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with confidence

Carbon as an asset class

Navigating risks and
opportunities for Chief
Financial Officers



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CarbonPool



Key messages

- Carbon credits are rapidly evolving into an asset critical to meet regulatory obligations that require proactive Chief Financial Officer (CFO) involvement.
- CFOs must develop an understanding about how carbon credits are valued and accounted for as businesses scale their investments in carbon credits to meet their net zero goals.
- CFOs play a central role in providing transparent disclosures about the use and financial impact of carbon credits, building trust with stakeholders and enhancing credibility.
- CFOs must identify and manage risks associated with carbon credits, such as delivery and permanence risks that are inherent to carbon markets.
- Carbon insurance can be a reliable and capital efficient risk mitigation tool to protect CFOs and their organizations from financial and reputational harm.
- By keeping up with the maturing field of carbon credit accounting, CFOs can help ensure that their finance and risk practices evolve and help support growth and resilience.

Carbon as a new responsibility for CFOs



Carbon credits, once introduced as a voluntary tool managed by corporate social responsibility functions, are rapidly evolving into an asset critical to meet regulatory obligations. Investors, regulators, and stakeholders increasingly pay attention and quantify corporate climate liabilities, including the cost to reduce and offset them through carbon credits. Chief Financial Officers play a key role in steering businesses to successfully navigate the shifting regulatory landscape and seize strategic opportunities tied to an emerging market for carbon credits.

The shifting regulatory environment in Europe and the United States is driving the demand for carbon credits across industries and emissions trading schemes. As public scrutiny of carbon markets has intensified in the past years, several initiatives have emerged to improve the integrity and quality of carbon credits. International regulators are quickly moving to formalize the trading rules for carbon credits. Attention is likely to spread further as global regulations are increasingly requiring corporate transparency around emissions and mitigation strategies, including the use of carbon credits. For example, the EU's Corporate Sustainability Reporting Directive (CSRD) mandates that large companies report environmental risks starting in 2024.

Firms using carbon credits proactively to offset residual emissions are better positioned to mitigate the financial impact of rising carbon costs. Carbon credits offer protection against future regulatory penalties by complementing

emissions reductions efforts and helping to offset any residual emissions which could not be reduced. This protection is paramount as carbon pricing is expected to evolve in the coming years in key jurisdictions, driven by ambitious climate goals and commitments to reach net zero emissions by 2050. The World Bank estimates that regulatory mechanisms already cover 23% of global emissions, up from 15% in 2019.

CFOs must familiarize themselves with key aspects of regulation, valuation, and risk management of carbon credits to maximize the value for their firms' stakeholders. Many CFOs may have up until now had limited involvement in the purchase of and accounting for carbon offsets. Their widespread adoption is bound to change this. Successfully navigating the emerging carbon markets requires CFOs to familiarize themselves with regulatory developments in their jurisdiction. They must build an understanding for the intricacies of valuing carbon liabilities and assets on their balance sheet and how to risk-manage these positions. These risks include non-delivery of pre-paid carbon credits due to, e.g., natural, political or operational risks and so-called 'reversal' risk, when already sequestered carbon is lost because the underlying asset storing the carbon is destroyed. It also includes market price volatility risks: carbon credit prices have shown high volatility despite growing demand, with offsets ranging from \$5 to over \$50 per ton in 2022, depending on project quality and location.

Executive briefing on the state of carbon markets today

Carbon markets play a pivotal role in corporate and governmental climate strategies, offering mechanisms to manage and mitigate greenhouse gas (GHG) emissions. They can broadly be categorized into compliance and voluntary markets. Compliance markets, such as the European Union Emissions Trading System (EU ETS), are regulated frameworks where entities must adhere to legally mandated emission limits, trading allowances as needed to meet these obligations. In contrast, voluntary carbon markets (VCMs) today operate without regulatory compulsion, enabling organizations to purchase carbon credits to offset their emissions voluntarily, often to meet publicly announced climate goals. These credits are typically generated from projects that reduce or remove emissions, including nature restoration or technological means of carbon removal such as direct air capture.

