EUROPEAN COMMISSION
DIRECTORATE-GENERAL
CLIMATE ACTION
Directorate C – Innovation for a Low Carbon, Resilient Economy
CLIMA.C.3 – Low Carbon Solutions (III): Land Economy & Carbon Removals

Brussels, 29 September 2023

Minutes
2nd Meeting of the Carbon Removals Expert Group
21 and 22 June 2023, Brussels

1. Approval of the agenda
The minutes of the 1st meeting of the carbon removals expert group on 7 March 2023 as well as the agenda of the 2nd meeting were adopted without comments.

2. Set-up of the meeting: 2nd Meeting of the Carbon Removals Expert Group
The second meeting of the Expert Group (EG) took place in a hybrid format, with WebEx available for experts who could not attend in person. The entire meeting was also web-streamed on the Slido platform to allow interaction with the wider public. The recordings of the sessions and the slide decks are available on the Commission Expert Group website.[1]

3. Summary of the discussions

3a Overview

Discussions covered three carbon farming methods: agriculture on mineral soils, forestry and peatlands. For each thematic area, CRETA provided an analysis of existing methodologies gathered via a public survey, and their high-level alignment with the proposed QU.A.L.ITY criteria. This was followed by more detailed presentations from the representatives of select certification methods and discussions with the members of the EG.

As summarised by the rapporteurs, for agriculture, the analysis found that several existing methodologies are aligned with the QU.A.L.ITY criteria and many practices optimise the productivity and GHG balance of farms. Removals are quantified using standard emissions factors, and modelled using soil and climate conditions as inputs. Hybrid measure-and-model approaches are also used. But more data is needed to improve the reliability of estimations. Key challenges identified were (i) achieving additionality in practice, and (ii) long term storage, with significant variations in the lengths of the monitoring periods. There are also variations across methodologies in measures and tools to quantify and track co-benefits. Liability is commonly handled through varying types of buffer pools.

For forestry, there is a need for better data infrastructure and innovation, including low-cost sensors and tools for measurements. Existing standards consider both regulatory and financial additionality. To ensure long-term storage, monitoring beyond project lifetime (up to 100 years)

[1] https://climate.ec.europa.eu/eu-action/sustainable-carbon-cycles/expert-group-carbon-removals_en

is required, although rules on this are not always clear. In terms of sustainability, existing EU rules require the application of the no-harm principle, but this does not cover leakage. Other co-benefits are considered by the existing methodologies, but not always quantified.

Finally, for peatlands, the methodologies were found to be sparse in number and of mixed quality. Key issues include baselines, reduction versus removals, permanence, and metrics.

The discussions and subsequent written feedback will feed into the development of the technical scoping paper on the existing methodologies that is being prepared by CRETA.

3b Detailed summary

OPENING SESSION

Chair: Christian Holzleitner (DG CLIMA)

Welcome and opening

Introduction by Christian Holzleitner - Head of unit Land economy and carbon removals (DG CLIMA)

DG CLIMA outlined the agenda of the two-day meeting, focussing on identifying existing best practices for carbon farming certification, discussing uptake factors and socio-economic aspects, and understanding where further research and innovation is needed. The outcome of a recent EU survey on carbon farming certification (presented at the meeting) would serve as input for the scoping papers to be developed later in 2023. DG CLIMA appreciated the feedback received from several NGOs regarding process, several aspects of which (such as allowing sufficient discussion time, gender balance of panels) have already been addressed in the preparation for this meeting.

DG CLIMA gave a brief overview of the on-going legislative process on the carbon removal certification framework (CRCF). Seven meetings have taken place in the Council and, in parallel, the proposal is being discussed in the European Parliament (ENVI and AGRI Committees). A balance is sought between defining robust QU.A.L.ITY criteria in the Regulation while keeping them flexible enough to allow for the tailored methodologies to be developed in Delegated Acts, in consultation with the EG. First draft certification methodologies should be ready in 2024 for the next Commission to focus on the implementation of carbon farming. Input and ideas from the EG will be much welcomed.

Supporting the EG: ongoing activities at the Commission

Presentations

Peter Karsch (CRETA) outlined the work of the Carbon Removal Expert group Technical Assistance (CRETA) team, which is structured around three main tasks: 1) Supporting the work of the EG, 2) Supporting the development of certification methodologies for carbon farming, and 3) Creating a Framework for Life Cycle Analysis and calculation methods for carbon storage in construction materials. The input from the EG is used for the scoping papers and "strawman" proposals for future methodologies. Any information and input from experts, of interest both for CRETA and the EG, may be shared via the specific web-based tool set up for the group ("Basecamp").

Greet Maenhout (JRC) outlined the on-going JRC work on the monitoring of carbon removals in land through Earth observation and hybrid models, and shared plans to give scientific support

to the EG, in particular in the development of certain aspects of the methodologies, such as standardised baselines.

John van Aardenne (EEA) explained the EEA's role in supporting the implementation of the LULUCF Regulation by providing reliable data on greenhouse gas (GHG) emissions and carbon removals at EU and Member State (MS) level. In addition, a Carbon Emissions and Removals Monitoring Group was set up in 2022 to support the CRCF, and to assess options to increase carbon removals without damaging biodiversity. The EEA's role will be crucial in ensuring an improvement of geographic tracking of carbon pools by MS, by using Copernicus services and developing tools for tracking progress and assessing land-based carbon removal options in Europe.

Kerstin Rosenow (DG AGRI) elaborated on the "Soil Mission" under the Horizon Europe research programme, which aims to make European soils healthy by 2030, including by enhancing carbon removals. Working with 100 living labs and lighthouses in a scientific way, the Mission has an integrated approach with a vast network across the EU. Relevant projects for carbon farming were highlighted: CREDIBLE (2023-2026), MRV4SOC (2023-2026), MARVIC (-2027) and ORCaSa (2022-2025). Other projects on climate-smart farming and paludiculture are also going to be funded in the next years. Rosenow emphasised the importance of scaling up and ensuring uptake of research results on the ground.

Discussion

Italy enquired about the links between the reporting under the LULUCF Regulation and the future CRCF. **DG CLIMA** responded that the certification framework is voluntary and any certified carbon removal activity taking place on the territory of a country should also be reflected in that country's national inventory. The LULUCF Regulation requires MS to use higher "tiers" for reporting with better granularity in some cases, which should ensure that carbon removal activities are well reflected in the inventories.

