

Gross Written Carbon:
Are carbon credits the next
billion-dollar insurance market?

February 2024

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The UN's Intergovernmental Panel on Climate Change has stressed that we need to decarbonise rapidly and remove carbon from the atmosphere to tackle climate change.

Countries, organisations, companies, and individuals must reduce their emissions to reach global temperature targets. This involves understanding the emissions being produced (Scope 1,2 and 3) and taking action to avoid and reduce them. Alongside this, they must also invest in ways to actively remove emissions which are already in the atmosphere.

The carbon markets have entered the spotlight as a key decarbonisation tool. They exist to manage and reduce emissions from high-emitting industries and drive capital towards carbon removal, reduction, and avoidance projects. They don't, by themselves, solve the problem – but they create a price incentive to decarbonise and help invest in solutions that pave a path towards net zero.

At COP28, global leaders recognised the potential of the carbon markets, with US Special Climate Envoy, John Kerry, stating: “I have become a firm believer in the power of carbon markets to drive increased climate ambition and action. Let's not waste any more time.”

However, there is a problem. Carbon markets are required (and expected) to scale significantly, as the world accelerates its decarbonisation journey. This leads to greater demand and thus a need for greater security, as more sophisticated investors enter the market. But the carbon markets are still nascent and there are significant risks that are not currently being managed effectively.

For example, what happens if you buy a carbon credit from a carbon project and the company goes bust? Or there is political instability halting the issuance of credits? Or there is a wildfire which destroys the project? These risks and several others have historically been managed in the carbon markets via contractual arrangements between the counterparties.

Insurance is an essential mechanism in managing risk and has been tried and tested in other markets successfully. Demand for risk transfer within the carbon markets has grown, revealing a significant opportunity for the insurance industry to both make a positive impact and build a profitable book of business in a new potential market of \$10-30bn annual GWP by 2050.

This report has been put together to share the perspectives of leading players in the carbon insurance market, lay out the role of insurance in de-risking carbon markets and establish the scale of the opportunity for insurers.

As experts in sustainability and carbon insurance, Oxbow Partners and Kita Earth are delighted to have co-authored this report. We hope it will encourage the insurance industry to enter this emerging sector and collaborate to provide new capital and solutions; whilst also enabling market participants to explore how insurance can provide a safety net which will enable them to invest and take action in the carbon markets with confidence.



Perspectives from Industry Leads

Insights from Aon, AXA XL, CFC, Chaucer, Fidelis MGU, Howden and Marsh unveil the value of insurance in the carbon markets, the challenges insurers face, and the opportunities available.

The opportunity for the insurance industry to achieve both profit and purpose is echoed across the industry. However, there is mutual recognition that there is significant work to be done. The insurance industry must become familiar with the carbon markets' risks; apply existing knowledge to a new setting; work to restore confidence; and evolve and react to the ever-changing nature of the markets.

The insurance industry is actively working with the carbon markets to present insurance products, developments and solutions which will enable the market to scale.

The exponential growth of insurance in this market is not a question of if, but when.

Carbon Markets 101: What are they?

To reach global temperature targets, we must rapidly reduce our emissions whilst simultaneously scaling carbon removal methods.

Currently, emissions are at an all-time high and the gap between the proposed amount of carbon dioxide removal and the amount of carbon dioxide removal required to meet the Paris Agreement temperature targets is expected to be between 0.9-2.8bn tonnes of CO₂/yr in 2030 and 1.8-6.9bn tonnes of CO₂/yr in 2050 (Smith et al (2023) *The State of Carbon Dioxide Removal*).

The carbon markets are a decarbonisation mechanism, which manage emissions from high-emitting industries and drive capital into carbon removal, reduction, and avoidance projects. The two major forms of market are the Compliance Carbon Markets (via 'cap & trade' or tax) and the Voluntary Carbon Markets (voluntary sale and purchase of carbon credits).

The major compliance carbon markets were expected to reach a total value of over \$800 billion* in 2023 (Bloomberg NEF, 2023). Whilst the Voluntary Carbon Market was valued at \$2 billion in 2022 (Morgan Stanley, 2022).



*All figures are in USD (\$) unless otherwise specified

Premiums With Purpose: The Role of Insurance

There are a range of risks associated with the carbon markets, including liability of the organisation, physical assets and intangible assets. Key risks include: non-delivery, reversal, counterparty, invalidation, political and reputational risks.

