Arbor Day Carbon

ARBOR DAY CARBON

2024 INSIGHTS SUMMARY

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EXECUTIVE SUMMARY

Though once far off, 2030 climate targets now loom just five years away. In the scope of corporate climate action, this may be one of the most important moments of the last 20 years. It's a moment in which corporations can choose to be bold, close the gap between their ambitions and their achievements, and reflect on how they're both contributing to and working against the climate crisis.

At Arbor Day Carbon, we believe a robust voluntary carbon market is a key mechanism in helping to address climate change and its effects. By purchasing or investing in nature-based solutions through this market, the private sector maintains an outsized ability to protect and restore critical ecosystems and ultimately promote global health and stability.

Though the voluntary carbon market is still maturing, promising developments in the last year signal positive evolution. As detailed in the following report, there's been a notable convergence around quality standards in the voluntary carbon market. Stakeholders across the spectrum — from project developers to verification bodies — are aligning on key principles for assessing carbon credit quality. The emergence of standardized rating agencies is further facilitating this trend, making it easier for buyers to compare and evaluate credits currently in the market and get preliminary ratings of new projects. This increased alignment, along with innovation in risk management tools like insurance products, are helping build confidence and trust in the space.

Of course, there are challenges inhibiting market growth. The ambiguity around Science Based Targets Initiative (SBTi) guidance regarding scope 3 emissions

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has perpetuated hesitation among potential buyers. There's also uncertainty around how the incoming U.S. presidential administration will approach the market, as other countries also explore changes in market-related regulations. And the ever-present concerns over transparency and integrity in the space continue to dull confidence.

Despite these uncertainties, we need bold private sector leaders to step forward to drive market scale and increase momentum.

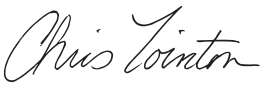
At the moment, the voluntary carbon market has insufficient carbon removal supply to meet projected demand. This means the longer companies delay engagement, waiting to buy carbon credits until 2029 or 2030, the less chance they have of actually securing available credits and almost guaranteeing that if they do buy credits, they'll be priced significantly higher than they are now. Early investment and binding offtake agreements in carbon credit project development are crucial for the long-term viability of this market, for companies to actually achieve their net-zero targets, and to ultimately shape a better future for us all.

That's why Arbor Day Carbon is committed to fostering strong connections with corporate partners, funders, project developers, and on-the-ground planting partners. We're in a unique position, serving as a connector with more than 50 years of tree planting experience under our belt. Combined with our team of industry experts, our global reach, and knowledge of reputable partners in the carbon space, we know how to drive tangible impact.

We are motivated to make a difference for the planet, using our business to reinvest into our mission, people, and networks.

In the following report, our team provides perspective on the current state of the voluntary carbon market and outlines critical steps needed to accelerate its development in service of our urgent climate goals. This analysis and examination of key trends is intended to help market participants navigate complexities, manage risks, and maximize their impact in the fight against climate change.

There are better days ahead and everyone plays a role in helping make them a reality.



Chris Tointon,
President,
Arbor Day Carbon

Jeremy Manion,
Managing Director,
Carbon Markets

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SUPPLY

A GREATER ALIGNMENT ON "QUALITY"

Historically, one of the foremost challenges of the voluntary carbon market has been the lack of standardization and consistency in how "quality" is defined and measured. With many different methodologies, protocols and guidance documents in use, it can be difficult for buyers to navigate the market and make informed decisions about where to direct their investment.

However, there are signs that the market is starting to come together around a common understanding of what constitutes quality in a carbon credit. There is growing convergence among stakeholders, including project developers, buyers, verification bodies and market infrastructure providers, on the key principles and criteria that should be used to assess the quality of carbon credits. For example, the Integrity Council for the Voluntary Carbon Market approved several nature-based carbon standards and methodologies this year for its Core Carbon Principles (CCPs) label. The CCP label indicates adherence to a global benchmark of carbon credit quality, helping buyers purchase credits that represent genuine climate impacts. The growing presence of ratings agencies is also helping facilitate this move towards quality, as they create greater uniformity in how existing carbon credits and new and early stage projects are graded and rated. This provides another tool for buyers to compare different credits and make informed decisions. The increased alignment is helping to build confidence and trust in the market and is making it easier for companies to purchase or invest in high-quality carbon credits that can help them achieve their climate goals.