Jean-François Soussana (INRAE, public research institute, France) understood that there is a need for a single certification methodology, while highlighting an array of interesting developments e.g., JRC and under the Soil Mission. Soussana asked how the EG will ensure convergence across existing approaches, and how INRAE can help.

Greet Maenhout (JRC) answered that in terms of convergence and consistency we can learn from past developments where we still need to invest to learn and to understand the discrepancies. The goal is not to have one single inventory, but different means of reducing emissions.

Greet Maenhout commented that JRC staff is actively involved in the work of the IPCC taskforce for inventories and therefore does have influence and impact on IPCC guidelines. Regarding consistency, **John van Aardenne (EEA)** added that there is detailed information available to develop the inventory according to the principles of the IPCC guidelines, but it needs to be compiled in a manageable way. **Peter Karsch (CRETA)** pointed out that the EG can build on IPCC guidelines when deciding what quality criteria are covered in the scoping papers and how.

Samantha Tanzer (Bellona Europe) argued in favour of activity-based rather than result-based carbon farming certification. **Greet Maenhout (JRC)** answered that the JRC is continually investing in monitoring tools to support the quantification of carbon farming results.

AGRICULTURE ON MINERAL SOILS
Chair: Grega Milcinski (Type A-expert)
Rapporteur: Giulia Maria Stellari (Type A-expert)

Setting the scene
Presentations
Jan Peter Lesschen (CRETA) presented the overview of certification methodologies for agricultural mineral soils gathered from the survey. Most schemes use a combination of approaches (model and sampling) to quantify soil organic carbon (SOC) changes. Most baselines are project-based, whereas standardised baselines are often set at zero removals. Most schemes require both regulatory and financial additionality, use buffers to address non-permanence risks, and include no-harm principles regarding sustainability. **Jos Cozijnsen (CRETA)** presented the market perspectives on carbon farming.

Martin Thorsoe (Road4Schemes) added that most schemes are activity-based with a price range from 20-50 Euro for supply chain payments to 30-500 Euro for voluntary carbon markets (VCM). Very few schemes have additional payments for ecosystem services. For farmers, the main barriers include a lack of knowledge, and the uncertainty and costs associated with MRV. Result-based payments could offer potential additional revenues. This information was based on an inventory of 180 carbon farming schemes that are available across MS (collected within the Road4Schemes project). The inventory will be available for researchers and the general public.

Aaron Scheid (Ecologic Institute) concluded with an overview of the challenges of certifying carbon farming based on existing soil carbon removal certification mechanisms. This included an assessment of key aspects of ten soil management methodologies[2], looking at the design and implementation of climate-friendly soil management measures and their alignment with the QU.A.L.ITY criteria. This project is part of a larger joined research project for the German Environmental Agency. The assessment will be published later this year.

Claire Chenu (INRAE) presented the design of a high-resolution and dynamic soil organic carbon monitoring system for agricultural land. Due to costs and uncertainty, it is important to adopt a combination of activity and result-based MRV, using farm data, remote sensing and automated, modular and large scale models to estimate SOC with an ecosystem approach.

Discussion
Jean-Francois Soussana (INRAE) highlighted that the widely used 100-year Global Warming Potential (GWP100) for carbon removals could be a challenge for carbon farming with a much shorter timeframe. Remote sensing should be used to see long-term trends of land use changes for carbon storage. **Hans Joosten (Greifswald University)** also noted that GWP100 might be a difficult metric to fit into our policy objectives for the next decades and that we need to look at radiative forcing (an energy imbalance imposed on the climate system (W/m^2) averaged over a particular period of time) instead.

Samantha Tanzer (Bellona Europe) pointed out that carbon removals are often used to compensate emissions, in which case not yearly removals, but life-cycle assessments (LCAs) should be considered. She also raised the issue of uncertainties regarding the quality and

[2] (American Carbon Registry, Interreg, Alberta, Emissions Reduction Fund, Verified Carbon Standard, NORI, Climate Action Reserve, Label Bas Carbone, Gold Standard & Ökoregion Kaindorf)

accuracy of quantification. **Jan Peter Lesschen (CRETA)** noted that uncertainties can be reduced when aggregating projects covering large regions and sufficient sample sizes, which was supported by **Max DuBuisson (Indigo)** during his presentation covering both CAR and VERRA methodologies. **Aaron Scheid (Ecologic Institute)** indicated soil carbon can be assessed but not accurately quantified due to the high variability within a short time. **Claire Chenu (INRAE)** noted that the problem is not the variation over a short time but rather the spatial variability, and the cost of measurement. If the quality of input data is improved, the quality of models improves. Thus, improved soil health requires an effective MRV system.

The Netherlands enquired about the use of certificates from carbon farming (such as for in-setting/scope 3 emissions versus off-setting). **Aaron Scheid (Ecologic Institute)** confirmed that food processors are keen to use the removal potential directly in their value chain for their own scope 3 reporting. **Jos Cozijnsen (CRETA)** added that in-setting has some benefits (in particular, since in-setting is based on yearly inventories, there is no need for buffers to account for non-permanence), but often there is no third-party issuance. Prices need to increase to provide incentives to farmers.

Andrew Voysey (CAA) stated that a robust and incentivising change in practice is required . The best way to achieve this is to enable peer-to-peer learning, where farmers who have already made a practice change have an important role. Additionality rules may become a challenge for those farmers, but some schemes have ways to ensure first movers are not penalised.

Examples of methodologies

Presentations

Max DuBuisson (Indigo) presented the VCS (Verra) VM0042 Methodology for improved agricultural land management and CAR Soil Enrichment Protocol. He noted that large scale decreases uncertainty, permanence is managed at project level, robust modelling is required and must be adaptable to changes in agricultural practices over time.

David Chiaramonti (Type A-expert) presented the ESCA (Emission Savings through soil Carbon Accumulation) factor under the Renewable Energy Directive with biochar as an example. The methodology requires a long-term commitment of at least 10 years. Biochar is a low ILUC feedstock with 97% recalcitrant fractions. It is a verifiable, measurable and stable form of carbon, has the highest C-removal threshold and is the cheapest way to ensure long-lived carbon removal in agriculture. Certain sectors like aviation cannot become net-zero without securing removals from other sectors, and can, for example, use biochar on the land within airports.

