CARBON FARMING IN FORESTRY AND CARBON STORAGE IN WOOD PRODUCTS. THE NEW CERTIFICATION FRAMEWORK AND THE POTENTIALS FOR THE RELATED MARKETS

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Abstract
The EU is committed to achieving climate neutrality by 2050 to ensure a sustainable future. The most urgent priority remains the reduction of greenhouse gas emissions. At the same time, the EU must compensate for remaining emissions that cannot be eliminated by scaling up carbon sinks by absorbing carbon dioxide from the atmosphere.

Carbon credits are a type of market-based instrument that allows stakeholders to address greenhouse gas emissions by financing projects that reduce or remove carbon dioxide or other harmful greenhouse gas (GHG) emissions from the atmosphere. The goal of carbon credits is to create a financial incentive for businesses and governments to reduce their carbon footprint and invest in cleaner, more sustainable practices. The carbon market is a system of buying and selling carbon credits. There are several types of carbon markets, including:

- *Compliance-based Carbon Markets (CCMs).*
- *Voluntary Carbon Markets (VCMs).*

A harmonized Union certification framework was recently issued to address the above issues. The framework is expected to enhance the environmental integrity and transparency of permanent carbon removals, carbon farming and carbon storage in products, while reducing the associated administrative costs.

This paper is a theoretical approach that explores the potential that the above framework offers in trying to integrate Greek forest land, as well as long-term carbon storage in wood products, into mandatory and voluntary carbon credit markets, through optimized forest management and carbon dioxide (CO_2) storage and the required collaborative ecosystem of forest owners, public and private, in the forestry sector.

Key words: *Carbon removals, carbon markets, forestry, wood products, certification framework*

Introduction

Climate change is one of the greatest challenges of our time, with carbon dioxide (CO_2) emissions contributing significantly to global warming. Forests play a key role as natural carbon sinks, absorbing CO_2 from the atmosphere and thus contributing to climate change mitigation. However, the accurate recording, monitoring and certification of carbon removals from forests remains a very complex and costly process, resulting in limited utilisation of carbon markets, especially in Greece. The EU is committed to achieving climate neutrality by 2050 to ensure a sustainable future for our continent and our planet. The first and most urgent priority remains the reduction of greenhouse gas emissions (GHG's). At the same time, the EU must compensate for remaining emissions that cannot be eliminated by scaling up carbon removals or, in other words, by absorbing carbon dioxide (CO2) from the atmosphere (EC, 2019).

Carbon Dioxide Removals (CDRs) refer to the process of removing CO2 from the atmosphere through anthropogenic activities. Since this is the opposite of emissions, practices or technologies that remove CO2 are often described as achieving 'negative emissions'. The process is sometimes more broadly referred to as greenhouse gas removal if it involves the removal of gases other than CO2. There are two main types of CDR: either enhancing existing natural processes that remove carbon from the atmosphere (e.g. by increasing its uptake by trees, soil or other 'carbon sinks') or using chemical processes to capture, for example, CO2 directly from the atmospheric air and store it elsewhere (e.g. underground). All CDR methods are at different stages of development (E.C., 2024).

Carbon credits are a type of market-based mean that allows companies, governments and other organizations to address greenhouse gas emissions by financing projects that reduce or remove carbon dioxide or other harmful greenhouse gas (GHG) emissions from the atmosphere (Trouwloon, et al. 2023; Freedman and Keith, 1996). The goal of carbon credits is to create a financial incentive for businesses and governments to reduce their carbon footprint and invest in cleaner, more sustainable practices. The carbon market is a system of buying and selling carbon credits. There are several types of carbon markets, including (EU ETS, 2025; Calel, 2013; Stephan and Paterson, 2012; Convery, 2009):

- Compliance-based Carbon Markets (CCMs).

CCMs have arisen from the need to comply with national, regional and/or international policy or legal requirements as a result of commitments made by countries to reduce their emissions under international agreements or treaties. CCMs are regulated by law and therefore operate on a mandatory basis, as participating organizations, i.e. companies and governments, have a legal obligation to offset their emissions. Emission permits are allocated according to a schedule and can be auctioned or purchased by other equivalent organizations.

- Voluntary carbon markets (Voluntary Carbon Markets or VCMs).

