

SCALING THE CARBON MARKETS:

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PARTNERSHIPS FOR  
NATURE-BASED  
REMOVALS



# EXECUTIVE SUMMARY

The carbon market is rapidly emerging as the next major investment class, presenting a significant opportunity for corporates, investors, and project developers. As more companies incorporate carbon credits into their sustainability strategies, demand is set to surge, particularly for nature-based carbon removal credits. These credits not only provide high-impact carbon credits but also deliver additional benefits, such as biodiversity preservation and community development.

This growing demand, however, is set to outpace supply by over 4.5 times<sup>(1)</sup>, with an estimated \$1 trillion<sup>(1)</sup> in investment needed to meet future market needs. Despite this opportunity, traditional investors, including institutional funds and banks, have been slow to respond, deterred by challenges such as long return timelines, and perceived risks associated with nature-based removals.

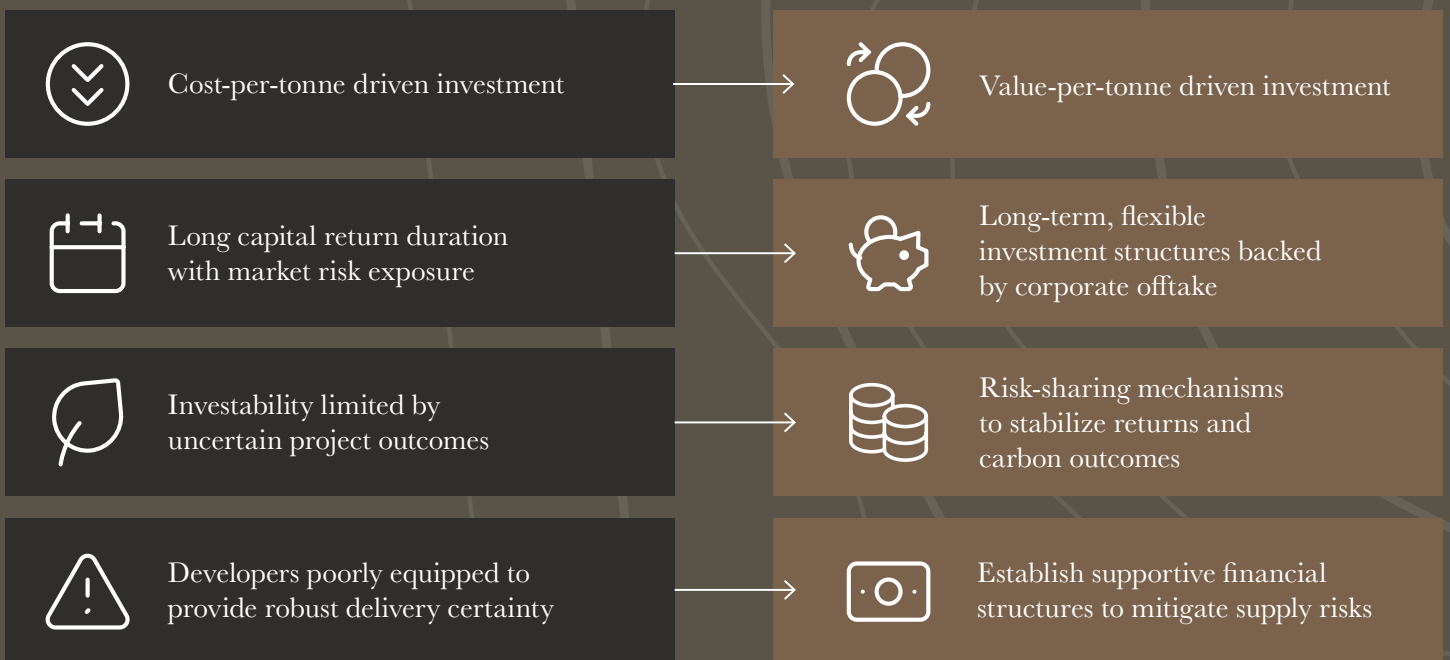
Overcoming these hurdles is crucial to unlocking the market's potential and creative approaches are going to be required. Fortunately, lessons from the renewable energy sector offer a proven roadmap to navigate these barriers.