Clothilde Tronquet (I4CE) presented methodologies for agricultural activities in the French Label Bas Carbone (LBC). 6 out of 13 validated methodologies are in the agricultural sector and account for half of the 1,6 Mt CO2eq of certified credits. Of these, 80% correspond to emission reductions and 20% to carbon removals. In terms of wider lessons learnt from the operation of LBC she concluded that attention needs to be paid to the trade-off between costs and MRV precision. Furthermore, costs are variable and higher than current prices on the VCM, thus creating a need for co-funding. Factors for success include simple methodologies, data availability, ownership by the sector, and technical support and diagnosis.

Lucia Perugini (Type A-expert) presented the efforts to map the carbon sequestration potential in agricultural land from the project LIFE C-Farms. GIS (Geographic Information System) can integrate carbon-relevant spatial data from different sources. The high-resolution

GIS-FARMS is a decision support system, wherein farmers can upload monitoring and measurement data, linked with the LPIS & GHG inventory agency. Farmers can simulate effects of different practices and use default factors in line with Italian inventories. However, more data are needed to improve the estimates and the models, and in turn GHG inventories.

Discussion

Irene de Tovar (COPA COGECA) highlighted the importance of the price gap between the cost of implementing carbon farming measures and the carbon price; this needs to be considered in the design of methodologies. In the debate of insetting vs offsetting, what matters is that payments go back to the primary producers in a fair way. **Clothilde Tronquet (I4CE)** added that it would be good to allow for different sources of public and private payments. Because of the low carbon prices, farmers are choosing from a limited number of options, and thus are not incentivised to undergo a major systemic change in the agricultural system.

Germany asked what the minimum requirement in terms of project duration for all carbon farming methodologies should be. **Lucia Perugini (Type A-expert)** explained that in their projects, where monitoring was performed each year and a first measurement after 10 years, they had to find a balance between scientific views and the economic needs of farmers. 100 years is not practical as it puts the burden on the next generations. **Max DuBuisson (Indigo)** noted that what counts is the duration of the project at the aggregate level, not at the individual level. In their case, farmers have a 5 year-commitment, but it is the project proponent (and not the farmer) that is liable. Project proponents have to provide farmers with the right incentives to continue the practices. **Martin Thorsoe (Road4Schemes)** added that, in practice, short-term storage is still valuable for climate mitigation, but it should not be used to offset permanent emissions.

Italy said that they approved a law in which the Ministry of Agriculture, Food Sovereignty and forests (CREA) established a registry of agro-forestry carbon credits on a voluntary basis; these credits must be additional and can be used exclusively in national voluntary markets. Complexities include the cost for public administration, risk of non-compliance with 2030 targets, double counting of carbon removals in view of art. 6 of the Paris Agreement, lack of demand for certificates from private companies and difficulty of application for SMEs. The CRCF proposal is welcome, but new highly-technical regulation requires scientific input from the EG to solve these complexities.

Latvia pointed out that soil carbon sequestration is possible but not always economically feasible.

France noted that in establishing the LBC the government aimed to have robust methods but was aware of the inevitable transaction costs. The ministries in charge of regulatory framework and of the registry played an important role in guaranteeing reliability, transparency, and involvement of stakeholders. Credits are non-transferable to avoid speculation.

A question from the SLIDO platform enquired about a possible contradiction between different monitoring options, for instance when the models show increase, but the measurement shows decrease in a particular case.

Greet Ruysschaert (ILVO) answered that further investigations of measurements must be undertaken to calibrate the model. **Max DuBuisson (Indigo)** added that the key is to make sure that the approaches measure the same thing, e.g. difference between two fluxes is what matters even if absolute SOC are not quite right. It is best to use data to recalibrate models. **Martin**

Thorsoe (Road4Schemes) noted that different approaches are complementary, e.g. use remote sensing to choose places where to take samples.

Hanna Winkler (IFOAM) had a number of questions about LBC: are intensive systems more likely to be rewarded? How can it be ensured that first-movers are not penalised? How to avoid perverse incentives? And, how much of the remuneration reaches the farmer? **Jean Francois Soussana (INRAE)** answered that build-up of SOC has more potential in degraded soils, which can be in intensive or extensive systems. Part of the credits are captured by the intermediaries, but remote sensing is interesting to drive these transaction costs down. There is no LCA analysis, the methods focus on a balance of emissions and removals at farm level.

Eli Mitchell-Larson (Carbon Gap) suggested that there was a consensus that soil-based carbon removals cannot be used to offset fossil emissions and supported activity-based rewards. **David Chiaramonti (Type A-expert)** on the contrary stated that there is a need to create market conditions for farmers, but for instance the fact that the Common Agriculture Policy (CAP) pays per hectare and not per unit of carbon constitutes a barrier to support carbon removals at sufficient scale. Farmers know the value of soil health and the impacts of climate change, and they should be rewarded for taking action.

Gottlieb Basch (ECAF) urged to look at activities that are capable of removing and storing carbon, given that intensive tillage has depleted our soils and there is a large potential to put this carbon back. He wondered if LBC and C-Farm have identified the activities with the greatest removal potential. **Lucia Perugini (Type A-expert)** stated that the greatest potential comes from combining several practices, while **Clothilde Tronquet (I4CE)** added that the measures that farmers are currently more interested in (intercropping, manure fertilisation) are not those with the largest potential.

Robert Höglund (Marginal Carbon) argued that there is no scientific consensus that methods to measure and store carbon in soils work. Consensus is crucial before any certificates are issued for offsetting.

Ricardo Beck (CREDIBLE project) asked to what extent funds from the CAP can be combined with VCMs for carbon farming and if there is an issue of additionality.

Jean-Francois Soussana (INRAE) explained that an INRAE study shows consensus on cover crops as a practice to improve soil carbon (depending on conditions). In general, the more carbon is put in the soil the more carbon will remain and build SOC. It is important to connect to adaptation, which is key to mitigation and soil carbon. **Gottlieb Basch (ECAF)** agreed that the more carbon is put in the soil and the less is mineralised, the more carbon is removed from the atmosphere and stored.

Samantha Tanzer (Bellona Europe) noted that uncertainties still exist about monitoring of emissions, with assumptions on carbon storage in soils, but models based on historical data may not be appropriate anymore. **Emanuele Lugato (JRC)** suggested a hybrid approach whereby the farmer is paid for the action (mitigation potential and co-benefits), while at the same time the CO_2 is accounted for certification schemes and LULUCF inventories.