The two market mechanisms operate independently today, although convergence is observable. Compliance market certificates are primarily traded on regulated exchanges or through government-facilitated platforms, such as the EU ETS or China's National Carbon Market. In contrast, voluntary market credits are transacted over the counter (OTC) or via specialized platforms or carbon registries such as Verra, Gold Standard, and American Carbon Registry. Corporates access these markets by engaging brokers, leveraging trading platforms, or partnering with carbon credit project developers. For many companies, participation begins by aligning their sustainability strategies with net zero goals, identifying suitable carbon credit sources, and navigating market standards and certifications to ensure compliance and credibility. Several jurisdictions already incorporate carbon credits from the voluntary carbon markets into their compliance markets, such as Canada, several Western US states, Australia, and Singapore, among others. Other actors such as the UK and the EU are contemplating following suit in the future.

Market dynamics in both markets are evolving rapidly, with significant growth observed in recent years. In 2023, the World Bank estimated that global emissions trading¹, carbon taxes and other carbon pricing revenues reached a record \$104 billion, reflecting the expanding scope of coverage. The voluntary carbon market, valued at approximately \$2 billion



in 2020, is expected to reach over \$180 billion by 2050, driven by increasing corporate commitments to net zero emissions and the growing demand for carbon offsets. This market expansion is reflected in rapidly increasing capital commitments for carbon projects which have already exceeded the full year 2023 figure of \$14 billion in the first 9 months of 2024. Recent developments have further paved the way: At COP29, countries reached an agreement on the implementation of Article 6 to establish a UN-led global market for carbon credits, aiming to mobilize substantial investments in emission-reducing and carbon removal projects. This agreement includes provisions to ensure the system's credibility and effectiveness in mitigating GHG emissions.

¹ World Bank, BloombergNEF

The evolving regulatory environment on carbon credits

Besides responding to demands for climate mitigation action from stakeholders, the adoption of carbon credits by corporate actors is to a significant degree driven by the evolving regulatory landscape, including disclosure requirements as well as requirements for corporate actors to offset a certain amount of their residual emissions using carbon credits.

The reporting standards around carbon emissions and the use of offsets are becoming more demanding across highly developed economies. New standards will require companies to put the types of carbon credits they are purchasing on record and in the public eye. Starting with the 2024 financial year, the EU's Corporate Sustainability Reporting Directive (CSRD) will require EU and non-EU companies meeting certain thresholds in size to report on how their business model and strategy are compatible with global climate goals. The disclosure includes the types of carbon credits corporates are using for offsetting. In March 2024, the US Securities and Exchange Commission (SEC) issued a final rule requiring all publicly traded US companies to report on several ESG metrics. This also includes the amount of carbon credits they have used and the amount of losses incurred on the credits, if it's a material component of the company's plans to achieve its climate goals. And part of the UK's 2023 Disclosure Framework for net zero Transition Plans includes annual reporting on whether and how a company plans to use carbon credits; the number of credits sold, purchased, and retired; the standards those credits are issued under; the type of carbon credit used (e.g., whether it is an emission reduction or carbon credit); and more. While the Framework is currently voluntary, it is expected that parts of the Framework will become mandatory for certain UK companies in the future.

New mandatory schemes requiring emissions offsetting are emerging. In recent years, regulatory schemes at the national and international levels have emerged which require mandatory emissions reductions (including using carbon credits). The International Civil Aviation Organization's (ICAO) CORSIA aviation scheme, for example, requires all airlines from participating countries to offset all international flight emissions above 85% compared to a 2019 baseline with, among other options, "CORSIA eligible emissions units" (i.e., a carbon credit equivalent to 1 tCO₂ removed or avoided). As

of 2025, 129 countries representing over 99% of international aviation emissions are participating in CORSIA. Apart from reputational repercussions, airlines that fail to meet these obligations may be subject to financial penalties set forward by their host country. Similar requirements are likely to arise as more emissions trading schemes (ETs) incorporate carbon credits from the voluntary carbon markets into their compliance markets.

Finally, regulators are imposing new requirements concerning the types of sustainability-related claims that companies can make given their carbon credit use. The most recent iteration of the EU's proposed Green Claims Directive requires a company using offsets to demonstrate that it has set a net zero target, to be "on a decarbonization pathway to meet the target," and requires it to disclose the percentage of its total greenhouse gas (GHG) emissions that it has "balanced out using carbon credits." Companies that break these rules face fines of at least 4% of annual turnover. Moreover, lawsuits against companies accused of greenwashing are becoming increasingly common. Companies making environmental claims therefore need to ensure they have robust evidence to support those claims or risk facing legal challenges and reputational damage.

How we see it

Reporting requirements for emissions and carbon offset use are set to become increasingly stringent, with a growing emphasis on the integrity of climate commitments by corporate actors. Market schemes making carbon credits eligible for use within compliance schemes are likely to emerge in more industries. Forward-thinking CFOs must therefore act now to develop the capabilities and processes to manage, report on and offset carbon liabilities in their organization, securing both reputational and financial advantages.

