

**NACAO**

**Nature-based Carbon Offsets**



# **NATURE-BASED SYSTEMS**

# **NATURE-BASED**

# **SOLUTIONS**

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Liken Carbon Hub

Luis Fernando Robles

Jose Antonio Gesto

**Nature-based  
systems as  
generators of  
emission offset  
units.**





# Emission reductions

There are three broad categories of options for reducing emissions:

## Emission Reduction

Deploy renewable energy and improve efficiency to replace fossil fuels.

## Carbon Capture

Capture and store carbon from industrial point sources or power stations.

## Nature based solutions

Protect ecosystems and their soils and vegetation to reduce emissions.



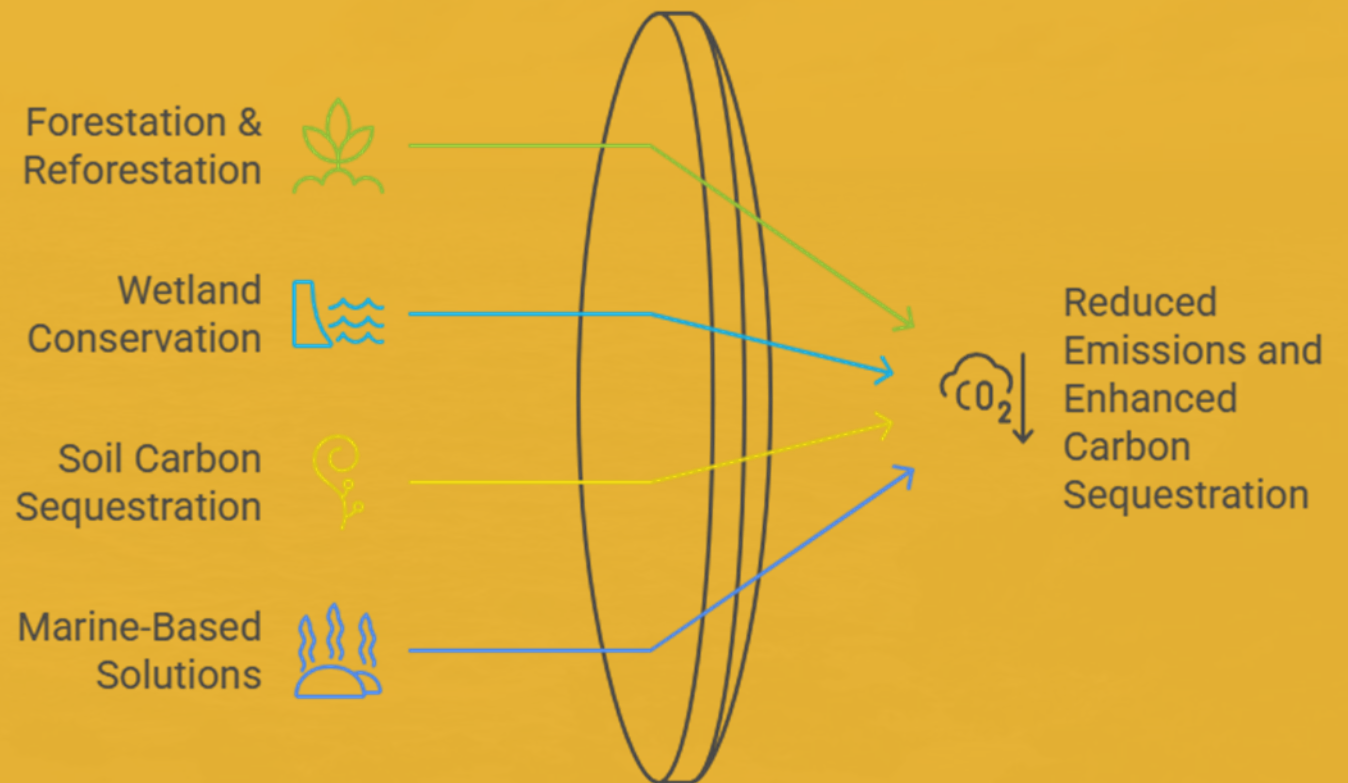
## Introduction to Nature-Based Systems

**Definition:** Nature-based systems (NBS) leverage ecosystem services to reduce greenhouse gas emissions and enhance carbon sequestration.

