



Sustainable
Stock Exchanges



Voluntary Carbon Markets:

An introduction for exchanges

2022



MARKET MONITOR



SDG 13 - Climate Action

Highlights

- Voluntary carbon markets (VCMs) leverage market mechanisms to promote investment in projects that reduce, avoid or remove harmful greenhouse gases.
- The voluntary carbon market environment is growing at a rapid pace, achieving record-breaking growth year on year.
- If held to high standards of integrity and transparency, carbon markets offer huge potential to advance efforts to accelerate critically-needed climate action.
- Carbon credits often include non-carbon co-benefits addressing other social and environmental issues. In this way, carbon markets may be useful in facilitating a just transition and contributing to a range of SDGs.
- The SSE is actively growing its knowledge base on carbon markets. To support this work, on 9 November 2022 at COP27, the SSE launched the SSE Carbon Markets Advisory Group, and invites SSE members and other relevant stakeholders to join. Contact the SSE at info@sseininitiative.org to join or learn more.

PART 1: INTRODUCTION TO VOLUNTARY MARKETS

? What are carbon markets and how did they originate?

The world needs to take urgent action to combat climate change and its impacts, as highlighted by Sustainable Development Goal 13 (Climate Action). An increasingly used response is to put a price on carbon emissions via the creation of a carbon market. Carbon markets are marketplaces or facilities where emission allowances, credits and financial instruments based on such credits are bought and sold. Carbon credits represent a reduction, sequestration or avoidance of the emission of a set amount of carbon dioxide or other greenhouse gas (GHG). A buyer of such a credit is buying the allowance to emit a set amount of GHG, which is offset against the credit amount.

Former Executive Secretary of the UNFCCC, Yvo de Boer has noted¹ that by putting a price on carbon, a “unique environmental commodity on the international market” was created. The notion of offsetting GHG emissions arose more than three decades ago,² as the need to mitigate climate change increasingly attracted the attention of policymakers. This led to climate policy instruments such as emissions trading systems (ETs) being established at national or regional levels. Simultaneously, private companies started to develop voluntary deals offsetting GHG emissions with carbon credits.

Article 6 of the Paris Agreement opens the door to countries to use international carbon markets to meet their nationally determined contributions (NDCs). More than two thirds of countries intend to use carbon markets to meet their NDCs, and a number of countries are investing in state-of-the-art digital infrastructure to enable participation in international carbon markets.³ It is estimated that trading in carbon credits could reduce the cost of implementing NDCs by more than half.⁴ Replacing the Kyoto Protocol’s international carbon credit programmes, the mechanisms under Article 6 are intended to intensify and accelerate action through more ambitious target setting. Additionally, these mechanisms can be used for the creation of new markets and large reductions in global GHG emissions.⁵

? What types of carbon markets exist and how do they differ?

Carbon markets today are primarily either *compliance markets* or *voluntary markets*.

- **Compliance markets** are regulated by law and mandate GHG emitters to meet reduction requirements. Offsets serve either as an alternative mechanism to direct emission reductions or as an allowance to meet an emissions cap (a maximum limit on the amount of emissions that is allowed).⁶ Compliance markets are primarily established as emissions trading schemes and use a “cap and trade system”, through which an absolute level of emissions (the ‘cap’) is established and emissions allowances are allocated to GHG emitters governed by the scheme. Allowances can be traded (bought and sold at a price) between such entities. The system thus provides financial incentives for emission reductions, as unneeded allowances can be sold to emitters that are unable to keep their emissions below their allocated amount. The cap is lowered over time to ensure emissions are reduced.

¹ At the [Bali Climate Change Conference](#) in December 2007

² Environmental Defense Fund web page [Three Decades of Carbon Markets Success](#)

³ World Bank (24 May 2022) [Countries on the cusp of carbon markets](#)

⁴ World Bank (17 May 2022) [What You Need to Know About Article 6 of the Paris Agreement](#)

⁵ Carbon Market Solutions (2018) [State of the International Carbon Market](#)

⁶ Carbon Offset Guide web page [Compliance Offset Programs](#)

- Voluntary carbon markets (VCMs)** serve the demand for credits outside of regulated schemes, and enable the buying and selling of emission credits that are issued under projects that achieve emission reductions. They enable the buying and selling of carbon offsets that are not used for compliance purposes. Participants in the voluntary market range across companies, governments and private individuals aiming to reduce their carbon footprint. Corporate participants range across various sectors, and participate either individually or as part of industry-wide schemes. Voluntary markets rely on verification or certification of projects to provide prospective buyers with confidence about the claimed amount of carbon emissions to be avoided, decreased or removed.

This Market Monitor focuses primarily on the voluntary carbon market, although the newly launched *SSE Carbon Markets Advisory Group* may also explore the compliance market in more depth as part of future work.

Why is there so much interest in VCMs?