The sector's evolution highlights the importance of strategic partnerships, innovative procurement models, and risk-sharing mechanisms in unlocking capital flows and achieving scale. These same approaches can be applied to the carbon market.

While nature-based removals face unique hurdles such as evolving quality standards, extended return timelines, and limited historical data to ensure predictability, these challenges are not insurmountable. By deploying partnerships, fostering collaboration among corporates, investors, and project developers, and applying lessons from other successful markets, stakeholders can create practical, scalable solutions to meet growing demand.

For agile investors, this represents an opportunity to work alongside industry stakeholders to responsibly deploy investment at scale, leveraging partnerships to enhance returns and protect capital.

## BARRIERS TO SOLUTIONS



<sup>(1)</sup> MSCI Research, September 2023. Mid-Case demand estimate 2050



# THE SCALING CARBON MARKETS

The carbon market is experiencing significant demand growth, with more companies launching procurement strategies for carbon credits to address residual emissions and achieve net-zero targets. In 2024, the number of entities retiring credits reached its highest ever, and 45% of Fortune 500 companies now plan to achieve net zero by 2050.<sup>(2)</sup>

However, demand for carbon credits is projected to outstrip supply by over 4.5 times, requiring an estimated \$1 trillion in investment to close the gap.<sup>(1)</sup>

This undersupply is particularly acute for nature-based carbon removal credits, as corporates increasingly prioritize high-quality, high-impact credits that sequester carbon and deliver co-benefits. Yet, these projects are capital-intensive and have long lead times, slowing the growth of supply.

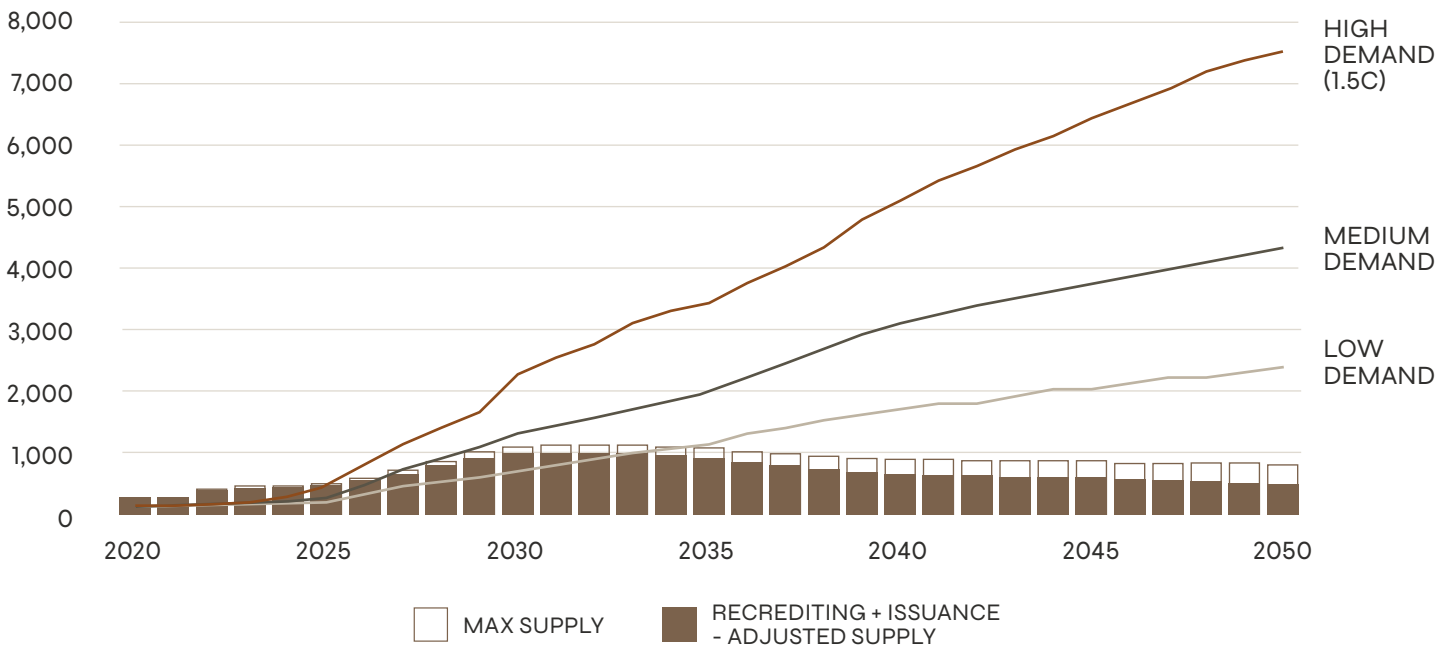
Traditional sources of capital, such as institutional investors and banks, have been slow to engage due to