Samy Porteron (ECOS) raised several points regarding the current approach to emission reductions and the need for a different perspective. The existing system tends to overlook farmers who have already implemented climate-friendly (CF) practices, thus failing to reward their efforts. This problem is worsened by a result-based approach that primarily focuses on

new carbon removals, further neglecting those who have made sustainable changes in the past. With activity-based rewarding (like in organic farming), farmers are first incentivised for conversion, and then for maintenance. This model can help with permanence issues better than when a credit is issued that leads to a compensation claim. Furthermore, it is crucial to reframe the discussion surrounding CF practices for farmers. Instead of emphasising the concept of carbon farming itself, the focus should shift towards promoting soil health. By highlighting the benefits of improved soil health, the uptake of CF practices among farmers can be enhanced.

Hans Joosten (Greifswald University) pointed out that some do not want to use carbon removals for offsetting, in which case accuracy and permanence are not a problem. However, to contribute to the net-zero target, real unavoidable emissions have to be both compensated and offset by real removals requiring a 1:1 equivalence between removals and emissions. The removals must be permanent with a differentiation between the project/crediting period and the permanence of long-term storage. In peatlands carbon release needs to be stopped first rather than immediately generating removals.

Léna Girard (FoodDrinkEurope) wondered if the experts in the EG were also involved in the discussions on the GHG protocol and the Science-Based Target Initiative, and whether it would be worthwhile to also cross-check for concepts of permanence and measurements. **Max DuBuisson (Indigo)** confirmed that they were involved and commented that accounting and data collection, monitoring and verification for agriculture is far more advanced than the offsetting space. **Clothilde Tronquet (I4CE)** remarked that those guidelines are useful but some discussions, like on double-claiming, have been blocking projects in the agricultural field.

FORESTRY

Chair: Sebastian Rüter (Type A-expert)
Rapporteur: Asger Olesen (Type A-expert)

Welcome and introduction

Asger Olesen (Type A-expert) welcomed the EG and commented that carbon removal certificates will have many potential uses, but also emphasised a clear distinction between the discussion on methodologies and the one on wider use which goes beyond the remit of the EG.

Setting the scene

Presentations

Sven van Baren (CRETA) presented the overview of certification methodologies gathered through the survey for forestry. Eleven methodologies were assessed that are applied at scale. Most use a project-based baseline, include regulatory and financial additionality and require compliance with the DNSH principle to ensure sustainability. As regards quantification, a combination of techniques seems to provide the best results. Certification periods vary between 30 and 100 years, with buffer approaches of 10-25% to address fire and wind risks. Mitigation strategies include avoiding high-risk sites and planting climate-resilient trees.

Kelsey Perlman (Fern) commented that buffer pools are a common approach in methodologies, but do not suffice to cover the gap in terms of results (in the US there is a 38% rate of failure measured). Many credits should therefore not be generated due to these rates of failure. There are many assumptions and gaps in the calculation of carbon credits and forest structure, whereby economic values often weigh heavier than environmental benefits.

Alan Devenish and Philip Mott (ESRI) presented GIS tools to integrate data for carbon removal certification in electronic maps, supporting data collection, the establishment of standards and the uptake of certification for different types of land activities, taking into consideration different approaches among MS. They highlighted the challenge to measure soil carbon, which the EU is working on in the EU soil observatory where they bring the soil data together with the above-ground biomass. GIS has the capacity to put all the data together and provides a system to share these massive datasets.

Discussion

Samantha Tanzer (Bellona Europe) posed several questions about overarching issues regarding methodology definition: how do baselines change when used for public or private financing; how do sustainability criteria change based on the larger policy landscape that the CRCF fits into; and how does the use of credits affect the different options for methodologies.

Austria asked if the methodologies assessed also consider forest soils and how carbon storage in forest soils can be measured with satellites, which would alleviate costs for robust results from soil field testing. **Sven van Baren (CRETA)** replied that soil organic carbon was mentioned in a few methodologies and agreed that soil organic carbon should be taken into account.

Kathy Fallon (Clean Air Task Force) asked whether, in the CRETA review, the baseline settings have a dynamic approach and consider potential changes in policies over time and suggested including an assessment of both drawbacks and co-benefits.

Italy inquired about additional activities compared to sustainable management as currently already practiced and suggested to expand the list of risks to droughts and pests.

France referred to the Label Bas Carbone methodology and explained that public and private forest actors work together without conflict of interest. Both can be responsible for a methodology, be project leader or part of the certificate technical group. The national forest and the GHG national inventories are part of the scientific and technical concept of the three forest methodologies that LBC currently has.

Examples of methodologies

Presentations

Panu Torniainen (ZertiCarbon) explained how Finnish, Spanish and Canadian forest owners are using Climate Smart Forestry (a targeted approach or strategy to increase the climate benefits from forests and the forest sector) to increase carbon sinks, creating an attractive source of income with digitised forest management models. The strategy prevents double-counting, is transparent and respects the environment and biodiversity. For digitisation (tree level), drones are used in combination with fieldwork. Land transformation that happened before the saplings are planted is taken into account, although it differs where the planting occurs. Each forest block has its credits: when the land manager of a given forest block sells the credits, there will be no more credits available for that forest block, so the manager has to create new credits with new trees. The information on the origin of the credits is available.

Moriz Vohrer (Ecosystem Value Association) presented the German Forest Carbon Standard which includes different methodologies that are developed under the standard: Reforestation, Afforestation and Agroforestry. Under improved forest management two other methodologies

are under development: forest transformation and prolonged rotation. Using a multi-stakeholder platform, the standard covers regulatory additionality, a baseline based on natural regeneration, fixed buffer of 15% and ecological and social safeguards. Parameter inputs are collected by the project developer and verified by an auditor. Requests for clarification on the CRCF were raised as regards double counting, climate claims and permanence.

Iván Martínez Castro (OECC) presented carbon removal projects within the Spanish Registry for carbon footprints and offsetting, under which organisations quantify and reduce their footprint by being compensated through operators who develop projects that increase removals via land converted to forests and restoration of burnt forests. The used baseline corresponds to zero, quantification is carried out ex-ante and ex-post with a 10% buffer as liability mechanism. Future challenges include new methodologies under assessment, consideration of other carbon pools, transparency, harmonisation of monitoring reports and information on other objectives.