**Key Concept:** Unlike technological solutions, NBS are :

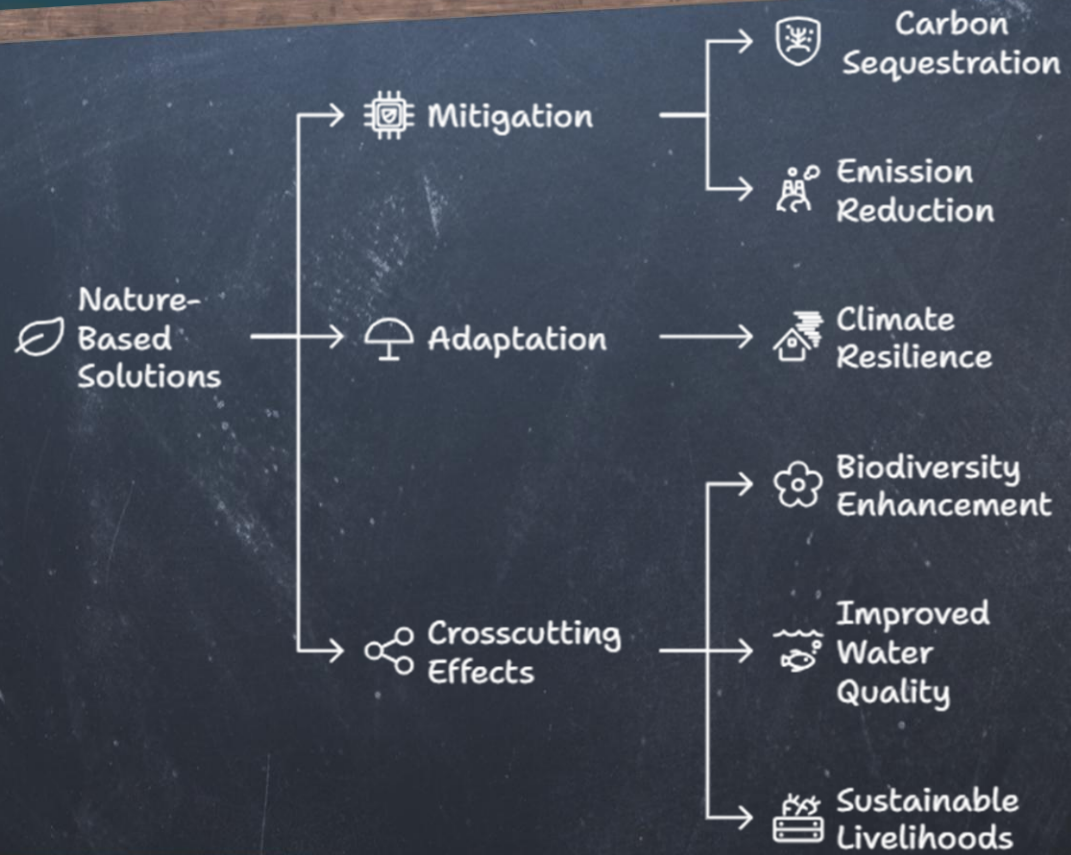
- Are cost-effective,
- Are Scalable
- Provide additional ecological benefits.

### Nature-Based Solutions for Climate Action





# The Role of Nature-Based Systems in Climate Action



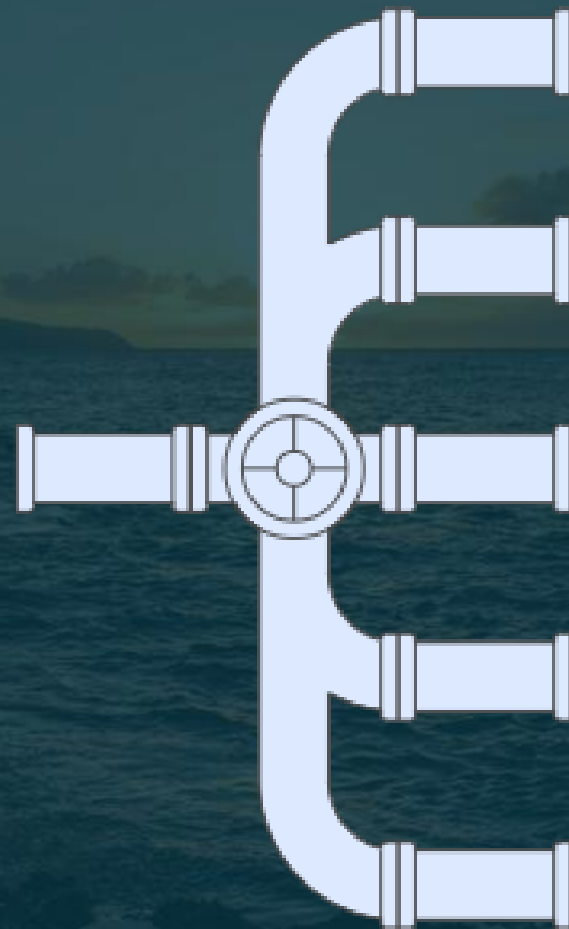
# Comparing nature-based and technological carbon offset generation options

