

# Trading Carbon Credits

Unlocking Value for Stock Exchanges

November 2022

## Contents

3	<b>Executive Summary</b>
7	<b>What Is ESG Investing?</b>
8	<b>What Is the Paris Agreement?</b> <ul style="list-style-type: none"><li>Goals of Paris Agreement</li><li>Global Stocktake</li><li>How Do Signatories Set and Achieve Climate Goals?</li></ul>
10	<b>What Are Carbon Credits?</b> <ul style="list-style-type: none"><li>How do Carbon Credits Fit Into the Paris Agreement?</li><li>How a Stock Exchange-Operated Carbon Credit Marketplace Works</li></ul>
13	<b>Carbon Credits on the Stock Exchange</b> <ul style="list-style-type: none"><li>Participants</li><li>Ecosystem Visualization</li><li>What is Tokenization, and Why Tokenize Carbon Credits?</li><li>Framework for Carbon Credits on the Stock Exchange</li><li>Reference Standards</li><li>Project Eligibility and Additionality</li><li>Verifier Registries</li></ul>
18	<b>Summary</b>

# Executive Summary

When it comes to investing, some things never change – investors will always seek to put their money into investments that generate the best ROI within their risk tolerance. However, other factors are entering this longstanding equation that simply cannot be ignored. In the 21st century, that factor is the importance of corporate commitment to Environmental, Social and Governance (ESG) mandates.

## Executive Summary

When it comes to investing, some things never change – investors will always seek to put their money into investments that generate the best ROI within their risk tolerance. However, other factors are entering this longstanding equation that simply cannot be ignored. In the 21st century, that factor is the importance of corporate commitment to Environmental, Social and Governance (ESG) mandates.

This is particularly true of the environment, especially since 2015 when 194 members of the United Nations signed the Paris Agreement on climate change. One of the chief goals of the Agreement was for countries to encourage the growth of a green economy through smart public policy, creating opportunities for green-minded entrepreneurs and investors.

There are many ways to accomplish these goals, and one of the most important is the creation and management of a fair and effective Carbon Credit Registry (CCR) as part of a cap-and-trade system for greenhouse gas (GHG) emissions. In these systems, polluters are taxed on their emissions, often in the millions of dollars, but can offset those taxes by supporting green businesses. Such CCRs empower green projects – those that minimize or reduce emissions of GHG – to quantify their positive impact in the form of credits and sell them for cash to investors and polluters. Companies that emit GHG above their government-set cap can purchase these credits to offset their emissions, supporting a green economy while eliminating their carbon tax burden.

In this sense, green projects behave like issuers in the stock market, providing disclosure and reporting on their activities to quantify their green benefit in credits, and selling those credits to raise capital.

While many independent CCRs exist already, they suffer from shortcomings and monitoring issues that undercut their authority and erode investor confidence in the carbon credit marketplace. Examples include:

- Double-spending of carbon credits
- Ineffective enforcement of standards for green projects
- Poor tracking of carbon credits in circulation
- Low transparency
- Difficult onboarding process deters projects
- Registry and trading are segmented
- Settlement risks
- The perceived risks and shortcomings of these exchanges keep skeptical ESG-minded investors from participating

Stock exchanges are the ideal organization to establish and run CCRs and support a green economy. They feature a strong reputation to list critical information people can trust, as well as an ecosystem of industry partners to perform key roles:

