

Voluntary carbon market supply chains

Mapping stakeholders

Voluntary carbon markets are key to net zero commitments by 2050. However, for this to happen VCM need to grow 15 times in 25 years to meet those goals.

VCMs are not regulated as compliance markets are, however, VCMs are more complex as voluntary carbon credits can be issued by different standards across the globe following diverse methodologies and traded in different registries through many intermediaries.

The VCM supply chain includes a range of intermediaries in complex finance and good flow. VCM starts the moment a **project developer** (e.g., company, farm, individual or organisation) plans, implements, registers carbon credits, and obtains certification of the project avoidance, reduction or removal. To obtain a verification, a project developer must comply with **carbon offset standards'** methodologies, processes and rules, apply methodologies approved by standards, and verify and validate their project through third-party auditors or **Validation and Verification Bodies**. Projects can be developed in different areas such as community-based, NbS projects (Forestry, Agriculture, and Wetlands), Energy, Construction, Waste, Agriculture, Grasslands, Livestock and manure, Industrial Processing, Transport, Mining, Forestry, Wetlands, etc.

Carbon offset standards

Set standards, and methodologies for different project types quantifying GHG benefits. These standards certify carbon projects and programs and facilitate carbon credit trading through their registries. Some of the most world-recognised carbon standards are the Verified Carbon Standard (VCS) by VERRA, the Gold Standard (GS), the American Carbon Registry (ACR), the Climate Action Reserve (CAR), Clean Development Mechanism (CDM), Plan Vivo (specific requirements to community projects in Global South), VERRA for Climate, Community and Biodiversity Standard (CCBA), the Sustainable Development Verified Impact Standard - SD VISta), the Gold Standard for the Global Goals (GS4GG), Peatland Code, Woodland Code, REDD+ Environmental Excellence Standard (ART/TREES), ISO 14064-2.

Carbon Standard	Credits
VCS	Verified Carbon Units (VCU)
GS	Verified Emission Reductions (VERs)
ACR	Emission Reduction Tons (ERTs)
CAR	Climate Reserve Tonnes (CRTs)
Woodland Carbon Code	Woodland Carbon Credits (WCCs)
Peatland Code	Peatland Carbon Units (PCUs)
Plan Vivo	Plan Vivo Certificates (PVCs)

**Each standard has a particular geographical and sectoral scope, and each credit represents 1tCO₂e.*

Registries: centralised registries are used to track all credits generated, transfer tradable credits and trace transactions between buyers and sellers.

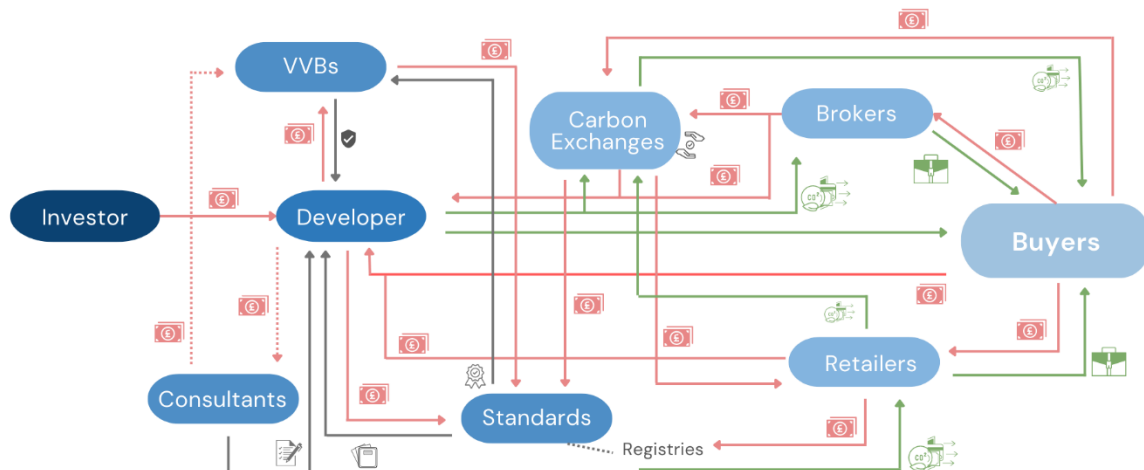
Validation and verification bodies

VVBs validate a project if all requirements are met either before or during implementation. If all conditions are met, then projects can be registered, and credits can be issued to be verified after registration. Third-party auditors verify reports of real avoided or sequestered data reported by developers during their projects.

Financial flows

Credit buyers can purchase carbon credits directly from developers or can use intermediaries either carbon exchanges, traders or brokers to complete their transactions (fig.1). Developers should pay fees for project registration and credit issuance to Carbon Standards, and they must pay validation and verification fees to Validation and Verification Bodies. Developers could pay VVBs directly or they could use consulting services to assist them in dealing with validation and verification processes. Consultants will also need to pay annual fees to Carbon Standards for accreditation.

Fig.1 Financial and Product Flows



Challenges

VCMs are becoming increasingly popular with the exploding Net zero targets, especially in the UK, and thus are expected to grow exponentially to meet the demand. However, one of the major challenges regarding VCM is regulation. VCM are mostly unregulated and could remain so considering the diversity of actors and multiple geographical and sectoral scopes which translates into an immediate need for transparency and integrity regarding double counting of GHG emission reductions, human rights abuses and greenwashing that has been a common denominator in many projects in the past. The versatility of VCM poses a question on power dynamics as some

companies get to decide and influence new rules or institutions not to mention the diversity of roles and overlapping interests – brokers can also be project developers; buyers can fund the development of projects.

Carbon Pricing in the voluntary market is diverse due to the different aspects involved in pricing such as what is intrinsically related to the project development –additionality, transparency and duration, and what is determined by carbon credits trading. Low transaction costs and the alternative of doing projects with more attractive prices flag the possibility of companies using voluntary carbon credits with no intention of reducing their emissions or committing to net-zero goals in the long term.

Although projects must be validated and verified before the issuance of carbon credits, it does not necessarily translate into effective carbon removals or reductions throughout their duration. Carbon emissions could be reversed, due to unexpected events like natural disasters, for instance, projects in afforestation/reforestation have a high risk of experiencing emissions removals.

What is coming ahead?

Establishing Core Carbon Principles (CCPs) set criteria for high-quality carbon credits to provide a framework for quality, integrity and transparency.

Corresponding adjustments for VCM to prevent double counting in international transactions.

While CCPs target supply-side quality and integrity, it is imperative to target demand quality and transparency. Participant eligibility criteria will be key to establishing principles for buyers in voluntary carbon markets and that those are not leaving aside their commitments and responsibilities to reduce emissions.

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