

# **Giving Credit:**

## **Strengths and Weaknesses in Carbon Credit Markets and Opportunities for Philanthropic Investors**

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**Arabella**  
Advisors

With support  
from:





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## About Arabella Advisors

Arabella Advisors supports changemakers pursuing significant social and environmental impact. An award-winning consulting firm and certified B Corporation, Arabella Advisors is dedicated to making philanthropic work more efficient, effective, and equitable.

## About the Osprey Foundation

The Osprey Foundation is a catalyst for empowered, healthy, and fulfilled lives. The foundation strives to create an equitable, peaceful world in which everyone can thrive. We work in various countries in sub-Saharan Africa, Latin America, and the Middle East, as well as in the United States, with a concentration in Baltimore. We focus on water, sanitation, and hygiene; cleaner cooking; ecumenical and interfaith community building; and social justice.

## INTRODUCTION

*The marketplace for buying and selling carbon credits has grown over the past several years, and with it, the opportunities for philanthropists and other investors to play an even greater role in supporting efforts to achieve emissions reductions targets while strengthening local communities. Investors who are interested in environmental sustainability may find that carbon credits offer an appealing avenue for funding a variety of projects across the sustainability spectrum that are essential for reaching these ambitious goals. The carbon credits market is a rare example of a market with the infrastructure to connect on-the-ground environmental initiatives, many of which are locally led, with global pools of institutional capital. But as this report details, the market still has a long way to go: there is a need for continued corporate support; a larger workforce; and greater standardization, transparency, and clarity in the rules and regulations that govern how credits are issued and exchanged in order for this marketplace to fulfill its promise of accelerating the transition to a truly sustainable society.*

This report provides an overview of the current state of and outlook for the voluntary carbon credit market (as opposed to compliance markets, which we explain in more detail below). A carbon credit is a complex financial instrument designed to facilitate the growth of projects that reduce the amount of carbon dioxide in the atmosphere. In its simplest form, a carbon credit is issued to a project developer (such as a conservationist protecting rainforest habitats or a builder of a solar farm) who can then sell that credit to a buyer interested in offsetting their own carbon emissions (such as a corporation that uses a substantial amount of energy to power its operations).

Carbon credits represent an opportunity for a broad set of stakeholders, ranging from public-sector to private-sector to civil-society actors, to access new sources of capital to fund important projects that have environmental benefits, as well as, in most cases, social benefits. Despite experiencing growth in recent years, the market remains relatively small and fragmented compared with the markets for other traded assets, for a variety of reasons. First, buyers are often held back by lack of clarity and confidence in the quality of credits and lack of certainty that the projects the credits will fund are creating real impact—a concept known as impact integrity. Additionally, there are high barriers to entry that make it challenging to determine which credits to buy, as well as to execute a project funded by carbon credits in the first place. Even so, the outlook for the market remains promising due to encouraging efforts by leading advocates, practitioners, and other stakeholders throughout the field to address these and other challenges.

For investors who are committed to catalyzing and scaling the carbon credit market and ensuring more carbon-reducing projects receive funding, there are a number of particularly effective strategies to pursue, according to our research. We recommend that these investors—from foundations to families and individuals to corporations—focus on projects with meaningful and verifiable socioeconomic and health benefits; seek to support market infrastructure; and avoid prioritizing projects that the broader market views as trendy, as these may not deliver optimal benefits.

## Methodology

In recent years, several of our clients have begun exploring impact investments that rely on the generation and sale of carbon credits, such as clean cookstove projects. One of these clients, the Osprey Foundation, expressed a desire to better understand the current state and future outlook of the carbon credit market. To develop this report, Arabella conducted extensive desk research and interviewed a series of experts on the carbon credit market. These experts (a list of interviewees can be found in Appendix B) brought a diversity of perspectives and types of experience.

We have divided this report into three sections: an overview of and background on global carbon credit markets, with a focus on the voluntary carbon market (VCM), the VCM's main challenges, and an outlook for the VCM along with considerations that foundations and other investors should keep in mind when exploring investing in the market. Because the opportunities our clients are exploring are predominantly tied to the VCM, this report focuses on that market.

## MARKET OVERVIEW

Climate change is one of the most pressing challenges humanity faces, and addressing it is critical to the health and safety of the planet, society, and future generations. Together, we must reduce current levels of global annual greenhouse gas (GHG) emissions by 50% by 2030 and reach net-zero by 2050 to limit global warming to 1.5 degrees Celsius, which is the target outlined in the Paris Agreement.<sup>1</sup> Carbon markets are one promising tool to drive reductions in GHG emissions by incentivizing projects and activities that reduce emissions. Carbon markets involve the trading of carbon credits, a term often used interchangeably with “carbon offsets” or “carbon offset credits.” Carbon credits are financial instruments issued by dedicated standards-setting organizations to project developers—organizations that prevent or remove carbon dioxide emissions through their projects. Each individual credit represents an emissions reduction of one metric ton of carbon dioxide (or CO<sub>2</sub>, which the industry generally refers to as just “carbon”). Carbon markets involve the financial transfer of credits from the entity that is delivering emissions reductions via its projects to another entity that is seeking to offset its own emissions using the credit earned by the project.

