The State of Carbon Credits 2024

Insightful data, analysis, and insights
to help you navigate the market and move forward.

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Executive Summary

Four implications for buyers and investors in the VCM

As 2024 came to a close, there were mixed sentiments amongst market participants in the voluntary carbon market (VCM).

For some, the year has been marked by positive developments that improved the integrity of the market and brought greater clarity for international carbon markets after COP29. Announcements from governments and regulatory bodies also signal a maturing market.

For others, the market developments in 2024 were insufficient to inspire confidence. Sellers still fret about future demand, and buyers are still weary about quality and struggle to procure credits efficiently. Overall, the market also saw further fragmentation of methodologies and standards, and a lock of robust demand signals.

This report does not attempt to unpack the details of individual market drivers (some of which are explained in separate posts on Article 6, CORSIA, ICVCM, SBTi).

Instead, this report focuses on market data to review the current state of the market, discuss the underlying causes, and elaborate on future implications for buyers and investors.

Overall, the market data in the following pages demonstrates how the VCM is going through a **gradual but significant transition.**

The headline figures show no major change: in terms of **total credit retirements** (still ~175 million in 2024), the mix of **registries** (still dominated by Verra) and **project types** (majority still renewables and REDD projects). **Transparency** in the use of carbon credits saw no real improvements.

However, the data also reveal structural evolutions in the market. In particular, non-anonymous buyers increasingly favour **higher quality** credits from projects with lower risks. There is significant growth in the activity of **durable CDR**, albeit driven by a limited set of companies. Companies now face a **price premium** to secure quality credits, although significant **price dispersion** continue to make this a complex process. The convergence with **compliance markets** has also accelerated in 2024.

Against this context, there are four key implications for buyers and investors:

1. Companies will have to navigate the tradeoff between price and quality, and decide what is appropriate for their needs.
2. To secure high-quality carbon credits, more companies will rely on pre-purchase or offtake agreements with pre-issuance projects.
3. Due diligence is just one part of the challenge. Market fragmentation and price dispersion make procurement difficult.
4. Standards and regulations will increasingly govern how companies use carbon credits. These will ultimately determine future demand and composition of the market.

Key themes from 2024

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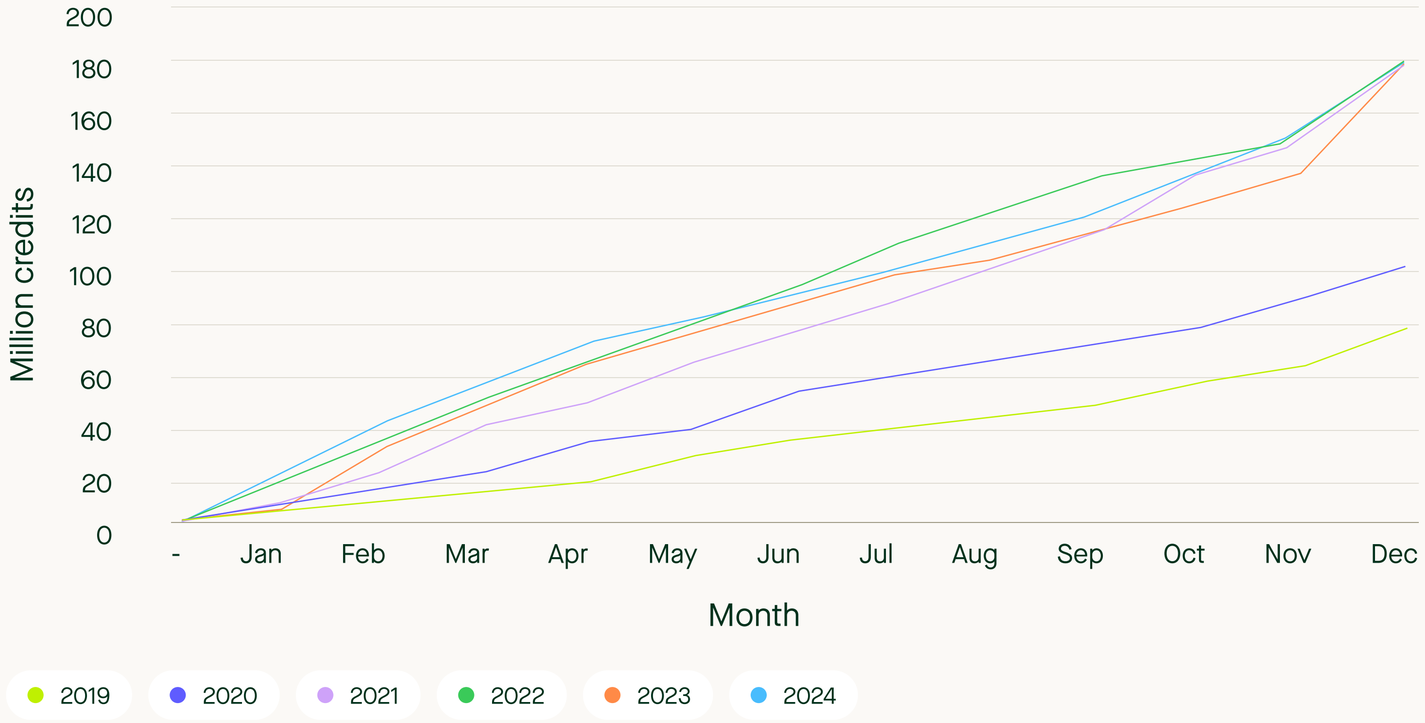
An overview of the key themes from 2024:

