# Carbon Markets Reimagined

## Scale, Resiliency, and Transparency through Digital Assets

kinexys
by J.P.Morgan

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We would also like to thank all of the interviewees and contributors to this paper who opted to remain anonymous.

# Introduction

At JPMorganChase, we believe operating sustainably increases efficiency, lowers costs, helps manage our environmental footprint, and improves workplace environments. We seek to implement solutions to responsibly meet our sustainability goals in line with business priorities. To complement our sustainable operations, we seek to buy and retire high-quality carbon removal credits to address our remaining emissions, and to help scale the global voluntary carbon market (VCM).[1]

We have also invested in our blockchain-focused business unit, Kinexys, over the last ten years and launched industry-first digital payments and digital asset solutions that enable 24/7 money movement, Programmable Payments, and multi-asset tokenization. SInce inception in 2020, Kinexys Digital Assets (KDA), the firm's multi-asset tokenization platform, has processed over $2 trillion in transaction volume and expanded to support three live applications across 10+ asset types.

In this report, we analyze the state of play for challenges impacting the growth of the VCM through insights from primary interviews with approximately 40 subject matter experts across 15 companies. We then discuss how tokenization may address some of these challenges, outline our development and testing activity with VCM infrastructure providers, and identify the opportunity landscape ahead.

Carbon as an asset class is at an inflection point, poised to mature as market infrastructure strengthens and innovation continues; however, a lack of advancement in either area may lead to further erosion of trust and demand. Across payments and traditional financial markets, we have seen improvements in efficiency, access, and liquidity over the past decade, enabled through innovations in blockchain and the emergence of tokenization platforms. When similarly applied to the carbon markets, these technologies could deliver standardization, transparency, and improved fungibility.

# Dynamics and incentives within carbon markets

Carbon markets are specialized financial systems where carbon instruments are issued/transacted by various participants, with the goal of reducing or removing carbon emissions.

There are two main types: Compliance Carbon Markets and the Voluntary Carbon Market.

**Compliance Carbon Markets (CCM)** are regulated by national, sub-national, or regional regimes that leverage cap-and-trade or carbon tax programs. These programs drive organizations to limit their emissions to government-defined levels. Governments typically issue carbon allowances that act as a permit to emit, with one allowance representing the right to emit one metric ton of carbon dioxide. These allowances can then be traded among market participants. Organizations can be fined or taxed if their emissions exceed the allowances they hold. The motivation to participate is mandated or externally incentivized.[2]

In contrast, the **Voluntary Carbon Market (VCM)** offers companies an avenue to voluntarily purchase carbon assets to address their remaining emissions, complementing decarbonization strategies. Unlike compliance markets, demand incentives in the VCM are self-determined rather than externally imposed.[3]

Core VCM activities include the registration, issuance, sale, and retirement of carbon assets, specifically carbon credits. Carbon credits are instruments that represent carbon emission reductions or removals, with one carbon credit being equivalent to one metric ton of carbon that has been mitigated through a specific project.[3] Buyers primarily purchase credits to address emissions they have previously generated or to account for projected future emissions.

# Key players

The VCM has typically have a broad network of participants, each of whom plays a key role in the ecosystem. These include, but are not limited to:

- Standards and registries
- Marketplaces
- Rating agencies
- Project developers
- Technology providers
- Insurance providers
- Buyers
- Traders, brokers, and retailers
- Legal firms

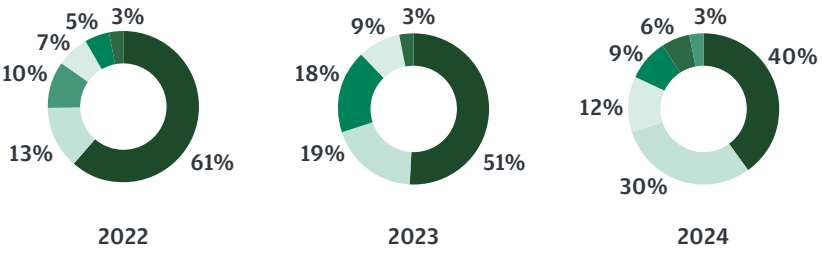
# Key Statistics*

**Total issuances and retirements**

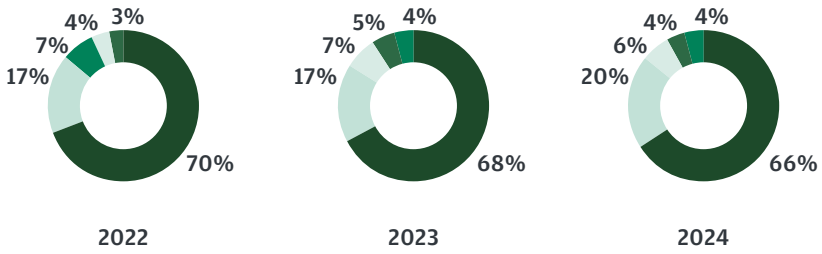
**279 Mt**
2024 total issuances
down ~12% from 2023