## Distinguishing Between Compliance Markets and Voluntary Markets

Carbon markets first emerged from the 1997 United Nations Kyoto Protocol, the first international agreement that sought to operationalize GHG reduction actions. The Kyoto Protocol set a per-country cap on carbon emissions, allowing participant countries to sell the credits from their emissions reduction projects to other countries. Building on this activity, independent organizations and actors began trading carbon voluntarily in the late 1990s. By the early 2000s, the first set of organizations dedicated to registering and issuing voluntary credits had emerged.<sup>2</sup>

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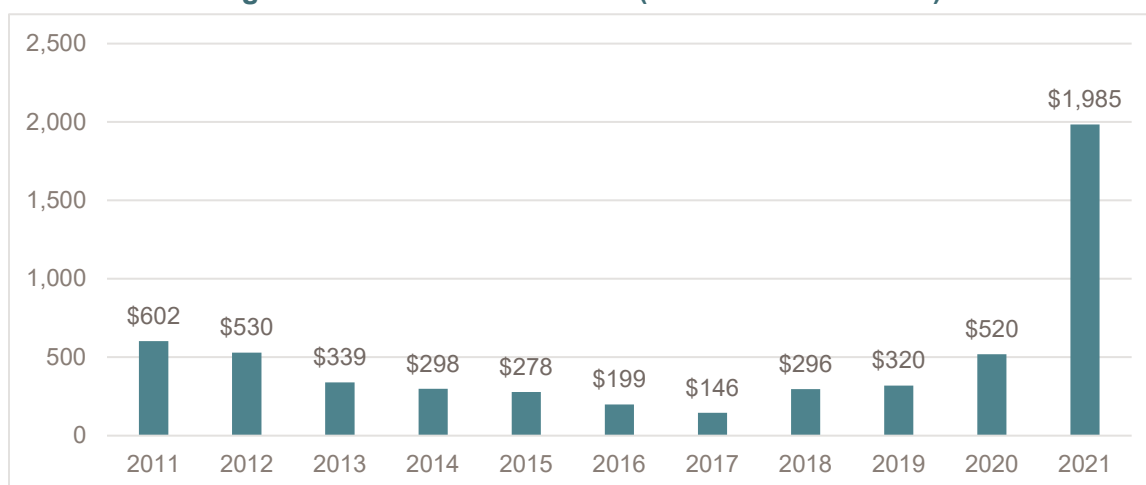
<sup>1</sup> See Appendix C: Terminology for more detail.

<sup>2</sup> “Voluntary carbon market derivatives: Growth, innovation & usage,” Science Direct, 2022, <https://www.sciencedirect.com/science/article/pii/S2214845022001053>

Thus, today, there are two types of carbon markets: **compliance carbon markets** and **voluntary carbon markets**. Credits granted in one market generally cannot be applied in the other market. However, shifts in pricing or demand in one market can impact the other.

- **Compliance carbon markets** are government-regulated marketplaces created to satisfy regulatory requirements on companies to meet certain emission-reduction targets. This type of market is often referred to as an emissions-trading system (ETS) or cap-and-trade program. In these markets, regulators set a limit on carbon emissions, and companies within the jurisdiction can either reduce their emissions or purchase credits to bring them under the limit. The total value of the global compliance market has grown exponentially in recent years, from \$186 billion in 2018 to \$865 billion in 2022.<sup>3</sup> As of early 2022, there were 34 emissions-trading systems in place globally, covering 38 national jurisdictions.<sup>4</sup> The largest by far is the European Union's ETS, which accounts for 87% of the total global market.<sup>5</sup> Others include those in the United Kingdom, China, South Korea, and New Zealand. As of 2022, these systems had a total value globally of \$865 billion.<sup>6</sup>
- The **voluntary carbon market (VCM)** is home to transactions of carbon credits that entities purchase voluntarily due to a desire to demonstrate a commitment to sustainability. Demand within the VCM is driven by companies and individuals that wish to take responsibility for offsetting their own emissions as well as by entities that purchase credits in anticipation of future regulations that will require emissions reductions (known as pre-compliance offsets). The VCM is global, fragmented, and far smaller than its compliance counterpart. That said, the VCM has grown steadily in recent years and experienced explosive growth between 2020 and 2021, reaching nearly \$2 billion in total transaction value in 2021 before experiencing a slight dip in early 2022, likely due to the invasion of Ukraine (full 2022 data are not yet available).<sup>7</sup>

**Figure 1. VCM Size Over Time (in millions of dollars)<sup>8</sup>**



<sup>3</sup> "Carbon Market Year in Review 2022," Refinitiv, 2023, [https://www.refinitiv.com/content/dam/marketing/en\\_us/documents/gated/reports/carbon-market-year-in-review-2022.pdf](https://www.refinitiv.com/content/dam/marketing/en_us/documents/gated/reports/carbon-market-year-in-review-2022.pdf)

<sup>4</sup> "State and Trends of Carbon Pricing," The World Bank, 2022, <https://openknowledge.worldbank.org/entities/publication/a1abead2-de91-5992-bb7a-73d8aaaf767f>

<sup>5</sup> "Carbon Market Year in Review 2022," Refinitiv, 2023, [https://www.refinitiv.com/content/dam/marketing/en\\_us/documents/gated/reports/carbon-market-year-in-review-2022.pdf](https://www.refinitiv.com/content/dam/marketing/en_us/documents/gated/reports/carbon-market-year-in-review-2022.pdf)

<sup>6</sup> Ibid

<sup>7</sup> Ibid

<sup>8</sup> "State of the Voluntary Carbon Markets 2022 Q3," Ecosystem Marketplace, 2022, <https://data.ecosystemmarketplace.com/>

## Stakeholders

There are four primary stakeholder groups that comprise the VCM: **project developers, standards organizations, buyers, and brokers and exchanges.**

