number of carbon credits they can produce. This tool aligns well with EU legislation which emphasize the importance of reliable, science-based methodologies for quantifying carbon removals. Additionality is ensured by linking credits to agricultural practices that go beyond business-as-usual, while permanence is addressed through buffers and conservative assumptions. However, while the CAFÉ tool supports these principles during the project period, the regulations require mechanisms to monitor and ensure the long-term maintenance of carbon stocks. The absence of explicit long-term verification or post-project monitoring within the CAFÉ framework could limit its full compliance with the EU's strict permanence requirements. Furthermore, CAFÉ's approach to using farm-specific data ensures conformity to the principle of local relevance emphasized in EU regulations. By incorporating field-specific parameters—such as soil type, crop management practices, and climatic conditions—CAFÉ aligns with the EU's demand for context-sensitive and science-based assessments.

The COFFEE tool allows buyers to estimate their CO2e debts and offset them by purchasing credits generated through sustainable agricultural practices. This tool is particularly aligned with the EU's focus on developing a transparent and standardized certification framework for carbon removals. By requiring buyers to provide detailed energy consumption and emissions data, COFFEE ensures that offsetting decisions are informed and measurable. However, one potential area of concern relates to the verification of offsets, a cornerstone of EU regulations. While COFFEE integrates a registry to track credits, the EU frameworks emphasize third-party verification and standardized methodologies to ensure the credibility and integrity of carbon markets. The GECO2 protocol would benefit from integrating its system into the Union certification framework, thereby aligning its registry and verification processes with established EU standards. The COFFEE tool's reliance on buyer-provided data is another area that could be strengthened. EU regulations require robust MRV (monitoring, reporting, and verification) protocols to ensure accuracy and prevent fraud. While the GECO2 system's registry provides a strong foundation, incorporating independent audits or cross-verification mechanisms would further enhance trust and compliance.

Another focus has been the methodological comparisons of the protocol. In this area, the first element of interest is the calculation models. The GeCO2 protocol utilizes a modular algorithmic approach to assess greenhouse gas emissions and carbon sequestration. In this dimension, another factor of interest is the estimation of carbon loss with RUSLE. A unique feature of the GeCO2 system is the use of the RUSLE equation to estimate carbon loss due to soil erosion. This approach integrates key factors such as rainfall, field slope, soil texture, and agricultural practices, providing a detailed assessment of erosion-related carbon dynamics. This is particularly relevant given the EU's focus on ensuring environmental sustainability and promoting practices that improve soil health and reduce degradation. However, the RUSLE equation, although widely used, has inherent limitations in predicting erosion under certain conditions, such as complex topography or extreme weather events.

Furthermore, EU regulations increasingly emphasize life cycle assessments (LCA) and co-benefits, such as biodiversity and water retention, which are not directly addressed by RUSLE. While the equation provides valuable information on carbon loss, integrating it with broader environmental impact assessments could improve the system's compliance with the EU's multidimensional sustainability goals. In this context, the GeCO2 modular framework can support the EU push towards standardized methodologies, although more explicit life-cycle integration could improve compliance. The second element of interest is related to the roles of stakeholders. The GECO2 model distinguishes between “sellers” (farmers) and “buyers” (users of offsets), tailoring the tools for each. Farmers calculate credits based on sustainable practices, while buyers offset emissions. EU Frameworks also highlight the importance of inclusive stakeholder participation in carbon farming initiatives. For these reasons, this dual-tool approach of GeCO2 is aligned with the EU's focus on stakeholder-specific methodologies.
Concerning the differentiation between the GECO2 model and the EU Framework, as just mentioned, the protocol could detail operational measures to address emissions shifting, developing explicit leakage mitigation strategies aligned with EU regulatory standards. Furthermore, GECO2’s voluntary market approach could benefit from alignment with compliance markets encouraged by EU frameworks. In this context, integration into Union certification schemes could be explored to increase market relevance and farmer participation.

1.4 Characteristics of a Voluntary Carbon Market (VCM) functioning system and organization (GECO2 model compared with elements of EU legislation)

Voluntary carbon markets (VCMs) play a crucial role in enabling organizations and individuals to offset their greenhouse gas emissions by purchasing carbon credits generated from carbon removal or emission reduction projects. The functioning system and organization of VCMs are critical for their effectiveness and credibility. The two functional VCMs, namely, Gold Standard and VERRA are mentioned earlier in this document. The EU Regulation is, in a way, a subset of the broader and more specific standards defined by Gold Standard and VERRA.

Both the GECO2 model and the EU framework aim to establish robust and transparent VCMs that promote high-quality carbon credits and ensure environmental integrity. The GECO2 model provides a practical example of a regional VCM focused on agricultural sector, while the EU framework sets out general principles and requirements for VCMs operating within the EU.

1.4.1 Low-cost and simple functioning market structure and matchmaking system (Working rules of Voluntary Carbon Markets)

Both the GECO2 model and the EU framework emphasize the importance of a low-cost and simple functioning market structure to encourage participation and facilitate the trading of carbon credits.

The GECO2 model aims to create a regional VCM that is accessible and affordable for farmers and other stakeholders. It focuses on simplifying the process of generating, certifying, and trading carbon credits, reducing transaction costs, and enhancing market efficiency.

The EU Regulation framework also recognizes the need for setting preconditions for getting certified units at low-cost and through a simple functioning VCM. It emphasizes the importance of standardization, harmonization, and streamlining processes to reduce administrative burdens and costs for project developers and buyers of carbon credits.

Both the GECO2 model and the EU Regulation framework promote the use of digital technologies and platforms to facilitate the trading of carbon credits. These technologies can help to reduce transaction costs, improve transparency, and enhance market access.

1.4.2 Credit generation, validation process procedures, Quality assurance and Avoidance of Double Counting (Registry for Carbon Credits)

A robust registry for carbon credits (certificate of compliance and certified units in certification registry in terminology of EU Regulation) is essential for ensuring the integrity and credibility of VCMs. The registry provides a centralized platform for recording, tracking, and managing carbon credits, preventing double counting, and enhancing transparency.

Both the GECO2 model and the EU Regulation framework recognize the importance of a reliable registry for carbon credits/certified units. The GECO2 model includes a registry for tracking carbon credits generated from agricultural carbon sequestration projects. The EU Regulation framework emphasizes the need for a harmonized EU registry for certified units, ensuring that all certified carbon removal activities are recorded and tracked in a consistent manner.

Both the GECO2 model and the EU framework promote the use of digital technologies and platforms for managing carbon credit/certified unit registries. These technologies can help to improve the efficiency, security, and transparency of the registry system.

1.4.3 Framework for Certification and Trading of Carbon Credits (Certification schemes)

Robust Certification schemes are essential for ensuring the quality and integrity of certificate of compliance and certified units. These schemes establish rules and procedures for assessing, verifying, and certifying carbon removal or emission reduction projects, ensuring that they meet established standards.

Both the GECO2 model and the EU Regulation framework recognize the importance of credible certification i.e. validation and verification of applied measures that reduce GHG emissions and sequester GHG. The GECO2 model involves the use of certification methodologies tailored to the context of agricultural carbon sequestration projects. The EU Regulation framework sets out general requirements for Certification schemes operating within the EU, including requirements for accreditation, independence, and transparency.

Both the GECO2 model and the EU Regulation framework promote the use of transparent and verifiable methodologies for quantifying carbon removals or emission reductions. These methodologies must be based on robust data and scientific principles.

1.5 Aspects related to Certification methodologies for achieved CO2 absorption/sequestration

General overview of certification methodologies for achieved CO2 absorption/sequestration

Certification methodologies play a crucial role in ensuring the credibility and reliability of carbon removal claims. These methodologies provide a framework for assessing, verifying, and certifying the amount of CO2 absorbed/sequestered through agricultural practices.

The EU Regulation mentions applicable certification methodology but for the time being it isn't defined besides need to comply with the quality criteria laid down in Articles 4 to 7 (the EU Regulation).

Both the EU Regulation framework and GECO2.2 emphasize the importance of robust certification methodologies. The EU Regulation framework sets out general requirements for certification, while GECO2.2 develops and implements specific methodologies tailored to the context of its projects.

The EU Regulation framework's requirements for certification include:

- Project registration: The projects are accepted i.e. registered with the Certification scheme, providing details about the project's objectives, activities, and location.
- Independent third-party verification: Certification must be conducted by independent third-party verification bodies (Certification body) that are accredited in the Member States. This ensures that the verification process is objective and unbiased. The Certification body verifies the data and assesses the project's compliance with the certification requirements.
- Robust methodologies: Certification must be based on robust methodologies for quantifying, monitoring, and verifying carbon removals. These methodologies must be transparent, verifiable, and consistent with the best available science.
- Transparency: Certification processes and results must be transparent and publicly available in the Certification registry. This allows stakeholders to access information about performed activities that yielded certified units and to assess their credibility. Certification registry issues certified units.

Initiatives like GECO2.2 develop and implement specific certification methodologies that are tailored to the context of their projects. These methodologies involve the following steps:

- Project identification and credits calculation using the calculator.
- Project registration: Carbon removal projects are registered in the online platform, providing details about the project's objectives, activities, and location.
- Methodology selection: The project use the calculator for quantifying carbon removals, based on about one hundred of information collected and verified by project technicians.
- Baseline establishment: A baseline is established to represent the level of carbon removals that would have occurred in the absence of the project.
- Monitoring[10] and verification: The project monitors the carbon removals achieved by the project and enters the data into the project data base and calculator. The project verifies the data and assesses the project's compliance with the certification requirements.
- Credit issuance: If the project meets the certification requirements and results with carbon removal, the carbon credits are issued to the farmer, representing the amount of t CO2eq absorbed/sequestered.

[10] There was no Monitoring in GECO2.0 and there verification was performed by the Project Management

Both the EU Regulation framework and initiatives like GECO2.2 recognize the importance of robust certification methodologies for ensuring the credibility and reliability of carbon removal claims. By developing and implementing appropriate methodologies, it is possible to provide a solid foundation for carbon accounting, reporting, and certification, fostering trust and transparency in carbon removal activities.

Comments related to the First and Second document and implications for GECO2.2.

In the Article 9 of the Second Document is described how to apply for certification of compliance with the Regulation.
An operator or a group of operators can set up a certification scheme or submit an application to an existing certification scheme. Once established certification scheme or upon acceptance of that application, the operator or group of operators shall submit to a certification body an activity plan that includes evidence of compliance with Articles 4 to 7 and the expected net carbon removal benefit or the expected net soil emission reduction benefit generated by the activity, and a monitoring plan.
The novelty is preparation and submission of an activity plan and a monitoring plan. Description of the advisory services shall be specified, too (EU member states may provide such services in organized way).

At least every five years, or more frequently, re-certification audit should be completed by the certification body. The certification body shall issue a re-certification audit report that includes a summary, and, where appropriate, shall issue an updated certificate of compliance.

Certification bodies appointed by certification schemes shall be accredited by a national accreditation body pursuant to Regulation (EC) No 765/2008 or be recognised by a national competent authority as being competent to cover the scope this Regulation or the specific scope of the certification scheme.
This novelty points to the accredited companies/individuals that are accredited for the standard ISO norms (relevant for this matter).

The Second Document defined in the Article 11 Operation of certification schemes.
The certification schemes shall at least annually publish in their certification registries (or once established, in the Union registry) a list of the appointed certification bodies, stating for each certification body by which national accreditation body it was accredited or by which national competent authority it was recognised and which national competent authority is monitoring it.

The Article 12 in the Second Document comments establishing of the Union registry for permanent carbon removals, carbon farming and carbon storage in products, and certification Registries. The Commission shall establish a Union registry by 27th December 2028.
The structure of the registry that will resemble the future Union registry is described, too.
The certification scheme should create the aforementioned registry.

The Article 12 defines that the certified units (carbon credits) shall be issued by certification registries or, once established, by the Union registry only after the generation of a net carbon removal benefit or net soil emission reduction benefit.

At the very end of Article 12.5 in the Second Document is stated:
"Carbon farming sequestration units and carbon storage in product units shall expire at the end of the monitoring period for the relevant activity, and be cancelled in the certification registry or, once established, in the Union registry, unless the long-term storage of the removed carbon is proven through continued monitoring, in accordance with the rules set out in the applicable certification methodology".
Clarification of the aforementioned is needed in order to be applied in the registry ie functionality of the data base.

Within the scope of the project GECO2.2 is possible to develop a certification scheme. The Article 13 in the Second Document specifies that "Only a certification scheme recognised by the Commission by means of a decision may be used by an operator or a group of operators to demonstrate compliance with this Regulation." This means that if a certification scheme is going to be developed in GECO2.2, it has to be submitted to the Commission for recognition (both public or private version). If the project partners will pursue this objective, the compliance with the Regulation will be prerequisite.

1.6 Final considerations on integration/modification differences between GECO2 model and EU legislation

The GECO2 model and the EU framework for carbon removals share a common goal of promoting sustainable carbon management practices. However, there are some differences in their approaches and scope.

The GECO2 model focuses on creating regional voluntary carbon markets that are tailored to the specific context of agricultural carbon sequestration. It emphasizes simplicity, accessibility, and affordability for farmers and other stakeholders.
The EU framework, on the other hand, aims to establish a harmonized regulatory framework for carbon removals across the EU. It sets out general principles and requirements for certification, quantification, and monitoring, providing a foundation for a robust and credible carbon removal market. Both systems are based on the same founding principles.
The GECO2 model could serve as a pilot for implementing the EU framework at the regional level, providing valuable insights and experience.
The EU framework can also provide guidance and support for the development and implementation of regional VCMs like GECO2, ensuring that they meet established standards and contribute to the overall climate objectives.
As reported in the dedicated paragraph, the GECO2 Carbon Calculation System demonstrates strong alignment with EU carbon removal regulations, particularly in its focus on additionality, permanence, and MRV. However, targeted enhancements in leakage management, co-benefits integration, and market alignment could strengthen its compatibility with the evolving EU policy landscape. At the same time, one of the critical issues with the model is the time-bound nature of the GeCO2 project.