**174 Mt**
2024 total retirements
up ~2% from 2023

**Registry market share by issuances**

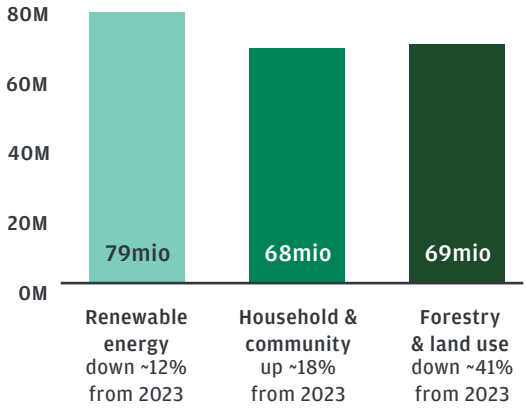



**Registry market share by retirements**

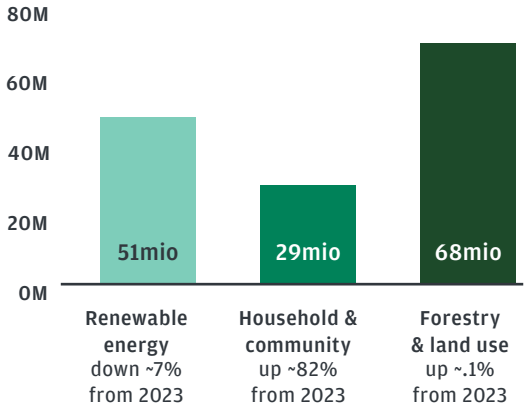



VCS Gold ART ACR Cercarbono CAR

**Top 3 2024 credit issuances by project type:**




**Top 3 2024 credit retirements by project type:**




**Source 1:** Verra Carbon Standard, Gold standard, Architecture for REDD+ Transactions, American Carbon Registry, Climate Action Reserve. Barbara K Haya, Tyler Bernard, Aline Abayo, Xinyun Rong, Ivy S. So, Micah Elias. (2025). Voluntary Registry Offsets Database v2025-04, Berkeley Carbon Trading Project, University of California, Berkeley. Retrieved from link.

**Source 02:** Cercarbono, Cercarbono primary data source, last updated: 24th June 2025

*the numbers represented here are an aggregation of data reported by source 01 and source 02

# Prevailing challenges in today's VCM

In the 2023 paper, "Carbon Market Principles", JPMorganChase identified market challenges pertaining to quality supply, market integrity, market complexity/fragmentation, and market maturity as the primary factors limiting market development.[1]

Nearly two years have passed since the release of the paper, and in that time, the VCM contracted and then stagnated.

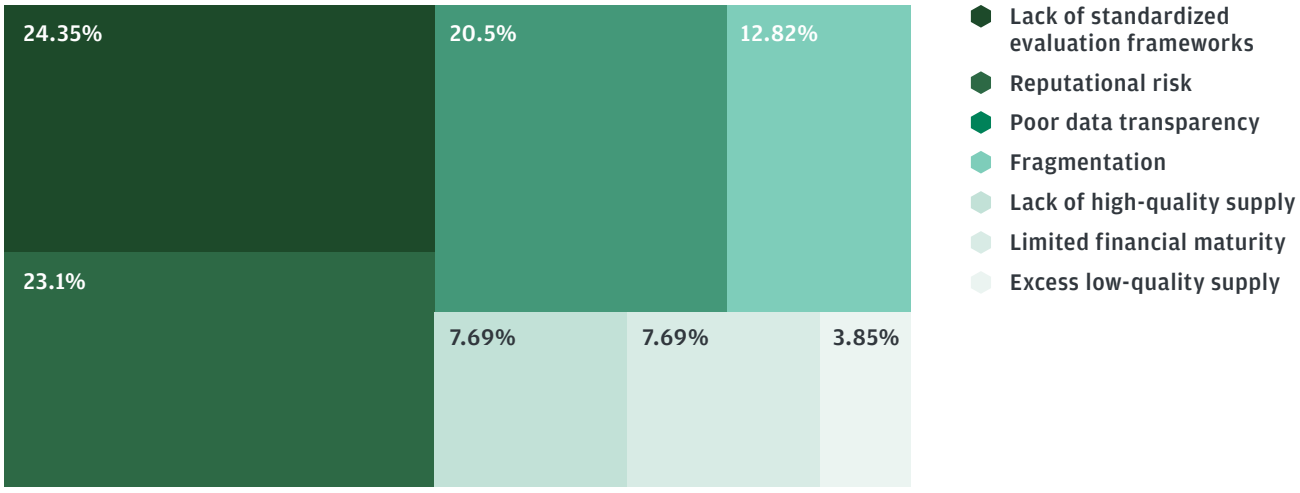
> ***"The core challenge is the lack of demand signal. Stronger demand unlocks project financing – and while there's no shortage of compelling projects, they need greater investment backing, which starts with a more robust demand side."***
> Marie Loustau, Head of Sales at Carbonplace

## Interviewee participant roles*


*~40 subject matter experts across 15 companies

During our research interviews, we outlined seven core challenges[4] and asked our interviewees to evaluate each one. These insights informed our view on how a blockchain-based solution from KDA could deliver meaningful value to carbon markets.

## Heat map: Top challenges in the carbon market, listed by interviewees



In examining the challenges, nearly all our interviewees highlighted one overarching theme: insufficient demand. A lack of demand in the VCM is a symptom felt across the market, and the seven challenges previously mentioned provide a view into some potential root causes of the current market contraction.

Of the seven, interviewees largely agreed that Challenge 3 (Poor data transparency), Challenge 4 (Financial and reputational risk), and Challenge 6 (Lack of standardized evaluation frameworks) are the most pertinent to resolve.

## Challenge 3: Poor data transparency

**Limited access to credit data:** Buyers often encounter restricted or opaque access to the data supporting a credit, and even when available, the data can be challenging to interpret. Our interviewees highlighted the considerable difficulty of evaluating carbon credits and making informed purchasing decisions without extensive expertise, with some paying for expensive third-party diligence to help validate their purchases.

> ***"Even if you had all the information you wanted, knowing how to assess and compare across projects to determine if something is high quality is very challenging for market participants"***
> Taylor Wright, Executive Director at JPMorganChase, Head of Operational Sustainability

**Limited access to price data:** The majority of carbon credits are traded over-the-counter (OTC), without any mandates to report on pricing. This contrasts with established practices in more mature financial markets, where price disclosure is a standard (though often aggregated across exchanges) and sometimes regulated activity.

The absence of price transparency makes it difficult for project developers and buyers to determine the appropriate commercial terms, and also hinders the ability of financial service providers to offer financing for capital-intensive, high-quality projects. Without clear indicative price levels or the ability to gauge demand, lenders are unable to model the potential resale value of carbon credits in default scenarios, where selling credits would be necessary to offset losses.