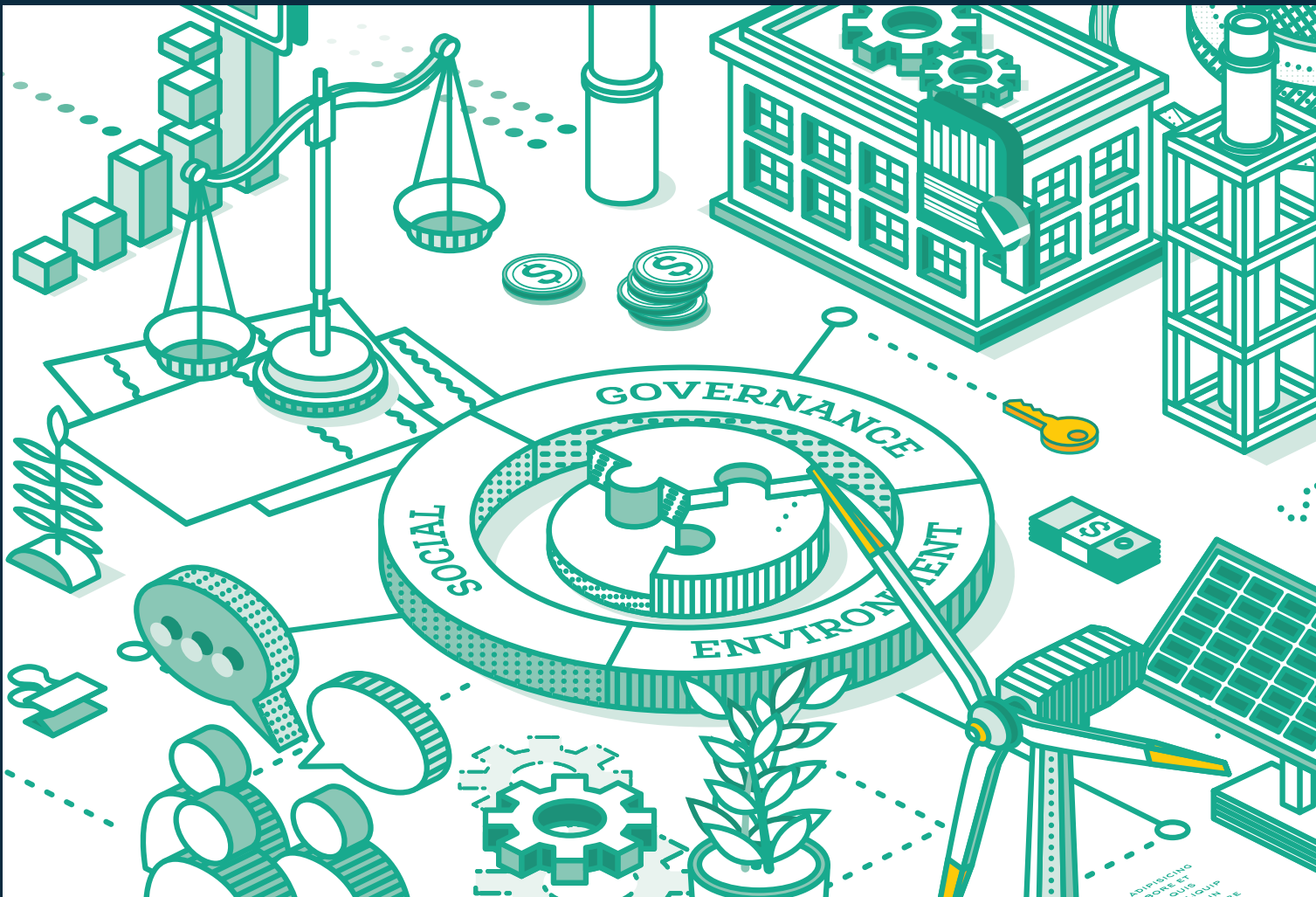
- Licensed broker-dealers to on-board investors and facilitate trades;
- Depositories and custodians to maintain safe custody and ensure settlement
- A regulatory body to monitor the marketplace

With their existing framework of strong regulatory adherence and ecosystem partners, stock exchanges are ideally placed to support their countries in meeting Environmental goals through the addition of Carbon Credits to their trading ecosystem. Further, by embracing modern technology. For example, the blockchain can act as a secure, immutable ledger of transactions, eliminating the double-spend problem and boosting transparency for the benefit of all participants. Further, it can be simple to integrate into stock exchange operations.

In doing so, stock exchanges stand to attract not only green companies, but the growing pool of ESG-minded investors, generating more listing and higher trading volumes simultaneously. Further, as many government sanctions prevent domestic industries from trading with polluters as part of their ESG mandates, it will become increasingly essential for GHG-emitting companies to offset their carbon footprint by purchasing carbon credits. This dynamic creates even more opportunities for stock exchanges to attract investors and generate trading volume.

**This white paper will provide background on ESG, the Paris Agreement, and Carbon Credits, and outline the role that blockchain technology and stock exchanges can play in driving growth as well as global efforts to halt climate change.**

ESG-rated listings can attract the growing number of socially conscious investors while generating increased trading volume.





# What Is ESG Investing?

Environmental, Social, and Governance (ESG) investing is a set of standards for a company's behaviour used by socially conscious investors to screen potential investments. Examples of environmental criteria include considering how a company safeguards the environment, reduces or offsets greenhouse gas (GHG) emissions, and adopts corporate policies addressing climate change.

For an example of this look no further than PGIM, a global investing firm with over \$1.3 trillion USD in total assets under management. Its leadership team recognizes the importance of ESG-minded investing, having grown its portfolio of impact investing by over \$2.5 billion in the last five years alone.

Stock exchanges that list more companies with strong ESG ratings stand strengthen their overall index from an ESG standpoint, attracting the growing number of socially conscious investors while generating increased trading volume. In doing so, they grow profits for all stakeholders as well as support the green economy, helping to meet their country's or region's overall Paris Agreement commitments and ultimately safeguard their global reputation and value.