**Project developers** are the organizations whose work prevents carbon from entering the atmosphere or removes existing carbon in the atmosphere. As a result of this work, these organizations receive carbon credits from standards organizations (see below). There are project developers all over the globe, but the largest concentrations are in Asia, Africa, and the Americas.<sup>9</sup> As of 2022, the five largest developers in the world, in terms of volume of credits generated, all focus on forest conservation or improved forest management.<sup>10</sup> Sustainable agriculture and clean cookstove project developers represent the fastest-growing segment of projects, with both experiencing greater than 50% year-over-year growth from 2021 to 2022.<sup>11</sup>

**Standards organizations** are responsible for issuing carbon credits to project developers and validating the volume of emissions reduced as a result of their work. One of the primary challenges facing the VCM is the fragmented nature of standards organizations and the complexities and inconsistencies of their various assessment processes, leading to confusion and a lack of confidence regarding the quality of credits in the VCM. Project developers register with one of these organizations, which often require a registration fee. The standards organizations in turn verify that the emissions prevention or reduction has occurred. The standards organization then issues the project developers their credits and lists those credits in their registries. The four leading standards organizations are [American Carbon Registry](#), [Climate Action Reserve](#), [Gold Standard](#), and [Verra](#), with Verra far and away the largest. Project developers select which standards organization to register their projects with. Project developers base their decision on which standards organization best fits the project's emissions-reduction methodology and their perception of which organization will most increase their project's value. Generally speaking, Gold Standard is seen as the market leader in terms of its quality and integrity standards, while Verra is viewed as being less stringent and thus more accessible for more projects.

Each standards organization has its own rules or parameters for assessing carbon credits, and they use different auditors to complete the actual credit assessment. Each standards organization certifies its auditors and has its own verification requirements that auditors must meet. However, third-party certifying organizations do check the auditors' findings, which helps review the auditors'—and by extension the standards organizations'—performance over time. These types of checks are intended to manage potential conflicts of interests created from project developers paying standards organizations to secure credits and validate their projects. That said, this dynamic of project developers effectively paying for verification creates some challenging incentives that can at times undermine confidence in the quality of credits.

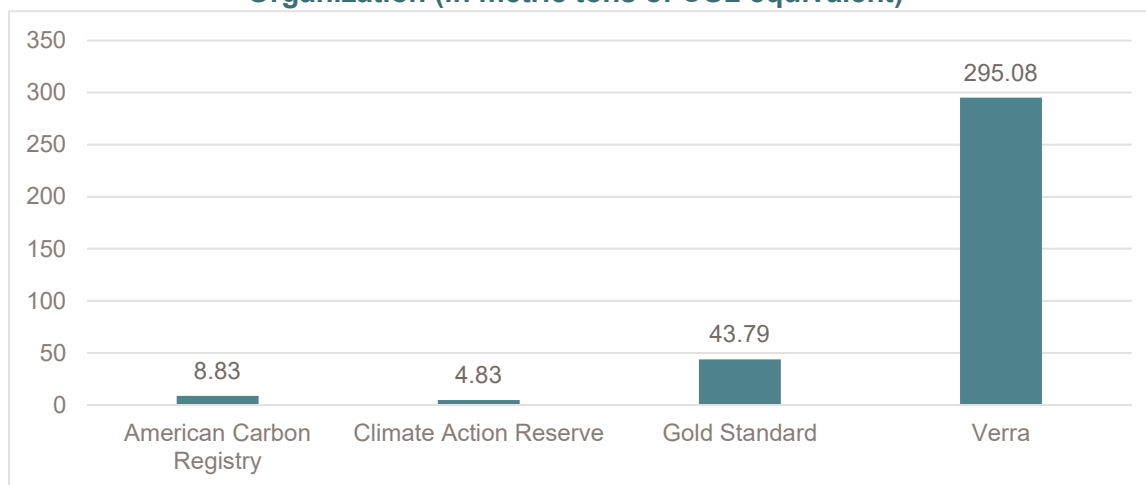
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<sup>9</sup> "The State of the Carbon Developer Ecosystem," Abatable, 2023, [https://25465925.fs1.hubspotusercontent-eu1.net/hubfs/25465925/Abatable%20Carbon%20Developer%20Ecosystem%20Report%20-%20January%202023.pdf?utm\\_medium=email&\\_hsmi=67944745&\\_hsenc=p2ANqtz-8\\_5byv\\_nmitu\\_n4ITTcwWWnE3AqX6g1rLXiJ\\_eAKa\\_J0kHAIva3xxtcCJmqbaQExBj0zMxglHgiW5SjHWtFqVxZvX7fm\\_dquNoimHgLE8cSAA2NG4k&utm\\_content=67944745&utm\\_source=hs\\_automation](https://25465925.fs1.hubspotusercontent-eu1.net/hubfs/25465925/Abatable%20Carbon%20Developer%20Ecosystem%20Report%20-%20January%202023.pdf?utm_medium=email&_hsmi=67944745&_hsenc=p2ANqtz-8_5byv_nmitu_n4ITTcwWWnE3AqX6g1rLXiJ_eAKa_J0kHAIva3xxtcCJmqbaQExBj0zMxglHgiW5SjHWtFqVxZvX7fm_dquNoimHgLE8cSAA2NG4k&utm_content=67944745&utm_source=hs_automation)

<sup>10</sup> Ibid

<sup>11</sup> Ibid

**Figure 2. Credit Transaction Volume in 2021, by Standards Organization (in metric tons of CO2 equivalent)<sup>12</sup>**



**Buyers** are entities acquiring credits in the market. In the VCM, most buyers are companies aiming to offset their emissions, though buyers can also be entities such as cities, endowments, and universities. Corporate buyers purchase credits to help them meet their commitments of moving toward or becoming carbon-neutral or net-zero—though marketing purposes generally motivate companies to make these commitments in the first place. There are two main groups of corporate buyers: those seeking to neutralize emissions or make immediate offsetting claims, and those that have long-term, company-wide commitments to becoming carbon-neutral. Currently, the majority of corporate buyers fall into the first group. The second group’s targets are far enough into the future that immediate credit purchases are not necessary, but the projected volume of VCM credits that will be required to meet this demand over the long term is very large.