> ***"Price transparency is really critical to get participants into the market… we are in the early days, but for carbon trading to become more sophisticated, we need to have clearer pricing."***
> Fintan West, Executive Director at J.P. Morgan, NRG Payments Advisory

## Challenge 4: Reputational risk

Interviewees noted that between 2021 and 2023, some companies received negative press in relation to their VCM engagement, heightening the reputational risk of participating in this market. Since then, many buyers have employed more stringent diligence practices, while others have opted out entirely.

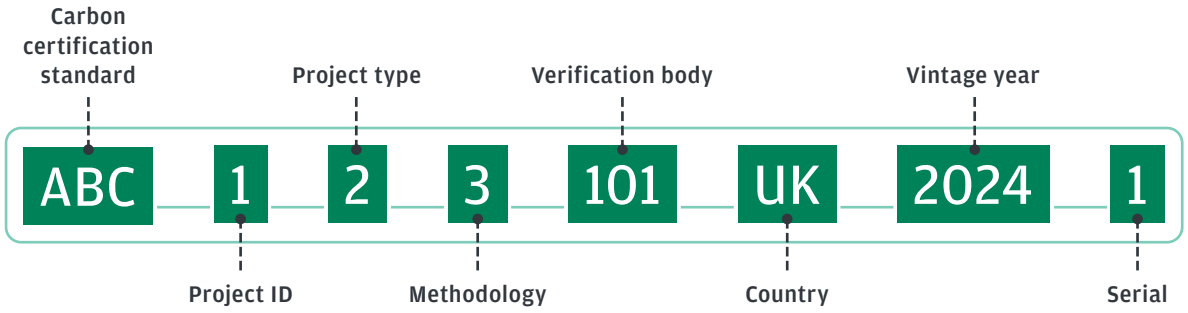
Discussions also referenced "green hushing," where companies now discreetly manage their carbon credit buying programs and ensure retirement claims are not publicly registered against their names. These organizations continue to address their emissions, but without attracting market attention, indicating that carbon credit demand is susceptible to fluctuations due to public scrutiny.

## Challenge 6: Lack of standardization

**Lack of credit data standardization across registries:** Credit attributes are embedded within project documentation across registries, typically in non-standardized PDFs rather than accessible data structures. Some registries use these attributes to create serial numbers for uniquely identifying credits, which can be decoded to uncover the unique attributes of a specific credit (see an example of a serial number in Diagram 4 below). However, this practice lacks standardization across registries, and consequently, most market participants do not depend on serial numbers to interpret credit data.

### Example serial number breakdown

*Diagram is shown for illustrative purposes only and may not be an exact representation of a registry serial number




**Lack of standardized access across registries:** Credits are currently tracked on disparate systems, with each system maintaining its own database of projects, credits, and transactions and its own unique methods for accessing and querying data. Market participants are often forced to interact with multiple registries in parallel or restrict allocation of resources to one registry/standard only. Our interviewees consistently referenced challenges related to sourcing information across various registries to form a comprehensive market picture for pricing and inventory.

**No standardized definition of a "high-quality" credit:** Interviewees agreed that it is extremely difficult to assess the quality of a credit without a standardized and stable definition of what constitutes "high-quality". We can contrast this paradigm with the more mature bond market, where a clear assignment of ratings helps market participants understand quality.

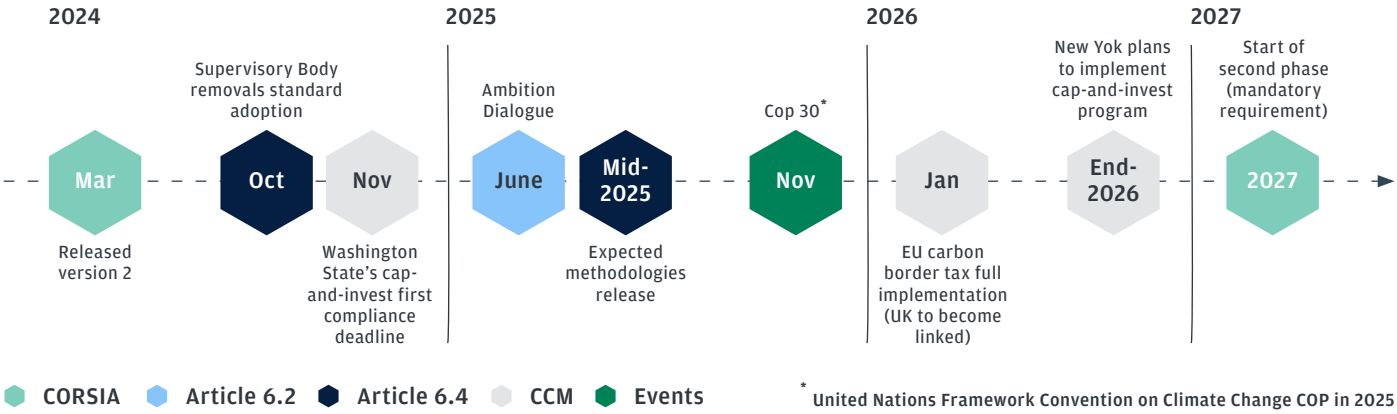
> ***"Lack of high-quality credits will always be an issue since the standards are always changing"***
> Alex Saer, CEO at Cercarbono

> ***"If you think about a commodity oil future, for example, you're not worried about quality as you know it's already met some standard… the carbon quality challenge can't be solved if it's kept subjective"*** Natalia Dorfman, CEO and Co-Founder at Kita

# Industry-wide catalysts and the potential for market growth

### Timeline of carbon market events




## DMRVs

Gaining regular insights into project performance and data integrity is difficult due to the predominantly manual methods used for monitoring and reporting. Over half of our interview participants highlighted digital monitoring, reporting, and verification (DMRV) technologies as a response to this challenge. DMRVs are emerging technologies that have the potential to drive real-time project reporting, new risk monitoring techniques, and automated verification. They leverage sensors, remote data, and algorithms to measure and validate emissions throughout the lifecycle of a project. Examples of DMRV technologies in practice include the satellite imaging of forests, IoT devices for weather and crop monitoring, and devices tracking direct air capture in real time. Standardizing and automating how carbon sequestration is measured can increase the data flowing to end users. This may offer confidence that carbon projects are advancing as anticipated and that credits accurately represent their stated fundamental value.