1. Credit retirements in 2024 exceeded 2023, but effectively plateaued for the last 4 years
2. Verra still dominates total credit retirements in 2024, but its influence is waning
3. Majority of 2024 credit retirements are still from renewables and REDD projects
4. There is no noticeable improvements in transparency of credit retirements
5. However, there is a clear shift towards quality amongst non-anonymous buyers
6. The durable carbon dioxide removals (CDR) market remains heavily dominated by a small number of buyers
7. On average, buyers pay a higher price for quality credits from projects with lower risks
8. Nonetheless, buyers still encounter significant price dispersion when procuring credits
9. The convergence with compliance markets are increasingly influencing the market for carbon credits

1. Credit retirements exceeded 2023, but effectively plateaued

Annual retirements from major registries in 2024 reached a total of 176 million

Total credit retirements, by year



Why have retirements plateaued?

- For four consecutive years between 2021-2024, annual credit retirement volumes have remained in the 175-180 million range.
- Despite repeated controversies around overcrediting (which caused some buyers to exit the market entirely), total demand held up due to the growing recognition that buyers can now identify high-quality projects, and that carbon markets provide a valuable way for some companies to contribute to climate action.
- This effective stagnation masks several significant changes in the structure of the market.

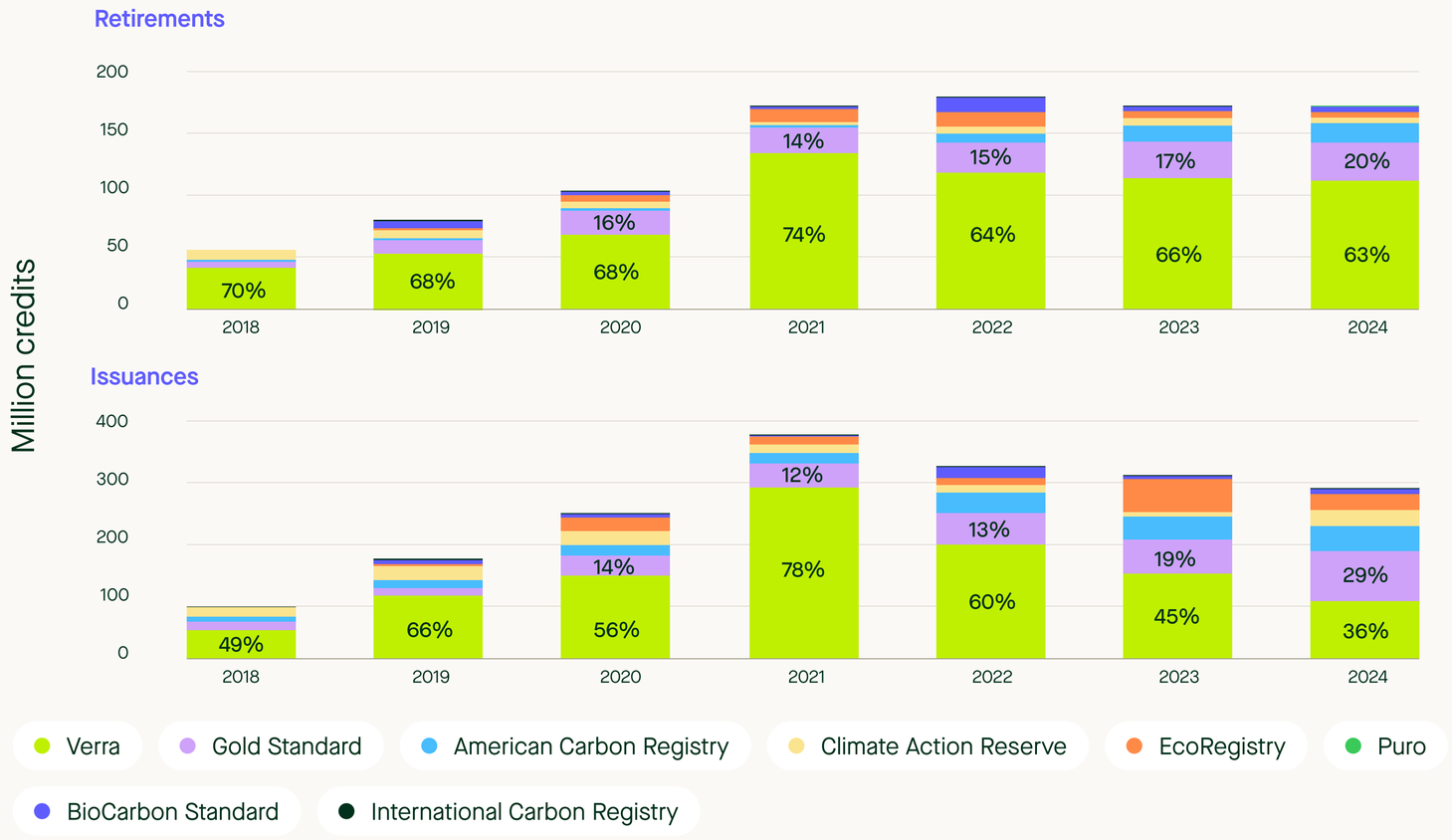
Source: registry retirements data (Verra, Gold Standard, ACR, CAR, EcoRegistry, BioCarbon, Puro, ICR)

Illustrative data

2. Verra credits still dominate credit retirements

63% of credits retired in 2024 are from Verra, but other registries are catching up

Annual credit retirements, by registry



Will other registries take the lead?