# What Is the Paris Agreement?

Often referred to as the Paris Accords or the Paris Climate Accords, the Paris Agreement is an international treaty on climate change that was adopted in 2015 through the United Nations Framework Convention on Climate Change (UNFCCC). Nearly 200 countries have signed and ratified the agreement, which commits them to setting and meeting various climate change goals through a mixture of public policy and investment impacting the direction of growth in the free market.

## Goals of Paris Agreement

From a purely climate perspective, the long-term goal is to limit the rise in mean global temperature to less than 2 °C (3.6 °F) above pre-industrial levels, and preferably limit the increase to 1.5 °C (2.7 °F). In order to accomplish this, GHG emissions should be reduced as soon as possible and reach net-zero by the middle of the 21st century, with an ambitious target cutting them in half by 2030.

Ultimately, the Agreement is intended to help countries adapt to climate change effects by encouraging them to develop policies and mobilize enough finance to achieve their climate goals.

## Global Stocktake

As part of the goal to hold signatories accountable and encourage them to take an increasingly aggressive stance on climate change, the Agreement mandates a Global Stocktake event that occurs every five years. This Conference of the Parties (COP) is an opportunity for signatories to report on their progress, set new goals, and collaborate on cross-border initiatives.



**United Nations**  
Climate Change

COP 27 - UN Climate Change Conference  
occurs in Egypt in November, 2022.



## How Do Signatories Set and Achieve Climate Goals?

Each country must determine, plan, and regularly report on its contributions to the international community. No mechanism forces a country to set specific emissions targets, but under the Agreement each successive target should be more aggressive than those that came before.

Climate contribution goals are set every five years and are to be registered by the UNFCCC Secretariat. Typically, the pathway to achieve the goals set is through a mixture of tools, including:

- Public policy imposing requirements on private corporations and citizens to curb GHG emissions and promote environmentally friendly behaviour
- Publicly funded works and infrastructure
- A cap-and-trade policy
- Taxes GHG-emitting corporations on emissions above a certain level, or government-mandated cap
- Allows emitters to offset those emissions by purchasing Carbon Credits (CCs) from GHG-reducing or otherwise green companies, or other investors who have purchased CCs for speculative purposes



# What Are Carbon Credits?

Carbon Credits (CCs) are any tradable token, certificate or permit representing the right to emit a set amount of carbon dioxide or tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e). They are an essential part of any cap-and-trade policy and feature prominently in many government efforts to mitigate the growth in concentrations of GHG.

A typical workflow for CCs is as follows:

1. A green project signs up with a Carbon Credit Registry (CCR) and provides detailed disclosure about their project, including how it will reduce GHG
2. An authoritative Validator with expertise in the project's sector (such as afforestation, solar power, etc.) monitors the project over a period of time and reports on the tonnes of carbon dioxide (tCO<sub>2</sub>) or equivalent gases (tCO<sub>2</sub>e) captured or reduced
3. The CCR onboards investors and GHG-emitting companies seeking to reduce their tax burden for exceeding the carbon emissions cap
4. GHG emitters and investors buy and sell CCs
5. GHG emitters claim the CCs they own against GHG emissions that exceed their cap, effectively retiring the CCs and removing them from the marketplace

In this way, CCs behave much like securities – their value fluctuates according to supply and demand, and great care must be taken to ensure a fair, effective and efficient marketplace that protects the integrity of its participants as well as the CCs themselves.

## How do Carbon Credits Fit Into the Paris Agreement?

CCs and CCRs incentivize companies to engage with green projects, knowing that they can commoditize their efforts by selling the carbon credits they generate. At the same time, CCs and CCRs permit essential industries that are GHG-intensive by nature to continue operations while empowering them to support green initiatives, effectively offsetting their carbon footprint.

The cap-and-trade model is widely viewed as an essential tool for creating a green economy that rewards companies for investing in green infrastructure and solutions while empowering polluters to generate a net benefit to the environment.

CCRs typically take steps to ensure that any green projects they list and issue credits for meet the definition of "Additional": the concept that the green project would not occur without the existence of a CCR in the first place. For instance, projects that are paid for through government funding or are required by law or are otherwise part of business as usual are not additional, while those undertaken voluntarily can be. Examples include:

Additional (Voluntary)	Not Additional (Non-Voluntary)
Creating a carbon sink where none would exist without the project	Installing solar panels due to government requirements
Planting new trees	Protecting natural areas from industrial use

The CC marketplace is small, currently valued at \$2 billion USD but set for explosive growth in the years to come as countries ramp up their efforts to meet and report on their Paris Agreement commitments.