> ***"I'm most excited about MRVs using a mix of surface-based data and satellite data."***
> Dr. Sarah Kapnick, Managing Director at J.P. Morgan, Global Head of Climate Advisory

> ***"With the increase in DMRVs capabilities, I would expect these to become embedded into any new carbon credit issuance in the near term, providing transparency on performance in an efficient and factual manner."*** *Gianluca Cantalupi, Managing Director at JPMorganChase, Firmwide Risk Executive and Head of Climate, Nature, and Social Risk*

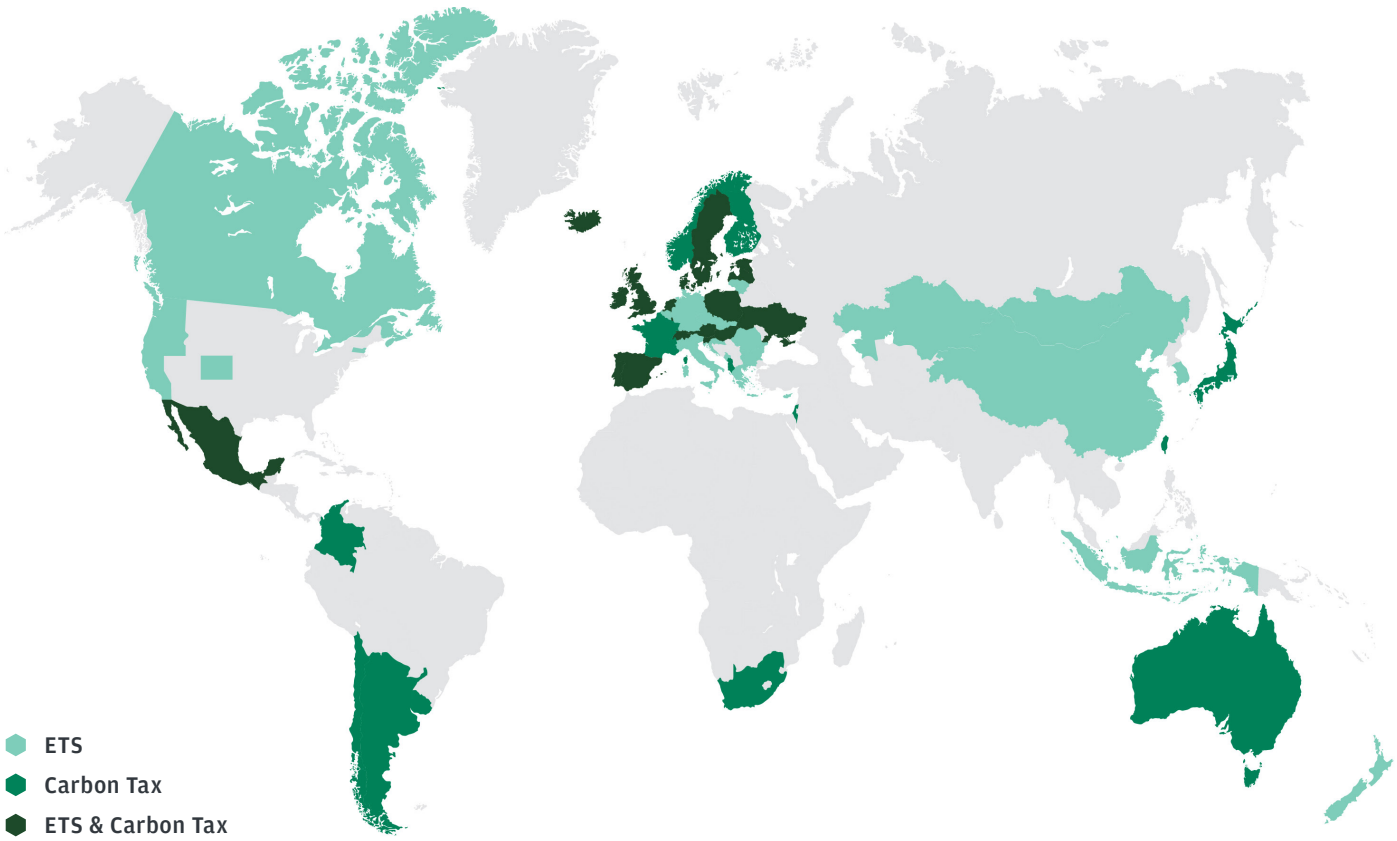
# Convergence of CCMs and the VCM

The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) and Article 6 of the Paris Agreement are two initiatives that may reshape Compliance Carbon Markets and enhance demand for credits supplied by the Voluntary Carbon Market in the coming years.[6] Most compliance programs do not currently permit the usage of carbon credits to meet allowances.

> ***"The convergence of compliance and voluntary markets excites me. It would justify the business case for engaging in voluntary markets, leading to a more liquid market."***
> Bee Hui Yeh, Head of Climate Strategy & Solutions at Patch

## Map of Compliance Carbon Markets

**Source:** World Bank Group, "State and Trends of Carbon Pricing Dashboard", last updated: 2025




## CORSIA

CORSIA (Carbon Offset and Reduction Scheme for International Aviation) is a global market mechanism that looks to measure and reduce emissions in the aviation sector.[8] There are 129 countries signed up to participate voluntarily in its first phase.[9] In 2027, CORSIA will enter its second phase, making it mandatory[10] for all countries that are members of the International Civil Aviation Organization (ICAO)[11]. To comply with this phase, airline companies in impacted jurisdictions must purchase and retire eligible carbon credits. The VCM is poised to serve as the primary source of supply, as compliance markets have not historically produced carbon credits.