Feature	Nature-Based Carbon Offsets	Technological Carbon Offsets
Mechanism	Leverage natural processes to remove or avoid carbon dioxide emissions.	Utilize engineered solutions to capture, remove, or avoid carbon dioxide emissions.
Examples	Afforestation and reforestation, sustainable agriculture, mangrove restoration, peatland conservation, improved forest management.	Direct Air Capture (DAC), Bioenergy with Carbon Capture and Storage (BECCS), enhanced weathering, carbon mineralization.
Co-benefits	Biodiversity enhancement, soil health improvement, water quality regulation, habitat creation, rural livelihoods support.	Few additional benefits beyond carbon capture
Potential Drawbacks	Risk of impermanence (e.g., due to natural disasters or land-use change), potential for "greenwashing" if not properly managed, measurement and verification can be complex.	Potential for permanent carbon storage, reduced land use compared to some nature-based solutions, creation of new industries and jobs.
Implementation Time	Varies (years to decades for full impact)	High initial costs, energy intensive in some cases, potential environmental impacts of deployment (e.g., land use for BECCS, water use for DAC), long-term storage safety and monitoring requirements.
Permanence	Can vary; some solutions offer long-term storage, while others are more vulnerable. Medium (risk of reversal due to land-use changes)	Requires extensive infrastructure, long R&D timelines
Potential Risks	Natural disruptions (wildfires, deforestation, extreme weather)	Aims for very long-term or permanent storage (e.g., geological storage). (theory)
Scalability	Significant potential, but can be limited by land availability and ecological constraints.	High energy demands, costly deployment
Cost	Generally lower cost per ton of CO <sub>2</sub> e abated compared to many technological solutions currently.	Theoretically high scalability, but many technologies are still in early stages of development and deployment.
		Generally higher cost per ton of CO <sub>2</sub> e abated, but costs are expected to decrease with technological advancements and scale.



# Navigating Challenges in Nature-Based Offsets

Challenges in Nature-Based Offsets



Permanence Risks

Measurement & Verification

Land Competition

Market Transparency

Time-Scale Limitations

## Nature-Based Offsets



Scalability

1



Cost-Effectiveness

2



Biodiversity Protection

3



Community Benefits

4



Water & Air Quality Improvement

5



**Voluntary  
emission  
offsets.**

**Use of carbon  
removals as  
offset**



## What is offsetting?

Offsetting is a climate action that enables individuals and organizations to compensate for the emissions they cannot avoid, by supporting worthy projects that reduce emissions somewhere else.

Offsetting is “*like crowdfunding*” for climate action: buying ERs is a direct financial contribution to the projects that allows them to continue reducing emissions and benefit the communities around them.



## What is offsetting?

Carbon offset and carbon credit are terms that are often used interchangeably but have distinct meanings:

