

# Scaling Today's Carbon Markets

A New Market Blueprint for 2024



A ValueExchange Report Created  
in Partnership with Nasdaq



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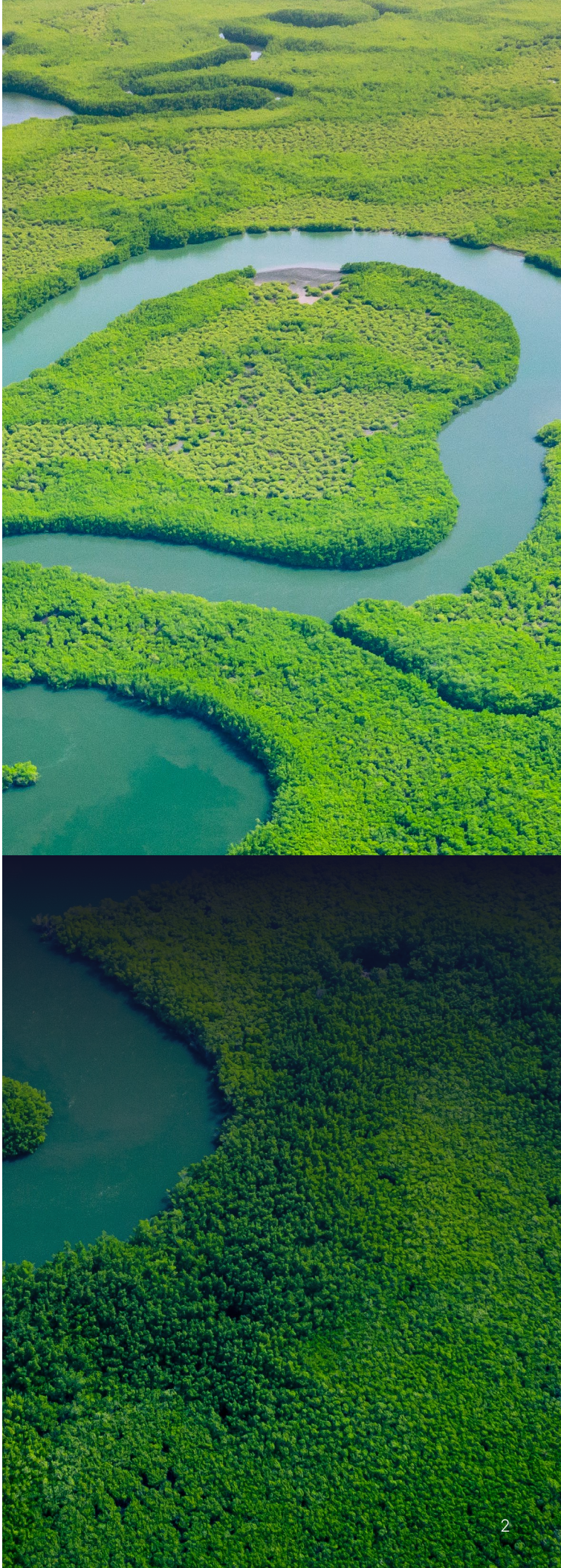
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# Introduction

Voluntary carbon markets (VCMs) are essential to many climate priorities, such as driving investment toward carbon-abating projects and providing corporations with a tool to help them achieve net-zero.

But the still relatively young global VCM ecosystem faces a challenging growth task: to condense and accelerate decades of market evolution, standardization and scale to meet demands for access, transparency, trust and climate action in the now.

To better understand the state of VCMs and their obstacles to growth, Nasdaq and the ValueExchange undertook a major international survey in late 2023, reaching out to strategic decision-makers across the voluntary carbon market trade life cycle. Drawing on views from global project owners, commercial banks, market operators, brokers and investors, this research has been run with two objectives in mind: first, to clearly define the problems that the industry faces today in trying to scale and grow; second, to develop an action plan as we look ahead to emerging needs and opportunities.

This report summarizes the statistical outputs from this survey, backed by discussions with over 18 industry leaders across North America, Europe and Asia-Pacific.

## Top VCM Scaling Challenges



Lack of price transparency



Lack of standardization



Market fragmentation and inefficiencies



Carbon credit quality and integrity



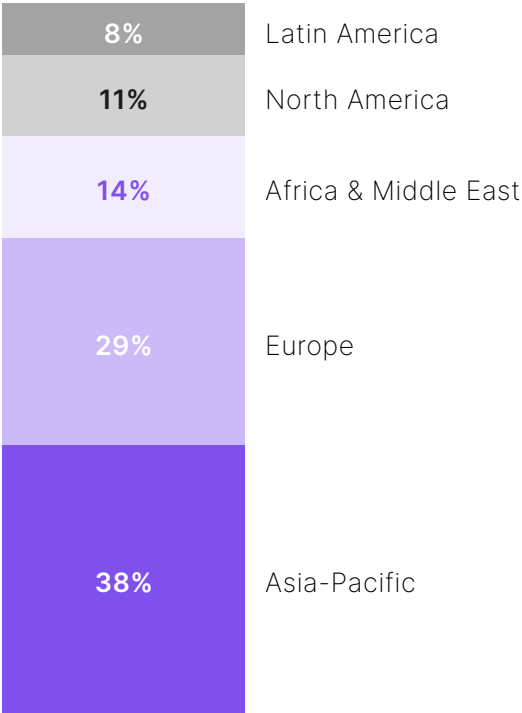
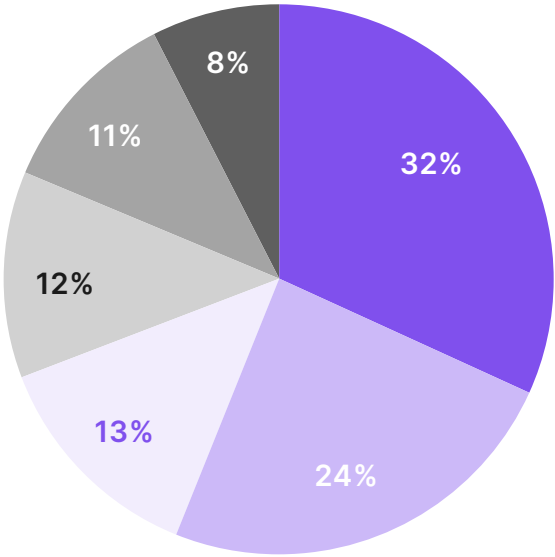
Liquidity concentration tied to small number of projects

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# Who participated?

This industry-wide survey benefits from the insights of 135 decision-makers from organizations across the globe. These respondents include:

- Project Owners
- Intermediaries  
(brokers and custodians)
- Financial Investors
- Market Operators
- Project Financiers
- Corporate  
End-Users



## Project Owners

- Carbon project owners

## Intermediaries

- Broker-dealers
- Investment banks
- Custodian banks
- Neobanks and fintechs

## Financial Investors

- Fund managers
- Private banks
- Wealth management
- Pension funds
- Public authorities

## Project Financiers

- Commercial banks
- Government authorities

## Market Operators

- Exchanges
- Central counterparty clearing houses (CCP)
- Registries and standards setters
- Auditors

## Corporate End-Users

- Corporate credit holders



# What is a carbon credit?

Carbon credits are tradeable certificates that represent the mitigation (reduction or removal) of a specified amount of greenhouse gas emissions. A carbon credit is underpinned by a project in a climate mitigation activity. One credit is equal to one metric ton of CO<sub>2</sub> or equivalent in greenhouse gas emissions reduced or removed from the atmosphere. The emissions reduction or removal resulting from a mitigation activity outside an organization's boundaries is used to counterbalance the residual emissions.

Carbon credits are often used by organizations to offset emissions but can also be acquired and retired without use as an offset as a form of extra value chain mitigation. Credit must go through a third-party verification process and once utilized by an organization, or "retired," the credit must be removed from the market.

There are two main types of carbon removal projects:

## Emission reductions

There are three broad categories for reducing emissions:

- 1 Avoid or reduce emissions from the geosphere (such as deploying renewable energy to replace fossil fuel use, or by improving efficiency).
- 2 Avoid or reduce emissions from the biosphere by protecting ecosystem, soil and vegetation from damage or degradation.
- 3 Reduce emissions from the geosphere by capturing and storing fossil carbon from industrial point sources or fossil-fueled power stations. The scope for further emission reductions will decrease as emissions decline towards the net zero target date.

## Carbon removal

There are two fundamentally different carbon removal types:

- 1 Carbon removal stored in the biosphere by restoring healthy ecosystems or enhancing soil carbon on agricultural land.
- 2 Carbon removal from the geosphere involves extracting CO<sub>2</sub> from the atmosphere and storing it in the geosphere, such as through direct air capture with geological storage (DACCS). The biosphere is already absorbing significant amounts of carbon in the absence of any active human intervention partly due to CO<sub>2</sub> fertilization and other indirect

effects of past emissions. This "passive" carbon uptake cannot be used to compensate for ongoing fossil-based emissions if the goal for net zero emissions is robust enough to halt global warming. Therefore, any fossil based residual emissions should be neutralized by durable (geosphere stored) carbon removals (according to the "like-for-like" principle)<sup>1</sup>.

<sup>1</sup>For more details around the net zero principle and the different types of carbon credits, refer to [Oxford Principles for Net Zero Aligned Carbon Offsetting](#) (revised 2024)



**“Different credits are emerging to serve different purposes, from decarbonization to financial returns. We need to be able to handle both in one industry.”**

Head of Carbon,  
Global Commercial Bank



# Demo Response



**\$1.9 Billion**  
in voluntary carbon  
market turnover



**254 Million**  
carbon credits  
transacted in 2022



Voluntary carbon credits  
issuance today across  
**98 Countries**

## Today's voluntary carbon markets: More growth, more diversity

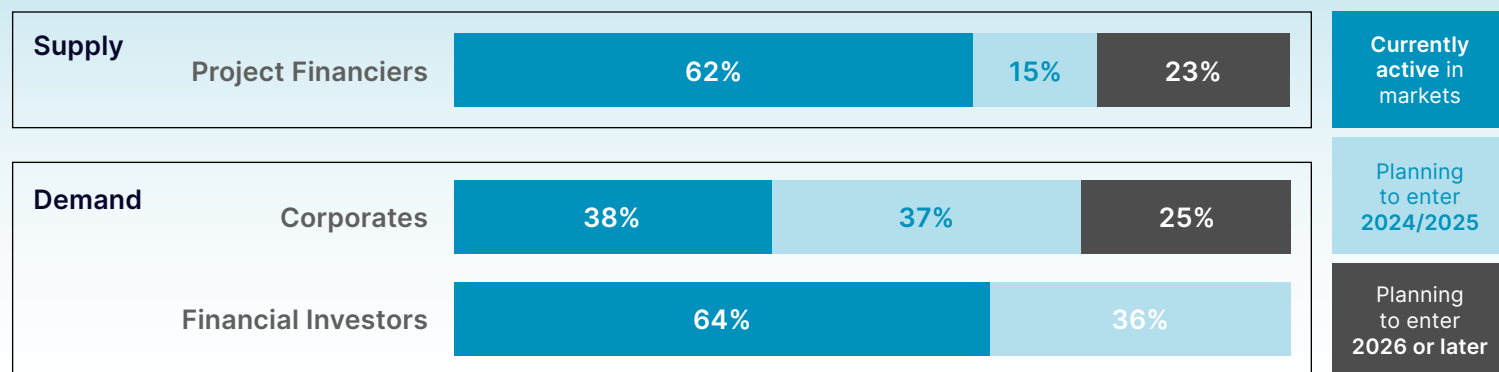
Twenty-five years after the first carbon credit was traded under the Kyoto protocol in 1997, VCMs have grown to now span 98 countries and have a global worth of \$1.9 billion in 2022, generating 254 metric tons of carbon reduction in 2023<sup>1</sup>.