> ***"CORSIA is poised to unlock demand in the VCM… (but) countries producing credits need to have effective systems in place to enter the CORSIA market."***
> Caitlin Guthrie, Vice President at J.P. Morgan, Climate Strategies Director at Campbell Global

CORSIA is expected to enforce strict quality criteria for carbon credits (addressing **Challenge 6 – Lack of Standardization**) from the VCM to be deemed eligible for use.[12] For example, in its first phase, CORSIA excluded certain credit types, such as Clean Development Mechanism (CDM) credits from Afforestation and Reforestation projects due to concerns about permanence, and REDD+ credits due to concerns about leakage.[10]

Nevertheless, there is uncertainty surrounding CORSIA's potential for impact, given its application is limited to one industry, and enforcement actions for non-compliance are handled by member states. While some governments, like the UK, are considering civil penalties, enforcement may ultimately vary across participating nations.

## Paris Climate Agreement: Articles 6.2 and 6.4

The Paris Climate Agreement is a binding international treaty on climate change that was adopted by 195 nations during COP 21 in 2015.[11] The treaty was presented with the primary goal of "holding the increase in the global average temperature to below 2ºC above pre-industrial levels". Article 6.2 and Article 6.4 of the Paris Climate Agreement may drive the convergence of the VCM with compliance frameworks. Exact timelines for implementation are to be determined.

| Feature | Article 6.2 | Article 6.4 |
|---|---|---|
| Status | Ongoing development—pilot deals in progress[12] | Ongoing development—first transactions expected late 2025 [13] |
| Mechanism | Decentralized, bilateral, or multilateral cooperation across jurisdictions[14] | Centralized crediting mechanism[14] |
| Governance | Managed by participating parties[14] | Overseen by UNFCCC Supervisory Body[14] |
| International transfers? | Yes[14] | Yes[14] |
| Use towards NDCs? | Yes[14] | Yes[14] |
| Project approval | Determined by cooperating countries[14] | Requires registration and validation by UN Supervisory Body[14] |
| Private sector role | Indirect[14] | Direct—project developers and investors can participate directly[14] |
| Sustainable development requirement | Encouraged[14] | Requires that projects must demonstrate how they contribute to sustainable development[14] |
| Additionality | Determined by participating countries[15] | Must be demonstrated per UN-approved methodologies[15] |
| Permanence | No uniform rule[16] | Required to have mechanisms in place to manage reversal risk[16] |

Nationally Determined Contributions (NDCs) are a key feature of the agreement in which countries set emissions targets and outline how they plan to achieve their agreed-upon goals. Article 6.2 provides a framework for countries to cooperate to achieve their NDCs by trading carbon offsets internationally. In practice, this could result in carbon credits issued in the VCM being eligible for purchase and retirement within a CCMs driven by NDCs.

> ***"There will be a switch between transactions happening in the VCM more towards Article 6… pretty excited for Article 6 regulations to be put in place and all the systems to start working around that."*** Alex Saer, CEO at Cercarbono

> ***"I'm very excited by national registries and the operationalization of Article 6.2 and 6.4. It will bring more trust as nations are trusting the market, so why shouldn't companies?"***
> Gudmunder Sigbergsson, Co-founder and CEO at International Carbon Registry

Article 6.4 outlines a UN-hosted carbon-crediting program with international standards for developing eligible projects, including approved standards and methodologies, and a mechanism to trade carbon offsets generated from those projects. Article 6.4 allows offsets to be traded domestically and with private sector participants. It lays out specific guidance and eligibility criteria for projects looking to issue credits under this mechanism, and VCM credits issued on approved registries with approved methodologies may be eligible for trading under Article 6.4. Interviewees opined that this may act as a "quality floor" for VCM carbon credits and enhance the credibility of the market overall[17], addressing **Challenge 6: Lack of standardization.**

There is uncertainty surrounding the extent to which Article 6 may be meaningfully adopted. Inconsistencies in how countries enact Article 6.2 will be publicized, and some of our interviewees felt this may impede effectiveness and temper VCM growth. Generally, a lack of global coordination and fragmented policy approaches between jurisdictions pose the highest risk to growth due to uncertainty regarding the treatment of VCM Credits, the constitution of "high-quality", and their utility within carbon compliance frameworks.

> ***"Alignment across jurisdictions will be important to get everyone to adopt standards [related to technologies which will be key for verification of projects against Article 6's quality criteria], for example, alignment on cross-country use of satellite data."***
> Dr. Sarah Kapnick, Managing Director at J.P. Morgan, Global Head of Climate Advisory

# KDA: tokenization for data standardization, transparency, and connectivity

Kinexys Digital Assets (KDA) is a multi-asset tokenization platform from JPMorganChase, designed to deliver streamlined settlement processes, automation, increased asset mobility, and enhanced capital deployment options to traditional financial markets.

**What is tokenization?**
Tokenization is a foundational construct across all our live applications. The term refers to the process of representing ownership, data attributes, and rules of financial assets on a blockchain under one technical construct: a digital token.

Our live applications span financing, collateral mobility, asset issuance, trading, and settlement use cases. We employ tokenization and smart contracts to orchestrate asset or trade lifecycles and automatically update asset and cash positions on top of our unified ledger.

## Revisiting tokenization models for voluntary carbon credits

Tokenization can follow two primary models: native tokenization and third-party tokenization.

Third-party tokenization depicted in Diagram 6, works by "locking" an existing asset in an off-chain system (typically its traditional register) so that it cannot be moved, and then encoding its characteristics on a blockchain-based system.