This analysis shows how in terms of compliance the GECO2 model and the EU framework can be considered highly synergistic. The GECO 2.2 project and the EU Regulation 2024/3012 share several commonalities that underline their alignment with the promotion of sustainable agricultural practices and the fight against climate change. Both initiatives prioritize the objective of achieving permanent carbon removal while promoting sustainability in agriculture. They are firmly rooted in scientific credibility, relying on robust monitoring and verification mechanisms to ensure reliable results.

The GECO2 Carbon Calculation System demonstrates strong alignment with EU carbon removal regulations, particularly regarding its focus on additionality, permanence, monitoring, reporting and verification (MRV). However, targeted enhancements in leakage management, co-benefits integration, and market alignment could strengthen its compatibility with the evolving EU policy landscape. At the same time, one of the critical issues with the model is the time-bound nature of the GECO2 project. Having time-bound nature introduces an important consideration regarding permanence and long-term impact of the GECO2 project.
The EU regulation emphasizes not only additionality but also the need for permanence in carbon removals. While GECO2 addresses permanence within the project timeframe, it is less clear how these practices will maintain their impact beyond the project's conclusion. The EU frameworks

require mechanisms to ensure that carbon stocks remain sequestered for extended periods, with monitoring and safeguards against reversal.

Another critical element of the introduction is GECO2's voluntary market framework, which aims to establish a local carbon credit market within the agricultural sector. This aligns with the EU's encouragement of market-based solutions to scale up carbon removal activities. However, for full regulatory alignment, GECO2's voluntary approach could benefit from integration with the Union's certification framework to enhance the market's credibility and scalability. The EU framework emphasizes standardization and transparency, and while GECO2 employs tools like its online carbon calculator and own type of registry, aligning these with EU certification schemes would enhance their regulatory compliance. Analysis shows that the GECO2 approach follows international protocols as ISO 14064-1 principles and integrates methodologies from the IPCC Good Practice Guidelines for Land Use, Land-Use Change, and Forestry (LULUCF). This ensures consistency with the EU's requirements for reliable measurement, reporting, and verification (MRV) of carbon sequestration. Its scientific rigor, emphasis on additionality, and integration with sustainability goals position it as a strong candidate for alignment with Regulation 2024/3012 and the other EU standards.
Lastly, GECO2's use of predictive modelling and buffers to reduce uncertainties in carbon balance calculations also reflects a degree of caution and scientific rigor that resonates with EU regulatory standards. However, while the introduction stresses the importance of reducing errors and uncertainties, the EU frameworks would likely require even more detailed lifecycle assessments and explicit provisions to account for leakage—the risk of emissions being displaced elsewhere as a result of project activities (e.g. due to diminished production and need to produce elsewhere using e.g. nitrogen-based fertilizers and excessive tillage).
The two instruments developed for GECO2 (CAFÉ and COFFEE) provide an innovative and practical approach to carbon accounting in agriculture, aligning well with key EU principles such as additionality and transparency. The dual-tool approach reflects the EU's emphasis on creating market-driven solutions for carbon removals, with clearly defined roles for sellers (farmers) and buyers (offset users). However, there are areas where the tools could evolve to meet the full scope of EU requirements:

- Long-Term Monitoring: Developing mechanisms to track and verify the permanence of carbon stocks beyond the project period.
- Co-Benefits: Expanding the calculators to capture and report environmental and social co-benefits, as highlighted in the EU frameworks.
- Integration with EU Certification Frameworks: Aligning the registry and verification processes with the Union's certification standards to enhance credibility and market acceptance.

- Develop systems for tracking carbon stocks over decades, incorporating satellite data and ground measurements to ensure permanence.
- Introduce regional assessments to identify and mitigate potential leakage effects.

By addressing identified gaps, the GECO2 protocol can serve as a model for agricultural carbon certification across the EU. The EU frameworks and the GECO2 protocol also emphasize additionality, requiring carbon credits to stem from activities that go beyond baseline practices. GECO2's methodology for determining baseline conditions and additionality complies with these requirements, ensuring that only genuine carbon removals are credited.

Two elements were not explored in depth in the analysis: inclusiveness and accessibility.

Concerning these two elements, the GECO2 model focuses on small and medium-sized farmers and aligns with the EU frameworks' goals to engage a broad range of stakeholders in carbon farming. This inclusiveness supports the EU's vision of making carbon farming accessible to diverse actors across member states. GECO2 prioritizes inclusiveness by enabling participation from small farmers, SMEs, and local actors. This focus aligns with the EU's goal to support carbon farming and involve a broad range of stakeholders.
This is an innovative and functional approach for small-scale agricultural contexts and/or in geographical and economic areas where there are a large number of micro and small agricultural enterprises. The original GECO2 methodology has demonstrated the value of small-scale agriculture projects, where local farmers engaged in improved agricultural practices that foster carbon farming, while at the same time connecting them with GHG emitters interested in reducing their negative environmental impacts through the purchase of carbon credits.
The current European Union regulatory framework for carbon removals, as articulated in the proposal of 30 November 2022 and the subsequent Regulation (EU) 2024/3012, provides a structured pathway to incentivize carbon sequestration practices. However, the emphasis on large-scale agricultural initiatives risks marginalizing the contributions of small-scale agricultural projects, which hold significant potential for environmental, economic, and social benefits. For a holistic approach to carbon removal, small-scale projects deserve enhanced recognition and support within the framework. Several analyses and critiques have addressed the European Union's Carbon Removal Certification Framework (CRCF) and its implications for small-scale agricultural projects. A notable concern is that the framework may inadvertently favour large-scale operations, potentially sidelining smaller farmers. For instance, Carbon Market Watch[11] highlights that "smaller-scale farmers are

[11] www.carbonmarketwatch.org/2022/11/04/eus-carbon-removals-certification-framework-is-certifiably-problematic

currently being entirely ignored by this regulation," suggesting a need for more inclusive policies that accommodate the unique capacities of smallholders. Further critiques emphasize the methodological challenges and potential biases within the CRCF. The Institute for Agriculture and Trade Policy (IATP)[12] points out that the framework could undermine environmental integrity and misdirect agricultural transformation efforts. They argue that the proposal leaves critical elements, such as addressing permanence and measurement of carbon removals, to a closed expert group, potentially excluding diverse stakeholder input. Additionally, the Oeko-Institut[13] underscores the importance of improving the CRCF's methodologies to ensure they effectively deliver on their goals. They stress that the regulation should create incentives that are accessible to all farmers, including smallholders, to promote widespread adoption of carbon removal practices. This documentation suggests that while the CRCF aims to standardize carbon removal certifications, it must be refined to inclusively support small-scale agricultural projects. By addressing these concerns, the framework can better promote equitable participation and maximize environmental benefits across diverse farming operations.

Small-scale agricultural projects could offer unique advantages in carbon sequestration and sustainable land management. Their localized implementation often leads to tailored land-use practices that are more attuned to specific ecological and social contexts. Unlike large-scale initiatives, these projects frequently rely on diversified crop-livestock systems, agroforestry, or regenerative agricultural techniques that improve soil health, increase biodiversity, and enhance resilience to climate variability. By prioritizing localized ecological optimization, small-scale projects could contribute to carbon removal while simultaneously delivering co-benefits such as soil erosion prevention, water retention, and habitat creation, all of which align with the EU's Green Deal and Farm to Fork Strategy. Currently, the EU framework disproportionately incentivizes high-output, large-scale projects through streamlined methodologies for monitoring, reporting, and verification (MRV) processes. These methodologies are often cost-prohibitive for small-scale initiatives, which may lack the financial and technical resources to comply with complex certification requirements. The absence of proportional MRV schemes tailored to the operational realities of smaller farms effectively excludes them from participation in carbon removal markets. Addressing this issue by developing simplified MRV protocols—such as digital tools, satellite-based assessments, or community-level aggregation methods—could democratize access to certification while maintaining robust environmental integrity.

Additionally, small-scale agricultural projects play a critical role in fostering rural economic development and social cohesion. They often involve cooperatives or family-run farms that are deeply embedded in rural communities. By supporting small-scale initiatives, the EU framework can contribute to local job creation, knowledge exchange, and the preservation of traditional agricultural

12 www.iatp.org/twelve-problems-ec-crcf?utm

13 www.oeko.de

practices. These social benefits have multiplier effects that extend beyond carbon removal, enhancing regional food security and promoting sustainable livelihoods. The current regulatory framework largely overlooks these non-carbon benefits, despite their alignment with EU priorities for inclusive and sustainable development. From a carbon accounting perspective, small-scale agricultural projects also offer scalability through aggregation mechanisms. Group certification schemes could enable multiple smallholders to collectively meet the thresholds for carbon removal certification, reducing administrative burdens and fostering collaboration. By incentivizing such collective approaches, the EU can unlock the untapped carbon sequestration potential of smaller plots while minimizing transaction costs.

The scheme can operate a management system that co-ordinates scheme activities which actively promote improvement in carbon farming within carbon market, Schemes, participating farms and buyers' firms. This management system should include the following generic steps: plan (establish the objectives including desired outcomes, scheme requirements and monitoring processes), do (implement scheme assessment systems and support structures), check (measure and monitor the process and results above a baseline statutes) and improve (take action to improve performance).

Integrating small-scale projects more effectively into the EU's carbon removal framework would also promote diversification in the carbon market. Overreliance on large-scale projects introduces systemic risks, such as monocultural practices or the vulnerability of single actors to financial or environmental shocks. Small-scale initiatives inherently diversify the market landscape, contributing to greater resilience and stability in carbon removal portfolios. Furthermore, the recognition of small-scale projects aligns with the principle of equity and the EU's commitment to just transitions. Smaller agricultural enterprises, especially in less economically developed regions, often face structural disadvantages in accessing funding and markets. By explicitly incorporating mechanisms to address these disparities—such as grants, technical assistance, or preferential treatment for smallholder projects—the framework could ensure more equitable participation and amplify the inclusivity of the carbon removal agenda.

Recalibrating the EU framework to better accommodate small-scale agricultural projects would yield significant environmental, social, and economic benefits. It would enhance ecological outcomes through localized land management, foster rural development, and diversify carbon removal markets while addressing equity concerns. To achieve these goals, the framework must include simplified MRV protocols, aggregation mechanisms, and targeted financial and technical support. By doing so, the EU can create a more comprehensive and equitable approach to carbon removal, maximizing its potential to meet climate and sustainability objectives.

The GECO2 approach would reduce barriers to entry for local farmers, enabling them to participate in carbon markets while improving the sustainability of their farming practices. Simplified monitoring, reporting, and verification (MRV) protocols tailored for smallholders could allow farmers to access certification schemes without the financial or administrative burdens often associated with large-

scale operations. For example, the use of aggregated certification models where multiple farmers pool resources to meet carbon removal thresholds would significantly reduce individual costs. This collective approach not only ensures market participation but also strengthens rural networks by promoting collaboration between farmers, cooperatives, and local stakeholders.

Furthermore, the ecological and geographical diversity of the regions involved in the GECO2 project aligns well with carbon removal practices that offer multiple co-benefits. Agroforestry, organic farming, and soil regeneration practices, already widespread in many of these regions, are particularly effective in sequestering carbon while improving soil fertility, preventing erosion, and promoting biodiversity. Integrating these practices into voluntary carbon credit markets could generate additional income streams for farmers, incentivizing the adoption of sustainable farming techniques and strengthening the environmental protection that already characterizes agriculture in the regions that participate in the GECO2 project.

In practical terms, enabling farmers to participate in the voluntary carbon market would require targeted support from regional authorities and industry bodies. Technical assistance to guide farmers through certification processes, as well as financial incentives to offset initial investment costs, would be crucial. Finally, the inclusion of small-scale farmers in voluntary carbon markets would have broader socioeconomic benefits for the regions. This would stimulate rural development by creating additional income opportunities, especially for young farmers, and promote knowledge sharing between generations.

2. GECO2.2 strategic outlines in the light of the comparison study

2.1 The comparison study

The comparison study assesses the GECO2 model against the EU Carbon Removal Certification Framework, specifically focusing on Regulation EU 2024/3012 and the November 2022 EU Proposal. Based on this study, here are strategic outlines to optimize compliance, enhance effectiveness, and maximize carbon sequestration potential.

1. Strengthening Compliance with EU Carbon Removal Certification Framework
Objective: Ensure that GECO2.2 fully aligns with EU Regulation principles for carbon removals.

Key Actions

- Implement preferably all quality criteria from EU Regulation (Quantification, Additionality, Long-term Storage in Soils and Biomass, Monitoring, Liability, Sustainability and Certification Methodologies) into GECO2.2 's protocols.
- Align carbon removal quantification with EU 2018/841 and 2018/1999 regulations, using standardized measurement systems.

2. Enhancing Monitoring, Reporting & Verification (MRV) Systems
Objective: Improve accuracy, transparency, and credibility of carbon sequestration claims

Key Actions

- Organise a detailed operational Plan for the Certification Scheme that includes calculation system, market rules, monitoring activities, tasks and responsibilities definition of the members.
- Require third-party verification for validating the Certification Scheme
- Expand long-term monitoring frameworks beyond the project period to track carbon permanence.
- Implement registry that has as many features as defined for certification registry for certification scheme (see Annex III of EU Regulation)

- Ensure public accessibility of certified units (i.e. verified carbon credit data) and future compatibility with EU-mandated registries.

3. Refining Carbon Credit Market Integration

Objective: Enhance the scalability and credibility of the GECO2 regional voluntary carbon market

Key Actions

- Verify GECO2's voluntary carbon market contents and rules at the light of the new EU legislation.
- Ensure full market transparency on market place platform and maintaining publicly accessible registry for carbon credits.
- Develop activities for increasing awareness and interest both on supply and demand side of the regional VCM that will become sustainable and will outlive GECO2.2 project.

4.Addressing Differentiation in Carbon Credit Validation

Objective: Standardize carbon measurement and verification for greater credibility

Key Actions

- Develop soil/colture specific methods in order to increase soil /biomass carbon.
- Develop region-specific sequestration models to account for climate, soil type, and farming methods.
- Establish risk buffer systems to mitigate potential carbon reversals.
- Strengthen farm-level data collection by integrating automated digital tools into GECO2's calculators for sellers (carbon farming, soil emission reductions, but also geological sequestration e.g biochar sequestration)
- Expand baseline measurement accuracy by ensuring all farms perform SOC analysis and land-use assessments.
- Standardize carbon baseline calculations at local level and level at regional base for soil/cultivation / farming practices. Establish a standard baseline and assess the quality using standard models.

