



MERLIN
OFF-THE-SHELF INSTRUMENT

Carbon sequestration credits

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Executive summary

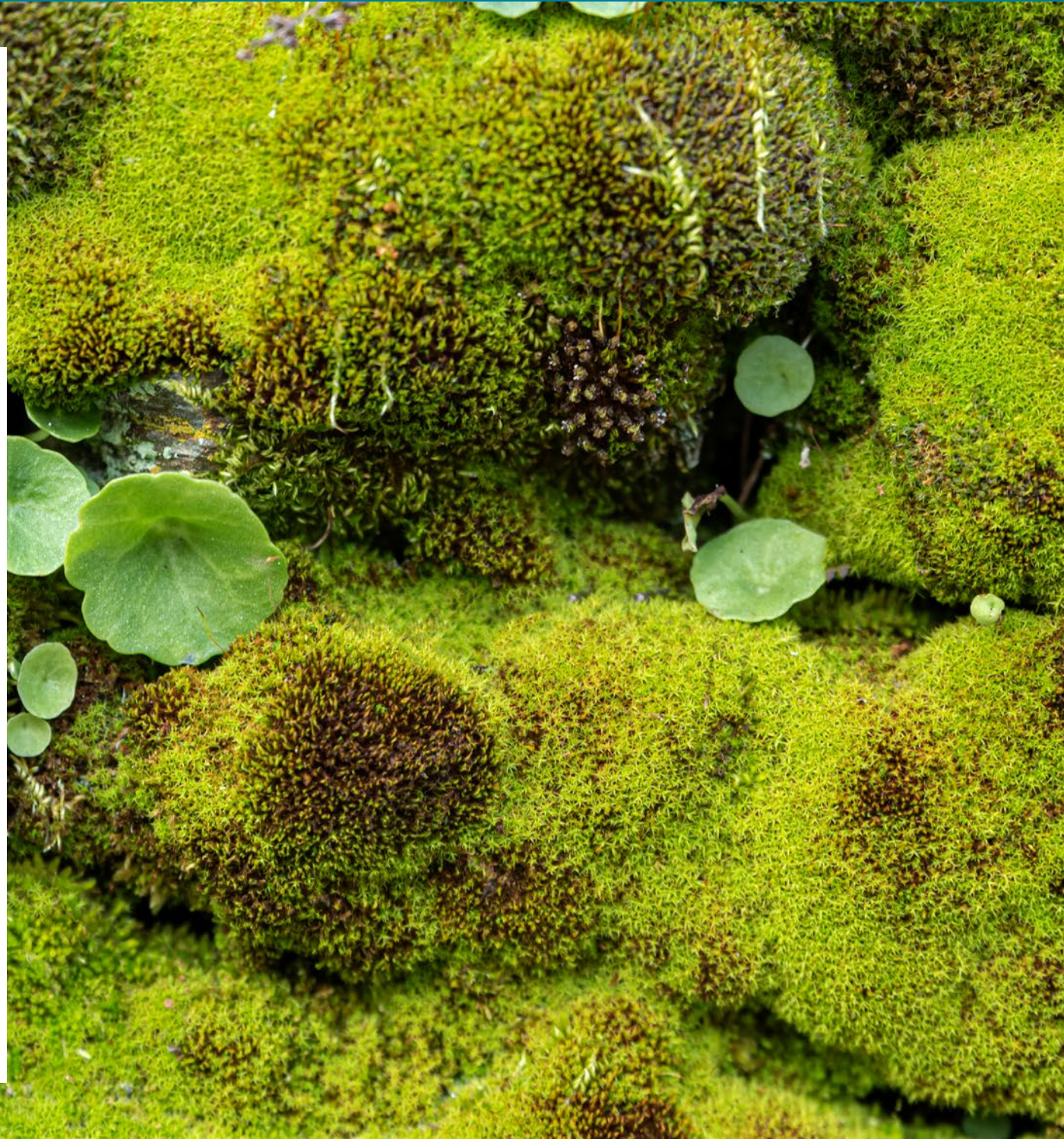
As the world continues its struggle to combat climate change, carbon credits have become one of the most prominent tools to help reduce greenhouse gas emissions and compensate for those that have already been emitted.

This report delves into the **context of carbon sequestration credits** with a focus on how freshwater ecosystem rehabilitation and restoration projects can effectively leverage them for their benefit. Moreover, valuable insight is offered into the **potential costs related to setting up the working project and the timeline needed** for its successful completion. The principal **advantages and disadvantages** of carbon sequestration credits are also emphasised, allowing for a proper view of this financial instrument before its selection for use.

This document also provides more practical guidance on implementing carbon credits. It presents examples of **successful case studies in Europe** that have established freshwater-focused nature restoration projects and obtained carbon sequestration credits, ready to be sold on the voluntary carbon marketplaces. The paper also shares a **list of prominent consulting agencies** that can help address difficulties during project implementation, along with the most notable **examples of voluntary carbon marketplaces** for selling carbon credits which are suitable for freshwater-focused projects.

The purpose of this report, part of the MERLIN Off-the-shelf Instruments (MERLIN OTSI), is to highlight an existing financial instrument – carbon sequestration credits – that, if well implemented, can have a positive impact on our planet and further the development and expansion of freshwater restoration projects. Carbon credits revenues can represent an alternative to grants for nature restoration projects. Some criticise this type of instrument for multiple reasons, some of which we will cover in this report. Our goal is to highlight the pros and cons as we present to you this instrument.

**Good luck with your
nature restoration efforts!**





Introduction

The continued increase in industrialisation worldwide has created numerous positive impacts on humanity, including more sophisticated goods, better quality at cheaper prices, and much more. Nevertheless, it has also been causing a constant and significant impact on our environment. Factories in particular are responsible for deforestation, the extinction of multiple species of flora and fauna, and, most notably, a significant decrease in air quality, while also contributing to global warming.

The world's communities have long realised the importance of tackling the constantly increasing GHG (extensive greenhouse gas) emissions from factories and have been preparing a plan of action. The first significant breakthrough, which was related to most industrialised countries and economies in transition, took place on 11 December 1997 in Kyoto, Japan, when an international protocol dedicated to limiting and reducing greenhouse gases was adopted. The document was legally binding only in case of ratification, and it was only asking related countries to adopt policies and measures on mitigation and to report periodically on results.

The **Kyoto Protocol** also assigned targets for reducing emission levels to the industrialised countries and economies in transition, 37 in total. To ensure the vast majority of countries could achieve the targets, a special flexible mechanism was introduced – the trade of emission permits. Referring to Article 17 of the Kyoto Protocol¹, countries that have decreased their amount of emitted greenhouse gases below the pre-assigned target can trade the “not used” units to countries that are over their targets. Considering that carbon dioxide (CO₂) is primary among the other greenhouse gases, the term “trading in carbon” was introduced, thus starting the establishment of the “carbon market”.



¹ United Nations Framework Convention on Climate Change (UNFCCC). (1998). Kyoto Protocol to the United Nations Framework Convention on Climate Change. <https://unfccc.int/resource/docs/convkp/kpeng.pdf>

Despite the clear purpose of the introduced initiative, its overcomplexity prevented the Kyoto Protocol from achieving the desired level of emissions decrease. The next significant step took place in Paris during the United Nations Climate Change Conference (COP21) in 2015, when the **Paris Agreement** was adopted by 195 countries.² The document shows how countries can cooperate voluntarily to reach climate targets by transferring the so-called “carbon credit” instrument to the reduction of greenhouse gas emissions.