While the last 18 months have been difficult, the consensus is the market is set to grow significantly for traditional credits. This is driven by a host of demand factors, from the imminent implementation of mandatory reporting under the CORSIA program (in 2027) to the growing convergence of compliance and voluntary markets under Article 6 of the Paris Agreement and the growing need for carbon removal in financial institutions' portfolios and lending books.

Together, these drivers are clearly drawing new participants into the world's voluntary carbon markets in ever-greater volumes. Just 14% of survey respondents had no plans to enter the market within the next five years.

On the demand side, 62% of responding corporates plan to enter the voluntary markets in the next three or more years, as do 36% of financial investors (which includes pension funds, mutual fund managers and wealth managers), driving a major increase in liquidity and funding to project owners. In parallel, 38% of commercial banks are soon to enter the market, as are 31% of broker dealers, each providing valuable infrastructure and lending to fuel further market liquidity.

What is still a nascent ecosystem looks set to expand significantly in the near term. But this also means global VCMs need to be ready to scale to accommodate more trading, more products, more markets and more geographies than ever before.

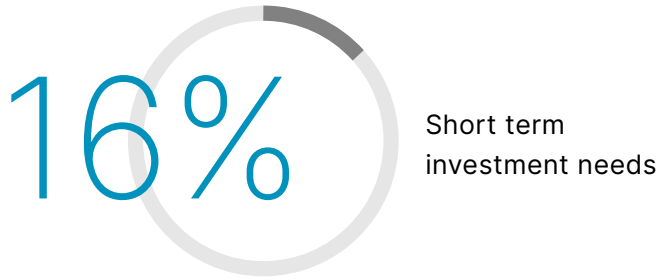
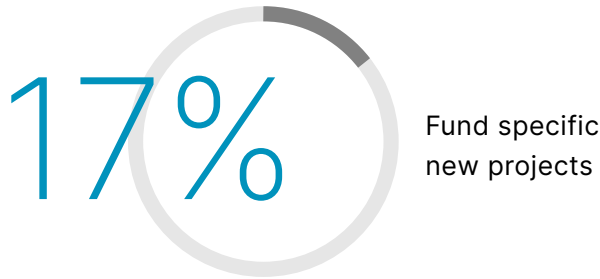
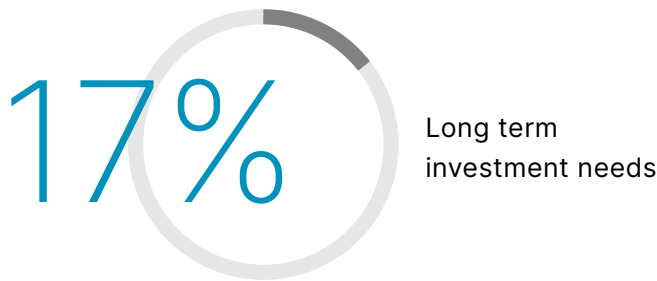


Source: Ecosystem Marketplace, November 2023

# Different investment objectives are driving different needs

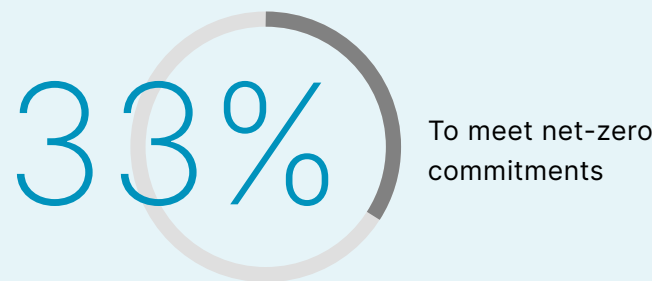
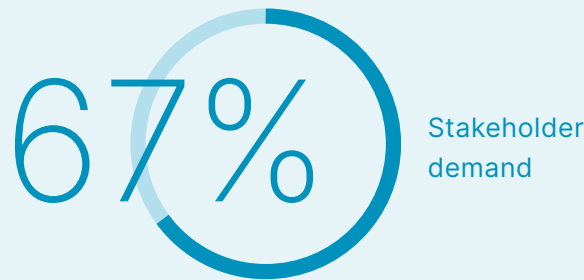
As with all financial markets, different players are active with different objectives, meaning that voluntary carbon markets are evolving to serve a growing diversity of needs.

## Commercial Banks



50% of commercial banks are active in VCMs to address their need to decarbonize existing loans and investment portfolios to maintain a “balanced book.” Increasingly, commercial banks are looking for a growing diversity of project tenors that can fit with their short-term and long-term investment needs.

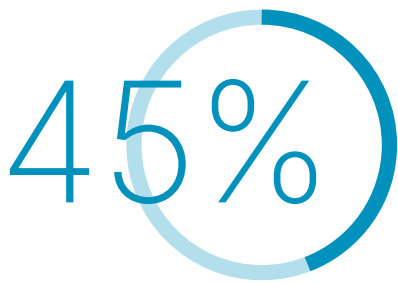
## Corporates



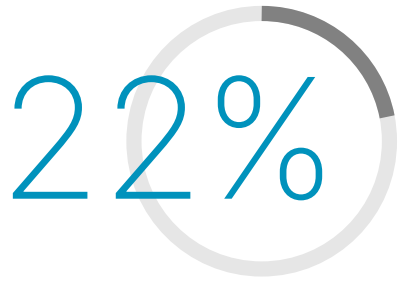
67% of corporates are driven by ESG priorities, both a focus of shareholders and long-term strategy. Progress toward net-zero commitments, for example, can come from participation in voluntary carbon markets. Generally, corporates are looking for a wide range of contracts that generate the highest possible levels of social impact through dimensions such as permanence and additionally to maximize shareholder appeal.

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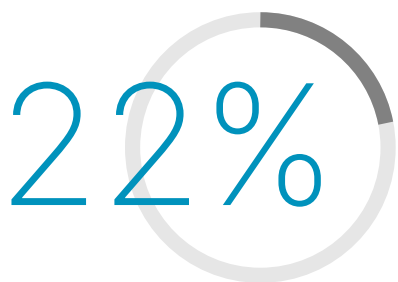
## Financial Investors



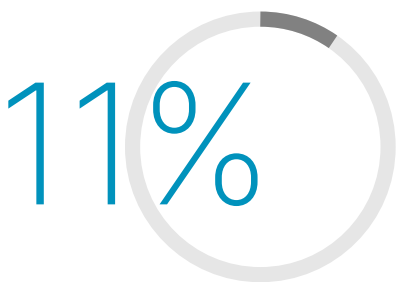
Investment returns /  
portfolio investment



Decarbonizing  
investment portfolio

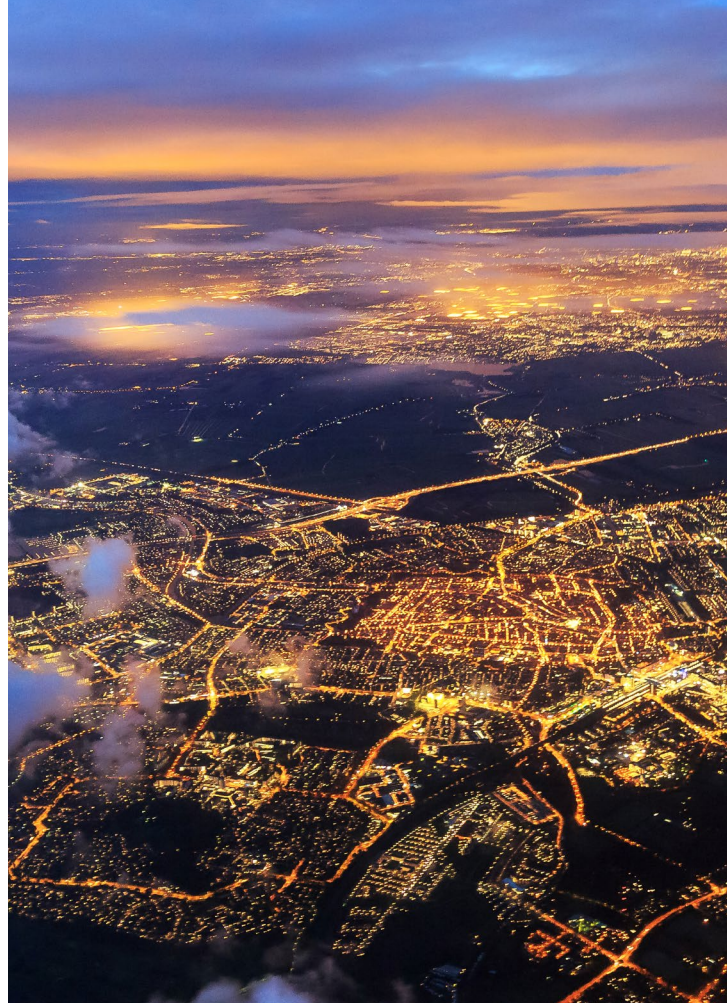


Offsetting carbon tax  
obligations



Stakeholder  
demand

Financial investors are largely split down the middle on their utilization of voluntary markets. For 45% of pension and fund managers, carbon markets are a portfolio investment play in which margin can be made and portfolio performance driven. Meanwhile, 44% of investors are using voluntary carbon credits to decarbonize investment portfolios or offset existing tax obligations.



### Are we ready for more diversity?

An increasingly populous and nuanced marketplace looks set to drive demand for a diverse range of credits. The direction of liquidity toward different kinds of credits will make markets more complex, which will in turn increase demand for product differentiation.

The pressing question is whether today's voluntary carbon markets are able to cater to these pressures of complexity and sophistication from different sources. Can the market meet demands in its current form? The answer is not likely—not without considerable progress to address structural issues.



# The Challenge with Scalability

## Market structure challenges hindering growth and maturation

While VCMs are attracting a diverse set of participants, nascent market structure creates obstacles that dampen demand growth and stifle further market evolution.

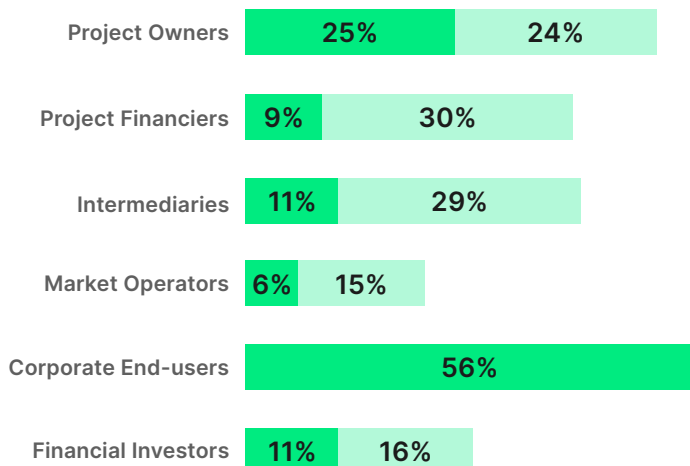
Challenges in issuance, verification, trading, reporting and retirement processes prevented 18% of all survey respondents from participating in today's voluntary carbon markets. A further 11% saw their volumes capped at less than half of their targets due to the same issues and 40% had ideal flows constrained by at least a quarter.