Wesley Snell and Anne van der Bruggen (Forest Stewardship Council) introduced the FSC ecosystem services procedure, with focus on the Swedish implementation. FSC ES procedure is a framework to demonstrate and (externally) verify positive impacts, while setting quality thresholds and reporting requirements, as well as no-harm safeguards. It is not a carbon specific standard but includes relevant impacts and is applied by 45 forest managers on 2.2 million hectares in the EU.

Discussion

Maria Pohjala (CEPF) inquired how the no-harm principle is addressed. She asked about the opportunity to link the forest certification PEFC and FSC to carbon removal certification schemes. She also expressed concern that only afforestation-based carbon credits may be allowed under the CRCF whereas several countries contribute to long-term carbon accumulation through sustainable forest management. Efforts relating to on-time thinning and high-quality breathing material and mixed species should also be acknowledged. She asked how already existing information on forest and afforestation will be distinguished under the future schemes.

Wijnand Stoefs (Carbon Market Watch) commented that a 100-year permanence is not appropriate for the current climate crisis and that the focus should be on activity-based methodologies and relevant financing. He asked to further explain the "counterintuitive concept" of lower thresholds of regulatory additionality that would not allow to reach the sector target. He also wondered about risk of double counting for forest projects considering the existence of the LULUCF framework.

Netherlands asked OECC whether the baseline around forest fires takes into consideration the situation before or after the fire, the latter raising issues as regards additionality. **Iván Martínez Castro (OECC)** answered that after forest fires the situation is re-evaluated after several years to see the rate of restoration. In case of unsuccessful restoration, the opportunity for new afforestation is created, counting as additional as otherwise there would be no forest anymore.

Finland asked about the method used to determine additionality for the FSC ES procedure. **Wesley Snell (FSC**) clarified that it requires a description of the objectives for the specific ecosystem service and the local context, and an environmental impact assessment. The regulatory and financial additionality are under revision to be published in 2024 and will link activities with impact resulting in quantifiable outputs of management activities.

Finland shared that the ISO and VERRA standards, despite being mostly used in Finland, do not take into account national laws and conditions, and that a new national ISO standard is in development. Finland inquired about the potential for carbon removals and additionality when forests are already in place and innovation is needed to go beyond business as usual. Finland also asked what happens with forest carbon credits where the timber is converted into harvested wood products (HWP). **Asger Olesen (Type A-expert)** pointed to the upcoming EG session on carbon storage in products later in 2023. One approach is to subtract the carbon credit from the footprint in scope of the reporting company and report any residue impact. It depends on the claim the actors want to make, and double counting needs to be carefully accounted for. **Hardo Becker (European State Forest Association)** seconded Finland's comment on the importance of identifying the baseline and business as usual, which differs across countries, and claimed that reforestation would not benefit all of them.

Samy Porteron (ECOS) noted that three out of the four presented methodologies are about offsets and wondered how such methodologies differ from the non-offset ones. Porteron warned of the risk of introducing bias in the framework. **Asger Olesen (Type A-expert)** answered that one important difference concerns scope reporting: permanence and additionality are not considered in factual reporting, but when there is a transaction, it is important to determine if the impact is permanent and how much of it is additional.

Moriz Vohrer (Ecosystem values association) provided clarity on the fact that ISO and IPPC are not methodologies but frameworks. He also noted that most soil carbon sequestration in forestry is activity-based, not result-based, and is roughly estimated. This depends on the location and does not contribute significantly to the GHG calculation when land changes are considered. Finally, he urged the EU to provide guidance for standards and methodologies to enable national systems to plug into.

Samantha Tanzer (Bellona Europe) pointed out that whereas baselines and carbon storage have been covered, associated emissions have not even though these may be significant (e.g., MRV-related, such as airplanes for LIDAR). **Moriz Vohrer (Ecosystem values association)** answered that in the ARCDM (Afforestation and Reforestation Clean Development Mechanism) associated emissions are included and called for precision with the calculations. If the associated emissions are below 5%, the project emission may be set to 0. **Clothilde Tronquet (I4CE)** specified that Label Bas Carbone uses the same method, when there is local legislation that prevails on other protocols. No green claims are laid out yet.

Wesley Snell (FSC) reminded that, regarding secondary effects, the FSC procedure is not a methodology, but an impact framework. The procedure has indicators for measuring carbon removals or avoided emissions, as well as losses by harvesting and/or biogenic project activities. The revision of the procedure will include out of scope claims and forest managers will have to identify the emission sources, for which they have to justify exclusion if they claim for it.

Netherlands asked whether any methodologies include mangroves, as the Swedish Council presidency has included coastal land management under carbon farming. **Sven van Baren (CRETA)** answered that FSC and VERRA also cover mangroves, but this is not included in current available European carbon removal certificates.

Marta Gomez (MRV4SOC project) commented that the upcoming European Space Agency mission BIOMASS will provide reliable information on tree height and carbon stored in forests. In-situ data and sampling network are still needed and the combination of in-situ data, remote sensing processes and base modelling approaches gives a robust methodology.

Sweden stressed the challenge to go beyond business as usual, calling for a clear distinction between BECCS and forests. Forests contribute to carbon removals in many ways, in biomass, but also wooden products, biochar and BECCS.

PEATLANDS

Chair: Francisca Demmendal-Wit (CRETA)
Rapporteur: Hans Joosten (Type A-expert)

Setting the scene

Presentations

Jasmijn Sybenga (CRETA) presented the overview of certification methodologies gathered through the survey for peatlands. Six methodologies have been submitted, four of which are operational and two in particular (MoorFutures and Peatland Code) have a large uptake. Uncertainties are covered via underestimation, buffer or project specific risk assessment. Most baselines are project-based, SNK includes standardized elements (regulated water table). Regulatory and financial additionalities are addressed and certification periods last 30 to 50 years, with no-harm principles. Valuation of co-benefits is limited.

Discussion

No questions.

Examples of methodologies

Presentations

Renée Kerkvliet-Hermans (IUCN UK) explained how the Peatland Code supports unlocking private finance for peatland restoration. The purpose is to provide trust needed to channel private money to landowners to fill the financial gap of 560 million GBP, using a government-backed approach to ensure buyer confidence. After registration and validation of a project, the peatland restoration can start, which then requires verification. Next steps include a paludiculture trial, carbon sequestration during the transitional phase and co-benefits.