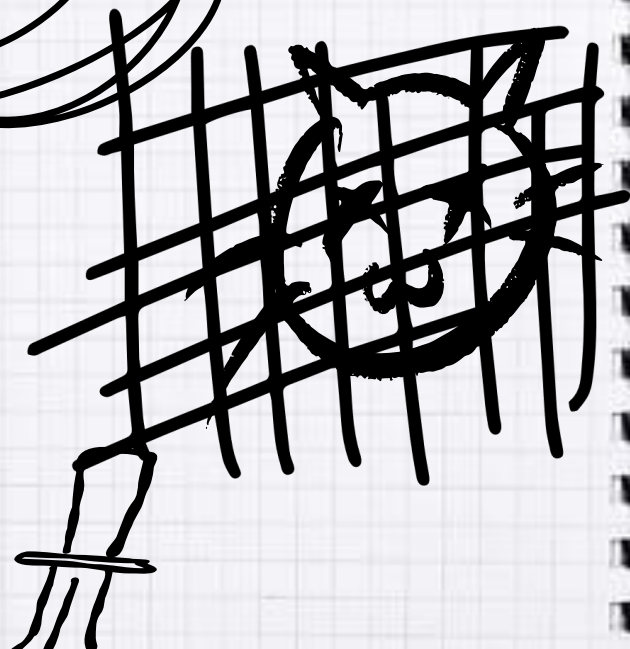
- **Carbon offset** refers to a reduction in carbon dioxide emissions made in one location to compensate for carbon emissions produced elsewhere (**CLIMATE CONCEPT**)
- **Carbon credit** is a tradable certificate, is a unit of CO<sub>2</sub> emission removed or reduced. Credits are generated by projects, and may be used ('retired') to offset. Carbon credits are used in emissions reductions trading schemes (**MARKET CONCEPT**)

Credits are generated by projects, and may be used ('retired') to offset emissions but may also be used for other purposes.

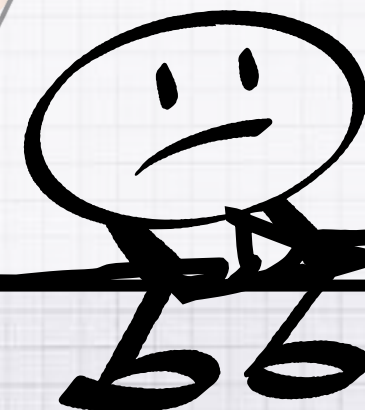
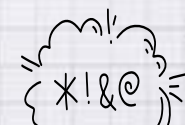
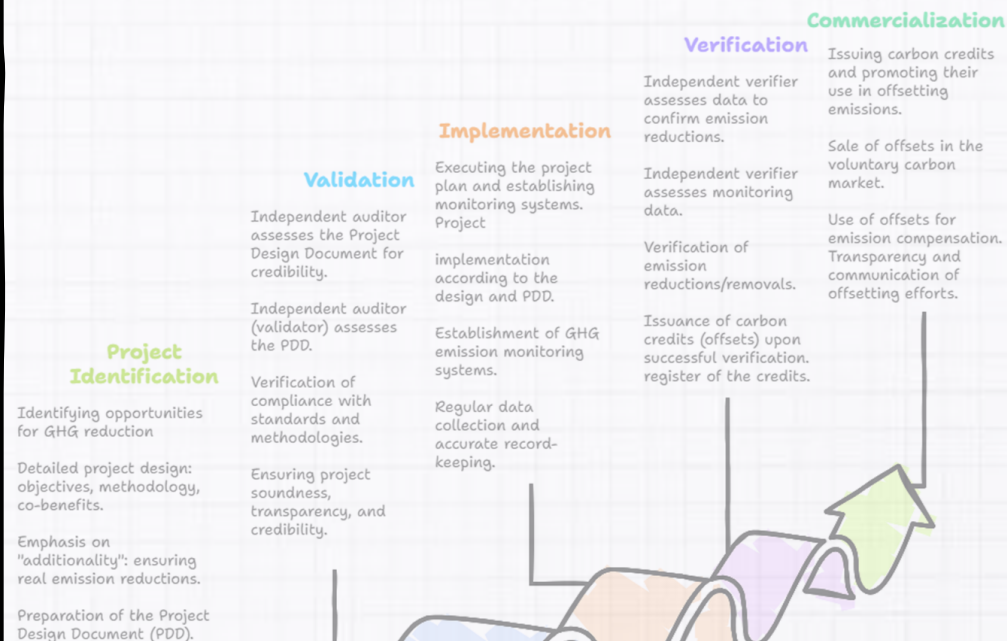
Projects can also serve other purposes than generating credits or being used as offsets.

