

Nature-based solutions and carbon credits: a scientific perspective



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The Integrated Carbon Observation System (ICOS), together with the Baltic Sea Action Group initiated a stakeholder discussion on the complex issue of integrating natural carbon removal solutions to a European carbon removal certification scheme. Key messages from a scientific perspective are listed below.

The page and paragraphs numbers refer to FLUXES, the European Greenhouse Gas Bulletin (volume 2) published by ICOS.

The need for a solid foundation

► **A European unified, science-based, transparent and robust Measuring, Reporting and Verification (MRV) system is the unavoidable foundation for a credible and trustworthy European carbon removal credit scheme.**

Such an MRV system would safeguard against greenwashing, prevent unsubstantiated claims, contribute to a fair market approach and guarantee the highest independence from any influence.

Unified: An MRV system based on standardised processes is crucial for fairness and efficiency in assessing objectives, practices, methods and results.

Science-based: An MRV system should be based on the latest available community science to ensure that the scientific consensus prevails on particular interests.

Transparent: Transparency in an MRV system is key to fairness for all stakeholders involved and an assurance to prevent manipulations, mistakes and fraud.

Robust: The robustness of an MRV system, especially at a financial level, is essential for its independence, credibility and legitimacy. It would also ensure its long-term operational life.

► **The scientific credibility of a unified European MRV system allows no shortcut: it requires the joint provision of ground-based observations, remote sensing and accurate models.**

The interconnection of these three scientific pillars provides for the delivery of precise, realistic and reliable predictions. Forest and soils are dynamic. Their ability to sequester carbon from the atmosphere and store it depends on their health condition, weather events, management decisions and the effects of climate change.

“If we want a reliable monitoring, reporting and verification system, we need all components: ground-based data, remote sensing, modelling and inventory analyses.”

Dr Ivan Janssens

ICOS Belgium, Professor, University of Antwerp

Integrating natural carbon sinks and their highly variable characteristics into a carbon removal credit scheme requires a capacity to train and feed models with real-time data measured at the highest definition possible, using cutting-edge ground-based station networks and state-of-the-art remote sensing techniques.

The role of ICOS in monitoring carbon sinks

ICOS uses standardised, high-quality methods to measure carbon exchanges between the vegetation and the atmosphere and the carbon stocks of the soil. ICOS also has a state-of-the-art laboratory for analysing the soil and plant samples.

“The EU regulatory framework calls for a scientifically robust assessment of carbon removals. This is where ICOS has a role to play.”

Dr Werner Kutsch

ICOS Director General

► **Nature-based carbon removal solutions provide crucial natural co-benefits but don't spare the need to reduce human-induced greenhouse gas emissions drastically.**

The EU urgently needs to protect its forests and restore its soils.

“Forest soil stores three times more carbon than the trees above ground. The less you disturb the soil, the better.”

Dr Manuel Acosta

Senior Scientist, Global Change Research Institute
CAS CzechGlobe

Forest carbon sinks are under pressure

The EU's total forest carbon sink decreased by nearly a third between 2010 and 2020 (FLUXES vol. 2, p.20).

Rotation-managed monoculture forests are less biodiverse and resilient while clear-cutting turns forests into a carbon source (FLUXES vol. 2, p.20, §5).

The few remaining old European forests are vital for biodiversity and play an essential role in carbon storage. (FLUXES vol. 2, p.24, §9).

► **Forest carbon sinks should not be an excuse for watering down emission reduction ambitions. Reducing fossil fuel consumption is still the most impactful climate mitigation measure.**

Carbon farming: improving soil health with huge co-benefits

Major agricultural emissions are methane from livestock and manure management, and nitrous oxide and carbon dioxide from the soils and fertilisers. Currently, croplands and grasslands release more carbon dioxide than they take up, according to the European Environmental Agency (Historical and projected emissions from the agriculture sector in the EU-27, 2022). We need to step up measures to reduce emissions from agriculture.

► **Carbon farming must be considered from a more general, sustainable farming perspective.**

Although the carbon sequestration potential per hectare is small, and not always permanent, carbon farming have multiple additional benefits improved soil health, better yield security & stability, better livelihood for the farmers. It also improves food security and biodiversity in a changing climate. (FLUXES vol. 2, p.51)

► **BSAG promotes regenerative agriculture as a holistic approach for sustainable food systems, soil health and climate action.**

Regenerative farming also reduces fossil-dependency in food systems through reduced need for mineral nitrogen fertilizers. The food industry is looking for ways to reduce their climate footprint and develop more sustainable supply chains. A robust carbon MRV system, also including metrics for biodiversity in the near future, is a key tool in the transition to sustainable food systems.



Read more on the land carbon sinks issues in FLUXES, the European Greenhouse Gas Bulletin by ICOS: icos-ri.eu/fluxes/2

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