REWARDING MECHANISM: CARBON MARKETS AND PAYMENTS FOR ECOSYSTEM SERVICES (PES)

Markets

Incentives driven by markets. For example, payments associated with selling claims or rights to ecosystem services (especially climate mitigation) to companies, governments, and individuals (often in the form of "credits"). The buyer may use the credits for their own purposes, e.g. to meet environmental targets, offset their own emissions, or contribute to environmental protection. A credit price is negotiated between the buyer and the seller (e.g. project developer, farmer).

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Voluntary Carbon Markets (VCM)

Tier 1	Monetary
Tier 2	**Markets**
Tier 3	**Voluntary Carbon Markets (VCM)**
Description	**Voluntary Carbon Markets (VCM)** are a trading system where companies, organizations, and individuals buy carbon credits. This is often motivated by a desire to "offset" their greenhouse gas (GHG) emissions. These credits are generated by projects that reduce or remove emissions, such as farmers implementing climate-smart farming practices. Generally, one carbon credit is equivalent to one tonne of carbon dioxide equivalent (1 t CO_2eq) that has been reduced or removed from the atmosphere. These credits are usually certified by private organizations or sometimes by governments (SDSN, 2023). Farmers who adopt climate-smart farming practices can generate credits and sell them to buyers, creating a new source of income. However, the certification process can be highly complex, and since participation in VCMs is voluntary, no mandatory monitoring, reporting, and verification (MRV) standards exist, but rather a multitude of heterogeneous quality standards, raising concerns about the credibility of some credits. The price of carbon credits can vary widely, creating financial uncertainty for both sellers and buyers. While VCMs have the potential to attract private funding for climate action in the agricultural sector, they also present risks and challenges depending on the design of the market structure and the quality of certification methodologies.
References	- Sustainable Development Solutions Network (SDSN). (2023). *Transforming our world: Interdisciplinary insights on the Sustainable Development Goals*. SDSN European Green Deal Senior Working Group. Retrieved from https://egd-report-2023.unsdsn.org/carbon-farming%20and-voluntary-carbon-markets-in-the-eu-an-updated-guide/ - Federal Ministry for Economic Affairs and Climate Action (BMWK). (2023). *Carbon markets*. Retrieved from https://www.carbon-mechanisms.de/en/introduction/carbon-market-basics - McDonald, H., Seeger, I., Lago, M., & Scholl, L. (2023). *Synthesis report on sustainable financing of the establishment of ponds and pondscapes* (Deliverable 1.4). PONDERFUL Project, EU Horizon 2020 (Grant Agreement No. 869296).

Advantages	Disadvantages
Farmers can earn money by selling carbon credits, offering a financial incentive for sustainable practices (COWI et al., 2021).	Carbon credit prices are often volatile, making farmers' income unpredictable and creating financial risks, as credits are not received immediately (McDonald, H., et al., 2021).
Participation is optional and less bureaucratic than compliance markets, allowing more tailored approaches for different farm types and regions (McDonald, H., et al., 2024).	Ensuring that carbon reductions are measurable and credible can be costly and complex, particularly for smallholders (SDSN, 2023).
	Many farmers may find the process of joining and complying with market standards difficult without external support or intermediaries (Barbato, C. T., et al., 2023).
	The VCM for climate-smart farming practices remains low.

Example Voluntary Carbon Markets (VCM): Label bas-carbone

Tier 1	Monetary	Supportive	Regulatory
Tier 2	**Markets**		
Tier 3	**Voluntary Carbon Markets (VCM)**		
Example	Label bas-carbone		
Summary	**The Label Bas-Carbone (Low-carbon standard)** is a voluntary climate certification framework for emissions reductions and carbon removals in France, managed by the French Government[1]. The framework provides rules and guidance by establishing a framework for monitoring, reporting and verification of greenhouse gas emission reductions or carbon removals of projects implemented in France. The French Ministry of Ecological Transition is responsible for approving methodologies, validating project applications, and officially awarding the label. Once a project is approved, external audits are conducted to ensure it meets the label's standards. To date, 15 methodologies have been approved by the Ministry across various sectors, including forestry, construction, transport, urban and marine environments, and agriculture. The agricultural sector alone accounts for six of these approved methodologies.		
Type of climate action	**Carbon removal**	**Emission reduction**	Climate adaptation
Appropriate for: Who can benefit from this type of rewarding mechanism (in the agricultural sector?)	- Farmers - Land users - Landowners - Farm advisors		
Source of rewarding mechanism: Who provides the rewarding mechanism?	Public	**Private**	Public-Private
Rewarding method: What is the reward based on?	Result based		

1 https://label-bas-carbone.ecologie.gouv.fr/quest-ce-que-le-label-bas-carbone

Type of on-farm action:
What is the recipient obliged to deliver in return?
	- Adoption of low carbon practices that lead to carbon removal or GHG emission reductions.
	- The practices implemented must be included in one of the 6 Label bas Carbone farming methods and can be for example (non-exhaustive):
	  - Reducing the use of mineral fertilisers for field crops
	  - Use of cover crops for field crops
	  - Optimising herd management in livestock farming
	  - Reducing the use of imported soya in livestock farming
	  - Planting hedges
	- Carbon audits are conducted both before the project begins and at its completion to measure progress in carbon sequestration and emission reduction.
	- The project design must be submitted and validated by the environmental ministry and progress is assessed by independent auditors.