The impact of these obstacles stretches from the 49% of project owners that face serious constraints in bringing their projects to the market to the 39% of banks that finance them being equally inhibited and the 40% of brokers facing limitations in trading.

## Who is facing limitations in their carbon trading today?

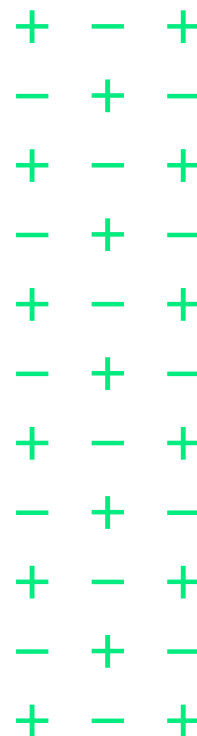
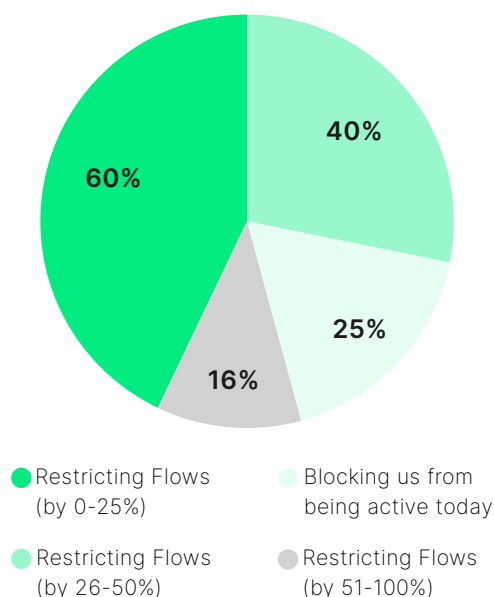
% of each segment facing issues in carbon trading

- Constrained by 51-100%
- Constrained by 26-50%



## How impactful are market issues for participants today?

% of respondents citing issues by impact



But nowhere are the current shortcomings more evident than among corporates, 56% of whom would like to double their carbon activity if only the market were to become more efficient. The same participant segment that is meant to fuel the carbon markets over the coming years are the ones who are most challenged by the market's current form.

By comparison, a worrying dissonance is found in the sentiment of market operators (including exchanges and registries), just 6% of whom rate these constraints to the same degree that their corporate end clients do.

**With almost one in three firms meaningfully challenged today, there is a clear need for fundamental change among VCMs if we are to unlock the opportunities and drive real scale.**

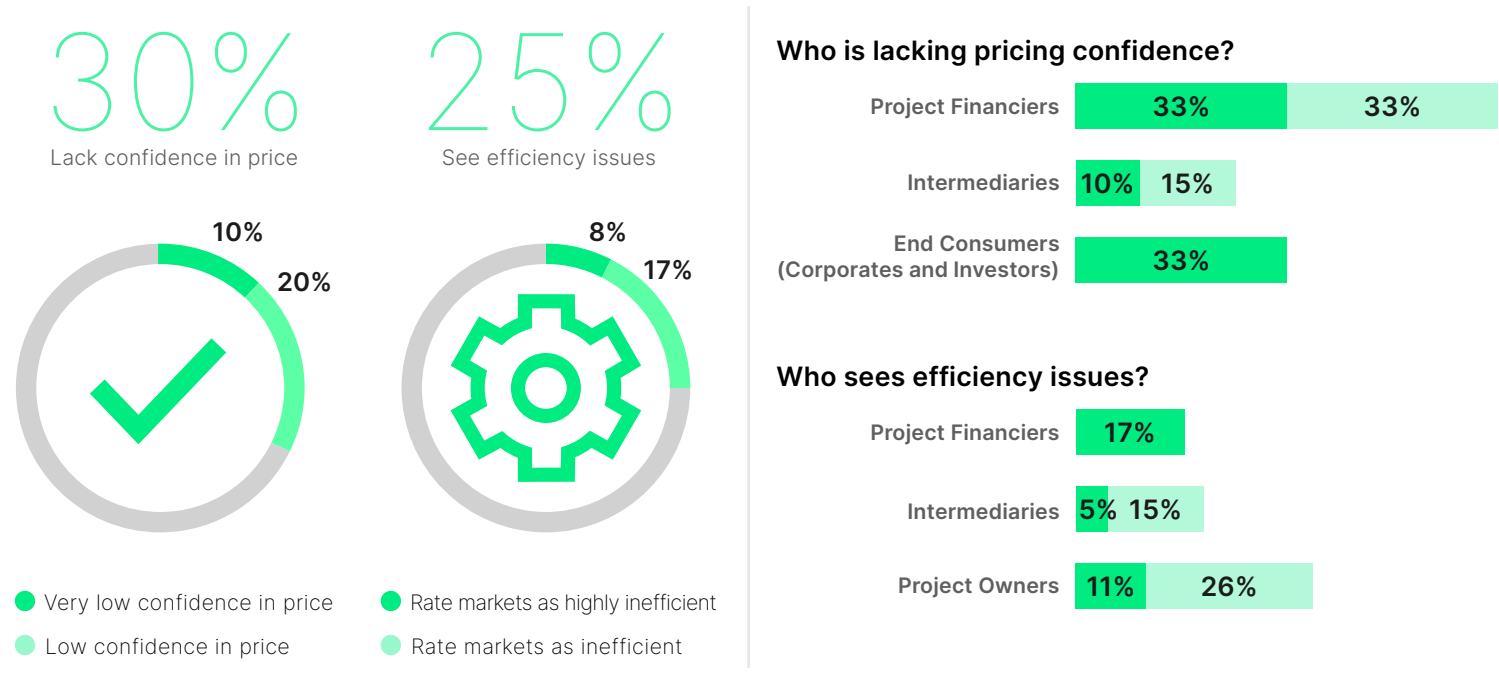
Taking a closer look under the hood of global voluntary carbon markets, the issues participants encounter generally fall into three main buckets:

**price transparency, standardization and fragmentation.**

**Price transparency**

Nearly one-third (30%) of participants had low confidence in the pricing of carbon assets, with 10% having very low confidence. The prevalence of that view underscores the issues across the carbon credit life cycle, many of which are fundamentally tied to price. Banks won't fund a market where they can't accurately model risk. Brokers won't trade and investors won't hold, and suppliers will struggle to attract financing.

**Fundamental challenges felt across buyer profiles**



This issue is felt across all buyers and financiers of voluntary carbon credits: 66% of commercial banks, 25% of intermediaries and 33% of buyers (including corporates and financial investors) have low or no confidence in the price of the credits that they are transacting.

A lack of trust in price quickly begets myriad issues. Poor pricing means inaccurate risk management, over-conservatism and limitations in liquidity. Banks won't fund a market where they cannot accurately model risk. Brokers won't trade and investors won't hold, leaving volumes capped at artificially low levels.

“We need to turn  
voluntary carbon  
credit pricing from an  
art-form to a science.”

Head of Commercial Banking,  
Asia, Tier 1 Global bank

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# Standardization

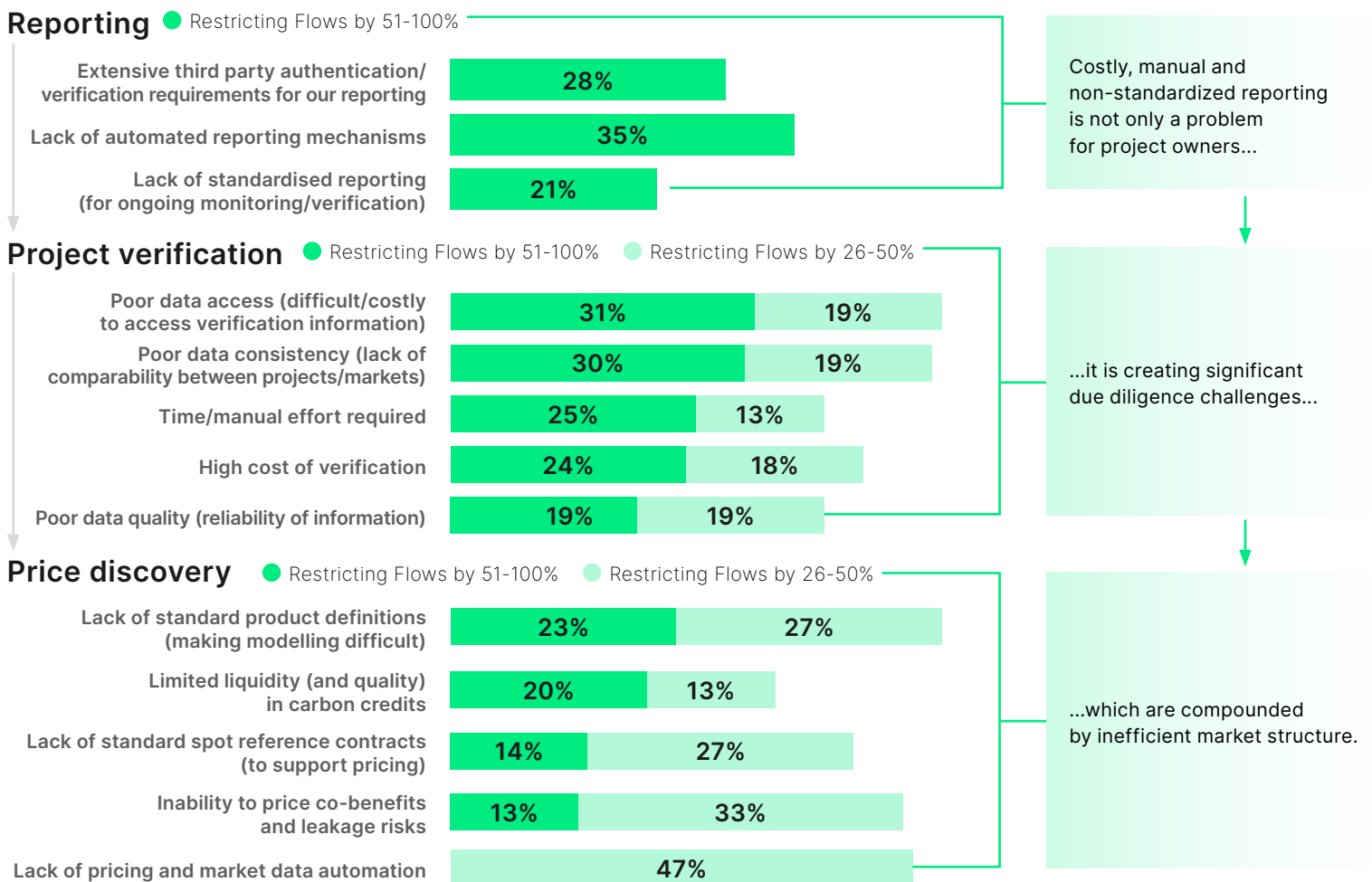
Digging deeper, concerns around pricing confidence are clearly grounded in the structure of the voluntary carbon markets today. They are simply too manual and too uneven today to support the volume and sophistication of participants needed to scale and deliver returns and climate action. The lack of standardization not only hampers trading but also limits the accessibility of local markets to foreign investors.