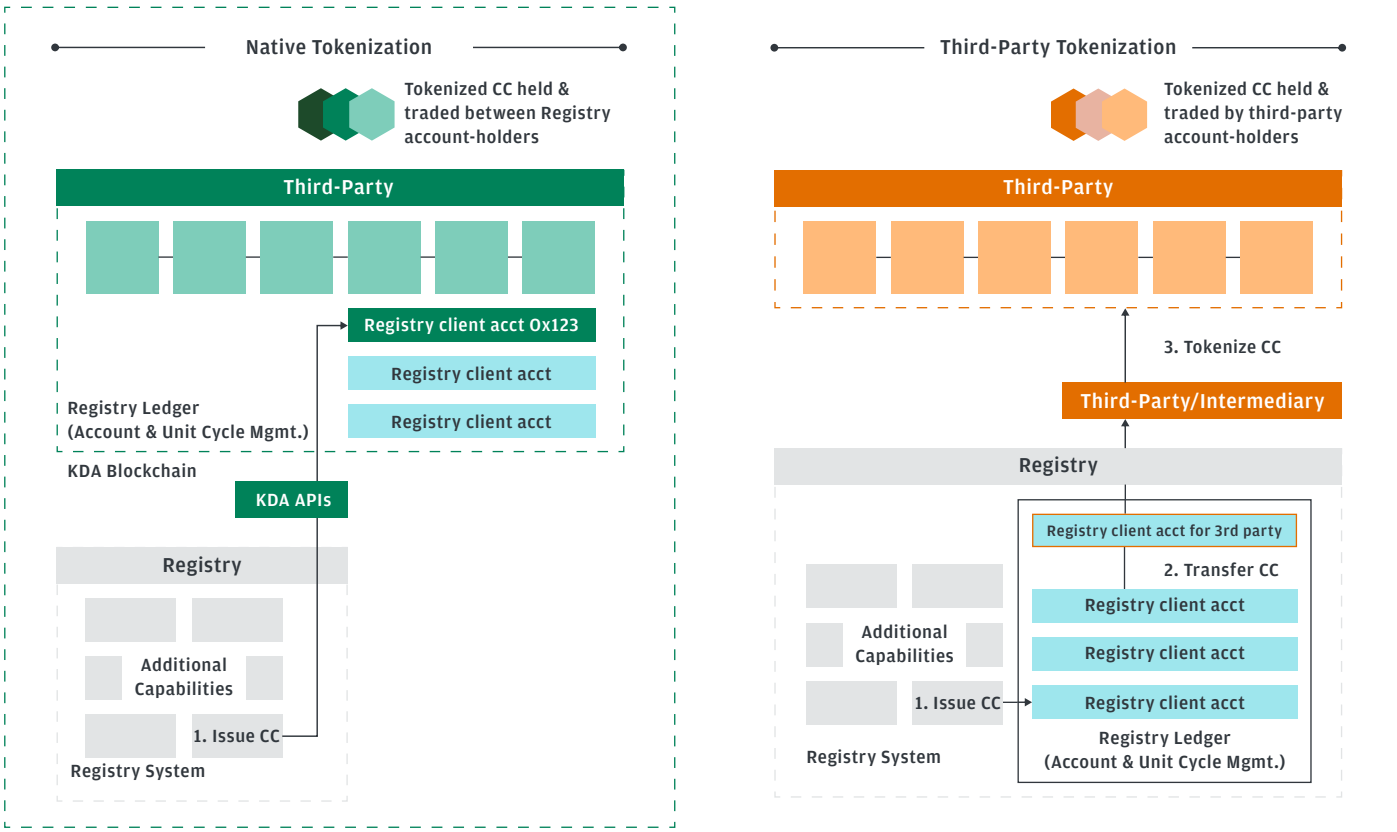
Some historical implementations of third-party tokenization in the VCM sparked concerns around the impact that improper tokenization of carbon credits could have on market integrity[18], particularly regarding the risk of double-counting or transacting retired credits. A key lesson here is that integration design is important, and to be credible, tokens should preserve traceability of ownership, credit status, and credit attributes across the traditional and blockchain ledgers.

With native tokenization, an asset is directly issued on the blockchain as the system of record. As a result, the need to manage two ledgers—on-chain and off-chain—and reconcile across them is removed. The blockchain functions as a unified and secure ledger that provides a reliable source of information for market participants.

## Native tokenization vs third-party tokenization

CC = Carbon Credit



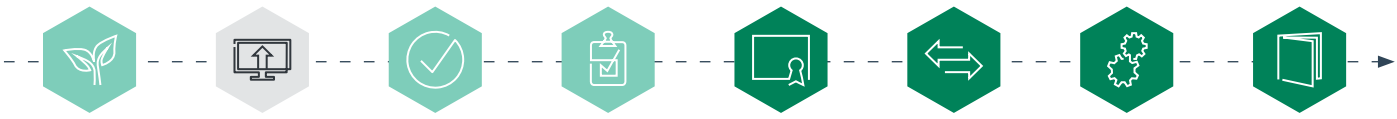

*Offering as a live product is subject to completion of development and internal review, as well as obtaining any regulatory approval that may be required.*

Native tokenization models can be difficult to implement in use cases based around mature markets with long-established registers and system integrations. However, in a market that is nascent and concentrated (such as the VCM, where a few registries account for 85-90% of assets issued), we believe the potential for faster adoption is much stronger.

# KDA prototype

We created an API-based prototype that enables registries to tokenize credits natively on the KDA blockchain ledger. Registries directly call our API functionality at issuance and proceed to use KDA as their primary record of ownership throughout the credit lifecycle.

## The role of KDA in the carbon credit lifecycle



**Account opening**
Entities request registry accounts and, after approval, are onboarded to the registry

**Project submission**
Project developers submit proposed methodologies and project descriptions to the registry.

**Project validation**
Validation Bodies assess project design and confirm descriptions match methodologies.

**ERR certification**
Projects submit monitoring reports; ERRs are verified and recorded on the registry

**Issuance**
Post-ERR certification, credit issuance is requested and post final checks (e.g. payment), approved.

**Transfer**
Registry account holders can transfer carbon credits to other accounts.

**Admin controls**
The registry can reverse transfers, suspend or cancel credits, and manage buffer units.

**Retirement**
Registry account holders can request credit retirement in the registry system.

No KDA involvement  Partial KDA functionality  KDA primary functionality

*Offering as a live product is subject to completion of development and internal review, as well as obtaining any regulatory approval that may be required.*

## Key features include:

- **Token standard:** A standardized carbon credit token interface. Core project and credit attributes are embedded within the token standard to uphold traceability throughout the credit's lifecycle. (*Challenge 3: Poor data transparency, Challenge 6: Lack of standardization*)