- Verra credits account for 63% of total retirements in 2024, but other registries are catching up.
- Credit issuance volumes indicate this shift more clearly: the share of Verra credits dropped to 36% in 2024, as many REDD projects held back from issuance. Gold Standard saw the largest increase in issuances.
- In **durable CDRs**, specialized registries such as Puro and Isometric are more dominant.
- It remains open as to which methodologies and registries will dominate for nature-based projects, which is also seeing a shift towards removals-based credits.

Source: registry retirements data (Verra, Gold Standard, ACR, CAR, EcoRegistry, BioCarbon, Puro, ICR)

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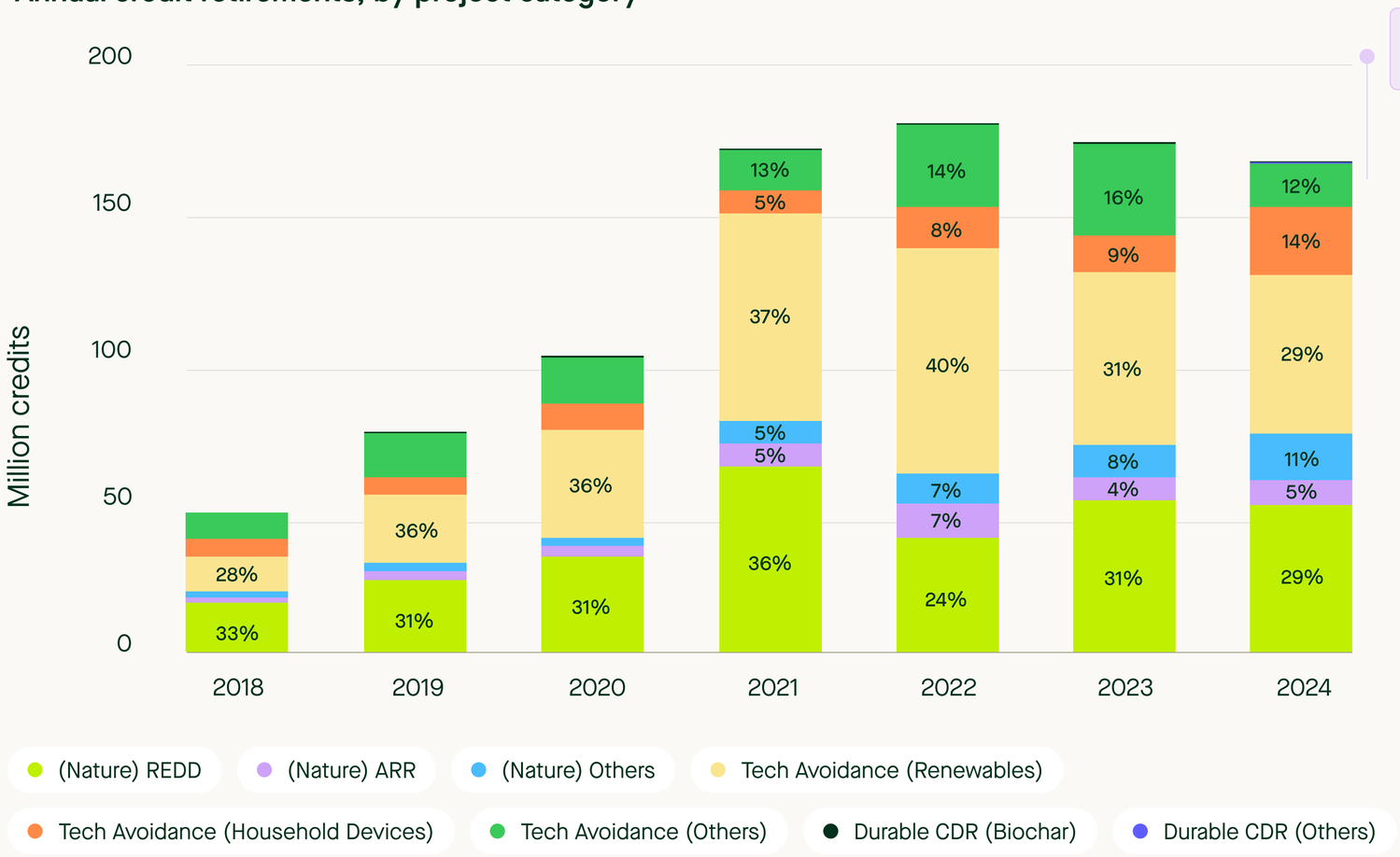
3. The majority of retirements are still from renewables and REDD

Renewables and REDD projects represent 58% of total credits retired in 2024

Annual credit retirements, by project category



Durable CDR just under 200k in 2024 (0.11% of total)

What explains the relative stability?

- Most buyers who retire credits in the VCM are constrained by what is available in the market, which is still dominated by renewables and REDD today.
- There is a clear appetite for alternative project types, as seen from the gradual shift towards other nature-based projects (e.g. ARR, IFM, agriculture) and durable CDR. However, the supply pipeline will take a few years to reach the scale of of REDD and renewables.
- Despite the high profile deals in durable CDR projects, the cumulative purchased volume remain under 16 million (with delivery dates spread out mostly between 2025 and 2030).