A perspective on accounting, valuation and risk management of carbon credits



Carbon credits can help mitigate emissions-related risks and align financial goals with sustainability objectives. The introduction of disclosure requirements, such as the Corporate Sustainability Reporting Directive (CSRD), which requires limited assurance but is under discussion to require reasonable assurance in the future, and the Task Force on Climate-Related Financial Disclosures (TCFD), underscores the urgency for CFOs, and other finance and risk professionals, to comprehend and adeptly manage carbon offsetting schemes. With carbon credit prices experiencing significant volatility and the potential for reputational risks associated with greenwashing, robust risk management and transparent financial modelling have become important. This chapter will explore some of the intricacies of accounting for, valuing, and managing the risks of carbon credits, providing insights that resonate with the responsibilities and concerns of finance and risk professionals, as they support their organizations towards their Net zero strategy.

Understanding carbon credits in corporate finance

Carbon credits are increasingly important in aligning corporate sustainability with financial strategies, serving as a non-accounting hedge against carbon price volatility and regulatory changes. The integration of carbon credits into capital allocation not only supports net zero commitments but may also promise financial returns, with the carbon credit market expected to reach \$180 billion by 2050. However, navigating this landscape requires careful consideration of price volatility, liquidity and other risks (e.g., non-delivery), and compliance with evolving regulatory standards. As companies explore carbon credit procurement strategies, robust risk management and due diligence are essential to mitigate reputational and regulatory risks, ensuring carbon credit investments align with long-term sustainability and financial goals.

A primer on accounting for carbon credits

The accounting for carbon credits is an evolving practice that reflects the dynamic nature of the market and the various types of carbon credit activities. Additionally, standard setters like the IASB are actively engaged in discussions regarding the accounting for carbon credits, acknowledging the need for clarity and consistency in how these activities are recognized and measured in financial statements. While there are no explicit requirements, several standards, including IFRS, among others, provide relevant guidance to consider.

For example, when purchasing carbon credits entities must differentiate between those held for trading and those for own use. Credits held for own use could be accounted for as intangible assets (IAS 38) or inventory (IAS 2), depending on their intended use and the ability to generate future economic benefits.² Carbon credits accounted for under IAS 2 might be initially measured at acquisition costs and subsequently at fair value less costs to sell or at the lower of cost and net realisable value with changes recognized in profit or loss, reflecting the market's price volatility and liquidity. Entities will generally apply IFRS 15 to account for the sale of carbon credits accounted for under IAS 2.

Conversely, if IAS 38 (intangible asset) is applied, an entity applies the cost model unless the credits or certificates are traded in an active market, in which case, the revaluation model can be applied. Here, it is necessary to perform an IAS 36 impairment test whenever there is an indication of impairment. Entities are required to assess at each reporting period whether any triggers of impairment exist for their assets, including carbon credits. Key indicators might include significant adverse changes in the market or economic conditions, technological obsolescence, or any increase in costs that could negatively impact the expected economic performance of the asset or Cash Generating Unit (CGU) – among other things. Such factors could arise from shifts in customer preferences towards more sustainable goods or services, increased maintenance costs due to extreme weather events, or changes in market interest rates that affect the discount rate used in calculating the asset's value in use. Adequate disclosure of how assets were tested for impairment, including key estimates and judgments, is

essential for transparency and understanding the financial implications of carbon credits in the context of sustainability. Upon derecognition, IAS 38 has its own disposal requirements, which require recognition of a gain or loss on disposal (i.e., a net amount).

Additional considerations apply to carbon credits generated by nature-based projects. For example, planting forests may be classified as biological assets according to IAS 41 Agriculture.³ Here, entities may need to consider the standard's applicability to assets held for producing carbon offsets. The valuation of these assets could involve considering the growth cycle, and the expected carbon sequestration benefits as well as whether they represent properties of bearer plants. For example, bearer plants related to agricultural activity are measured at fair value less costs to sell at initial recognition and subsequently.⁴

Investments into offtake agreements related to carbon credits are typically accounted for as non-financial executory contracts when they are intended for the entity's own use, such as for offsetting carbon emissions. These contracts are recognized under the guidance of IAS 32.8 and IFRS 9.2.4.14,⁵ which dictate that such agreements should not be settled on a net basis in cash or another financial instrument. This accounting treatment aligns with the “own use exemption”, ensuring that the financial statements reflect the commitment to receive and pay for the carbon credits in the future, rather than recognizing them as financial instruments with immediate changes in fair value through profit or loss.