Franziska Tanneberger (Greifswald University) elaborated on the 2017 VSC methodology of MoorFutures for peatland rewetting in temperate regions. With just 10 projects and more in the pipeline, the readiness from landowners to participate is low, but 4 federal states and other countries are interested. The GEST approach was successful and now new methodologies for co-benefits are being developed. There is a need to develop spatial planning for carbon farming and paludiculture and to include flexibility with a shorter crediting period to address the low uptake (which needs to increase from 2.000 to 50.000 ha/year). So far, the methodology concerns only emission reduction, removals may be elaborated upon in the future by pooling sites and low-level liability approaches.

Wytze van der Gaast (SNK) presented the Currency for Peat scheme, which calculates GHG emission reductions or carbon removal in the Netherlands using a rulebook for a variety of projects, including additionality and a checks-and-balance system for certification and validation by external independent auditors. Buyers register as end users; credits cannot be used for compliance with existing regulations and should be transparently reported to avoid double

counting. The registry, validation and issuing are done by SNK, but the trading of certificates is done by other platforms. Despite the sales, the emission reductions from the activity remain with the farmers. Farmers find the process complex, which is addressed through the bundling of activities in larger programmes to lower the MRV price.

Philip Marzahn (Rostock University) explained their work on remote sensing for wetland habitats, wherein different sensors can perform long-term series and multi-scale observation measurements over large areas and provide input data for models. For instance, satellites can observe subsidence, water levels, soil moisture and vegetation parameters. Microwaves may be used to continuously monitor land surface processes, independent of illumination, weather, or vegetation.

Discussion

Hanna Winkler (IFOAM) noted that in the Peatland Code the presented project sizes are 145 ha and wondered if this is accessible for smaller farmers. **Renée Kerkvliet-Hermans (IUCN UK)** answered that the cost of the baseline can be prohibitive for small landowners, so often there are intermediaries who pool projects.

Paul Chatterton (Landscape Finance Lab) asked the Peatland Code how to increase scale and engagement, and connect these projects to benefit from cross-peatland approaches. **Renée Kerkvliet-Hermans (IUCN UK)** agreed that it is important to take a wider landscape approach.

Samantha Tanzer (Bellona Europe) repeated the concern of including emission reductions in a framework on carbon removals, and questioned whether one could state that emission reductions are permanent. **Franziska Tanneberger (Greifswald University)** responded that if the water level is raised, emissions will be avoided, and even when it is lowered again, those emissions that were avoided will still be avoided. MoorFutures is conservative and does not include sequestration due to lack of information on when the sink function starts again. **Hans Joosten (Greifswald University)** added that MoorFutures is indeed researching the capacity for removals and concluded that, for continuous carbon sequestration, the water level needs to be raised continuously, which interferes with the site hydrology.

Catherina Hohenthal (CEPI) asked how the methane dynamics and the indirect emissions from previous land use that moved elsewhere after rewetting are accounted in the MoorFutures methodologies. **Franziska Tanneberger (Greifswald University)** explained that there is an inverse linear relationship between water depth and CO_2 emissions , i.e. the higher the water table the lower the CO_2 emissions, but that methane emissions increase after inundation and that this is included in the assessment, together with leakage and activity-shifting. 80% of the rewetted peatlands were used for agriculture, which was stopped on the restored sites, but there is no indication that this activity shifted to other areas. **Hans Joosten (Greifswald University)** added that rewetted peatlands always emit methane, which is a strong but short-lived GHG. The ratio between CO_2 and CH_4 depends on the timeframe used to calculate the Global Warming Potential (GWP). The standard period to express the GWP is currently 100 years, for 20 years the ratio between CH_4 and CO_2 is much larger (i.e. the GWP100 of CH_4 is circa 30, the GWP20 of CH_4 is circa 80, cf. IPCC AR6, 2021. With the aim for climate neutrality in 2040-2050, GWP100 is probably not the right metric and radiative force is more applicable as rewetting of drained peatlands immediately leads to substantial emission reductions, but only after some decades to an absolute climate cooling effect.

Latvia highlighted that currently neighbouring countries use different emission factors, which can have big impacts in terms of certification, and recommended that this be harmonised. They

also emphasised that there are more ways to certify organic soils besides rewetting, such as afforestation. **Hans Joosten (Greifswald University)** answered that the emission factor closest to reality needs to be chosen, because there are different circumstances even within the same country. **Germany** responded that peatland rewetting is a big driver for mitigation and as such is funded in Germany as part of the national strategy, developed with stakeholders, based on voluntary participation. Since 2023 there is also an action plan for ecosystems. Germany noted they are considering the potential of peatland rewetting in the context of carbon removals as negative emissions are required for the country's 2045 net zero target and the 2050 net negative target. **Ireland** added that its peatlands had been used for energy extraction and are currently being restored, partly using the Just Transition Fund. There are many opportunities to engage local communities, in which mapping, data and sharing is critical.

Germany noted that most examples show a project-specific baseline and asked how a standardised baseline as included in the CRCF proposal could be developed. **Ireland** added that the land is very dependent on circumstances, which is something that a standardised baseline would need to take into account.

A question from **SLIDO** enquired about the potential use of peatland previously used for agriculture after re-wetting. **Hans Joosten (Greifswald University)** answered that food production for human consumption is currently not possible on rewetted peatland, but production of energy crops is, so practices for food production should switch to mineral soils and energy crops to rewetted organic soils.

Aaron Scheid (Ecologic Institute) asked if it is possible to link the emission reductions under peatland restoration to carbon removal methodologies. **Hans Joosten (Greifswald University)** pointed out that for removals in wetlands, they need to be rewetted first, which leads to reductions. For climate, reductions and removals are still the same. Until 2050 both reductions and removals are needed. After 2050, the net negative target requires that any remaining emission is compensated by an equivalent removal, and that additionally extra removals are necessary. Avoidance is currently still the prime issue for peatlands, there is much larger potential to reduce than to sequester.

Latvia asked, as peat formation can be variable across years, if it should be partial or complete rewetting. **Hans Joosten (Greifswald University)** answered that IPCC uses two different definitions of "rewetting". The 2014 Revised Supplementary Methods define "rewetting" as "the direct human-induced partial or total reversal of drainage", whereas the 2014 Wetland Supplement defines "rewetting" as "the process of changing a drained soil into a wet soil".