Recipient requirements: What requirements must the recipient meet to receive finance?	- The plan is submitted to the environmental authority, which validates the credibility of the approach. The farmer must then implement the actions, and independent audits check that the targets are being met. The financial contract between the farmer and the funder is not regulated and can take a variety of forms.
Timing of rewarding: When is the reward received?	Ex-ante and ex-post
Rewarding timeline: How often is the reward received?	Multi-year payment, differs according to the methodology used 5 years (renewable) For agricultural methods, the project duration is five years. Depending on the contract established between the farmer, the funders, and the intermediaries, farmers may receive funding either annually or in a single payment at the end of the five-year period.
Governance: Who manages the programme, provides the reward, and where does the money come from?	- The programme is managed by the French Ministry of Ecological Transition. With the help of an independent expert group, it validates the methodologies developed by the stakeholders, assesses whether the projects comply with the methodologies and controls the work of the third-party auditors. Entities (mostly private companies, but also some public bodies) willing to offset or contribute to climate change mitigation finance the projects. - The label is part of the National Low-Carbon Strategy
References:	- Institute for Climate Economics (I4CE). (2019). *Domestic carbon standards in Europe: Overview and perspectives.* Retrieved from https://www.i4ce.org/wp-content/uploads/0218-i4ce3153-DomecticCarbonStandards.pdf - Ministère de la Transition écologique et de la Cohésion des territoires. (2024). *Qu'est-ce que le Label bas-carbone ?* Retrieved from https://label-bas-carbone.ecologie.gouv.fr/quest-ce-que-le-label-bas-carbone

Example Voluntary Carbon Markets (VCM): MoorFutures

Tier 1	Monetary	Supportive	Regulatory
Tier 2	**Markets**		
Tier 3	**Voluntary Carbon Markets (VCM)**		
Example	MoorFutures		
Summary	Moorfuture is a voluntary carbon scheme aimed at financing the restoration and rewetting of drained peatlands to reduce CO_2 emissions and enhance the carbon sequestration potential of these ecosystems. The scheme follows a regional approach, currently operating in three German federal states (Länder), and forms part of their broader GHG reduction strategies. The price of carbon credits under MoorFutures is calculated based on the cost of implementation, divided by the total projected emission reductions over the crediting period (expressed in EUR per tonne of CO_2 equivalent). The revenue from certificate sales supports all stages of the project, including planning, scientific monitoring, and compensation for landowners. Both individuals and businesses can purchase project-specific certificates, allowing for transparent and targeted climate contributions. While the methodology is adapted from the Verra standard, it has been tailored to reflect regional conditions, thereby enhancing the delivery of local environmental and social co-benefits.		
Type of climate action	**Carbon removal**	**Emission reduction**	**Climate adaptation**
Appropriate for: Who can benefit from this type of rewarding mechanism (in the agricultural sector?)	- Farmers - Land users - Landowners - Farm advisors		
Source of rewarding mechanism: Who provides the rewarding mechanism?	Public	Private	**Public-Private**
Rewarding method: What is the reward based on?	Result-based		

Type of on-farm action: What is the recipient obliged to deliver in return?	Peatland restoration and rewetting to reduce CO2 emissions
Recipient requirements: What requirements must the recipient meet to receive finance?	- Project location: Mecklenburg-Western Pomerania, Brandenburg, and Schleswig-Holstein - MRV done by regional scientific institutions
Timing of rewarding: When is the reward received?	Ex-ante Duration of the project 30 – 50 years
Rewarding timeline: How often is the reward received?	One off
Governance: Who manages the programme, provides the reward, and where does the money come from?	- The Ministry for Climate Protection, Agriculture, Rural Areas, and the Environment of Mecklenburg-Vorpommern serves as an intermediary body[2], ensuring that MoorFutures projects are maintained for a minimum of 30 to 50 years. - This program is funded through a voluntary carbon credit scheme, allowing government bodies, companies, and private citizens to purchase carbon offset credits that support peatland restoration.
References:	- Institute for Climate Economics (I4CE). (2019). *Domestic carbon standards in Europe: Overview and perspectives*. Retrieved from https://www.i4ce.org/wp-content/uploads/0218-i4ce3153-DomecticCarbonStandards.pdf - MoorFutures. (2017). *Der MoorFutures-Standard*. Retrieved from https://www.moorfutures.de/konzept/moorfutures-standard/

2 https://foresteurope.org/wp-content/uploads/2017/08/PFES-Template_rePE-Moorfutures.pdf

2. Payments for ecosystems services (PES)

Tier 1	Monetary
Tier 2	**Markets**
Tier 3	**Payment for Ecosystem Services (PES)**
Description	**PES** are financial mechanisms based on the voluntary transaction between ecosystem services providers and beneficiaries who pay for those services (IPBES, 2019). In the Carbon farming context, farmers deliver ecosystem services - such as water filtration, biodiversity conservation, soil health improvement, cultural and spiritual values among others – by adopting sustainable farming practices. Through agreement with governments or private entities, farmers receive payments as an incentive to maintain or increase the ecosystem service supply.
References	- Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). (2019). Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. https://doi.org/10.5281/zenodo.3831673 - McDonald, H., Seeger, I., Lago, M., & Scholl, L. (2023) Synthesis report on sustainable financing of the establishment of ponds and pondscapes. PONDERFUL Project (EU Horizon 2020 GA no. ID869296), Deliverable 1.4.