According to the Carbon Offset Guide, a carbon credit is a tradable instrument (usually a virtual certificate) that conveys a claim of avoided GHG emissions or enhanced removal of GHG emissions from the atmosphere. Thus, 1 carbon credit equals 1 ton of carbon dioxide (CO₂) that has been either sequestered (i.e., removed from the atmosphere and stored to prevent re-emission), avoided, or reduced.

In Article 6.4 of the Paris Agreement³, a new UN high-integrity crediting mechanism was created – the Paris Agreement Crediting Mechanism (PACM) – with the goals of:

- Promoting the mitigation of greenhouse gas emissions while fostering sustainable development
- Incentivising and facilitating participation in the mitigation of greenhouse gas emissions by public and private entities authorised by a participant country
- Contributing to mitigation activities resulting in emission reductions in the participant country, which can also be used by another participating country to fulfil its own nationally determined contribution to reductions, and
- Delivering an overall mitigation of global emissions

The PACM’s benefits were clear, but the mechanism encountered a long and politically complex process in its development and implementation. Over several COP conferences, contentious issues have emerged, including the risk of double counting and the continued use of old carbon credits originally issued under the Clean Development Mechanism of the Kyoto Protocol. These debates were only settled at COP26 in Glasgow, Scotland, in 2021, with the adoption of the **Glasgow Climate Pact**.⁴ This document, as a continuation of Article 6 of the Paris Agreement⁵, has ensured that carbon credits are not double-counted towards national emission targets. It was also agreed that 5% of revenues from selling carbon credits would proceed to the UN Adaptation Fund to support vulnerable countries in adapting to the effects of climate change. Finally, it established criteria and methodologies for how old CDM projects (registered before 2013) are allowed to have their credits used under Article 6.4.⁶

Another important milestone was achieved in November 2024, when the **European Council approved a new regulation that establishes the first EU-wide certification framework for carbon removals, carbon farming, and carbon storage in products**. This voluntary framework aims to support the EU's goal of achieving net-zero emissions by 2050 by promoting technological and nature-based carbon removal and soil emission reduction efforts.⁷ By setting EU quality criteria and outlining robust monitoring and reporting processes for carbon removal activities, the regulation seeks to facilitate investment in nature restoration projects and address concerns about greenwashing of the initiatives.

However, the EU's approach has faced criticism because some argue that the Carbon Removals and Carbon Farming (CRCF) Regulation represents a shift in EU climate policy towards carbon credits instead of systemic change and emission cuts. Concerns have been raised that overreliance on carbon credits could delay decarbonization efforts and lead to human rights violations (e.g., forceful evictions of the Ogiek indigenous community in Kenya).⁸ While the new certification framework is a significant step forward, it is essential to ensure that carbon sequestration initiatives are implemented with rigorous evaluation and transparency to avoid unintended negative consequences.

Thus, following years of discussions, disagreements, and concerns, the European and the global communities have finally established a mechanism to move forward, potentially generating trillions of dollars to invest in projects aimed at reducing emissions, including reforestation and the development of renewable energy sources. And several nature (including freshwater ecosystems) restoration projects are already benefiting from this carbon credits instrument.



² United Nations Framework Convention on Climate Change (UNFCCC). (n.d.). Paris Agreement. Retrieved from <https://unfccc.int/process-and-meetings/the-paris-agreement>

³ United Nations Framework Convention on Climate Change (UNFCCC). (n.d.). Article 6.4 mechanism. Retrieved from <https://unfccc.int/process-and-meetings/the-paris-agreement/article-64-mechanism>

⁴ Earth.Org. (n.d.). What is the Glasgow Climate Pact? <https://earth.org/what-is-the-glasgow-climate-pact/>

⁵ United Nations Framework Convention on Climate Change (UNFCCC). (n.d.). Article 6 of the Paris Agreement. Retrieved from <https://unfccc.int/process-and-meetings/the-paris-agreement/article6>

⁶ United Nations Framework Convention on Climate Change (UNFCCC). (n.d.). COP26 outcomes: Market mechanisms and non-market approaches (Article 6). Retrieved from <https://unfccc.int/process-and-meetings/the-paris-agreement/the-glasgow-climate-pact/cop26-outcomes-market-mechanisms-and-non-market-approaches-article-6#What-loose-ends-still-need-to-be-tied-up-in-terms->

⁷ European Council. Council greenlights EU certification framework for permanent carbon removals, carbon farming and carbon storage in products. 19 November 2024.

<https://www.consilium.europa.eu/en/press/press-releases/2024/11/19/council-greenlights-eu-certification-framework-for-permanent-carbon-removals-carbon-farming-and-carbon-storage-in-products/>

⁸ Semafor. Kenyan communities are battling disruptive carbon credit schemes. https://www.semafor.com/article/11/30/2023/kenyan-communities-battle-carbon-credit-schemes?utm_campaign=semaforreddit

Aim of the instrument

The direct purpose of carbon credits lies in removing greenhouse gas emissions from the atmosphere by implementing environmental projects. The MERLIN project is freshwater-focused. Restoration of freshwater ecosystems can generate climate benefits by enhancing carbon sequestration in above-ground biomass (e.g., planting trees in riparian buffers) and soils (e.g., raising the water table level in peatlands to reduce organic matter oxidation). These benefits can be quantified and translated into carbon credits, which provide a tradable claim for the avoided or removed greenhouse gas emissions. To ensure credibility and market value, such credits are typically verified and issued through official certification schemes.

Carbon credit sales occur on dedicated platforms, known as voluntary carbon marketplaces (VCMs), which support ecosystem improvement by helping connect project developers (e.g. nature restoration managers) who issue credits with potential buyers.

For these buyers, who are usually private individuals or large companies, such credits are a valuable component of zero-emission policies. **In recent years, more and more firms have set their sights on reaching the net-zero goal, aiming to balance the amount of emitted greenhouse gases (GHG) and the amount of emissions removed from the atmosphere.** In a market full of competitors, reputation is a key asset, so it is essential to follow through on promised goals; otherwise, the company can damage its reputation. By acquiring carbon sequestration credits, companies finance environmental changes that support sustainable development, and play a significant role in meeting predefined expectations for reducing carbon dioxide emissions.

Potential beneficiaries and target groups

In the process of developing a program that generates carbon credits, two groups of stakeholders can be identified. The first group, which represents the **supply side** and is thus affected/involved during the creation of credits, may include the following:

- Investors (companies, financial institutions; fund the creation of the project)
- Project developers (governments, NGO's; support in the creation and operational activity of the initiative)
- 3rd party auditors (Gold Standard, Carbon Check; verify project outcomes)

The second group of stakeholders, who represent the **demand side** for carbon credits, can be divided into three subgroups:

- Intermediaries (carbon brokers and retailers; help companies acquire carbon credits without wasting too much time engaging directly with carbon offset producers)
- Corporate buyers (i.e., Nestle; large corporations aiming for net-zero targets)
- Public sector institutions (organisations willing to compensate for the emissions they have created)

All of the stakeholders listed above are beneficiaries of the program.