REAL-WORLD EXAMPLES

### Carbon Credit Registries (CCRs)

CCRs are organizations that typically limit their activities to the registration and verification of GHG-reducing projects, as well as quantifying the credits they are issued to sell and further support their green activities. Most CCRs do not also act as the marketplace where the buying and selling of Carbon Credits (CCs) occurs.

CCRs typically enter into partnerships with exchanges that rely on the CCR’s expertise to validate green projects and the CCs traded.

EXAMPLES INCLUDE:

- American Carbon Registry (ACR)
- Gold Standard Foundation
- BC Carbon Registry
- The Climate Registry
- Climate Action Reserve

### Carbon Credit Exchanges

Exchanges are where CCs are bought, sold and retired to offset a polluter’s GHG emissions and tax burden for exceeding their GHG emission cap.

They often operate independently of the CCR and are responsible for tracking all trade activity, including the retirement of credits from the market when polluters claim them against their emissions cap tax burden.

EXAMPLES INCLUDE:

- Carbon Trade eXchange (CTX)
- AirCarbon Exchange (ACX)
- Toucan Protocol
- Xpansiv

## How a Stock Exchange-Operated Carbon Credit Marketplace Works

The existing CC ecosystem today operates similarly to a security marketplace, with roles for:

- Exchange (list projects; manage the market)
- Broker (onboard investors and emitters; make trades)
- Projects (issuers of CCs who provide disclosure and list their green projects on the marketplace to sell)
- Investor/Polluter (buy and sell CCs; retire CCs to claim against tax burden)








The most notable addition to this ecosystem is the Verifier, which is essentially an independent auditor for Projects. These are typically engineering firms with subject matter expertise in the area of a given carbon credit type, such as forest restoration, fuel efficiency or solar power, among others. The firm must have methods of measuring with a consistent documented standard. Although not required in all regions, it can add more trust if the verifiers have certifications of quality standards like ISO and DNV.

While CCRs exist, problems exist in the current market:

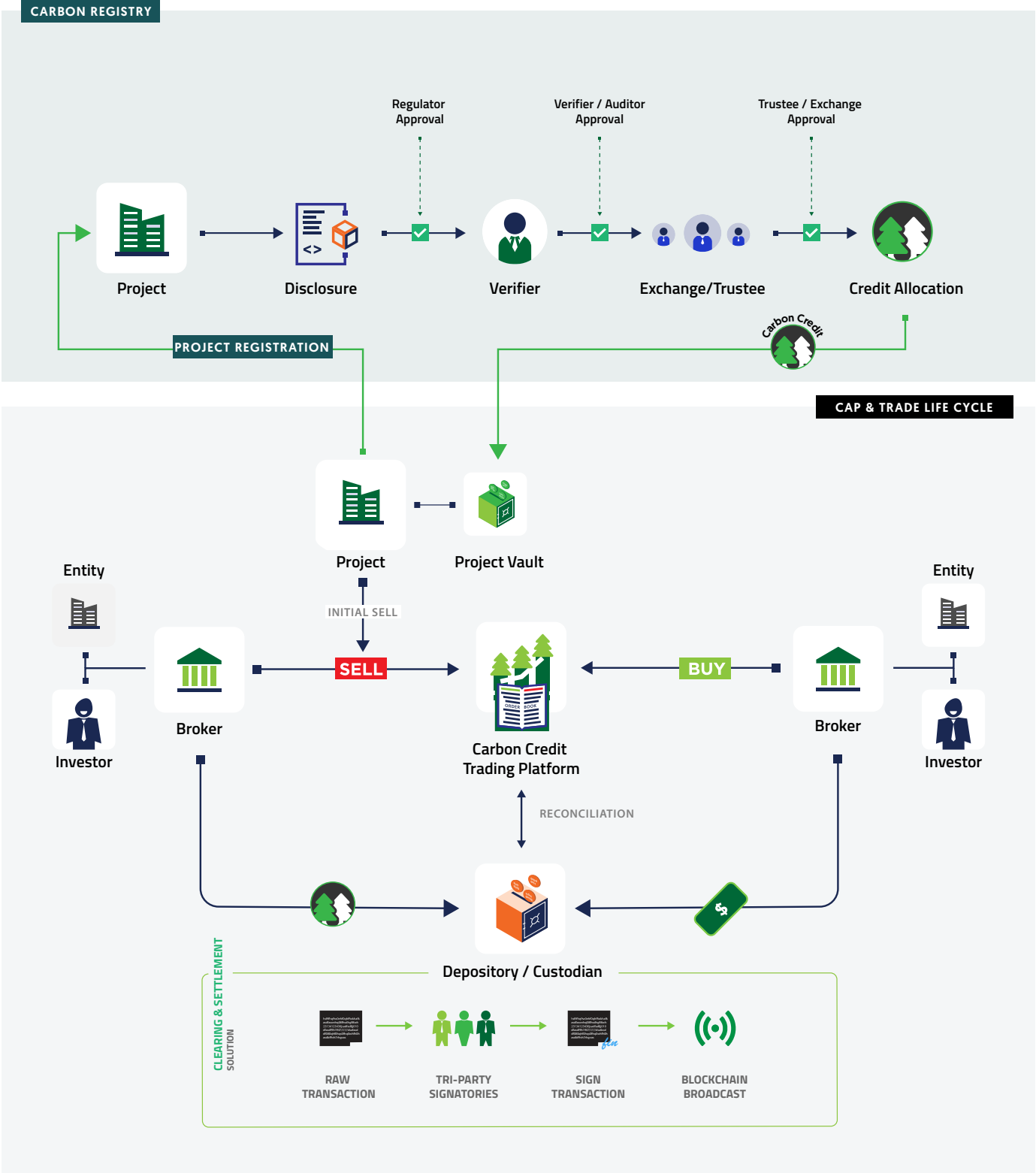
- **Poor Enforcement of Additionality:** registries often do not confirm that a project is over and above business as usual
- **Double-Spending:** the same carbon credit can be claimed by GHG emitters multiple times, diluting its power to support climate change efforts
- **Double-Listing:** the same project can list and sell the same credits on multiple exchanges, receiving more profit for less environmental benefit