The absence of standardized, automated reporting across registries and auditors costs firms too much resources and time to manually source, consolidate and review. Consider settlement: Across the capital markets, settlements are a scale activity. Over several decades, the world's financial markets have driven settlement costs through standardized contracts, processes, connectivity and messaging formats to the point that settlement instructions against most major securities depositories in the world can use the same network and format (e.g. SWIFT). As a result, millions of trades per day in major markets are settled at a minimal unit cost and with automation levels of over 98%.

Few of these foundations to scale are present in today's voluntary carbon markets. At a base level, there is still a great need to standardize taxonomies and protocols used to define the credit instrument. This obstacle raises the bar for everything that comes after. In trading, disparate contract parameters inhibit accurate and transparent pricing. Issues are further amplified by the spread of registries, with no clear standard established for instruction formats or processing rules. The automation that standardization can enable is then not present, leading to reliance on manual methods, which themselves lead to higher costs.

## Top issues faced by firms in the reporting, verification and pricing stages

% of respondents



**Additionally, without standardized product definitions, 50% of respondents struggle in price discovery as they are unable to model or benchmark specific credits against any kind of market reference contracts.**

“Market fragmentation is leaving us with a growing number of liquidity puddles - none of them deep enough to be a pool and all of them sub-scale in terms of costs and connectivity.”

Head of Carbon Trading, European Broker

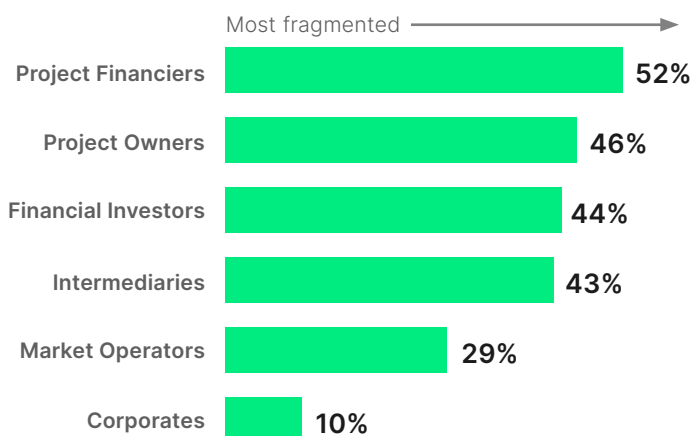
## Fragmentation

Fragmentation can be found across critical infrastructures and geographies. This is especially felt with respect to registries and how difficult and expensive interacting with individual registries is for different types of carbon credits: 96% of agricultural projects are in Verra/VCS, for example. And with little to no standardization or interoperability, each of these minor concentrations is today a “puddle of liquidity”—each devoid of scale, isolated and requiring entirely bespoke, manual resources to manage.

Today, the average voluntary carbon market participant faces between six and eight different registries - with the levels of fragmentation highest for commercial banks and for financial investors (52% and 44% of whom face more than four registries on a daily basis, respectively). These organizations, whose role it is to provide financing or funding to a wide range of projects, are the most exposed to multiple registries and hence to the exponentially higher costs, risks and processing limitations facing each registry manually for due diligence, trading and risk management. The more deals they do, the faster these manual costs escalate.

### How fragmented are the voluntary carbon markets?

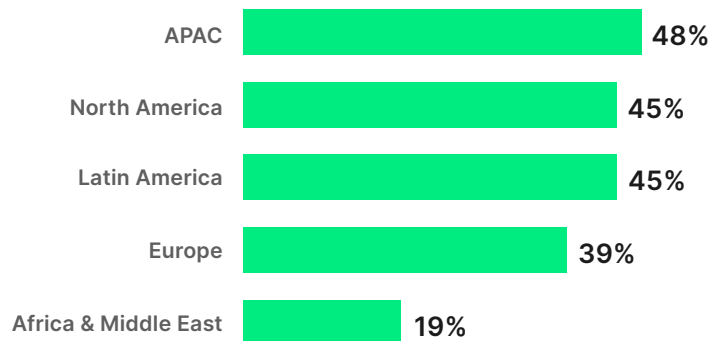
% of respondents facing four or more registries



Another factor to fragmentation is locality. While the growth of voluntary markets across continents, particularly in the Global South, has been one of the truly positive recent advancements, the lack of integration between them blockades growth and scale. Over 42% of voluntary carbon credits are traded locally today.

### How localized are the voluntary carbon markets today?

% of credits per region that are originated and sold in the same region



The wide variety in local legal and accounting frameworks across different markets makes it time-consuming and manually intensive for investors to fully understand the true impacts of holding credits in distant jurisdictions.

At a contract level, the lack of standardization and the highly customized nature of voluntary carbon credit trades is a natural obstacle to global reach. It is time-consuming and manually intensive for investors to fully understand the true impacts of holding credits in distant jurisdictions.

At a project level, investors face a host of challenges from having to read hand-written due diligence documents in multiple foreign languages to a lack of standardization in monitoring, reporting and verification standards across different markets. Without the ability for investor liquidity to scale across regions, we risk further reinforcing the fragmentation barriers that restrict today's carbon trading to localized puddles of liquidity.



“We look to source credits as locally as possible – mainly because we can track and see their credibility more easily.”

Head of Sales, European Investment Manager

## Markets at a critical juncture

This combination of disparate, fragmented and manual interactions across the trade cycle is fundamentally undermining the industry’s ability to price and risk manage voluntary carbon credits in a scalable and accessible way.

Far from facilitating growth, the persistent need to perform manual due diligence and pricing for each project and credit remains a significant barrier to entry. If only those with the deep industry specialty and appetite to assume the significant risks of voluntary carbon credit trading are able to enter, then we will continue to see industry liquidity running at a fraction of its true potential and concentrated in a precious few number of projects.

For those that do enter the market, higher due diligence costs per project will inevitably drive commercial banks, corporates and investors to seek out or entertain only larger deals, disenfranchising smaller project owners and smaller banks. The market will concentrate rather than diversify—reinforcing the consolidation of liquidity that we are already seeing take place today.

# Market Efficiency: A Compounding Effect

Price transparency is a leading pain point for voluntary carbon credit participants today, but market efficiency is not far behind: 25% had low confidence in market efficiency, with 8% having very low confidence.

Across today's voluntary carbon credit trade cycle, 94% of processes are managed manually (i.e. using phone calls and emails), which creates costs, risks and limitations to scale. The lack of standardization and automation seen in pricing bleeds into efficiency and compounds the issues.



**“The challenges in the [voluntary] carbon markets today are about market structure - not our own operating models”**

Head of Sustainability, Leading Corporate

## Defining the industry challenge

% of respondents facing serious issues in their carbon activities (restricting volumes by >25%)



At the root of inefficiency is the reliance on manual methods for managing core trading and issuance activities. Phone calls and emails were predominant methods across the credit lifecycle, but far from the preferred option for respondents, who want to see automation in project listing, trade execution and reporting, among other areas.

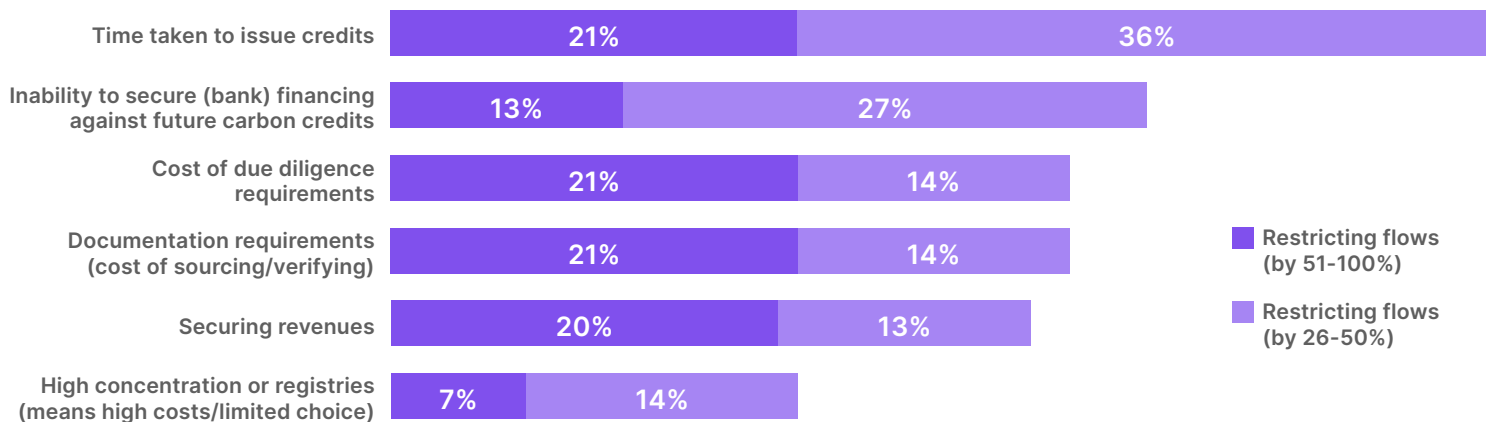
## Projects face long time to listing

57% of project owners see their businesses severely limited by the fact that new credit listings can take months to be onboarded at existing registries. In the absence of standardized (or regulated) onboarding requirements, registries' long and bespoke onboarding processes not only generate costs but they also impede project owners' access to capital when it is most needed. If financing through carbon credits is available only to projects that can withstand a months-long wait for funding, then a large number of projects will inevitably be disenfranchised—and with them large amounts of carbon left in the atmosphere.

Faster time to market supported by registry capabilities not only accelerates access to capital but also grows the market by expanding the number of projects available to market participants.