Risks can occur at various stages during a carbon project lifecycle and can impact multiple market participants. Currently, market actors are dealing with risk via traditional methods such as contracts or buffers. Insurance presents an effective risk mitigation tool, which can be used to pass on high-severity, low-frequency risks.

Insurance brings four key benefits to the carbon markets: (1) A balance between traditional risk management practices and innovation; (2) a stamp of confidence; (3) a detailed assessment of carbon project risk; and (4) encouragement for market participants to take necessary risks.

The benefits of insurance have been recognised by leading market participants, leading to an increase in demand. Multiple insurance bodies are providing innovative products and services to the markets, which address the unique risks and demand associated with the carbon markets. Including permanence, invalidation, under-delivery, and natural catastrophes.



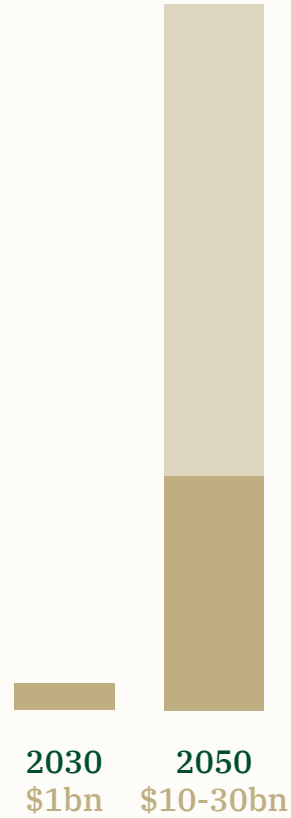
Gross Written Carbon: Opportunity, Value, Challenges and the Way Forward

The Voluntary Carbon Market (VCM) was valued at \$2 billion in 2022. Despite a turbulent few years, expectations of growth remain optimistic, with expected valuations of between \$10 – 250 billion by 2030 and over \$1 trillion by 2050.

In 2023, the value of the global Compliance Carbon Markets was estimated to be over \$800 billion. This is expected to grow but will be impacted by external factors such as policy change and geopolitical tensions.

We estimate by 2030 that Gross Written Premium (GWP) could be up to \$1bn annually and by 2050 could be up to \$10-30bn annually, underwritten across the industry.

There are a number of challenges which could negatively impact the insurance TAM including: significant risks which are yet to be addressed; shifting markets; a lack of data; confidence; and market education. The insurance industry must work to overcome those challenges via: data collection; strengthening current risk management mechanisms to improve market confidence; working with the wider carbon market; making it easy for clients; and working alongside other (re)insurance companies to find solutions.



Gross Written Premium

Perspectives from Industry Leads

Natalia Moudrak

Head of North America, Aon

01/02



“Insurers are a key stakeholder in restoring confidence in the voluntary carbon market”

What do you see as the role of insurance in the carbon markets today?

Insurance helps boost confidence in Voluntary Carbon Market (VCM) transactions and helps to unlock additional capital for high quality projects. To understand the value-add of insurance for our clients in this space, we asked a range of market participants: How do you define high-quality / high-integrity projects? How are you managing risks? Where could insurance be helpful for you?

We found that the role of insurance comes down to two key things: Firstly, a signal of quality for the underlying project. Insurers and reinsurers provide a second pair of eyes to assess underlying risk and how it is being managed. If an insurance carrier assesses the risk and takes it onto their balance sheet, then that could be an additional signal of quality. Secondly, insurance can act as a catalyst to accelerate capital going into high-quality projects, with investors who would otherwise be hesitant to participate in the VCM entertaining investments if the underlying projects are insured.

What insurance solutions do you see in this space?

We have clients globally who are interested in exploring insurance coverage for VCM projects. Most of the projects we see today are nature-based projects and the risks that are commonly being sought to cover are:

- Natural disaster risks, that can cause damage and destruction to the asset sequestering the carbon.
- Environmental risks, such as pest infestations, disease, and pollution that can also damage these assets.
- Political risks, such as nationalization, asset expropriation, and other government actions that may result in a loss of project and/or associated revenues.
- Fraud and negligence, as well as non-delivery and invalidation of carbon credits.

As more institutional capital moves into this space, it will bring greater rigour and due diligence, driving the demand for insurance.