The VCM has experienced major growth in recent years in large part due to the increase in companies making carbon-neutral or net-zero commitments. Of companies listed on the FTSE100, 60% had made such a commitment as of 2021, double the number from the year prior.<sup>13</sup> Major examples include Amazon, Disney, Google, Microsoft, Shell, and Unilever. Of the 2,000 largest companies with net-zero commitments, 31% set a timeline of reaching this goal by 2030, 16% set a target between 2031 and 2040, and 59% set a target between 2041 and 2050.<sup>14</sup>

“Companies buy voluntary credits entirely because of peer pressure—it’s all peer pressure.”

Leading carbon credit consultant

**Brokers and exchanges** are organizations that facilitate the purchase and sale of carbon credits, helping coordinate supply and demand. Exchanges list credits for sale and work with registries to enable transfers, making purchases relatively quick and easy. Exchanges establish standard trading terms,

<sup>12</sup> “State and Trends of Carbon Pricing,” The World Bank, 2022

<sup>13</sup> “Voluntary Carbon Markets and Offsetting,” Climate Change Committee, 2022, <https://www.theccc.org.uk/publication/voluntary-carbon-markets-and-offsetting/>

<sup>14</sup> “Net Zero Target Dates,” Net Zero Tracker, 2022, <https://zerotracker.net/analysis>

which helps to improve transparency in the VCM. The largest exchange globally is [CBL Xpansiv](#).<sup>15</sup> Other active exchanges include [ACX](#) (formerly AirCarbon Exchange), [Carbon Trade eXchange](#), and [Climate Impact X](#). Despite the number of brokers and exchanges, buying directly from a project developer remains the most common way that buyers purchase credits within the VCM.<sup>16</sup>

## Project Types

There are many different types of projects that generate carbon credits, and they are often grouped into two general categories: **reduction projects** and **removal projects**. Reduction projects aim to prevent carbon from being released. For these projects, a credit represents the prevention of the emission of one metric ton of carbon dioxide that would otherwise occur if not for the project. Examples include renewable energy, forest management and conservation, and clean cookstoves. Removal projects aim to permanently remove carbon that is currently present in the atmosphere. Examples include reforestation, soil carbon sequestration, and technology-based removal initiatives, such as projects that use new, more sustainable building materials or projects that employ direct air capture (a method that uses chemical reactions to capture CO<sub>2</sub> from the atmosphere). Reduction projects made up 90% of the VCM as of 2021, with an average price of \$1.71/ton, compared to the \$7.98/ton average price for removal projects.<sup>17</sup> This relationship between type of project, volume, and price is expected to shift significantly over the next decade, with removal projects projected to comprise a slight majority of the market by 2030, which will likely lead to decreases in the price of credits for these projects.<sup>18</sup> (Please refer to the Pricing and Quality section, below, for more detail about the price differentials between these types of projects.)

Carbon credit projects—both reduction and removal—generally fall into eight broad project types: agriculture, chemical processes or industrial manufacturing, energy efficiency or fuel switching, forestry and land use, household or community devices, renewable energy, transportation, and waste disposal. Currently, forestry and land use and renewable energy are the most common project types in the VCM.

**Figure 3. Carbon Credit Project Types in 2021, by Volume of Carbon Removed, Credit Price, and Total Transaction Value<sup>19</sup>**

	Volume of CO <sub>2</sub> Removed (Metric Tons)	Credit Price (USD)	Total Transaction Value (USD)
Forestry and Land Use	227.7MM	\$5.80	\$1,327.5MM
Renewable Energy	211.4MM	\$2.26	\$479.1MM
Chemical Processes/Industrial Manufacturing	17.3MM	\$3.12	\$53.9MM

<sup>15</sup> “Voluntary Carbon Market Derivatives: Growth, Innovation & Usage,” Borsa Istanbul Review, 2022, <https://www.sciencedirect.com/science/article/pii/S2214845022001053>

<sup>16</sup> “State of the Voluntary Carbon Markets 2022 Q3,” Ecosystem Marketplace, 2022

<sup>17</sup> “Removal and Reductions Price and Volumes,” Ecosystem Marketplace, 2022, <https://data.ecosystemmarketplace.com/>

<sup>18</sup> “Taskforce on Scaling Voluntary Carbon Markets: Final Report,” Taskforce on Scaling Voluntary Carbon Markets, 2022, [https://www.iif.com/Portals/1/Files/TSVCM\\_Report.pdf](https://www.iif.com/Portals/1/Files/TSVCM_Report.pdf)

