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Barriers and incentives for sharing inputdata needed in carbon farming and MRV systems in Europe

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Key messages

An EU-coherent Monitoring, Reporting, and Verification (MRV) system needs the development of agreed rules for data sharing among public and private sectors, together with open access tools and procedures enabling for the standardisation and harmonisation of data. The following principles are recognised as essential to promote data sharing: collecting once and using for multiple purposes, respecting personal data privacy, defining and agreeing on the data re-use, giving a service back, and rewarding intellectual property rights.





Introduction

Balancing the need for accuracy –towards high value carbon credits– and the need for sustainable and affordable costs of certification systems, and the specific role played by incentivising data sharing among public and private actors involved, is the topic of discussions held in the Focus Group 3.1 of the Project Credible during 2024 and the first months of 2025. Active members of the Focus Group belong both to the public and private sector, and both to research and to farm-advisory certification bodies.

The EU Carbon Removals and Carbon Farming (CRCF) Certification Framework aims at increasing stakeholders' faith in the Voluntary Carbon Market (VCM) through robust, cost-effective, and transparent Monitoring, Reporting, and Verification (MRV) systems.

In order to have a coherent MRV system which could apply at different scales –from the field scale to the reporting at national and international scale– there is a need for the EU-wide sharing of standardised and harmonised information, with agreed sharing rules between private and public entities, and with standardisation and harmonisation procedures adopted at different levels. This should start with procedures, instruments, and protocols adopted in the field, passing through the analytical methods and standards adopted, the carbon modelling methods adopted, and finally be the base of the reporting procedure. Several types of data are needed, such as soil data, biomass input data, land use and management data, climatic data, land parcels data, possibly proximal and remote sensing data. In order to have comparable and coherent results, there is the need to overcome several technical, economic and legal challenges.

Regulatory framework

Directive 2003/04/EC on public access to environmental information • EU Accounts Modernisation Directive 2003 and Transparency Directive 2004 • Directive 2003/98/EC on the re-use of public sector information • Directive 2007/2/EC — Infrastructure for Spatial Information (INSPIRE), that aims to promote public access to spatial and infrastructure data that may impact on the environment • Directive 2010/75/EU on industrial emissions (IED) • Directive 2014/95/EU on non-financial reporting including the disclosure of policies on environmental, social and other matters by large undertakings and groups • Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants amending Directive 2003/35/EC for public participation relating to environment plans and programmes • Directive 1024/2019/EC on open data and re-use of public sector information, known as the Open Data Directive • Directive 2854/2023 on harmonised rules on fair access to and use of data, amending Regulation (EU)





2017/2394 and Directive (EU) 2020/1828 (Data Act) • Regulation 3012/2024, The Carbon Removals and Carbon Farming (CRCF) Regulation.

Recommendations

To overcome several technical, economic and legal challenges, and towards harmonisation we recommend:

Recommendation 1

Recognising the advantages of a standardised baseline as defined by CRCF, in order to reward early movers, encourage new adopters and simplify additionality tests, the representativeness of the data used is recognised as a core criterion for the establishment of a robust standardised baseline. This should be accompanied by a regular recalibration –to reflect evolving practices and climate trends (Don et al., 2023)– which implies the implementation of an EU-wide system for data sharing, based on EU legislation (see the regulatory framework).

Recommendation 2

Clarification should be given about the concept of baseline to clearly distinguish among baseline for carbon removal in aboveground and belowground biomass, baseline for carbon removal in soil, baseline in greenhouse gases emission reductions.

Recommendation 3

A full implementation of INSPIRE regulation is needed for all types of data needed in the MRV systems –climate data, soil data, greenhouse gases emission data, carbon and nitrogen input data, agricultural and forestry management data, plant phenology data, remote sensing and proximal sensing data– in terms of data model structures, ontologies, sampling protocols and analytical procedures, quality criteria for laboratories, unit of measure, data formats, and their mutual transformation rules and standard procedures to determine the associated uncertainties. The tools and knowledge developed for the INSPIRE implementation should be made freely available to both public and private users, and should be user friendly for both the data owners/holders and the end users.