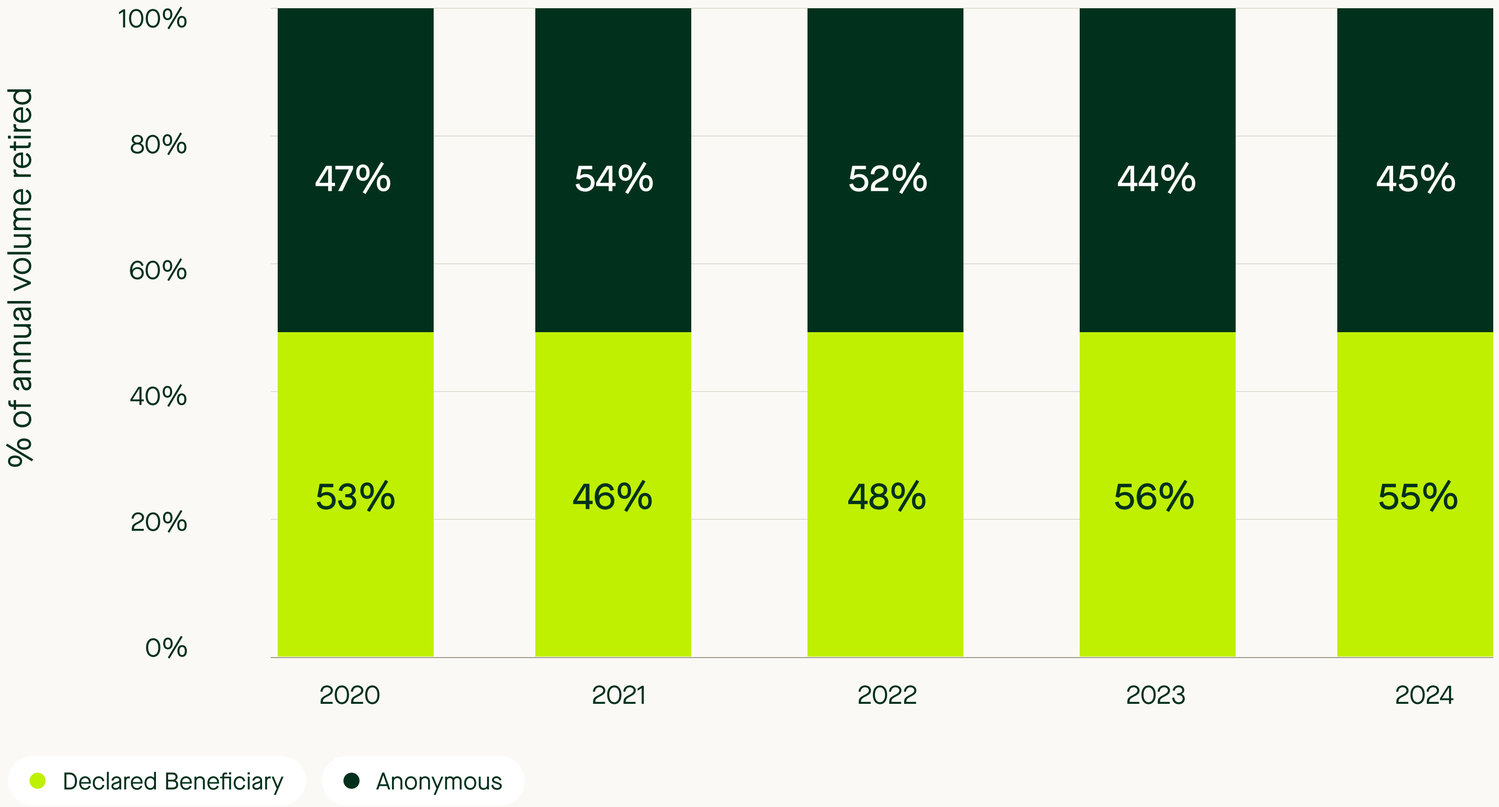
Source: registry retirements data (Verra, Gold Standard, ACR, CAR, EcoRegistry, BioCarbon, Puro, ICR)

Illustrative data

4. There’s no improvement in the transparency of credit retirements

Roughly 45% of credits in 2024 are still retired anonymously, similar to 2023

Credit retirements, by anonymous and non-anonymous sources



Why has transparency stagnated?

- Despite calls for better transparency in the use of carbon credits and related sustainability claims, there is currently no consequence for companies to remain anonymous.
- Indeed, the reputational risks of retiring credits from problematic projects might have caused some companies to prefer anonymity.
- However, greater transparency is expected from the introduction of regulations in the US and the EU, as well as latest requirements under the International Sustainability Standards Board (ISSB).*

* Such as California’s “Anti-Greenwashing Law” (AB 1305), EU’s Corporate Sustainability Reporting Directive, and the ISSB’s IFRS S2 Climate-related disclosure

Source: registry retirements data (Verra, Gold Standard, ACR, CAR)