Hence, **all credits and offsets require projects, but not all projects generate credits or offsets**

# PROJECT CYCLE OFFSET CREDITS

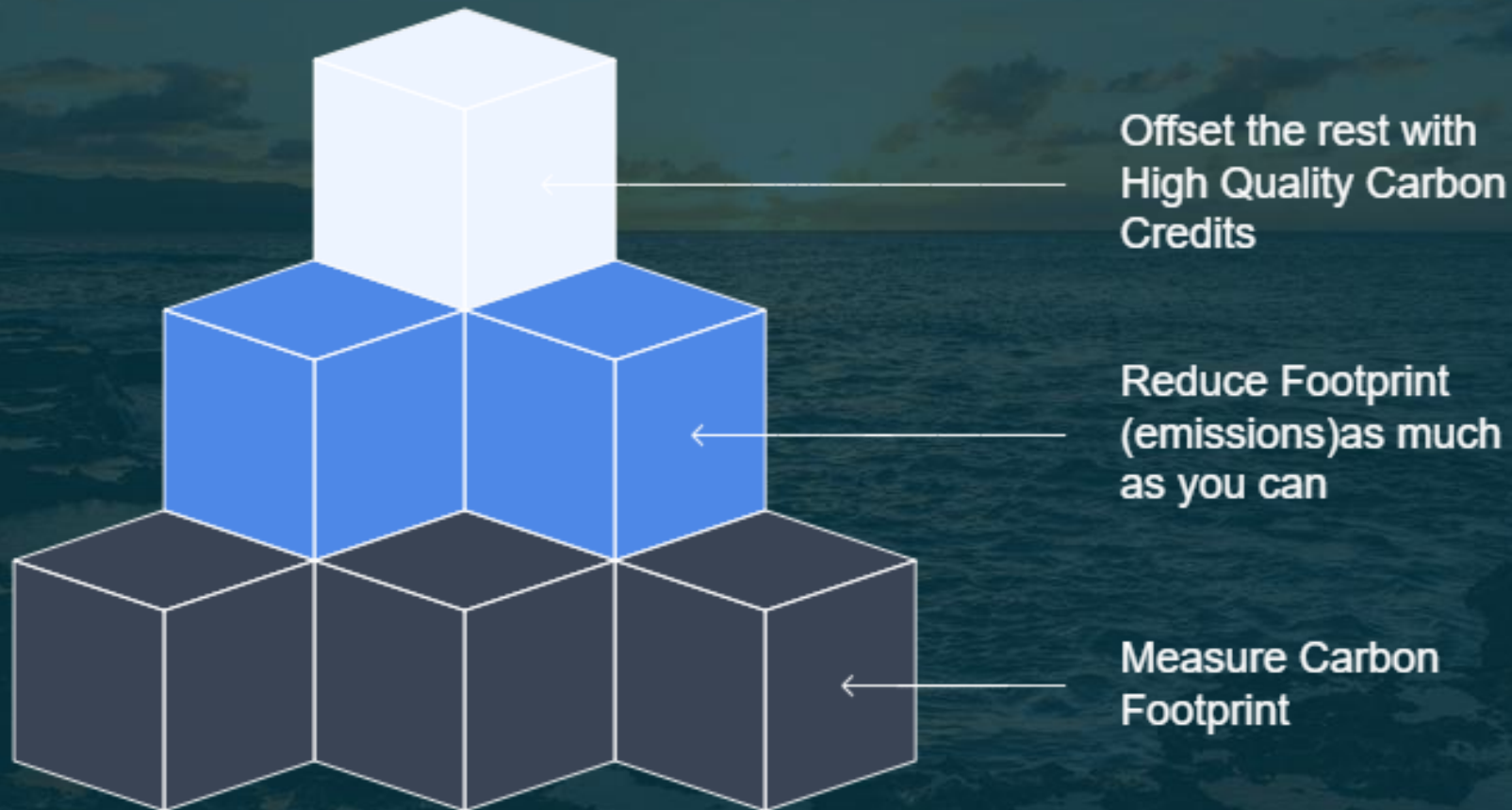


## Steps to Carbon Credit Commercialization





Offsetting is a part of the 3-step process:



## What Makes a Higher-Quality Carbon Credit?

The central idea behind a carbon credit is that it can substitute for reductions that you, as a buyer, could have made to your own emissions. For this to be true, the world must be at least as well off when you use a carbon credit as it would have been if you had reduced your own emissions.

When people talk about the “quality” of a carbon credit, they are referring to the level of confidence one can have that the use of the credit will fulfill this basic principle.