VCMs are supported by non-state actors and enable companies to take the initiative to voluntarily reduce their own carbon footprint beyond what is required by law. Rather than being driven by international regulations or agreements, the voluntary purchasing 'movement' was created so that companies can join the effort to address climate change by offsetting the greenhouse gas emissions they cause, alongside the direct emissions reductions they implement in their production chain. With increased investment demand for actions with a positive environmental footprint supported by scientific evidence, VCMs have emerged as fast-growing markets. By investing in carbon reduction projects, companies can issue Voluntary Carbon Offset Credits, which can then be offered through VCMs to companies that need to reduce their own carbon footprint, or to investors seeking rewarding and sustainable investments.

Voluntary Carbon Offset Credits (VCCs) can be generated by various types of projects that reduce greenhouse gas emissions, including:

- Projects related to nature-based solutions: enhancing the capacity of natural ecosystems to sequester CO2 or reversing ecosystem degradation to prevent the release of carbon into the atmosphere. Typical examples include reforestation and sustainable forest management efforts.
- Blue carbon projects: They focus on coastal ecosystems such as mangroves, seaweed and reefs. These ecosystems store large volumes of carbon within marine flora and sediment.
- Agricultural projects: improve land management practices to reduce emissions and enhance carbon removal in the soil.
- Green-green infrastructure projects: 'integrate' nature into urban and rural lands.
- Technology projects: rely on technology to reduce emissions, such as renewable energy initiatives, direct atmospheric carbon capture technologies, energy efficiency improvement projects, fuel switch projects and efficient waste management.

Carbon pricing is a central element of the EU's successful and ambitious climate policies, implemented through the EU Emissions Trading Scheme (EU ETS). Greenhouse gas pricing is a fair and cost-effective way to reduce greenhouse gas emissions by penalising polluters and providing incentives to invest in clean technologies. Carbon pricing also generates revenue for public sector investment in climate action. Since the introduction of the EU ETS in 2005, emissions in the sectors covered have fallen by more than 37 %. In addition, revenues from the EU ETS have amounted to €175 billion. Since 1990, total EU emissions have fallen by 32.5 %, while our economy has grown by around 65 %, showing that we have succeeded in decoupling economic growth from emissions. Emissions trading will soon be applied to new sectors in Europe under recently agreed reforms, with an extension to maritime and aviation transport, and later to fuels for buildings and road transport.

For the relevant market to work, there will need to be the development of an adapted certification method for the resulting carbon capture activities. This approach was adopted by the European Parliament in November 2023 with the Carbon Removals Certification Framework - Final adoption 6/11/2024 (EC, 2024). The voluntary framework aims to facilitate and accelerate the development of high-quality carbon removal and land-based emission reduction activities in the EU.

However, in Greece, the regulatory framework for the integration of private forests into the carbon market remains unclear and limited. Small and medium forest owners face high costs and complex certification and verification procedures, which limits their ability to participate in the carbon market. At the same time, the lack of transparency and credibility in voluntary carbon markets, such as double counting of removals, undermines buyer confidence, leading to price volatility and limited demand.

Certification of carbon removals for carbon credits

The agreement extends the scope of the regulation to land-based emission reductions and maintains an open definition of carbon removal, in line with that used by the UN Intergovernmental Panel on Climate Change (IPCC). It also distinguishes between the following carbon removal and emission reduction activities and four corresponding types of units (EC, 2024):

- permanent carbon removal (storage of atmospheric or biogenic carbon for several centuries)

- temporary storage of carbon in long-life products (such as wood-based construction) for at least 35 years and which can be monitored on site throughout the monitoring period
- temporary carbon storage from carbon farming (e.g. forest and soil restoration, wetland management, seagrass meadows)
- reduction of soil emissions (from carbon farming), which includes carbon and nitrous oxide reduction from soil management and, where these activities lead to an overall improvement of the soil carbon balance, wetland management, no tillage and cover cropping practices combined with reduced fertiliser use, etc.