<sup>19</sup> Ibid

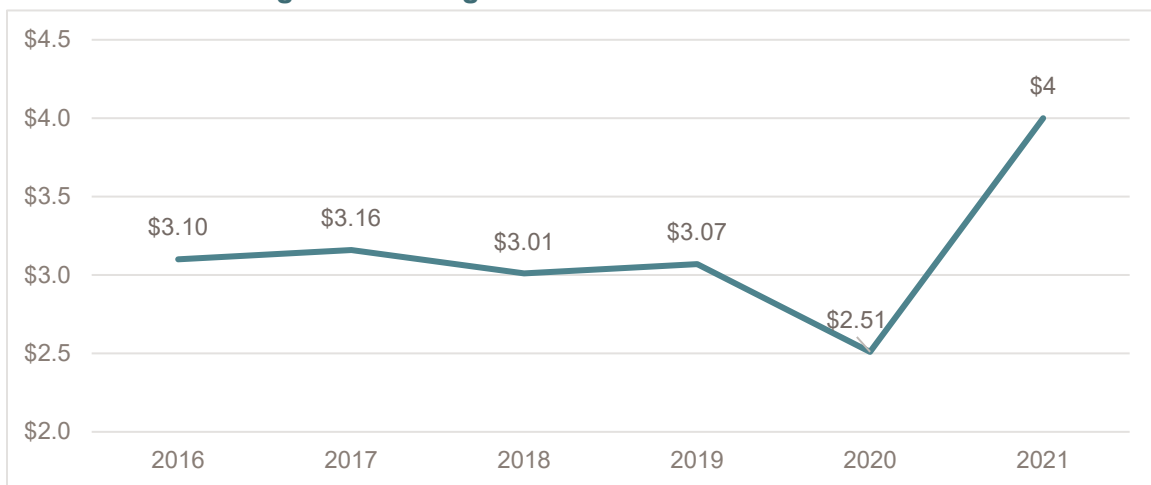


	Volume of CO2 Removed (Metric Tons)	Credit Price (USD)	Total Transaction Value (USD)
Waste Disposal	11.4MM	\$3.62	\$41.2MM
Energy Efficiency/Fuel Switching	10.9MM	\$1.99	\$21.9MM
Household/Community Devices	8MM	\$5.36	\$43.3MM
Transportation	5.4MM	\$1.16	\$6.3MM
Agriculture	1MM	\$8.81	\$8.7MM

## Pricing and Quality

There is no set and transparent price for credits in the VCM. Prices range from \$1/ton to \$15/ton based on the project's quality, type, size, location, and accreditation standard. The average global VCM price was \$4/ton in 2021—a 59% increase from the year prior, stemming from a spike in corporate demand.<sup>20</sup> Prices dropped in 2020 primarily due to the pandemic after being generally flat from 2016 to 2019.<sup>21</sup>

**Figure 4. Average VCM Credit Price Over Time<sup>22</sup>**



Pricing in the VCM is often linked to the perceived quality of each credit. At a basic level, a high-quality carbon credit is a net negative in carbon reduction. That is, a high-quality carbon credit represents the same amount of carbon prevention or removal as if the buyer had reduced their own carbon footprint. However, there is no universally agreed-upon definition for a high-quality carbon credit, though there is general agreement that the projects and their associated credits should have both environmental and social integrity. A credit with strong environmental integrity has three key elements: **additionality**, **leakage**, and **permanence**. However, all three of these elements are challenging to measure and verify.

<sup>20</sup> Pricing data from Ecosystem Marketplace, <https://data.ecosystemmarketplace.com/>

<sup>21</sup> Ibid

<sup>22</sup> Ibid

- **Additionality** is a positive trait that means the emissions reduction or removal associated with the credit would only occur if the project producing that credit takes place. A high-quality credit *does have* additionality.
- **Leakage** is a negative trait that means the project producing the credit simply displaces or moves the driver of emissions. A high-quality credit *does not have* leakage.
- **Permanence** is a positive trait that means the emissions reduction or removal associated with the credit is lasting and won't simply be reversed in the future (a typical target time horizon being 100 years). A high-quality credit *does have* permanence.

Consider the example of an anti-deforestation project. To generate the highest-quality credits, the anti-deforestation project must: 1) be focused on a forest that is under real threat of being cut down (additionality); 2) ensure that stopping the deforestation will not simply lead to a neighboring forest being cut down (leakage); and 3) confirm that the forest will not be chopped down for at least 100 years (permanence).

High-quality carbon credits also have strong social integrity, meaning that they do not cause any type of socioeconomic harm to communities and that they have co-benefits. Co-benefits refers to the credit producing positive changes for the local community where the project is located beyond emissions avoidance and removal. Examples of co-benefits are greater local employment opportunities, better access to health and education services, improved air or water quality, and increased biodiversity—all as a direct or indirect result of the project.

## CHALLENGES

Despite its recent growth, the VCM remains illiquid, fragmented, and relatively small compared to compliance markets. The process of matching individual buyers with sellers (typically project developers) is time-consuming and inefficient. This reality is due to a number of challenges, but four stand out: **credit quality, buyer integrity, pricing, and high barriers to entry**. Fortunately, to address these challenges, there are several promising efforts underway, which are detailed at the end of this section.

### Credit Quality

In the VCM, there are two main issues related to quality: 1) the quality of the projects generating and backing the credits—that is, their efficacy in reducing emissions; and 2) the quality of the credits themselves—particularly the inability (of buyers and other stakeholders) to objectively assess whether or not the credit represents a high-quality, effective project.

There are general concerns with the environmental and social integrity of many credits. Most projects producing credits face challenges in making sure they have additionality and permanence. They also struggle with preventing or measuring leakage. The quality of some projects has also been more specifically critiqued by investors, the media, and others due to their harmful impact on local communities, or simply due to a lack of clarity as to how the supposed benefits of some projects are being conveyed to these communities. Still, these projects can and do sell credits to interested buyers, regardless of their actual environmental or social impact.