Arbor Day Carbon is well-positioned to play a leading role in this trend towards greater quality and transparency in the voluntary carbon market. With more than 50 years of trees on our side, we have a deep understanding of tree planting and how to leverage partnerships to drive tangible impact in critical ecosystems. In a space with many players, we act as the connective tissue that unites stakeholders across the market's spectrum by fostering strong connections with corporate partners, funders, project developers, and on-the-ground planting partners. Our uniquely broad reach and market experts enables us to promote a high standard of quality in a forestry carbon credit project, from start to finish.

Establishing trust and confidence in the voluntary carbon market is an effort bigger than all of us, and it will take all of us to achieve it. Every player in this space has a responsibility to hold high expectations and continue raising the bar on quality.

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EARLY INVESTMENT TO CATALYZE SUPPLY

The market still faces reduced demand, while concerns mount about insufficient high-quality supply to meet the anticipated needs of 2030, 2040, and 2050 climate targets. It suggests a potential supply crunch as companies transition from today's wait-and-see approach to more aggressive purchasing to fulfill climate commitments. According to some market leaders, if all companies that have made net-zero commitments were to actually meet those goals, the demand for carbon credits would far outstrip the available supply. The market urgently needs more upfront investment from institutional and commercial capital players, with binding offtake agreements from corporate end buyers at prices that incentivize landholders to protect and restore forests, instead of destroy them.

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There are benefits for investors and buyers to get involved earlier, like the ability to help design and de-risk the project. This not only makes the project more likely to succeed but also allows the company to make stronger claims about its role in bringing the project to life. For example, a company that invests or commits to buy early in a reforestation project can point to the specific design elements it helped to implement, such as the selection of tree species or the approach to community engagement. This level of detail and specificity can be much more compelling than simply buying credits from a project that has already been developed. For a healthy and growing market, we need vibrant project funding and spot purchasing markets.

Perhaps most notably, early investment in carbon credit projects can also provide a financial benefit to companies. Because the project is still in its early stages, buyers can lock in a pricing schedule and fix variables like volume and term. It's an advantage in a market where prices continue to rise for high-quality forestry removals. According to some estimates, the price of credits could drastically increase over the next few decades. Purchasing or investing now and securing credits at a known price can be an important consideration given the growing pressure to reduce costs and increase efficiency in corporate sustainability programs.

Arbor Day Carbon is working to bring new reforestation, agroforestry, and mangrove carbon credit projects to life and create more removals supply through our new partnership with Pollination, a climate and nature investment and advisory firm. The company specializes in providing early-stage funding and technical support to carbon removal projects. Our partnership will accelerate our ability to discover, co-develop, fund, and market high-quality and high-integrity forestry carbon removal projects across the globe. Together, we'll be able to channel resources to credible project developers to get their projects off the ground and scale, which can be a major challenge in the early stages of a project's life cycle. Pollination's team also has expertise in navigating the legal and regulatory challenges facing carbon credit projects which helps de-risk investments for potential buyers and attract more interest.

By establishing this partnership, we aim to stimulate the growth of new carbon removal supply in the voluntary carbon market and support the restoration of critical forest ecosystems.

INNOVATIONS IN BUYING

The voluntary carbon market is witnessing significant innovations to streamline its traditionally complex purchasing process. Advance Market Commitments (AMCs), for example, are an emerging method that could help generate new, needed supply for the voluntary carbon market. These commitments, in which a group of buyers agree to purchase a certain volume of credits at a set price in advance of issuance, can be a powerful tool for stimulating the development of new projects and credits.

As noted earlier, many carbon credit projects struggle to get off the ground without sufficient financial backing in their early stages. By providing upfront investment or firm purchase commitments that institutional and commercial capital organizations can finance against, AMCs can help project developers to secure the financing needed to launch new initiatives, knowing they have sales in the pipeline.

