Working Group III – Carbon Capture, Use, Storage and Compensation

RULEBOOK

DEMO VERSION

HIGHLIGHTS

- Understand the principles of carbon quality and transparency to ensure effective and trustworthy carbon compensation purchases
- Outline each user's journey to achieve sustainable outcomes tailored to their unique needs and goals
- Develop a decision tree structure for the rulebook that utilizes a bottom-up approach to enhance user outcomes
- Guide users from beginners to advanced levels in exploring carbon compensation options effectively

ABSTRACT

Climate change poses significant threats to ecosystems and economies, driving the urgent need for effective climate solutions. The carbon market offers several unique synergies where organizations can enhance their sustainability, mitigate their environmental impact whilst foster innovation and investment.

This Rulebook consolidates lessons learned from years of inconsistencies in the carbon market, specifically focusing on transparency in the industrial supply chain, which can help track and reduce carbon emissions (e.g. CBAM). It aims to provide clear guidelines and examples of best practices for organizations seeking to navigate carbon compensation effectively.

By addressing common challenges and highlighting successful strategies, the Rulebook serves as a valuable resource for newcomers and seasoned carbon market participants, fostering transparency and promoting sustainable practices throughout the supply chain.

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INTRODUCTION

Recent data indicate that greenhouse gas (GHG) emissions continue to rise across all major global sectors, and despite some progress, July 2024 marked the hottest month on record (*Data source: ERA5. Credit: Copernicus Climate Change Service /ECMWF).* This critical situation highlights the need for innovative and scalable solutions to mitigate climate change.

Many countries and organizations are turning to carbon markets to address the climate crisis and meet their compliance obligations. However, growing evidence reveals significant issues with quality and transparency within the supply chain for creating these credits (Michaelowa et al. 2022).

On a positive note, renewable energy sources are often cheaper than fossil fuels, which can drive innovation and research, particularly when paired with Carbon Removal methods such as Technology-based Solutions (TbS) or Negative Emissions Technologies (NETs). For example, integrating renewables with reforestation efforts helps capture carbon, boost biodiversity, and improve local air quality simultaneously (Jad Daley, 2024).

In the face of interconnected challenges such as climate change, biodiversity loss, and increasing socio-economic inequality, industries must urgently reassess their business and sustainable development approaches. Embracing a more sustainable mindset is essential for ensuring long-term resilience and positive impacts on society and the environment.

This Rulebook compiles over a decade of lessons learned from discrepancies in carbon markets to guide you in starting your journey, overcoming barriers, and enhancing your organization’s climate impact. It reflects the collaborative efforts of stakeholders from academia, industry, and the marketplace, all working towards a more effective and transparent carbon management strategy for the ESTAINIUM community.

How to read this Rulebook?

There are seven (7) sections in this Rulebook, including a glossary at the end of the paper, which explains the terminology in more depth. These sections are each dedicated to the specific components of the Rulebook.

A user experience method, and the Decision Tree are provided to help you dive deeper and apply the knowledge to your organisation’s sustainability-specific journey. In practice, the user's journey is usually implemented in a step-by-step order. However, in this Rulebook, some early sections may be redundant if you believe your organisation already applies most of the principles stated in the foundational part.

Feel free to jump into those sections that are most relevant to you. Each section’s introduction will navigate you towards the information, tools, and resources you need. The Rulebook does not aim to be a blueprint that guarantees outcomes. However, it provides guidance, shares principles and experiences, and indicates what you should consider when your sustainability journey presents a barrier.

To benefit from the Rulebook, you must apply the tool and principles according to your organisation's specific needs.

Instructions for Using the Rulebook

Who Can Use This Rulebook

- Anyone interested in purchasing carbon compensation?
- Organizations wanting to benchmark their sustainability.
- Individuals from supply chains, climate finance firms, NGOs, governments, or private investors.

What to Expect

- Guidance for starting your sustainability journey.
- Information on carbon compensation options.

Who Is Considered a User?

- Any individual or organization starting their sustainability efforts.
- Anyone wanting to learn about climate-positive impacts and sustainable supply chains.

Getting Started

- Review your current level of sustainability.
- Explore the resources in this Rulebook to improve your practices.

Take Others Along on the journey

Share your journey and insights with others who are interested in sustainability.

Contents

1. FUNDAMENTALS

This is where our Rulebook journey starts. In this “Fundamentals” section, we’ll learn briefly about the foundation of this booklet. In “*About Carbon Marke*t” section, we explore the need for a holistic approach and the role that this framework provides. Following this, we dive deep into the themes that make up the structure of section 2 “D*ecision Tree”.* In the *Users Journey (*section 3), we present the diversity of sustainability journeys depending on the organization’s objective and maturity level. In *Unveiling the Frameworks* (section 4), some of the most recognized and sustainable frameworks are presented in a table array format to offer users an overview of current global climate initiatives. In section 5, we briefly introduce the role of carbon registries in the current carbon market. Finally, in *A Practitioner’s View,* we can share experiences or stories that demonstrate the diverse ways in which carbon projects can create real impact.

About Carbon Markets

In brief, carbon markets are trading systems in which carbon compensation is bought and sold. Companies or individuals can use carbon markets to compensate for their greenhouse gas emissions by purchasing carbon credits from entities that reduce or offset greenhouse gas emissions (UNDP, 2022). One tradable unit or a carbon credit equals one tonne of carbon dioxide (1t $CO_{2\text{-eq}}$) or the equivalent amount of a different greenhouse gas reduced, sequestered or avoided.

While the terms "carbon credits" and "carbon offset" are often used interchangeably, they refer to two distinct products that serve two very different purposes. Before we begin purchasing either, it’s essential to understand the differences between them and which one will help you meet your goals. Here is a broad definition of the terms (carboncredit.com).