5. Strengthening GECO2's Integration into EU Policy and Regulations

Objective: Align GECO2 methodologies with EU Green Deal, Common Agricultural Policy (CAP), and climate goals.

Key Actions

- Actively collaborate with EU policymakers to refine carbon schemes, certification standards and methodologies /models.
- Ensure GECO2 integrates into the broader EU-wide carbon market by harmonizing with compliance and voluntary schemes.
- Align GECO2's carbon sequestration and emissions reduction strategies with the EU's evolving policy landscape.
- Support policy innovations to better integrate smallholder farms into EU carbon markets.

6. Ensuring Long-Term Viability & Compliance

- Implement continuous monitoring mechanisms to track the impact of farming practices on carbon sequestration.
- Conduct regular re-certifications to ensure farms maintain compliance with EU carbon farming standards.
- Establish farm-level sustainability roadmaps, defining carbon sequestration goals and performance benchmarks.
- Make GECO2 compliant with EU Certification Scheme
- Implement all necessary preconditions to ensure a complete compatibility of GECO2 with registry to a Union registry (valid before December 27, 2028).

2.2 Guidelines for Voluntary Carbon Market (VCM) functioning system and organization in the framework of Reg. 2024/3012;

1. Framework for Certification and Trading of Carbon Credits

- Article 1, Reg. 2024/3012 (Subject matter and scope):
    - This article establishes a voluntary Union framework for certifying carbon removals and soil emission reductions.
    - The framework includes:
        - Quality criteria for activities generating carbon removals or soil emission reductions.
        - Verification and certification rules to ensure these activities meet high standards.

        - Rules for certification schemes recognized by the EU.
        - Issuance and use of certified units for trading in carbon markets.
    - The framework complements emission reduction efforts in various sectors to meet the EU's climate-neutrality objective by 2050 under Regulation (EU) 2021/1119 (European Climate Law).

GECO2.2. full comply with EU objectives.

2. Promotion of Voluntary Carbon Markets

    - The document emphasizes the role of voluntary carbon markets in fostering innovation and flexibility for entities seeking to offset emissions.
    - The European Commission is tasked with assessing alignment with:
        - Article 6(2) and (4) of the Paris Agreement, which provides guidelines for international cooperation and carbon markets.
        - Best practices in voluntary carbon markets, focusing on:
            - Baselines and monitoring.
            - Additionality of projects (ensuring they wouldn't happen without carbon finance).
            - Liability for non-permanence risks.
    - It calls for a legislative proposal to enhance the alignment of the EU certification framework with voluntary market rules, encouraging broader participation and transparency.

GECO2.2. full comply with EU promotion of voluntary markets.

3. Certification Methodologies and Targets

- Article 8, Reg. 2024/3012 (Certification Methodologies):
    - Certification schemes should be used by operators to demonstrate compliance with this Regulation. Therefore, certification schemes should operate on the basis of reliable and transparent rules and procedures and should ensure the non-repudiation of the origin of, and protection against fraud relating to, information and data submitted by operators, as well as the accuracy, reliability and integrity of such information and data. They should also ensure that there is correct accounting of the

certified carbon removal or soil emission reduction units, in particular by avoiding double counting. Key Elements:

- Activities must deliver measurable, additional, and long-term carbon removals or reductions. When developing certification methodologies in the context of carbon farming, the Commission should take into account the need to contribute to ensuring food security, the need to promote the protection and the restoration of biodiversity and ecosystems, and the need to avoid the acquisition of land for speculative purposes resulting in negative effects on rural communities, as well as the need to respect the rights of local communities and indigenous people affected by those activities, where relevant in accordance with national law, both within and outside the Union. It should promote those activities that have the largest potential to provide positive co-benefits for biodiversity, as well as consider long-term forest structure, the long-term stability of carbon pools, ecosystem health, resilience and the risk of natural disturbances.
- A robust quantification system must be in place to calculate net carbon benefits:
  - Example formulas: Net benefit = removals under baseline - total removals - greenhouse gas emissions associated with the activity.
- Monitoring systems must combine on-site measurements with remote sensing and modelling for accuracy.

- The European Commission will periodically review and update methodologies to incorporate new scientific advancements and improve transparency.
- These methodologies form the basis for trading credible and verifiable carbon credits.

GECO2.2. has to define a scheme for being fully EU compliant.

4. Addressing specification in Carbon Credit production and Validation
Objective: Standardize carbon assessment and verification for carbon projects oriented to increase credibility
Key Actions

- The methodologies define carbon farming and soil emission reduction activities, assessment of carbon balance; are evaluated and verified. Carbon farming activities should at least generate co-benefits for the objective of protection and restoration of biodiversity and eco-systems, including soil health as well as avoidance of land degradation. Some minimum sustainability requirements should take into account the

impact of the activity both within and outside the Union as well as local conditions, and, where appropriate, be consistent with the technical screening criteria for the 'do no significant harm' principle, and be in line with the sustainability and greenhouse gas emissions saving criteria for forest and agriculture biomass raw material laid down in Directive (EU) 2018/2001. Practices that produce harmful effects on biodiversity, such as forest monocultures producing harmful effects on biodiversity, should not be eligible for certification.

Key items for GECO2.2 are:

- Develop soil/colture specific methods in order to increase soil /biomass carbon.
- Develop region-specific sequestration models to account for climate, soil type, and farming methods.
- Establish risk buffer systems to mitigate potential carbon reversals.
- Strengthen farm-level data collection by integrating automated digital tools into GECO2's calculators for sellers (carbon farming, soil emission reductions, but also geological sequestration e.g biochar sequestration)
- Expand baseline measurement accuracy and defining a soil carbon and biomass monitoring. Include some assessment evaluating carbon stock, fluxes and land-use.
- Define carbon baseline calculations at local and regional level for each soil/cultivation / farming practices. Establish a standard baseline and assess the quality using standard models.

5. Registry for Carbon Credits

Objective: in order to ensure transparency and full traceability of certified units, and to avoid the risk of fraud and double counting, the Commission should establish within four years of the date of entry into force of this Regulation and thereafter maintain a Union registry for permanent carbon removals, carbon farming and carbon storage in products (the Union registry).
Key Actions

- Union registry (article 12): Union registry for permanent carbon removals, carbon farming and carbon storage in products
    - A Union registry will be established to record certified units, ensuring transparency, traceability, and integrity.
    - Purpose:

        - Define the issuance and use of certified units.
        - verify whether the information and data submitted by an operator or a group of operators for the certification of compliance pursuant to Article 9 were subject to independent auditing and whether the certification of compliance was carried out in an accurate, reliable and cost-effective manner.
        - Avoid risks of fraud or double counting by assigning unique identifiers to each certified unit.
        - Monitor transactions within voluntary and compliance markets.
    - The registry will include automated systems and electronic templates to facilitate efficiency.
    - Before the Union registry is operational, recognized certification schemes must maintain interoperable certification registries.

Until the establishment of the Union registry, GECO2.2 certification scheme shall establish and duly maintain a certification registry to make publicly accessible in a secure way the information related to the certification process, including the certificates of compliance and updated certificates of compliance, containing, as a minimum, the information set out in Annex III, to enable the tracing of the quantity of units certified in accordance with Article 9.

6. Incentives for Market Participation

The objective of EU Regulation is to facilitate and encourage the deployment of permanent carbon removals, carbon farming and carbon storage in products by operators or groups of operators, as a complement to sustained emission reductions across all sectors to meet the objectives and targets laid down in Regulation (EU) 2021/1119. Paragraph 31 (introduction,) indicates that it is crucial to create further business opportunities for a sustainable agrifood value chain and leverage private funds in synergy with public funding.

- Purpose :
    - Encourages the creation of market-based mechanisms to drive investments in sustainable carbon farming and carbon removal technologies.
    - Aligns these incentives with public funding to increase farmers' participation.
    - Emphasizes fair trading practices to reward efforts by farmers and small operators, boosting revenues and promoting sustainable agriculture.
    - Key Benefits:
        - Attracts private capital.

- Ensures equitable access to carbon markets.
- Strengthens cooperation along the supply chain.

GECO2.2. is oriented to market participation, and it is compliant with those objectives.

7. Avoidance of Double Counting

- Paragraphes in introduction (3,23, 33 and 36) and Article 12 outline this key issue:
  - Certified removals and reductions under the EU framework are strictly tied to EU climate goals (not third-party commitments or international schemes).
  - Importance for Trading:
    - Prevents double counting, which could undermine the integrity and credibility of carbon credits.
    - Aligns the framework with international best practices and EU climate policies.
    - Ensures all credits are unique and contribute solely to the Union's nationally determined contributions (NDCs).

GECO2.2. is compliant with double counting avoidance: market platform developed in GECO2 was already compliant.

3. Final considerations and integration/modification with GECO2.2 strategic planning

The GECO2 model and the EU framework for carbon removals share a common goal of promoting sustainable carbon management practices, increasing soil carbon, reducing agriculture emissions, environment protection and sustainable development.

In order to full understand the final consideration of GECO2.2 and EU legislation are relevant outline some EU general principles.

Climate change is a critical challenge that is already affecting States, businesses and communities around the world, with the likelihood of far more disruptive impacts in the future. UN agenda 2030, European Union Policy and Scientific community indicate that to avoid the worst of these impacts, the world should aim to limit the increase in global average temperature to below 1.5°C, and that doing so requires achieving net-zero greenhouse gas (GHG) emissions by mid-century, with half or more of the necessary reductions occurring by 2030, from a 2010 baseline.

Article 11 of the Treaty on the Functioning of the European Union (TFEU) provides that environmental protection requirements must be integrated into the definition and implementation of the Union's policies and activities, in particular with a view to promoting sustainable development.

Union policy on the environment aims at a high level of protection. It is based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay[14].

In the light of the principles laid down in the Treaty, there are two complementary ways to mitigate the impact of the GHG emissions on the environment:

(a) as a priority, by reducing those emissions;

(b) by compensating for residual emissions through offsetting.

In order to join these objectives voluntary carbon market is a key instrument. Voluntary carbon market continues to evolve rapidly and unpredictably, some regional accelerating factors as GECO2.2 can help it growing in virtuous circle. Regulation (EU) 2024/3012 of the European Parliament and of the Council of 27 November 2024 establishing a Union certification framework for permanent carbon removals, carbon farming and carbon storage in products (second document) outlines the importance of carbon storage and carbon market in all the key issues. With the aim of outline the importance of GECO2.2 as local/regional carbon market developer there are two basic principles we would like to emphasize: first, agriculture can store carbon by doing adaptation and mitigation at the same time, and second, carbon offsets is important mechanism for all GHG emission sectors. The GECO2.2 project - as GECO2 already made - creates a carbon market that acts on both sectors and facilitates the acceleration of a virtuous market.

Fist principle: the management of agriculture can contribute to mitigation by storing carbon, reducing carbon emissions from soil degradation, reducing non-CO2 emissions from agriculture; can increase the adaptation to climate variations: adequate agricultural management enhances food security, biodiversity in hedgerows support pollination and regulate the microclimate locally (at local level), improving and water regionally (in watersheds), and soil buffer the impacts of extreme climate events, increasing water infiltration and recharge of aquifers. In addition, those are adaptation

[14] Article 191 TFEU.

measures and nature-based solutions can be implemented to reduce the vulnerability of agriculture to climate change.[15]

Second Principle: It is a general interest of all companies to pursue efforts to avoid, reduce and/or neutralize emissions in their own operations and across their value chains — in that order — and that carbon credits should not be used to unreasonably forestall or supplant these efforts. However, carbon markets can play an important role in both complementing such efforts and accelerating the overall transition to a low-carbon economy[16] and also join a net zero condition[17].

The viewpoints and principles already used in GECO2 are informed by standards and guidance from leading organizations — such as the Integrity Council for the Voluntary Carbon Market (IC-VCM)[18] and The Oxford Principles[19] — as well as the GECO2 experience has gained through the market experimentation. In addition to this, the following ISO standards are key documents:

- International Standard Organization (2023): ISO 14068-1:2023: Climate change management – Transition to net zero – Part 1: Carbon neutrality; November 30th 2023.
- International Standard Organization (2022): Net Zero Guidelines – Accelerating the transition to net zero, International Workshop Agreement (IWA 42 (E), November 2022.
- International Standard Organization (2019): ISO 14064-1, Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.

[15] Locatelli, B. Ch Pavegeau E. Pramova, M. Di Gregorio (2015). Integrating climate change mitigation and adaptation in agriculture and forestry: opportunities and trade-offs. WIREs Clim Change 2015, 6:585–598. doi: 10.1002/wcc.357

[16] Vieira L.C., Longo M., Mura M., 2021, Are the European manufacturing and energy sectors on track for achieving net-zero emissions in 2050? An empirical analysis, Energy Policy, 156, 112464.

Gerres T., Ávila J.P.C., Llamas P.L., San Román T.G., 2019, A review of cross-sector decarbonisation potentials in the European energy intensive industry, Journal of Cleaner Production, 210, 585-601.

[17] The Intergovernmental Panel on Climate Change defines GHG-neutrality as a condition in which the total amount of GHG emissions (sources) is balanced by the total amount of GHG removals (sinks) within a certain time period – usually a year (IPCC 2022). This definition - also referred to as net zero – is the base for all the organizations. The method used to calculate GHG inventories have to be in line with the UN Framework Convention on Climate Change (UNFCCC 1999) and according IPCC guidelines, they are based on at organization level on data, at national/subnational level the source and territory principle using official national statistics. Sources: IPCC (2022): Annex I: Glossary [van Diemen, R., J.B.R. Matthews, V. Möller, J.S. Fuglestvedt, V. Masson-Del-motte, C. Méndez, A. Reisinger, S. Semenov (eds)]. In IPCC, 2022: Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.020.

UNFCCC (1999): Decision 4/CP.5: Guidelines for the preparation of national communications by Parties, included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications. In: FCCC/CP/1999/6/Add.1. Online available at https://unfccc.int/sites/default/files/resource/docs/cop5/06a01.pdf.

[18] https://icvcm.org/

[19] https://www.smithschool.ox.ac.uk/sites/default/files/2022-01/Oxford-Offsetting-Principles-2020.pdf

- International Standard Organization (2019a): ISO 14064-3, Greenhouse gases – Part 3: Specification with guidance for the verification and validation of greenhouse gas statements.
- International Standard Organization (2018): ISO 14067, Greenhouse gases – Carbon footprint of products – Requirements and guidelines for quantification.