In this way, the regulatory structure and rigor of a traditional Stock Exchange lends itself well to the creation of a healthy Carbon Credit Marketplace. Further, use of the Blockchain can ensure that CCs on registries across the globe can be trusted as original and immutable while being transferred with ease.

# Carbon Credits on the Stock Exchange

Participants	Responsibility
 <b>Exchange/Market Operator</b>	<ul style="list-style-type: none"> <li>Creates and maintains trading environment</li> <li>Onboards green projects according to strict criteria</li> <li>Maintains reporting requirements for projects</li> <li>Ensures 'additionality' (a green project's efforts would not have occurred without the existence of a carbon credit market)</li> <li>Set the rules and objectives of the marketplace including requirements of verifiers and approved methodologies</li> </ul>
 <b>Regulator</b> (if separate from the Exchange)	<ul style="list-style-type: none"> <li>Monitors trading activity for fraudulent activity</li> <li>Ensures compliant disclosure for green projects</li> </ul>
 <b>Depository/Custodian (NEW)</b>	<ul style="list-style-type: none"> <li>Trusted third party to ensure safe custody and settlement of assets</li> </ul>
 <b>Verifier</b>	<ul style="list-style-type: none"> <li>Recognized auditing entity with expertise in a given area of carbon credits (e.g., solar, afforestation, etc.)</li> <li>Contracted to audit a green project and report to the Exchange/Market Operator on amount of Carbon Credits the project is eligible to sell</li> </ul>
 <b>Broker</b>	<ul style="list-style-type: none"> <li>Onboards investors (speculative as well as GHG-emitting companies)</li> <li>Maintains adherence to KYC/AML regulations</li> <li>Facilitate investors to buy and sell</li> </ul>
 <b>Project/Issuer</b>	<ul style="list-style-type: none"> <li>Company conducting green project to reduce GHG emissions</li> <li>Must adhere to Exchange/Market Operator reporting and disclosure rules</li> <li>Must contract with a recognized Verifier to report on GHG reductions</li> </ul>
 <b>Investor</b>	<ul style="list-style-type: none"> <li>Buys and sells carbon credits through a participating Broker</li> </ul>

# Ecosystem Visualization





The Stock Exchange, through its expertise in enforcing a fair and efficient securities market, is well positioned to add Carbon Credits to its portfolio, growing its ESG index and attracting ESG-minded investors in the process.

Further, with their experience in meeting regulatory standards, stock exchanges are well equipped to work with a standards-issuing body to assist (see Framework for Carbon Credits on the Stock Exchange below) in the due diligence process of reviewing projects for additionality and ensuring they work with accredited Verifiers to quantify their CC output.

