

ECOSYSTEM MARKETPLACE INSIGHTS REPORT

Paying for Quality

State of the Voluntary Carbon Markets 2023

November 28, 2023

This report is a lead up to this year's UN Climate Change Conference, COP28 Dubai, to provide updated pricing and trends in global voluntary carbon markets, CORSIA-eligible units, and other relevant data and insights related to Article 6 of the Paris Agreement.

These carbon credit transaction and registry data focus on 2020-2023. Ecosystem Marketplace Respondents are still submitting trade reports for 2023, so 2023 data should be considered preliminary, with complete data and analysis forthcoming in early 2024.

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State of the Voluntary Carbon Markets 2023

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About Ecosystem Marketplace

Ecosystem Marketplace (EM), a non-profit initiative of Forest Trends, is a leading global source of credible information on environmental finance, markets, and payments for ecosystem services. For nearly two decades, EM has run the world's first and only globally recognized and standardized reporting and transparency platform for voluntary carbon market (VCM) credit pricing data, news, and insights.

EM holds the world's largest repository of valuable carbon market insights and data disclosed by a growing international network of more than 270 "EM Respondents," including project developers, investors, and intermediaries with headquarters in over 40 countries. Respondents share over the counter and exchange/trading platform carbon credit sales on thousands of nature-based and technological carbon projects in over 100 countries.

EM's flagship State of the Voluntary Carbon Markets reports and other analyses on carbon credit market dynamics (e.g., prices, volumes, projects, corporate buyers, sellers, etc.) and carbon standards' issuance and retirement data have become anticipated industry staples. EM also provides a publicly accessible data intelligence dashboard and a news platform for breaking news and market coverage.

EM data on prices, regulation, science, and other relevant issues on environmental services markets and climate finance have been used extensively by companies, journalists, investors, practitioners, natural resource agencies, academics, and local and indigenous communities.

Additionally, EM thanks its core partners, supporters, and collaborators.

About Forest Trends

Forest Trends Association is a 501(c)(3) organization founded in 1998. Forest Trends works to conserve forests and other ecosystems through the creation and wide adoption of a broad range of environmental finance, markets, and other payment and incentive mechanisms. Forest Trends does so by 1) providing transparent information on ecosystem values, finance, and markets through knowledge acquisition, analysis, and dissemination; 2) convening diverse coalitions, partners, and communities of practice to promote environmental values and advance the development of new markets and payment mechanisms; and 3) demonstrating successful tools, standards, and models of innovative finance for conservation. For up-to-date information on environmental markets, sign up for EM newsletters: http://www.forest-trends.org/dir/em_newsletter.

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Attribution

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These data on voluntary carbon market dynamics come from EM's database of voluntarily disclosed over-the-counter (OTC) carbon credit transactions, which are shared with us by an international network of more than 270 "EM Respondents," including project developers, investors, and intermediaries with headquarters in over 40 countries and representing carbon credit sales from thousands of nature-based and technological carbon projects in over 100 countries.

Data on project registrations, credit issuances, and retirements come from the following project registries: ACR (formerly American Carbon Registry), Clean Development Mechanism (CDM), Climate Action Reserve (CAR), City Forest Credits, Global Carbon Council, Gold Standard, Plan Vivo, VCS, UK Peatland Code, and UK Woodland Carbon Code. We thank Garance Wood-Moulin (Peatland Code) and Vicky West (Woodland Carbon Code) for their assistance in obtaining relevant registry data.

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Introduction

In 2022, EM observed an all-time high global volume weighted average price of \$7.37 per ton of CO₂e, which just slightly beats the previous market record, set in 2008 when average prices hit \$7.34 per ton. EM recorded this price 15 years ago at a time when VCM volumes and value were half of what they reached in 2022 (123.4 MtCO₂e and \$704.8 Million in 2008 compared to 254,084,605 and \$1,873,151,444 in 2022).

Prices back then were driven by profoundly different factors than they are today. One of the most significant was a hope for “pre-compliance.” A decade and a half ago, the United States, which was the dominant source and demand for the VCM, was on the cusp of national climate change legislation. The high volumes in the first half of the year 2008 were largely attributed to transaction volumes on the Chicago Climate Exchange, which was angling for fungibility of its credits into a national cap-and-trade carbon market. Unfortunately, market activity in 2008 plummeted when the global recession drove companies to turn their attention away from environmental impacts and cut discretionary spending, and when any potential US climate policy went out of the window as the Obama administration instead focused on healthcare.