As the field of carbon credits accounting continues to evolve, entities must stay informed about changes in accounting standards and practices. The differentiation between compliance and voluntary markets, the nature of the credits, and the specific features of carbon credit projects all play a role in determining the appropriate accounting treatment. Entities must carefully assess these features and provide transparent disclosures to reflect the financial impact of carbon credits accurately. With the growing importance of carbon credits in corporate strategies, the accounting for these assets will likely continue to evolve, necessitating ongoing attention and adaptation by finance and risk professionals.

² <https://www.isda.org/a/Vf7gE/Accounting-for-Carbon-Credits.pdf>

³ https://www.ey.com/en_gl/ifrs-technical-resources/accounting-for-trees-held-to-generate-carbon-offsets-for-use-or-sale

⁴ If the presumption that fair value can be reliably measured is rebutted on initial recognition, IAS 41.30 permits an entity to measure a biological asset at its cost less any accumulated depreciation until fair value becomes reliably measurable

⁵ <https://www.isda.org/a/Vf7gE/Accounting-for-Carbon-Credits.pdf>



Risk management of carbon credits

The primary risks associated with carbon credits include 1) delivery risks, where projects or intermediaries fail to deliver the promised carbon credits on time due to unforeseen issues such as project delays or underperformance, and 2) permanence risks, where the carbon sequestered by a project is later released back into the atmosphere, undermining the long-term climate benefits of the credits and potentially leading to their invalidation. These risks can lead to significant financial harm such as the loss of the initial financial investment as well as the need to procure additional carbon credits at potentially higher prices to replace lost ones. Moreover, association with controversial or poorly managed carbon offset projects that do not deliver the promised climate benefit can damage the credibility and public image of participants in the carbon market.

Companies must first define their investment scope and risk appetite, circumscribe a diversified portfolio mix, and lastly engage in thorough project evaluation to understand the specific risks associated with each carbon project. The investment scope should outline the key perimeters of the sourcing mandate, such as methodologies geographies and standards considered. Diversifying the carbon credit portfolio across different types of carbon credit projects and geographical locations can reduce portfolio risk. An example for a diversified portfolio is shown in Figure 1. The due diligence should include assessing the project's methodology, exposure to natural, political and reputational risks, and the experience and track record of the project developers. Lastly, establishing strong contractual agreements with clear terms regarding delivery timelines, quality standards, and recourse in the event of non-delivery or project failure is crucial. These agreements can provide a legal framework for recourse, ensuring that companies have a mechanism to recover costs or receive compensation in the event of project underperformance or failure. However, enforcing such contracts can be challenging in practice and any recovery of costs or cash compensation will not necessarily be easily deployable in carbon credits, given the frequent shortage in supply and volatile prices.

How we see it

Until standard setters, like the IASB, provide specific guidance and requirements, entities must carefully assess the features of their use of carbon credits to ensure proper accounting. Finance and risk professionals should adopt rigorous due diligence and diversification strategies and consider using familiar risk mitigation tools like insurance. As the voluntary carbon market grows, insurance will play an increasingly vital role in managing financial, regulatory, and reputational risks. Insurance products can help CFOs mitigate some of the risks involved in investing in carbon credits, including the reputational risks of failure to deliver on climate commitments.