## What is Tokenization, and Why Tokenize Carbon Credits?

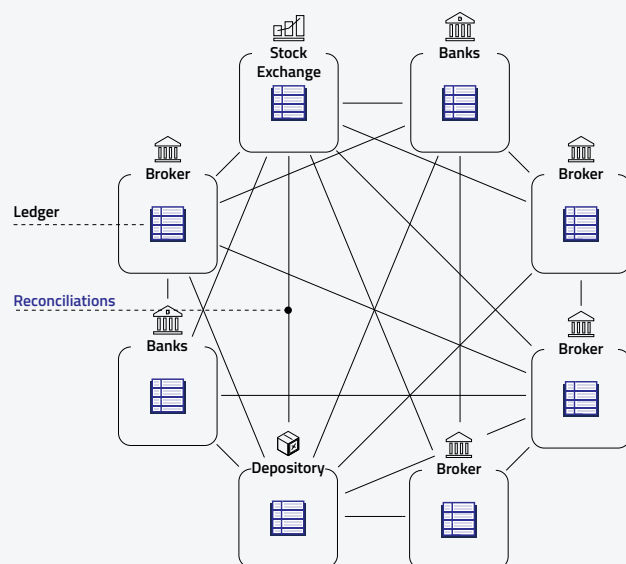
Tokenization means creating a digital representation of a carbon credit that can be tracked and monitored in a transparent and secure manner on the blockchain. Use of blockchain technology is what can separate a stock exchange-based CCR from the independent CCRs today that suffer from the double-spend problem.

### Traditional Workflows vs. Blockchain

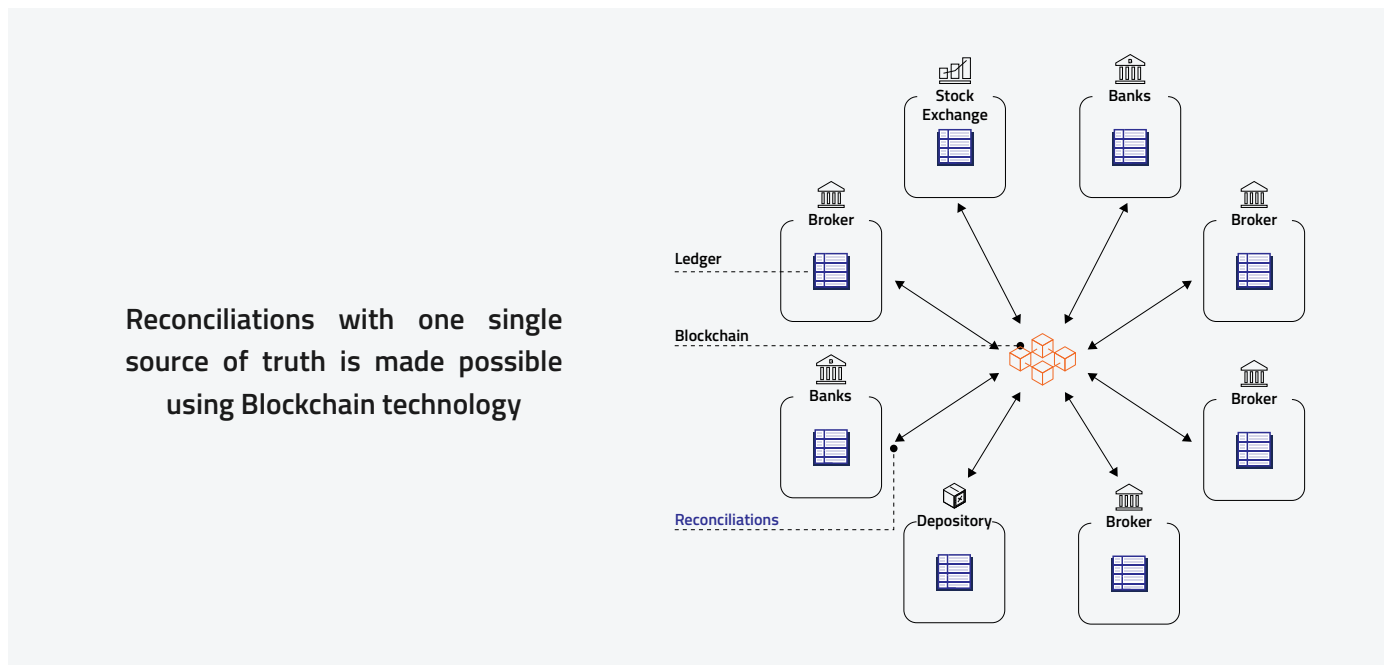
Blockchain technology is essential to creating investor confidence that a given exchange's CC marketplace is authoritative, fair and efficient.

In a traditional trading ecosystem, including CCRs and nearly every stock exchange today, each participant maintains their own ledger of transactions. Every time a trade occurs or assets change hands, the transaction is recorded on each entity's ledger, and there is often a complex process of reconciling records against one another to ensure consistency in reporting and audits. Further, sometimes tri-party reconciliation fails and requires investigation.

Reconciliation in traditional workflows is a complex, resource-intensive process.