What is the central idea behind a carbon credit?

A carbon credit can substitute for reductions in your own emissions, ensuring the world is at least as well off as if you had reduced your emissions directly.

What does the “quality” of a carbon credit refer to?

It refers to the level of confidence that using the credit will fulfill the principle of effective emission reduction.





A **high-integrity nature-based offset** is a carbon credit derived from a project that effectively removes or reduces greenhouse gas emissions while ensuring environmental and social benefits. To be considered high-integrity, offsets must meet the following conditions:



#### Additionality

Ensures that the carbon offset would not have occurred without the project.

Guarantees that the carbon reductions are lasting and not temporary.

#### Permanence



#### Verification & Transparency

Involves independent verification of the offset's effectiveness and openness in reporting.

Highlights additional environmental or social advantages provided by the project.

#### Co-benefits



#### No Leakage

Ensures that the project does not cause emissions to increase elsewhere.

Confirms that the claimed carbon reductions are realistic and accurate.

#### Not Overestimated



#### No Significant Harms

Ensures that the project does not negatively impact social or environmental conditions.

**EU Regulation 2024/3012**  
establishing an EU  
certification framework  
for permanent carbon  
sequestration, carbon  
sequestration culture and  
carbon storage in  
products.



**Paris Agreement Article**



## Carbon removals

**IPCC LULUCF** (Land Use, Land Use Change and Forestry) sector covers:

- land management for cropland,
- grassland,
- wetlands,
- forests,
- green areas at urban settlements;

also including land use change such as **afforestation (tree planting) and deforestation.**

Agricultural and forestry land alone covers more than 75% of the EU territory, providing extensive opportunities for CO<sub>2</sub> sequestration from the atmosphere and constituting a decisive element in the fight against climate change.

In aggregate terms for the EU, LULUCF sector means the capture of more than **230 million tonnes of CO<sub>2</sub>e per year**

## European Climate Law. Carbon offsets as compensation units. Targets in the European Union framework.

European Climate Law: Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021, establishing the framework for achieving climate neutrality.

The European Climate Law sets out among other objectives:

- **EU climate neutrality by 2050** ; the EU to achieve negative emissions thereafter.
- **Reduction of net greenhouse gas emissions (emissions after removals)** by at least **55% by 2030** compared to 1990 levels.
- **A cap on removals** from the EU's natural carbon sinks that can be counted as a contribution to the climate neutrality objective in 2050, to increase the effort based on technological change. The EU will also aim to achieve a higher net carbon sink by 2030.
- Key sectors of the economy to develop voluntary roadmaps to reach the EU's 2050 climate neutrality target.



## Regulation (EU) 2024/3012 CRCF

**REGULATION (EU) 2024/3012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL** of 27 November 2024 establishing a Union certification framework for permanent carbon removals, carbon farming and carbon storage in products.

Published on 6th December 2024 in the Official Journal of the European Union; in force since 27 December 2024

Background: after a long process of discussion within the European Parliament and the European Commission, it is based on a mandate from the Parliament to the Commission: Union certification framework for carbon removals (European Parliament legislative resolution of 10 April 2024)-

Objectives: **to establish a voluntary framework within the European Union for the certification of carbon removals and emission reductions as permanent results, and of certain carbon farming and carbon storage activities in products, as temporary removals.**

Related to other European legislation:

- Regulation EU 2018/841 & Regulation EU 2018/842 ; Regulation EU 2021/1119.
- Directive 2003/87/EC & Directive EU 2018/2001.
- **Future Delegated Acts**

Regulation  
UE 2024/3012

CARBON HUB



### Key elements of the Regulation:

- **Typology of removal units:** four different typologies, with consideration as permanent (2) or temporary (2)
- **Framework of project activities:**
  - quality requirements as generation of net removals/reductions,
  - additionality,
  - sustainability conditions.
- **Methodologies to be used:** use of standardized baselines; use of specific baselines
- **Operational elements of the regulation:** project activity, operators / project developers, certification schemes, certification bodies. Registers of certification schemes; unified register of the European Commission.