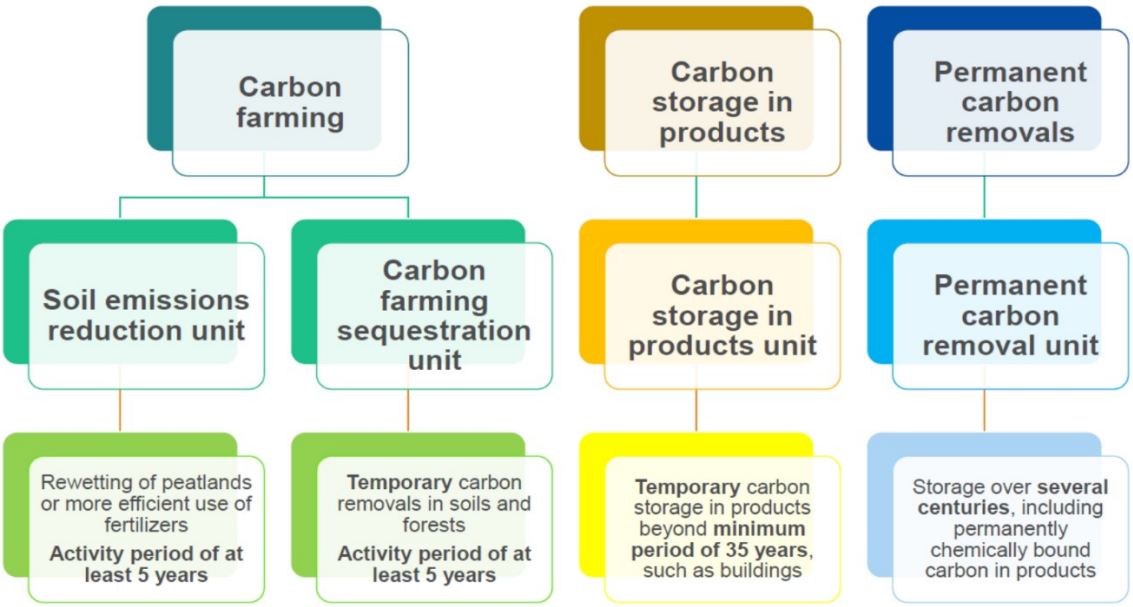

Figure 1: Carbon removal activities (*Source: European Commission, DG CLIMA, Unit C3 -5th Meeting of the Carbon Removals Expert Group*)

More generally, in line with the relevant EU Regulation to ensure the quality and comparability of carbon removals, we have a first EU-wide voluntary certification framework for carbon removals. The proposal sets out requirements for third-party verification and certification of carbon removals, the management of certification schemes and the operation of registries. Four QU.A.L.ITY criteria are established (EC, 2024):

- QUantification: carbon removal activities must be accurately measured and yield indisputable carbon removal benefits. The additional carbon removals produced by an activity (compared to a baseline) should exceed any greenhouse gas emissions produced as a consequence of the implementation of the activity throughout its life cycle. The 'net carbon removal benefit' should be quantified in a reliable and accurate manner. In the context of carbon removal agriculture, the quantification of the benefit in terms of net carbon removal can be done in a cost-effective way by using empirical data, remote sensing technologies (e.g. Copernicus) and highly accurate models based on machine learning and artificial intelligence. The acquisition of climate-relevant data compatible with electronic maps will also contribute significantly to improving the quality of national GHG inventories for the LULUCF (land use, land use change and forestry) sector and will improve the quality of forest monitoring activities under the forthcoming proposal for a regulation on forest monitoring.

- Additionality: carbon removal activities should go beyond existing practices and legal requirements. The preferred way of demonstrating additionality is to establish a 'standard' baseline that accurately reflects the normal practices, regulatory and market conditions under

which the activity takes place. A standardized baseline facilitates cost-effective and objective demonstration of additionality and has the advantage of recognizing the early efforts of land managers and industries that have already been involved in carbon removal activities in the past. To ensure ambition over time, the standardized baseline should be updated periodically.

- Long-term storage: carbon removal activities should ensure that the carbon sequestered is stored for as long as possible and that the risk of carbon release is minimized. The certificates will clearly indicate the duration of the carbon storage and distinguish between permanent and temporary storage. The release risk varies between carbon removal activities. Therefore, the risk should be monitored and mitigated, and operators should be held responsible through specific liability mechanisms in the event of a carbon release. In addition, certificates should transparently indicate an expiry date which depends on the release risk of each type of carbon removal. In this way, the proposal distinguishes between technologies that ensure permanent carbon storage (for which there should be no expiry date) and temporary carbon removals (e.g. from carbon farming and carbon storage in products). Thanks to these rules, providers of temporary carbon removal services will be subject to more realistic commitments that do not prevent adoption, while having an incentive to continue carbon removal activity in order to be recertified.