Deep dive: building a portfolio of low-risk carbon credits

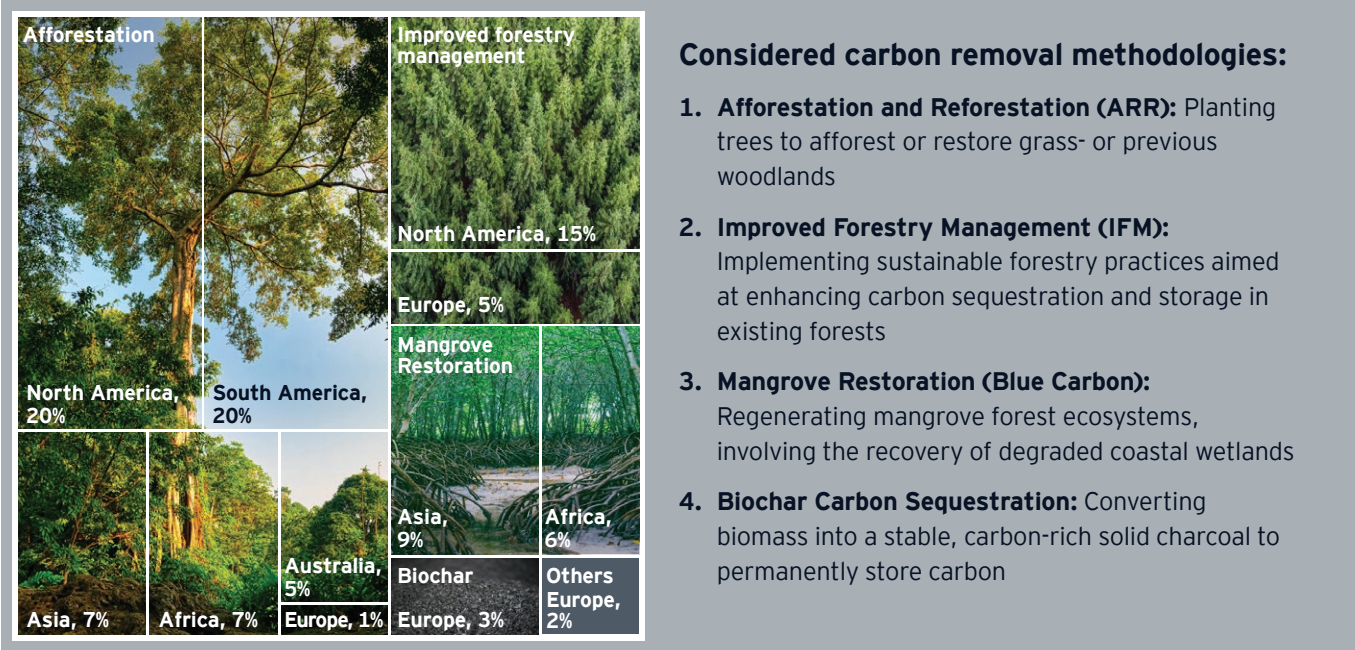
Carbon credits need to be methodically selected and managed in a balanced portfolio to benefit from diversification effects. From a risk management perspective, carbon credits behave similarly to other financial assets, and comparable criteria and practices should be applied by organizations that hold them.

1. Define your investment scope: Like other asset portfolios, it is essential to define a scope for the investable universe before acting.

Scoping dimensions	CarbonPool's scoping criteria (example only)
Carbon methodologies	Nature-based removals and engineered removals
Geography	OECD countries and the Brazilian Amazon
Quality criteria	BBB-rating or higher by a carbon credit rating agency plus in-house risk assessment
Integrity standards	Aligned with Core Carbon Principles
Verification and registration	The project must be registered with a registry endorsed by the International Carbon Reduction and Offset Alliance

2. Diversify your portfolio: Carbon buyers and investors should diversify their portfolio across methodologies and geographies. Below we show an example portfolio composition of 20 assets based on actual market availability as of the end of 2024.

Figure 1: Example of a diversified portfolio of carbon credits across methodologies and geographies



The role of insurance in mitigating risks and supporting your net zero agenda



Insurance, while never the first line of defence, plays a vital role as a risk mitigation tool in the carbon markets. After implementing due diligence, project evaluation, diversification and contractual safeguards, tailored insurance products are becoming essential to manage financial, regulatory, and reputational risks.

Insurance can de-risk investments and reputational exposure in the carbon credit market by guarding against unexpected project carbon delivery and permanence risks. By transferring risks such as delivery failure, reversal, resilience, regulatory changes, and resulting reputational damage to specialized insurance providers, buyers and investors can mitigate exposures that would otherwise be difficult to manage. Moreover, insurance can provide a stamp of confidence in the voluntary carbon market through the insurance industry's long history of capital risk management and regulatory expertise. By combining traditional coverage with innovative insurance solutions tailored to the carbon market, investors can effectively de-risk their carbon credit purchases, provide more support for offsetting projects, and grow confidence in the market.