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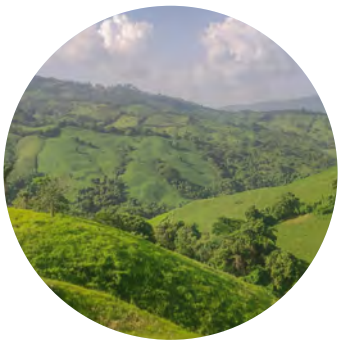

In the future, buyers' groups could become useful means of market entry for smaller and medium-sized businesses that might not have the resources or knowledge needed to drive significant impact through the market on their own. For now, we're largely seeing this method being leveraged by larger companies. In 2024, Symbiosis, a coalition of four major tech companies (Google, Meta, Microsoft, and Salesforce) announced an initiative to contract up to 20 million tons of nature-based carbon removal credits by 2030. The effort aims to drive greater scale and catalyze more afforestation and reforestation carbon crediting projects. As a current or historical partner of each of Symbiosis' founding members, Arbor Day Carbon is hopeful this coalition will show market leadership, stimulate more demand-side activity, and push developers to be more sophisticated and rigorous in their approach to remain competitive.

Specialized auctions are also emerging as a key innovation in the carbon credit buying process. These platforms aim to reduce the extensive research burden on buyers by centralizing project diligence information and creating more transparent, standardized purchasing mechanisms. The goal is to shift away from the current system where buyers must become domain experts just to complete basic transactions. The American Forest Foundation is pioneering this approach with the first nature-based carbon credit auction scheduled for February 2025, which aims to provide a more streamlined and transparent way of purchasing carbon credits.

As these innovations develop, they possess the potential to ease some of the friction in the buying process and support the needed overall growth of the market.

From higher quality standards to creative financing and streamlined purchasing, innovation across the carbon market is making it easier to channel needed investment into on-the-ground impact. Together, these advances are creating the foundation for a more efficient, transparent, and impactful market that can drive meaningful climate action at scale.

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THE IMPACT OF AMBIGUITY

Significant shifts, evolving standards, and regulatory changes in the voluntary carbon market have shrouded the space in uncertainty. One area of ambiguity is the ongoing review of Science Based Targets Initiative (SBTi)'s Corporate Net-Zero standard. Earlier this year, SBTi announced it would review its guidelines to consider whether carbon credits could be used to address Scope 3 emissions as part of climate targets thousands of companies have aligned with. Though the merits of using carbon credits to account for Scope 3 emissions has been debated for years, many market stakeholders, including Arbor Day Carbon, agree the potential inclusion of Scope 3 in net zero standards would significantly help increase the demand for carbon credits and direct more critical financial resources to nature-based projects. Still, to this moment in December 2024, SBTi has not issued any final guidance either for or against the inclusion of Scope 3.

Because of the lack of clarity, business leaders are understandably reluctant to channel their resources toward carbon credits, knowing there's a possibility that a future change in guidance could potentially nullify their investment or purchase to "count" on their path to reaching their climate goals. This ongoing ambiguity demotivates potential buyers and has prompted many to scale down market involvement. It's a dangerous consequence in a period where the planet desperately needs more immediate and long-term commitments to jump-start nature-based projects and address the effects of the climate crisis.

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As Arbor Day Carbon works alongside corporations trying to navigate this uncertainty, we're trying to direct people toward commitments and frameworks where they can feel more confidence, rather than sitting out of the market all together. This is no time to put a pause on the race to net-zero. This is a voluntary market and there are other frameworks available that can give potential buyers pragmatic guidance, like the recently revised Oxford Principles for Net Zero Aligned Carbon Offsetting. In the face of uncertainty, potential buyers can also begin to rethink how they purchase or invest in the market. Instead of addressing scope 1, 2, and 3 emissions holistically, companies can start by addressing just a part of those emissions. Arbor Day Carbon recently collaborated with MathWorks — a leader in science, engineering, and mathematical computing software — to enter the market using this tailored approach. The organization had started to address its Scope 1 and Scope 2 goals but like many corporations, was more challenged to obtain high-quality data in Scope 3, a common challenge for many corporations. Instead of letting the complexities of Scope 3 keep the company on the sideline, MathWorks collaborated with Arbor Day Carbon to reshape its approach to carbon crediting and made a large carbon removals purchase to address a portion its hard-to-avoid emissions now. The purchase will also benefit MathWorks in the future as securing the removal credits now helps it hedge against future price uncertainty, regardless of how the company chooses to apply them later as market guidance changes. The bold purchase is an acknowledgement of the urgency of this moment, and an important refusal to let uncertainty inhibit action.