The benefits for both carbon credit creators and buyers include the following:

Supply side of carbon credits	Demand side for carbon credits
→ Financial benefits from selling credits	→ Financial benefits through fees for intermediaries and brokers
→ Contribution to the environment of a particular country	→ An opportunity to receive a highly valuable seal of excellence in carbon neutrality (i.e., Climate Neutral Certification)
→ Worldwide recognition and reputation increase (essential for future carbon credit-focused initiatives)	→ Reputational benefits linked to implementing announced emission reduction strategies





How does it work

As mentioned earlier, carbon credits may be obtained through a dedicated nature restoration project and purchased by entities willing to compensate for their emissions. **Every single carbon credit equals 1 tonne of CO₂ emissions sequestered or avoided.** In this report we focus on carbon credits obtained from freshwater-focused projects through carbon dioxide sequestration and sold on voluntary carbon markets (VCM).

For a company willing to buy carbon credits, the entire process begins with the decision to offset a portion of their emissions. **Nowadays, carbon credits may be purchased on the voluntary market directly from project developers.** It is also worth noting that if the company represents a highly emitting sector – like aviation, oil and gas production, metal industry, and others – they

are required to proceed with the compliance markets to compensate or reduce their emissions via carbon credits. The company then selects the project most suitable for itself, taking into account available information (type of technology used, project location, nature restoration specifications, etc.) and the price of credits. With multiple types of carbon sequestration, the price of credits on the voluntary market will differ – the most expensive are called **»blue carbon credits«**, which are connected to freshwater-focused projects and are costly due to the specific location and the need for advanced preparation and project implementation. This high price represents an opportunity for freshwater ecosystems-related projects.

The final price of carbon credits is also impacted by the cost of project verification, followed by the issuance of the carbon credits. Due to the risk that greenhouse gas emissions might leak back into the atmosphere, the project is **required to conduct periodic verification** (approximately every five years) to ensure all standards are followed and the project is effective in sequestering greenhouse gas emissions. The verification process is conducted by external audit companies, such as SGS Global Service, DNV, and Control Union, according to specific standards, including the Gold Standard, Verra, the UK Peatland Code, and Plan Vivo.

The credits purchased by a company are then transferred to it with dedicated certificates, and can be used by the company to claim reduced net emissions.

Pros and cons of the carbon sequestration credits



With legislation related to carbon credits becoming more transparent and convenient for buyers, while also protecting producers and countries, the number of projects concerning carbon dioxide capture and sequestration activities has been on the rise. Nevertheless, the process of obtaining carbon credits does not consist only of benefits. It also has certain disadvantages that should be taken into consideration, in particular by freshwater-focused project developers prior to allocating their time and resources:



Advantage of starting a carbon credit project (PROs)

- An important instrument in fighting climate change and stopping global warming.
- Carbon credits generated from freshwater-focused projects have higher prices than the credits from other initiatives (i.e., due to the costly development of freshwater-focused projects).
- With a growing market and increasing number of brokers/agencies, it is easier to find lower fees and suitable help with fees for support with project activities.
- Significantly raises attention to the project itself, allowing for other sources of direct or indirect support to the project (e.g., donation, support from local institutions, etc.).

Disadvantages of starting a carbon credit project (CONs)

- May require a long preparation and actual development time (2–5 years) and high cost in passing all necessary procedures (validation, verification, monitoring) to obtain the final carbon credits, depending on project type and bureaucracy in a country.
- Can increase tensions for project developers if mistakes are made in the project development process, i.e., with leakages of GHG emissions, especially when the credits are already issued.
- Constantly fluctuating prices on voluntary carbon markets may cause a certain degree of uncertainty for project developers.
- While chasing the goal of securing the maximum number of possible carbon credits, project developers often neglect focusing on the goal of overall environmental improvement (i.e., planting a single type of fast-growing plant in a wetland, causing a loss in biodiversity).

It is also worth mentioning that some **additional disadvantages of carbon sequestration** credits arise from the conditions of the carbon market; these include:

- A preference for standardisation and simplicity over diversity and long-term benefits related to projects. This favors large linear projects and creates problems for small initiatives.
- Complicated financial structures, including revenue payment to project developers. Issues arise from the need for initial investments, while the revenue payment period can sometimes stretch over 5 years.
- Access to technological support. Certain market procedures, such as monitoring, can be costly for small projects, disincentivising them from further development.

These issues need to be addressed to increase the likelihood of a greater number of project developers choosing carbon sequestration credits as a solid and trustworthy financial tool.



Expected time to implement

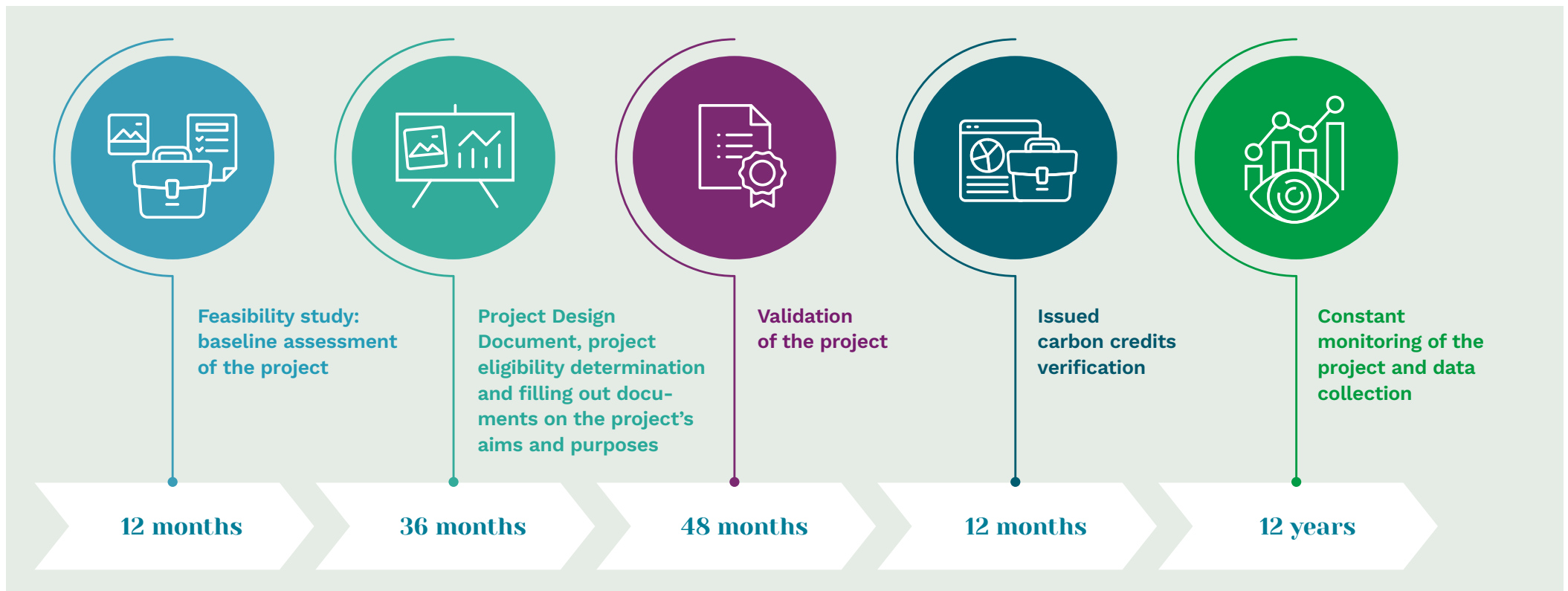
A freshwater-focused carbon credits project consists of multiple stages which all need to be followed, and so the average timeline is not short. **On average, the time from starting the feasibility study and assessment to verification of a carbon credit is 3,5 years.** However, it is also worth accounting for a project’s complexity, size, and country of implementation, as these factors can extend the time required to complete official procedures by several months. Below you will find the **average expected time for each of the required phases.**

The “durability” of a project, that is to say the expected duration of carbon storage, varies greatly. Some projects are short, capturing and storing carbon for 10–100 years. Others are medium and capture carbon for 100–1000 years. Still others are long and capture carbon for 1000+ years.¹ It is worth noting that projects do not issue credits every year for 100–1000 years; the project developers issue the credits once, sell them on the voluntary carbon market and take responsibility to ensure the GHG emissions, for which the credits were sold, are stored for the mentioned duration of the project (30, 100, or 1000 years).