The standards organizations address this issue by verifying or assessing credits. However, as mentioned above, this presents a different set of issues. The VCM lacks a shared definition of quality, and there is no clearly agreed-upon set of standards for assessing and verifying credits. The general system of project developers paying standards organizations to verify and issue credits creates difficult conflicts of interest. In various high-profile articles, experts have questioned the usefulness of existing standards organizations' methodologies. Many standards organizations also employ methodologies that require updating, further undermining faith in credits associated with those standards organizations. It is difficult for buyers to discern which projects have been issued credits by more rigorous modern methodologies and which by their less thorough predecessors. What's more, having multiple registries listing the same credits leads to concerns about credits being double counted. Together, these obstacles mean there is no easy, transparent way for prospective buyers to differentiate between high- and low-quality credits.

“There is a lot of crappy carbon out there in the market currently.”

Seasoned carbon credit investor

## Buyer Integrity

There is no consensus on the degree to which it is ethically or environmentally acceptable for corporations to use credits as a partial or full alternative to actually decarbonizing their operations; there is also disagreement about the right balance between these two approaches. Corporations that could potentially be buyers in the VCM often hesitate to participate due to concern that purchasing carbon credits might be perceived as greenwashing or a lack of genuine or ambitious climate action. There is also a lack of transparency about how many and which credits corporate buyers purchase. Similarly, there is no exact accounting for how buying credits impacts companies' overall sustainability efforts. This

“Corporate buyers really do not like being criticized for trying to do a good thing.”

Prominent carbon credit validator

lack of transparency contributes to concerns about greenwashing. The risk companies face in this regard and the general lack of clarity in this area limit their willingness to engage actively in the market. A higher level of corporate participation, on the other hand, would likely entice more organizations to develop emissions-reductions projects that generate credits.

## Pricing

The price of credits in the VCM is highly variable, and fundamentally too low. The general price of credits does not reflect the true value or cost of climate change mitigation, limiting the potential climate and community benefits of the VCM.

Low prices also make it less desirable for new projects to enter the market. Similarly, prices are too low for existing projects to generate enough revenue that would allow them to scale significantly. The lack of new projects and inability to scale current projects have a detrimental environmental impact. Fewer and smaller projects mean less carbon prevention or removal, and more

“Carbon pricing is a whole Wild West.”

Veteran carbon credit investor

carbon buildup in the atmosphere. Currently, there are not nearly enough active projects to produce the emissions reductions required to reach the Paris Agreement's global warming reduction goals.<sup>23</sup>

General risks about the quality and integrity of credits decrease the demand for credits, which in turn suppresses price. Unpredictable and variable pricing makes planning for carbon credit sales more challenging, and this keeps some investors out of the market, leaving potentially high-quality projects unfunded. For the VCM to scale significantly, the price of credits needs to be stable, transparent, and generally higher to reflect the true value and cost of climate change mitigation.

## High Barriers to Entry

It is difficult for both buyers and sellers to navigate the VCM. This is especially true for those with limited resources. Purchasing credits requires technical knowledge, the ability to navigate and understand myriad complex independent standards, and trusted references for pricing. Project developers, meanwhile, face a long, costly, and technical process to verify credits. Once credits have been issued, prices for those credits are low, and there remains uncertainty about the future demand for those credits, despite some promising signs. All these factors combine to limit projects' access to financing (through the sale of carbon credits), creating a self-perpetuating negative cycle for the market as a whole. Related to this issue is the fact that the VCM is facing a general shortage of qualified talent. Organizations operating in the market, such as standards organizations, find it exceedingly difficult to identify and hire individuals with meaningful experience and expertise in carbon markets. This dearth of expertise has both led to and exacerbates the issues mentioned above, which then curb the number of other organizations and individuals looking to enter the market as either buyers or sellers.

The VCM's high barriers to entry for both buyers and sellers are in part driven by the general lack of adequate market infrastructure. Many of the organizations playing a key role in providing this infrastructure for the VCM, such as standards organizations like Gold Standard or Verra, are nonprofits whose financial, technological, and human resources are limited—and further stretched when faced with high transaction volume. While the market's major players lack certain necessary capacities, the market itself lacks risk management tools, such as futures reference contracts and an active secondary market. Better risk management and data tools would allow market participants to effectively manage price risk and their overall exposure, and thus grow more confident in increasing their activity in the market itself. Part of the reason for the lack of such tools is that the VCM does not have accessible and transparent reference and market data. There are limited data on the type, price, and retirement of purchased carbon credits. Whereas similar securities markets have centralized public data sources listing all sales and purchases, the VCM does not.

## Mitigation Efforts

There are several promising efforts underway to address the weaknesses outlined in this section and others that exist in the VCM. One particularly promising effort is the [Taskforce on Scaling Voluntary Carbon Markets \(TSVCM\)](#). TSVCM launched in late 2020 to advance the VCM. The initiative has over 250 members representing credit buyers and sellers, standards organizations, and market infrastructure

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<sup>23</sup> The Paris Agreement is the most recent international treaty on climate change, adopted in 2015. Its overarching goal is to limit global warming to 1.5 degrees Celsius.



providers. After a lengthy review process, the initiative established the [Integrity Council for the Voluntary Carbon Market \(ICVCM\)](#) and the [Voluntary Carbon Markets Integrity Initiative \(VCMI\)](#) in late 2021. ICVCM acts as an independent governance body for the market; it intends to establish a clear set of criteria for high-integrity carbon credits, which it calls the Core Carbon Principles, and which ICVCM believes can serve as the standard for the entire market. ICVCM recently went through an extensive consultation process to help it develop these principles, and it is expected to release the finalized principles in 2023. VCMI, which aims to standardize and promote high-quality corporate claims, recently underwent a similar consultation process. Both are highly promising efforts that represent an impressive confluence of key stakeholders across the VCM, creating significant potential to succeed in their goals. If successful, these efforts would be able to effectively tackle the quality and integrity concerns that currently limit the VCM. They would also lower barriers to entry and help prices adjust to more accurately reflect market demand.