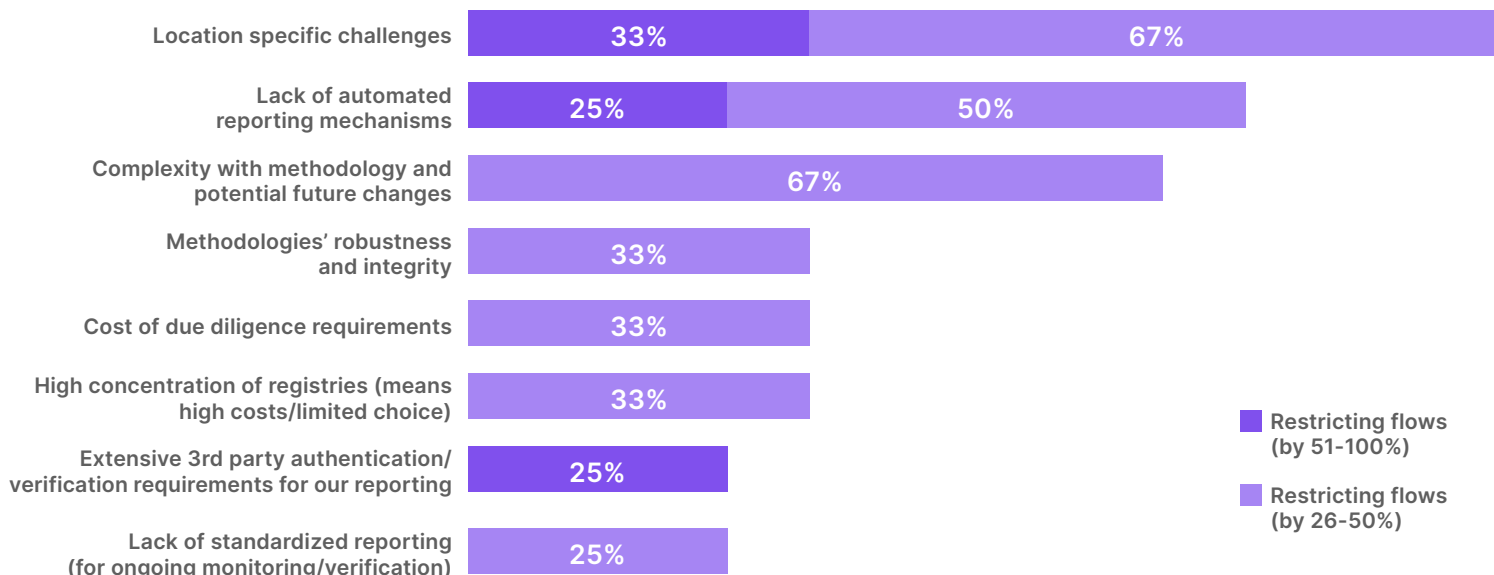
## Key issues faced in project listing % of respondents facing each issue



## Commercial banks cite due diligence problems

Besides manual reporting and oversight, risk management is a top challenge for commercial banks. Counterparty risk was often cited—especially for banks that do not have an established history in the agriculture and forestry sectors, for example. Given the regional variance of these factors around the world, the location-specific nature of projects and their constructs is an issue for 100% of commercial banks today. Ultimately, this means that new entrant banks either stay out of the market or they severely limit their funding capacity as they build out the necessary competencies and expertise to safely manage these issues. In an era of increasing risk management, it can take banks several years to build out entirely new credit risk frameworks.

## Key issues faced in project verification % of respondents facing each issue



“As we’ve seen with many recent deals, the huge range of variables in carbon projects means a large volume of heavily bespoke contracts, with very little consistency at all.”

Head of Carbon, Leading Commercial Bank

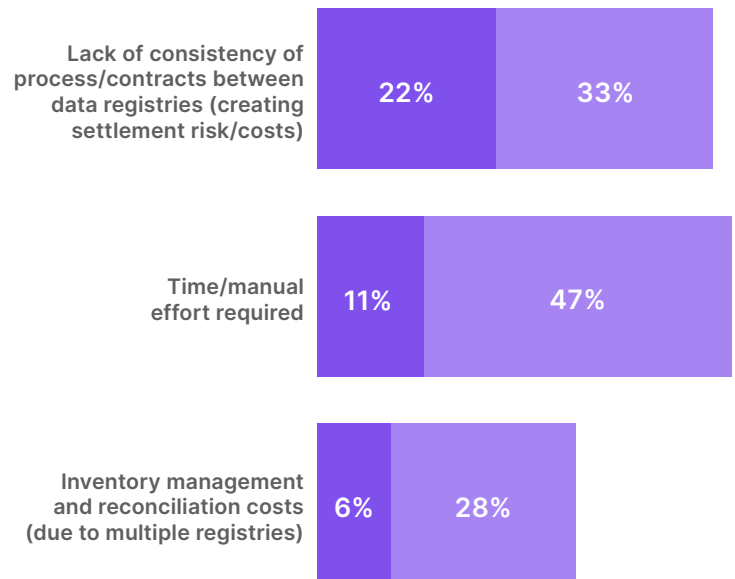
## Costs on the minds of intermediaries

All parties to a credit trade are sensitive to its costs, so it's concerning that 100% of market participants see high settlement transaction costs (with registries) as an issue that is severely limiting their carbon credit trading volumes.

For brokers and intermediaries, these costs can be an existential issue rather than a mere cost of doing business. If the costs of intermediating a trade are disproportionately high, they risk eating up all of the commission or margin that a broker may be making on a trade, putting the broker at a loss. If brokers are losing money, then their willingness and ability to provide valuable liquidity to the market will lessen or disappear.

## Settlements

■ Restricting flows (by 51-100%) ■ Restricting flows (by 26-50%)



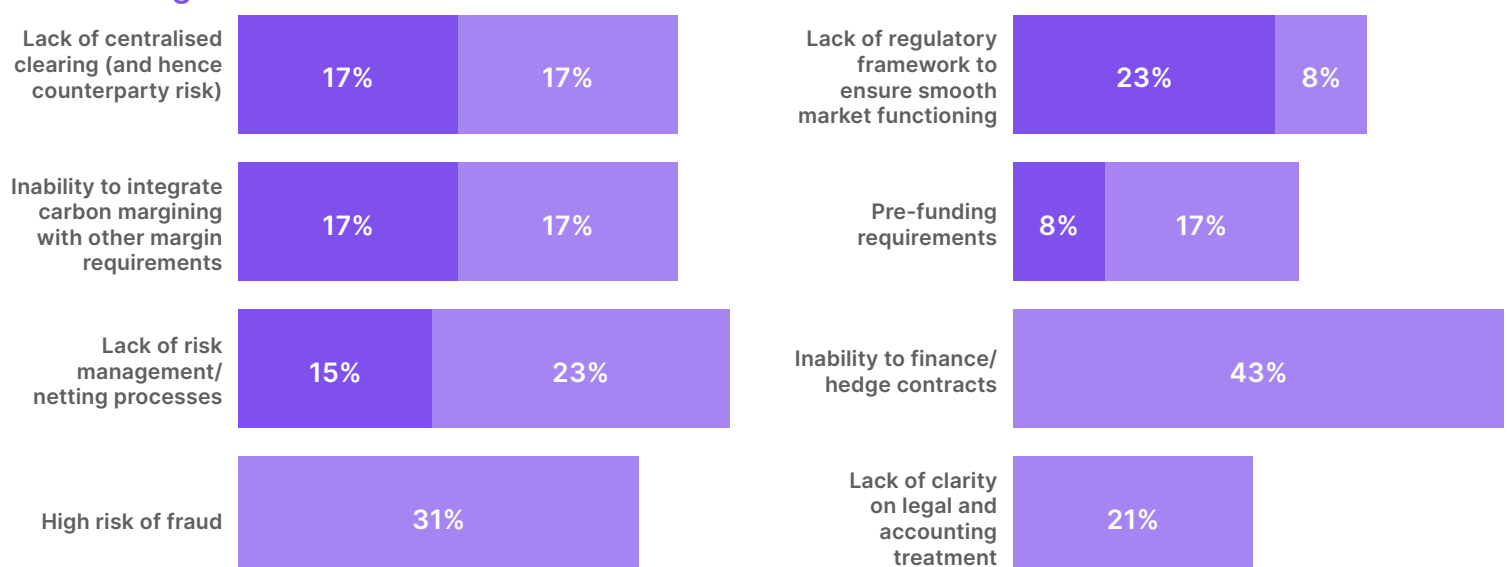
## Market sophistication causing a blockage for institutional investors

The world's leading institutional investors (including the world's largest sovereign wealth and pension funds) have evolved over recent decades to maintain investment risk oversight frameworks that are second-to-none. From account structures to counterparty risk monitoring, these investors' demands of the markets and service providers in which they operate are stringent and exacting.

It's concerning then that 32% of these same investors are challenged when they come to invest in the voluntary carbon markets, mostly by the lack of regulatory frameworks and a lack of clarity on how their investments should be classified.

If we want the world's largest investors to enter the market then we need to both help them to grow their expertise and to ensure that the frameworks exist for their investments to be safely managed within regulated and transparent frameworks.

## Risk Management



■ Restricting flows (by 51-100%) ■ Restricting flows (by 26-50%)



“We’re not a grown-up market yet. So far most volumes have come from impact investors or corporates—and the world’s major institutional investors are only now beginning to learn what questions to be asking”

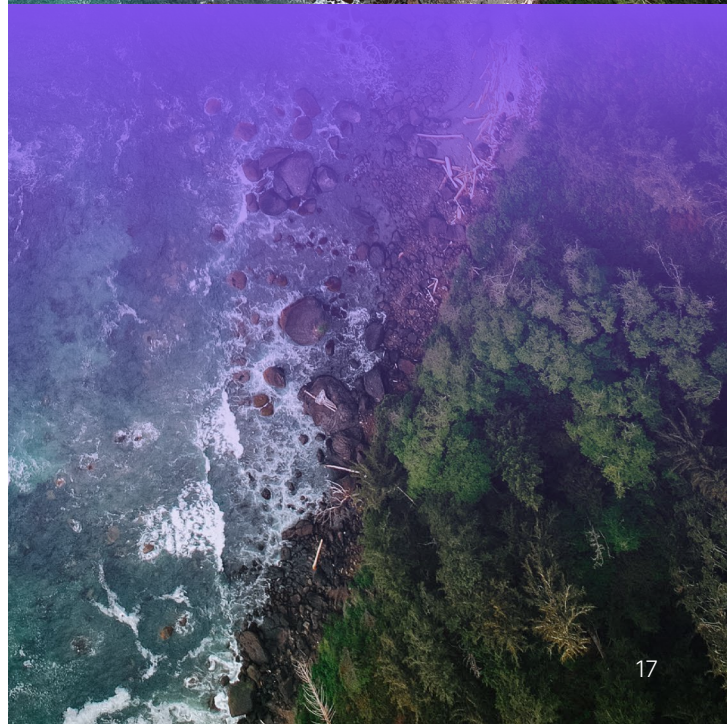
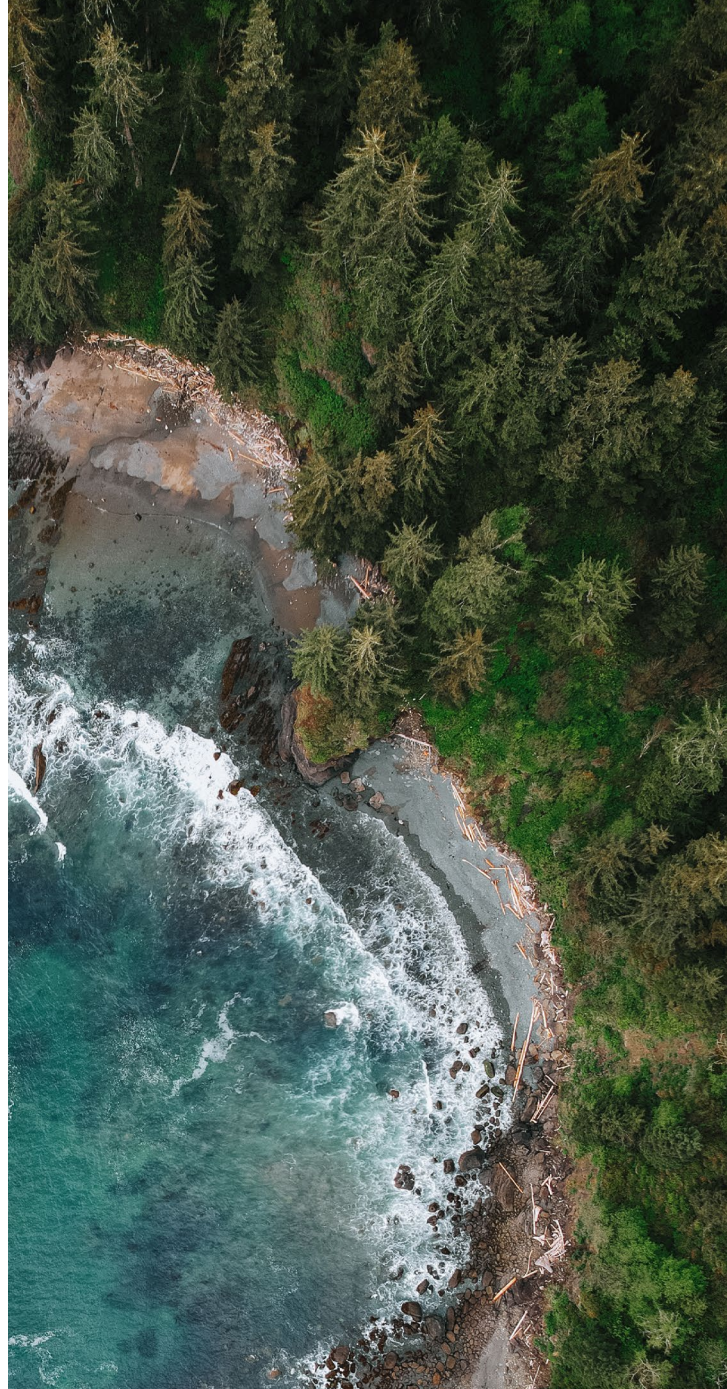
Global Head of Distribution,  
Carbon Credit Investment Fund Manager