- Carbon offset: A **removal** of GHGs from the atmosphere
- Carbon credit: A **reduction** in GHGs released into the atmosphere

Carbon markets are categorised as either voluntary carbon markets (VCMs) or compliance carbon markets (CCMs), which differ significantly from each other in terms of regulations, impact, and market size, among other factors (msci.com, 2022). Carbon credits are primarily traded in compliance markets, governed by regulations that mandate legally required emission reductions. In contrast, voluntary carbon credits cater to entities not under regulatory obligations, allowing a broader range of participants to engage in offsetting their emissions. Despite these differences, both types of credits often share trading platforms, emphasizing the need for transparency and robust governance to ensure credibility across markets.

In this Rulebook, we will primarily discuss the dynamics of the voluntary carbon market that align more closely with the strategic imperative of our stakeholders' supply chain.

VCMs are unregulated markets that enable individuals, firms, governments, and non-governmental organisations to voluntarily purchase carbon offsets from project developers to achieve carbon compensation and neutralisation (msci.com, 2022). The size of VCMs is still relatively small, with approximately **USD 1 billion** of carbon offsets traded in 2021 (Ecosystem Marketplace, 2021), which currently lacks the scale required for institutional investors. Also, a lack of high-quality (environmental and social integrity of projects) carbon offsets has held back the growth of this market (tsvcm- Phase II Report Summary." Taskforce on Scaling Voluntary Carbon Markets, July 8, 2021).

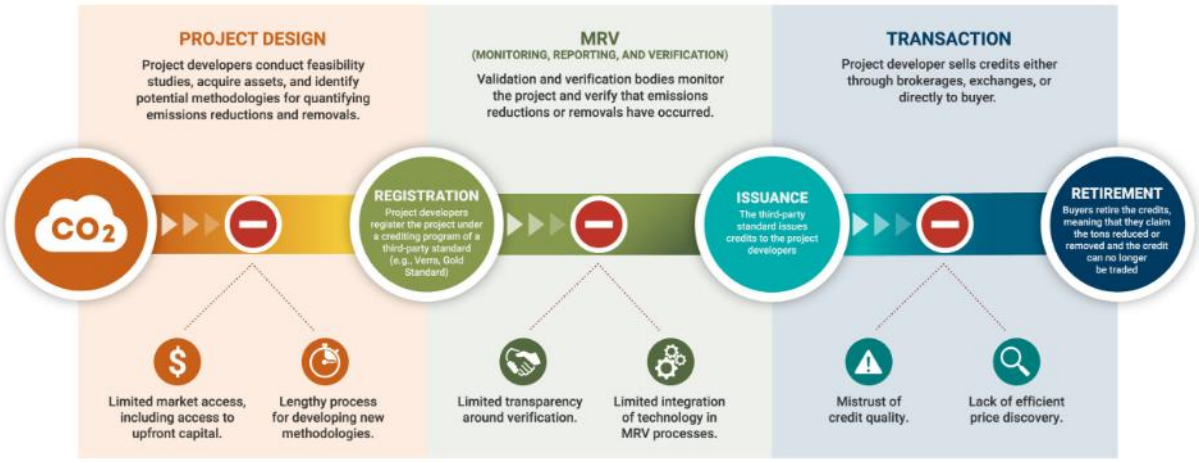

Fig.1 Life of a carbon credit: this graphic illustrates the process of developing and bringing carbon credits to market, highlighting a set of non-exhaustive set of barriers ensuring trusted and efficient VCMs (rmi.org, 2022)

Development in the last 10 years

The carbon market ecosystem has only developed recently, largely dominated by a few players who have driven companies to engage in carbon offsetting. These early entrants often offered 'one-stop shop' solutions, bundling services in ways that created significant conflicts of interest. Over the past four to five years, more players have entered this small market, resulting in increased competition. However, this has also introduced challenges, such as unclear pricing and combined solutions, making it harder to find neutral and trustworthy advice.

As with any emerging market, once money enters the system, it attracts dubious actors. The carbon market has suffered a significant loss of trust over the last three years, particularly after reports from Zeit and The Guardian exposed fraud in prominent projects, leading to a swift decline in confidence and acceptance (The Australia Institute, 2024).

This decrease in trust can be summarized into the following three key issues:

- **Deceptive Carbon Credits:** Investigations have revealed that a significant portion of rainforest carbon offsets, particularly those certified by leading organisations, are found to be ineffective and misleading. For instance, over 90% of certain offsets were deemed to lack genuine carbon reduction impacts (Verra-Report, 2023; The Australia Institute, 2024).
- **Conflicts of Interest:** Some major players in the market were found to bundle services, creating conflicts of interest that compromised the integrity of the credits being traded.
- **Poor Governance:** An example of poor governance in the carbon market is the absence of standardized methodologies for verifying the authenticity of carbon credits. This has led to inconsistencies in how credits are calculated and validated, allowing some projects to inflate their claims of carbon reduction (csis.org, 2024).

Where are we now

The voluntary carbon market (VCM) is in a wait-and-see mode. Companies must comply with regulations, some of which require a compensation strategy; however, many face uncertainty and lack expertise in project selection. No one wants to risk accusations of greenwashing.

We expect demand for nature-based offsetting projects to surge due to corporate climate commitments, which are driving up prices. Companies with long-term decarbonization strategies are already securing carbon credits from high-quality projects. Meanwhile, SMEs struggle with transparency issues, risking delayed or overpriced purchases and potentially lower-quality projects, which could harm their reputation.

Nevertheless, looking ahead, the forecast for voluntary carbon markets is promising. As climate change continues to escalate, the demand for carbon offsets is expected to grow exponentially, creating opportunities for innovation and investment in climate solutions (CFA Institute, 2024).

If integrity issues within the sector are resolved, the value of the global VCMs is forecast to exceed one trillion U.S. dollars per annum by 2050. However, should integrity issues remain unresolved, the market value would reach just $ 34 billion that same year (Tiseo, 2024).