- Sustainability: carbon removal activities should have a neutral impact or produce co-benefits for other environmental objectives such as biodiversity, climate change adaptation, greenhouse gas emission reduction, water quality, zero pollution or the circular economy. For example, industrial solutions such as BECCS should not lead to unsustainable biomass demand. The Commission will prioritize the development of adapted certification methodologies for carbon removal activities that provide significant co-benefits for biodiversity. At the same time, practices such as monoculture forestry, which have harmful impacts on biodiversity, should not be eligible for certification.

To apply for certification of compliance under the Regulation, an operator or a group of operators applies to a certification scheme. Upon acceptance of that application, the operator or group of operators shall submit to a certification body a plan of activities including evidence of compliance and the expected net benefit in terms of carbon removal or the expected net benefit in terms of soil emission reduction resulting from the activity, and a monitoring plan. The certification scheme shall designate a certification body to carry out a certification audit to verify that the information submitted is accurate and reliable, and to confirm the compliance of the activity. At least every five years, or more frequently if specified in the applicable certification methodology based on the characteristics of the activity concerned, the certification body shall carry out recertification audits to reconfirm the compliance of the activity and to verify the net carbon removal benefit or the net soil emission reduction benefit resulting from the activity (EC, 2024).

Certification bodies designated by certification schemes shall be accredited by a national accreditation body or recognized by a national competent authority as competent to cover the scope of this Regulation or the specific scope of the certification scheme. Certification bodies (EC, 2024):

- are responsible for carrying out the certification audit and the re-certification audit;
- be legally and financially independent of an operator or a group of operators; and
- carry out in the public interest the activities required under the Regulation.

The EU Commission shall establish by 2028, and thereafter duly maintain, a Union registry for permanent carbon removal, carbon removal agriculture and carbon storage in products, with a view to making information related to the certification process publicly available in an accessible manner. Certified units shall be issued once and shall not be used by more than one natural or legal person at any time. Permanent carbon removal units, product

carbon storage units and soil emission reduction units shall remain distinct from each other (EC, 2024).

The role of forests and wood products

Forests can make a substantial contribution to this market as they are the most important carbon pool with a constant potential for improvement. In combination with agriculture, products, and construction (especially wood) a significant potential for carbon sinks can be developed with multiple benefits for companies - investors - cooperatives with additional revenues. There is a very high demand for carbon sinks especially from carbon removal projects and investments in the primary sector.

Carbon is stored in the aboveground biomass of plants (stems, bark, leaves, branches, understorey), underground (roots, stumps), in forest soil but also as leaf litter and dead wood. A much larger amount is stored in soil than in biomass. The stored carbon is associated with the wood stock (i.e. the woody capital). To do this, the wood stock is converted to aboveground biomass in tons of dry mass using BCEF (Biomass Conversion and Expansion Factors) factors according to IPCC 2006 (Guidelines for National Greenhouse Gas Inventories) and IPCC 2019. These factors take into account branches, leaf litter and shrub understory as well as wood density in different forest types. The biomass is converted into stored carbon with the so-called carbon fraction, which according to the above-mentioned source is 0,47. Thus, according to the Forest Europe 2020 report on European forests, the total carbon storage capacity for forest biomass (above and below ground) in the forests of Southeast Europe is estimated at about 41.6tn/ha. Also, according to the same report, the wood stock of Greek forests is about 47m3/ha. From the above it can be generally concluded that a total of about 100-160mt of carbon is stored in the Greek forests, as the area of forests and woodlands is about 3.9 million ha. According to relevant research in Greece (Pappas et al, 2015), and considering the CO2 uptake per area occupied by forest types, the storage (CO2/ha), in aboveground and belowground biomass, was significantly higher in deciduous broadleaf species than in coniferous and evergreen broadleaf species by 26.7 and 36.1%, respectively. In terms of annual uptake, it was significantly lower in coniferous species by 55.7 and 47.2% respectively compared to deciduous and broadleaf species. These differences could be attributed to the different physiology, growth mode (fast-growing, slow growing), allometry, density and chemical composition of the biomass, which characterize the functional groups of forest species. The influence of the forest species on both the storage and annual uptake of atmospheric carbon dioxide is important.