Perspectives from Industry Leads

Natalia Moudrak

Head of North America, Aon

02/02



“We need to think holistically about risk management and include insurance as a line item on the project budget.”

What are the main challenges in this space?

The biggest challenge today is the loss of confidence in the VCM and demand-side hesitation. The VCM is an efficient driver of capital towards nature conservation and restoration. However, we have seen the impact of media coverage on the demand for carbon credits from corporate buyers. Many buyers are hesitant to commit capital, particularly in the nature-based solutions space and, more specifically, those projects preserving intact ecosystems (such as REDD). These projects are important, not only for carbon sequestration purposes but also for biodiversity and community benefits. There is a new generation of project developers, committed to holding themselves to higher standards, by implementing new methodologies, using the latest monitoring, reporting, and verification techniques, and ensuring that their projects are publicly rated. There is greater professionalism and rigour emerging in the space but, unfortunately, everyone is being painted with the same brush in the shadow of negative news. At Aon, we are thinking about how we can be a helpful player to an ecosystem of others, who are looking to restore confidence in the VCM.

What is the future for insurance in this space?

Ideally, insurance will be a consideration right from the start, as opposed to an afterthought. We need to think holistically about risk management and include insurance as a line item on the project budget. Currently, insurance is not a requirement in the VCM. As more institutional capital moves into this space, insurance should become an expectation.

What are the opportunities when the markets takes off? What needs to happen to facilitate that growth?

We can see the potential for carbon credits to become a new (insurable) asset class, enabling new financial products for the low carbon transition to come to market. Yet, some of the foundations are still being laid: clarity in policy and regulations; alignment on the use of credits for public and private sector entities' achieving decarbonization targets; on appropriate disclosures; performance monitoring standards etc. There needs to be better dialogue between the various players of this ecosystem regarding how to restore confidence in the VCM, as it's an integral piece of the low carbon transition puzzle.

Perspectives from Industry Leads

Nathalie Thong

ESG Manager, AXA XL

01/02



“We start answering the difficult questions when we open the doors to each other”

What do you see as the value of insurance in the carbon markets today?

Insurance is the lynchpin that connects so many different areas. Sustainability and insurance are closely tied, in that longevity and risk transfer are central to both topics. In the guts of each industry we are trying to protect the areas and people that matter. This is a new space which people do not yet fully understand. To scale up investment, people need a long-term security net, to enable them to try new things and provide protection, resilience, and adaptation. This is where insurance can provide value.

What products are required to unlock this space?

Existing products in the traditional insurance market could be adapted to the carbon space. For example, AXA Climate’s parametric natural hazard risk products or our ART/Structured Risk Solutions for technological performance could play a key role for carbon solutions. Tapping into this new market involves not only adapting existing products but addressing new risks via new products. The carbon market spans so many different areas, stakeholders, and geographies. Therefore, we need to take a step back and see the full picture to analyse where insurance can service transactions and have intrinsic value. We need to connect the dots across the value chain and see the carbon markets as a cycle within itself.

How do you see the role of insurance changing as the markets grow?

Ideally, the market will grow linearly allowing insurance to fall into business as usual, with clear product lines and carbon teams. However, where the market is currently, it is hard to assume the market is going to grow in a linear way. We are therefore building in flexibility and partnering with our clients to create bespoke solutions. This allows us to understand the underlying risks our clients are concerned about and build products that suit them.



“The London market is fantastically positioned to work together and syndicate risk together”

Is the retrenchment of the voluntary carbon market a temporary or fundamental challenge?

This market is an innovative space which comes with challenges but also creates exciting opportunities to try new things and events this year reflect both these situations. Many people we have spoken with have a real growth mindset and attitude and we are continuing to learn lessons about the industry and how it can improve.

What are the biggest challenges facing insurance in this space?

The first key challenge for insurers is the education piece. The hurdle here is finding partners who are speaking the same carbon language and are on the same page. Secondly, we need to make carbon insurance easy to use, so that clients can tie these products into what they are already doing. This is what we have done with our Excess Emissions Insurance (EEI) product, which allows clients to view environmental indemnity alongside financial indemnity. The final challenge is building the innovation mindset. Insurance carriers are naturally risk averse and entering new markets means we need to think outside the box to solve these complex problems.

What are the greatest opportunities for insurers and how can we facilitate growth?