perceived risks and long return horizons, creating an opportunity for early investors to fill the gap.

Without sufficient financing options, corporates are often forced to invest directly in projects, limiting their ability to engage with the broader market, or to rely on intermediaries, which offer no guaranteed long-term supply and reduce oversight of credit quality and integrity. To meet corporate demand, new investment models are essential. The unique characteristics of the nature-based carbon removal industry present both challenges and opportunities.

Drawing on lessons from the renewable energy sector, targeted solutions can be adapted to address the most prevalent investment barriers. These solutions require a collaborative approach by today's market leaders, across project developers, investors, corporates, and market facilitators such as insurance, but pave the way for new case studies for responsible carbon removal investment from which to scale.

ANNUAL SUPPLY AND DEMAND – ALL CREDITS (MTCO2E/YR)<sup>(1)</sup>



(1) MSCI Research, September 2023. Mid-Case demand estimate 2050

(2) <https://www.climateimpact.com/news-insights/fortune-global-500-climate-commitments/>



## THE GROWING SENSE OF URGENCY

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Leading companies procuring carbon removals are already sounding the alarm that 2030 net-zero targets will be missed because of the lack of supply. Nature-based solutions have the potential to respond at sufficient scale to deliver the necessary carbon removal. However, given the long development and growth timelines, planting needs to begin today to generate carbon removals by 2030.

New York Climate Week 2024 showed a stronger commitment than ever before to tackle the challenges faced by the carbon market, with a growing number of precedent-setting transactions. But there is still a need for the industry to establish shared standards to support replicable and scalable investment, particularly around project quality and corporate offtake terms.

The industry is calling for urgent progress, as shown by the emergence of best-in-class project developers and corporate buyers launching advance market commitments to provide a clear demand signal. We are confident the carbon removal industry can be scaled to support net-zero pathways, but it will require market participants to be coordinated and collaborative .



# LESSONS FROM THE GROWTH OF RENEWABLE ENERGY MARKETS

The journey of the renewable energy sector – particularly for solar, wind, and battery technologies – offers a valuable blueprint for scaling carbon markets.

Initially viewed as too expensive and inefficient to compete with fossil fuels, renewables gained momentum through targeted policies, private sector investment, and falling technology costs.

## STEP 1

### EARLY EXPERIMENTATION AND NICHE APPLICATIONS

In the 1970s and 1980s, renewable energy technologies like solar panels were considered suitable mainly for niche applications, due to their high production costs. Projects were often small-scale and driven by research institutions, environmental enthusiasts, or experimental government programs rather than mainstream commercial adoption.

## STEP 2

### GOVERNMENT POLICIES TO SPUR DEMAND AND REDUCE RISK

Recognizing the potential of renewables to enhance energy security and reduce emissions, governments around the world began implementing supportive policies in the late 1990s and early 2000s. Subsidies, tax credits, feed-in tariffs, and Renewable Portfolio Standards (RPS) were introduced to create demand, incentivize production, and reduce investment risk.

## STEP 3

### CORPORATE PURCHASES OF POWER PURCHASE AGREEMENTS (PPAs) DRIVE PRIVATE SECTOR INVESTMENT

With government support established, private sector investment in renewables surged. Corporations, utilities, and financial institutions recognized renewables as long-term assets with steady return potential. Large technology firms like Google and Microsoft committed to powering operations with 100% renewable energy, using substantial power purchase agreements (PPAs) that underpinned large-scale projects and injected crucial capital into the market.