Achieving effective climate action requires a large increase in investment. Policymakers and the private sector are both looking to carbon markets as part of the answer to finance the transformation needed to address the climate crisis.

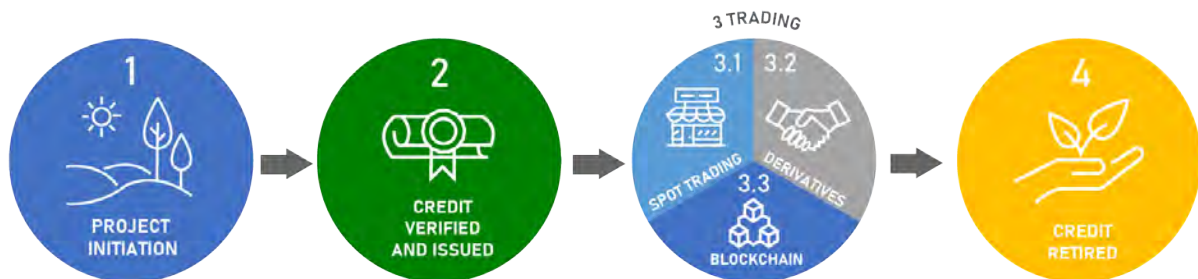
VCMs have the potential to mobilise investments and infrastructure where resources may otherwise be insufficient to realise emission reduction commitments.⁷ In this way, VCMs can unlock financing to be directed to climate-action projects that could make a critical difference in the transition that is needed. In addition, buying carbon credits is one way for an entity to address emissions that it may not be able to remove with existing technologies. VCMs offer access to emission credits to assist organisations to meet net zero commitments.

In addition, there is a growing recognition and integration of non-carbon co-benefits (such as social upliftment or biodiversity benefits) into carbon credit projects. This increases the attractiveness of projects for participants in the carbon market as part of action towards meeting broader sustainable development objectives.

How does a VCM work?

The value chain of a VCM typically has four elements.

Figure 1: Typical Structure of a VCM



Source: UN SSE

⁷ Climate Focus (Aug 2021) Balancing the needs of stakeholders for a successful voluntary carbon market

Step 1: Project initiation: Credits are generated from projects that aim to achieve environmental benefits across two broad groups:

- GHG *avoidance / reduction* from existing sources. For example, funding the implementation of lower-carbon technologies such as renewable energy, or avoiding practices that cause emissions such as reducing deforestation.
- GHG *removal / sequestration*, which involves taking CO₂ out of the atmosphere and using or storing it, either through nature-based solutions such as reforestation, or technology-based removal such as carbon capture and storage mechanisms.⁸

It is becoming increasingly common for projects to also generate broader environmental, social, and economic co-benefits, whether through increased biodiversity or benefits for local communities such as job creation, greater gender equality or health benefits from avoided pollution.

Step 2: Verification. A GHG accreditation and verification methodology (generally known as a “*carbon standard*”) is applied to *certify* the emission reductions / avoidance / removal claim, based on evidence of compliance being reviewed by an independent third-party. When verified, credits are issued, entered into a registry and made available for trade. The registry records and labels the credit, tracks the owners, and makes information about credits on offer publicly available through a ledger.⁹ The registry bodies set the relevant standards for verification and monitoring.

Four private carbon standards registry bodies dominate the VCM environment at present:

Figure 2: The four dominant carbon standard setting bodies

Standard	Market share	Name of Credits	Geographical scope	Sectoral scope
Verified Carbon Standard (Verra)	Approx. 70.4%	Verified Carbon Units (VCUs)	Global (dominant in developing countries)	All project classes
Gold Standard (GS)	Approx. 17.3%	Verified Emission Reductions (VERs)	Global (buyers mostly from EU)	Most project classes except REDD+
Climate Action Reserve (CAR)	Approx 6.93%	Climate Reserve Tons (CRT)	United States and pilot project in Mexico	Agriculture, forestry, energy, waste, non-CO ₂ GHG abatement
American Carbon Registry (ACR)	Approx. 5.95%	Emission Reduction Tons (ERTs)	United States	Industrial processes, land use, forestry, carbon capture, waste

Source: Climate Focus (2022) [The Voluntary Carbon Market Explained](#) Chapter 7

Step 3: Trading: Buying and selling of credits take place when polluters buy credits made available by projects to offset their own emissions. The credits can be traded on a physical or spot market (where funds and credits are exchanged immediately) ([Step 3.1](#)) or be applied as the underlying asset to carbon derivatives contracts for physical delivery ([Step 3.2](#)). Credits can also be included in index products. In a market-based environment, it is increasingly common for projects to be pooled based on a suite of project-specific risk factors or specified characteristics. Such pools of carbon credits can be traded as

⁸ Taskforce On Scaling Voluntary Carbon Markets Report (January 2021) [A blueprint for Scaling Voluntary Carbon Markets](#)

⁹ CarbonBetter (13 July 2022) [Carbon Offset Registries: An Overview - CarbonBetter](#)

tokens on a digital exchange in a similar way to how they can be traded on traditional trading platforms (Step 3.3).