## Regulation (EU) 2024/3012 CRCF (III)

### Use of certified removals units under Regulation (EU) 2024/3012 CRCF

Regulation UE 2024/3012 CRCF clearly states that **all carbon removals and soil emission reductions generated** under this Regulation **shall only contribute to the achievement of the European Union member states nationally determined contributions** (NDCs) and its climate targets, and **not to the nationally determined contributions of third countries** (non-EU Member States) or to international compliance schemes.

BUT

Article 18 of the Regulation also states that: “**By 31 July 2026**, the Commission shall assess the additional requirements necessary to align this Regulation with Article 6 of the Paris Agreement and best practices, including the corresponding adjustments, host Party authorisation and methodologies. In that assessment, **the Commission shall review the use of certified units to offset emissions generated outside the EU member states** nationally determined contributions and the Union's climate targets”.

Regulation  
UE 2024/3012

CARBON HUB



## Regulation (EU) 2024/3012 CRCF (IV)

### Typology of project activities and certified removals units under Regulation (EU) 2024/3012 CRCF

#### a) PERMANENT units

**a.1) Permanent carbon sequestration:** process that captures and stores atmospheric or biogenic carbon for **several centuries**.

➤ **'Permanent carbon sequestration unit':** a metric tonne of CO<sub>2</sub> equivalent, with net benefit of permanent carbon sequestration, generated by a permanent carbon sequestration activity.

**a.2) Soil emission reductions:** activity that provides the reduction of net greenhouse gas emissions from biogenic carbon stores: living biomass, litter, dead wood, dead organic matter, mineral soils and organic soils.

➤ **'Soil Emission Reduction Unit':** a metric tonne of CO<sub>2</sub> equivalent with net benefit from the reduction of soil emissions generated by a carbon farming activity.



## Regulation (EU) 2024/3012 CRCF (V)

### Typology of project activities and certified removals units under Regulation (EU) 2024/3012 CRCF (cont)

#### b) TEMPORARY units

**b.1) Carbon farming:** process carried out over a period of activity of **at least five years (5)**, related to the management of a terrestrial or maritime environment, involving the capture and **temporary storage** of atmospheric or biogenic carbon in biogenic carbon stores, or the temporary reduction of emissions from soil.

➤ **"Carbon sequestration unit"**, a metric tonne of CO<sub>2</sub> equivalent with a net benefit of temporary carbon sequestration generated by a carbon sequestration activity.

**b.2) Product carbon storage:** process that captures and stores atmospheric or biogenic carbon for **at least thirty-five years (35)** in durable products (e.g. products used in construction)

➤ **"Product carbon storage unit"** means a metric tonne of CO<sub>2</sub> equivalent with a net benefit of temporary carbon sequestration generated by a product carbon storage activity.

**By 31 July 2026**, the Commission shall review the application of this Regulation and the introduction of '**enteric fermentation**' and '**manure management**' project categories for the achievement of emission reductions and/or net carbon removals.

# Regulation (EU) 2024/3012 CRCF (VI)

## Project activities

Project activities **shall demonstrate that they generate net removals** of atmospheric carbon compared to the baseline, also taking into account GHG emissions that may occur as a result of their activity.

**Standardized baselines or specific baselines** may be used by the project activity. Baseline calculation and emission reduction/removal enhancement **methodologies shall be approved by Delegated Acts.**

Project activities shall have a **monitoring period** during which the p.a. developer assess the reduction of soil emissions or the increase of carbon storage, covering at least the activity period determined in the applicable certification methodology; monitoring should be based on an appropriate **combination of in-situ measurements and remote sensing or modelling.**

### Additionality conditions are:

- (a) P.a. goes beyond national and European Union legal requirements (applicable to the p.a. operator / project developer)
- (b) project activity financial viability is reached due to the income from the certification obtained
- (c) when the standardized baseline is used, additionality shall be deemed to be met
- (d) if a specific baseline is used, this specific baseline methodology shall provide for additionality tests specific to the project activity.

**Project activities are required to meet sustainability criteria** in parallel to additionality criteria, demonstrating inter alia: contribution to climate change adaptation, sustainable use and protection of water and marine resources, protection and restoration of biodiversity and ecosystems, contribution to circular economy, etc.



# Regulation (EU) 2024/3012 CRCF (VII)

## Certification schemes

Certification schemes are a relative novelty in European climate change regulation. They already exist in other areas such as the certification of renewable biomass or the certification of renewable fuels of non-biogenic origin (RFNBOs).