Just as we reflected last year in “The Art of Integrity,”¹ we find ourselves in a new cycle of VCM market growth followed by contraction, driven by uncertainties external to the market itself.

While this report largely presents 2022 data for the first time, we cannot ignore the fundamentally different position that the VCM has found itself in as we approach the final days and weeks of 2023. For this reason, we are also providing current-year data and gathered sentiments from our network of experts. Over the past ten months, we’ve observed strong signals of depressed market conditions for carbon sales in 2023. While some might refer to this as a “stalling” of the market, we interpret the surrounding factors and drivers to indicate a necessary “regrouping” before an anticipated “acceleration forward.”

The fact is that global carbon markets are in a fundamentally different position than they were decade-and-a-half ago. Market participants we interviewed in preparation for this report are optimistic about a high integrity-focused rebound of the VCM in the near term, as opposed to the long rebuilding that we observed after the 2008-2009 market drop.

There are a number of reasons we anticipate the VCM’s continued growth, including:

The world urgently needs climate solutions.

- There is scientific consensus that to have any chance of achieving the Paris Agreement 2°C pathway, the global community needs to cut predicted 2030 greenhouse gas emissions by 28 percent. Experts continue to send the message that this level of climate action cannot be achieved without project-based and jurisdictional REDD+ carbon markets, as well as new solutions such as engineered removals.²

Buyers that are still in the market are committed.

- The data are clear: some buyers have exited the market since 2021 or are engaging in fewer transactions in terms of volume. Yet those who remain are signaling a willingness to pay a great deal more for quality. The growth in credit prices tracked by EM over the past few years is driven by high-quality credits, full stop, whether the credits have nature-based solutions, co-benefits, and Sustainable Development Goals (SDGs), newer vintages that are signals of newer methodologies and projects, and quality criteria standardization per CORSIA.
- We’re hearing from project developers that the sophistication of carbon buyers has increased, with buyers setting clear sourcing principles and/or requirements to conduct their own on-site project audits or hiring independent service providers to do this on their behalf. Relatedly, developers have told us over the past couple of years of a greater interest in buyers to have direct carbon credit procurement relationships with them.
- In fact, we’ve heard from market experts that co-benefits certifications like the Climate, Community, and Biodiversity Standard are helpful because they require prior examination of all impacts of a project (community, biodiversity, etc.). Interestingly, we’ve also heard that unlike in past years where CCB was more optional for REDD+, now it is more of a requirement for REDD+ projects from a buyer comfort perspective.

¹ Ecosystem Marketplace, The Art of Integrity: State of the Voluntary Carbon Market 2022 Q3, (Washington, DC: Forest Trends, 2022), <https://www.ecosystemmarketplace.com/publications/state-of-the-voluntary-carbon-markets-2022/>

² United Nations Environment Programme (UNEP), Emissions Gap Report, (Nairobi, Kenya: UNEP, 2023), <https://www.unep.org/resources/emissions-gap-report-2023>

- Lastly, we are seeing a return of the VCM being an end buyers' market, although it's uncertain how long this will last. Aside from the transaction data reported to EM, we've heard from market participants that in general there have been fewer transactions with fewer buyers, and fewer new buyers entering the market. Further, intermediaries appear to be stepping back in 2023, particularly for nature-based credits. The reputation of the project developer was also cited as a factor amongst buyers. The impact of this is that while there's a stable source of demand for project developers and resellers who have existing relationships, it may be more challenging for new project proponents and participants to access the buy side. In addition, prices tend to come down with higher-volume purchases.

The VCM is more mature and global, adding to stability.

- The VCM is now more diverse and global than ever before. EM transaction data for 2021-2023 alone covers 1,530 projects from 98 countries.
- Compliance carbon markets offer new opportunities for the VCM in the form of burgeoning demand for CORSIA-eligible credits and Article 6 of the Paris Agreement.

Quality continues to ratchet upward.