Step 4: Retirement: When carbon credits are purchased, they are retired to enable the buyer to *realise the benefit of the reduction*, namely to offset their own emissions. Upon completion of the transaction, the registry will retire the relevant credit on the ledger to make sure no one else can buy it again. This ensures that the same carbon credit cannot be applied to more than one claim of offset.

❓ How big is the voluntary carbon market?

The global voluntary carbon market has nearly quadrupled in value from 2020, according to a recent briefing by Ecosystem Marketplace (EM), which has been tracking the state of VCMs since 2006.¹⁰ Their research shows that the current global VCM environment grew to nearly \$2 billion in value in 2021. The growth is being attributed to an acceleration of trading volume in nature-based solutions and global prices trending upwards. The report further shows that about 500 million carbon credits were traded in the same year, surpassing the previous year's data by 66%. As a result, approximately 23% of global emissions are now covered by some form of carbon pricing (either VCMs or compliance markets).¹¹ The World Bank has developed a Carbon Pricing Dashboard that tracks which countries have implemented compliance offset programs and other carbon pricing instruments.¹²

❓ What are some success factors for a viable VCM?

- **Liquidity:** An efficient VCM needs a robust supply of projects balanced with sufficiently healthy demand for credits and related financial instruments. This will enable a well-functioning marketplace where liquidity is present and bargaining of prices can take place.
- **Integrity:** To support economic viability and scaling of the VCM, the credibility of participants and integrity of the credits and related processes need to be above reproach and sufficiently transparent. The VCM achieves its ultimate purpose if project implementation achieves the intended outcome in emissions abatement. Where credits are traded through more sophisticated financial instruments such as futures contracts or tokens, reliance on verification is critical to ensure that the ultimate buyer can realise the offset when the credit is retired.
- **Additionality:** The credits need to represent reductions that are 'additional' to what would have happened if the project had not been carried out. Only carbon credits from projects that are 'additional to' the business-as-usual scenario represent a net environmental benefit.¹³

❓ What are some of the current complexities facing VCMs?

- **Policy:** Both public and private sector actors are still developing their knowledge about how best to leverage VCMs. As with all public markets, policy and regulation are critical to ensuring the stability, integrity and security of the market. A balanced policy approach is needed to simultaneously ensure integrity in VCMs (including combatting greenwashing), while also allowing VCMs enough flexibility to evolve and innovate optimum approaches to financing emissions reductions.
- **Classification:** Despite a relatively common view that a carbon credit is akin to a commodity, lack of clarity exists about the precise legal classification of the asset. Given its intangible nature, the

¹⁰ Ecosystem Marketplace (Aug 2022) [VCM Reaches Towards \\$2 Billion in 2021: New Market Analysis Published from Ecosystem Marketplace](#)

¹¹ UNDP Climate Promise (16 June 2022) [Africa needs carbon markets | Climate Promise](#)

¹² World Bank [Carbon Pricing Dashboard](#)

¹³ Gold Standard (17 November 2020) [What does "additionality" mean and why is it important? : Gold Standard](#)

legal rights attached to the creation, verification and transfer of a credit, as well as related aspects such as its treatment for accounting purposes, may vary according to regulatory interpretations of these questions across different jurisdictions.¹⁴

- **Regulation:** VCMs can be seen as opaque and difficult to navigate because they are currently mostly unregulated. The uncertainty about the governance rules that apply, creates a risk that project implementation may be delayed. In addition, project developers may view the development of new projects as prohibitively risky in light of these uncertainties.¹⁵
- **Evasion:** One of the criticisms levelled at VCMs is that the offset mechanism they supply may be used as a replacement for direct actions to implement emission reductions elsewhere in the economy. The resultant offsets may create misconceptions that emission reductions are occurring, negating the need for regulatory interventions to mandate direct actions.¹⁶
- **Volatility:** In voluntary markets, pricing is not necessarily regulated according to a particular project or program,¹⁷ and can vary considerably according to the project type, its age, the size of the transaction and the standard to which it is accredited.¹⁸ The uncertainty and volatility in pricing is particularly acute in lower-income developing countries, and can lead to perceptions that the VCM is chaotic and unpredictable.
- **Fragmentation:** The lack of transferability of carbon credits between registries can cause market fragmentation. Credits are typically issued by a particular standards body and stored in a registry managed or retained by this body. Since VCMs typically work with a single preferred standard and registry, the access of buyers in this market is limited in terms of the range of credits to which they have access.

PART 2: CONSIDERATIONS FOR EXCHANGES

? What is the role for exchanges in VCMs?