On the blockchain, settlement transactions are recorded on a single, shared ledger accessible by all parties. Each participant may still maintain their own ledger internally for security reasons, but the blockchain serves as a single, real-time record that all other ledgers can compare against in real time:



Listing CCs on the blockchain resolves the double-spending problem because the shared ledger only permits a given Credit to exist in one place at a time while also tracking the entire transaction history for that Credit. Further, once a Credit is retired, it is permanently removed from the trading ecosystem. In this way, the double-spending problem is eliminated while security, transparency, and reconciliation times are greatly enhanced.

## Framework for Carbon Credits on the Stock Exchange

Given the similarities between how CCRs and Stock Exchanges operate, exchanges seeking to add CC listings to strengthen their ESG index can do so with the assistance of the consultants and software partners.

At the lightest level, stock exchanges can choose to operate strictly as a marketplace, listing green projects that have been sourced and verified by independent CCRs. However, the path to becoming a full-fledged CCR in their own right is simpler than it seems, with many resources such as the Reference Standards available to inform their efforts:

## Reference Standards

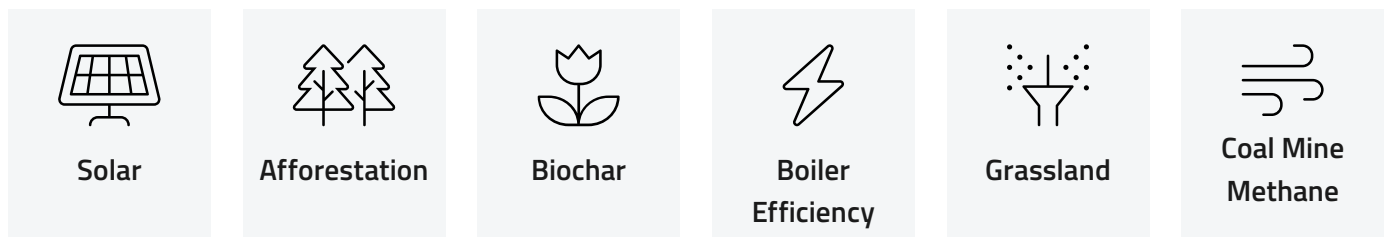
CCRs typically rely on GHG reduction standards that have been developed and published by authoritative third parties, such as the International Standards Organization (ISO).

SUCH STANDARDS INCLUDE:

- [ISO 14064, Part 2](#): Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements
- World Resources Institute/World Business Council for Sustainable Development (WRI/WBCSD) [Greenhouse Gas Protocol for Project Accounting](#)
- United Nations Framework Convention on Climate Change (UNFCCC) [Accounting for Grid Connected Renewable Energy Projects](#)
- International Civil Aviation Organization (ICAO) [Carbon Offsetting and Reduction Scheme for International Aviation \(CORSIA\)](#) – development of reporting tool and related standards still in progress
- United Nations [Clean Development Mechanism \(CDM\) Methodologies](#) defining internationally recognized projects types for GHG reduction
- [DNV international registrar](#) and classification society, with presence in over 100 countries

## Project Eligibility and Additionality

Each Stock Exchange has the authority to determine the nature of the CC projects it wishes to list and register. Examples include:



A given exchange can accept as few or as many as it deems fit, based on relevance to the national economy, internal expertise, and other criteria.

## Verifier Registries

Exchanges can access pre-existing, international listings of verifiers relevant to their list of eligible projects, such as the ANSI National Accreditation Board is one such body that recognizes auditors as accepted [Verifiers for GHG reduction projects](#).

Alternately, exchanges can create their own criteria for verifiers in different fields and use existing registries such as ANSI as a starting point.

# Summary

Carbon Credits are an essential part of your country's commitment to meeting its obligations under the Paris Agreement. Creating a Carbon Credit Registry on your exchange can be an important step in:

- Meeting ESG mandates
- Attracting new listings and investors
- Driving trading volume
- Making a positive contribution to climate change
- Protecting the global value of your countries commodities

The marketplace framework is there. The technology to create an efficient, secure and trustworthy marketplace exists.