## Corporates are diverse - but need to be ready to disclose

A common theme across all corporates is the need to provide the right levels of (sophisticated) disclosures to their shareholders—yet the corporate world is increasingly divided.

Amongst the 167 firms that make up 80% of emissions, carbon neutrality management is becoming a core competency that stretches well beyond the simple management of carbon credits. Having built out portfolio based strategies across multiple projects (Microsoft has invested in 1.5m tons of CO<sub>2</sub>e across 17 projects), blue chips’ interactions with project owners now closely resemble those of commercial and funding banks—where information flows are constant and heavily tailored, all with the aim of being ready to provide deep and accurate disclosures to their sovereign-wealth and pension fund shareholders. In this context, the “Venture capital” problem highlighted above is manifest: If each corporate has to work extensively to ensure that it can receive the right levels of information, in the right format, from every project, then its appetite to entertain new project owners is inevitably low.

Smaller corporates are finding themselves under more acute pressures, stranded as they are between unstandardized processes at a project and registry level, and growing disclosure requirements from index providers and regulators. Too small to compel each project to adopt their own reporting standards, these companies nevertheless face constant pressure to support growing disclosures to index providers (such as S&P and MSCI) in order to remain desirable to investors. Add to that the ongoing variance on net-zero definitions and questions around measurability and the operating agenda for smaller corporates is highly complex. There is an increasing need for more clarity in the frameworks for corporates claims. To scale demand, corporates need clarity on the appropriate utilization of carbon credits from one of their peers. With these pressures most acutely felt from European shareholders today, smaller companies seeking global investors are having to invest to build the human expertise to bridge the gap.







# Building Blocks to Scale

Investors are ready to pay a premium for transparency. Faced by challenges in pricing and risk management, voluntary carbon market participants are clearly seeking out and rewarding all areas of improved transparency and disclosure.

But buyers and market participants are not waiting for the structural and process challenges above to be resolved. Compelled by the core and immediate demand drivers, participants are turning to a range of solutions that are available today. But, while valuable in the short term, the increased use of tactical solutions risks exacerbating existing market issues by adding variability and complexity that takes us further from a coherent and scalable operating model for voluntary carbon markets.

“There are two paths for different types of carbon credits. Those that can be verified quantitatively will attract more financing at differentiated pricing. Those that can’t will face higher costs and, eventually, avoidance.”

COO, Leading Carbon Trading Venue

## Growing use of exchanges for spot markets

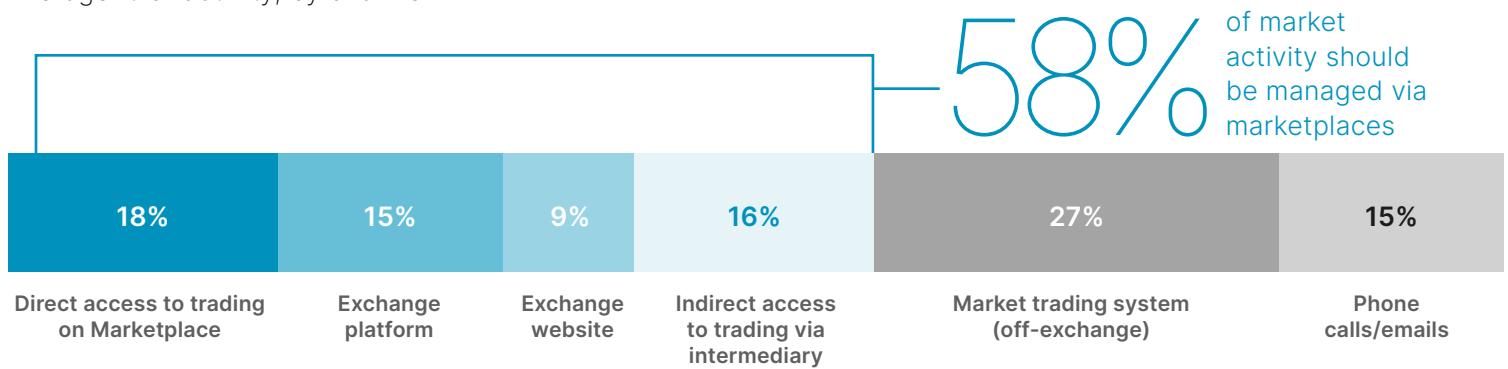
A clear and proven source of transparency for all securities is exchange trading, which is the preferred model for 43% of all voluntary carbon market participants today. With the growth of new exchange platforms such as **Climate Impact X**, as well as the entry of traditional major players, liquidity is quickly beginning to form. Leveraging strengths in product standardization and the depth of consistent, automated market data and analytics, the growth of exchange-traded credits is both positive and unavoidable.

Yet the majority of this trading today remains concentrated on nascent, specialist and unregulated exchanges that lack the full weight of legal and regulatory oversight of traditional securities or derivatives exchanges and which many banks and financial investors require. Given their specialist role, they also remain fragile to significant market changes. Fortunately, these new exchange venues are receiving extensive support from governments, regulatory authorities and banks, meaning that many of the current limitations are currently being solved.



## What does the industry target operating model look like?

Average % of activity, by channel



## Carbon credit activity today

By tenor



The growing role of engineered carbon removal projects is evidence that permanence is commanding a material premium today - trading at up to \$350 USD per CO<sub>2</sub>e. Permanence means certainty and therefore offers a clear premium through lowering the complexity of due diligence, as well as reducing ongoing monitoring and verification costs. Whilst only 15% of our respondents are trading in engineered carbon removals today, those that do see the market integrity as a core driver.

“There is increasing purism emerging – where only engineered carbon removals can work, because no one wants to wear the risk.”

Head of Investor Relations,  
Mid-cap Canadian Corporate

# Traditional carbon credits: evolving fast

Traditional carbon credits remain the mainstay of the voluntary carbon markets today, with over 55% of our respondents trading in this space due to the relatively higher levels of supply and belief around the market’s long term growth potential.

Fortunately, however, this market is not standing still. Echoing the growing premiums derived from improved transparency in engineered carbon removals, there is a growing distinction even in the traditional credits space between newer credits and their older counterparts.

As registries have continued to update their methodologies (to mitigate more risks and improve transparency), newer credits have become increasingly desirable, meaning that over 64% of commercial banks, corporates and financial investors now see credits for new projects (i.e. Year 0 credits) as preferable in tenor to those for existing projects. As methodologies have evolved to manage and mitigate more risks, buyers have seen both a net transfer of project risk and greater transparency around the risks that they need to track and monitor.

The fact that CORSIA-eligible credits have seen a 126% price rise in 2022/2023 is clear evidence of the growing value of quality and transparency.

The market is acting to improve risk and transparency—and buyers appear to be rewarding these efforts.

## Distribution of carbon credit activity by project type

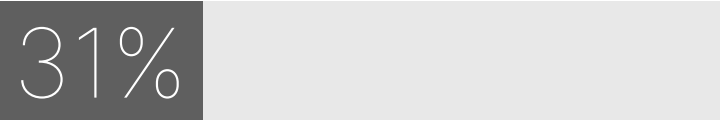
And core drivers



**Traditional carbon credits**  
Example: forestry, renewable energy, waste management

**Key drivers:**

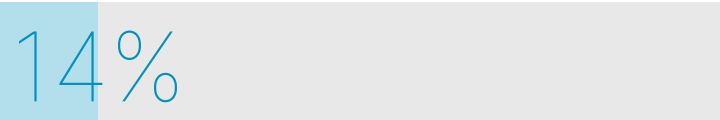
- Long-term growth potential
- Highest supply of projects
- Most transparent/reliable information



**Nature-based carbon removals**  
Example: blue carbon, reforestation

**Key drivers:**

- Low competition and low supply
- Easiest to mark to market
- Niche/core specialism



**Engineered carbon removals**  
Example: BECCS, DACCS, biochar

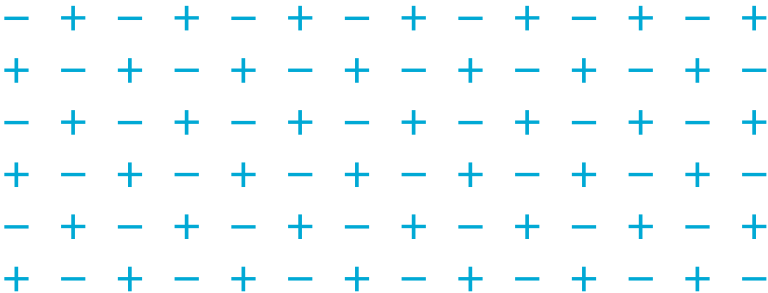
**Key drivers:**

- Highest returns (@ \$350 per CO2e ton)
- Integrity and climate benefits (i.e. permanence)
- Known sponsors

## Beyond carbon: additional certification

A further area where transparency is commanding a premium (albeit at a cost) is in the area of additionalities or social co-benefits for traditional carbon credits. As a key area of distinguishing value in credits, the wider impact of carbon projects is often hard to quantify. Yet projects that have external certification of their co-benefits are today attracting a 78% price premium. There is clear value in evidencing these benefits but to do so means enlisting the support of more parties in the chain. Data evidence is becoming an industry in its own right.