Recommendation 4

The following principles are recognised as essential to promote data sharing: i) collecting data once and using them for multiple purposes; ii) confidentiality of personal data; iii) recognising data ownership; iv) defining and agreeing on the data re-use; v) giving a service back; vi) rewarding intellectual property rights. As farm data –including georeferenced soil data– are recognised as





personal data (Fantappiè et al., 2021), the confidentiality should be guaranteed by anonymisation/aggregation procedures, or by access/sharing with request procedures, which imply the signing of embedded contracts for data sharing with farmers.

Recommendation 5

To incentivise private companies to share their data, the effort of data collection should in large part be subsidised with the support of the EU. One farmer should have the ability to request a subsidy for data collection –such as soil sampling– and hire himself a company to perform both sampling and lab analysis. Farmers will be incentivised to share openly their data if a service is given back, such an open system that estimates baselines and SOC storage potential (with associated uncertainty).

Background information

Focus Group 3.1 has a diverse membership spanning academia (e.g., soil science, proximal sensing, social sciences), farmers, research institutes, and the private sector. There are currently 37 members in total, both internal and external to Project Credible. The discussion within the Focus Group has centred around three main themes related to MRV: 1. harmonising soil analysis: standards and protocols; 2. enabling soil data sharing; 3. producing baselines – needs and challenges. The three themes are connected in the standardisation and harmonisation effort. The focus group has mainly met online, but has also organised an in-person breakout session at the First European Carbon Farming Summit in Valencia (March 2024), where the discussion on the three main themes continued. The Focus Group analysed the current international research projects and other initiatives, both at national and international scale, on the topic (e.g., JRC-EUSO, EJPSOIL, MARVIC, MRV4SOC, ICOS, eLTER, EUROSOLAN, SOILWISE, BONARES, GOV4ALL among others), extending the discussion to private stakeholders; the key take-home messages are synthesised in the present document.

Back notes on dissenting views from the Focus Group

In this paragraph we report as back notes some dissenting views and controversies arising from the discussion inside the Focus Group 3.1, which were also collected through an <u>open consultation</u>. We report those views in a synthetic form here, and we will expand them in the final report which will be produced by the Focus Group 3.1, that is the "D3.1 A roadmap for harmonisation and improvements of mapping and monitoring soil carbon dynamics (stocks and fluxes) supporting the EUSO in the construction of an EU-harmonised soil monitoring system".





We report here the above-mentioned dissenting views, which do not represent what agreed by the rest of the Focus Group: the numbers reported are part of the dissenting views. At the base of the dissenting views is the ascertainment that soils across agricultural field plots are inherently heterogeneous to such an extent that estimating soil carbon accumulation and accrual rates –as required by carbon farming– would require in the whereabouts of 200 to 500 hundred "samples" per hectare. The annual soil carbon accrual rates are most often of one to a few hundred Kg of carbon ha-1 year-1. The error associated with existing SOC estimates through soil sampling are often one to two orders of magnitude larger than these accrual rates. Given the hundreds of samples required for soil mapping, it is difficult to see how this cost could be offset by carbon credits. This conceptual flaw leads to unresolvable problems such as non-additivity of carbon credits given the lack of baselines, leakage and permanence issues, lack of precision, poor economics. Summarising, from this dissenting point of view, there is yet no clear solution underway that could satisfy the regulatory, financial institutions or investors wanting to buy such carbon credits. A different approach is proposed, which would not need soil sampling, based on nutrient management plans for agronomic field-crops such as cereals & rapeseed (www.polyor.fr).

References

Don, A., Seidel, F., Leifeld, J., Kätterer, T., Martin, M., Pellerin, S., | Emde, D., Seitz, D., Chenu, C., 2023. Carbon sequestration in soils and climate change mitigation—Definitions and pitfalls. Glob Change Biol. 2024;30:e16983. <u>https://onlinelibrary.wiley.com/doi/epdf/10.1111/gcb.16983</u>

Fantappiè, M., Peruginelli, G., Conti, S., Rennes, S., Le Bas, C., van Egmond, F., Smreczak, B., Wetterlind, J., Chenu, C., Bispo, A., Oorts, K., & Bulens, J. (2021). Report on the national and EU regulations on agricultural soil data sharing and national monitoring activities. Zenodo. https://doi.org/10.5281/zenodo.10014912