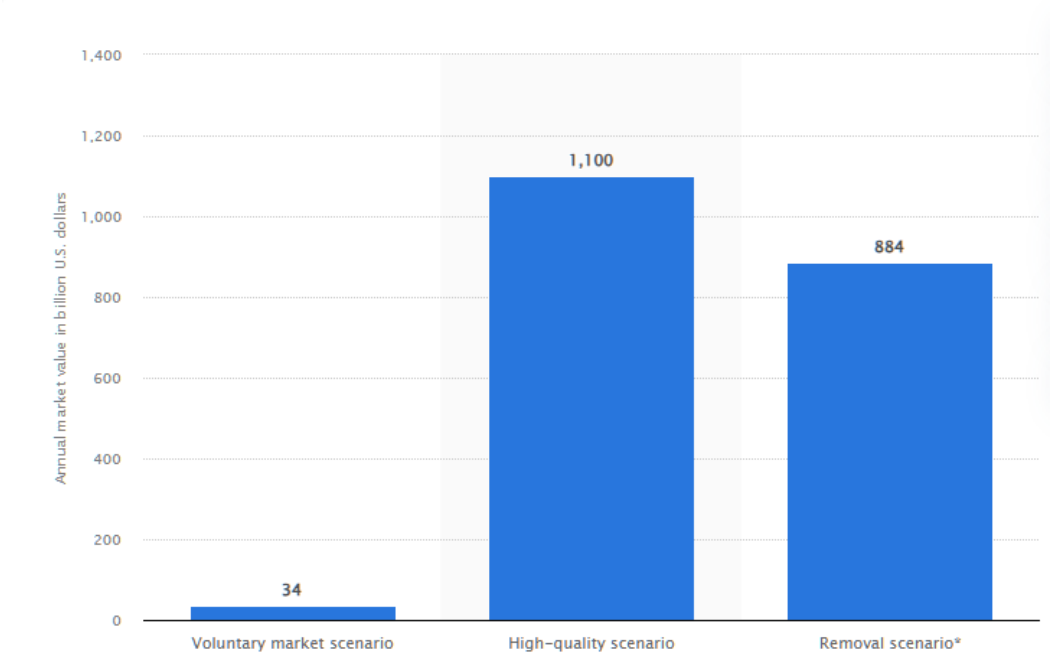

Fig.2: Forecast carbon offset market value worldwide in 2050, by scenario (Tiseo, 2024)

What everyone should know about offsetting

For companies pursuing decarbonisation, understanding the risks and opportunities in the market is crucial. The priority should always be to reduce and avoid emissions (Oxford offsets Principles). When offsetting residual emissions, consider the following:

- The market is opaque, and many projects are of low quality. Careful project selection is key to avoiding reputational risk.

- A few dominant suppliers make pricing unclear, and inflated prices are common. Estimate the project's cost and climate benefit. Consider using "*cost-benefit analysis"* (CBA) frameworks or tools such as *marginal abatement cost curves* (MACC) to evaluate the financial and environmental trade-offs.

- Ensure the offset partner has *no conflicts of interest* and offers independent advice.

- Projects should align with *your* company's region and products.

- The price per ton should be based on the EU Emissions Trading Scheme and/or local ETS system (e.g. Switzerland carbon tax,etc.)

- Instead of offsetting as cheaply as possible, "set an internal CO_2 budget" and invest in high-quality projects.

- Communicate your offsetting actions to demonstrate a commitment to climate and encourage others.

- Strictly follow the rules on claims; products or companies should no longer be advertised as carbon neutral without proper verification.

Challenges for the future of VCM

The voluntary carbon market plays a crucial role in global climate efforts, yet various persistent challenges undermine its effectiveness. Some of the challenges and criticisms that VCM is currently facing stem from the lack of transparency that plagues certain carbon operations and schemes, which leads to issues such as double-counting and greenwashing, thereby damaging the reputation of the institutions in charge and creating suspicion towards the market (Mak, 2024).

Nevertheless, VCM remains one of the most accessible and potentially efficient platforms for addressing climate change mitigation. More work needs to be done to promote its growth and credibility (World Bank,2024). For example, a trusted system is essential to attract private capital for nature-based projects, along with government acceptance and regulation to provide certainty. No one will invest at the risk of damaging their reputation.

Carbon credits from projects that fail to deliver promised benefits or are found to be fraudulent must be removed from the market. If these credits are accepted, they will continue to fuel fraud and undermine credibility. This Rulebook aims to address these challenges, encouraging corporate and individual participation, particularly in the growth of the CDR market and the achievement of members' climate goals.

2. THE DECISION TREE

For the development of the Rulebook, we started from a traditional approach, where carbon market components underscore the need to create an Inventory of Carbon Credits Programs and offset protocols to better define the scope and boundaries of our endeavour. In addition, throughout an iterative process of stakeholder engagement, we promoted the creation of a series of value propositions, providing a holistic perspective on the sustainability orientation of the working group project.

We outlined an initial scope for the Rulebook, aiming to provide guidance on the complexities of the carbon market, with a focus on quality and transparency criteria.