Noteworthy is that co-benefits are of less importance in the market for durable carbon removals. This is due to the certainty of this tool (i.e., robust carbon impact from the removal and the storage of CO2) and the fact this type of instrument has a very different price level.





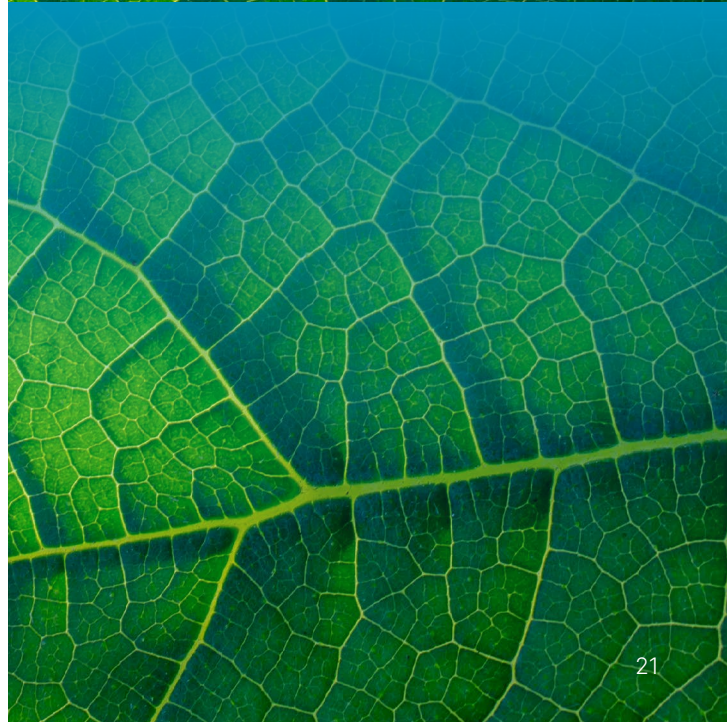
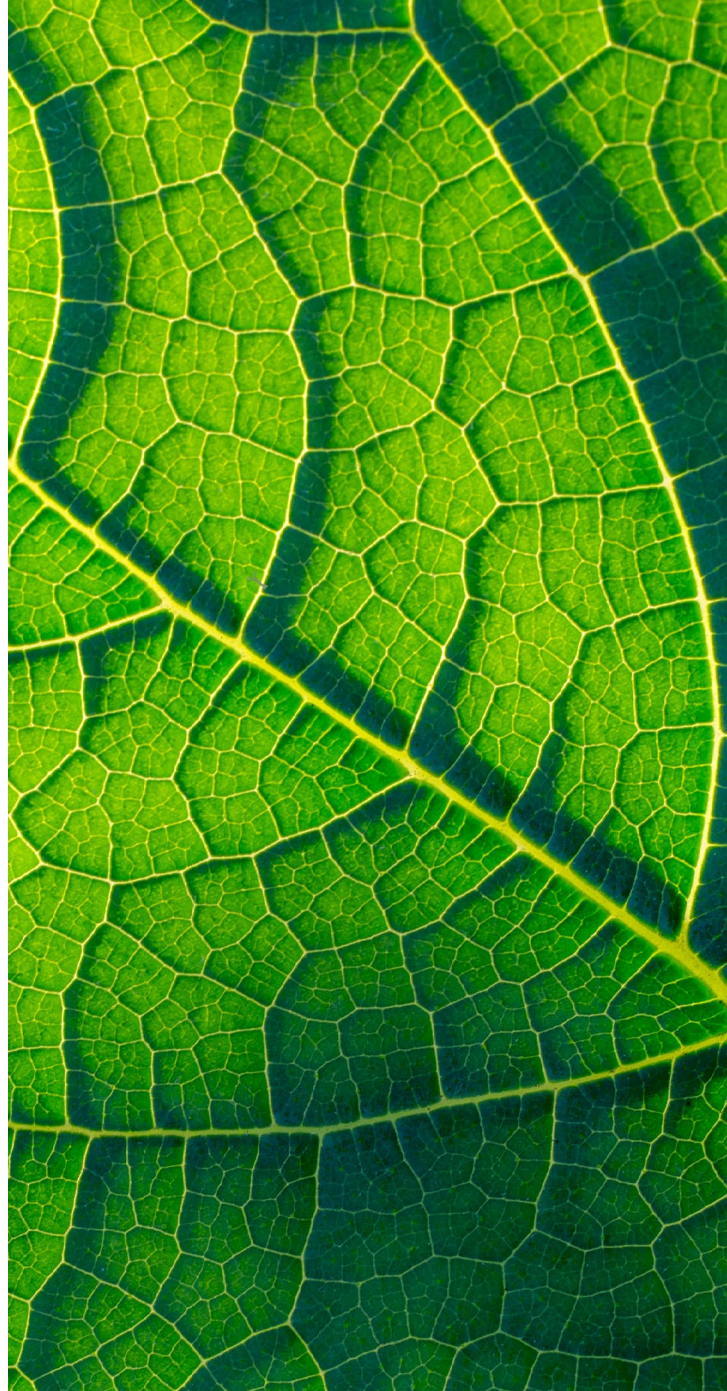
## Buyers taking matters into their own hands

In an effort to boost confidence, the industry is seeking out improved transparency wherever possible today. Yet the challenge with many of the above developments is that they are all nascent and future-dated. They are cause for optimism but they are not addressing the central, confidence-linked challenges that buyers face in the voluntary carbon credit markets.

To really solve these problems today, investors are taking matters into their own hands. Rather than rely on manual and unreliable information from many parts of the investment chain, major corporates and financial investors are disintermediating brokers and commercial banks to take up direct relationships with project owners. Buyers are setting their own sourcing rules, finding their own projects and conducting their own (onsite) due diligence—in a major increase in project investment and resourcing.

This benefits buyers in two ways. Firstly it gives them direct access to the information they need straight away. It is easier to standardize when you are the one asking questions. Secondly it gives investors greater say and influence in the future strategy and evolution of the projects that they invest in. Visibility today, control tomorrow—both of which mean greater confidence.

The problem is that this cannot scale. In another echo of the private equity model mentioned above, more time spent on each project inevitably means that fewer transactions can be managed across the industry. And higher onboarding costs per project can only mean that smaller projects become unviable simply due to the due diligence costs.





# Our Industry To Do-List

## To grow demand or to service demand?

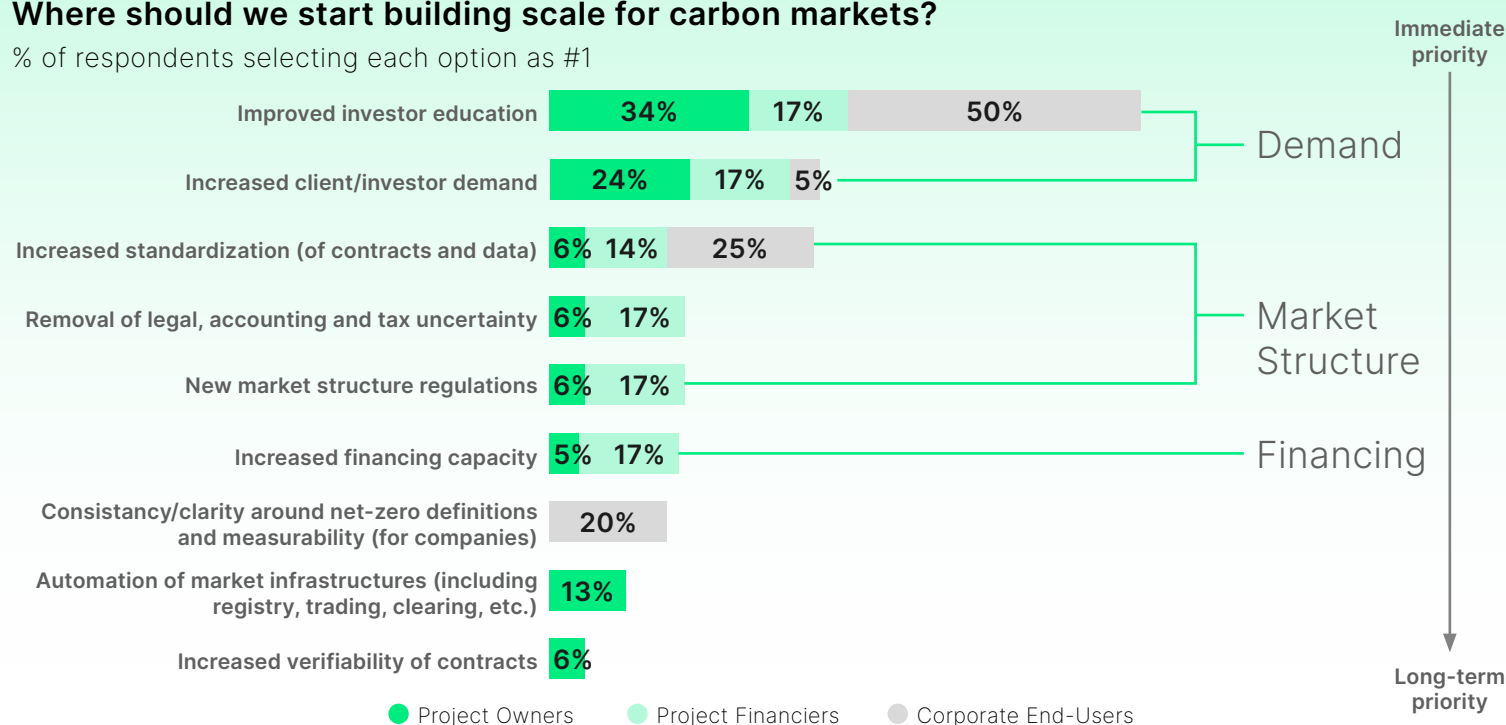
Based on our survey, it appears that any plan to scale voluntary carbon markets will rest on two pillars: education and infrastructure. In order to grow demand—and facilitate the entry of the firms that are still standing on the sidelines of the market today—we need to provide greater investor education. And in order to service this demand (and to unlock new, incremental volumes from existing participants), we need to focus on market structure and standardization.

“The single biggest thing that we can do to help the carbon markets is to help people to know what questions they should be asking.”

Head of Sales, US Fund Manager

## Where should we start building scale for carbon markets?

% of respondents selecting each option as #1



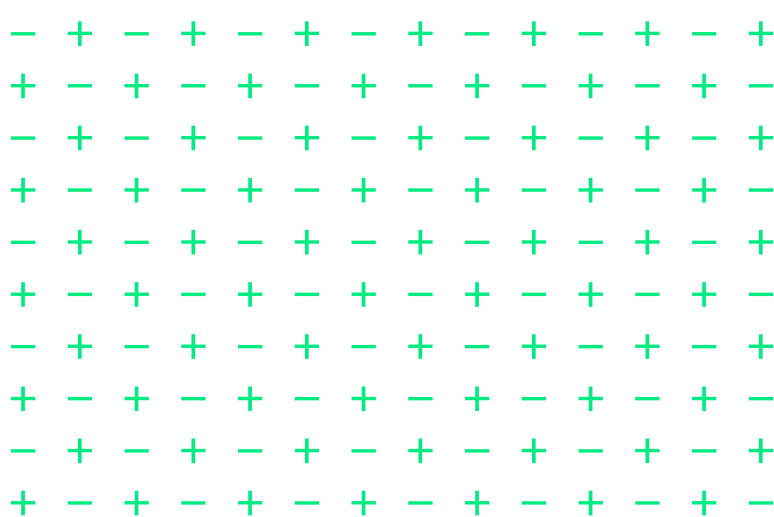


# Education to create a better understanding

Many respondents cite the need to better educate participants and stakeholders on basics of carbon markets and credits. This is in direct response to negative media stories about greenwashing that detract from markets and projects. The issues are a clear problem for commercial banks and investment advisors in particular, who struggle to secure management and customer support in “putting the carbon markets on the agenda.”