## STEP 4

### MAINSTREAM FINANCIAL INSTITUTIONS ENTER THE MARKET

As returns became more predictable, mainstream financial institutions, including pension funds, sovereign wealth funds, and infrastructure investors, entered the renewables market. Renewables became a stable, long-term investment asset with predictable cash flows, making them attractive to institutional investors. By the 2010s, renewables were cost-competitive with fossil fuels, solidifying their place in the global energy mix.

## STEP 5

### ECONOMIES OF SCALE AND COST REDUCTIONS DRIVE MASS ADOPTION

The increased investment led to economies of scale in manufacturing and supply chains which, combined with technological advancements, drove costs down even further. Solar panel costs dropped by nearly 90% from 2010 to 2020, making renewables competitive with, or even cheaper than, fossil fuels.

# APPLYING THESE STEPS TO SCALE CARBON MARKETS



To replicate the renewable energy market's success in carbon markets at speed, stakeholders need to focus on similar steps.

By following this trajectory, carbon markets can scale into mainstream, high-impact climate solutions.

WE ARE HERE →





# FINANCING NATURE-BASED REMOVALS: BARRIERS AND SOLUTIONS

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Scaling nature-based projects to meet the expected demand for carbon credits relies on private sector investment, but unique barriers exist here that were not present in the renewable energy sector.

Additional efforts are needed to address these obstacles. Scaling nature-based carbon removal requires solutions that support increased investment from the private sector.



BARRIER 1

# COST-PER-TONNE DRIVEN INVESTMENT

As the standards for carbon credits shift to prioritize quality, the cost of generating these credits has greatly increased beyond the price-per-tonne sales we are seeing in the market today. Similarly cost-plus pricing models, where pre-purchased credits are priced at the cost of production plus a margin for developers, have disincentivized how projects can be improved over time to meet evolving standards.

Quality features in newly-designed projects such as native-species planting, rigorous and dynamic measurement, reporting and verification, long-term permanence safeguards, increased community economic participation, and implementation and monitoring of ecosystem benefits, have brought these projects to the top of the cost curve for nature-based carbon removal. Without transparent, corresponding price signals and the carbon market’s history as a ‘commoditized’ market, investors lack the required incentives to drive capital into high-quality projects.