Eli Mitchell-Larson (Carbon Gap) remarked that companies use the credits to offset emission, which cannot form the basis for a climate neutrality claim. Offsets should not be the main motivation behind the support for peatland rewetting, and methodologies should be used also for national policies or public support at national and EU level. **Renée Kerkvliet-Hermans (IUCN UK)** explained that the Peatland Code is about setting a standard for landowners to sell their credits and not on the use of these credits, but the issue of greenwashing is important. They look at the international integrity initiatives on voluntary carbon markets for an internationally agreed way forward to put more scrutiny on what buyers say when using these units for offsets.

4. Conclusions by the rapporteurs

Takeaways from the three rapporteurs

<u>AGRICULTURE</u>

Giulia Maria Stellari (Type A-expert) concluded that several methodologies are aligned with the QU.A.L.ITY criteria and many practices optimise the productivity and GHG balance of the farm. For **quantification**, the existing methodologies calculate removals using standard emissions factors and models using soil and climate conditions as inputs as well hybrid measure-and-model approaches. Direct measurement of soil organic carbon would support the spatial variability in soil carbon. Additional data, and especially farm management data, is needed to improve the reliability of the estimation. For **additionality**, whereas there is consensus on regulatory and financial additionality, baselining of local practices, and barrier analysis with thresholds, there may be challenges to achieving additionality in practice. **Long-Term Storage** is one of the main challenges, and there is significant variation (5/10/20/50 years) in the lengths of the monitoring periods in the current slate of certification standards, all shorter than for forms of more permanent carbon removal, where there is around a 100-year threshold. **Liability** seems to be commonly handled through buffer pools of carbon credits that will require alignment. As regards **sustainability,** standards show variations in measures and tools to quantify and track co-benefits. Monitoring the no-harm impacts and tracking positive impacts will go a long way to ensure that the co-benefits related to improved crop productivity, lower costs for the farmer, and improved water use are recognised and rewarded.
Questions that EG may want to consider going forward are:

- The long-term storage in agricultural soils will certainly span multiple generations of farmers. What are the implications for land ownership transitions including transitions of the liabilities for reversals?
- Use of certified carbon credits including Scope 3 greenhouse gas emissions reductions targets. What mechanisms are needed to ensure that carbon removals remain in the agricultural supply chain and what does this imply for the traceability of the underlying commodity?

FORESTRY

Asger Olesen (Type A-expert) concluded that for forest soil, low-cost sensors, tools, measurements and innovation are needed and market infrastructure is lacking beyond projects, e.g. to verify green claims. Regarding **quantification**, digitisation is leading to data surplus after a long time of data scarcity. Tools, AI and technologies will allow comparison of application of methodologies. However, methodologies for the under the COC may need to be defined better in terms of content and rules, including guiding materials. Existing methodologies consider both regulatory and financial **additionality**. For **long-term storage**, monitoring beyond project lifetime is required (up to 100 years), although reversal rules remain unclear leading to liability issues for permanence. The EU Taxonomy requires no-harm in terms of **sustainability**, however leakage is not covered. Other benefits are considered but not always quantified.

PEATLANDS

Hans Joosten (Greifswald University) highlighted that peatlands are huge carbon stocks, and rewetting leads to substantial reduction of emissions. This makes it attractive to carbon farming, but uptake is limited due to difficult rules and lack of long-term economic perspectives. Methodologies are sparse in number and of mixed quality, but many show innovation. Points of attention include baselines, reduction versus removals, permanence and metrics. After rewetting, a peatland becomes a carbon sink with a negative Global Warming Potential of 100 years (GWP100), but continues climate warming (in terms of radiative forcing) for decades/centuries. The GWP100 may therefore not be adequate for judging interventions focusing on 2050 climate neutrality, whereas radiation balance is a better metric to assess climate effects, but is more complex and hence not yet used in any methodology. To make

drained peatlands persistently climate cooling requires continuous water level rise, time, CH_4 reduction through management of hydrology, hydrochemistry and vegetation. For productive wetland use paludiculture is the key.

5. Next steps

Jan Peter Lesschen (CRETA) explained that the results of this EG meeting, as well as any feedback received via Basecamp, will complement the review and invited the EG to reach out to CRETA in case of additional information or required corrections. The review will be finalised mid-July and re-distributed to the EG. The review document will primarily serve as an inventory of existing methodologies and will refrain from judgements regarding the usefulness of any methodology. The review is the starting point for the scoping papers, but other publications and certification methodologies in development will also be taken into account , for which expert input regarding good practices will be required. CRETA urged the EG to be specific when providing input in the form of scientific papers and reviews.

DG CLIMA concluded that the results of this two-day meeting show how much is already happening in Europe and the value a European certification framework can add. The key point is to develop a reliable quantification using different methods. Uptake is crucial - farmers and forest owners need to be motivated to participate, with interesting costs and benefits prospects. DG CLIMA warmly thanked all the participants for their active participation and contributions and welcomed any further input and suggestions for the next meeting.

6. Next meeting

The next meeting of the EG will focus on industrial removals (permanent storage and long-lasting carbon storage products) and will take place in a hybrid format in October/November 2023. The precise date of the meeting will be announced in due time.

Annex 1: List of participants

List of representatives of members of EG participating, including Observers, ad hoc invited participants, and European Commission

A-Type Members of Expert Group (independent experts)	
Last name	**First name**
CAMES	Martin
CHIARAMONTI	David
MILCINSKI	Grega
OLESEN	Asger
PERUGINI	Lucia
RÜTER	Sebastian
STELLARI	Giulia Marina
VAN ACKER	Joris
HOGLUND	Robert (Observer)
JOOSTEN	Hans (Observer)
TAMME	Eve (Observer)

B-Type Members of Expert Group		
Last name	**First name**	**Organisation**
GRANHOLM	Kaj	Baltic Sea Action Group
KRACKE	Frauke	Stripe climate / Frontier
VOYSEY	Andrew	Climate Agriculture Alliance (Observer)