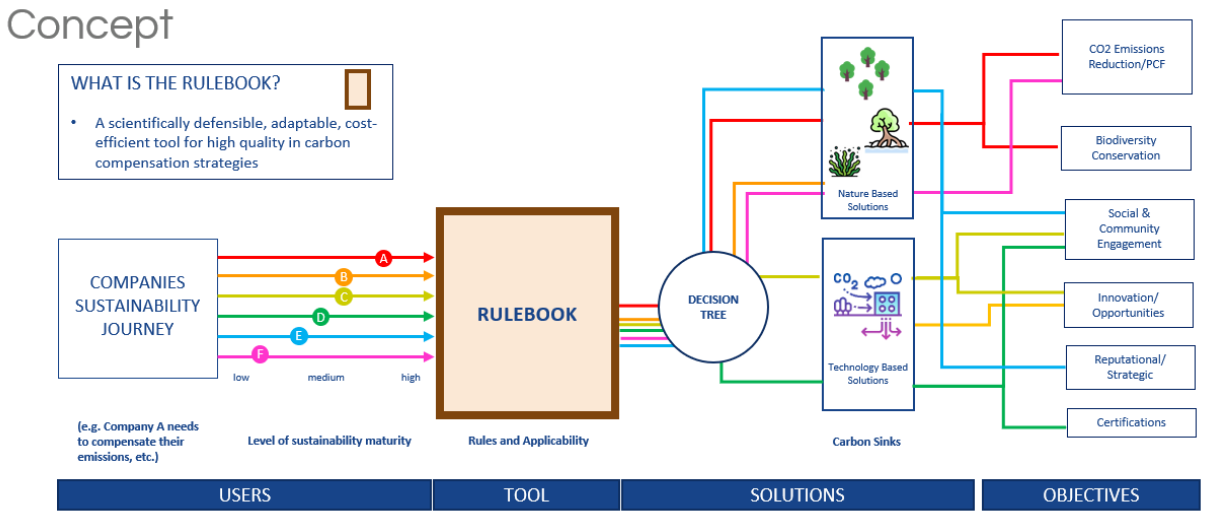

Fig.3: The Rulebook concept flow (Estainium, 2024)

The graphic concept above illustrates the finalised process flow, which began with a simple idea of connecting carbon sinks to companies' emissions (courtesy of Eberhard Niggemann, *Estainium member*). This scheme's evolution now represents an example of a comprehensive overview of how different organisations embark on their sustainability journey, seeking tailored or shared climate objectives (concept: Estainium,2024).

It was clear that an organised framework was needed to guide users through their journey. To achieve this, a Rulebook was created, outlining the steps and requirements in stages, following a typical bottom-up approach. This Rulebook is structured as a decision tree, divided into three distinct phases.

The first phase is the **Initial Scrutiny Phase**, where we assess the sustainability maturity of the organizations or users. This helps us understand their current stance on environmental efforts.

The second phase is the **Carbon Project Phase**, during which we apply specific quality criteria and parameters to evaluate the projects they are working on. This ensures that only high-quality projects are considered.

Finally, the **Retirement or Finalisation Phase** focuses on the financial aspect. It involves the final transaction details, such as the amount and price of the compensation option, followed by a review and feedback process.

This is the conceptual version of the decision tree, outlined on paper. However, if we decide to transition this process into a digital tool, such as a **chatbot**, the format might be adjusted slightly to suit the digital environment.

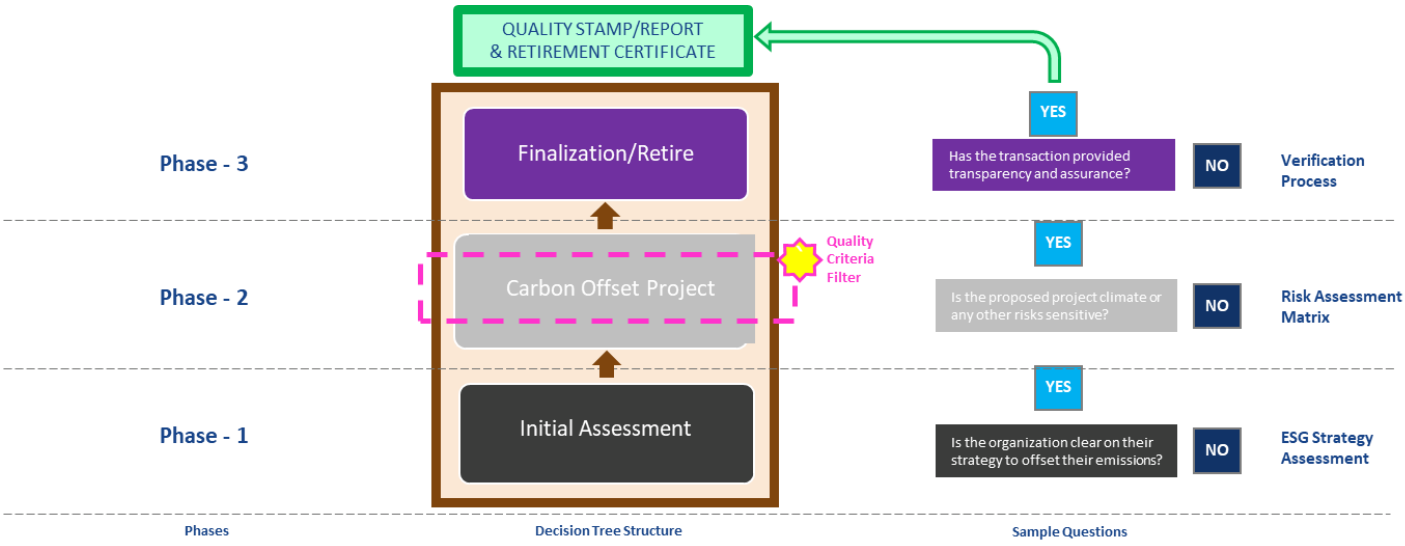

Fig.4: The Rulebook – An example of the Decision Tree structure with the three different phases (Estainium, 2024)

To fully explore the graphic version of the decision tree, please download the complete graphic via the provided **link or QR code or use the digital version of the demo**. A snapshot of one step is shown below. The decision tree provides various pathways, with each stage culminating in a summary of decisions that enables organisations to benchmark their progress. While many standards are incorporated, harmonisation remains challenging, and only the most effective standards are selected. *This process is a personal journey toward climate goals, without final commitments*, as the improvement of MRV for many CDR methodologies and biodiversity is ongoing and certifications are still in development.