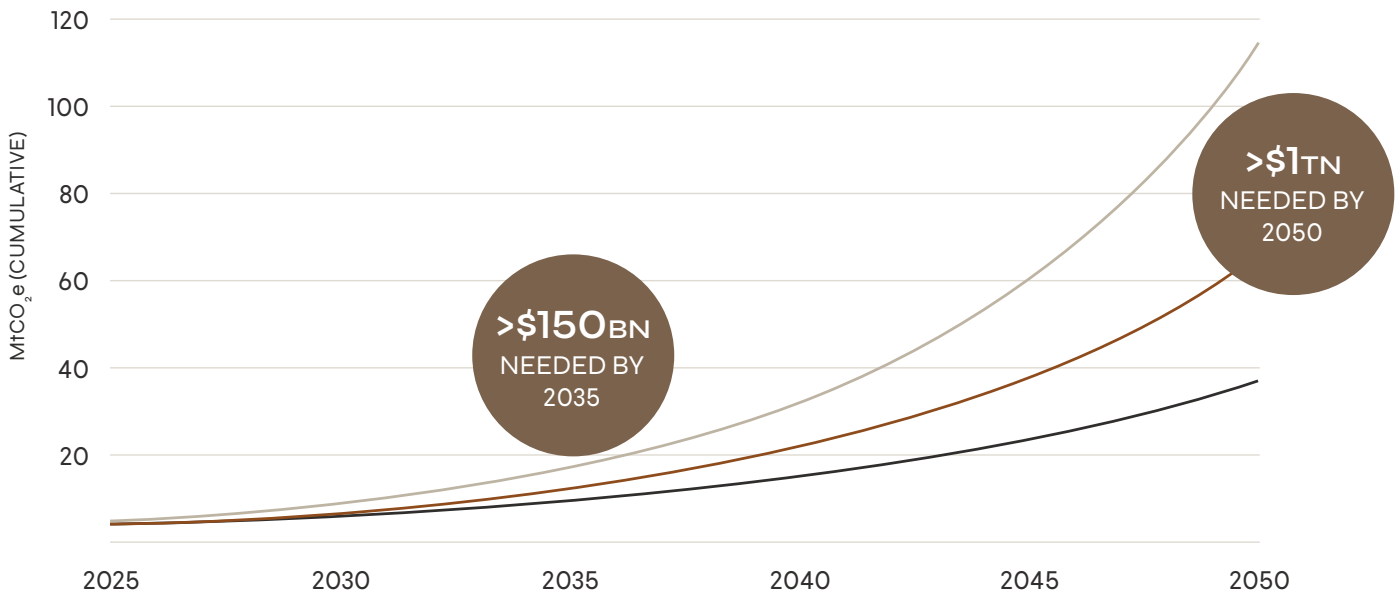
SOLUTION

# VALUE-PER-TONNE DRIVEN INVESTMENT

Shifting the focus from a cost-per-tonne to a value-per-tonne approach can align the pricing and, therefore, incentivize offtakers and developers to invest in high-quality projects. Value-per-tonne calls for standardizing buyer-determined priorities (whether carbon, community, or ecosystem related), and incorporating them into the pricing equation. This promotes a dialogue between market participants on the true cost of quality-driven project development, and how we deliver impact as well as investment return.

While demand signals for high value-per-tonne projects are improving via long-term offtake purchases, the pricing mechanics are often opaque. This leaves investors in the dark on how they should view price evolution in the market in the future: reducing to the lowest marginal cost of production, or increasing to the highest value-per tonne.

CUMULATIVE CARBON CREDIT DEMAND AND REQUIRED INVESTMENT





BARRIER 2

# LONG CAPITAL RETURN DURATIONS WITH MARKET RISK

Investors face challenges due to the long capital return timelines associated with novel carbon technologies. Nature-based removal projects often take years or even decades to produce measurable results, making them less attractive and harder to finance. The extended duration also delays the ability to demonstrate success stories and statistically reliable outcomes, which are crucial for building investor confidence and attracting larger capital flows.