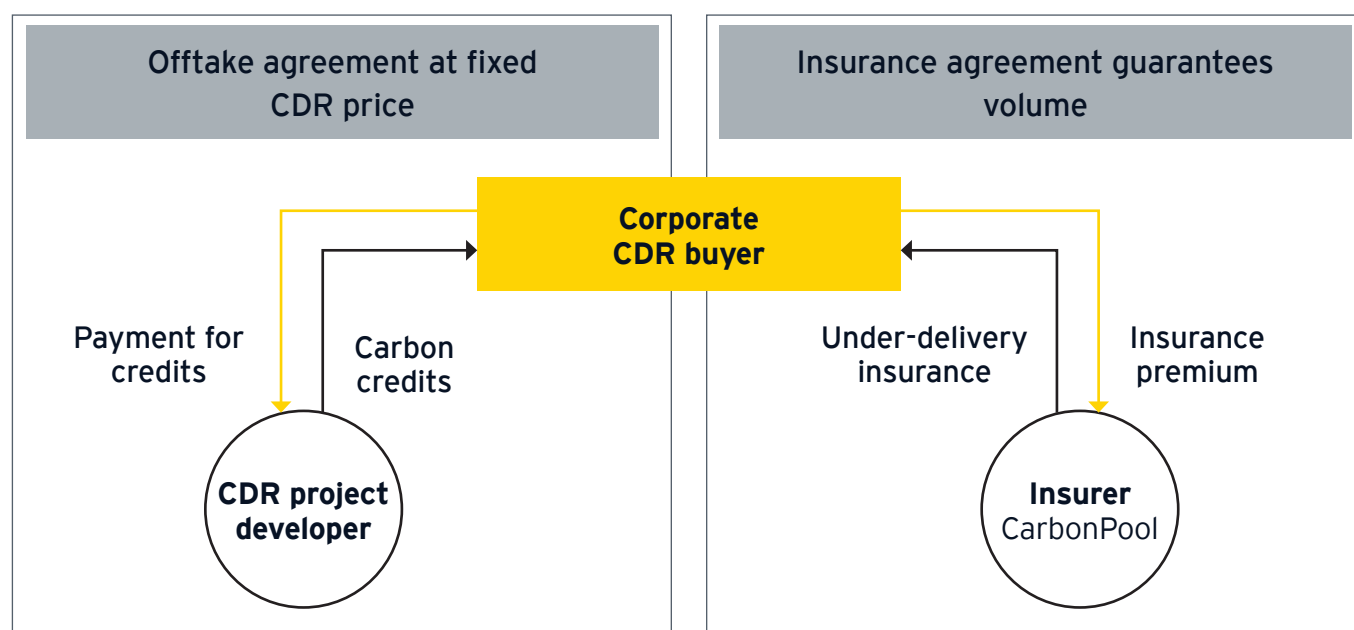
In-kind insurance paying in carbon credits offers a unique advantage that cash insurance does not, given that it takes availability and pricing risks off the shoulders of the buyer. Traditional insurance typically compensates losses in monetary terms, which may not adequately address the challenges faced by companies seeking to offset their emissions through the purchase of carbon credits. The voluntary carbon market is still evolving and lacks liquidity, leading to potential shortages of high-quality credits and significant price fluctuations. Therefore, a policy holder receiving a cash compensation may not be able to secure the quantity and quality of carbon credits needed at the desired price. In-kind insurance, such as the product offered currently by CarbonPool in pre-underwriting,⁶ mitigates these risks by providing replacement credits of similar quality in the event of non-delivery due to natural catastrophe, or weather events. This innovative approach ensures that companies can meet their climate commitments without being exposed to the price volatility and carbon credit availability risk inherent to the carbon credit markets today.

⁶ CarbonPool is currently awaiting receipt of an insurance license in Switzerland and therefore not yet licensed to underwrite. CarbonPool expects to receive an insurance license and initiate underwriting in 2025.

Deep dive: the value of carbon insurance for carbon buyers

A corporate buyer looking to source a desired quantity carbon credits at a fixed price can do so with the help of CarbonPool's shortfall insurance. Voluntary market transactions today typically function through multi-year offtake agreements with project developers or carbon market intermediaries. These forward agreements help to determine a fixed price per carbon credit for the transaction, but the inherent delivery risk leaves the buyer exposed in case their counterparty is not able to deliver the agreed volume of carbon credit. In this setup CarbonPool can provide under-delivery insurance to the buyer. Any covered shortfalls in delivery are made whole by CarbonPool, securing the delivery of a fixed number of credits to buyer.