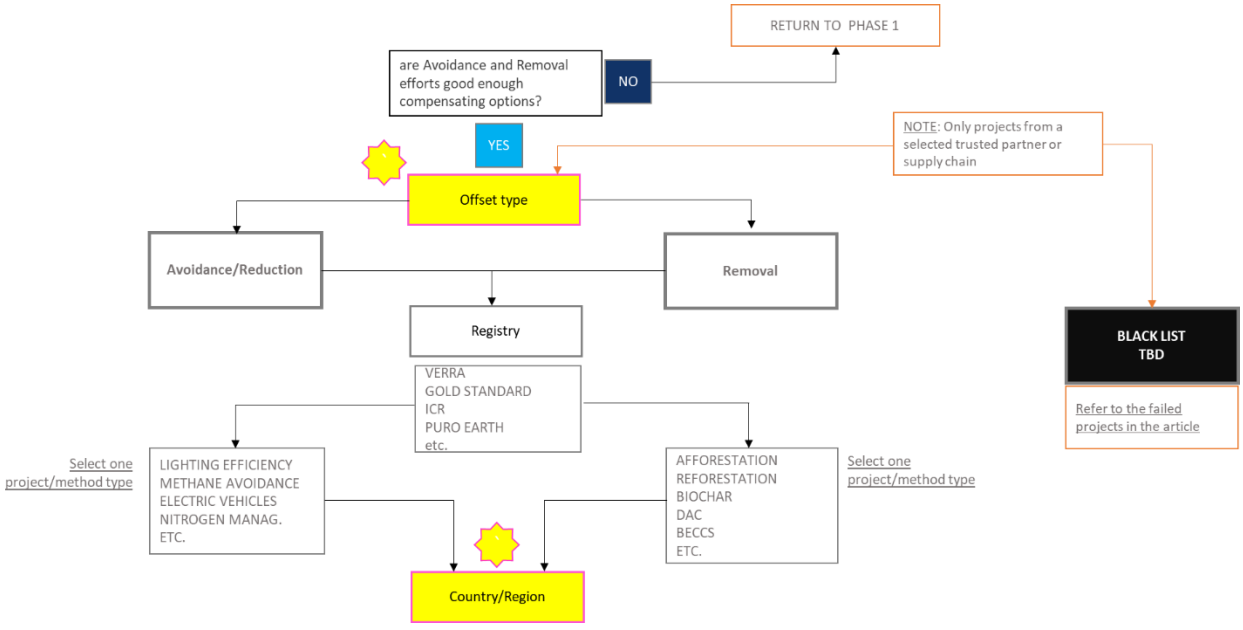

Fig.5: The Decision tree: A snapshot of phase 2 – Carbon project Quality Criteria selection – (Estainium, 2024)

Our journey begins in **Phase 1, the Initial Assessment**, where users provide essential details about their organisation, including its sector type and any participation in sustainability initiatives. This phase is crucial for identifying climate goals and available resources. The answers selected guide the decision tree toward possible solutions. Below are some of the main takeaways of phase 1:

- Users enter their organization details, including sector type and sustainability reporting initiatives.
- Declare the organization's climate commitment, vision, and available resources.
- The answers lead to different branches of the decision tree with tailored solutions.
- Not all organizations are required to follow the suggestions, but decarbonization is encouraged.

This approach aligns with the Oxford Carbon Principles, emphasising decarbonization efforts to achieve a sustainable future.

The core phase of the decision tree process is **Phase 2, Carbon Project**, (Fig 5 above), where we delve into the specifics of compensation options. The primary goal of this phase is to identify the most suitable projects that align with the organisation's vision, ensuring only high-quality and credible projects are selected. Below are listed some of the specific details:

- Phase 2 focuses on details such as project location, carbon removal methods, MRV, carbon registry, standards, and other critical factors.
- Co-benefits play a key role in this phase, where users select benefits such as biodiversity, certification, community development, and improved air and water quality.
- Develop a link to a Blacklist, highlighting past projects with poor performance or quality, backed by evidence and sources.
- The project selection process will evolve with periodic updates.

Phase 3, Finalisation, marks the final stage of the carbon credit transaction process, where the purchase of carbon credits or offsets, along with their respective quantities and prices, is completed. It is crucial to ensure data integrity, as this is a common challenge in carbon market transactions (MSCI,2024)

- Collect and verify as much data as possible to maintain data integrity.
- Ensure accessibility to the Third-party verification process.
- Annotate the transaction with any relevant factors, such as legal jurisdiction.
- Link the transaction to the relevant carbon registry to avoid double-counting and explore potential external links or APIs to trustworthy marketplaces for future developments.

3. USERS JOURNEY

Carbon compensation is not a one-size-fits-all solution, and each organisation faces unique challenges based on its industry, scale, and sustainability goals. Whether you're a large enterprise, a small business, an institutional investor, or a conservation group, our Rulebook provides tailored pathways to help you navigate carbon compensation effectively. By choosing your journey, you can align with best practices, avoid common pitfalls, and tackle barriers such as transparency, financial viability, and reporting compliance. This guide empowers organizations to make informed decisions, ensuring that their carbon compensation efforts contribute meaningfully to climate action.

Below is a list of 10 different user journeys for carbon credit buyers, categorised by specific buyer typology based on existing literature. These journeys reflect the goals and motivations of different buyer types based on their distinct organizational and sustainability objectives.

Categorized by buyer's typology (10) See Table below

- Corporate Sustainability Officer (Large Enterprise)
- Small Business Owner
- Individual Conscious Consumer
- Institutional Investor
- NGO/Non-profit Organization
- Airline or Travel Industry
- Government or Public Sector
- Tech / Startups
- Conservation Group
- Agricultural Enterprise

Carbon Credits Buyers - Users Journey Assessment Table

This assessment table helps credit buyers navigate their carbon compensation journey by evaluating key metrics. *Target/Objectives* define the organization's sustainability goals, guiding credit selection. *Project Range* outlines the types of carbon offset projects available, ensuring alignment with priorities. *Purchase* covers transaction details, including volume and pricing considerations. *Reporting* focuses on transparency, helping buyers meet disclosure and compliance standards. Use this matrix to compare pathways and make informed decisions tailored to your needs.