In the framework of Regulation (EU) 2024/3012 CRCF, **certification schemes can be public or private entities.**

- If it is a **public entity**: the **Member State shall apply to the Commission** for recognition.
- If it is a private entity: its legal representative shall notify the Commission of the application for recognition.

Operators or project promoters may only use a certification scheme recognized by the Commission for a maximum period of five years.

**The certification scheme** establishes its membership rules, certification processes, public registers, specific methodologies, and issues the certified units upon proof of compliance with the requirements of the Commission and the certification scheme itself. It is the so called “technical platform”

The registers of these systems must be interoperable and communicated with each other, at least until the European Commission creates its own register (27 December 2028 at the latest).



# Regulation (EU) 2024/3012 CRCF (VIII)

## Certification process

Certification process: **carried out by certification entities acting as an independent third party**, accredited by national accreditation bodies of the Member States, or recognized by a national authority competent for the implementation of the Regulation.

Two distinct phases:

**(a) certification audit:** this is the approval of the project. Objective: verification of compliance with the applicable requirements. The certification body shall issue a certification audit report including a summary and issue a certificate of compliance.

**(b) certification renewal audits:** equivalent to verification of net removals / net reductions achieved. At least every five years, or more frequently if it is required by the applied methodology. The certification body shall issue a re-certification audit report including a summary and an updated certificate of compliance.

Following the re-certification audit: **the certification scheme** shall issue the certified units according to the outcome of the re-certification audit.

- **Temporary units ('carbon farming sequestration units' and 'product carbon storage units')** shall expire at the end of the monitoring period of the project activity and shall be cancelled in the certification register, unless long-term storage of the carbon sequestered is demonstrated by continued monitoring.

# Regulation (EU) 2024/3012 CRCF (IX)

## EU DG CLIMA calendar

DG CLIMA - European Commission, CRCF milestones in 2025: tentative timeline for Expert Group (EG) meetings to finalize the delegated acts on the CRCF methodologies and the implementing act on third-party verification under CRCF.

When	What?
26 March 2025	EG Meeting on CRCF methodologies: Permanent Removals and Carbon Storage in Buildings (full day)
08 May 2025	EG Meeting on CRCF methodologies: Agriculture (09:30-12:30)
13 May 2025	EG Meeting on CRCF methodologies: Peatland Rewetting (09:30-12:30)
15 May 2025	EG Meeting on CRCF methodologies: Planting of Trees (09:30-12:30)
End of May 2025	Workshop on Carbon Farming: Perspectives on Purchasing Programmes for CRCF Credits
End of May 2025	Workshop on Permanent Carbon Removals: Perspectives on Purchasing Programmes for CRCF Credits
End of June 2025	EG Meeting on Delegated Act for Permanent Removals
June / July 2025	Workshop on Enhanced Rock Weathering
Sept/ Oct 2025	EG Meeting on Delegated Act for Carbon Farming

Regulation  
UE 2024/3012

## Article 6 of Paris Agreement

Article 6.2.: international carbon markets between Parties. Units subject of purchasing are called "Internationally transfers of mitigation outcomes", ITMOs

Article 6.4.: project based mechanism (Paris Agreement Crediting Mechanism or Sustainable Development Mechanism): under the specific rules of the Art. 6.4. Supervisory Body

Article 6.8.: non-market based mechanism: cooperation between Parties that is not substantiated in the transfer of carbon units / carbon credits (e.g. capacity building, technical cooperation, technology transfers, etc.)

The EU region "Syldavia" has a commitment of increase carbon removals, 10 Mt CO<sub>2</sub>

According to Regulation (EU) 2024/3012, 11 Mt CO<sub>2</sub> are certified as permanent removals

After 31/07/2026, Member State which Syldavia belongs **authorize and drives the transfer of the excess of 1 Mt CO<sub>2</sub>** for compliance purposes of the NDC of a third party out of the EU

**Article 6.2, Article 6.4, Article 6.8 ??**



**Thank you very  
much for your kind  
attention**



+34 91 048 32 04



Calle Manzanares 4 28805  
Madrid

[www.likencarbon.com](http://www.likencarbon.com)



[lrobles@likencarbon.com](mailto:lrobles@likencarbon.com)

[jagesto@likencarbon.com](mailto:jagesto@likencarbon.com)