## RECOMMENDATIONS FOR INVESTORS

Despite the numerous weaknesses of the VCM, investors—including philanthropists of all kinds—can feel confident making investments in businesses that rely on carbon credit transactions, as long as they approach these deals with caution and remain mindful of focusing on projects with high-quality credits, particularly those projects with co-benefits. The VCM has made progress over the last decade in terms of credit integrity, transparency, and market efficiency, although much work remains. While numerous experts on the market acknowledge that its recent wave of growth is not likely to be sustainable at its current pace, they also express confidence that the VCM is likely to continue growing in the decades to come, just at a slower pace. They also agree it is certainly not at risk of disappearing altogether. Conservative projections estimate that the market size will be between \$5B and \$30B by 2030.<sup>24</sup>

Ultimately, mobilizing private capital, including philanthropic capital, is pivotal if the world is to meet the Paris Agreement's targets. The urgency of the issue is likely to ensure that corporations continue to feel pressure to make net-zero commitments, and the VCM provides a strong mechanism to enable these entities to reduce or remove emissions. Efforts to address the market's main challenges have momentum and are likely to make many of these organizations more comfortable with engaging in the market, improving demand and spurring the overall scaling of the VCM.

For foundations and other philanthropists to be catalytic and thoughtful investors in this market, they should be particularly mindful of three specific considerations: **the importance of co-benefits**, **supporting market infrastructure**, and **avoiding the temptation of so-called “charismatic” credits**.

### The Importance of Co-Benefits

Catalytic investors should consider an approach that focuses on credits with meaningful co-benefits in addition to satisfying additionality, leakage, and permanence. Clean cookstove projects are examples of projects with strong co-benefits, as these efforts not only reduce emissions but also reduce the time and effort that women in many countries around the world spend

“[Project] credits with co-benefits are richly rewarded.”

Leading carbon credit consultant

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<sup>24</sup> “Taskforce on Scaling Voluntary Carbon Markets: Final Report,” Taskforce on Scaling Voluntary Carbon Markets, 2022

collecting fuelwood, while decreasing indoor air pollution, which is harmful to these families' health. These projects' multiple benefits make them attractive to impact-oriented organizations, driving demand for these projects' credits. This helps keep the price of these credits high compared to the rest of the market. In 2021, credits with co-benefits issued by Gold Standard had an average price 35% higher than credits issued by the organization without co-benefits.<sup>25</sup> Generally, strong co-benefits are a main driver of high-quality carbon credits with high prices, and they enable investments to produce meaningful impact beyond the environmental sphere, often in regions in particular need of such support.

## Supporting Market Infrastructure

An investor looking to be catalytic for the broader carbon market should also consider supporting market infrastructure as opposed to or in addition to directly buying credits or financing project developers. As discussed, one of the VCM's most pressing challenges is the lack of infrastructure—such as risk management and data tools—which is essential to a highly developed and efficient global market. Better market infrastructure is necessary to increase the confidence of those investing in businesses that rely on selling carbon credits. It is also necessary for the VCM to scale to a size that can make a genuine impact on the fight against climate change. In practice, this support could entail direct investments or grants to organizations working to provide such infrastructure, or it could mean engaging in advocacy to push for new, improved frameworks that assess, measure, and monitor the quality of credits in the market.

“The market infrastructure on which all this is built is not adequate for the volume that is currently being transacted.”

Leading carbon credit validator

## Avoiding the Temptation of Charismatic Credits

Most buyers in the VCM have a bias toward projects that will look good from a marketing and corporate social responsibility perspective. Additionally, the general uncertainty in the market about the quality and integrity of credits, and the high barriers to entry, biases buyers toward trendy project types that are widely accepted as impactful. Credits associated with these types of projects are commonly known as charismatic credits, meaning their popularity in large part stems from perception rather than a scientific evaluation of their quality and impact. This dynamic leads to many important projects—those with the potential for high environmental and socioeconomic impact, such as waste and landfill management

“The market is driven by trend rather than science. ...It does not take a scientific perspective as to where carbon finance would be most impactful.”

Experienced carbon credit market participant

projects—going woefully underfunded.

Meanwhile, projects that are easier to understand and market to the public, such as anti-deforestation projects, receive disproportionate support. An investor looking to be catalytic should focus on overlooked projects that are still high-quality and can produce co-benefits.

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<sup>25</sup> “State of the Voluntary Carbon Markets 2022 Q3,” Ecosystem Marketplace, 2022