- Carbon credit standards such as Verra³ are updating existing project methodologies⁴ while also ensuring newly developed methodologies account for the latest science and technology. This is especially true for nature-based projects, as standards address challenges to baselines, deforestation rates, and associated climate benefits calculations, as well as monitoring, reporting, and verification (MRV) approaches. We've heard from project developers that these new developments, while beneficial in the long run, can have near-term impacts on sales as it could lead to buyers pausing their credit purchases from related projects.
- There's more focus today than ever before to ensure the VCM works for Indigenous Peoples and Local Communities (IPLCs), not just the other way around. One way this is reflected is in the work of the Integrity Council and the VCMI, which have included IPLCs in their processes, and in particular the newly developed IPs & LCs VCM Engagement Forum.⁵ This forum will "elevate IPs & LCs priorities, to provide closer coordination and targeted capacity building to support strengthening their role as both beneficiaries and shareholders in a high-integrity voluntary carbon market (VCM)."
- Over the past couple of years, there's been an emergence for the first time of independent supply-side quality initiatives including the Integrity Council's Core Carbon Principles⁶ and the Carbon Credit Quality Initiative,⁷ as well as demand-side integrity efforts to clarify how companies can best claim credits for their climate action strategies with the Voluntary Carbon Markets Integrity Initiative. See for instance the VCMI's "Claims Code of Practice" guidance slated to be released on the same day as this report's publication.⁸ That being said, we've heard from market participants that publicly traded companies are struggling to continue credit purchases in the near term with emerging requirements and regulations (e.g., California's recently approved Assembly Bill (AB) Number 1305)⁹ around claims. In addition, there are a legion of other stakeholders working to service the growing network of governments implementing CORSIA and Article 6 of the Paris Agreement, carbon project developers, carbon credit buyers, investors, and more.

Other forces have the potential to fundamentally alter the VCM trajectory. There is an array of regulatory and oversight issues we're keeping a close eye on – from stock exchanges' disclosure requirements to regulation by the United States Commodities Futures Trading Commission to government-enforced claims regulations. And widely read media coverage of unethical and/or ineffective carbon projects and standards – fair or not – can have a chilling effect on the market, as seems to have been the case of late.

EM continues to track all of the above dynamics, and are committed to bringing our readers new data, analysis, and market insights together with our global market of carbon market experts and survey respondents and grounded in nearly two decades of experience tracking the VCM as an unbiased, not-for-profit information provider.

³ "Verra Conducts Quality Review of VCS Methodologies, Inactivates 10 with No Use", Verra, September 11, 2023, <https://verra.org/verra-conducts-quality-review-of-vcs-methodologies-inactivates-10-with-low-or-no-use/>

⁴ "Verra Launches New Era of Forest Protection with Transformative REDD Methodology", Verra, November 27, 2023, <https://verra.org/verra-launches-new-era-of-forest-protection-with-transformative-redd-methodology/>

⁵ "The IPs & LCs VCM Engagement Forum", The Integrity Council for the Voluntary Carbon Market, accessed November 27, 2023, <https://icvcm.org/the-ips-lcs-vc-m-engagement-forum/>

⁶ "The Core Carbon Principles", The Integrity Council for the Voluntary Carbon Market, accessed November 27, 2023, <https://icvcm.org/the-core-carbon-principles/>

⁷ The Carbon Credit Quality Initiative, <https://carboncreditquality.org/>

⁸ VCMI Claims Code of Practice, Voluntary Carbon Markets Integrity Initiative (VCMI), accessed November 27, 2023, <https://vcmintegrity.org/vc-mi-claims-code-of-practice/>

⁹ Jay Tipton, "California Aiming to Improve the VCM", *Ecosystem Marketplace*, October 24, 2023, <https://www.ecosystemmarketplace.com/articles/california-aiming-to-improve-the-vc-m/>

Key Findings

Average voluntary carbon markets (VCM) credit prices in 2022 were higher than they have been in 15 years, while overall trade volumes dropped from a 2021 peak. While the volume of VCM credits traded dropped by 51 percent, the average price per credit skyrocketed, rising by 82 percent from \$4.04 per ton in 2021 to \$7.37 per ton in 2022.

This price hike allowed the overall value of the VCM to hold relatively steady in 2022, at just under \$2 billion.

To date in 2023, the average credit price is down slightly from 2022, to \$6.97 per ton.

Credits connected to nature-based solutions were a primary driver of high market value. Nature-based projects, including Forestry and Land Use and Agriculture projects, made up almost half of the market share at 46 percent. From 2021 to 2022, the average price of these kinds of credits increased by 75 percent and 14 percent, respectively. Credits from Agriculture projects also increased in volume by 283 percent.