Here are some examples of freshwater-focused carbon credit projects, and their expected durations, according to the online portal of the Markit Environmental Registry:²

- **Abergwesyn Hill** (ID: 104000000027000): **30 years**
- **Alladale 1, Bodach Mor** (ID: 104000000029843): **70 years**
- **Bile Buidhe Phase 1** (ID: 104000000029052): **45 years**
- **Craigengillan peatland restoration** (ID: 104000000028024): **55 years**

Figure: Average expected time for each of the required phases



¹ Sylvera (2025) How Long Do Carbon Credits Last: Understanding the Lifespan of Offsets.

Retrieved from <https://www.sylvera.com/blog/how-long-do-carbon-credits-last#:~:text=Carbon%20projects%20get%20durability%20ratings,building%20a%20carbon%20offset%20program>

² <https://mer.markit.com/>

Set-up and operational costs

The costs of developing a carbon credits project can be divided into two categories: set-up costs, which are the expenses required to start the project, and operational costs, which cover the expenses necessary to run and manage the project efficiently. For better visualisation, a freshwater-focused (i.e., peatland restoration) carbon credit project is outlined below.

Set-up costs

The set-up costs for such a project would depend on the complexity and the size of the project, but here is an approximation:

Cost category	Description	% of total costs (approx.)	Amount of money, € (approx.)
Feasibility costs	→ Costs for identifying the project type and selecting the partners and consultants, including their fees.	20%	€110,000
Implementation and administrative costs	→ The initial work of restoration, training of personnel and overhead	30%	€165,000
Negotiation costs	→ Marketing of carbon credits → Brokerage needed for the purchase of the credits → Obtaining permits and licenses	18%	€100,000
Regulatory costs (partly)	→ -Validation costs → Costs for carbon credits certification → Costs for project registration by a regulatory body	32%	€180,000
Total set-up costs		100%	€555,000

Please note that the above figures pertain to the total set-up costs of a project, not its revenues. The categories of expenses may vary depending on the country, type of project, involved service providers, and unforeseen complexities, among other factors. Many of the above costs may be renegotiated in order to be paid only once the project starts generating revenues.

Operational costs

Operational costs are related to the expenses that occur when the project has been running for some time. As was mentioned earlier, the complexity and size of the project affect its costs. These expenses include the following categories and can be calculated in the following way:

Cost category	Description	% of total costs (approx.)	Amount of money, € (approx.)
Implementation and administrative costs	→ Maintenance of the site, salaries of the personnel, and overhead costs	20%	€90,000
Monitoring costs	→ Preparation of a monitoring plan → Measurements for the listing documents and monitoring reports	35%	€155,000
Regulatory costs (partly)	→ Periodical audits → Compliance reporting → Re-verification of project (conducted once every 5 years)	25%	€110,000
Insurance costs	→ Project risk insurance; → Costs of ensuring the emission reductions	20%	€90,000
Total operational costs		100%	€450,000

Operational costs are an essential part of the implementation of every project and can vary depending on the project's approach (i.e., the number of workers, price of consultancies), the territory, and the complexity of works on it (i.e., will cause the insurance costs to go up or down compared to the sample figure, as well as the regulatory expenses). A proper allocation of the budget, together with certain amounts preserved for overhead costs, is the key to the smooth implementation of prescribed works.



Prerequisites to implement

In addition to the official procedures established by institutions, markets, and authorities to ensure a fair and high-quality process for funding ecological projects and receiving carbon credits, other preconditions must be met. Their implementation will enable stable and competent work on the project.

These preconditions include:

- **Reliable team** – the team should include specialists with proper backgrounds who have previously implemented similar types of projects. Negative experiences are also valuable, as that can prevent team members from repeating mistakes and allow them to create mitigation initiatives in advance. Team members with an entrepreneurial mindset, as Connectology frequently advocates, are a plus for any carbon credits project.
- **Measurable future results** – a freshwater-focused carbon credit project should allow a standardised method of measuring and quantifying the amount of carbon dioxide being removed from the atmosphere.
- **Permanence assurance** – the carbon credit project must ensure that removed emissions are held for a required amount of time and are not returned to the atmosphere.
- **Documentation** – the project team must ensure it follows an approach and uses documentation that is applicable for a particular climatic zone, type of project, and features of bureaucratic policy in a country.
- **Verified and validated assurance** – carbon offset producers must select only reliable independent auditors with a proven reputation to validate and verify their offset project.

Consulting companies that can support the instrument set-up/management

Several specialised consulting firms across Europe provide expertise in the development, implementation, and management of carbon sequestration credit instruments. The list below highlights a selection of such firms, along with their contact information.

Name of the consulting firm	Address of the consulting firm	Telephone number and contact email	Address of the website
AECO	Germany	contact@aeco.earth	www.aeco.earth
Climate Focus	Netherlands	info@climatefocus.com	www.climatefocus.com
CO₂balance	1 Discovery House, Cook Way, Taunton, Somerset TA2 6BJ, UK	+44 (0) 1823 332233 enquiries@co2balance.com	www.co2balance.com
EcoAct Spain	C. de Pere IV, 291, 08020 Barcelona, Spain	+34 935 851122 contacta@eco-act.com	www.eco-act.com
FORLIANCE Gmbh	Eifelstrasse 20, 53119 Bonn, Germany	+ 49 (0) 228 969 119 0 info@forliance.com	www.forliance.com
Silvestrum	UK	info@silvestrum.com	www.silvestrum.com
South Pole	Technoparkstrasse 1, 8005 Zurich, CH Switzerland	+41 43 501 35 50 info@southpole.com	www.southpole.com

Please note that this list is not exhaustive; new service providers enter the market every month. You may have someone in your organisation who can support you in implementing your project without requiring external consulting firms. The above is not a list of service providers recommended by the MERLIN project, and should not be considered an endorsement of their services by the MERLIN project.



Players and platforms in the market

Improved legislation has created additional opportunities for project developers to add their carbon credits to certain voluntary markets, with one of the most prominent examples being the **ClimateTrade marketplace**.

The ClimateTrade platform is very easy to use and navigate. The project developer has complete freedom to add details about the project, thus preventing loss of information as the project moves through various mediators. The platform also requests the critical information needed for potential buyers: the project type, the technology used, the registration standard for the carbon credits, and the start and end date of the project. The project representative then must add details on the carbon credits: the volume, price, and when they were issued. To verify the existence of the project and carbon credits, the project representative needs to submit the necessary documentation, which includes the Project Design Document (PDD), proof of issuance and ownership of carbon credits, verification and validation reports, registry serial numbers, vintage, and any documentation, if available, related to other co-benefits.

Following the submission, the ClimateTrade platform team will review the details for their accuracy and authenticity. If approved, the project is listed on the marketplace and can be found by potential buyers according to the categories selected by the project developer.