Figure 2: A template for guaranteeing carbon credit transactions



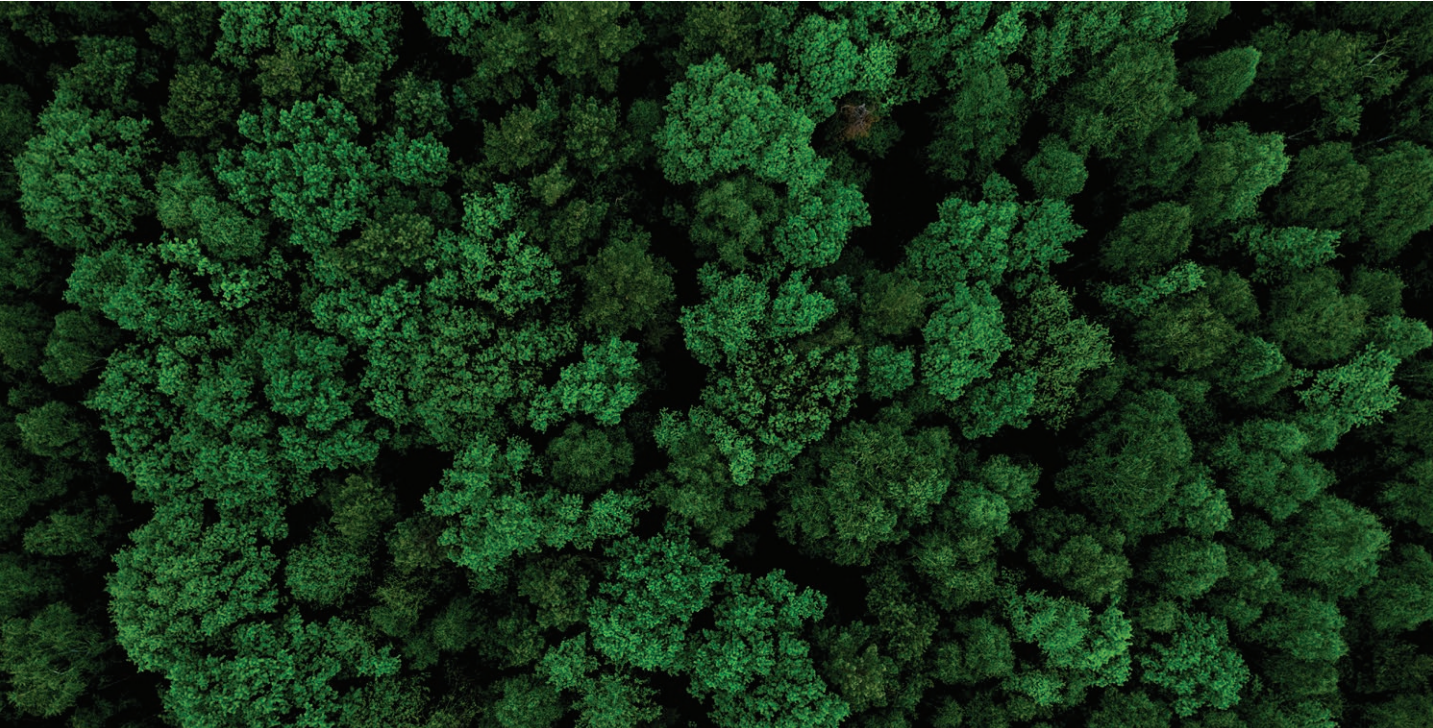
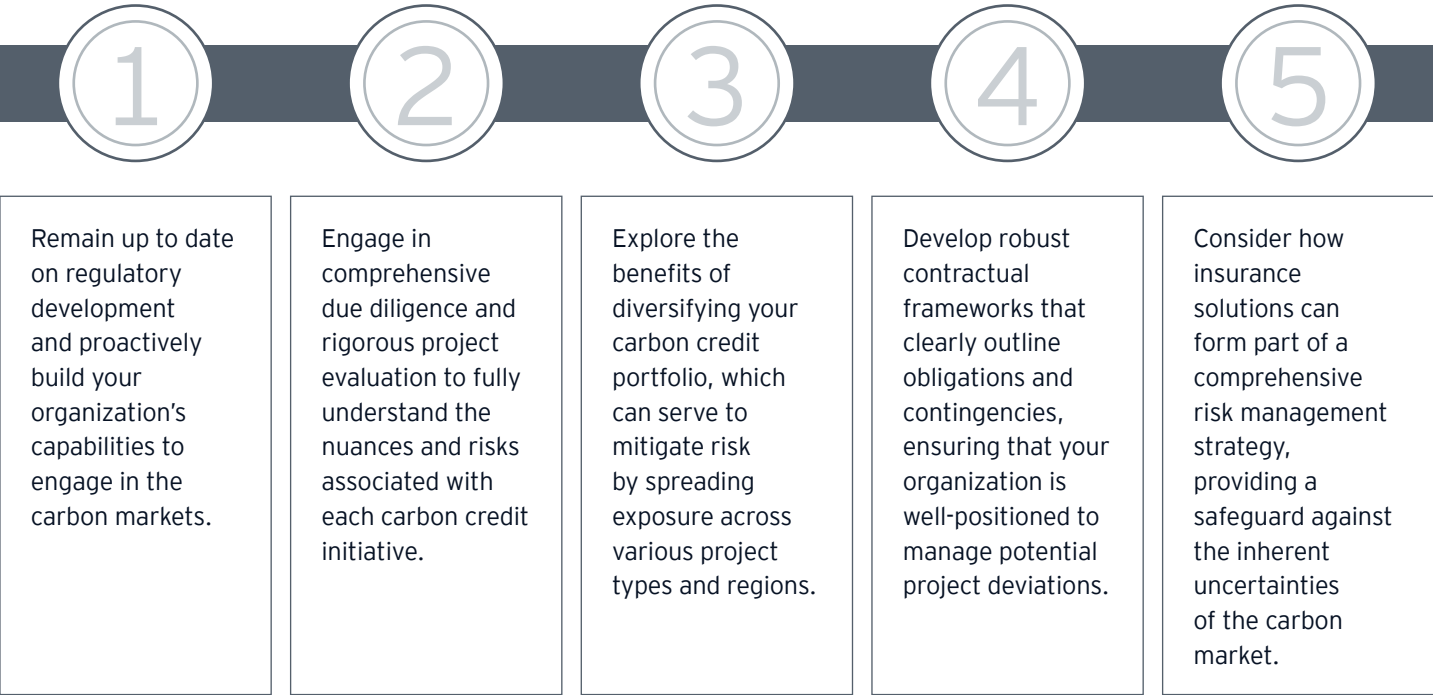
How we see it