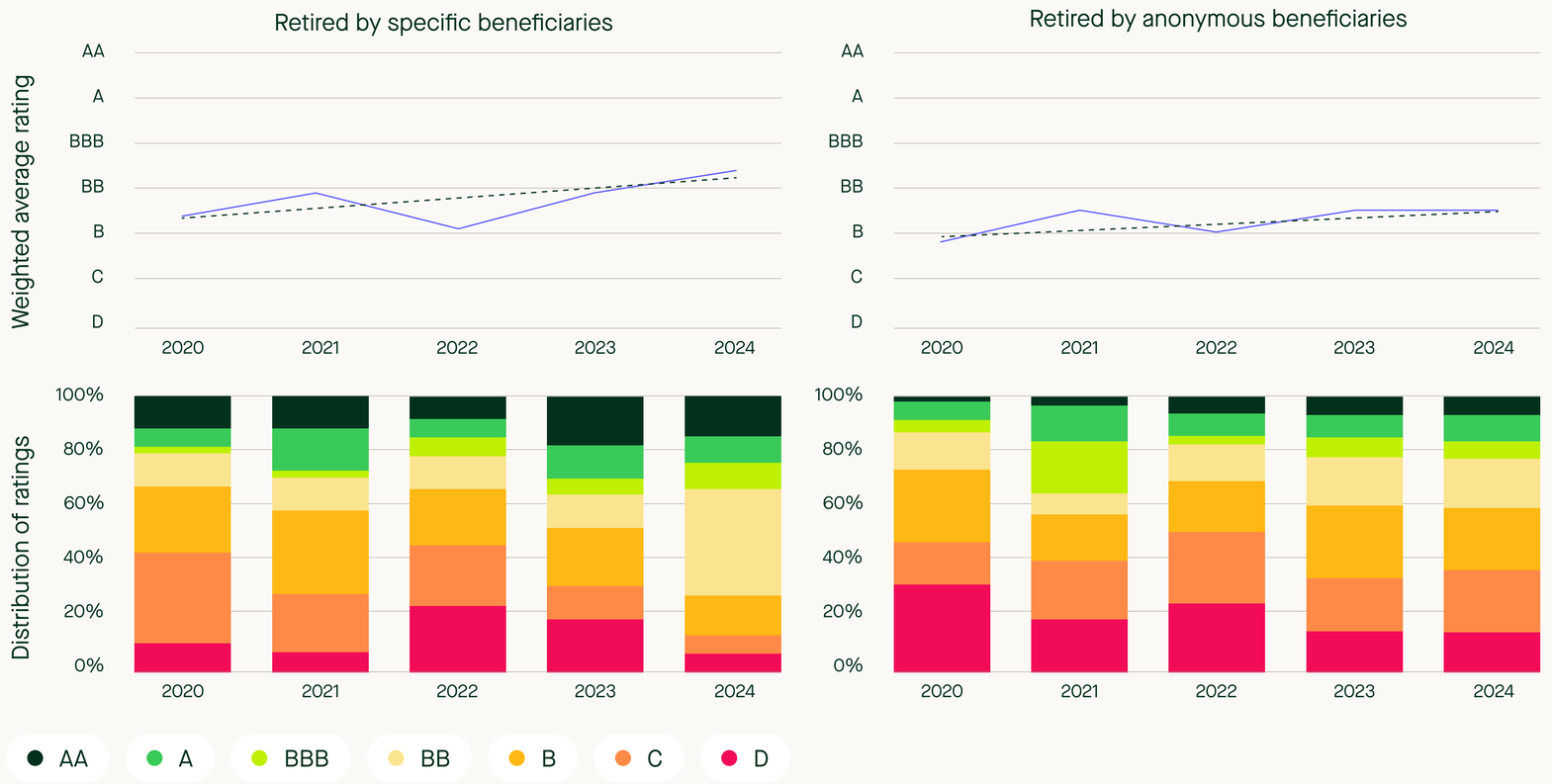
Illustrative data

5. There’s a gradual shift to higher quality projects

There is a clearer shift towards high quality projects from non-anonymous beneficiaries

Sylvera ratings amongst retired credits

Credits from projects (fully or provisionally) rated by Sylvera represent 55-60% of total retirements in all years



Why has quality improved?

- After multiple controversies reported in the last few years, companies are increasingly aware of the quality issues with carbon credits.
- More companies are now screening out high-risk projects via ratings provided by Sylvera and other rating agencies, or simply avoiding entire project categories that are prone to overcrediting and permanence risks.
- However, the improvement is less visible amongst credits retired by anonymous beneficiaries.
- There is likely self-selection where organizations that retire credits from high-risk projects do so anonymously.

Source: Sylvera ratings; registry retirements data (Verra, Gold Standard, ACR, CAR)

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6. The demand is skewed for durable CDR

Over 95% of purchases are still to be delivered, of which majority are BECCS and DACCS

Durable CDR purchases and deliveries to date, by CDR method

	# of unique buyers	Tons delivered ('000)	Tons purchased ('000)
Biochar	340	491	1614
DACCS	91	1	2,139
Enhanced Weathering	83	7	560
Bio-oil	56	7	205
Marine Biomass Sinking	33	22	28
Biomass Direct Storage	31	19	204
Ex-Situ Mineralization	24	13	199
BECCS	20	10	7,653
Direct Ocean Removal	20	0	65
Ocean Alkalinity Enhancement	10	0	84
Surficial Mineralization	8	0	3
River Alkalinity Enhancement	5	0	60
In-situ Mineralization	4	0	9
Microbial Mineralization	4	1	7
Microalgal Capture and Storage	2	0	2
Other	2	3	3
Total	**429**	**573**	**12,835**

Sylvera and CDR.fyi are conducting a joint survey of CDR market participants – stay tuned for updates!