When it comes to payments for credits, the project representative receives notifications when such transactions have occurred and needs to upload the registry cancellation/transfer certificates regarding the credits used in the transaction. ClimateTrade manages payments via a set of methods, including credit cards and PayPal, and transfers the funds to the project representative after the confirmation of payment occurs, withholding 10% of the amount as a fee for using the platform. This 10% fee is the only payment the project has to pay to the platform, and it is only charged in case of the sale of carbon credits.

Below is an example of how the blue carbon project page looks on the ClimateTrade platform:

Certification			
Registry Name	ICR (International Carbon Registry)	Registry Url	https://www.carbonregist...
Validator	Earthood Services Private Limited	Status	Registered
Type	Blue Carbon	First verifier	Earthood Services Private Limited
Credit start	Jan 10, 2023	Credit end	Dec 20, 2024
Validation documentation	Rreport.pdf PDD.pdf	Standards	ICR Standard

What is a carbon offsetting project

Carbon offsetting is the process of funding projects that reduce or remove greenhouse gas emissions to compensate for one's own emissions, in order to achieve a net zero carbon footprint.

Each ton of carbon absorbed from the atmosphere constitutes a carbon credit or carbon offset. To make sure these credits are legit, they have to be approved by independent groups like Verra or Gold Standard. These groups make sure the project is actually making a positive impact on the environment and wouldn't have happened without the project.

Pricing: €234.09 /tCO2e

Vintage: 2023

Amount: 1 tCO2e

Available stock: 2,468 tCO2e
Minimum purchases: 1 tCO2e

Transaction fee: €0.36
VAT: €0.00
Total: €234.38

[Buy now €234.39](#)

[Add to cart](#)

[Make an offer](#)

Sea Cave True Blue Carbon project details

Source: ClimateTrade platform¹

Many companies have recently started using carbon credits to decrease their emissions and improve their market reputation. Such companies include Barclays (a UK-based bank, one of the main buyers of carbon offsets), Ryanair (Europe's leading low-cost airline), Volkswagen (a German-based vehicle manufacturer conglomerate), and Unilever (leader of environmental sustainability).

Top voluntary carbon credit marketplaces working in Europe

Carbon Club	club.forestcarbon.co.uk
Climate Impact X	climateimpactx.com
ClimateTrade	market.climatetrade.com/results/en
IMPT	app.impt.io/projects
Klimate	www.klimate.co
Senken	www.senken.io
South Pole	shop.southpole.com
Vlinder	vlinderclimate.com



¹ Climate Trade (n.d.) Your all-in-one carbon offset marketplace. Retrieved from <https://market.climatetrade.com/results>

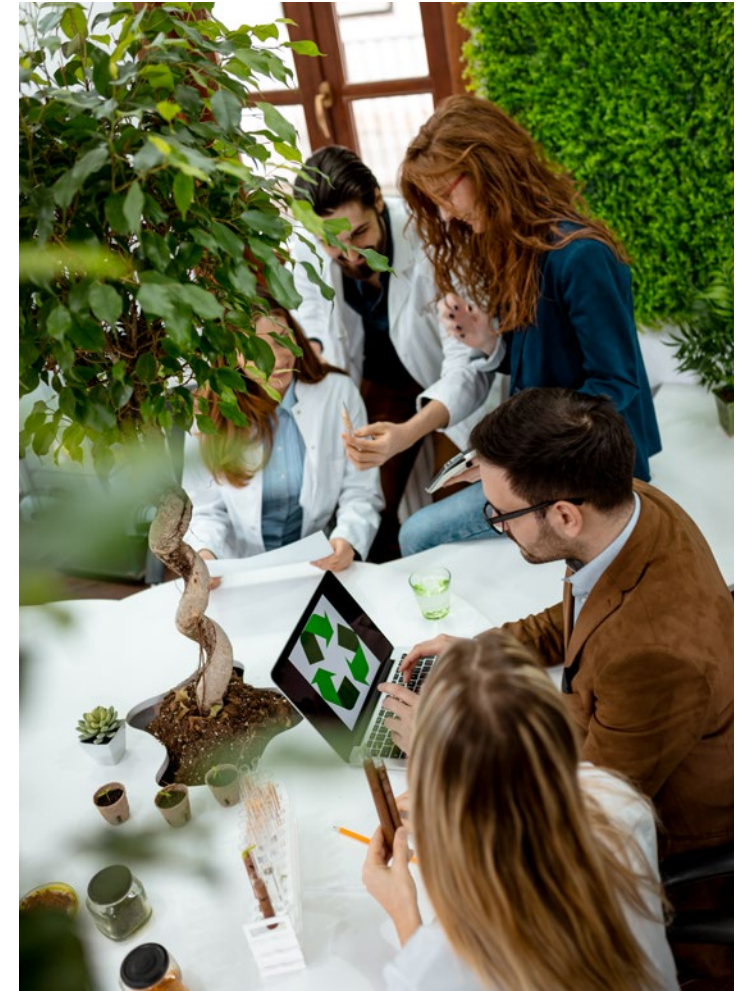
How to implement the instrument

The process of obtaining carbon credits is not easy – it consists of multiple details and requires diligent implementation, monitoring, verification, and validation. The step-by-step process, from setting up the project to listing credits to the voluntary carbon marketplace, is mentioned below:

- **Project design:** Choosing the project concept and a suitable methodology, and verifying all requirements.
- **Validation and registration:** The project is validated by an independent auditor and then officially registered.
- **Monitoring:** Over the course of a year, the project is closely monitored for improvement and appropriateness (as a result, a monitoring report is produced).
- **Verification:** A third-party auditor (different from the auditor that was conducting the validation phase) verifies the project based on the monitoring report and other supplemental documents.
- **Certification:** The issued carbon credits are certified according to the pre-established standards.
- **Carbon credit listing and selling:** After being certified, carbon credits can officially be listed on a voluntary market and sold to an interested buyer.
- **Carbon credits transfer:** The certificates for the sold credits need to be transferred to the buyer, who then retires them to claim the benefit for their organisation.

Each of these points requires thorough preparation and alignment with the standards. In particular, the monitoring scheme is especially robust, as it includes a **set of principles which must be followed throughout the whole lifecycle**. They are:

1. **Additionality** – ensure that the emission reductions or removals are additional to what would have happened without the project
2. **Permanence** – ensure that the carbon sequestration is long-term and won't be reversed later (i.e., due to wildfires, pesticides, resumed industrial activities on territories, etc.)
3. **Baseline establishment** – estimate the potential amount of emissions without the project to understand the scale of reduction
4. **Leakage** – ensure that the carbon emissions are not displaced to areas outside the scope of the project
5. **Double counting prevention** – ensure the carbon credits are counted only once towards the emission reduction targets



Best practice recommendations

The **best practices** for creating a well-developed freshwater-focused carbon credit project include:

- Ensure you have a **reliable and experienced team** (ideally with an entrepreneurial attitude) to manage the project.
- **Involve support organisations with experience** in the area, such as an NGO, to back your project and its implementation.
- **Prepare a step-by-step plan** from the initial to the final phase, highlighting the areas with the most significant risks and chances of deviation from the original target indicator. Ensure you have mitigation actions ready for such situations.
- **Fill out all necessary documents**, depending on the country in which the program is being developed (use the support of local consultancies if the legal aspect is not fully familiar to your team).
- **Create or use a pre-existing legal entity** in a country to receive the revenue from selling credits.
- Analyse the **climate of the country and apply preventive measures** (in case of a possibility of forest fires or illegal logging), such as getting insurance.
- **Make sure the carbon dioxide will not be leaking back into the atmosphere** and will remain sequestered (otherwise, the whole project is at risk of being deemed unsuccessful).
- **Hire different independent auditors** for the validation and verification phases.
- For the **certification phase, an experienced and reliable consulting firm** might offer good support.
- **Conduct a thorough marketing analysis** to sell carbon credits at the highest price, and look thoroughly for different possible markets.