Emerging regulations and laws are also contributing to a culture of hesitation. This year in the United States, the SEC finalized nearly 900 pages of climate disclosure rules. These rules require public companies to provide detailed disclosures in their annual reports and registration statements, representing a major shift in climate reporting requirements in the U.S. Similarly, the European Union's Green Claims Directive includes stricter rules for carbon credit claims, requiring companies to provide transparent information about credit types and quantities. These evolving regulations have slowed purchasing as companies work to understand them and adhere.

The market's ongoing transition from first-generation to second-generation methodologies is also a source of uncertainty. We're seeing many dollars and purchase commitments shift toward new projects rather than existing ones. We believe this is due to a perception amongst buyers that second-generation projects

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are higher quality because of their more precise quantification methods like dynamic baselines. But each, undoubtedly, carries risk, especially counterparty and delivery risks, and abandoning first-generation projects will not serve to promote the longevity of the market. There's a need for both an active spot purchasing market to achieve near-term goals and a robust new project funding market to generate long-term supply and stability.

BENEFITS BEYOND CARBON

The reduced demand in the voluntary carbon market is also reflective of the "carbon tunnel vision" plaguing both the market and the greater fight against climate change. Yes, the ongoing uncertainty around if an investment will "count" towards a science-based target is frustrating. But even if changes in guidance mean it won't count, there is still value in that investment or purchase for the buyer.

While it may be surprising to some, the voluntary carbon market is not solely about carbon. At its best, the voluntary carbon market is a transition mechanism to restore and protect ecosystems, unlocking benefits beyond carbon reduction. Forestry carbon credit projects specifically can improve water quality and quantity, restore wildlife habitat, support landowner livelihoods, and change lives. The voluntary carbon market provides an avenue to channel needed resources into ecosystems and communities struggling to endure the pressures of a changing climate and lack of opportunity. It's a meeting of natural science and social science, for the good of people and the planet.

By engaging in forestry carbon credit projects, buyers have the ability to showcase the real, tangible effect of their purchases and investment. And data shows consumers want to see that kind of engagement. According to the Arbor Day Foundation's Canopy Report, 71% of U.S. adults say they're more loyal to companies that take an active role in protecting the environment. Because trees and forests can create profound layers of good, buyers can choose to purchase or invest in projects that are easily relatable to their audiences. For example, many have chosen to tell their nature-based carbon removal story through the biodiversity co-benefits of their project. It gives them the ability to make claims about increasing wildlife species populations when investing in projects that restore habitat. Focusing on biodiversity can also help corporate leaders understand the effects of and risks to their supply chain operations more holistically, rather than solely considering carbon emissions. During COP16, the UN Conference on Biological Diversity, Arbor Day Carbon's Science and Technical Lead Ali Loker, DPH, noted a marked increase in representation from the private sector, with about 3,000 business delegates in attendance. We're hopeful this signals a shift in priorities amongst buyers to further integrate biodiversity into broader climate goals to foster thriving ecosystems.

Buyers can also benefit from purchasing or investing in projects that support their supply chain or business operations. A company that relies heavily on water in its manufacturing process may choose to support a reforestation project that helps restore a watershed. Investing in projects that protect and enhance these

business-critical ecosystem services can also promote the long-term viability of the business itself.

It's undoubtedly important for companies to advance their climate goals by decarbonizing and balancing hard to avoid emissions. But making purchases and investments in this market is also about the added benefits for communities and ecosystems beyond carbon.

ADDRESSING RISK THROUGH INSURANCE

Uncovering ways to de-risk the voluntary carbon market for potential buyers is key in growing demand. Carbon insurance companies have a potentially key role to play in this effort by helping give buyers the confidence and security needed to purchase or invest in the development of new and existing projects.