In order to full understand the final considerations on comparison between GECO2.2 and EU legislation, are relevant the following definitions (Reg. 2024/3012; Article 2, Definitions):
(1) 'carbon removal 'means the anthropogenic removal of carbon from the atmosphere and its durable storage in
geological, terrestrial or ocean reservoirs, or in long-lasting products;
(2) 'soil emission reduction 'means the reduction of net greenhouse gas emissions from biogenic carbon pools as listed in Section B, points (e) and (f), of Annex I to Regulation (EU) 2018/841 or the reduction of greenhouse gas emissions from the IPCC source category of agriculture, subcategory of 3.D agricultural soils, as determined pursuant to Regulation (EU) 2018/1999 and the implementing acts adopted pursuant to it, where the relevant activity, overall, reduces the emission of carbon from soil carbon pools or increases carbon removals in biogenic carbon pools;
(3) 'activity 'means one or more practices or processes carried out by an operator, or a group of operators, resulting in a permanent carbon removal, a temporary carbon removal through carbon farming or through carbon storage in
products, or soil emission reductions through carbon farming where such carbon farming, overall, reduces the
emissions of carbon from soil carbon pools or increases carbon removals in biogenic carbon pools;
(4) 'biogenic carbon pool 'means living biomass, litter, deadwood, dead organic matter, mineral soils and organic soils as listed in Section B, points (a) to (f), of Annex I to Regulation (EU) 2018/841;
(5) 'operator 'means any natural or legal person or public entity that operates or controls an activity, or to whom or to which decisive economic power over the technical functioning of the activity has been delegated; in the case of
a carbon farming activity, 'operator 'means a farmer as defined in Article 3, point (1), of Regulation (EU) 2021/2115,
any other manager of an activity in a terrestrial or coastal environment, a forest owner or manager as defined by
national law, or a competent public entity;
(6) 'group of operators 'means a legal entity that represents at least two operators and is responsible for ensuring that those operators comply with this Regulation;
(7) 'activity period 'means a period during which the activity generates a net carbon removal benefit or a net soil emission reduction benefit, and which is determined in the applicable certification methodology;

(8) 'monitoring period 'means a period during which the soil emission reduction or storage of carbon is monitored by an operator or a group of operators, which covers at least the activity period, and which is determined in the applicable certification methodology;
(9) 'permanent carbon removal 'means any practice or process that, under normal circumstances and using appropriate management practices, captures and stores atmospheric or biogenic carbon for several centuries, including permanently chemically bound carbon in products, and which is not combined with enhanced hydrocarbon recovery;
(10) 'carbon farming 'means any practice or process carried out over an activity period of at least five years, related to the management of a terrestrial or coastal environment and resulting in the capture and temporary storage of atmospheric or biogenic carbon in biogenic carbon pools, or in the reduction of soil emissions;
(Omissis)
14) 'certification body 'means an accredited or recognised independent conformity assessment body that has concluded an agreement with a certification scheme to carry out certification audits and issue certificates of compliance;
(15) 'certification scheme 'means an organisation that certifies the compliance of activities and operators with the quality criteria and certification rules set out in this Regulation;
(16) 'certification audit 'means an audit carried out by a certification body;
(17) 're-certification audit 'means an audit carried out in the process of renewing a certificate of compliance issued by a certification body;
(18) 'certificate of compliance 'means a conformity statement issued by a certification body certifying that an activity complies with this Regulation;
(Omissis)
(20) 'soil emission reduction unit 'means one metric tonne of CO2 equivalent of certified net soil emission reduction benefit
generated by a carbon farming activity and registered by a certification scheme in its certification registry or, as applicable, in the Union registry provided for in Article 12;
(Omissis)
(22) 'carbon farming sequestration unit 'means one metric tonne of CO2 equivalent of certified temporary net carbon removal benefit generated by a carbon farming activity and registered by a certification scheme in its certification registry or, as applicable, in the Union registry provided for in Article 12;

There are several issues of the First and Second Document relevant to achieving the GECO2.2 project objectives:

- The operator or group of operators activity plan that includes evidence of compliance with Articles 4 to 7 and the expected net carbon removal benefit or the expected net soil emission

reduction benefit generated by the activity, and a monitoring plan. The GECO2.2 certification scheme will include an activity plan in compliance with Articles 4 to 7 of Regulation (EU) 2024/3012 where will be emphasized the following issues; expected net carbon removal benefit or the expected net soil emission reduction benefit generated by the project; tasks and responsibilities of partners; market functioning rules and tools; organization of a registry of credits; a detailed monitoring plan. Reporting of schemes are needed: "certification schemes should report to the Commission regularly on their activity. Such reports should be made publicly available, in full or, where appropriate, in an aggregated form, in order to increase transparency and to improve supervision by the Commission."(Reg. 2024/3012; introductory part, paragraph 37).

- The Voluntary Carbon Market must have credible system that enables retirement of the certified units and prevents double counting. This control was controlled in project GECO2 and will be improved in project GECO2.2.
- GECO2.2 has to define the baseline definition methodology according to Reg.(EU) 2024/3012; The calculation of the baseline and definition of the common practice in a certain agricultural region has to be clarified and applied in the algorithm i.e. calculator. Baseline measurement and definition of standard baseline (Reg. 2024/3012; introductory part, paragraph 22)
- GECO2.2 version of farm calculator has to take into account the all the principles of Regulation (EU) 2024/3012 as: quantification (article 4), additionally (article 5), quality (article 6) and sustainability (article 7). The GECO2.2 calculation system (i.e. the calculators) and monitoring plan as to be compliant with reg 2024/3012 in all his parts.
- Monitoring (article 6): monitoring methods should be clearly defined, also using remote sensing data and data available from European databases[20], always accompanied by an expert assessment with a site visit and survey. "Operators should take all relevant preventive measures to mitigate those risks and duly monitor whether carbon continues to be stored over the monitoring period set for the relevant activity. The validity of the certified unit should depend on the expected duration of the storage and the different risks of reversal associated with the given activity" (Reg. 2024/3012; introductory part, paragraph 22).
- An Operator or a group of operators as GECO2.2. shall participate in a certification scheme[21]. Geco2.2 must in particular follow the following paragraphs of the European regulation.

[20] for example: soil data base available at JRC: https://esdac.jrc.ec.europa.eu/; ecological data available at: https://www.eea.europa.eu/en/datahub?size=n_10_n&filters[0][field]=issued.date&filters[0][type]=any&filters[0][values][0]=All time

[21] To apply for certification of compliance with this Regulation, an operator or a group of operators shall submit an application to a certification scheme. Upon acceptance of that application, the operator or group of operators shall submit to a certification body an activity plan that includes evidence of compliance with Articles 4 to 7 and the expected net carbon removal benefit or the expected net soil emission reduction benefit generated by the activity, and a monitoring plan. Groups

"Certification schemes shall operate in an independent manner on the basis of reliable and transparent rules and procedures, in particular with regard to internal management and monitoring, handling of complaints and appeals, stakeholder consultation, transparency and publication of information, appointment and training of certification bodies, addressing non-conformity issues, and development and management of certification registries. Certification schemes shall set transparent fees and make information about those fees easily accessible to operators, including by publishing them on their websites. Certification schemes shall put in place easily accessible complaint and appeal procedures. Information about those procedures shall be made publicly available in the certification registry or, once established, in the Union registry. 3. Certification schemes shall verify whether the information and data submitted by an operator or a group of operators for the certification of compliance pursuant to Article 9 were subject to independent auditing and whether the certification of compliance, including the re-certification audit reports, was carried out in an accurate, reliable and cost-effective manner. 4. Certification schemes shall at least annually publish in their certification registries" (Reg. 2024/3012; article 11). "Only a certification scheme recognised by the Commission by means of a decision may be used by an operator or a group of operators to demonstrate compliance with this Regulation. Such decision shall be valid for a period of no more than five years and shall be made publicly available in the Union registry." (Reg. 2024/3012; article 13)."Certification schemes should be used by operators to demonstrate compliance with this Regulation. Therefore, certification schemes should operate on the basis of reliable and transparent rules and procedures and should ensure the non-repudiation of the origin of, and protection against fraud relating to, information and data submitted by operators, as well as the accuracy, reliability and integrity of such information and data. They should also ensure that there is correct accounting of the certified carbon removal or soil emission reduction units, in particular by avoiding double counting.(Reg. 2024/3012; introductory part, paragraph 33).

- The certification scheme shall appoint a certification body, which shall conduct a certification audit to verify that the information. Certification bodies appointed by the certification schemes shall be accredited by a national accreditation body pursuant to Regulation (EC) No 765/2008 or be recognized by a national competent authority as being competent to cover the scope this Regulation or the specific scope of the certification scheme. GECO2.2 scheme

of operators shall also specify how advisory services are provided, in particular to small-scale carbon farming operators. For carbon farming activities, Member States may provide advice to farmers in the framework of the farm advisory services referred to in Article 15 of Regulation (EU) 2021/2115. (Reg. 2024/3012; article 9, paragraph 1).

must be re-evaluated (at least) every 5 years by a certification body[22]. The certification scheme shall review the re-certification audit report and the updated certificate of compliance[23].

- GECO2.2 follows the principle that the certified units (carbon credits) shall be issued by certification registries or, once established, by the Union registry (after 27th December 2028) only after carbon farming activities or net soil emission reduction, based on a valid certificate of compliance resulting from a re-certification audit.
- GECO2 had planned and created a support system for farmers and calculation tool. "Providing carbon farming operators with improved knowledge, tools and methods for a better assessment and the optimization of certified carbon removals and soil emission reductions is essential for the cost-efficient implementation of mitigation actions and for securing their engagement in carbon farming" (reg 2024/3012; introductory part, paragraph 29). This approach is perfectly in line with and GECO2.2 will continue within the same general framework creating a lasting support system.
- GECO2 have to be compliant with the Union registry ("In order to ensure transparency and full traceability of certified units, and to avoid the risk of fraud and double counting, the Commission should establish within four years of the date of entry into force of this Regulation and thereafter maintain a Union registry for permanent carbon removals, carbon farming and carbon storage in products (the 'Union registry'). The Commission should take into account the reports referred to in Article 30(5), point (a), of Directive 2003/87/EC and Article 17(3) of Regulation (EU) 2018/84.")
- GECO2 tokes into account sustainability principles (Article 7, reg 2024/3012) as be consistent with "do no significant harm" principle in all the metrics climate change adaptation and mitigation, water sustainable use and protection, circular economy, including the efficient use of sustainably sourced bio-based materials, pollution prevention and control, protection and

[22] "At least every five years, or more frequently where so specified in the applicable certification methodology based on the characteristics of the relevant activity, the certification body shall carry out re-certification audits to reconfirm compliance of the activity with Articles 4 to 7 and verify the net carbon removal benefit or the net soil emission reduction benefit generated by the activity. As a result of that re-certification audit, the certification body shall issue a re-certification audit report that includes a summary, and, where appropriate, shall issue an updated certificate of compliance. The certification scheme shall review the re-certification audit report and the updated certificate of compliance, and make the re-certification audit report, in full or, where necessary to preserve the confidentiality of commercially sensitive information, in a summarised form, and the updated certificate of compliance publicly available in its certification registry or, once established, in the Union The certification registry of the certification scheme or, once established, the Union ."(Reg. 2024/3012; article 9, paragraph 3).

[23]" All activities should also be subject to periodic re-certification audits at least every five years, or otherwise more frequently as specified in the applicable certification methodology based on the characteristics of the relevant activity. The re-certification audits should verify the compliance of the activity with the quality criteria of this Regulation and the net carbon removal benefit or net soil emission reduction benefit generated by the activity. As a result of a re-certification audit, the certification body should issue a re-certification audit report that includes a summary and, where appropriate, an updated certificate of compliance" (reg 2024/3012; introductory part, paragraph 29).

restoration of biodiversity and ecosystems, including soil health; co-benefits for the sustainability objective; promote the sustainability of forest and agriculture biomass raw material. GECO2.2 will improve those principles as evident in methodology for GECO2.2 projects making temporary net carbon removal (agriculture, biomass and soil) and net soil emission reduction.

- The price and market value of carbon credit[24] were not considered in the European regulations. For the principles of justice and fairness present in European legislation and in particular in the farm to fork strategy, it might be correct to define a price as already tested in the GECO2 project.

[24] Finch A., van den Bergh J., 2022, Assessing the authenticity of national carbon prices: A comparison of 31 countries, Global Environmental Change, 74, 102525.

Annex A

Extensive comments of “Proposal for a regulation of the European Parliament and of the Council establishing a Union certification framework for carbon removals” and difference to the “Regulation of the European parliament and of the Council establishing a Union certification framework for permanent carbon removals, carbon farming and carbon storage in products”.

Introduction

In this appendix are comments of “Proposal for a regulation of the European Parliament and of the Council establishing a Union certification framework for carbon removals”. Aforementioned Proposal is extensively analysed and commented. The EU Parliament and Council passed the more detailed and specific “Regulation of the European parliament and of the Council establishing a Union certification framework for permanent carbon removals, carbon farming and carbon storage in products” in November 2024. The former document about regulation is compared with the Proposal.

Proposal for a regulation of the European Parliament and of the Council establishing a Union certification framework for carbon removals

Abstract
On 30 November 2022, the European Commission introduced a proposal for an EU Carbon Removal Certification Framework (CRCF). However, this framework risks compromising the environmental integrity of the EU's climate strategies. The concern is further amplified by the lack of a clear agreement on the EU's approach to carbon removals beyond 2030.
This document evaluates the Commission’s CRCF proposal, examining its connections with other EU climate legislation. It provides a comprehensive analysis of the framework’s key components and assesses them using specific criteria: (1) whether the proposal fortifies EU climate strategies, (2) whether it upholds the integrity of climate policies, (3) whether it fosters robust environmental

practices, and (4) whether it considers other vital factors influencing carbon removal adoption, such as energy efficiency, cost-effectiveness, and innovation.

Summary
On 30 November 2022, the European Commission introduced a proposal for the EU Carbon Removal Certification Framework (CRCF). This initiative seeks to encourage the implementation of carbon removal strategies across the EU, aiming to facilitate additional funding for such activities.