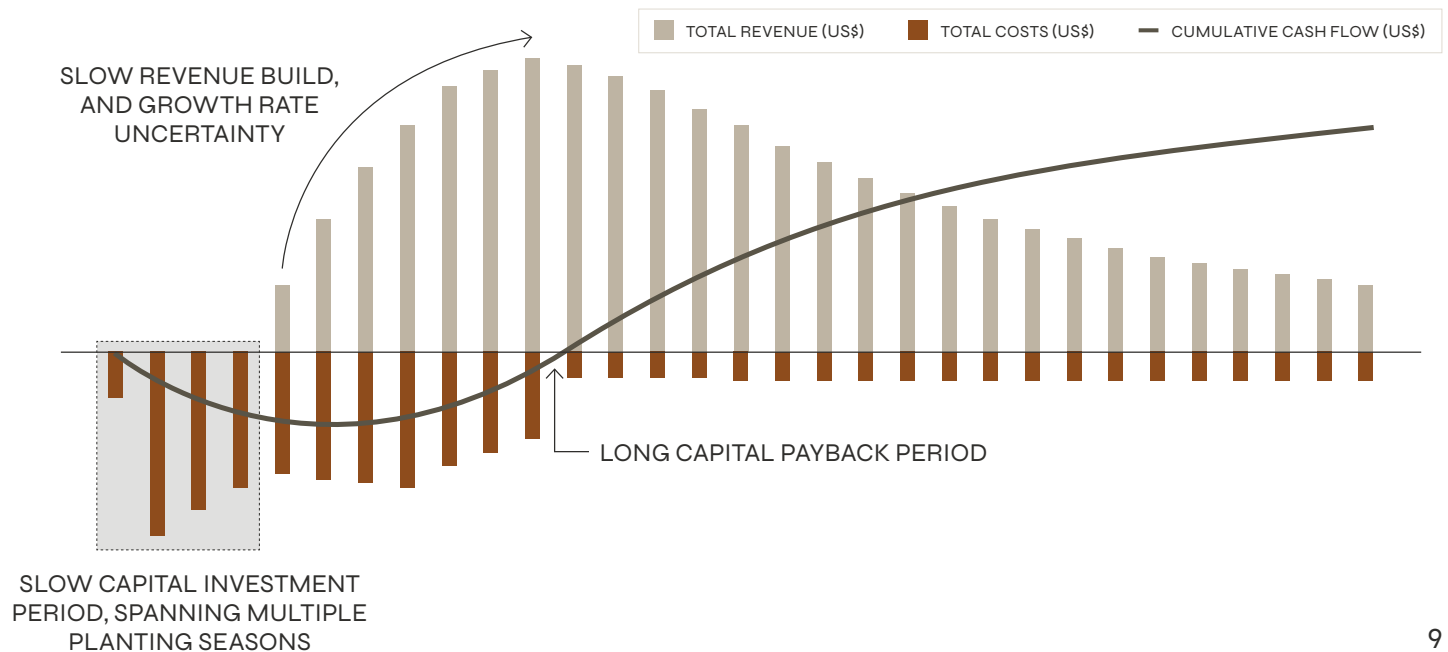
SOLUTION

# LONG-TERM, FLEXIBLE INVESTMENT STRUCTURES BACKED BY CORPORATE OFFTAKE

To overcome this barrier, capital investment must be structured to support extended capital return cycles, with longer tenors than conventional project debt and flexible repayment profiles. A yield-driven approach, with return taken over the project life, can align the goals of investors and project sponsors.

Structuring capital investment alongside a corporate long-term, forward purchase agreement provides both stability and protection for investors so they can feel more confident about investing over the long time horizons. This ‘demand-led’ capital allocation strategy promotes collaboration between today’s leading corporate buyers and investors, and prioritizes efficient allocation of capital to service projects that meet today’s stringent demand requirements.

ILLUSTRATIVE REVENUES, COSTS AND CUMULATIVE CASH FLOWS FOR NATURE-BASED REMOVAL PROJECTS



BARRIER 3

## INVESTABILITY LIMITED BY UNCERTAIN PROJECT OUTCOMES

Nature-based solutions, like reforestation, face inherent uncertainties, including unproven growth and mortality rates, insufficient nursery capacity and seedling supply, challenging measurement and reporting, and susceptibility to environmental factors such as droughts, fires, or pests. Additionally, projects in high-impact areas, like the Global South, may face jurisdictional risks. These include political instability, policy shifts, or tax changes.

Previously, project developers, investors and corporate offtakers have encountered challenges in allocating risks, which can leave participants feeling exposed and limiting bankability.

SOLUTION

## RISK-SHARING MECHANISMS TO STABILIZE RETURNS AND CARBON OUTCOMES

Designing investment structures around project risks and adapting insurance products can improve investability. The toolkit for risk mitigation and risk sharing can include:

- **Early partnership between project participants**  
 Collaboration ensures that financing structures and project design align to the needs of the project developer, investor, and offtaker, increasing the chance of success over long time horizons. The project's financial health supports permanence and project integrity over the long-term, attributes which corporates require for their carbon programs. Approaches to delivery guarantees need to be collaborative and supportive.
- **Comprehensive due diligence**  
 Early risk mapping helps establish capital deployment milestones that proactively address challenges like delivery delays or jurisdictional hurdles. Shared due diligence between project participants can support the funding and pricing of de-risking and quality-enhancing initiatives.
- **Layered insurance**  
 Insurance models for risks that can impact carbon delivery, whether natural or political, already exist in other industries (forestry, agriculture etc.). These models are being rapidly adapted to carbon projects. Early use of insurance will ensure future availability at a scale to match investment and corporate demand.



#### BARRIER 4

## DEVELOPERS POORLY EQUIPPED TO PROVIDE ROBUST DELIVERY CERTAINTY

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The carbon market lacks reliable performance guarantees, with thinly capitalized developers unable to absorb risks associated with under-delivery. Carbon credits are non-fungible, varying widely by project and methodology, making standardization difficult.