Advantages	**Disadvantages**
Farmers receive compensation for providing measurable environmental benefits (e.g., carbon sequestration, water purification, biodiversity) (McDonald, H., et al., 2024).	Quantifying ecosystem services can be complex and costly, especially in diverse landscapes (Barbato, C. T., et al., 2023).
Payments are usually based on individual contracts, offering more certainty and flexibility than volatile markets (IPBES, 2019).	Farmers may face paperwork, compliance audits, and reporting requirements that are difficult to manage without support (IPBES, 2019).
	Smaller or marginalized farmers may be excluded if programs favour large landowners or require upfront investments.

Example Payments for ecosystems services (PES): HUMUS +, Ecoregion Kaindorf (Austria)

Tier 1	Monetary	Supportive	Regulatory
Tier 2	**Carbon Markets and PES**		
Tier 3	**Payments for ecosystems services**		
Example	HUMUS +, Ecoregion Kaindorf (Austria)		
Summary	The HUMUS+ program, part of the Ökoregion Kaindorf in Austria, aims to improve soil health conditions and tackle climate change by increasing soil organic carbon (SOC) in the form of humus. Participating farmers agree to adopting recommended practices which increase soil humus content, thereby improving soil fertility, enhancing water retention, and reducing soil erosion. Farmers receive a "success fee" based on the tons of CO2 they demonstrate to sequester, which is verified through soil testing. These payments are funded by companies that voluntarily purchase CO_2 certificates to offset their unavoidable emissions.		
Type of climate action	**Carbon removal**	**Emission reduction**	**Climate adaptation**
Appropriate for: Who can benefit from this type of rewarding mechanism (in the agricultural sector?)	- Farmers - Land users - Landowners - Farm advisors		
Source of rewarding mechanism: Who provides the rewarding mechanism?	Public	**Private**	**Public-Private**
Rewarding method: What is the reward based on?	Result-based		
Type of on-farm action: What is the recipient obliged to deliver in return?	Farming practices promoting carbon in agricultural soil: - Maximize diversity: Crop rotation, catch crops, undersowing, mixed sowing, winter greening, agroforestry, hedges - Maximize photosynthesis: Intercropping, undersowing, mixed sowing, winter greening, agroforestry, hedges, healthy plants, compost, plant charcoal. - Minimize soil disturbance: reduced tillage, direct sowing, mulch sowing, reduction of agrochemicals.		

Recipient requirements: What requirements must the recipient meet to receive finance?	- Register at the HUMUS+ website - Agreement to participate in the program, with a commitment of 12 years - Initial soil sampling paid by the farmer - Follow up soil sample (after 5 – 7 year) cover by the program to confirm the humus build-up - If the humus build-up is successful (from an increase of 0,3%), the farmer receives a success fee per tonne of stored CO2.
Timing of rewarding: When is the reward received?	Ex-post. To complete the entire process and obtain humus certificates, the project has to last at least 7 years.
Rewarding timeline: How often is the reward received?	On-going - Farmer receives initial payment after 5 to 7 years after demonstrating SOC increase - After 5 years, a second payment is made when the farmer demonstrates that the humus level has been maintained.
Governance: Who manages the programme, provides the reward, and where does the money come from?	- Managed by the Association nonprofit "Verein Ökoregion Kaindorf"in collaboration with the Institute for Soil Research at the University of Natural Resources and Life Sciences (BOKU) in Vienna - Austrian Ministry of Agriculture, Regions and Tourism
References:	- Association HUMUS+. (2024). *HUMUS+ Model Ökoregion Kaindorf.* Retrieved from https://www.humusplus.at/ - CONSOLE Project. (2022). *The Humus-Program of the Ökoregion Kaindorf.* Retrieved from https://console-project.eu/Nuevos_deliverables/AT4_fin_2022.pdf - COWI, Ecologic Institute, & Institute for European Environmental Policy (IEEP). (2021). *Operationalising an EU carbon farming initiative: Annexes – Case studies.* Retrieved from https://www.ecologic.eu/sites/default/files/publication/2021/Carbon-Farming_CaseStudies.pdf - Institute for Climate Economics (I4CE). (2019). *Domestic carbon standards in Europe: Overview and perspectives.* Retrieved from https://www.i4ce.org/wp-content/uploads/0218-i4ce3153-DomecticCarbonStandards.pdf - Result Based Payments Network. (2019). *Humus-Program of the Ökoregion Kaindorf.* Retrieved from https://www.rbpnetwork.eu/country-infos/austria/humus-program-of-the-oekoregion-kaindorf-50/