What is driving CDR demand?

- There are over a dozen of CDR methods, but **93%** of purchased volumes belong to just four types: BECCS, DACCS, biochar and enhanced weathering.
- Purchased volumes skew towards BECCS and DACCS mostly due to several major projects that could deliver significant quantities when fully operational.
- Demand is concentrated by buyers with large appetite for CDR credits: Microsoft alone accounts for 64% of all purchased volumes, and the top 10 buyers account for 86% of the total.
- 79% of CDR buyers purchased biochar credits, though at smaller volumes.

Note: CDR methods discussed on this page are limited to durable CDR methods.

Source: licensed data from CDR.fyi

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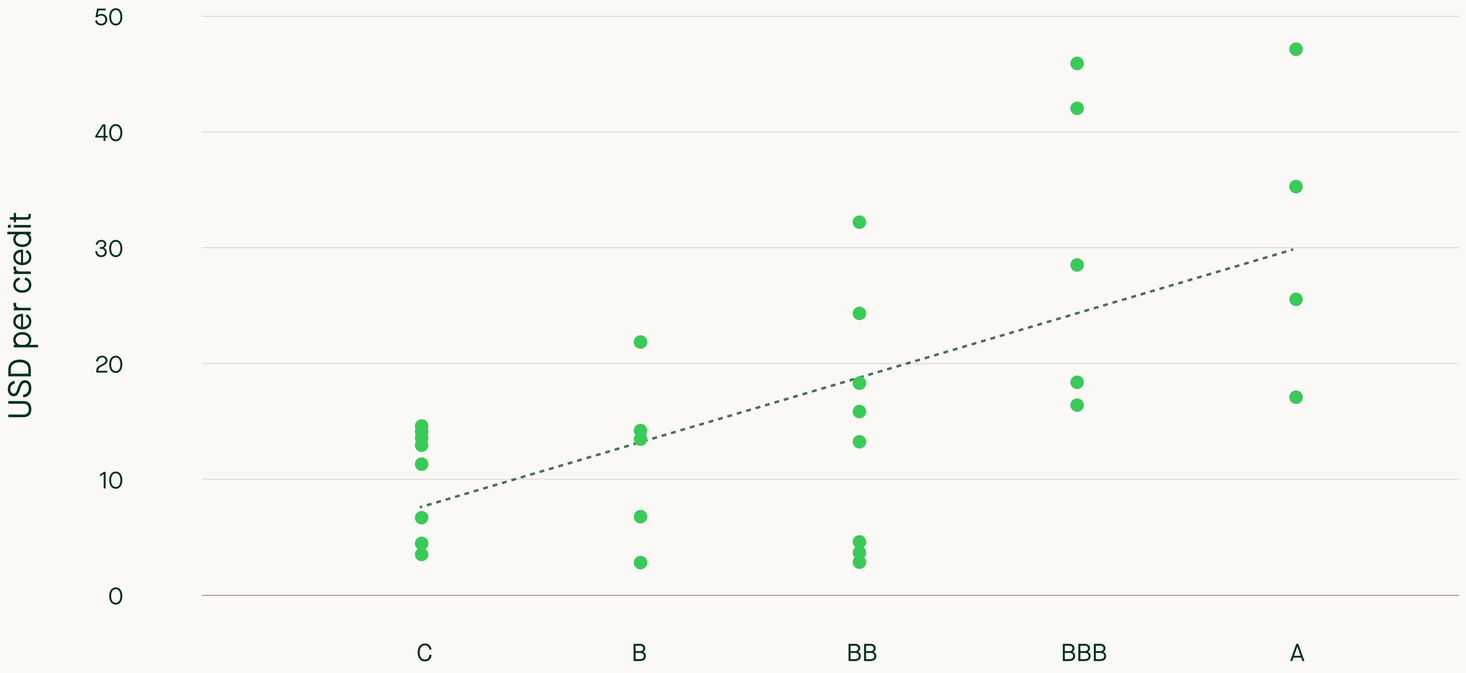
7. On average, there’s a price premium for higher quality

Buyers typically pay a quality premium, averaging +$5 per rating band in ARR projects

ARR credit spot prices (for projects with price quotes in L12M)

Covering 36 projects that have 44 million issued credits, ~63% of all ARR credits issued historically



What does this mean for buyers?

- Buyers could expect, on average, to pay a higher price for credits that come from projects with lower risks (i.e., overcrediting, additionality and permanence risks).
- This trend partly reflects the higher costs of developing high-quality projects, as well as the increased willingness-to-pay from buyers for better projects.
- Nonetheless, there is still significant price dispersion within each rating level. While some of this may reflect a premium on other project attributes (e.g., co-benefits), this data suggests some buyers might be overpaying for their credits.

Note: each point on the scatter plot refer to a distinct ARR project rated by Sylvera. Pricing data restricted to quotes above 5,000 tons and vintages 2018 or above.