Buyer	*Target / Objectives*	*Project Range*	*Purchase*	*Reporting*
Corporate Sustainability Officer	Carbon Neutrality or Net Zero	Verified carbon credit projects (e.g., renewable energy, reforestation)	Large volume of carbon credits from certified projects to meet carbon neutrality targets	Sustainability Reporting Initiatives (e.g., GRI, TCFD).
NGO/Non-profit Organization	Support renewable energy transition, climate action, philanthropic	Renewable and Afforestation	Renewable energy-focused carbon credits or afforestation	Sustainability impacts reporting

Small Business Owner	Community engagement, brand differentiation, low-cost options	Affordable carbon offsetting solutions	Buys carbon credits to offset a percentage of the business's operational footprint.	N/A Only promote sustainability to customers.
Individual Conscious Consumer	Personal responsibility for climate change, aligning personal values with actions	Chooses a platform offering carbon credits from verified and ethical projects.	Purchases credits to offset personal carbon footprint (e.g., for travel, lifestyle)	N/A Shares the experience on social media or with friends
Government or Public Sector	Regulatory compliance, achieving national emission targets, environmental leadership	Potential projects and carbon credit standards that align with national policies	Promotes carbon credit purchase programs to businesses, councils, citizens	Publishes annual reports to stakeholders on the effects of carbon credits programs

Airline or Travel Industry	Passenger demand for sustainable travel, regulatory compliance, carbon neutrality	Carbon credits such as public transport electrification or fuel-efficient vehicles (EV)	Credits on behalf of customers to neutralize the carbon emissions of specific flights.	CORSIA+ Communicates to customers positive environmental impacts.
Big (Tech) / Startups*	Achieve negative emissions through carbon removal technologies (DAC, bioenergy with carbon capture and storage - BECCS).	All CDRs	Invests in carbon credits generated by carbon removal technologies or projects focusing on durable storage	Tracks and reports on the total amount of CO_2 captured, aiming to demonstrate negative emissions
Conservation Group	Protect biodiversity through habitat preservation and sustainable land-use practices.	Projects that focus on biodiversity conservation, and the protection of endangered ecosystems	Carbon credits generated by biodiversity-focused projects	Reports on the outcomes through publications and impact assessments
Agricultural Enterprises	Reduce agricultural emissions through sustainable practices and regenerative agriculture	Regenerative agriculture and soil carbon sequestration	Carbon credits from regenerative agriculture projects that promote sustainable land management and soil health	Increasing demands to provide greenhouse gas (GHG) emissions data to supply chains and the finance sector
Institutional Investor	Financial return, impact investing, sustainable portfolio diversification	Analyzes different carbon credit projects and marketplaces for investment opportunities	Large quantities of carbon credits as part of diversified green investment portfolio	Mandatory climate-related financial disclosures

4. UNVEILING THE FRAMEWORKS

Understanding sustainability frameworks is key to making informed decisions in carbon markets. This table presents a structured assessment of major frameworks, including the SDG, ICROA, SBTi, and ICVCM.

Highlighting their characteristics in terms of objectives, metrics, global scope, and more, buyers and stakeholders can use this matrix to evaluate project quality, align with best practices, or deepen their engagement in climate action.

Whether seeking transparency, credibility, or sector-specific standards, these frameworks offer guidance for responsible carbon compensation and sustainability strategies. Use this resource to refine your approach and select the most suitable path for your organization**.**

Framework	*Category/ Field*	*Key Metrics*	*Scope*	*Objective*	*other*
Sustainable Development Goals Framework **(SDGs)**	Sustainability Reporting / CSR	Global Indicators Framework (reduce CO2 emissions, GDP per capita, etc.)	Global, Regional and Local	17 Sustainable Development Goals (SDGs)	Interoperability with other initiatives
Oxford Offset Principles	Global Framework/ Carbon Markets	Emission reductions, carbon removal, durability, transparency	Global	Align carbon offsetting with net zero goals, ensuring environmental integrity	Prioritize cutting emissions first, transition to durable carbon removals, support new solutions
Science Based Target initiative **(SBTi)**	CSR/ Climate Action/Industry	Emission reduction targets, sector-specific pathways, net-zero alignment	Global applicability, covering industries, businesses	Limit global temperature rise to 1.5°C, drive corporate climate action	Science-based validation, long-term sustainability strategies, transparent reporting
Ecological Benefits Framework **(EBF)**	Ecological Impacts / CSR	Air, Water, Soil, Biodiversity, Equity and Carbon	Global	•Nature- based approach •Regeneration and Stewardship •Transparency and Integrity, etc.	Six (6) unique user's journeys
Integrity Council for the Voluntary Carbon Market **(ICVCM)**	Voluntary Carbon Market (VCM)	10 Core Carbon Principles	Global Local Communities	Set a global benchmark for high integrity in the voluntary carbon market	Contains the Assessment Framework, Definitions and the Assessment Procedure.

International Carbon Reduction and Offset Alliance **(ICROA)**	Voluntary Carbon Market (VCM)	High-quality carbon credits, emission reductions, environmental integrity	Global applicability, focusing on corporate carbon mngt.	Promote best practices in voluntary carbon markets and ensure credible offsetting	ICROA-approved organizations must meet strict standards for carbon credit transactions and advisory services

5. CARBON REGISTRIES

Carbon registries are the cornerstone of the voluntary carbon market (VCM) and play a crucial role in ensuring the credibility and transparency of carbon credit transactions. These registries track and certify emission reductions, providing verification standards that help buyers assess the quality and impact of carbon offset projects. In addition, they issue unique serial numbers for each credit, documenting project methodologies, and overseeing third-party verification.