Examples of effective carbon farming practices according to the European Commission include afforestation and forest management that respect biodiversity-friendly ecological principles and enhanced sustainable forest management, including biodiversity-friendly practices and forest adaptation to climate change.

Focusing on forests, carbon foresight refers to the management of carbon pools, such as forests, and greenhouse gas flows at the forest farm level, to mitigate climate change. This includes the management of both land and livestock, all carbon pools in soils, materials and vegetation, as well as carbon dioxide (CO_2) and methane (CH4) and nitrous oxide (N2O) fluxes. Carbon forestry is a land management concept that first gained global interest after the Kyoto Protocol (KP) entered into force in 2004. In recent years, following the Paris Agreement and the recognition of nature-based solutions as key to achieving climate neutrality by 2050 at the latest, interest from the private sector has increased. However, no national or international compliance system has recognized mitigation outcomes from action under land use, land use change and forestry (LULUCF) in the form of credits.

In the EU, Regulation 2018/841 on LULUCF to meet the objectives of the Paris Agreement, the European Green Deal from 2019 and the new European Forest Strategy changed the framework. The Farm to Fork Strategy, the Circular Economy Package and the Fit for 55% program make it clear that the land sector needs more and better incentives to manage carbon emissions in order to drive the necessary transformation towards 2050. Improved understanding and implementation by land managers and in carbon forestry will be a critical factor, along with a strong and transparent governance system that sets out common and clear rules for monitoring, reporting and verification and the use of results from carbon 'farming' activities.

A holistic approach is required that considers carbon storage in forest biomass, soil and wood products, substitution effects, and potential leakage effects. In addition, sustainable, climate-smart forest management must secure current and future supplies of raw materials, protect, and enhance biodiversity and maintain soil and water quality, for a balanced contribution to all ecological, economic and social functions. In managed forests, carbon removal should be enhanced by stimulating forest productivity (e.g. selection of species and tree origin, thinning and harvesting regimes) and by enhancing the resilience of forests to climate change (e.g. increasing species diversity). This should be achieved through sustainable forest management practices that are local oriented and take into account future climate conditions (EC, 2021).

The Regulation (EU 2018) on land use, land use change and forestry (LULUCF) activities ensure that Member States report and account for changes in carbon stocks not only in forests but also in carbon pools of harvested products, which will be strengthened under the revised regulation proposed as part of the 'Fit for 55 %' package. Logging products in the EU represent an active net carbon sink of around -40 million tonnes of carbon dioxide equivalent (MtCO2e)/year, and generate climate benefits through material substitution, with values ranging from -18 to -43 MtCO2e/year (E.C. 2020). The longer the life of the product, the more climate change mitigation is favored, which is then reflected in increased net removals in Member States' LULUCF reporting and accounting, and, as it reflects substitution effects, reported and accounted for indirectly as reduced emissions in other sectors.

Forest harvesting and carbon storage should be analyzed in conjunction with the other functions performed by forests. Reducing harvesting increases carbon storage in forest ecosystems in the short term and can bring benefits for biodiversity, soil, and water quality. However, it can jeopardize the economic benefits of forests and the increase in carbon storage is valid until the carbon pool in the forest is saturated. In addition, forest management should also consider that natural disturbances such as storms, fires and pests are expected to increase under climate change conditions, with a direct economic impact in terms of wood applications, and ultimately lead to carbon release into the atmosphere.

We also underline that the market for forest carbon credits using cutting-edge technologies is growing globally. In Greece it is at an early stage, while in Europe and globally initiatives such as Puro.earth in Finland and the Land Life Company in the Netherlands are using advanced technologies such as drones and GIS for carbon capture and credit marketing. Carbon Direct in the UK offers analytics for credit management, while in the US Pachama and VERRA are applying artificial intelligence and geospatial technologies for certification. The global REDD+ program uses remote sensing and lidar to monitor forests.