Exchanges are engaged in nearly all aspects of the VCM value chain (see Figure 1 above). This includes facilitating the trading of credits, either through offering or collaborating with trading platforms to match buyers and sellers (Step 3.1), or through listing futures contracts based on carbon credits (Step 3.2). However, exchanges have also started entering other aspects of the value chain, including facilitation of project development financing (Step 1) and registry services for verified credits (Step 2). This suggests that there may be multiple opportunities for exchanges to contribute to the VCM environment. The exact opportunities for an exchange to engage with VCMs may vary depending on whether the exchange is trying to engage with global-, regional- or national-level markets.

? How can exchanges get involved?

- While various initiatives to support the low-carbon transition continue to grow, there is a need for faster and more extensive scaling to meet the ambitions agreed to under the Paris Agreement. VCMs can play a significant role to enlarge the scope of opportunity. VCMs also lend themselves to global markets, as they seek maximum liquidity and exchanges are well-positioned to support the scaling needed to achieve this.

¹⁴ ISDA (1 December 2021) [Legal Implications of Voluntary Carbon Credits](#)

¹⁵ Voluntary Carbon Markets Global Dialogue [Project Developer Engagement with the VCM](#)

¹⁶ Voluntary Carbon Markets Global Dialogue [Project Developer Engagement with the VCM](#)

¹⁷ Carbon Offset Guide web page [Compliance Offset Programs](#)

¹⁸ Trove Research (June 2021) [Future Demand, Supply and Prices for Voluntary Carbon Credits – Keeping the Balance](#)

- VCMs are part of a broader ecosystem of mutually supportive efforts to enable the low-carbon transition (“one of many puzzle pieces in effective climate action and policy”).¹⁹ Projects issuing a credit on a VCM may, for example, be financed through multiple routes. Similarly, exchanges may be able to offer various capital raising opportunities to projects to support not only the issue of credits but the ultimate realisation of emission reductions.
- It is well established that exchanges can enhance price discovery and liquidity in other asset classes, and it may be able to support these aspects of voluntary carbon trading as well.
- As technologically-driven organisations, exchanges may be able to offer new and fast-evolving technologies to support scaling as well as transparency and integrity.
- Through their unique positioning in the capital markets, exchanges may be able to facilitate capacity building and stakeholder collaboration, and contribute to policy discussions. The advanced work of many exchanges in promoting greater transparency and disclosure on ESG, as well as efforts to support green finance, will serve as a useful backdrop to such efforts.

❓ How can the SSE support exchanges work on carbon markets?

At COP27 the SSE officially launched its new *SSE Carbon Markets Advisory Group*. This advisory group will convene parties across the value chain to continue building a knowledge base about developments in carbon markets and the particular relevance for exchanges. By offering its stakeholders (and particularly SSE Partner Exchanges) the opportunity to learn from those that are already active in the VCM environment, share their own experiences and challenges, and facilitate the development of guidance, the SSE aims to assist exchanges that are exploring VCM options for their markets and accelerate good practices in this area. To join this advisory group or learn more about the SSE’s work on carbon markets, contact us at: info@SSEinitiative.org

¹⁹ Voluntary Carbon Markets Global Dialogue [Project Developer Engagement with the VCM](#)

Note

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About UN SSE

The SSE initiative is a UN Partnership Programme organised by UNCTAD, the UN Global Compact, UNEP FI and the PRI. The SSE's mission is to provide a global platform for exploring how exchanges, in collaboration with investors, companies (issuers), regulators, policy makers and relevant international organisations can enhance performance on environmental, social and corporate governance issues and encourage sustainable investment, including the financing of the UN Sustainable Development Goals. The SSE seeks to achieve this mission through an integrated programme of conducting evidence-based policy analysis, facilitating a network and forum for multi-stakeholder consensus-building, and providing technical guidelines, advisory services and training.

Acknowledgements

The report was prepared by: Corli Le Roux (SSE Senior Specialist), Anthony Miller (SSE Coordinator), Lisa Remke (SSE Deputy Coordinator), and Tiffany Grabski (Lead, SSE Academy). The design of the cover and the typesetting of the report were done by Nahir Cavaleri (SSE Design Assistant). This document has benefited from information exchanges and informal discussions with a range of organisations. These include the following SSE Partner Exchanges: CME Group, The Egyptian Exchange (EGX), Hong Kong Exchanges and Clearing Market (HKEX), the Intercontinental Exchange (ICE), MexiCO2 at the Bolsa Mexicana de Valores and Nasdaq. Other organisations consulted include the the United States Commodity Futures Trading Commission (CFTC), the Futures Industry Association (FIA), the International Organization of Securities Commissions (IOSCO), the International Swaps and Derivatives Association (ISDA), the United Nations Framework Convention on Climate Change (UNFCCC) and Verra.



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