However, key regulatory aspects remain ambiguous within the proposal, posing considerable risks to the quality and application of carbon removal units. This lack of clarity may ultimately jeopardize the environmental integrity of EU climate policies.

The proposal raises several critical concerns:

- Unrestricted use of removal units:

The proposal does not specify limits on how removal units can be utilized, creating one of the most significant challenges in regulating carbon certification. This unrestricted use enables units to serve any purpose, raising concerns. Substituting carbon securely stored in geological reservoirs like coal, oil, or gas — which are not prone to natural reversal risks — with carbon temporarily stored in terrestrial reservoirs such as biomass or products introduces significant anthropogenic and natural risks. Over-reliance on removals instead of emission reductions could hinder the 1.5°C target, increase atmospheric CO2 levels, and activate climate tipping points. Furthermore, allowing unlimited use for offsetting raises risks of double counting.

To mitigate these risks, the CRCF should prohibit removal units from being used for emission reduction obligations. Instead, their use should be restricted to:

1. Compliance with carbon removal obligations under EU, national, or sub-national policies other than the ETS, ESR, or LULUCF Regulation.
2. Voluntary applications other than offsetting, such as contribution claims.
3. Allocation of subsidies or incentives.
   Bioenergy with carbon capture and storage (BECCS) removals, given limited sustainable biomass, should generally be excluded from CRCF certification.

- Lack of a clear strategy for carbon removals:

The EU has not established how carbon removals will contribute to climate targets beyond 2030. While the 2030 target defines removals' role, the 2050 neutrality target does not specify their role, and the 2040 target remains undefined. Current regulations, including the ETS and ESR, limit removals' use, yet there are proposals to integrate them into compliance mechanisms.

In the absence of strategic clarity, promoting removal units for offsetting emissions is risky. Without safeguards limiting usage and ensuring high-quality standards, CRCF could allow emissions to be substituted with removals, undermining EU climate policy. Setting specific targets for removals — such as those for carbon farming or geological sequestration for 2040 and 2050 — is essential to avoid these pitfalls.

- Definition of carbon removals:

The CRCF defines carbon removals as including "reductions in carbon release from biogenic carbon pools." However, this conflates emission reductions and removals, diverging from UNFCCC and IPCC definitions, which consider removals as the extraction of greenhouse gases from the atmosphere. This approach inflates the availability of removal units without guaranteeing actual atmospheric carbon withdrawal, undermining negative emissions goals under the European Climate Law (ECL).

- Definition of permanence:

The CRCF describes "permanent carbon storage" as lasting several centuries without clarifying this duration. Given that CO2 persists in the atmosphere far longer, permanence should align with its atmospheric lifespan. Unlike the CRCF, the Clean Development Mechanism (CDM) prudently regards geological storage as potentially non-permanent, and the CRCF should adopt a similar stance.

- Expiry and validity of removal units:

The proposal does not address expiration for geological storage-based removals but treats them as permanent. Conversely, removals from carbon farming or products expire with the monitoring period, reflecting temporary storage. To prevent misuse, temporary units should not balance emissions unless renewed throughout the CO2 atmospheric lifespan. Strong liability measures are also needed to address reversals during monitoring.

- Absence of legal obligations for long-term storage:

The CRCF requires operators to "aim" at long-term storage but imposes no enforceable obligation or clear definition of "long-term." This vagueness undermines the framework's credibility.

- Transfer of responsibility and cost externalization:

Under the CCS Directive's liability rules, responsibility for geological storage shifts from operators to the state post-closure. Given the scale of anticipated storage by 2050, this could burden future generations, especially if leakages exceed expectations.

- Standardized baselines for quantification:

The proposal adopts a standardized baseline for calculating removals, equating to average performance within the sector. This approach risks certifying already occurring activities and lacks ambition, undermining the framework's environmental credibility.

- Conservative quantification:

Global standards prioritize conservative quantification to avoid overestimating removals. The CRCF, however, prioritizes accuracy, a weaker stance that diverges from international practices and undermines credibility.

- Delegation of power:

The CRCF authorizes the Commission to define key elements, such as permanence and removal unit usage, via delegated acts. However, under Article 290 of the Treaty on the Functioning of the European Union, essential elements of legislative acts cannot be delegated, raising legal questions about this approach.

Achieving the goal of limiting global temperature increases to well below 2°C or, ideally, to 1.5°C above pre-industrial levels necessitates drastic and immediate reductions in greenhouse gas (GHG) emissions. However, such reductions alone are likely to fall short. The Intergovernmental Panel on Climate Change (IPCC) emphasizes that nearly all pathways capable of limiting warming to 1.5°C (with over a 50% probability) or to 2°C (with more than a 67% probability) include the removal of carbon dioxide (CO_2) from the atmosphere, referred to as Carbon Dioxide Removal (CDR) (IPCC 2021). The use of CDR to offset residual emissions that are difficult to eliminate is deemed "unavoidable" by the IPCC.

Recognizing the significance of carbon removals, the European Union has enshrined their role within its policies and legislation. The European Climate Law (ECL), for instance, mandates a legally binding target for the EU to achieve climate neutrality by 2050. By this deadline, greenhouse gas emissions and removals under EU regulation must be balanced. Moreover, the ECL establishes a net GHG emissions reduction target for 2030, allowing net removals to contribute a maximum of 225 million tonnes of CO_2 equivalent toward this target. Beyond 2050, the ECL requires the EU to strive for net negative emissions, whereby more GHG is removed than emitted. Additional legislative instruments, such as the LULUCF Regulation and the long-term climate strategies of Member States, also highlight the necessity of carbon removal.

The political dialogue surrounding carbon removals has intensified with the European Commission's proposal for a Carbon Removal Certification Framework (CRCF), introduced on 30 November 2022. This voluntary EU framework aims to establish criteria for the certification of carbon removals, set rules for the certification process, and recognize certification schemes. By proposing this framework, the Commission seeks to facilitate the efficient scaling up of carbon removal activities across the EU.

This report examines the CRCF proposal against the backdrop of the broader EU climate policy framework. It provides a concise overview of the main elements of the proposal and evaluates them based on four key criteria:

1. Whether the proposal enhances EU climate policies.
2. Whether it ensures the integrity of these policies.
3. Whether it supports robust environmental policies.
4. Whether it considers other factors critical to the adoption of carbon removal practices, such as energy efficiency, cost-effectiveness, and innovation.

In its final section, the report explores the interplay between the CRCF and other EU climate regulations, emphasizing potential synergies and conflicts.

The Commission's Proposal: Main Elements and Assessment

The Commission's proposal establishes a framework for carbon removal certification across the EU, as outlined in Article 1. Specifically, it sets criteria for issuing carbon removal units within the EU, alongside rules governing the certification process and the recognition of certification schemes. The primary objectives of this framework are to ensure that carbon removal units are of high quality, to prevent greenwashing, and to promote actions supporting the implementation and funding of carbon removals within the EU (recitals 3 and 4).

Assessment

Voluntary EU Framework for Certification of Carbon Removals

The CRCF proposes a voluntary certification framework, meaning that operators[1] and certifiers are not legally obligated to participate. However, the framework introduces specific legal obligations for those who opt to engage with it:

- Operators: If operators seek EU certification under the CRCF, they must comply with the framework's established obligations.

- Member States and the Commission: Member States are tasked with supervising certification schemes, while the Commission is responsible for the recognition of these schemes.

This voluntary approach balances flexibility for participants with mandatory compliance requirements for those choosing to adopt the framework.

Use of Carbon Removal Units

The proposal does not specify explicit restrictions on how carbon removal units can be used, meaning these units could theoretically be utilized for any purpose. Recital 21 supports this interpretation[2]. Below are several potential applications of carbon removal units:

1. Compliance Use Under EU Climate Regulations
    - Entities under the EU Emissions Trading System (ETS) could theoretically use removal units to meet their obligations[3]. Similarly, Member States might use these units to fulfil their commitments under the Effort Sharing Regulation (ESR) or the Land Use, Land Use Change, and Forestry (LULUCF) Regulation.

However, such uses are currently not permitted. The ETS, ESR, and LULUCF regulations prohibit the use of CRCF-certified removal units to prevent double counting of removals. Since Member States automatically include these removals in measuring their progress under the EU LULUCF regulation, allowing them for other purposes would undermine the EU's climate governance.

2. Compliance Use Under CORSIA
    - Carbon removal units might be recognized under the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). However, the CRCF framework significantly differs from established carbon crediting schemes recognized by CORSIA.
    - Furthermore, using removal units for CORSIA would necessitate EU authorization of the underlying mitigation outcomes under Article 6 of the Paris Agreement for use in other international mitigation purposes (OIMP). This would prevent the EU from counting these removals toward its own nationally determined contributions (NDCs), undermining its ability to achieve them. The proposal does not address this potential use.

3. Compliance Use Under Other EU, National, or Sub-National Policies
    - EU or Member State laws could theoretically permit entities to use carbon removal units to fulfil obligations under specific policies. For instance, removal units could help meet compliance targets under the EU Fuel Quality Directive, which governs the emissions intensity of transport fuels. However, the proposal does not explicitly address whether such uses would be allowed.

4. Voluntary Use for Offsetting
    - Companies, institutions, jurisdictions, or individuals could use carbon removal units to voluntarily offset their emissions. Examples might include corporate entities offsetting operational emissions or individuals offsetting their personal carbon footprint.
    - Double claiming remains a contentious issue in this context. If double claiming with NDCs is to be avoided, the underlying mitigation outcomes must be authorized under Article 6 of the Paris Agreement. However, this would prevent the EU from counting these removals toward its own NDC. Additionally, the same removals would simultaneously be used by Member States to meet LULUCF targets and by private entities for offsetting, creating further risks of double counting. The proposal does not address these challenges.

5. Voluntary Use for Non-Offsetting Purposes
    - To avoid the challenges of double claiming, some stakeholders propose using removal units to make climate contributions rather than offsetting. For instance, companies or institutions could make “contribution claims,” wherein removals are acknowledged as contributing to climate goals without counting toward specific targets.
    - These contributions could include the development of labels or recognition programs for entities supporting carbon removal activities. Organizations like WWF and the NewClimate Institute have explored these concepts under terms like “climate responsibility” and “contribution claims” (WWF 2021; WWF 2022; NewClimate Institute 2020).

6. Use as vehicle to disburse subsidies or provide incentives
   Carbon removal units could also serve as a mechanism to facilitate the allocation of public subsidies or other financial incentives. For example:

   - Farmers or land managers could receive subsidies for each carbon removal unit they generate and surrender.
   - Subsidies tied to the Common Agricultural Policy (CAP) could be accessible to farmers who meet specific conditions, including generating and surrendering carbon removal units as part of their compliance with sustainable agricultural practices.

This particular application of removal units does not carry the risks associated with double claiming, as the units would solely be linked to the financial disbursement process and would not overlap with obligations under emissions reduction targets or NDC accounting.

The overall environmental integrity[5] of the CRCF is closely tied to the intended purpose and use of carbon removal units. While using these units to fulfil emission reduction obligations risks undermining the credibility and robustness of climate policies (as detailed in the text box below), alternative uses—such as certification for labelling purposes or as instruments for distributing subsidies—pose significantly less risk.

These non-offsetting applications are generally more aligned with the goals of promoting environmental sustainability and incentivizing carbon removal activities, without jeopardizing the integrity of broader climate policies.

Carbon removals and the integrity of climate policies

While both emission reductions and carbon removals play critical roles in mitigating climate change, carbon removals are inherently less robust as a form of climate action due to unique challenges that do not affect emission reductions. These challenges are outlined below:

1. Permanence

Unlike fossil carbon stored in coal, gas, or oil deposits, which remains securely sequestered for millennia, the storage of carbon in biomass and biotic systems is inherently temporary. Over time,

carbon stored in plants, soils, or organic matter is re-released into the atmosphere, whether through natural processes like decomposition or through human activities such as land-use changes.

- Biotic vs. Fossil Carbon Cycles:

  Fossil carbon is part of a long-term geological carbon sink, while biotic carbon belongs to the active, short-term carbon cycle. This distinction creates a "fundamental barrier to equivalence" between biotic and fossil carbon storage (Carton et al. 2021).
- Challenges with Products and CCU:

  Carbon stored in materials like building components only remains out of the atmosphere for the lifetime of the product, which may span decades at most. Similarly, carbon capture and utilization (CCU) processes delay CO2 emissions rather than providing permanent storage (European Commission 2022).

Although technology-based removal methods, such as direct air carbon capture and storage (DACCS), promise long-term or even permanent carbon storage, they face their own challenges. These include uncertainties about their long-term environmental impacts, high energy demands, substantial costs, limited scalability, biodiversity implications, and potential land-use conflicts (IPCC 2005). While innovation might address some of these issues in the future, they remain significant barriers today.

2. Lock-In of High Emission Pathways and Risk of Climate Feedback Loops

Over-reliance on carbon removals, rather than prioritizing immediate and deep emission reductions, risks locking the world into high-emission pathways. This approach could make the 1.5°C target increasingly unattainable.

- Delaying Emission Reductions:

  Substituting deep emission cuts today with removals could result in higher cumulative greenhouse gas concentrations in the atmosphere. These elevated levels amplify the risk of triggering climate system tipping points, such as the collapse of ice sheets or the release of methane from permafrost. Once triggered, these feedback loops exacerbate emissions and accelerate global warming, making mitigation significantly harder (IPCC 2021).
- Irreversibility of Emissions:
  Carbon removals cannot fully compensate for delayed or foregone emission reductions. Unlike direct emission cuts, which prevent greenhouse gases from entering the atmosphere, removals primarily serve as a remedial action, often with less predictable outcomes and long-term risks

3. Challenges in Ensuring High-Quality Removal Units

Certifying carbon removals, particularly those derived from nature-based solutions, presents significant obstacles compared to certifying emission reductions.

- Data Quality and Environmental Impacts:

  Reliable data on the effectiveness and broader environmental impacts of carbon removal activities is often lacking. Additionally, these activities can have global implications, including risks related to leakage (the displacement of emissions to other regions) and food security.
- Baseline Uncertainties:

  Establishing accurate baselines for nature-based carbon removal activities is fraught with uncertainty. Without robust baselines, it becomes challenging to measure the actual additionality and permanence of the removals.