If it is not possible to immediately find buyers for the credits, consider hiring **carbon credit brokers**.



Successful case studies

In this section, we will cover some successful cases of implementation of carbon sequestration credits, and projects/technologies that can enhance carbon sequestration credits:

Trees for Life, Dundreggan, Scotland

Carbon credits and environmentally-focused tourism enabled Trees for Life to receive a loan of £2,000,000 (€2,360,000) from Triodos Bank for its land regeneration ambitions.

Trees for Life is a small charity in the Highlands of Scotland, focusing on **rewilding (including tree planting) and community support and development**. Trees for Life acquired 4,000 hectares of land at Dundreggan in 2009. This site is situated near Loch Ness in Glen Moriston. In its early years, the charity struggled to cover the running costs of the tree nursery, the volunteering program, the centre, and land management. Native trees for planting cost between £0.35 (€0.41) and £0.80 (€0.94) per tree, depending on the species and sapling height. Rarer species were priced at around £1.50 (€1.77). Planting costs using hand mounding vary from location to location, but tend to be around £0.85 (€1) per tree.

After considering a range of services that could be sold, **the initial focus was identified as carbon credits generated through woodland planting**. Those carbon credits represent either the permanent removal of a tonne of carbon dioxide equivalent (CO_{2e}) from the atmosphere or the avoidance of one tonne of CO_{2e} being emitted in the first place.

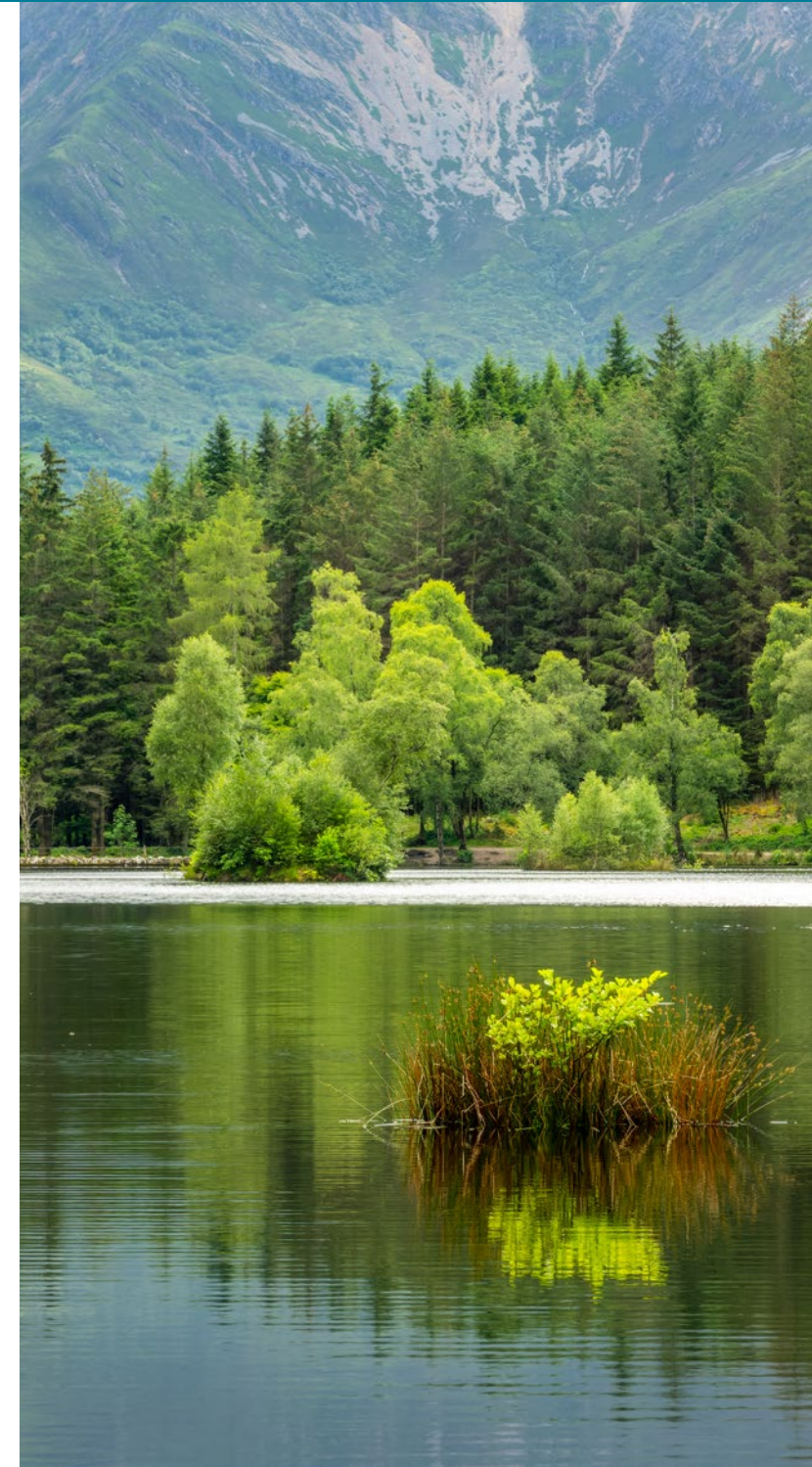
A high carbon price of £28 (€33), pending issuance, was obtained by Trees for Life in December 2021, **driven by the narrative of rewilding, biodiversity, and land restoration**. The charity transfers £10 (€11.80) per tonne from each sale to local community organisations to spend on projects related to the land and nature, as well as housing. The units are sold to organisations which are already taking action to reduce their carbon footprints to as close to zero as possible, but which want to offset unavoidable emissions as they work towards this goal.

The carbon units were accredited by the **UK Woodland Carbon Code**, developed by Scottish Forestry, which **independently calculated and verified the amount of carbon that woodland habitats could absorb over the specified period**.

Through the UK's first-ever community carbon share scheme, funding of £23,000 (€27,140) was granted and shared by two local groups in the Scottish Highlands in April 2022. As of 2024, Trees for Life continued to successfully finance its rewilding activities at Dundreggan through the sale of **Pending Issuance Units (PIUs)** accredited under the UK Woodland Carbon Code. These PIUs are sold to organisations with strong climate commitments and are particularly attractive due to the project's narrative of biodiversity restoration and community engagement. Notably, Trees for Life transfers £10 (€11.80) to £13 (€15.34) from each carbon unit sale to local community groups to fund nature-related initiatives, such as biodiversity signage and playgrounds. The charity is currently generating PIUs from Allt Ruadh woodland, with over 200,000 trees already planted and an estimated 132 hectares of land under restoration. The project has achieved unit sale prices significantly above the market average, reflecting its strong environmental and social impact.