Source: average price quoted per project, based on data aggregated by Sylvera’s Connect to Supply and network of brokers and traders

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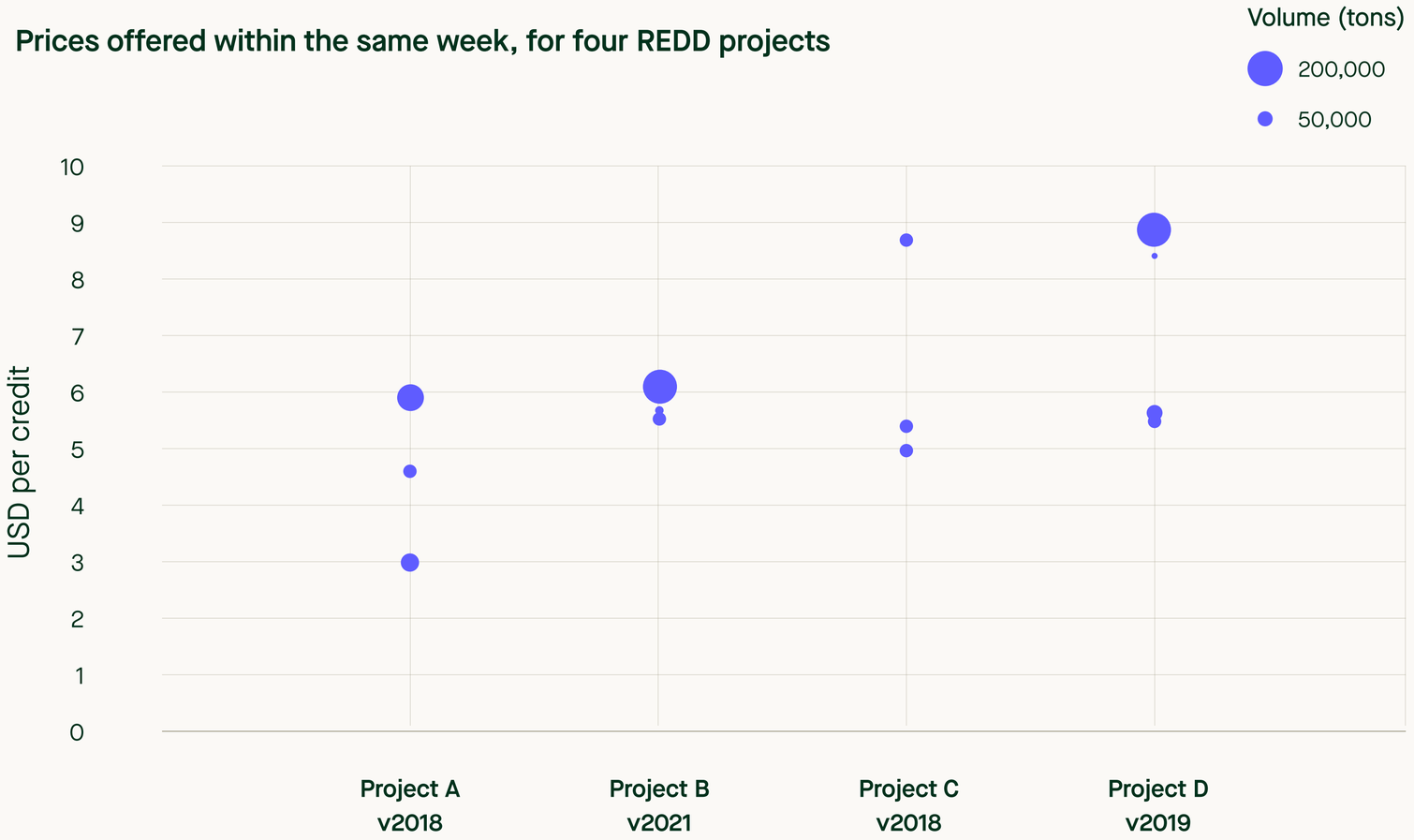
8. Buyers are seeing a price dispersion

There is significant price dispersion, even for credits from the same project and vintage

Prices offered within the same week, for four REDD projects



Will price dispersion continue?

- Market fragmentation, in which carbon credits trading activity is spread across multiple venues (often over the counter), tends to limit price discovery and increase price dispersion.
- Significant price dispersion will likely continue as long as there is significant market fragmentation.
- Such price dispersion, alongside the related challenge of identifying available supply volumes, will continue to make it difficult to procure credits efficiently.
- However, the growth of compliance demand (e.g. for CORSIA) may reduce market fragmentation and price dispersion amongst eligible credits

*Four representative REDD projects are selected to illustrate the extent of price dispersion faced by the typical buyer. The broader pattern generally holds for other project types beyond REDD projects, but such pricing data is relatively scarce.

Source: price quotes based on data from Sylvera's Connect to Supply and network of brokers

Illustrative data

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9. The overlap with compliance markets is increasing

Early signs of the ‘convergence’ of voluntary and compliance carbon markets

There is growing recognition amongst market participants that the lines between voluntary and compliance markets are increasingly blurred. Indeed, carbon credits are now seen as instruments that may often have overlapping use cases.

Below, we highlight three examples in which the overlap with compliance markets is having an impact on the market for carbon credits.