4. Inventory Visibility

A significant challenge for the effective implementation of carbon removals is ensuring their visibility in national greenhouse gas (GHG) inventories. Certain carbon removal activities, such as direct air carbon capture and storage (DACCS), carbon storage in long-lasting products, rock carbonization/enhanced weathering, and marine geoengineering, currently lack agreed-upon quantification methodologies under the Intergovernmental Panel on Climate Change (IPCC) or approval by the United Nations Framework Convention on Climate Change (UNFCCC). This lack of standardized methodologies hinders consistent monitoring, reporting, and validation of these activities.

Moreover, the categorization of potential carbon removal activities within existing GHG inventory systems remains unresolved. For example, it is unclear how to allocate some activities to specific inventory categories. Land-use activities, such as soil carbon enhancement, pose an additional challenge because the granularity of national GHG inventories often falls short of what is needed to capture these activities accurately. Insufficient granularity can obscure these removal activities in national reporting systems, reducing their visibility and recognition (Schneider et al., 2022).

Ensuring proper visibility of carbon removals in inventories and their accurate allocation to inventory categories is vital for the European Union. It allows these removals to be accounted for when assessing progress toward the EU's nationally determined contributions (NDCs). While emission reductions are typically well-represented in GHG inventories, certain types of carbon removals risk being overlooked or underreported, undermining the EU's ability to meet its climate goals effectively.

5. The Risk of Non-Materialization of Expected Removals

Another critical issue with carbon removals is the uncertainty surrounding their actual realization. This challenge is closely tied to problems with data quality, which make it difficult to project the EU's carbon removal potential with accuracy.

Uncertainties arise from several factors, including the anticipated and unanticipated impacts of climate change, as well as natural disturbances such as wildfires, pests, or extreme weather events, all of which can reduce the capacity of natural sinks to sequester carbon. In the face of these uncertainties, there is a significant risk that while emissions persist, the removals expected to counterbalance them may fail to materialize. This mismatch could jeopardize the EU's ability to achieve its climate objectives, highlighting the need for robust monitoring and adaptive strategies to mitigate such risks.

Recommendations on Limiting the Use of Carbon Removal Units

To preserve the integrity of the Carbon Removal Certification Framework (CRCF) and mitigate the risks associated with double counting, we recommend that Article 1 explicitly prohibit the use of removal units for complying with emission reduction obligations or for offsetting purposes. Instead, the use of carbon removal units should be strictly limited to the following purposes:

- Compliance with carbon removal obligations: Removal units may be used to fulfill carbon removal requirements under EU, national, or sub-national policies, provided these policies are distinct from the EU Emissions Trading System (ETS), Effort Sharing Regulation (ESR), or the Land Use, Land Use Change, and Forestry (LULUCF) Regulation.
- Voluntary non-offsetting applications: Units may be used for purposes such as contribution claims, which recognize climate mitigation contributions without substituting for emissions reductions.
- Subsidy disbursement and incentives: Units may serve as instruments for distributing public subsidies or other financial incentives, such as rewarding farmers or operators who generate and surrender removal units under schemes like the Common Agricultural Policy (CAP).

Limiting the use of removal units to these applications is critical not only up to 2030 but also beyond. The risks of double counting, particularly in cases where removals are used for offsetting or compliance with emission reduction obligations, will persist beyond the short term.

Regulatory Framework for Eligible and Non-Eligible Uses

The CRCF must regulate the eligible and non-eligible uses of carbon removal units within the binding Articles of the Regulation itself, rather than relegating such guidance to non-binding recitals. As the purpose of removal units is a fundamental element of the CRCF, it is essential to ensure that these rules are clearly articulated and legally enforceable.

Separate Targets for Removals and Reductions

To safeguard the integrity of climate policies, we also recommend establishing distinct and quantified targets for emission reductions and carbon removals. For example, the EU climate target for 2030 could be complemented by separate targets for carbon farming and geological sequestration approaches. This separation would clarify the respective roles of removals and reductions in achieving climate objectives and prevent unintended overlaps (McLaren et al., 2019).

Relevance to the QU.A.L.ITY Criteria

Defining the eligible uses of removal units is also pivotal for establishing appropriate QU.A.L.ITY certification standards. For non-offsetting applications, such as contribution claims, it may be reasonable to adopt less stringent certification standards in certain areas, given that these units are not being used to meet emission reduction targets. This reduced stringency can lower environmental integrity risks for these specific applications.

Nevertheless, the QU.A.L.ITY criteria—encompassing quantification, additionality, long-term storage, and sustainability—remain essential. They ensure that funding allocated to removal activities is used effectively and that these activities deliver meaningful outcomes without undermining broader environmental and social objectives (McDonald et al., 2023).

Definitions (Article 2)

Article 2 outlines the definitions governing the Carbon Removal Certification Framework (CRCF). These include key terms such as carbon removal, carbon removal activities, biogenic carbon pools, long-lasting products, and permanence. The definitions in this provision are fundamental to understanding and implementing the framework.

Carbon Removal (Article 2.1(a))

The proposal defines "carbon removal" as:

- "The storage of atmospheric or biogenic carbon within geological carbon pools, biogenic carbon pools, long-lasting products and materials, and the marine environment," or
- "The reduction of carbon release from a biogenic carbon pool to the atmosphere."

Similarly, a "carbon removal activity" is defined as "one or more practices or processes carried out by an operator resulting in permanent carbon storage, enhancing carbon capture in a biogenic carbon pool, reducing the release of carbon from a biogenic carbon pool to the atmosphere, or storing atmospheric or biogenic carbon in long-lasting products or materials" (Art. 2.1(b)).

Within this framework, the proposal identifies three main types of carbon removal activities:

- Permanent carbon storage: Defined in Article 2.1(g) (discussed further in section 2.2.2 below).
- Carbon farming: Defined in Article 2.2(h) as a carbon removal activity related to land management that increases carbon storage in living biomass, dead organic matter, and soils by enhancing carbon capture or reducing carbon release.
- Carbon storage in products: Defined in Article 2.1(i) as a carbon removal activity that stores atmospheric or biogenic carbon in long-lasting products or materials.

A distinction is also made between:

- Certificates: These merely confirm compliance of carbon removal activities with CRCF rules.
- Carbon removal units: These quantify certified net carbon removal benefits, measured in tonnes of CO2 generated by the activities.

Assessment

The IPCC defines carbon dioxide removals (CDRs) as "the withdrawal of greenhouse gases from the atmosphere as a result of deliberate human activities."[6] The CRCF's definition under Article 2.1(a) diverges significantly from this standard:

- Reductions vs. Removals: Unlike the IPCC definition, the CRCF includes "the reduction of carbon release from a biogenic carbon pool to the atmosphere." This inclusion conflates emission reductions—which slow the rate of atmospheric GHG accumulation—with carbon removals, which actively decrease atmospheric GHG concentrations.

- Carbon Releases vs. Greenhouse Gases: The CRCF refers to "carbon releases," which appears to encompass carbon dioxide (CO2) and methane (CH4), but excludes other greenhouse gases not containing carbon. The IPCC, in contrast, focuses on all greenhouse gases, ensuring broader applicability.

Consequences of the Proposal's Definition
The CRCF's definition has several negative implications:

- Regulatory Ambiguity: The framework's title emphasizes carbon removal, which implies the subtraction of carbon from the atmosphere. However, by including emission reductions, the proposal undermines regulatory clarity and complicates an already intricate system, contravening the EU's Better Regulation Guidelines.
- Equal Treatment of Removal Options: Despite acknowledging the varying characteristics of different carbon removal options (recital 5), the definition treats permanent and non-permanent removals as equivalent. This is problematic, as it conflates fundamentally distinct approaches.
- Climate Neutrality and Net Negative Emissions: Mixing reductions with removals blurs progress toward climate neutrality and net negative emissions. If avoided emissions are classified as removals, it becomes harder to track progress toward the European Climate Law's (ECL) climate neutrality targets. Monitoring pathways and verifying achievements would also become more complex and less reliable.

Permanent Carbon Storage

The permanence of carbon storage is a crucial regulatory element. The CRCF defines "permanent carbon storage" as "a carbon removal activity that, under normal circumstances and using appropriate management practices, stores atmospheric or biogenic carbon for several centuries, including bioenergy with carbon capture and storage (BECCS) and direct air carbon capture and storage (DACCS)" (Art. 2.1(g)).

The framework differentiates between permanent and non-permanent removals:

- Non-permanent removals: Article 6.3 specifies that for activities such as carbon farming or carbon storage in products, the stored carbon is considered released back into the atmosphere at the end of the monitoring period[7]. This distinction highlights that these activities cannot qualify as permanent storage (see also section 2.3.3).

- Permanent removals: BECCS and DACCS are treated as permanent carbon removal methods under the CRCF.

Article 8.2 grants the Commission the authority to adopt delegated acts to establish technical certification methodologies for permanent carbon storage, carbon farming, and carbon storage in products.

Assessment of Permanence

While the CRCF delegates the establishment of detailed technical rules on permanence to delegated acts at a later stage, the current definition of permanence in the proposal has notable deficiencies that require attention:

- Duration of Storage:

  The proposal's definition of permanence, which refers to storing carbon for "several centuries," falls significantly short of the timescale necessary to mitigate climate impacts. Large portions of emitted CO2 persist in the atmosphere[8] for thousands of years, far exceeding the proposed timeframe. Fossil carbon stored in coal, oil, and gas reservoirs, in contrast, remains sequestered for millions of years. Defining permanence with the vague term "several centuries" risks creating regulatory ambiguity and undermining the robustness of the framework. To align with scientific understanding and climate objectives, the definition of permanence should reflect the atmospheric lifespan of CO2, ensuring that the proposed storage period matches the duration CO2 remains a climate threat.

7 According to the proposal, 'carbon storage in products' means a carbon removal activity that stores atmospheric and biogenic carbon in long-lasting products or materials (Art. 2.1.(i), emphasis added).

8 Inman (2008) citing IPCC (2007): "About 50% of a CO2 increase will be removed from the atmosphere within 30 years, and a further 30% will be removed within a few centuries. The remaining 20% may stay in the atmosphere for many thousands of years." But if cumulative emissions are high, the portion remaining in the atmosphere could be higher than this, models suggest.

- Non-Permanence of BECCS and DACCS:

Bioenergy with carbon capture and storage (BECCS) and direct air carbon capture and storage (DACCS) are categorized as permanent removal methods under the proposal. However, neither BECCS nor DACCS inherently ensures permanent carbon storage. The geological formations used for storage are subject to risks of reversal, such as leakage caused by geological instability, seismic activity, or poor maintenance.

Notably, under the Kyoto Protocol, Parties have acknowledged that carbon capture and storage (CCS) activities carry inherent risks of non-permanence. To address these risks, the Clean Development Mechanism (CDM) developed a comprehensive set of rules to monitor, manage, and compensate for any reversals associated with CCS projects. The CRCF should similarly recognize these risks and include robust safeguards to mitigate potential reversals from BECCS and DACCS activities. These safeguards could include stringent monitoring requirements, liability mechanisms, and mandatory compensation for reversals to maintain the environmental integrity of the framework.

Certification Requirements (Articles 3–8)

The CRCF proposal establishes five key certification requirements for carbon removal activities to qualify for certification:

- They must be quantified to result in a net removal benefit (Article 4).
- They must be additional (Article 5).
- They must aim to ensure long-term storage of carbon (Article 6).
- They must comply with the Regulation's sustainability criteria (Article 7).
- They must be independently verified (Article 8).

Quantification

The proposal specifies several requirements for the quantification of carbon removals:

- Net Carbon Removal Benefit:
  Carbon removal activities must generate a net benefit, calculated using the formula:

Net Carbon Removal Benefit= $CR_{baseline} - Cr_{total} - GHG_{increase} > 0$

Here, $CR_{baseline}$ represents removals under a baseline scenario, CR_{total} refers to total carbon removals from the activity, and $GHG_{increase}$ captures greenhouse gas increases caused by the activity (Article 4.1).

- Baseline:
  Removals are quantified using a standardized baseline, representing the typical carbon removal performance of comparable activities under similar social, economic, and environmental conditions (Article 4.5). Individual baselines may be used in exceptional cases (Article 4.6).
- General Requirements for Quantification:
  Quantification must adhere to principles of relevance, accuracy, completeness, consistency, comparability, and transparency (Article 4.4).
- Uncertainties:
  The methodology must account for uncertainties using recognized statistical approaches (Article 4.8).

Assessment

- Conservativeness vs. Accuracy:

The inclusion of greenhouse gas emissions caused by removal activities—such as emissions from fertilizer use, land-use changes, or energy consumption—is a positive step toward ensuring net-positive climate impacts. However, international standards, such as those under the Clean Development Mechanism (CDM) and the Paris Agreement's Article 6.4 mechanism, prioritize conservative quantification to address uncertainties and avoid overestimating benefits. The CRCF's emphasis on accuracy over conservativeness is a major weakness, diverging from best practices and potentially reducing ambition compared to global carbon markets.

- Baseline Ambition:

The proposal allows baselines to reflect the average performance of comparable activities, which could incentivize operators already performing better than average to certify ongoing practices rather than pursue additional mitigation efforts. To align with the Paris Agreement, baselines

should reflect best available performance rather than average performance, and should be updated regularly (e.g., every five years).

- Lack of Explicit Metrics:

The CRCF uses the term "carbon removal benefit" but does not specify metrics such as "carbon dioxide equivalents," which are standard in international frameworks. This omission risks creating ambiguity in certification processes.

Additionality

Article 5 requires carbon removal activities to be "additional," meaning they must:

1. Exceed existing EU or national legal requirements.
2. Be driven by the incentives provided through CRCF certification.
3. Go beyond the baseline removals used for quantification (see 2.3.1).

Assessment

- Concerns for Nature-Based Removals:

  Standardized baselines raise doubts about the additionality of nature-based removals. Many practices, such as soil carbon enhancement or forest management, align with standard practices in certain regions, reducing the likelihood of additional benefits. Similarly, products derived from biogenic carbon are often already part of standard operations, further limiting their additionality (McDonald et al., 2023).