Representatives of C-Type Members of Expert Group
Bellona Europa
Carbon Market Watch
CEFIC (European Chemical Industry Council)
CEMBUREAU - The European Cement Association
CEWEP, Confederation of European Waste-to-Energy Plants
Clean Air Task Force
Climate Leadership Coalition
Confederation of European Forest Owners (CEPF)
Confederation of European Paper Industries (CEPI)
Copa Cogeca
Ecologic Institute
Environmental Coalition on Standards (ECOS)
European Biochar Industry (EBI)
European Confederation of Woodworking Industries (CEI-Bois)
European Council of Young Farmers (CEJA)
European Environmental Bureau
European Landowners' Organization
European State Forest Association (EUSTAFOR)
FoodDrinkEurope
I4CE Institute for Climate Economics (Observer)
IETA (International Emissions Trading Association)

IFOAM Organics Europe
Indigo Agriculture Europe GmbH (Observer)
IOGP International Association of Oil&Gas Producers
ISCC System GmbH (Observer)
Negative Emissions Platform
Negative Emissions Platform
REC Standard Foundation (Observer)
Stichting BirdLife Europe
Stockholm Exergi AB
TIC Council
Umweltbundesamt GmbH (Observer)
Zero Emissions Platform (ZEP)

Representative of D/E-Type Members of EG	
Delegation	**Organisation**
Austria	Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology
Belgium	Environment Public Service/Climate Change Unit
Bulgaria	Ministry of Environment and Water
Croatia	Ministry of economy and sustainable development
Cyprus	Department of Environment
Cyprus	Department of Environment, Climate Change division
Czechia	Ministry of the Environment
Denmark	Danish Ministry of Climate, Energy and Utilities
Estonia	Ministry of the Environment of the Republic of Estonia
Finland	Ministry of Agriculture and Forestry of Finland
Finland	Ministry of Economic Affairs and Employment of Finland
Finland	Ministry of the Environment
France	Ministry of Agriculture
France	Ministry of Energy transition
Germany	BMEL
Germany	BMUV
Greece	Ministry for Environment and Energy
Hungary	Institute of Agricultural Economics
Hungary	Ministry of Agriculture of Hungary
Hungary	Ministry of Agriculture of Hungary
Ireland	Department for Agriculture, Food and Marine
Ireland	Department of the Environment, Climate and Communications
Italy	Institute for Environmental Protection and Research, ISPRA
Italy	Ministry of the Environment and Energy Security
Italy	Ministry of Agriculture, of Sovereignty
Italy	Food and Forestry
Latvia	Ministry of agriculture
Lithuania	Ministry of Environment
Lithuania	State Forest Service
Lithuania	The Ministry of Agriculture
Netherlands	Ministry of Agriculture, Nature and Food Quality

Norway	Norwegian Environment Agency
Poland	Ministry of Climate
Portugal	Portuguese Environment Agency
Romania	Ministry of Environment, Waters and Forests
Slovakia	Ministry of Agriculture and Rural Development
Slovakia	Ministry of Environment
Slovenia	Slovenian Forestry Institute
Spain	Ministry for the Ecological Transition
Sweden	Swedish Environmental Protection Agency

Invited experts: *representative from*
Carbon Gap
Committee of Regions (CoR)
Cool Farm Alliance (CFA)
Cool Farm Tool
CREDIBLE
EEA
Partners for Innovation (CRETA-project manager)
Soil Mission
Wageningen Research (CRETA Scientific coordinator)

European Commission: *representative from*
DG AGRI
DG CLIMA
DG ENER
DG ENV
DG GROW
DG RTD
JRC

Annex 2: Questions from the public ('Slido')

The questions below were raised on the 'Slido' platform and will be taken into account as input for the subsequent meetings of the EG.

Question text	User Name
Will this GIS available? Can an European project participate or contribute to feed relevant information?jv.nava@icamcyl.com	Anonymous
where can we take a look of this GIS?	Anonymous
which is the name and address of GIS expert? thanks!	Anonymous
I think it's important to note that probably most to all of the methodologies are still "under construction" and getting improved in various aspects	Anonymous
Why do we mix carbon farming and biodiversity?	Anonymous
We can't properly measure forest soil carbon yet and we can't even correctly and safely model the long to medium forest soil carbon circles yet	Anonymous
So if we don't really understand the cycles yet how do you want to take soil C into consideration and tell what's the cause for any changes measured?	Anonymous
The forest area stays the same - reforestation has to be made. Loosing area leads to misunderstanding.	Anonymous
Do you take into account airborn carbon footprint in the balance of CO2 sequestration ?	Anonymous
What is the cost of MRV at the Ha level ?	Anonymous
Shouldn´t it be the aim to create carbon removal without endangering food production? Option 1 is the opposite of it.	Anonymous
Without clear addressing & solving the "problem" of double counting the whole EU carbon farming program is going to fail before it starts. we need some info soon	Anonymous
Does Spain not legally bind the forest owner to keep forest (or rebuild the forest) on forest land? So it's still reforestation then.	Anonymous
What is the potential for carbon removal in European forests taking into account quality criteria?	Anonymous
The main issue for European forests is diebacks combined with reduction of growth : forests may become sources. Are there methodologies tackling this issue ?	Anonymous
Wood products when it comes to sequ. C can only be used to prolongue the duration of a forest credit, but the subsitution effects can be counted for the WP	Anonymous
Of course a valid management improvement methodology has to take into consideration a potential increasing or decreasing baseline that the project is based on.	Anonymous
Please consider that improved management credits per definition can't have the same duration than (re)afforestation. You're dealing with grown trees	Anonymous
Which part of the peatland currently certified is nature and which part is farm land. For a farm a +30 year runtime seems very long.	Sanne Dekker FrieslandCampina/EDA
Where rewetting of farmland happens what happens to food production? Is it all lost? Or only a percentage?	Paul Brannen CEI-BOIS
Do we have enough water to rewet peatland?	Anonymous
How can houses and infrastructure prevented to be destroyed by rewetted peatland?	Anonymous
So ruminants and methane has also to be seen different, also in case of keeping grassland in use and keep the big storage of carbon.	Anonymous

Does Nature Restoration Law damage the national aims for peatlands, as support gets more difficult or even impossible?	Anonymous
Emission reductions are crucial but must not be mixed with removals, nor should they have the same value	Anonymous
Why not to design the system in a way that credits are bought for fixed price by nat´l governments or the EU?	Anonymous
Yes, paying for costs is not enough. climate services have to be a proper service that gets paid and give farmers a meaningful thing to do, not another subsidy	Anonymous