At AXA, we see ESG as a central market for the future. Sustainability is at the core of our purpose and we are positioning ourselves for this opportunity by signalling to clients that align to the same values that we are here to help. The London market is fantastically positioned to work together and syndicate risk together and that needs to happen for us to serve our clients' needs. Having alignment, working on similar projects, going after the same issues at the same time so we are building the same knowledge at once, rather than separate silos, will be a key driver of how we will facilitate growth. We need to build collective knowledge and have a common hymn sheet that we can all work from.

Perspectives from Industry Leads

George Beattie

Head of Innovation, CFC

01/02



“Insurance is a marker of quality and, if done right, will drive the growth of a high-quality carbon market”

What are your thoughts on the carbon markets?

Historically, the insurance industry has struggled to keep up with change in a fast moving world; at the moment the trend is that the sector caters for a reducing proportion of global GDP. In the context of climate change and the industry’s role, we have spent a long time discussing the topic of ESG, and now face a challenge of how to convert the conviction that there is a role for the industry into action. The industry is waking up to the fact that we must go further, to seek new risk solutions that will enable capital to flow into the markets that have the potential to make a huge impact – such as the carbon markets. The carbon markets tie equity into both the pursuit of profit and the protection of natural assets; an exciting combination which is bound to result in growth.

Is insurance a consequence or driver of carbon market growth?

The answer is a mixture of both. However, the ability for insurance to drive growth of the carbon markets is noteworthy. Currently, corporates are cautious to participate in the markets. They are facing thousands of initiatives, unfamiliar counterparties, and locations worldwide. Insurance can step in between the project developers and the buyers/investors, to facilitate a due diligence process which enables counterparties to have greater trust in one another and move faster throughout the sales cycle.

Currently, there is a split in the market – with many projects lacking in quality. If a project is subject to insurance, it must meet a certain quality threshold. Therefore, insurance can drive liquidity into those projects which are of higher quality and highlight to the market the principles which enabled that project to become insured. In this way, insurance can drive the growth of a high-quality market.

“The range of risks and the distinct value chain means there is an opportunity for many different insurance products along the carbon value chain.”

What is the value of insurance in the market?

We can show the value of insurance by providing an example of two key risks – delivery risk and reputational risk. For delivery risk, insurance can provide a monetary or carbon payout, if the insured does not receive their carbon credits. I don't believe we can yet explicitly insure reputational risk via a policy because we need to be careful not to remove the cost of engaging in bad behaviour. However, if we are willing to underwrite an investment into a certain project, it confirms that it has met a certain quality threshold. Therefore, a market actor can be hedged for delivery and hedged by proxy for some aspect of the reputational risk.

What are the challenges for insurance in this market?

There are three key challenges for insurance in any market, including the carbon markets. Firstly, capacity. The insurance industry struggles with products that do not fall within certain product silos. Therefore, securing capacity for innovative products is challenging as often they do not fall within a familiar silo. To tackle this problem, Lloyd's introduced Innovation ICX, which provides insurers with greater lateral freedom to explore innovation. I believe this is one of Lloyd's greatest achievements. Secondly, infrastructure. Insurance companies must have strong talent and robust processes, to successfully take a product through its development and lifecycle. Finally, leadership. In this space, leaders must be invested in looking for 'long and deep' value over time and not necessarily for a quick win. They must be patient and place a long term value bet that their innovation will pay off in the future.

What is the opportunity for insurance?

The carbon markets present a significant opportunity for the insurance industry. The markets present familiar risks such as wind, fire, political, fraud, crime and credit. Therefore, to some extent great progress into the protection gap can be made by weaving together strands of data that we already have and applying them in a new context. The range of risks and the distinct value chain means there is an opportunity for many different insurance products along the carbon value chain. This provides the industry with a significant opportunity, which is both long-term and potentially very material from a 'net new' income perspective.

Overall, this market enables insurers to pursue differentiated profit, provide brand enhancement, and facilitate a vital environmental market: the gold standard of innovation.

Perspectives from Industry Leads

Hayley Maynard — Head of Innovation, Chaucer

Tom Graham — Head of Partnership, Chaucer

01/02



“The exponential growth of the carbon markets and carbon insurance is inevitable: the question is not if, but when?”

What are the challenges and opportunities for insurance in the carbon markets?