Carbon insurance companies now offer several different types of insurance products, each designed to address specific risks including human-caused, nature-related, or regulation risks. Despite the potential for insurance companies to play a major role in the voluntary carbon market, there are still significant barriers to widespread adoption. Perhaps the biggest of those barriers is the financial burden. Right now, many buyers are already struggling to secure budget approval for the purchase of carbon credits. Adding the additional cost of insurance may be a stretch for all but the largest and most committed players in the space, alienating less sophisticated buyers with smaller budgets. Some buyers have also questioned if they should be responsible at all for purchasing insurance, or if the responsibility should fall to either the intermediary who facilitates the transaction or the project developer. Until there is greater clarity on this point, it may be difficult for insurance companies to design and market products in a way that meets the needs of the intended customer base.

Despite these challenges, there is a clear need for insurance solutions to manage the risks associated with investing in the credits needed to meet emissions reduction targets. The key to growing this space will be demonstrating that these products can deliver on their promises when claims are made. When an insurer steps in to pay out on a policy, whether in cash or with replacement credits, and help a company meet its climate goals despite an unexpected setback, it will send a powerful signal to the market about the value that insurance can provide in the carbon credits space and poise the carbon insurance industry — and the market as a whole — for rapid expansion.

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MARKET OBSERVATIONS

MARKET OBSERVATIONS

IMPACT OF ARTIFICIAL INTELLIGENCE

While technology companies have historically been leaders in corporate climate action and renewable energy adoption, the rapid rise of artificial intelligence (AI) is creating unexpected challenges for their environmental goals.

In the last ten years, we've seen technology companies make significant progress in decarbonizing their operations, transitioning to renewable energy to power their data centers, and supporting the restoration of critical ecosystems through the voluntary carbon market. However, the AI revolution is rapidly reversing this positive trend. The computing power required to support AI demands an unprecedented number of new data centers, each with a substantial energy and water footprint. As tech companies compete to develop and deploy the most advanced AI systems, some are being forced to reactivate coal-fired power plants or purchase and restart nuclear facilities because they can't deploy reliable renewable energy infrastructure quickly enough to meet their growing power demands.

The environmental impact extends beyond just carbon emissions. Data centers require massive amounts of water for cooling systems to keep technology properly operating, putting additional pressure on local watersheds and water resources. This dual challenge of managing both energy and water consumption makes the environmental impact of AI development particularly complex.

For companies that were previously confident about meeting their 2030, 2040, or 2050 climate goals, this new reality is causing significant concern. While there are still many unknowns regarding the full scale of AI's impact, it has the potential to undo years of progress in corporate sustainability and the voluntary carbon market. The path forward will require tech companies to reinvigorate their commitment to sustainability, potentially through increased investment in nature-based projects, next-generation nuclear and renewable energy, development of more efficient cooling systems, and careful consideration of the environmental impact of their AI strategies. Without such measures, the sector risks undermining its own climate commitments in the pursuit of AI advancement.

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GLOBAL SHIFTS TOWARDS REGULATIONS

We're observing an interesting shift in the carbon market landscape, as more regions move from voluntary to compliance-based systems. In Brazil for example, the National Congress recently passed a law setting the framework of a national cap-and-trade market. This new system, similar to California's approach, requires certain emitters to operate under an emissions cap while allowing them to use carbon credits as part of their reduction strategy. Significantly, Brazil's system includes nature-based solutions in its compliance market, a feature that sets it apart from many other global compliance markets. Pending approval from the president, Brazil's compliance market is expected to be fully operational in five to six years and will be overseen by the government.

In the United States, while we saw federal affirmation of carbon markets earlier this year, the future of national-level regulation remains uncertain with incoming administration changes. However, this federal uncertainty isn't stopping state-level progress. Oregon, for instance, is developing its own compliance market that includes forestry projects.

This movement toward compliance markets at various governmental levels showcases how the innovations, challenges, and lessons learned from voluntary markets are proving invaluable in designing more effective compliance systems. Ultimately, that progress will result in bringing in entities that might have otherwise remained on the sidelines. Looking ahead, we can expect to see more compliance markets emerge globally, each building upon the foundations laid by voluntary markets.