Credits that certified additional robust environmental and social co-benefits “beyond carbon” had a significant price premium. Credits from projects with at least one co-benefit certification had a 78 percent price premium in 2022, compared to projects without any co-benefit certification. Experts interviewed by Ecosystem Marketplace (EM) emphasized that these certifications are increasingly becoming required by buyers, and many are preferentially seeking them out. Projects working towards the UN Sustainable Development Goals (SDGs) also demonstrated a substantial price premium at 86 percent higher prices than projects not associated with SDGs – yet another indicator of buyer emphasis on carbon credits that do more for people and the environment.

Newer credits are attracting higher prices, indicating that buyers are seeking newer vintages with more robust recent methodologies, or are paying more for credits that align with their current emissions years as much as possible. In 2022, the price premium for carbon credits with a more recent vintage representing more recent emissions reductions activities was 57 percent higher than “older” credits, compared to a 38 percent recency premium in 2021 (using a historical five-year rolling cutoff date from the year of transaction).

CORSIA-eligible project credits gained market value, driven by a 126 percent increase in price. CORSIA's notable growth in the VCM in 2022 indicates a growing relationship between compliance markets and the VCM. This is a key consideration for market participants for three main reasons: 1) quality criteria set by CORSIA have been incorporated by the Voluntary Carbon Markets Integrity Initiative (VCMI) until the Integrity Council's core carbon principles are implemented, 2) CORSIA enters its first compliance phase in 2024, and 3) countries are beginning to implement Article 6 of the Paris Agreement.

Market Overview

VOLUNTARY CARBON MARKETS (VCM) TOTAL VOLUME, VALUE, AND PRICE BY TRANSACTIONS

In 2022, the value of the voluntary carbon market (VCM) held pace with 2021 at just under 1.9 Billion for the year, largely due to a staggering 82 percent increase in the price of VCM credits from 2021 (Table 1), counterbalanced by a near-halving in transaction volume year-over-year. In other words, the value of the VCM shrank only 11 percent from 2021, even though transaction volume decreased by 51 percent over the same period (Figures 1 and 2).

This prompts further investigation to understand what drove up prices, which is explored further in this report. In general, we observe a distillation of the VCM, with lower transaction volumes and higher prices in 2022 that has continued into 2023. According to insights gathered from market participants interviewed in preparation for this report, one of the key reasons for the drop in transaction volume in 2023 is due to a 38.5% decline in issuances from 2022 by about 162.7 million tons CO₂e (MtCO₂e) - see the [Issuances & Retirements](#) section below. Further, we can derive from EM data that credit buyers' focus on key attributes associated with higher-quality projects and credits from these projects that are typically of a more recent vintage. In general, these carbon credit buyers are investing in durable removals of carbon from the atmosphere and provide robust beyond-carbon co-benefits, and often take advantage of nature-based solutions to achieve these ends.

Table 1. Annual Total Voluntary Carbon Markets Transaction Volume, Value, and Price per tCO₂e for All Projects. 2021-2023 (YTD)

| 2021 | | | 2022 | | | 2021-2022 PERCENT CHANGE | | | 2023 (YTD)* | | |
|------------------------------|-------------|-------------|------------------------------|-------------|-------------|--------------------------|-------|-------|------------------------------|-------------|---------------|
| VOLUME (MtCO ₂ e) | VALUE (USD) | PRICE (USD) | VOLUME (MtCO ₂ e) | VALUE (USD) | PRICE (USD) | VOLUME | VALUE | PRICE | VOLUME (MtCO ₂ e) | VALUE (USD) | PRICE** (USD) |
| 517 | \$2.1Bn | \$4.04 | 254 | \$1.9Bn | \$7.37 | -51% | -10% | +82% | 49.2 | \$343M | \$6.97 |

Notes:

Price data is expressed as volume-weighted averages.

2021 and 2022 volumes, values, and prices update as new data are reported by EM Respondents, which may cause discrepancies between the data in the table above and data reported in previous EM reports.

* 2023 Volumes and Values will be reported in early 2024.

** 2023 average price is preliminary for transactions taking place from January 1-November 21, 2023, which were reported to EM as of November 20, 2023. However, the above-reported 2023 price is not inclusive of all EM Respondents through this date due to variances in their trade reporting frequencies. The totals above represent 151 unique respondents in 2021, 113 unique respondents in 2022, and 74 unique respondents in 2023 to date.