The carbon markets are rapidly evolving and we are seeing three major changes taking place. Firstly, the rise in offtake agreements. Secondly, the emergence of engineered projects, such as Direct Air Capture (DAC) and biochar. Thirdly, the merging of the compliance and voluntary market. Due to these changes, we are seeing larger scale projects and a change of buyer profile, to a more sophisticated buyer making significant investments. Both large projects and sophisticated investors mandate insurance. Therefore, the market landscape is evolving into one which is well-suited to the insurance industry.

However, there are also challenges. Firstly, there is significant cross-pollination of market segmentation. Market actors can sit within multiple market segments. For example, an intermediary may be selling credits but also looking to invest in projects. Therefore, it is difficult for the insurance industry to identify the customers and market segments to target. Equally, the rapidly evolving nature of the market presents difficulties. The insurance industry is typically slow-moving and it takes a significant amount of time to design the highly regulated, interdisciplinary, complex insurance products that the carbon markets demand. Therefore, the insurance industry needs to work hard to keep pace with the rapid changes taking place and ensure we are presenting products which meet the evolving needs of the market.

How do you expect the markets and carbon insurance to evolve?

We estimate that the market will grow significantly over the next few years. Despite recent dissent, there is still a strong signal that the market will continue to scale. From a scientific perspective, the IPCC have made clear that carbon sequestration and removal are necessary to reach global temperature targets and that will not change. From a market perspective, the carbon markets are only becoming bigger and more professional. That is why we are investing so much time and resource into building products.

As the market grows, we will need to respond to its changing needs. For example, adapting our products to larger engineered projects. If we draw parallels with renewable energy, we have seen that the emergence of multi-billion dollar technological projects demands insurance. Therefore, as this large-scale growth and investment takes place, insurance will be in high demand.

Perspectives from Industry Leads

Hayley Maynard — Head of Innovation, Chaucer

Tom Graham — Head of Partnership, Chaucer

02/02

“As we approach 2025 and 2030 environmental targets, we expect there will be an increased interest in the carbon markets”

What are the biggest risks to growth of insurance in this sector?

There are a number of scenarios which may impact the growth of insurance in this sector. Firstly, CFO's may see investment into the carbon markets as a balance sheet risk, as opposed to one which requires insurance. Secondly, the risk could be transferred to a different entity to carry, such as a derivative or the government. Finally, it may be that insurance evolves such that these risks can be containable within an existing product form. These risks seem unlikely but are possible.

The growth of insurance in the market is also naturally reliant upon the market growing exponentially. Therefore, challenges to the market, such as calibration of quality, project financing, international movement of credits and baseline risk could also impact growth. Also, as larger projects come online, project risks could stunt market growth. For example, a project must gain permits, governmental approval, supplies and so on. These elements and requirements are more likely to cause delays than any issues with the actual market.

In our opinion, there is no doubt that carbon insurance is a significant opportunity and this market will grow exponentially. The real question is not if, but when? As we approach 2025 and 2030 environmental targets, we expect there will be an increased interest in the carbon markets and organisations will be seeking solutions quickly and safely. Insurance has an integral role to play in this process and that is why the first mover advantage is so important for commercial success.

Perspectives from Industry Leads

Olivia Brindle — Head of Sustainability, Fidelis

Richard Rudden — Head of Energy Transition, Fidelis

01/02



“Insurers will have a role in improving transparency and the level of buyer certainty underpinning each transaction”

What are the current challenges faced by the voluntary carbon market?

Overall, the voluntary carbon market is a positive force and extremely important in supporting corporates in their decarbonisation journeys. However, it has recently faced criticism which has unfortunately led to a loss in momentum. The issues that have been raised are not without foundation and, as a nascent market, it is not surprising that there are still some challenges we need to work through. The market needs regulation and standardisation, but this relates to details and execution, rather than the idea itself.

One fundamental challenge is how the numbers are calculated and communicated. For some projects, working out how much carbon is being sequestered is a genuine challenge. For others, a robust assessment can be made, but this still relies on assumptions. In all cases, the key is transparency. We need to be transparent, both with regards to methodology and assumptions. If the numbers are not perfect, we at least need to know how they have been calculated. At the moment, this is not always the case and data related to the carbon markets is not always reliable or comparable.

Perspectives from Industry Leads

Olivia Brindle — Head of Sustainability, Fidelis

Richard Rudden — Head of Energy Transition, Fidelis

02/02



“Ultimately, if the industry itself is not clear on the role it can play, it is hard to expect there to be demand.”