In the VCM, registries are not regulatory bodies but **independent platforms** that maintain environmental standards and facilitate market trust. As outlined in the previous chapters, voluntary carbon markets (VCMs) have faced persistent challenges related to transparency and credit quality, often leading to unintended and counterproductive outcomes.

In response, the sector is undergoing a continuous process of self-improvement aimed at enhancing market integrity, accountability, and customer confidence. This evolution includes efforts to harmonize standards, improve verification protocols (MRV), and increase data accessibility to ensure that carbon credits meet the highest expectations for environmental impact and reliability.

According to the *Enhancing the Voluntary Carbon Market* report by the CFA Institute, fragmented standards and a lack of transparency have undermined trust in the VCM, prompting calls for unified frameworks and technological solutions to rebuild credibility (Toucan,2022)

In recent years, more accountability and further revision of the criteria as been undertaken to create a more transparent process. Carbon registry’s objective is to facilitate companies and individuals to offset emissions voluntarily, often in pursuit of sustainability goals (e.g. Net Zero, etc)

By listing major registries with relevant links, this guide offers a resource for users to explore established platforms, understand certification processes, and engage in responsible carbon compensation. Whether you're a corporate buyer, investor, or sustainability advocate, these registries support informed decision-making in carbon markets.

Who's Doing What: Key Carbon Registries (2024)

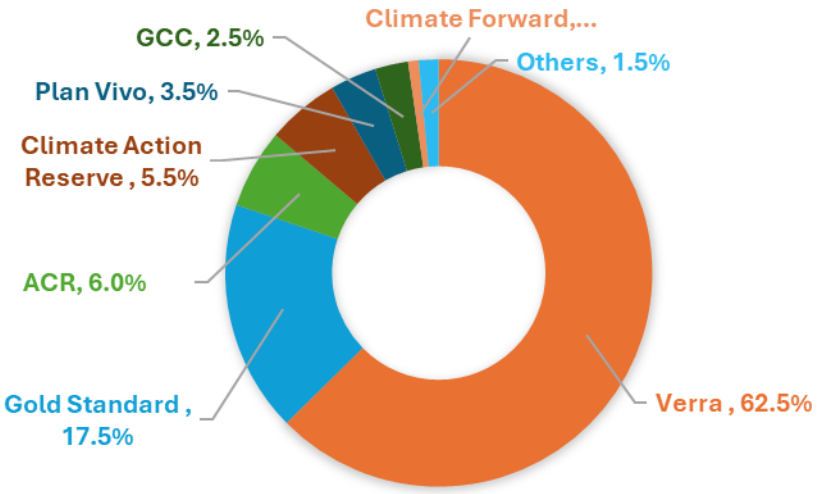

Fig.6: Market Volume Shares of Carbon Credits Issued in 2024 (carboncredits.com, 2024)

Useful Links

Verra:	Verified Carbon Standard (Verra)
Gold Standards:	Gold Standard Impact Registry
ACR:	American Carbon Registry
CAR:	Climate Action Reserve (CAR)
Puro Earth:	Puro.Earth
Plan Vivo:	Plan Vivo
Isometric:	Isometric
ICR:	International Carbon Registry (ICR)
GCC:	https://globalcarboncouncil.com/
Climate Forward:	https://climateforward.org/

Furthermore, in the table below, we present some of the focus areas and the role in the VCM of the most popular carbon registry and offsets initiatives reported in 2024. We suggest reviewing those programs and familiarising yourself with their methodologies, project sectors, and the climate objectives they provide to market customers.

Carbon Registry Program	Market Volume (Million Credits)	Project Locations	Project Sectors
Verified Carbon Standard A VERRA STANDARD	~1,223	Global (notably India, China, USA, Brazil)	Energy, Agriculture & Forestry, Waste, Transport, Industry, Carbon Capture
Gold Standard	~84	110 countries (strong in Africa, Asia, LATAM)	Community Services, Forestry, Waste, Blue Carbon, Agriculture, Shipping
American Carbon Registry	~37	USA, North America, growing global footprint	Industrial Processes, Forestry, Agriculture, Methane Capture, CCS
CLIMATE ACTION RESERVE	~63	USA, Mexico, Dominican Republic, China	Forests, Livestock, Cement, Landfill, Organic Waste, Grasslands
puro.earth	~1.16	USA, Finland, Bolivia, Brazil, UK, Austria	Biochar, Geologic Storage (DACCS, BECCS), Carbonated Materials, Wooden Elements
ISOMETRIC	Data not disclosed	Global (protocols tailored by geography)	Direct Air Capture, Enhanced Weathering, Reforestation, Biochar, Ocean CDR
PLAN VIVO For nature, climate and communities	~10.8	Africa, Asia, Latin America	Reforestation, Agroforestry, REDD+, Blue Carbon, Soil Restoration
GLOBAL CARBON COUNCIL	~3.36	Global South (Asia, Africa, Middle East)	Renewable Energy, CCS, Nature-Based Solutions, Waste, Transport
CLIMATE FORWARD	Data not disclosed	USA, Latin America, Global pipeline	Forecasted Mitigation: Megafires, Composting, Energy Efficiency, Reforestation
ICR international carbon registry	~0.51 ex-post, ~0.01 ex-ante	Global reach; active in Europe, Asia-Pacific, USA	Agriculture, Waste Mgmt, Energy, Forestry, Mining, Fugitive Emissions;

Table 3: Key comparison among the most popular carbon offset programs to consider in 2024.