Figure 1. Voluntary Carbon Market Size by Value of Traded Carbon Credits, pre-2005 to 2022

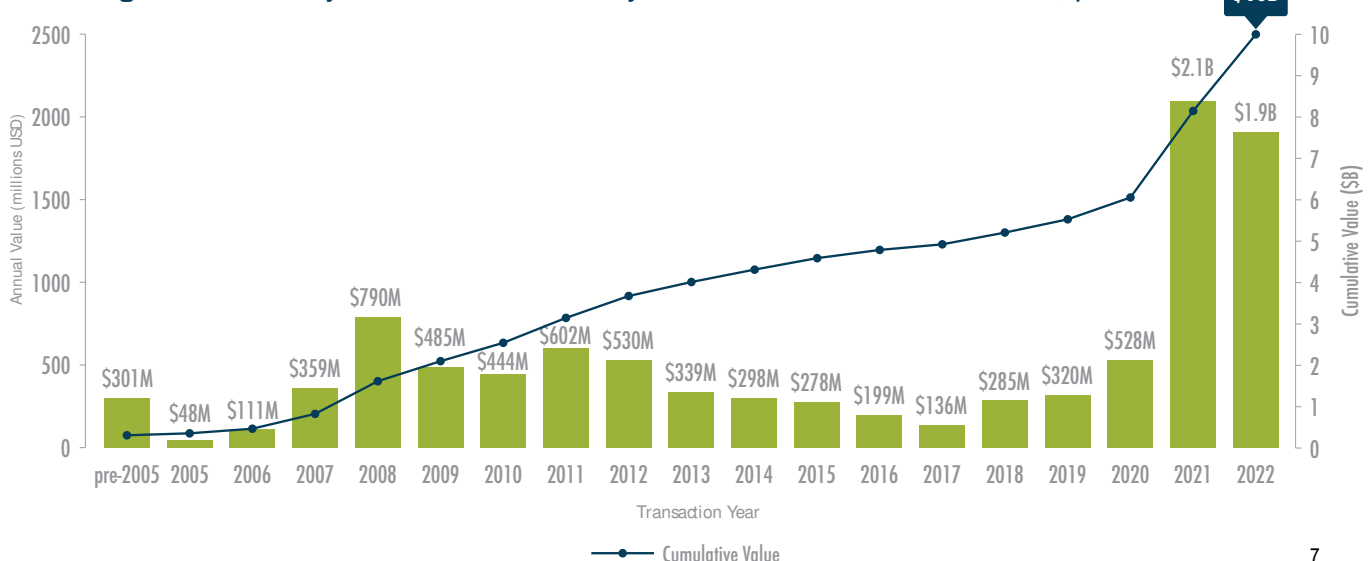
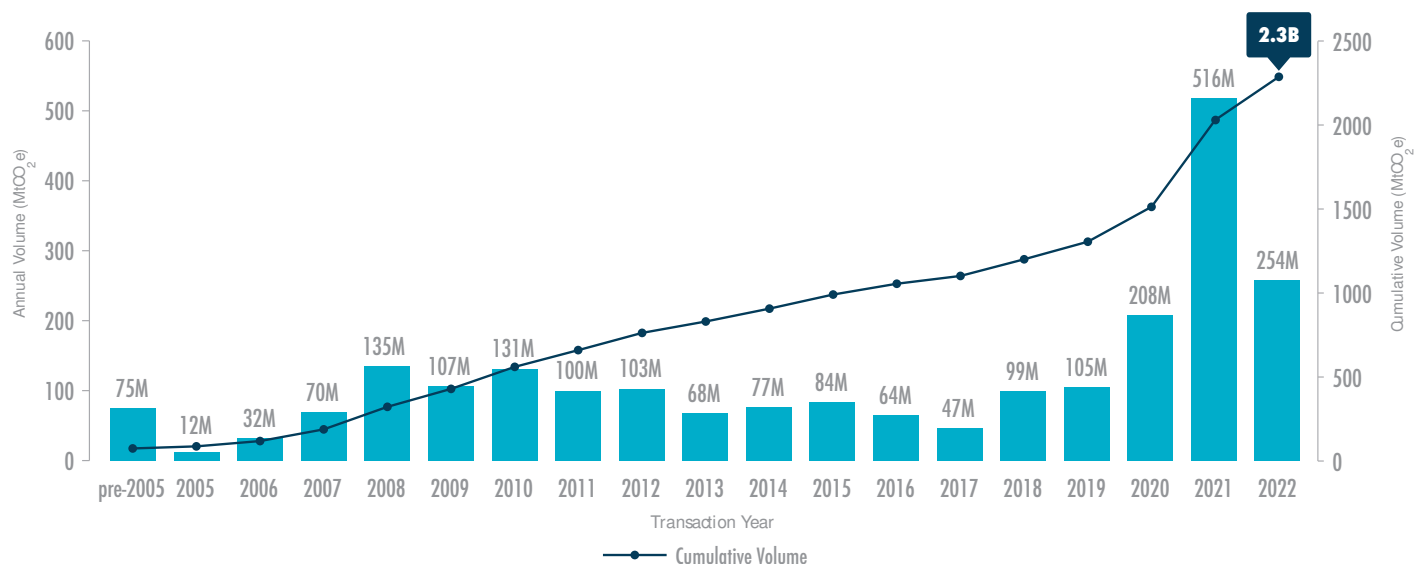