For corporate officers seeking to achieve net zero or making a climate claim, it is carbon credits – not cash – that is needed to meet their objectives and obligations. Therefore, in-kind insurance is the most effective and capital efficient risk management tool available to hedge against net zero risks in the carbon market. Cash-based solutions fall short in that they leave the buyer with the risks inherent to converting the cash received into high-quality carbon credits, often at short notice.

Conclusion

Call to action

For companies’ CFOs, the evolving landscape of carbon credits presents both challenges and opportunities. Considering this, companies should consider a reflective and forward-thinking approach to their organization’s carbon management strategies which include the following:



How CarbonPool Can Help

- **Carbon shortfall insurance:** CarbonPool's shortfall insurance mitigates **delivery risks** by ensuring delivery of committed carbon credits despite any unforeseen issues affecting the project. By delivering the promised carbon credits, CarbonPool insurance protects the corporate's sustainability pledges and reduces the risks of financial loss and reputational damage.
- **Carbon reversal insurance:** CarbonPool's reversal insurance mitigates **permanence risks** by ensuring delivery to the corporate of high-quality replacement credits for any carbon which was inadvertently released back into the atmosphere or not sequestered as planned. By delivering these replacement credits, CarbonPool reduces financial loss associated with procurement of additional carbon credits, protects the corporate's sustainability pledges and reduces reputational risks associated with carbon projects not delivering the promised offsets.
- **Customized portfolio solutions:** CarbonPool can provide customized portfolio solutions and tailored risk management strategies to optimize your carbon credit procurement strategy and ensure successful achievement of sustainability goals for resilience and reliability.

How EY Teams Can Help

- **Advanced carbon accounting:** EY provides professional advice on understanding and implementing the latest accounting standards and regulatory requirements for carbon credits, complying with standards such as IFRS or local GAAP.
- **Insurance solutions in Switzerland:** We assist in setting up insurance companies or captives in Switzerland – an ideal location due to its strong financial services landscape – as well as support you through the FINMA licensing process.
- **Offtake agreements:** We conduct due diligence for carbon credit offtake agreements, serving as an attestation collaborator to verify compliance and contract integrity, and as a trusted verification partner to help ensure the validity and accuracy of carbon credits from these agreements.
- **Regulatory navigation:** Our professionals guide you through evolving regulation, such as the Corporate Sustainability Reporting Directive (CSRD), helping you stay ahead in compliance and policy adaptation.
- **Supply chain emissions optimization:** We assist you in reducing emissions across your supply chain with broad improvement strategies, contributing to your net zero goals.

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