(Data source estimated based on issuance and retirement volumes tracked by Climate Focus and registry annual reports)

https://climatefocus.com/initiatives/voluntary-carbon-market-dashboard/

https://www.planvivo.org/news/plan-vivo-annual-report-2023-2024

6. A PRACTITIONER'S VIEW

The following insights represent expert feedback from the carbon marketplace, offering valuable perspectives on the current challenges faced in the carbon credit market.

These considerations highlight key factors influencing decision-making for companies and stakeholders involved in carbon offsetting.

> "Companies that have decided to use carbon credits in the Voluntary Carbon Market (VCM) are faced with a difficult decision. Firstly, it is important to understand the difference between the compliance market and the VCM. When offsetting in the voluntary market, it is important to determine in which segment my offsetting should take place. The first decision to be made is whether I want to buy carbon credits from technical solutions or nature-based solutions. Technical **solutions can offer promising long-term potential, though they are currently less scalable and more costly".**
> **"Nature-based solutions provide a range of co-benefits in addition to climate benefits, such as biodiversity, local livelihoods and water quality.**
> There are also large price differences between projects in different sectors, due to various factors such as co-benefits, project location, and project development cost.
> To maintain an overview, avoid reputational risks, and support a project with the highest possible benefit, you need trustworthy partners who can guarantee an appropriate quality assessment of the projects on offer" (*Rudolf Maier,* Co-Founder, Callirius).

7. CONCLUSIONS

The carbon market has long faced challenges related to transparency, quality, and credibility, with past discrepancies undermining trust in carbon compensation options. Issues such as overestimated offsets, double counting, and weak verification standards have slowed meaningful climate progress.

Our current endeavor serves as both an entry point for newcomers exploring the carbon market and a pathway to deeper commitments for sustainability-driven enterprises. This Rulebook provides a structured approach to quality criteria, ensuring transparency and integrity at every stage.

The Decision Tree section serves as a strategic selection process, aligning carbon market participation with key sustainability objectives, ranging from climate action and biodiversity protection to social responsibility, ensuring that investments truly make a difference. By integrating these priorities, we empower organizations to make informed, high-impact choices in their climate strategies.

However, the road ahead remains complex, with regulatory shifts, technological advancements, and economic uncertainties shaping the future of carbon markets. Despite these challenges, urgent action is needed to embrace science-driven and transparent solutions as the key to achieving long-term climate resilience. We call on all stakeholders to commit to higher standards, drive innovation, and actively contribute to a just and effective transition toward a sustainable and decarbonized future.

DISCLAIMER

This guide provides an overview of carbon compensation options; however, all estimates are approximations and may not accurately reflect the precise outcomes. Before making any selection or purchases, companies should consult with an expert and their CFO to ensure alignment with financial and sustainability strategies. Additional regulatory and market factors should also be carefully reviewed.

GLOSSARY

Article 6 (UNEP / Paris Agreement): A framework enabling countries to cooperate on climate action through carbon markets (Articles 6.2 & 6.4) and non-market approaches (Article 6.8), aimed at enhancing ambition and sustainable development

Carbon credit: Tradable permits representing one metric ton of CO_2 (or equivalent GHG) reduced or removed from the atmosphere

Carbon offset: A reduction or removal of greenhouse gas emissions, typically through projects like reforestation or renewable energy, used to compensate for emissions produced elsewhere

Carbon Dioxide Removal (CDR): Processes that physically remove anthropogenic CO_2 from the atmosphere using methods like direct air capture, reforestation, or ocean-based approaches to help reduce global warming

Carbon neutrality: Achieving a balance between carbon emissions produced and removed, typically by avoiding and reducing emissions first and offsetting the remaining through carbon credits or removal projects

Carbon sequestration: Is the process of capturing and securely storing atmospheric carbon dioxide in natural or engineered systems to reduce greenhouse gas concentrations and help mitigate the impacts of climate change.

Carbon sink: is a natural or artificial system that absorbs more carbon dioxide from the atmosphere than it releases, helping to reduce greenhouse gas levels and mitigate climate change.

Emission reduction and avoidance: Emission reduction and avoidance involve actions that decrease greenhouse gas emissions or prevent them from occurring, helping to mitigate climate change by improving efficiency, transitioning to clean energy, or changing practices.

ESG: Environmental, Social, and Governance refers to a set of criteria used to evaluate a company's performance in sustainability, ethical impact, and corporate governance, guiding responsible investment and business practices.

Marketplace: A marketplace is a platform where carbon credits are bought and sold, enabling organizations to offset emissions and financially support projects that reduce or remove greenhouse gases from the atmosphere.

NbS: Nature-based solutions (NbS) are strategies that leverage natural ecosystems to address environmental, social, and economic challenges. These solutions include reforestation, wetland restoration, sustainable agriculture, and coastal protection to enhance biodiversity, mitigate climate change, and improve resilience.

NETs: Negative Emission Technologies (NETs) refer to methods that actively remove carbon dioxide (CO_2) from the atmosphere to counteract climate change. These technologies include Direct Air Capture (DAC), Bioenergy with Carbon Capture and Storage (BECCS), and enhanced weathering, among others.

Net Zero: Net zero refers to balancing the amount of greenhouse gases emitted with the amount removed from the atmosphere, achieving a state where no additional climate-warming emissions are added overall.

Project developer: A project developer in a carbon market designs, implements, and manages projects that reduce or remove greenhouse gas emissions, generating carbon credits for sale or trade within compliance or voluntary carbon markets.

Risk management is the process followed by anyone responsible for an activity or workspace. It involves identifying hazards, assessing the risk presented by those hazards, determining the most effective way of controlling that risk, and checking to see if the controls are effective over time.

Risk assessment helps determine the best way to minimize (or control) risks. We should always attempt to eliminate a hazard, but this is not always possible.

Third-party verification involves an independent organization assessing a project's emission reductions or removals to ensure accuracy, credibility, and compliance with established carbon standards and methodologies.

TbS: Refer to NETs definition

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