- **Transparent, immutable ledger:** All carbon credit transactions are recorded on the KDA blockchain, which forms the unified ledger for the VCM and creates a trusted audit trail that can be accessed by market participants. (*Challenge 3: Poor data transparency, Challenge 6: Lack of standardization*)

- **Secure bank-grade platform:** The KDA blockchain and wider platform adhere to robust JPMorganChase security and controls criteria, securing assets throughout their lifecycle.

| Potential Benefits | Challenges | Commentary |
|---|---|---|
| Technically enforced standardization | Challenge 6: Lack of standardization | Tokenization creates shared standards that can be adopted and enforced at scale. These standards include data models, protocols, and smart contracts. |
| Transparency and auditability | Challenge 3: Poor data transparency | Transactions are recorded immutably on a ledger that participating institutions and intermediaries can monitor in real time. |
| Improved access to price data for automated trade settlements | Challenge 3: Poor data transparency | On KDA, both cash and assets are issued as programmable instruments on the same ledger. This unlocks delivery-versus-payment (DvP) settlement, where assets are exchanged for cash per pre-agreed conditions. Pricing information is therefore available on the ledger, though from our interviews, the market may opt to receive such information in an aggregated form. |
| Scalability and network effects | Challenge 5: Fragmentation | By embracing KDA infrastructure and standards, registries may join a blockchain network of financial institutions that participate in KDA's multiple use cases, facilitating the potential for more rapid institutional scaling. Note that while KDA may address technical and operational challenges pertaining to fragmentation, participants may still need to establish relationships directly with one another to interact. |

KDA is not an authority on quality. Our role is to enforce standardized data structures, improve transparency, strengthen resiliency, and enable users to independently assess and interpret the available information for specific projects and credits on our platform.

We believe that transparency in the VCM is key to stimulating both demand and supply. While some buyers may look for permanent and measurable carbon removal credits, other buyers may seek to support the preservation of existing carbon sinks. Both activities have a role to play in mitigating carbon emissions, and it is important that the market can identify which projects and credits align with their sustainability strategies.

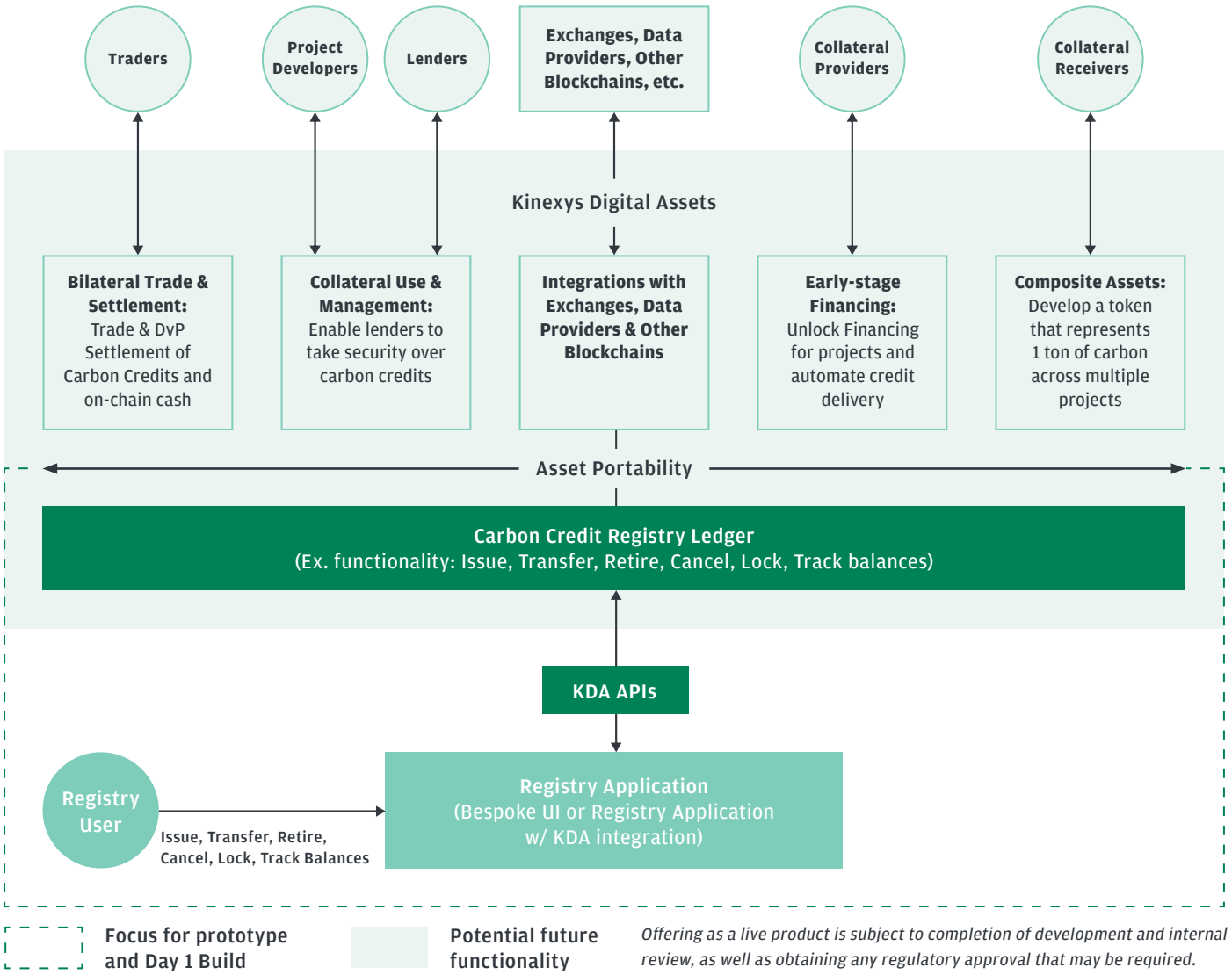
We are testing our prototype with several carbon credit registries and registry technology providers to assess the compatibility of our data models/systems, understand any functionality gaps, and validate utility. Additionally, we are actively engaging the market to identify complementary solutions to connect across the ecosystem. While a KDA application has the potential to help alleviate some of the market challenges previously discussed, considering it as a standalone solution limits the extent to which market growth and demand may be unlocked.