You can find more information about Trees for Life here: <https://hive.greenfinanceinstitute.com/gfihive/revenues-for-nature/case-studies/trees-for-life>

Lochan summer landscape
near Glencoe in the
Highlands of Scotland, UK



MoorFutures, Germany

In Europe, one of the recently successfully implemented projects is the “MoorFutures”¹ project, which was introduced in 2010. **At the time, it was the first regional scheme in the world** – other similar projects were either national (under EU ETS) or voluntary, through international standards (i.e., Verra). **It was also initiated by public administration bodies, showing that public institutions can successfully design and manage projects aimed at nature restoration and also obtain carbon credits.** The credits were later sold at a local auction.

The project’s main idea is a gradual decrease in the amount of carbon dioxide emitted from dried peat soils.

The MoorFutures project is dependent on carbon credits (MoorFutures). The income from the sale of the credits is used to finance rewetting other peatlands. Currently, the project operates in two German states. All carbon credits (or MoorFutures) have been sold out, and “new projects are being designed to offer MoorFutures certificates this year.”

This project is a completely voluntary initiative; any person or entity may buy MoorFutures to help mitigate global warming, air pollution, and other side effects from CO₂ emissions into the atmosphere. One MoorFuture corresponds to the emission reduction of one tonne of CO₂ equivalent.

The project coordinator stated that the Moor Futures are **“clear, transparent and trustworthy... and can clearly be traced back to specific projects that can be experienced on-site”**.

The MoorFutures project, besides helping reduce greenhouse gas emissions, also focuses on preserving native flora and fauna. With the rewetting practice, unique animals and plants are preserved in their natural habitat.

To understand the potential of one MoorFutures project over a period of 50 years, we can observe the data from the Könningsmoor project, one of the decommissioned initiatives under the MoorFutures label. According to the official website of the Könningsmoor project, its key numbers are as follows:

Category	Numerical expression
Investment period	50 years
Square of the land	68 hectares
Investment volume	39,520 MoorFutures (39,520 tonnes of carbon dioxide equivalents)
Price per MoorFuture (plus VAT)	€53.78

Cùl Mòr Peatland Restoration project in Assynt-Coigach National Scenic Area in Scotland, the UK

Another example of a freshwater-focused project which has successfully implemented a carbon credit scheme is Cùl Mòr Peatland Restoration project in Assynt-Coigach National Scenic Area in Scotland, the UK, developed by Forest Carbon.²

The project focuses on re-vegetating bare peat, involving re-profiling hags (sites of erosion) and blocking ditches and drains to raise the water table. The project representatives state that “these plants sequester carbon during their lifecycle, and the waterlogged habitat preserves their carbon in layers of peat after they die”. The restoration will reduce greenhouse gas emissions from the site and also allow carbon credits to be issued for further funding of the project.

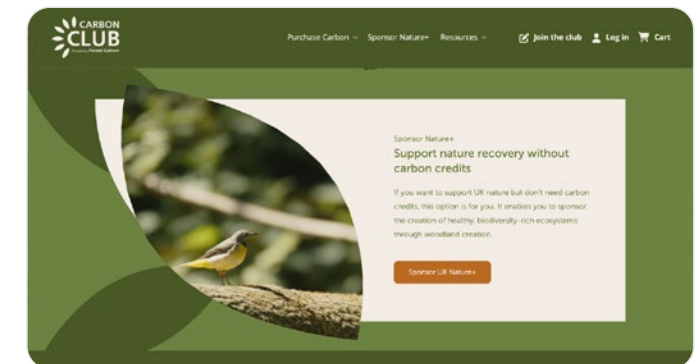
According to project stats, the overall area restored is 83.66 ha, while the total avoided tCO₂ (expected over the contract) is 13 370.

The carbon credits issued are validated under the IUCN UK Peatland Code and are priced at €31 per tCO₂.

To conclude, the Cùl Mòr Peatland Restoration project is another successful example of a project that has managed to combine natural area restoration with opening great funding opportunities for further operation expansion to other areas.



www.moorfutures.de, climate protection meets biodiversity



club.forestcarbon.co.uk, restoring UK nature since 2006

¹ Moor Futures (n.d.) MoorFutures. Klimaschutz trifft Biodiversität! Retrieved from <https://www.moorfutures.de/>

² Carbon Club (n.d.) UK Projects. Retrieved from <https://club.forestcarbon.co.uk/collections/uk-projects>

Suggested Key Performance Indicators (KPIs)

The indicator to take into consideration in case of freshwater ecosystems restoration is the **Total CO₂ sequestered from a particular project**. The formula aims to show that the project provides a benefit to the area through carbon dioxide emissions removal, and that the benefit is more significant than the baseline estimation. Therefore, the formula is as follows:

$$\text{CO}_2\text{e Avoided} = (\text{EF}_{\text{baseline}} - \text{EF}_{\text{project}}) \times \text{A} \times \text{T}$$

where

EF_{baseline} = emissions factor under the baseline estimation of carbon dioxide emissions removal without the implementation of the project,

EF_{project} = emissions factor after the implementation of the carbon dioxide sequestration project

A = Area (in hectares),

T = Duration of the project (in years).

It's also worth mentioning one more important indicator: **the price of a carbon offset credit on the voluntary market**.

The prices for carbon sequestration credits vary depending on the technology used to sequester carbon dioxide. For example, **freshwater-focused projects tend to command a much higher cost** (€60 per tonne on average (per carbon credit) than forestry projects (€37 per tonne) due to their complexity of implementation, higher standards for compliance, and greater risk that the project will not reach the pre-defined targets regarding amount of carbon dioxide sequestered or prevented from being emitted.

The prices are often an important indicator to ensure the sustainability of the initiative and will also factor into calculation of the potential expansion of the project. The project team also needs to understand that carbon credit prices tend to fluctuate due to certain events (i.e., policy restrictions or problems with certifications can cause a lack of supply on the market, causing the prices to go up; and vice versa, development of new projects or creation of new voluntary markets can lower the prices). It might be better to manage expectations as to possible carbon credit prices; otherwise, unmet expectations can affect a project team's attitude toward their initiative and dampen their desire for further project development and potential

expansion. Nevertheless, with the new ecological policies being implemented on the market, and more and more entities following the carbon-neutral trends, project teams can be sure that the prices will remain stable and high for the next 10–15 years.

Last but not least, a very important KPI: **rate of return**. The rate of return expresses how much an investment grows or shrinks over a given period. A simple **rate of return is calculated by subtracting the initial value of the investment from its current value, dividing that difference by the initial value, and then multiplying the result by 100 to express it as a percentage**.

$$\text{Rate of return} = \frac{(\text{Current value} - \text{Initial value})}{\text{Initial value}} \times 100$$

Therefore, while a high rate of return may signal financial viability, it should be considered alongside these other metrics to determine the overall success of a carbon credit project.



Conclusion

With more and more companies starting to consider their impact on the environment in terms of emissions produced, together with more strict European Union laws, carbon sequestration credits are becoming a powerful tool in addressing current ecological challenges. **Carbon sequestration credits offer advantages for both sides: offsetting emissions for companies, thus aligning with their net-zero goals, and producing revenues for project developers, helping their nature restoration efforts.** The implementation of this tool, however, does not come without its hurdles.