- Lower Risks for Technical Removals:

  Technical removals, such as DACCS, are less likely to face additionality concerns, as they do not overlap with existing legal requirements. EU and national policies do not currently

mandate operators to undertake such removals, making their activities more clearly attributable to CRCF incentives.

Long-Term Storage

Article 6.1 stipulates that operators must demonstrate their activities aim to ensure long-term storage of carbon. The proposal, however, does not define fixed timeframes for "long-term" storage. Instead, operators must:

- Monitor and mitigate risks of carbon release during the monitoring period.
- Be subject to liability mechanisms to address reversals during this period.

The Commission may establish additional certification methodologies through delegated acts (Annex 1).

Assessment

- No Legal Obligation for Long-Term Storage:

  The proposal obliges operators only to "aim" for long-term storage rather than mandating it. This language weakens the framework, as operators are not held legally accountable for ensuring permanent storage. Monitoring and mitigation requirements during the monitoring period are insufficient without strong liability mechanisms.

- Weak Liability Mechanisms:

  The proposal lists possible mechanisms, such as discounting carbon removal units, buffer accounts, or insurance. However, these mechanisms remain vague and non-compulsory. Liability mechanisms must ensure accountability for intentional reversals and offer compensation for unintentional reversals (e.g., due to extreme weather). Stronger safeguards are necessary to ensure long-term storage and to address scenarios where operators terminate projects or face insolvency.

- Short-Term Storage Risks:

While the "long-term" criterion seemingly excludes activities offering short-term storage (e.g., less than 1–3 years), the lack of a legal obligation to ensure permanence means certification could still apply to activities with limited mitigation benefits.

Sustainability

Article 7 requires that carbon removal activities must have either a neutral or positive impact on sustainability objectives, which include:

- Climate change mitigation and adaptation.
- Circular economy.
- Pollution prevention and control.
- Biodiversity and ecosystem restoration.
- Sustainable use and protection of water and marine resources.

Recital 15 suggests drawing sustainability criteria for forestry and agricultural activities from existing frameworks, such as the EU Taxonomy and the Renewable Energy Directive. Activities harming biodiversity—such as forest monocultures—should not be certified.

Assessment

The sustainability criteria outlined in the proposal are vague and lack regulatory specificity. Delegated acts are necessary to define these criteria in greater detail. Beyond the current framework, delegated acts should mandate that certified removal activities demonstrate net positive sustainability impacts. This approach would ensure that all eligible removal activities are designed to avoid negative social or environmental outcomes (McDonald et al., 2023).

For effective implementation, carbon removal units under the CRCF should include transparent and detailed information about their sustainability impacts. Such transparency would help communicate the unique advantages of carbon farming activities compared to other removal approaches.

The reference to the Renewable Energy Directive's sustainability criteria for forest and agricultural biomass raw materials is a positive inclusion. However, it is critical to ensure there is no weakening or backsliding of these rules in the CRCF framework.

Validity of Certified Carbon Removal Units

The proposal does not establish fixed validity periods for carbon removal units or set explicit expiry dates. Instead, the validity of certified removals is tied to the expected duration of carbon storage and the associated risks of reversal (recital 13).

For temporary removals, such as those generated through carbon farming or stored in products, the validity should coincide with the end of the monitoring period. Once this period concludes, it is assumed that the carbon is released back into the atmosphere unless the operator proves continued storage through uninterrupted monitoring (recital 13).

For removals stored in geological formations, the proposal assumes no expiry date. Recital 13 indicates that geological storage is considered to provide "enough certainties" of long-term storage for several centuries, qualifying it as permanent storage.

Assessment

The validity period of removal units is a critical component of the proposal, yet the proposed rules raise several concerns:

- No Obligation to Renew or Replace Expired Units:

  The proposal does not require operators to renew removal units after the monitoring period. Similarly, buyers are not obligated to purchase new removal units when temporary units expire. This lack of obligation is problematic if the units are used to offset emissions, as CO2 remains in the atmosphere for much longer periods. To ensure effective mitigation, removals must either provide storage for the same duration as the atmospheric lifespan of CO2 or be continually renewed. However, the practicality of requiring uninterrupted renewal or 1,000-year validity periods is questionable.

- No Monitoring Period for Geological Storage:

  The proposal assumes that geological storage is permanent and, consequently, does not subject these activities to monitoring periods. This approach has significant implications:

  - Operators storing carbon in geological formations are not explicitly required to monitor, mitigate risks, or assume liability for potential leaks beyond the monitoring period.

  - Article 6.2 requires operators to mitigate risks and assume liability only during the monitoring period, leaving uncertainty about responsibilities for geological storage beyond this timeframe.
  -

- Unaddressed Reversals Before Monitoring Ends:

  The proposal lacks specific provisions for situations where carbon is released before the monitoring period concludes. There are no clear rules to ensure that removal units become invalid or that reversals are appropriately compensated.

Liability

To ensure long-term storage, operators are required to implement "appropriate liability mechanisms" (Articles 6.1 and 6.2). Recital 14 suggests examples of such mechanisms, including:

- Discounting carbon removal units,
- Collective buffers or accounts of removal units,
- Up-front insurance mechanisms.

The proposal empowers the Commission to regulate liability details through delegated acts.

Recital 14 also aims to prevent regulatory overlap by referencing existing liability frameworks under the CCS and ETS Directives. For geological storage, Article 34 of the CCS Directive applies the Environmental Liability Directive to address leakages in principle.

In principle, the operator of a Carbon Capture and Storage (CCS) project retains responsibility for monitoring, reporting, and implementing corrective measures until the storage site is officially closed, as stipulated in Article 18 of the CCS Directive. A storage site is considered closed once the requirements outlined in the storage permit have been met. These requirements include sealing the storage site and removing injection facilities.

Upon closure, the operator's legal obligations are transferred to the competent authority or the host state overseeing the storage site. However, this transfer of responsibility—or externalization of costs to the state—is contingent on the following conditions:

1. Complete and permanent containment: The stored CO2 must be deemed entirely and permanently contained. This determination typically involves a 10-year period without

leakage and verification that the storage site aligns with its geological and operational models (Weber, 2018).
2. Minimum monitoring period: A minimum period, generally no less than 20 years, must have elapsed. The exact duration is determined by the competent authority.
3. Fulfillment of financial obligations: All financial requirements outlined in Article 20 of the CCS Directive must be satisfied.
4. Site closure compliance: The site must be sealed, and injection facilities must be removed.

Even after the transfer of responsibility, the operator's obligations may not cease entirely. If evidence of deficient data, concealment of relevant information, negligence, willful deceit, or failure to exercise due diligence emerges, the competent authority retains the right to recover costs from the former operator (Article 18(7) of the CCS Directive).

Financial Security Requirements

Article 19 of the CCS Directive mandates that operators provide financial securities to ensure all obligations under the storage permit are fulfilled. This financial security must remain valid until the responsibilities of the operator are transferred to the competent authority. Operators are also required to submit a comprehensive report documenting the permanent and complete storage of CO2.

Financial Contributions for Long-Term Monitoring

Under Article 20 of the CCS Directive, Member States must ensure that operators provide a financial contribution to the competent authority prior to the transfer of responsibility. This contribution is designed to cover anticipated costs for monitoring the storage site for at least 30 years, as well as any additional expenses associated with site maintenance. Member States determine the specifics of this financial contribution, taking into account the criteria outlined in Annex I of the Directive.

Assessment

Liability for carbon leakage is a critical aspect of the proposed regulation. While the framework introduces some liability rules for carbon storage in products and biomass, requiring an "appropriate system" (see sections 2.3.3 and 2.4), the rules for carbon storage in geological formations defer to the more detailed liability provisions under the ETS and CCS Directives. However, several key issues remain unresolved:

- Externalization of Costs for Thousands of Years:

  The proposal does not establish rules holding operators accountable for the entire duration that CO2 remains in the atmosphere. Under the CCS Directive, responsibility for leakage transfers to the state after a storage site is closed, which occurs well before the stored CO2 leaves the atmosphere. Given the large volumes of carbon expected to be stored by 2050 and beyond, this transfer of responsibility could impose significant financial and environmental burdens on future generations, especially if leakage from geological formations exceeds current expectations. Furthermore, the long-term durability and environmental impacts of geological storage have not been sufficiently tested over extended periods.

- Adequacy of Financial Contributions:

  The CCS Directive requires operators to provide financial contributions to cover monitoring costs for at least 30 years and other maintenance expenses. However, if applied to geological storage under this framework, these contributions would not address costs arising from CO2 leaks occurring after the transfer of responsibility.

- Lack of Preference for a Specific Liability System:

  While the proposal mentions possible liability systems, such as discounting carbon removal units, collective buffers, or up-front insurance mechanisms, it does not specify which systems are preferable. Recital 14 provides some guidance but lacks legal enforceability. The proposal also does not explore personal liability for operators, which could offer stronger accountability. To date, no liability system in the voluntary carbon market has reliably addressed reversals or ensured permanence for extended durations.

- Applicability of the Environmental Liability Directive (ELD):

  Article 34 of the CCS Directive applies the ELD to geological storage of CO2. However, the ELD's scope is limited to environmental damage caused by diffuse pollution where a causal link to an operator's activities can be established. Given the diffuse and long-term nature of carbon leakage and its impacts on the climate, it is questionable whether the ELD would effectively add a robust layer of liability for geological storage.

- Consequences of Liability System Failures:

The proposal specifies that removal activities cannot be certified if no appropriate liability system is in place. However, it does not address the legal or practical consequences if a liability system fails or ceases to function after certification but before the end of the monitoring period. Additionally, the proposal does not clarify the consequences if operators fail to mitigate risks of reversal.

Certification Bodies, Certification Schemes, and Certification Process

Certification Bodies (CBs)

Certification bodies play a central role in the certification of carbon dioxide removals (CDR). They are responsible for conducting certification audits and issuing certificates upon satisfactory verification. They also oversee recertification processes for certified activities.

To perform these functions, certification bodies must:

- Be competent to conduct audits (Article 10.2(a)).
- Operate independently of operators and act in the public interest (Article 10.2(b)).
- Be accredited by a national accreditation authority under Regulation No 765/2008 (Article 10.1).

Certification bodies enter into agreements with certification schemes to carry out certification audits. They also issue certificates upon successful verification of compliance. Member States supervise the operation of certification bodies and are required to promptly notify the certification body and the relevant certification scheme of any instances of non-compliance (Article 10.4).

Certification Schemes (CSs)

Certification schemes are another cornerstone of the CRCF. Operators may only use schemes that have been recognized by the European Commission.

Under the proposal, a certification scheme is defined as an entity managed by a private or public organization responsible for overseeing the compliance of operators or groups of operators with the CRCF (Article 2.1(k)). Certification schemes must adhere to reliable and transparent rules and procedures established through implementing acts (Article 11.2).

Key responsibilities of certification schemes include:

- Publishing an annual list of appointed certification bodies (Article 11.4).
- Maintaining a public registry of carbon removal activities and certified carbon removal units, using automated systems (Article 12.1).
- Submitting annual operational reports to the European Commission (Article 14.1).

The Commission retains the authority to revoke recognition of a certification scheme if it fails to meet its obligations under the implementing acts (Article 13.3).

Certification Process

The proposal outlines a three-step certification process for carbon removal activities (Article 9):

1. Submission of Application:

   The operator submits an application to the certification scheme, which includes a management plan. This plan outlines expected total carbon dioxide removals (CDRs) and the net removal benefits. It also demonstrates how the removal activity complies with CRCF regulations.

2. Certification Audit:

   The management plan is reviewed by the certification body, which conducts an audit to verify compliance with the CRCF. If the activity meets the requirements, the certification body issues a certificate. Each certificate must contain the information specified in Annex II of the proposal.

3. Registry Entry:

   Once certified, the carbon removal activity is entered into the public registry maintained by the certification scheme.

To ensure the ongoing compliance of carbon removal activities with the approved management plan, the certification body conducts periodic re-certification audits. These audits serve to:

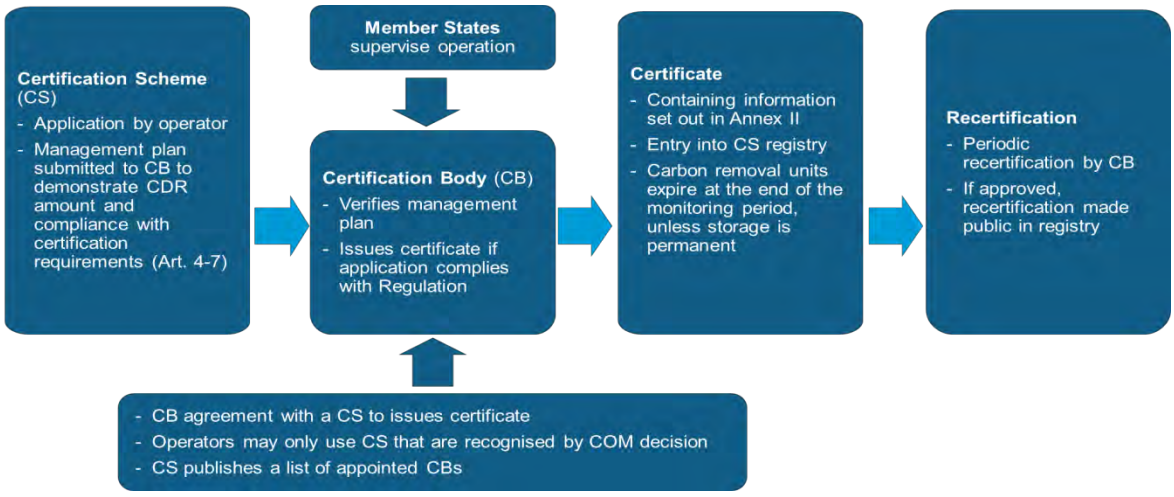
- Reconfirm that the activity continues to meet the requirements specified in Articles 4 to 7, including quantification, additionality, long-term storage, and sustainability.

- Verify that the carbon benefit generated by the activity aligns with the standards outlined in the certification framework.

The details of the certification methodology, including the specific criteria for permanence and other essential aspects of the EU Carbon Removal Framework (ECRF), are determined through delegated acts. These delegated acts aim to provide the technical guidance and consistency necessary for robust certification practices.

A visual representation of the certification process, including the key steps and actors involved, is provided in Figure 1. This figure outlines the sequence of activities, from initial application and management plan submission to certification, periodic re-certification, and the monitoring of compliance.