What is the role of insurance in the carbon markets?

A big problem for the market is a lack of trust. This stems from the absence of a centralised regulatory/validation framework or a trusted body that provides a view on the credits and, ultimately, how much carbon is being sequestered. For the market to scale, there needs to be external validation and a centralised framework that market actors can point to, to make decisions and justify these decisions to other stakeholders, including investors and regulators.

Insurance can play a part in addressing that lack of trust and it can bring about the confidence needed to scale the market. If an insurer agrees to underwrite a project or transaction, they provide a degree of external validation, by indicating that a credit is robust. Alongside validation, if something goes wrong insurance protects the insured (the buyer or seller of the credit). These factors provide actors with the confidence to participate in the carbon markets and to undertake transactions.

Equally, there is an opportunity for surety or contract frustration insurance to help to secure funding for green projects.

What is the challenge for insurance in this industry right now and how can we overcome this?

The insurance industry does not completely understand the role it can play in the carbon markets and, currently, does not have the right products available. There is a degree of reluctance and fear of the unknown, as this is a (somewhat) new risk and we have limited data on some aspects of it. A number of insurers have been proactive in working with carbon credit providers to develop products, but these are still in the early stages. We are not yet at the point where there is a clear and standardised offering. Ultimately, if the industry itself is not clear on the role it can play, it is hard to expect there to be demand.

In terms of what can be done to address these challenges: first and foremost, we can encourage conversations and education within the industry to drive better understanding of the role that insurance can play within carbon markets. Second, we can make existing data more widely available. The carbon markets have been around for long enough that data on key perils exists. However, that data is not easily accessible or adapted for underwriting. Finally, we can share examples of successful solutions. If there were widely shared examples of portfolios, lines of business or carriers who were taking time to deploy capital into carbon credit insurance, this would help to generate comfort with the topic and hopefully stimulate others to look into it.

It is worth noting that there are factors outside the insurance industry’s immediate control that will affect the growth of the market. For example, how committed the real economy is to decarbonisation and how much of this will be supported by carbon credits.



“The power of insurance is to enable outcomes that otherwise would not be possible – in our markets that means insurance has a wonderful power for good.”

What do you see as the role/value of insurance in the carbon markets today?

Currently, investing into carbon is very niche and risky. It typically combines project financing, long term horizons, emerging markets, young companies, nuanced processes, unproven technologies and all the while taking in societal and environmental considerations. These factors make investment into the carbon markets a tricky path to navigate.

Insurance enables participants to transfer those risks away, to a qualified third party. This clears the path and opens up the carbon markets to a wider range of investors who can undertake deals quickly. Thus, dramatically increasing the overall size of the market.

Who do you see as the biggest clients?

Today, financial intermediaries (typically investors who are used to buying insurance) are the primary client. As each investor has a different risk appetite, we need a suite of insurance products to cover all profiles.

As the market develops, the clientele will likely change to project developers and those involved at an earlier stage of the carbon transaction. Eventually, insurance will be embedded into their processes and follow the credit throughout its lifecycle.

How do you see the role of insurance evolving as the carbon markets grow?

We are already seeing the emergence of distinct products for the carbon markets. Howden has over 40 different underwriters who we work with for carbon-related products. These underwriters fall under a range of different markets including political risk, structured credit, Warranty & Indemnity and marine insurance.

“The other exciting side of nature-based solutions is the development of solutions which link to other parts of ecosystem recovery like biodiversity, soil, and water.”

What are the biggest challenges facing insurance in this space? How do we overcome those challenges?

The first key challenge is a lack of trust. Trust in the market has eroded dramatically over the past 24 months, which has had an unfavourable impact on the market. In response, we are seeing the emergence of entities such as specialised standards, ratings agencies and insurance companies. Each of these entities are at an early stage but they are working to instil confidence in the market. We are also improving processes through digitisation. From data collection to methodologies, we are seeing how digitisation can help increase transparency.

The second challenge is the split between avoidance & removal and nature-based & engineered solutions. I expect that there will become a clean divergence between nature-based and engineered solutions. The former will be absorbed into wider ecological frameworks, including biodiversity, water, and soil health. Engineered solutions will be more heavily focused on carbon and will be easier to measure and verify, which in turn should help to build trust.