## CONCLUSION

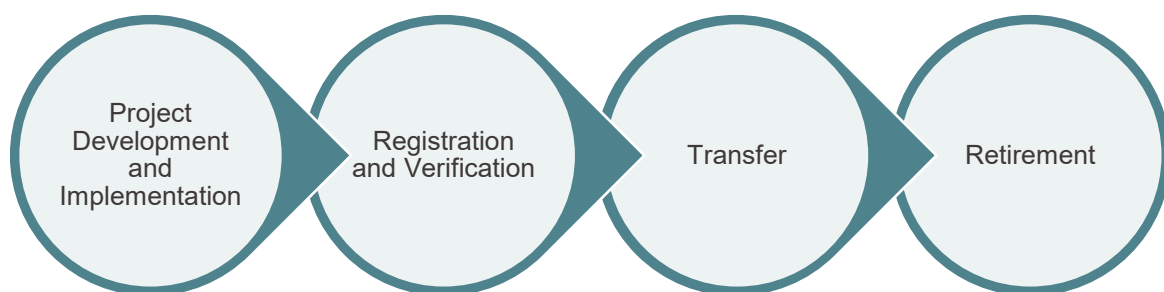
The VCM has the potential to be a powerful driver of climate change solutions, and like most markets in their early stages of development, the VCM requires careful and thoughtful investments to ensure the market gains credibility and can sustain for years to come. There are several high-value features to the VCM, such as corporate net-zero commitments and increased project development, that appear to be outpacing the challenges, including a lack of standardization and isolated instances of greenwashing. And by using market-based solutions to promote and reward impactful projects, the VCM is recognizing the value in supporting projects that aim to mitigate, slow, or reverse climate change. There are a number of strategies that impact-oriented investors can take to ensure their dollars go as far as possible and maximize their ability to benefit communities around the world as well as the planet as a whole.

## APPENDIX A: THE CARBON CREDIT TRANSACTION PROCESS

There are generally four steps in the lifecycle of a carbon credit: project development and implementation, registration and verification, transfer, and retirement. An investor can offer financing or agree to purchase credits at any of these four steps.

1. **Project development:** The first step of a transaction is the design of the project that will produce a carbon credit (or offset). This includes identifying potential methodologies for quantifying emissions reductions and removals, conducting feasibility studies, and acquiring the needed assets. The project developer then implements or stands up the project to begin reducing or removing emissions.
2. **Registration and verification:** The project developer then registers their project with a standards organization, such as Gold Standard or Verra. These standards organizations then monitor the project over a period of time and verify that emissions reductions or removals have occurred. Once verified, the same standards organization issues the corresponding credits to the project developer.
3. **Transfer:** Developers then sell their credits to buyers, either through brokerages or exchanges or directly. At this stage, credits may change hands multiple times.
4. **Retirement:** The final step in the lifecycle of a carbon credit is the retirement of the credit by the buyer, meaning they claim the tons of emissions reduced or removed. Once a credit has been retired, it is taken out of circulation and can no longer be transferred or used. Retirement occurs according to a process specified by the standards organization that issued the credit.

Figure 5. Carbon Credit Transaction Process





## APPENDIX B: INTERVIEWEES

- Matthew Arnold – Global Head of Impact Finance & Markets, The Nature Conservancy
- Amrita Bhandari – Chief of Insights & Strategy, Acumen Fund
- Glenn Bush – Associate Scientist, Woodwell Climate Research Fund
- Dan Hammer – Founder & Partner, Earthrise Media
- John Paul (JP) Moscarella – Senior Vice President, WSP USA
- Hugh Salway – Head of Environmental Markets, The Gold Standard
- Melissa Weigel – Managing Director of Capital Raising, The Nature Conservancy

## APPENDIX C: TERMINOLOGY

- **Additionality:** A feature of carbon credit projects that confirms the emissions reductions from the project would not have occurred in the absence of a market for credits. Additionality is an essential feature of a high-quality carbon credit.
- **Carbon Credit:** A financial instrument representing the avoidance or removal of greenhouse gas emissions, with each individual credit representing an emissions reduction of one metric ton of CO<sub>2</sub>.
- **Charismatic Credits:** Carbon credits that are popular primarily due to perception rather than a scientific evaluation of their quality and impact.
- **Credit Retirement:** A step in the lifecycle of a carbon credit when the credit buyer claims the ton of CO<sub>2</sub> represented by the credit reduced or removed, meaning the credit can no longer be transferred or used.
- **Co-Benefits:** A feature of carbon credits that produce broader socioeconomic or health benefits beyond the emissions reduction or removal.
- **Compliance Carbon Markets:** Markets for the trading of carbon credits created by governmental regulatory requirements to meet certain emissions reduction targets.
- **Double Counting:** Carbon credits being claimed by multiple entities.
- **Greenhouse Gases (GHGs):** Gases in the Earth's atmosphere that trap heat. Human activities have led to a dramatic increase in the release of GHGs, which is the cause of global warming and climate change.
- **Greenwashing:** Dishonest or misleading marketing about a company's or product's environmental impact.
- **Leakage:** This refers to efforts to reduce emissions that simply shift the cause of the emissions elsewhere. A high-quality carbon credit must not feature leakage.
- **Paris Agreement:** The most recent international treaty on climate change adopted in 2015. Its overarching goal is to limit global warming to 1.5 degrees Celsius. The agreement requires each signatory country to submit national climate action plans, known as nationally determined contributions (NDCs), which will lead to meeting the global target.
- **Permanence:** A feature of carbon credit projects that confirms the emissions reductions from the project cannot be reversed or reintroduced into the atmosphere. Permanence is an essential feature of a high-quality carbon credit.
- **Project Developers:** Organizations whose work reduces or prevents carbon from entering the atmosphere and thus generates carbon credits.
- **Reduction Projects:** Carbon credit projects that reduce emissions from current sources, such as funding the implementation of renewable energy.
- **Removal Projects:** Carbon credit projects that remove CO<sub>2</sub> from the atmosphere and use or store it in sustainable ways. These projects include nature-based removal such as reforestation and technology-based removal such as bio-energy with carbon capture and storage.
- **Standards Organizations:** Organizations responsible for issuing and validating credits in the VCM.
- **Voluntary Carbon Market (VCM):** The market for the trading of carbon credits purchased voluntarily.