# As the VCM matures, there are opportunities for financial innovation, which KDA can support

Blockchain technology could support enhanced connectivity and transparency in the VCM, and provide a scalable infrastructure layer for the evolution of financial use cases in the market.

Market connectivity is a core principle for KDA as we strive to build composable financial ecosystems. We envision market participants, DMRV solutions, and related service providers connecting to the platform, directly integrating

## KDA carbon vision




*Offering as a live product is subject to completion of development and internal review, as well as obtaining any regulatory approval that may be required.*

services with natively tokenized credits and independently realizing their own value streams. This could include insurance providers and rating agencies integrating directly with the registry layer, marketplaces listing tokenized credits, or financial institutions structuring new products and offering them across the KDA platform.

> ***"Before this call, I was skeptical about blockchain, but this application could add value... It's unique within the industry and could provide value by creating convergence around registries and industry standards."*** Bjorn de Groote, Director of Carbon Solutions at CO280

> ***"Integration with rating agencies is a must-have because ratings are an important indicator of quality for the market."*** Oli Torfason, Co-founder and COO at International Carbon Registry

> ***"The reality is, if we are to do this successfully, we need to get the industry to rally around a single solution to drive standardization and universal adoption."***
> Alastair Northway, Executive Director at J.P. Morgan, Global Head of NRG Payments Advisory

# Use cases

## Asset portability

Once carbon credits are tokenized on KDA and multiple registries, exchanges, and platforms are connected to the platform, credits could move more seamlessly between counterparties and utilities.

The ledger facilitates the movement of credits between users or systems, without the need for duplicative verification or reissuance, reducing friction and supporting a more interconnected market infrastructure. This is relevant as the VCM converges with CCMs, where a clearer path emerges for multi-registry, cross-border interoperability. Additionally, tokenization establishes shared standards which, when adopted and enforced at scale, may bring increased fungibility to carbon credits – facilitating more seamless trading, asset interoperability, and cross-platform utility.

As jurisdictions begin to integrate voluntary carbon credits into compliance pathways under mechanisms such as Article 6, the need for a solution to support traceable and transferable credits, while mitigating the risk of double counting, increases.

> ***"It is important to enable data aggregation and there are some market participants focused on this, but interoperability that allows credits to be transferred between registries and systems is the key to unlock liquidity"*** Robin Klemens, Founder and CEO at Kumo

## Bilateral trade and settlement enabled via blockchain payments:

Enabling blockchain payments on the same ledger as tokenized assets can improve bilateral trade and settlement. Counterparties can execute and settle trades via smart contracts, which can ensure delivery versus payment is atomic, reducing settlement risk. With settlement occurring on-chain, price transparency is intrinsic to the solution, providing a data store for the cash amount exchanged for a specified quantity of carbon credits.

> ***"The market could grow significantly with institutions like JPMorganChase, which bring bankable technology, resilience, brand, and decades of experience. Atomic settlement is a key opportunity for the market, given the current challenges in the clearing and settlement of transactions. The registry space is ripe for innovation."*** Simon Puleston Jones, Founder and Managing Director at Emral Carbon

## Collateral use and management:

Once tokenized, carbon credits could more easily be utilized as collateral across a variety of different trades or transactions without requiring registries to drastically modify their operating models. Smart contracts could be used to "lock" tokenized credits and encode security interests held over the asset.

> ***"I think being able to borrow money against the asset is very important… some banks don't understand how they are meant to take security over credits."***
> Oli Torfason, Co-founder and COO at International Carbon Registry

## Early-stage financing:

Today, smart contracts on KDA encode deal and transaction terms for financed tokenized assets. We foresee the same pattern extending to early-stage financing of carbon projects, where lenders offer financing to project developers based on offtake agreements or through prepayments. Encoded financing terms can help lenders have greater confidence that any collateral received against their loans will be securely held in their name.

For example, an application on KDA could automatically direct payments received by project developers upon the maturity of an offtake agreement to offtake financiers. Similarly, lenders who have purchased or financed prepayments may also benefit from automated delivery of the credits, and subsequently cash, upon issuance, reducing the chance of a default due to non-delivery.

> ***"Security over carbon credits for lenders should be a must-have. It ensures offtakers will use the carbon credit for their needs, building trust and confidence in the market."***
> Juan Duran, Co-Founder and CEO at EcoRegistry

> ***"Every client I have would like to raise money financing carbon credit streams… a lot of client interest."***
> Colin DeHart, Vice President at J.P. Morgan, Global Corporate Banking - Green Economy

## Composite assets:

Tokenized credits can be fractionalized while maintaining granular asset attributes and traceability back to their issuing projects. KDA may assist market participants in the seamless creation of composite assets while helping them to maintain transparency.

A carbon composite asset could represent one metric ton of carbon, composed of fractionalized credits from various independent projects that share core asset attributes, offering diversification. This product could provide more attractive buying options and diversify risk for offtake purchasing agreements. Consider a scenario where a buyer purchases a share of a portfolio of offtakes and receives composite assets as projects deliver. Without the composite asset, offtake purchasers would receive a carbon credit from a single project within the portfolio, resulting in less diversified delivery despite investing in a portfolio comprising multiple projects.

> ***"…may have just solved the problem of project-based emissions all trading at different prices"***
> Simon Puleston Jones, Founder and Managing Director at Emral Carbon

> ***" Being able to blend them together in a composite, as a portfolio, seems very important to me…***
> Spencer Meyer, PhD, Chief Ratings Officer at BeZero Carbon

# Next steps

Whether you're interested in learning more about our prototype and broader vision, exploring collaboration opportunities, or have a solution that could be of interest, please reach out to us at kda.carbon@jpmorgan.com.

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