On the other hand, the sustainable use of wood for materials and products should follow the principles of cascading use (EC, 2018). Cascading use of biomass refers to the resource-efficient and cyclical use of biomass (E.C. 2016). Cascading use of forest woody biomass refers to the practice of utilizing wood and its products in successive stages, maximizing the value of the material and minimizing waste. This approach is fundamental to the development of a cyclical and climate-neutral wood-based bioeconomy, which seeks to keep resources in

use for as long as possible. In this approach, wood is used, reused and recycled, thus extending the life of the material within the system. In addition, wood should be used for products that store carbon for as long as possible and for products that provide large substitution benefits by avoiding emissions. Forest-based bioenergy has a role to play in the transition of the energy sector towards emission-free energy production. When using woody biomass for energy purposes, preference should be given to post-consumer wood and forest residues which are not suitable to produce other materials, and which do not lead to additional harvesting.

According to the European Forestry Strategy (EU 2021), given the increasing and sometimes competing demands on forests, it is necessary to ensure that the amount of wood used remains within the limits of sustainability and is used optimally, in line with the principle of chain of custody and the circular economy approach. This will ensure as far as possible the substitution of circular or non-cyclical materials and products that are fossil-based, long-lived and of greatest value for carbon storage, the circular economy and the bio-economy. It is vital, in building a sustainable and climate-neutral economy, to optimize the use of wood in accordance with the principle of chain of custody, in particular by creating market incentives. This means that wood should be used as much as possible for materials and long-life products to replace carbon-intensive and fossil-based materials and products, for example in buildings and furniture; it is obvious, however, that not every type of wood is suitable for such use. Process innovations in this area can also provide bio-based materials and products with a lower environmental footprint than fossil-based materials and products in the context of the bio-economy.

Short-life wood-based products can also play a role, as a substitute for their fossil-based counterparts. Wood used to produce short-life products as well as for energy production should be based on the type of wood that is unsuitable for long-life materials and products, as well as on secondary woody biomass, such as sawmill by-products, logging residues and recycled materials. Technological advances are already facilitating the processing of woody biomass residues and waste for cyclically innovative materials and products, resulting in the diversification of bio-based products, and providing climate-friendly solutions for new or emerging application areas (E.E. 2021). Respecting the principles of the circular economy is also crucial. Priority should be given to better use, reuse, and recycling of all wood-based products, as enhancing the circularity of products offers the possibility to keep all wood-based products in the economy for a longer period of time for multiple uses (E.U. 2021).

Challenges and potentials for related markets

There is a growing understanding that a rethink of the global economic system is necessary to address the root causes of unsustainable use of natural resources and achieve sustainable development. However, forests and the forest sector are important elements of a sustainable and climate-neutral circular bioeconomy. This is precisely why the role of forests and their products, in particular wood products, are included in all strategy documents for achieving a sustainable and climate-neutral economy, such as the European Green Deal, the Bioeconomy Strategy, the Action Plan for the Circular Economy, the European Forestry Strategy (E.E. 2018; 2019; 2020; 2021) and many others. While forest products can offer benefits compared to the use of non-renewable GHG-intensive materials, there are also potential risks associated with increased production and consumption of forest products. The production and extraction of the raw materials needed to manufacture products has economic, social and environmental impacts. Increased use of forest products raises concerns about increasing pressure on forests and the people who depend on them, which, in the case of unsustainable practices, could potentially lead to forest degradation and ultimately to a loss of biodiversity and a reduction in

carbon stocks and storage. Existing analyses of the life cycle of forest products show that the processing, manufacturing, use and disposal of wood products has climate-related and other environmental impacts.

As mentioned, given the increasing and sometimes competing demands on forests, we need to ensure that the amount of wood we use remains within the limits of sustainability and is used in an optimal way, in line with the principle of chain of custody and the circular economy approach (EU 2021). Respecting the principles of the circular economy is vital. Priority should be given to the best use, reuse and recycling of all wood-based products, as enhancing the circularity of products offers the possibility of keeping all products for a longer period of time in the economy for multiple uses (EU 2021). High ecological value timber should not be used and the wood-based bioeconomy should remain within the limits of sustainability and be compatible with the EU's climate and biodiversity targets for 2030 and 2050. As reported in recent studies (Grassi et al. 2021), in the short to medium term, i.e. up to 2050, the potential additional benefits from harvesting products and material substitution are unlikely to offset the reduction in net forest sink associated with increased logging.