Figure 2. Voluntary Carbon Market Size by Volume of Traded Carbon Credits, pre-2005 to 2022



In fact, average prices to date in 2023, despite dipping below 2022 prices by ~\$0.40 per ton, remain higher than they have been in 15 years. The \$7.37 per ton average price of VCM credits in 2022 represents a high that has not been seen since 2008.

Although it's too early to substantively report on 2023, we are seeing clear indications from initial volumes and value data that the market is stepping back to accelerate forward. In fact, the EM Respondents that have currently reported nearly 50 million tons of carbon dioxide equivalent (MtCO₂e)¹⁰ represented roughly 75 percent of all transactions reported to EM for 2022 and 2021, and around 65 percent of total transaction volume for 2020. This is an early indication that 2023 will be an even lower volume year than 2022. It is important to note that the busiest times of year for VCM trading are quarters 4 and 1, so it is still too early to make any complete assumptions about total volume and value in 2023.

THE BUYER MATTERS: END USERS PAY MORE FOR CREDITS THAN RESELLERS

In 2022, VCM sellers continued to receive a premium when transacting credits either directly to end users or to intermediaries that operate as a go-between the seller and buyer but do not take delivery of the credits themselves. Meanwhile, consistent with data from years past, intermediaries who take ownership of credits (e.g., speculative interests) are more risk- and price-sensitive and pay less for credits (Table 2). Preliminary 2023 data confirm this buyer type relationship with price at even higher margins.

Table 2. Annual Voluntary Carbon Markets Transaction Price (USD), by Buyer Type, 2021-2023 (YTD)

| BUYER | 2021 | 2022 | 2023 (YTD) |
|--------------|--------|--------|------------|
| TOTAL VCM | \$4.04 | \$7.37 | \$6.97 |
| END USER | \$5.68 | \$8.52 | \$8.35 |
| INTERMEDIARY | \$4.24 | \$6.54 | \$5.96 |

Notes:

2023 data are being processed and will be published in early 2024.

Price data is expressed as volume-weighted averages.

"End User" includes transactions where the buyer is identified as an Intermediary that doesn't take ownership of credits.

"Total VCM" includes some transactions that were reported with unknown End User/Intermediary status. In 2021, 108 unique respondents reported sales to End Users and 69 unique respondents reported sales to Intermediaries. In 2022, 81 unique respondents reported sales to End Users and 44 unique respondents reported sales to Intermediaries.

¹⁰ Transactions reported to Ecosystem Marketplace cover dates up through November 21, 2023, however it should be noted that by the time of finalizing the dataset for the writing this report that some EM Respondents have reported only partial year data for 2023. In addition, there are a number of EM Respondents that have not yet reported transactions as they disclose their sales to EM on an annual cycle, and other EM Respondents have not had sales in 2023 due to a variety of reasons.

EM data show that the biggest premiums are for sales to end users for Energy Efficiency and Waste Disposal credits. EM analysis also finds that end users pay more for Gold Standard credits than their intermediary counterparts. It appears that many buyers still rely more on intermediaries for Agriculture, Forestry and Land Use, and Household/Community Devices projects than other project types. This may either be because those intermediaries had previously purchased supplies of these credits for resale knowing there would be future market opportunities, or for other reasons, such as buyers engaging with an intermediary to vet projects and credits for quality.