CALCULATING THE INTERNAL COST OF CARBON

Nature and business operations are fundamentally interconnected. Companies rely heavily on ecosystem services – like water filtration and flood control provided by forests. Historically, businesses have benefited from these natural services without accounting for their true value, effectively receiving substantial economic benefits at no direct cost.

However, as ecosystems face increasing degradation from human activity and climate change, the ecosystem services that businesses have long taken for granted are becoming scarce or unreliable. This deterioration creates unprecedented risks to business stability and operational predictability. Forward-thinking companies are beginning to recognize that protecting ecosystem services is not merely an environmental concern but a crucial strategy for preventing significant financial losses and supply chain disruptions.

A growing recognition of nature dependencies and the pressure to reduce carbon emissions is contributing to an increasing awareness around internal carbon pricing and how companies can factor it into their decarbonization strategies. Calculating an internal cost of carbon requires companies to conduct a comprehensive assessment of their transition to a lower-carbon future. This includes identifying the investment requirements for renewable energy infrastructure, potential financial impacts of climate-related supply chain disruptions, expenses related to adaptation measures, and the value of ecosystems at risk of impact.

By establishing an internal carbon price, companies can make informed decisions about how to best allocate resources toward sustainability initiatives and voluntary carbon market investments that both reduce emissions and protect vital ecosystem services that are most material to the company's operations. This strategic planning is particularly crucial for companies with complex supply chains or operations in climate-vulnerable regions.

Companies that proactively integrate carbon costs into their decision-making processes will be better positioned to navigate future market regulations and carbon pricing mechanisms. As carbon prices are projected to rise significantly in the coming years, early adopters gain a distinct advantage in understanding and managing their climate-related risks and opportunities.

This approach transcends environmental responsibility. It represents strategic business planning in a rapidly evolving global economy. By recognizing and accounting for both the value of ecosystem services and the cost of carbon emissions, companies can build more resilient and sustainable business models for the future.

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BOTTOM LINE

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BOTTOM LINE

The voluntary carbon market, despite its challenges, represents more than just a mechanism for emissions reduction—it embodies our collective hope and determination to address the climate crisis. In an era where climate anxiety and fear can be paralyzing, the market provides a tangible path for action and demonstrates that meaningful change is possible through collaboration and action.

The trends and developments outlined in this report paint a picture of a market that is steadily maturing and professionalizing. From the convergence around quality standards to innovative financing mechanisms and risk management tools, we're seeing the emergence of more sophisticated approaches to carbon credit project development. While progress may sometimes feel slow, and market volatility creates near-term challenges, the overall trajectory is encouraging.

What's particularly heartening is the growing recognition that we already possess the tools and capabilities needed to create positive change. The key lies in how we deploy these tools and, more importantly, how we work together. Arbor Day Carbon's many years of experience has shown that relationships are the foundation of effective climate action. When organizations come together—whether through advance market commitments, knowledge

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sharing, or project partnerships—they create momentum that extends far beyond what any single entity could achieve alone.

These relationships serve as a powerful antidote to climate despair. They remind us that we're not facing this challenge in isolation, and that collective action can lead to transformative outcomes. As more participants enter the market, bringing fresh perspectives and innovative solutions, we're building a community united in its commitment to creating a more sustainable future.

The path forward will require continued patience and persistence. We must maintain our commitment to high standards while making the market more accessible to a broader range of participants. We need to balance the urgency of climate action with the time required to develop high-quality projects and build lasting partnerships.

But perhaps most importantly, we must remember that every purchase and investment in the voluntary carbon market represents more than just a financial transaction—it's an investment in hope, in action, and in our shared future. By working together, supporting one another, and maintaining our focus on long-term impact, we can help create a market that truly serves both people and planet.

The voluntary carbon market's evolution may not always follow a straight line, but its direction is clear. As we continue to build relationships, improve standards, and welcome new participants, we're creating a more robust and effective tool for addressing the climate crisis. The future we envision—one of thriving ecosystems, resilient communities, and a stable climate—is possible. And together, we can make it reality.

In the face of a rapidly changing world, Arbor Day Carbon invests in people and partnerships to preserve forests and grow new trees at scale.

Interested in discussing how nature-based carbon credits could fit into your strategies?
Let's talk.

Arbor Day Carbon

arborday.org/carbon