Like renewables, where delivery guarantees evolved with the support of intermediaries, carbon offtake agreements need flexible structures and alternative delivery assurances.

#### SOLUTION

## ESTABLISH SUPPORTIVE FINANCIAL STRUCTURES TO MITIGATE SUPPLY RISKS

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To address delivery risks in carbon projects, funding partners and insurance providers must help bridge gaps left by undercapitalized developers.

Key strategies include in-kind insurance against delivery shortfalls, establishing fungibility standards, and securing bridging capital.

Investors like Terra can support market stability by pooling credits across financed portfolios and offering flexible delivery options. This lays the groundwork for a flexible market structure similar to the derivative markets in renewable energy.

Early forms of finance, like that provided by Terra, are essential to allow the market to mature. As the market matures with project bankability, demand predictability, and access to derivatives and hedging, broader pools of capital will become available to continue to scale the industry.

# PATH FORWARD: BUILDING MOMENTUM THROUGH PARTNERSHIPS AND SUCCESS STORIES

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Scaling the carbon market requires coordinated partnerships and successful case studies to attract broader financial support. Several pioneering partnerships are already paving the way. Case studies from our New York Climate Week event help demonstrate how collaboration among corporate buyers, investors, and project developers can overcome the challenges facing the market:

## **World Bank and Mombak**

The World Bank has partnered with Mombak to advance reforestation efforts in Brazil, through a bond expected to raise around \$200 million<sup>(3)</sup>. This partnership combines the World Bank's innovative financial support with Mombak's expertise in nature-based solutions, generating high-quality carbon credits to meet growing global demand.

## **TotalEnergies and Anew**

TotalEnergies has entered into a \$100 million agreement with Anew Climate and Aurora Sustainable Lands for projects aimed at protecting productive U.S. forests and enhancing their ability to store more carbon from the atmosphere. The carbon credits generated will be acquired by TotalEnergies, and is part of a goal to invest \$100 million per year to build a portfolio of projects capable of generating at least 5 million metric tons of CO<sub>2</sub>e of carbon credits per year by 2030.

## **Breitling and ClimeWorks**

Luxury watchmaker Breitling partnered with ClimeWorks in 2024 under a pioneering 12-year agreement for a carbon removal portfolio that mainly includes ClimeWorks' own direct air capture technology, as well as enhanced weathering. This collaboration demonstrates aligned values between the firms to set a benchmark for high-quality and robust carbon removal.

## **Symbiosis Coalition: Microsoft, Google, Meta and Salesforce**

Microsoft, Google, Meta and Salesforce have partnered to form the Symbiosis Coalition, which aims to facilitate an advance market commitment of up to 20 million tons of nature-based carbon removal credits. The goal of the Symbiosis Coalition is to send a strong demand signal to accelerate the development of high-impact, science-based restoration projects, establish and communicate clear quality criteria, and paying the real cost necessary to enable these projects to happen.

## ACTIONS THAT CAN BE TAKEN TODAY

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These partnerships illustrate the potential for strategic collaboration to help overcome financial and operational challenges in carbon markets.

To support continued growth and attract broader financial support, stakeholders can build on these foundations by:

### **1. Expanding strategic partnerships**

Corporates and financiers must coordinate efforts so that offtake agreements and project finance complement each other. Too much time is lost acting in sequence rather than in coordination.

### **2. Innovating financial models**

New models for project finance are required, with longer duration and flexibility, as are mechanisms and tools for risk mitigation and sharing between developer, offtaker and financier.

### **3. Creating success stories to attract institutional investors**

Demonstrating predictability through successful projects will allow broad-based capital and corporates to enter the market.