REGISTRY DATA CONFIRMS BROAD VCM TRENDS

Our analysis of publicly available¹¹ data from carbon credit project registries supports our analysis of transaction data reported by EM respondents; the VCM is currently (2022-2023) less active than it was during its peak transaction volume year of 2021. We have also found that global carbon markets have continued to grow since 2020, which is a more realistic and recent benchmark year. However, we are likely to see a different picture in 2024 as registry activity catches up with the downturn in market trading activity that we have witnessed in 2022-2023. See [Box 1](#) for details on the nuances of registry data as it pertains to market assessment.

BOX 1. WHAT YOU NEED TO KNOW ABOUT REGISTRY DATA

It is important to note the following nuances to registry data – date of project registration, as well as volumes of credit issuances and retirements, that make it challenging to assess the market based on this data alone:

1. ***The timeframe from project idea to project implementation:*** Project developers tell us that it can take months , sometimes years, to move a project from concept to registration. The market can change dramatically over time, meaning that demand preferences could shift (e.g., for or against certain project attributes, prices actors are willing to pay, etc.). These factors, among others, can impact what is transacted to secondary market actors for future sales or end users for retirement. There could also be delayed or expedited influence on which projects are being registered and/or issued.
2. ***There can be a lag between transaction for end use and retirement.*** Most transactions occur bilaterally between seller and buyer, and the date of those transactions do not necessarily match the retirement date reflected on the registries, even for spot market transactions. EM often receives questions about why its data does not align perfectly with registry data, and this is a key reason why. EM datasets include only transactions confirmed as completed by EM Respondents.
3. ***Transactions between parties not resulting in a retirement are not reflected in registries:*** This is one of the fundamental differences between confidential transaction data reported to EM and registries. Registries do not capture transactions between buyer and seller unless it's a transfer to another registry account and/or a retirement. Even in these instances, registries do not capture transactions, pricing data or transfers, or retirements.
4. ***Issuance dates are often correlated with sales dates and are sometimes a better indicator of "current" market conditions than retirements are (if using registry data in isolation).*** For many years, EM has heard from project developers and other actors that, due to the costs they must incur from the carbon credit standards to process and issue credits, they often wait to issue their credits until they sell them.
5. ***Retirements are often made on behalf of the end user without transferring registry accounts:*** Buyers who do not wish to have a registry account with the relevant carbon standard can elect to have credits retired on their behalf by a registry account holder. In these cases, the retiree has the option to have their name recorded as part of the registry transfer data.

¹¹ While EM considers the carbon standards' registry data to be publicly available, while some standards allow for a data export from their registries (e.g., Verra, Gold Standard, ACR, ART TREES, CAR, CDM, City Forest Credits), it should be noted that not all do (e.g., Plan Vivo, Peatland Code, Woodland Carbon Code). For these cases, EM receives the data directly from the standards through data sharing arrangements.

NEW PROJECT REGISTRATIONS

The Project Categories below have vastly different issuances potentials related to their underlying overall supply potential. Therefore, the number of project registrations, separate from issuances and retirements from new and historical projects, is an important metric to evaluate market demand.

Encouragingly, by-category trends in project registrations line up with observations from our own transactions data, as well as with insights shared during interviews with market participants in preparation for this report (Figure 3). Forestry and Land Use, Household/Community Devices, and Renewable Energy continued to be the most prevalent categories for new projects in 2022, a trend which appears will continue into 2023. Agriculture projects made a strong showing in 2022 and 2023, and continued growth is expected in this space as market participants seek out climate solutions within Agriculture, Forestry, and Other Land Use (AFOLU) that were either previously underexplored or have since become viable after a market price increase. The growth in new project registrations in the Transportation category in 2022 is also notable – almost all these projects are registered with ACR.

Figure 3. Carbon Credit Project Registrations by Category, 2020-2023

Year

Notes:

Figure 3 includes data on project registrations from ACR, CAR, CDM, City Forest Credits, Global Carbon Council, Gold Standard, Peatland Code, Plan Vivo, Woodland Carbon Code, and VCS registries.

2023 data is partial and includes project registrations through October 16, 2023.