The required solutions here are two-fold. At a market level, 50% of respondents believe the definition of carbon neutrality as a measurable objective should be the center of our investor education plan. With regulations such as the European Commission's Corporate Sustainability Reporting Directive (CSRD) due to provide significant transparency on company sustainability disclosures, there should be much less scope for fraudulent or highly subjective disclosures on the part of companies. In turn, it will increase pressure on companies to verify and ensure that all of their credits are legitimate and delivering. Transparency will help to remove greenwashing risk and improve the credibility of credits.

At a micro-level, there is also a pressing need to develop firms' ability to understand, size and manage due diligence risks around voluntary carbon credits. With significantly varying degrees of expertise across the industry today, the structuring and treatment of projects is creating a trend towards personalization and away from standardization. Initiatives such as Carbonplace, TSVCM and ICVCM can all play a role in helping firms to educate each other and ensure alignment, instead of divergence.



“We have a massive credibility gap in the market today. When credits are fraught with greenwashing risk and media coverage, there is a very negative perception around (voluntary) carbon credits. We can never stop trying to close this gap.”

COO, Leading Carbon Marketplace

# Standards and market structure to unlock incremental volumes

Our survey highlights that standardization and automation for due diligence data and contracts would allow more than 30% of current market participants to double their credit trading activities. This journey has several steps:

## Step 1

Create and embrace standardized taxonomies to define carbon credits and accommodate their unique qualities. Being able to differentiate credits is the basis for standardized documentation and contracts that improve all downstream trading and settlement processes.

## Step 2

More pressing, anecdotally, is the need to standardize due diligence information and disclosures across the entire credit life cycle. In order to facilitate automation (and to pave the way for transformational monitoring technologies using IoT, etc.) banks, corporates and investors need the carbon markets to look and behave like other derivative or securities markets as soon as possible. For up to 40% of market participants, this means seamless and standardized connectivity from exchange venue to trading systems and to registries—so that deep, market pricing and statistical, comparable analytics are available in real time from a single trading desktop.

## Step 3

An important facilitator of VCM growth is transparency in pricing. Given the reliance and importance of transaction in future deliveries (through power purchase agreements or offtake agreements) the market ecosystem would greatly benefit from improving price transparency, which itself derives from standardization, automation and exchange-based transactions.

## Step 4

The resolution of pending questions around the legal, accounting and tax treatment of voluntary carbon credits is essential. Not only would this provide the basis for common treatment of credits across the industry (removing variance in reporting), but it would also help to reduce the number of risks that buyers need to address through highly bespoke project and contract terms, helping us to take a further step toward industry alignment.

## Step 5

Regulated marketplaces and participants need to use standardized product definitions that support interoperability and connect to industry payment mechanisms to support true delivery-versus-payment (DVP). Through regulated markets, counterparty due diligence burdens could be reduced and risks transparently assigned to key participants. Through interoperability, transaction volumes could consolidate and reach levels of scale that deliver true efficiencies to buyers and sellers. And through DVP, trading volumes could scale in balance-sheet-friendly way (with minimal RWA consumption).

## Ideal operating model #1 ideal option per function, % of respondents

Function	Ideal Option	Respondents
Project listing	Registry site (using standardized documentation)	79%
Monitoring, reporting and verification	Automated reporting	76%
Trade execution	Marketplace and exchange-based	59%
Credit retirement management	Registry platform	50%
Price discovery	Market trading system	41%
Inventory/risk management	Exchange	38%

## Moving forward: registries at the heart of the solution

This is a pivotal time for carbon markets. The weight of the task to scale up is felt across the ecosystem, but who will seize the initiative to drive real change that ultimately creates more efficient markets that reward project owners, financiers and investors alike?

Increasingly, the carbon community is looking to registries to solve these topline issues. **Two-thirds of respondents (66%) see registries as the most important facilitator to improving markets and leading change.**

As the guarantors of quality in the voluntary carbon markets, registries have two core levers to drive confidence. The first is their traditional strength of project verification and methodology, where evolution continues.

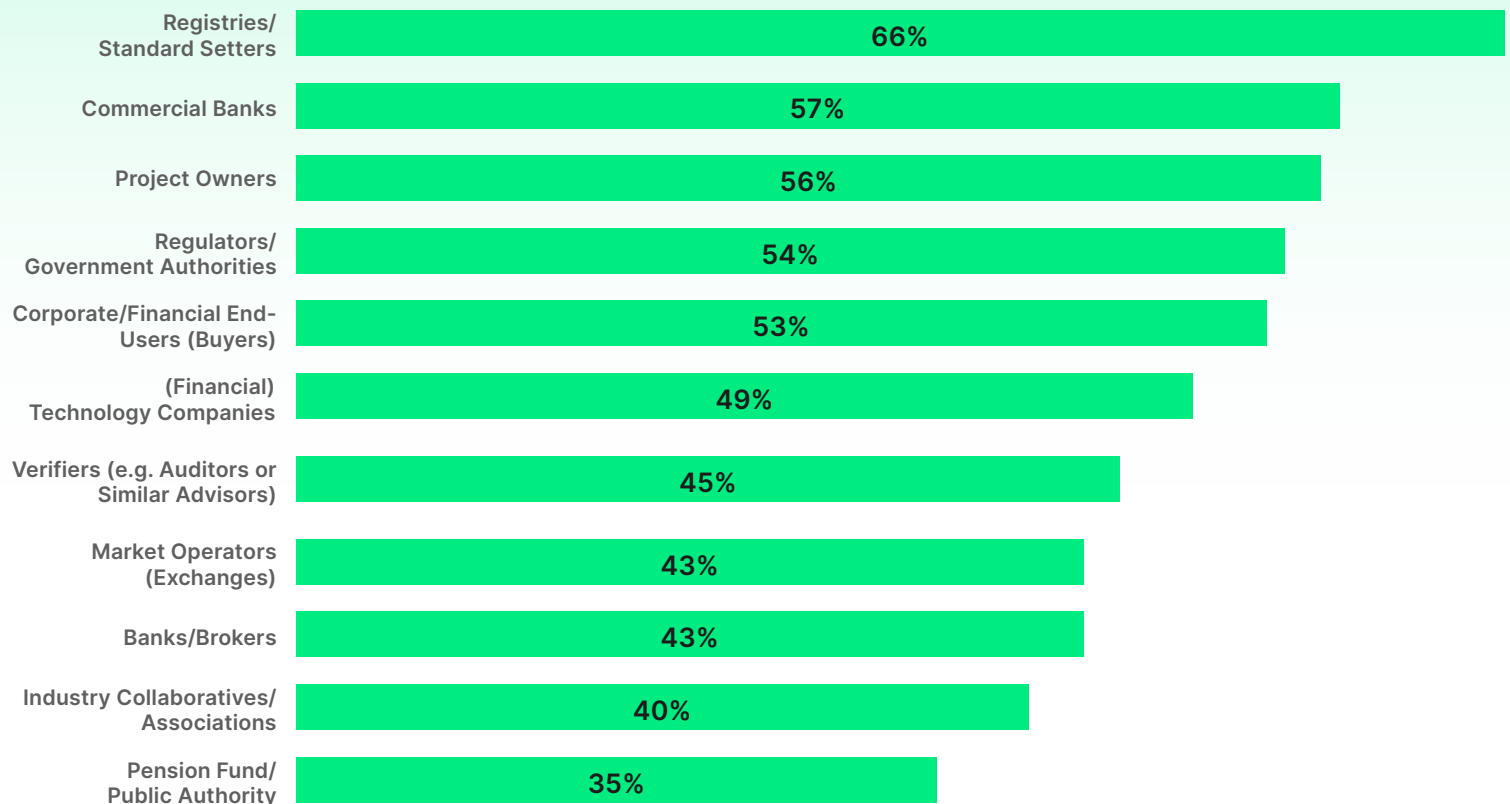
They alone can drive the standardization in the products that they hold, in the data that describes them and in the availability of that data across multiple platforms. Through standardization they can enable automation and connectivity, which accelerates due diligence, increases price transparency and reduces transaction costs. In doing so they can address the fundamental confidence issues that undermine our industry today and help to put the world's voluntary carbon markets on a scalable growth path.

In the same way as securities depositories have facilitated scale and access to liquidity in the world's listed securities markets, registries today have the power to help over 30% of firms to double their trading volumes today and to help exponentially more players to enter the voluntary carbon markets. Most of all, they have the power to set the standards that the markets will follow.

With so much potential on the line, it remains a massive question as to how registries will unlock value. One certainty is that investment in standardized infrastructure and technology will help them support efficiency, transparency and dependability

### Who plays the leading role in driving change?

% of respondents selecting each option as critical enablers





## About Nasdaq

Nasdaq is a technology provider to over 130 financial market infrastructures (FMIs) around the world, including carbon markets. Through these relationships, we have gained first-hand insights, best practices and experience to apply in growing and scaling voluntary carbon markets. Above all, these experiences inform our technology solutions and the needed functionality for carbon credit exchanges and registries to support their transaction lifecycle with end-to-end capabilities and build for the future, including:

- Trading technology with multi-parameter matching model capabilities that enable buyers to search for and find credits that meet exact requirements for vintage, locality, project type and certification body, among other factors.
- Tailored matching models for carbon credit trading venues, including custom matching models, algorithms, order types, order validations, attributes and safeguards with optionality and flexibility to rapidly expand into new credit types and meet diversified, modern participant demands.
- Comprehensive registry tools to onboard participants, securely issue, digitize and assign credits, track ownership, transfer between accounts, retire credits and maintain immutable audit records throughout the trade lifecycle—which are all key to creating trust within markets necessary to scale.

Emblematic of this commitment to scaling markets is our partnership with **Puro.earth, a global leading crediting platform** for engineered carbon removal. Leveraging our issuance, settlement and custody capabilities for carbon registries, Puro.earth has succeeded in issuing hundreds of thousands of carbon credits, attracting new buyers and refining its certification services, contributing to the scaling and growth of voluntary carbon markets and projects worldwide.

Learn more about Nasdaq financial technology for carbon markets and registries [here](#).



“No project is entirely good or bad – unless you can’t manage the risk.”

CIO, Tier 1 Commercial Bank

## About the ValueExchange

**VX** is a research, benchmarking and sales enablement company. Partnering extensively with industry associations across the globe, our aim is to not just answer questions but also to make sure that statistical insights support advocacy on leading themes and industry pressure areas.