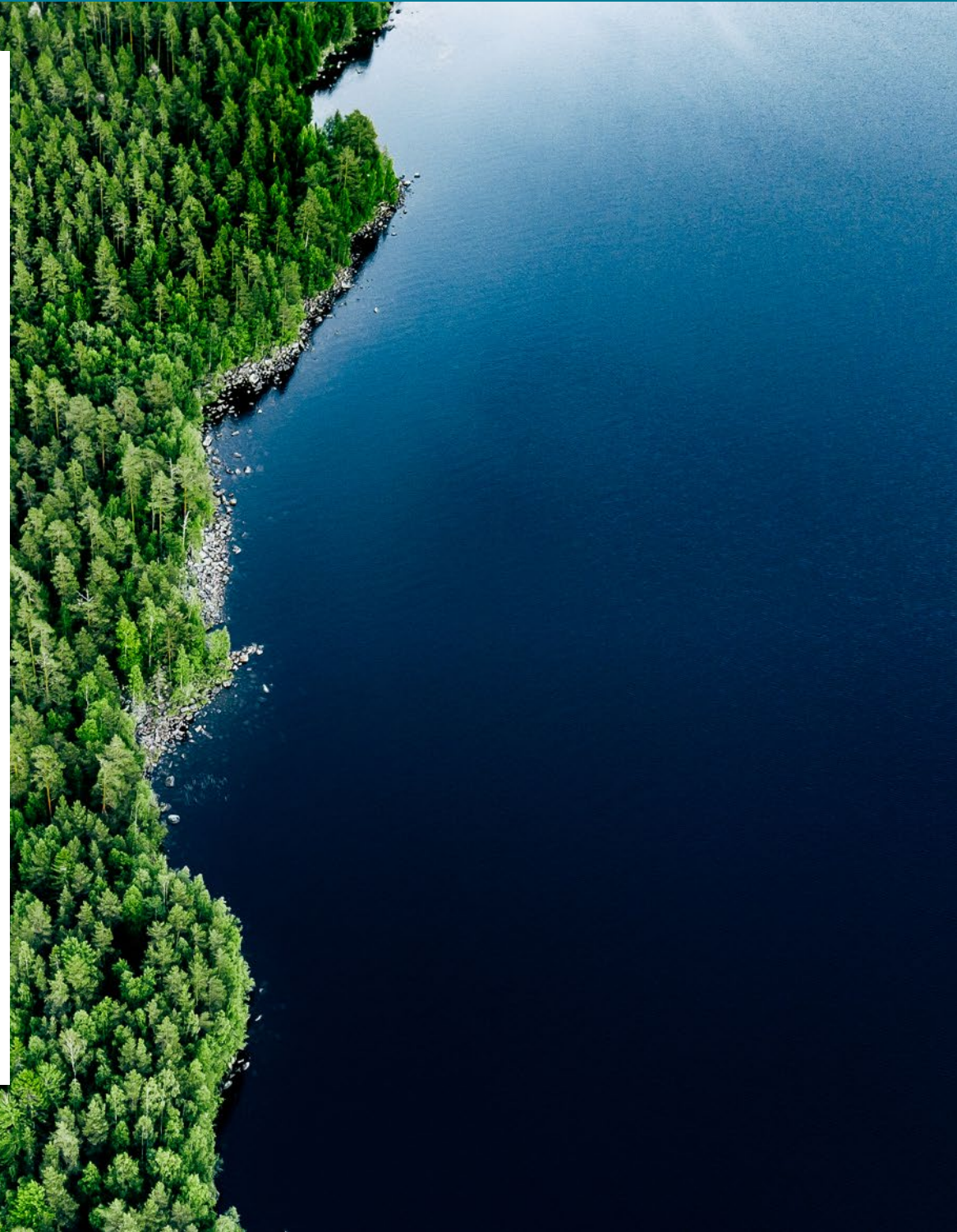
As mentioned, burdensome registration, validation, and monitoring processes are necessary to bring a project to fruition. Moreover, not only are carbon market prices volatile, but they also vary depending on the sequestration technology in use, which makes monitoring and managing credit prices a difficult task.

Nonetheless, as the provided examples of successful case studies suggest, carbon sequestration projects can yield substantial returns if their stakeholders plan cautiously and adhere to best practices. Platforms, such as ClimateTrade and Klimate, and consulting firms assist with and facilitate smooth selling of carbon credits and transfer of funds back to project developers. It is possible for organisations new to the market to seek support from such intermediaries and to receive assistance with navigating the market's regulatory requirements or with optimising project outcomes.

Thanks to the increasing global demand for carbon credits and the growing interest of both major corporations and small companies in offsetting their emissions, the carbon credit market is set on a robust upward trajectory. So, by leveraging the insights, case studies, and recommendations in this paper, stakeholders can unlock the potential of carbon credit use more easily, fostering a more sustainable future and ultimately contributing to the preservation of our planet for generations to come.

As mentioned in the introduction of this report, carbon credits revenues can represent an alternative to grants for funding nature restoration projects. Some criticise this type of instrument due to reasons which we covered in this report; for example, it doesn't incentivise systemic change and emission cuts. Our goal is to present this instrument to you and to highlight the pros and cons. The decision to implement carbon credits or not is yours.

Good luck with your restoration efforts!



Glossary

Carbon broker	A person or intermediary offering a range of credits and services in order to reduce the time spent in engaging directly with project developers.	Net-zero policy	Policy of organisations, companies, and individuals who aim to balance the amount of emitted greenhouse gases (GHG) and the amount of emissions removed from the atmosphere; may include usage of carbon sequestration credits.
Carbon dioxide (CO₂)	A gas that is emitted into the atmosphere and is a driver of climate change.	Project listing	The process of publishing information about a nature restoration project on a dedicated marketplace (in the context of this report, a freshwater-focused project that has obtained carbon credits on the voluntary carbon market platform).
Carbon footprint	The total amount of greenhouse gases in the atmosphere that is generated as a result of all activities carried out by humankind.	Sequestration	The process of storing carbon dioxide from the atmosphere.
Carbon marketplace	A market institution that connects carbon credit sellers with carbon credit buyers, and where the listing, selling, and buying of carbon credits occurs.	Sustainable development	Development that fully meets the needs of present generations without compromising future generations' ability to fulfil their own needs.
Carbon quotas	A predefined level (in tonnes) of carbon dioxide that a particular company is allowed to emit.	Validation	Ensuring that a carbon offsetting project satisfies all necessary requirements and preconditions implemented by special institutions. Validation is conducted by an independent auditor.
Carbon sequestration credit	A special certificate awarded to carbon offsetting project developers for removing and storing 1 tonne of carbon dioxide.	Vegetation	Flora that grows on a particular territory (plants, trees, bushes, etc.).
Carbon stocks	The amount of carbon that may be stored in a particular soil or be absorbed by certain vegetation.	Verification	a periodic process of controlling the appropriateness of a carbon offsetting project to specific standards and the expectations of its developers and ensuring the project is running in compliance with the law.
Certification	The process of achieving licenses or permits from a special organisation to establish a project and earn carbon credits in the future.	Voluntary market	A financial institution that operates as a matter of corporate social responsibility and as a response to market pressure and public opinion. It allows businesses, non-governmental organisations, and individuals to offset their own emissions voluntarily by purchasing carbon credits.
Greenhouse effect	A significant increase in temperature levels caused by extensive greenhouse gas (GHG) emissions into the atmosphere. Emissions create “a blanket” that does not allow heat from Earth to escape into space, thus causing global warming.	Zero-emissions policy	A company’s policy of achieving a complete reduction of emissions by implementing modern equipment, renewable sources of energy, or voluntarily using carbon offsets.
Independent auditors	Certified third-party specialists that examine the financial conditions of an organisation or a project and check its credibility and reliability.		
Monitoring	The process of constant observation of adherence to official standards and project implementation quality.		

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