Figure 1: Overview of proposed certification process



Assessment

The proposed certification process raises significant questions regarding the scope and implementation of periodic re-certification. Key concerns include:

- Ambiguity of Periodic Re-Certification:

  The proposal does not clarify what periodic re-certification entails, how frequently it will be conducted, or under what circumstances a certification may be revoked based on these

audits. The lack of clarity could undermine the reliability and accountability of the certification process.

- Sufficiency of Implementing Acts:

  It is unclear whether implementing acts alone provide an adequate legal basis for repealing a certification, particularly when long-term monitoring and compliance are at stake. Stronger regulatory guidance may be required to address potential disputes or lapses in adherence to CRCF standards.

- Public Registry and Transparency:

  The inclusion of a public registry is a positive feature of the CRCF, as it enhances transparency and accountability. However, an essential omission in Annex II is the lack of publicly accessible information on the quantification of certified carbon removals. Publishing this data aligns with practices in the voluntary carbon market and is crucial for fostering public trust and stakeholder confidence.

Power of Delegation

The proposal grants the European Commission significant authority to adopt implementing and delegated acts indefinitely (Article 16.2). Specifically, the Commission has the power to define the certification methodology and the content of certificates as outlined in Annex II.

However, this delegation of power is subject to certain limitations:

- Scope:
  The regulation constrains the scope of the Commission's mandate using broad and vague criteria. For example, the Commission must consider factors such as the robustness of carbon removals, ecosystem protection, and minimizing administrative burdens. Additionally, Annex I offers only general principles and requirements, granting the Commission considerable discretion in its regulatory decisions.
- Process:
  The European Parliament or Council may revoke the Commission's delegated powers at any

time. Furthermore, the Commission must consult experts designated by Member States under the Inter-Institutional Agreement on Better Law-Making. Delegated acts only take effect if neither Parliament nor the Council raises objections within two months of notification.

Assessment

Under Article 290 of the Treaty on the Functioning of the European Union (TFEU), the "essential elements" of a legislative act must remain under the authority of the legislator. These essential elements include provisions that concretely shape the fundamental guidelines of EU policy[9]. According to rulings by the European Court of Justice, essential elements include:

- Provisions defining the material, geographical, or temporal scope of a basic act[10].

Article 16 of the CRCF proposal authorizes the Commission to regulate critical aspects of the certification methodology, including the definition of permanence and the use of removal units, through delegated acts. While Annex I is intended to limit the Commission's discretion, its use of broad and non-specific language fails to establish meaningful boundaries. Given the importance of defining permanence and the application of removal units to the CRCF's overarching goals, these elements can arguably be considered "essential." As such, delegating these decisions to the Commission raises questions about the compatibility of Article 16 with Article 290 TFEU. It is difficult to justify that such decisions, particularly defining permanence, are "non-essential.

Proposal on Carbon Removal Certification: Interaction with EU Laws and Policies

Examples of Legal Interaction

The CRCF is a voluntary certification framework that introduces procedural rules for carbon removals without imposing material obligations. It does not mandate the use of removal units, serving primarily as a tool to certify carbon removals. Due to its voluntary and procedural nature, the CRCF has limited immediate effects on the implementation of the following EU laws:

- European Climate Law (ECL):

The ECL establishes legally binding climate targets, requiring Member States to remove greenhouse gases (GHG) from the atmosphere. These targets include a quantified 2030 climate target and an unquantified 2050 climate neutrality target. However, the ECL does not require Member States to certify removals under the CRCF. Consequently, the CRCF has no direct impact on the implementation of the ECL.

- LULUCF Regulation:

  Like the ECL, the LULUCF Regulation sets removal targets for Member States but does not mandate certification of removals under the CRCF. Additionally, the effectiveness of the CRCF as a policy tool for national targets is undermined by insufficient granularity and accuracy in Member States' GHG inventory methods, which may fail to capture certified removal activities adequately.

- Emission Trading Scheme (ETS) and Effort Sharing Regulation (ESR):

  The EU ETS Directive currently prohibits the use of removal units to meet ETS obligations. However, avoided emissions captured and stored geologically do not require surrendering allowances (Article 12.3(a) of the ETS Directive). This provision allows fossil CCS to be used for ETS compliance, although its adoption remains limited. Discussions on incorporating negative emissions technologies into the ETS are ongoing.
  Under the ESR, up to 280 Mt of LULUCF removals may be used to meet national targets. However, this does not depend on certification under the CRCF.

- Nature Restoration Law:

  The proposed EU Nature Restoration Law sets binding restoration targets for ecosystems and includes indicators such as carbon stocks in cropland mineral soils and forests. While the CRCF could support objectives related to carbon stock in soils, there are no direct legal links between the CRCF and the restoration law, as the latter imposes obligations on Member States, whereas the CRCF remains voluntary.

International Implications

The CRCF is less aligned with the baselines and quantification rules under negotiation in the context of Article 6 of the Paris Agreement, where stricter standards are being discussed. This discrepancy does not render the CRCF illegal but weakens the EU's negotiating position in international forums.

Political Implications of the CRCF

Although the CRCF has limited immediate effects on EU climate rules, it has significant political implications:

- Promoting Emission Offsetting Risks Undermining Climate Action Integrity:

  The CRCF is being proposed in a context where the EU has not fully determined the role of carbon removals in its broader climate strategy. While the 2030 climate target quantifies removals, the 2050 climate neutrality target remains vague regarding the permissible share of removals versus reductions, and a 2040 climate target has yet to be adopted.

  In this strategic vacuum, promoting the use of carbon removal units—especially for offsetting emissions—poses risks. Without clear safeguards to limit the use of removal units and ensure high standards for their quality, the CRCF could inadvertently enable the substitution of emission reductions with removals. This substitution could compromise the integrity of EU climate action by deterring the deep emission cuts required to meet long-term climate goals (Carton et al., 2021).

  Proposals to use carbon removals as a compliance mechanism within the ETS (Rickels et al., 2022) may gain traction once removals are certified under EU law. To maintain the integrity of its climate policies, the EU should establish a clear and strategic role for carbon removals before adopting a certification framework.

- Separate and Quantified Removal Targets Are Essential:

  Clear and distinct removal targets—such as those in the 2030 climate target—help prevent the conflation of reductions and removals. Separate targets enhance transparency, facilitate accountability, and safeguard environmental integrity by explicitly defining the permissible role of removals in achieving climate goals.

  By contrast, the 2050 climate neutrality target does not differentiate between reductions and removals, potentially diluting the EU's climate strategy. While the CRCF could help formalize separate removal targets, its success in doing so remains uncertain.

On the one hand, the low cost of some removal options and vested interests in using these removals to offset reduction obligations may hinder the adoption of separate targets. On the other hand, the precedent set by the 2030 climate target demonstrates that such safeguards are feasible and necessary to protect the integrity of EU climate policies.

Detailed Comparison of 2022 and 2024 EU Documents on Union Certification Framework for Carbon Removals

This document provides a comprehensive comparison of the differences and modifications between the 2022 and 2024 EU documents establishing a Union certification framework for carbon removals. The 2024 version reflects significant updates in scope, methodology, and alignment with broader European policies, aimed at addressing challenges in achieving climate neutrality and enhancing trust in carbon removal mechanisms.

1. Expanded Scope and Terminology
The 2024 document substantially broadens the framework's scope, reflecting evolving priorities in carbon management and sustainability.
2022 Document: Focuses on the development of a certification framework for carbon removals, primarily emphasizing high-quality removals through both natural ecosystems and industrial processes. The document aimed to establish baseline definitions and methodologies.
2024 Document: Broadens the scope to include not only carbon removals but also “carbon farming”, “carbon storage in products”, and “soil emission reductions”. This evolution reflects the diverse methods and sectors involved in achieving net carbon reductions. New definitions and terminologies are introduced, such as 'permanent carbon removals' and 'carbon farming sequestration units,' aligning with the expanded scope.

2. Integration of Co-Benefits
The 2024 framework places greater emphasis on co-benefits, recognizing the synergies between carbon removal activities and broader environmental objectives.
- 2022 Document: While environmental sustainability is mentioned, the emphasis is limited to meeting minimum biodiversity and ecological standards.
- 2024 Document: Co-benefits are deeply integrated into the framework. Practices such as agroforestry, peatland restoration, and afforestation are explicitly incentivized for their positive impacts on biodiversity, soil health, and ecosystem services. The document introduces market

mechanisms to reward activities that generate these co-benefits, creating potential for enhanced economic value.

3. Enhanced Monitoring and Technology Use
Advanced monitoring and verification technologies are emphasized in the 2024 document, reflecting the need for more precise and cost-effective approaches.
- 2022 Document: Advocates for accurate monitoring and reporting but lacks specificity regarding technological implementation.
- 2024 Document: Encourages the adoption of cutting-edge technologies such as „remote sensing, geographic information systems (GIS), AI, machine learning, and satellite imagery". The use of these tools aims to reduce administrative costs and ensure consistency with national greenhouse gas inventories. Digital platforms and registries are highlighted as crucial for transparency and traceability.

4. Temporary vs. Permanent Carbon Storage
The 2024 document introduces a clear differentiation between temporary and permanent carbon storage, addressing risks associated with each.
- 2022 Document: Does not explicitly differentiate between temporary and permanent storage risks, nor does it provide mechanisms for addressing reversals.
- 2024 Document: Introduces „expiry periods" for temporary storage solutions, such as those involving carbon farming. Monitoring periods for temporary storage are set at a minimum of 35 years, with incentives for prolonging these periods. Permanent storage solutions, such as geological sequestration, are highlighted as preferred methods due to their long-term stability.

5. Liability Mechanisms
Liability mechanisms are significantly enhanced in the 2024 document, ensuring accountability for carbon storage failures.
- 2022 Document: No specific mention of liability mechanisms or corrective actions for carbon reversals.
- 2024 Document: Introduces detailed liability mechanisms, such as „collective buffers and insurance schemes", to address potential carbon release or failure in carbon storage activities. The document also requires operators to implement preventive measures and establish monitoring systems to mitigate risks.
6. Alignment with Broader EU Policies
The 2024 framework aligns more closely with existing EU policies, ensuring harmonization across sectors.
- 2022 Document: Provides general references to the European Green Deal and LULUCF, with limited integration into other policies.

- 2024 Document: Deepens integration with the „Common Agricultural Policy (CAP)“, „Renewable Energy Directive“, and „EU Forest Strategy“. It emphasizes alignment with biodiversity and zero-pollution goals, reflecting a more holistic approach to policy coherence.

Conclusion

The 2024 version of the EU document represents a significant evolution, reflecting lessons learned and emerging priorities in carbon management. By expanding its scope, integrating co-benefits, adopting advanced technologies, and aligning more closely with EU policies, the framework is better equipped to address the complexities of achieving climate neutrality. These updates position the framework as a robust tool for incentivizing sustainable carbon removals while ensuring environmental integrity. The EU Commission will over time add recommendations and guidelines that will sufficiently define the whole carbon management process and procedures.

ANNEX B Similarities between the EU Regulation, GOLD STANDARD and VERRA VCS METHODOLOGY

In this annex is provided a brief introduction to the similarities between the key definitions and terms used in the Second Document (EU Regulation, November 2024), GOLD STANDARD FOR THE GLOBAL GOALS- Soil Organic Carbon Framework Methodology (Version 1.0 Published January 2020) and VERRA VCS Methodology VM0042-IMPROVED AGRICULTURAL LAND MANAGEMENT (September 2024).

The Gold Standard and VERRA document use terms more specific to carbon accounting in agricultural and soil-based projects, whereas the Article 2 Regulation document includes more general regulatory and certification-related terms and doesn't deal with details that are important for realization of GECO2.2. project.

In the table that follows are terms used by the Second Document, GOLD and VERRA. The Second Document in the Article 2 provides definitions. Out of 23 definitions 12 of them are relevant for GECO 2.2. project. The table that follows provides the similar definitions for the 12 relevant definitions for GECO2.2. , GOLD and VERRA.

Table 1 Key definitions used by the EU regulation, Gold Standard and VERRA

EU Regulation, November 2024	GOLD STANDARD FOR THE GLOBAL GOALS- Soil Organic Carbon Framework Methodology	VERRA VCS Methodology VM0042-IMPROVED AGRICULTURAL LAND MANAGEMENT
Term in "Article 2 Regulation Terms"	Equivalent or Similar Term in "Soil-Organic-Carbon-Framework-Methodology"	
Carbon removal	Soil organic carbon (SOC) sequestration, Carbon sequestration	
Soil emission reduction	SOC reduction, GHG emission reductions, Emission reductions	GHG emission reductions from soil, Net GHG emission reductions

Biogenic carbon pool	Soil Organic Matter (SOM), Soil Organic Carbon (SOC) pool	Soil Organic Carbon (SOC) pool, Carbon stocks
Activity period	Calculation period, Project crediting period	Project crediting period, Baseline period
Monitoring period	Monitoring period	Monitoring period, Data and parameters monitored
Permanent carbon removal	SOC sequestration, Long-term carbon storage	SOC sequestration, Long-term carbon storage
Certification body	Gold Standard certification, Validation and Verification Body (VVB)	Validation and Verification Body (VVB), Gold Standard certification
Certification audit	Project performance certifications, Validation audit	Project performance certification, Validation audit
Re-certification audit	On-going project validation, Renewal certification	On-going project validation, Renewal certification
Permanent carbon removal unit	SOC accrual unit, Carbon crediting unit	SOC accrual unit, Verified Carbon Units (VCU)
Soil emission reduction unit	GHG emission reduction from soil, SOC carbon stock change unit	GHG emission reduction from soil, SOC stock change unit
Carbon farming sequestration unit	SOC sequestration credits, Soil carbon stock changes	SOC sequestration credits, Soil carbon stock changes

Interestingly, the Second Document stipulates the need that carbon farming doesn't diminish production of food. The same clauses have both, GOLD STANDARD and VERRA.

The Recital 17 (page 5/29) of the EU Regulation: "Carbon farming activities generally improve soil quality, which has a positive impact on soil resilience and productivity, but in some circumstances, they might also generate a decrease in food production and therefore lead to a carbon leakage effect from indirect land use change, and accordingly the related indirect emissions should be taken into account.