We welcome working sessions to accelerate partnerships that will help deliver these actions

(3) <https://energynews.oedigital.com/climate-change/2024/07/15/world-bank-to-provide-200-million-bond-to-enhance-amazon-reforestation>

(4) <https://corporate.totalenergies.us/news/totalenergies-invests-sustainable-forestry-operations-preserve-sustainable-carbon-sinks>

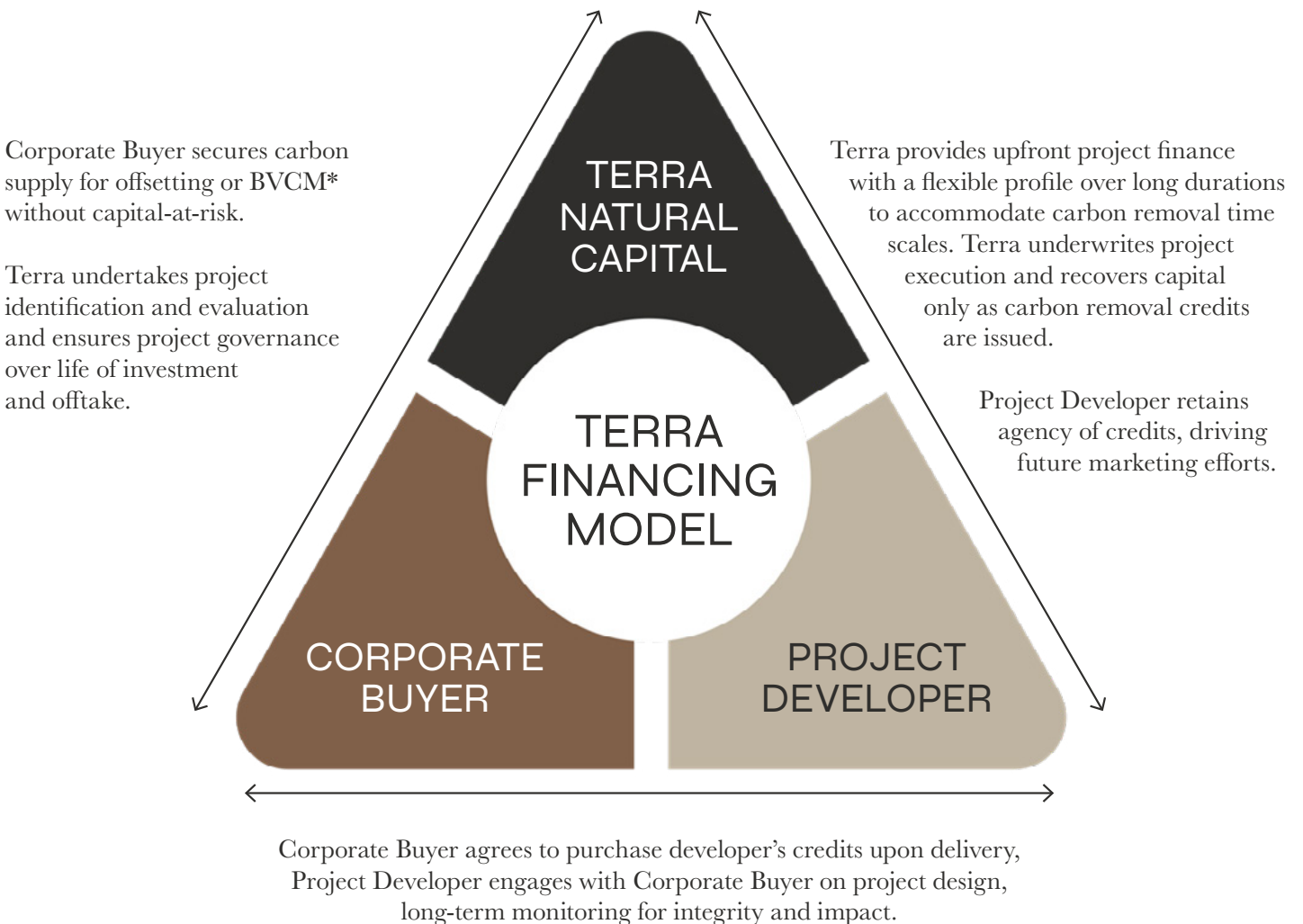
(5) <https://climeworks.com/news/breitling-joins-forces-with-climeworks-for-its-net-zero-strategy>





## ABOUT TERRA

We provide a differentiated financing solution that provides long-term capital to both project developers and corporates. This allows developers to scale their projects and corporates to secure reliable, high-quality carbon credits – without unmanageable risk



\*BVCM: Beyond Value Chain Mitigation