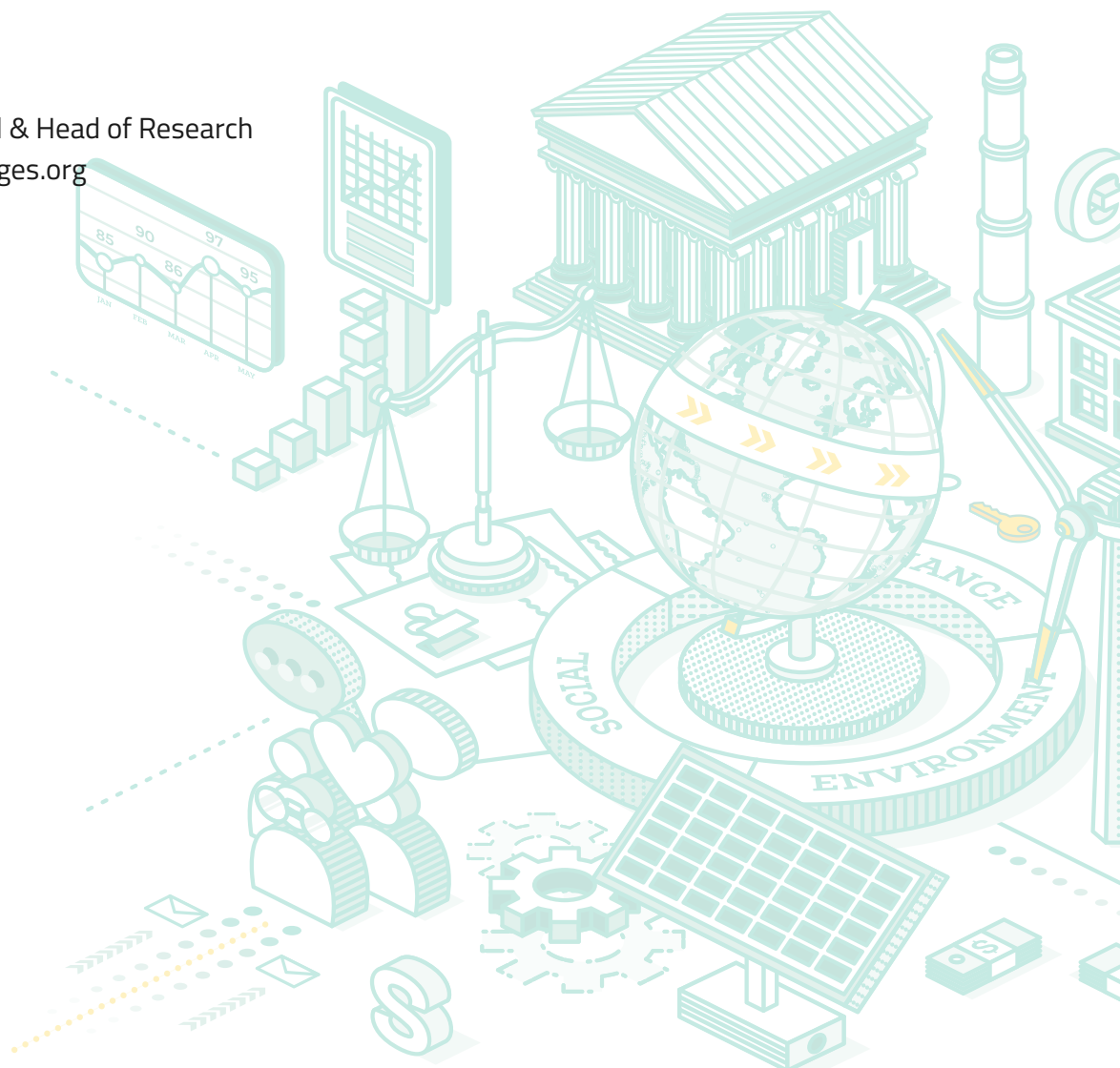
For further information on the topic or inquiries please contact:

## AFCM

Fadi Kansa  
Deputy Secretary General & Head of Research  
[fadi.kansa@arab-exchanges.org](mailto:fadi.kansa@arab-exchanges.org)

## Blockstation

Jai Waterman  
CEO  
[j@blockstation.com](mailto:j@blockstation.com)



## Trading Carbon Credits

Unlocking Value for Stock Exchanges

### Editors & Contributors

Rami El Dokany

Fadi Kansa

Michael Spiar

Kody Zhou

Jai Waterman

Matt Singh

#### DISCLAIMER

While the information contained herein is believed to be accurate and reliable, AFCM, Blockstation and its subsidiaries and/or affiliates, and their respective agents, advisors, directors, officers, employees and shareholders make no representations or warranties, expressed or implied, as to the accuracy or completeness of such information, and, Blockstation expressly disclaims any and all liability that may be based on such information, or errors or omissions thereof. The forward-looking statements contained herein (such as statements relating to the future anticipated direction of the industry, plans for future expansion, various business development activities, planned capital expenditures, future funding sources, anticipated sales growth and potential contracts) involve important risks and uncertainties that could significantly affect anticipated results in the future and, accordingly, such results may vary materially from those expressed in any forward-looking statements made by or on behalf of, Blockstation. There can be no assurance that, Blockstation will achieve the results projected or implied by the forward looking statements included in this presentation. These risks and uncertainties include, but are not limited to, those relating to development and expansion activities, dependence on existing management, financial activities, domestic and global economic conditions, uncertain regulatory environments, marketing, changes in federal or provincial income tax laws and market competition factors.