	Article 6.4	CORSIA	California Cap-and-Trade
What it is	• The new carbon crediting mechanism under the Paris Agreement • Replaces the Clean Development Mechanism (CDM) • Some CDM projects can ‘transition’ into the new mechanism	• Global scheme to offset emissions from international aviation • Agreed in 2016; overseen by the UN • Currently 129 countries participating, including the US, UK, Germany, Japan, UAE and Singapore	• Emissions trading scheme covering roughly 75% of the state’s emissions • Covers the transport, buildings, industry and power sectors • Launched in 2012 and linked with the Quebec ETS in 2014
Developments in 2024	• Headline rules for Article 6.4 agreed at COP29 in November, including a new name: the Paris Agreement Crediting Mechanism (PACM) • First 10 CDM projects approved for transition by host governments	• Start of Phase 1 on 1 January 2024 • Major crediting standards and methodologies approved to be eligible for Phase 1 • 2024 marks the first year when the sector’s emissions significantly exceeded the baseline, hence CORSIA became a source of demand for credits	• Start of fifth compliance period on 1 January 2024 • Highest ever prices reached, exceeding $40/t for the first time • These higher prices likely contributed to VCM prices for California-eligible credits to surge in 2024

Conclusions

The four implications we're seeing for buyers and investors in the VCM

1

Paying more for quality

Companies will have to navigate the tradeoff between between price and quality, especially when comparing carbon credits from projects of the same activity type.

2

Securing future access

To secure future access to high-quality carbon credits, more companies are signing pre-purchase or offtake agreements with pre-issuance projects.

3

Complex execution

Due diligence is just one part of the challenge. Market fragmentation and price dispersion will make procurement and investments complex and time-consuming.

4

Future demand

Standards and regulations will increasingly govern how companies use carbon credits. These will ultimately determine future demand and composition of the market.

Annex: a brief note on carbon credits

Definition, supply, demand, and market

Definition

What is a carbon credit?

There is no universal definition.

Generally speaking, each carbon credit represents 1 metric ton of CO2e being reduced or removed from the atmosphere.
However, a carbon credit from one project is often valued differently to one from another project, even though both credits nominally represent 1 metric ton of CO2e.

The complexity partly lies in establishing an appropriate counterfactual, as well as measuring the climate outcomes from each project accurately. In addition to the climate benefits of a project (i.e. in terms of emissions), some projects are valued additionally for their benefits to local communities or the natural environment.

Supply

How are they created?

Projects generate carbon credits by demonstrating to a **standard** (i.e., standard-setting body) that they have either reduced or removed emissions.

To do so, the **project developer** would have followed the required steps under a **methodology** defined by the standard.

There are hundreds of methodologies in the VCM, covering dozens of **project types**, e.g. nature-based (e.g., afforestation) and tech-based (e.g., renewables).

The implementation and resulting documents from the developer would be checked by a **validation/verification body.**

The standard will then permit the project to issue carbon credits on a **registry**, which holds the digital records of all their credits.

Demand

How are they used?

Globally, carbon credits are being used in two main situations currently:

1 Voluntary (~80% of demand)

Some companies 'offset' or 'neutralize' their own emissions via retiring carbon credits, so as to claim for low carbon products or net zero emissions (note: hotly contested topic). Other companies merely use it to contribute to climate action without claiming to compensate for emissions.

1 Compliance (~20% of demand)

Some companies are regulated by carbon pricing schemes (e.g. South Africa, California, CORSIA) where regulators allow them to purchase and use carbon credits in lieu of existing compliance obligations.

NB: Some governments may use carbon credits to meet their emissions targets ("NDCs" under the Paris Agreement). This could emerge in the coming years.

Market

How are carbon credits sold?

The **spot market** has historically been the main channel through which buyers acquire carbon credits. Spot trades are predominantly done OTC instead of exchanges. As such, there is limited data on the full extent of the market.

There is also a **futures market** for carbon credits, but it is relatively small in volume.

Increasingly, buyers are signing bilateral forward contracts, such as **offtake or pre-purchase agreements**, to secure future carbon credits from specific projects. This is pervasive in durable CDR (Carbon Dioxide Removal), and increasingly common in nature-based removals such as ARR (Afforestation, Reforestation, & Revegetation) projects.

Glossary

ARR

Afforestation, reforestation and revegetation (a project type)

BECCS

Bioenergy with carbon capture and storage (a project type)

Carbon Credit

Each carbon credit represents 1 metric ton of CO2e being reduced or removed (see nuance on previous page)

CCP

Core Carbon Principles, as introduced by the ICVCM

CDR

Carbon dioxide removal

CORSIA

Carbon Offsetting and Reduction Scheme for International Aviation (a compliance scheme for airline operators)

SBTi

Science Based Targets Initiative

VCM

Voluntary carbon market

DACCS

Direct air carbon capture and storage (a project type)

Durable CDR

Durable carbon dioxide removal, generally considered for CDR methods that have storage period for 100+ years

ICVCM

Integrity Council for the Voluntary Carbon Market

IFM

Improved forest management (a project type)

NDCs

Nationally Determined Contributions, i.e. national emissions targets in accordance with the Paris Agreement

OTC

Over the counter

REDD

Reducing emissions from deforestation and forest degradation (a project type)

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Sylvera is a leading carbon data provider. Our mission is to incentivize investment in real climate action. To help organizations ensure they're making the most effective investments toward net zero, we build software that independently and accurately automates the evaluation of carbon projects that capture, remove, or avoid emissions. With Sylvera's data and tools, businesses and governments can confidently invest in, benchmark, deliver, and report real climate impact. We're backed by renowned investors like Balderton Capital, Index Ventures, Insight Partners, LocalGlobe, and Salesforce Ventures.

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