The CRCF would not directly impact on voluntary markets – legally these markets could continue to certify activities according to their own rules, irresectable of the new requirements set by the CRCF. However, the CRCF could have a significant effect on voluntary carbon markets. For the first time, the EU – home of the world's largest carbon market – would set legally binding rules for the certification of carbon removals. Project developers as well as buyers of carbon credits are likely to prefer certification under the CRCF because of its greater legal and political weight and credibility.

The regulation does not regulate the end-use of certified credits, to avoid duplication with horizontal EU legislation on reporting and climate-related claims. Rather, the EU certification framework is intended to help public and private organizations to support their voluntary claims on carbon removal. With certification under today's proposal, carbon farming can provide a new source of income for farmers, foresters and land managers. Carbon removal activities have great potential to offer mutually beneficial solutions for sustainability.

There are various examples of the use of carbon removals for the distribution of subsidies. One example is the EU's Common Agricultural Policy (CAP), which provides subsidies to farmers for various agricultural practices, including those that have positive environmental impacts such as carbon removal through soil carbon sequestration. Another example is the EU's Innovation Fund. Carbon removal technologies, such as direct air capture and carbon mineralization, are eligible for funding under this fund. The UK government's Woodland Carbon Guarantee scheme or the US Department of Agriculture's Conservation Reserve Program are examples from outside the EU. The CRCF could facilitate the distribution of results-based subsidies for certified activities (in contrast to investment subsidies) which provide incentives for the effective implementation of removal activities. Carbon removal certificates can be used for outcome-based rewards from private or public sources. Several examples follow:

- Food companies can reward farmers for higher carbon removals resulting from greater carbon storage in soils or other climate-friendly practices such as agroforestry. While farmers will benefit from additional income, food companies can reliably document their carbon footprint. It will be easier for consumers and investors to compare food companies' climate claims thanks to harmonized certification rules.
- Public authorities or private investors who want to finance innovative carbon removal projects or procure carbon removal - e.g. through reverse public auctions or upfront market commitments - can use the certification rules to better compare bids and reward projects based on the amount of certified removal.

- Regional authorities can finance the creation or expansion of natural parks through the sale of carbon removal certificates, monetizing both climate and biodiversity benefits.
- Construction companies or property owners who invest in the long-term use of more sustainable building materials that remove and store carbon - such as wood-based ones - can earn additional income through the sale of carbon capture certificates. Labelling schemes for sustainable building materials could equally benefit from harmonized certification rules.
- Carbon reduction certificates can be used for results-based funding under EU programs such as the Common Agricultural Policy or the Innovation Fund, or state aid schemes by Member States.
- Certificates can also increase transparency in private markets, such as under the CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) mechanism for offsetting emissions from international aviation.
- Carbon offset certificates can also help public and private organizations to support credible carbon offset claims and meet high stakeholder expectations that carbon offsets should not be used for "greenwashing", in line with the Corporate Social Responsibility Directive and related sustainability reporting standards.

The challenge that is also posed by the proposed EU framework concerning certification schemes is that they should operate based on reliable and transparent rules and procedures and should ensure the accuracy, reliability, integrity and non-questionability of the information and data submitted by operators, as well as protection against fraud. They should also ensure the correct accounting of certified carbon removal units, by avoiding double counting. To this end, techniques - methodologies for certification, including appropriate standards of reliability, transparency, accounting, and independent verification to be applied by the certification schemes should be developed, while ensuring a cost-effective certification process by reducing unnecessary administrative burden for operators or groups of operators, for small and medium-sized enterprises, including small foresters.

Carbon and nature pricing efforts to address the global climate and biodiversity crisis may not be perfect solutions, but these mechanisms should be strengthened and improved, rather than discarded altogether. Nature and carbon markets could potentially bring new sources of finance, especially from the private sector, to address severely underfunded natural and climate crises. Complex regulatory frameworks, which are necessary to define markets, protect public safety, and achieve societal goals such as environmental justice, may generate costs that reduce or potentially even prevent investment in infrastructure supporting CO2 utilization markets and can slow down the diffusion of CO2 utilization technologies needed to support a net-zero future.

All governments should craft regulations that are efficient and clearly communicated to achieve public policy goals while providing a usable framework for participation in CO2 utilization markets without unnecessarily penalizing the deployment of CO2 utilization projects across the value chain. The CCRF manages to coordinate the permitting and authorization process for CO2 utilization projects, guiding developers through the process of dealing with the multiple states and localities to obtain the required permits.

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