The biggest concern is that, due to a drop in demand, there have been less transactions taking place in the market. As insurance follows a transaction, this negatively impacts companies' profits and run-rates. The insurance industry is therefore fully incentivised to improve the market, its integrity, and how it functions.

What are the greatest opportunities for insurers?

In the nature-based market, projects are facing an increased risk of adverse weather and natural catastrophes. This represents a large opportunity for the insurance industry. Projects also require significant upfront financing to begin implementation. Therefore, there are opportunities for balance sheet protection for upfront equity costs and the cash flow protection of forward-looking loss of revenue from sales of carbon credits. The other exciting side of nature-based solutions is the development of solutions which link to other parts of ecosystem recovery like biodiversity, soil, and water.

To reach global temperature targets, carbon dioxide removal, and more specifically engineered solutions, must scale rapidly. This requires significant investment. As insurance is the enabler for that investment, I expect this section of the market will unveil an enormous opportunity for the insurance industry in the coming years.

Perspectives from Industry Leads

Steve Forrest — Managing Director,
Climate and Sustainability, Marsh

Ryan Bond — Head of Insurance Innovation,
Climate and Sustainability, Marsh

01/02



“The Carbon Market has got to provide confidence for buyers, then find a role for insurance”

What do you see as the role/value of insurance in the carbon markets today?

Many people highlight how insurance is the driver of the carbon market as it provides confidence to buyers entering. However, whilst true to an extent, the reality is that insurance is more a dependency of a strong carbon market – once there is more confidence in the market, there will be more buyers and there will be a need for insurance.

Insurance provides protection against a variety of risks, with different products for different players, depending on what the party is going to do with the credits (e.g. investors, buyers and developers). There are some risks that insurance is well placed to mitigate and some risks for which it is not as well placed. For example, insurance can address the potential implications of wildfire destroying trees planted to remove carbon from the atmosphere (the destruction of carbon credits), but would not be well placed to reduce the risk of price fluctuations of carbon credits.

Who is buying insurance in the carbon markets?

All participants within the VCM face risks. For example, a buyer who uses credits to make a claim may face reputational risk. Equally, a project developer whose project is impacted by wildfire could face business interruption risk.

However, just because market participants face risk it does not mean they will purchase insurance. Both breadth of cover and commerciality have a role to play. Insurance policies include many T&C's and exclusions, limiting the breadth of cover to specific risks. Commercially, a party must then determine how much they are willing to spend on an insurance policy which may only address part of the overall problem. A prime example is a project developer, who may not purchase insurance because they are a not-for-profit organisation who does not accept liability under the contract.

Perspectives from Industry Leads

Steve Forrest — Managing Director,
Climate and Sustainability, Marsh

Ryan Bond — Head of Insurance Innovation,
Climate and Sustainability, Marsh

02/02



“As insurers become more comfortable with the landscape and its risks, they can begin to expand the breadth of cover and focus the price.”

How do you see this market evolving from an insurance perspective?

The carbon markets are highly variable - from contracts, to market participants, to credit quality. Therefore, we need to develop a plethora of insurance solutions that address the various risks within the ecosystem. So far, carbon insurers have taken alternative approaches, focusing on specific sections of the supply chain which fit within their risk appetite. As insurers become more comfortable with the landscape and its risks, they can begin to expand the breadth of cover and focus the price.

With regards to who will be buying insurance, large corporates have significant carbon commitments. However, these do not exceed their self-insured risk appetite. Therefore, they do not require insurance for an investment into the voluntary carbon market (VCM). As the market develops and confidence is instilled, we will see an increase in the number of smaller corporates participating in the VCM. These companies will have a lower risk appetite, so may wish to purchase insurance.

There is also a globalisation element. Marsh's teams in Hong Kong, Shanghai and Singapore are very active in talking to clients and traders. In these regions, there is a clear demand for carbon insurance.

What needs to happen in order to help the insurance market evolve?

At the moment we are in a difficult economic landscape. Therefore, if at all, companies are channelling their capital towards emissions reductions rather than credits. As global economies grow, resulting in greater flows of capital, this will naturally stimulate demand.

Much of the evolution will take place naturally. For example, regulation is already pushing companies towards setting climate strategies. Over time, as this regulation comes to fruition, we will see a shift towards the use of carbon credits. Equally, we have seen early-stage insurance solutions emerging in the London Market which we expect will stimulate innovation globally.

2. Carbon Markets 101

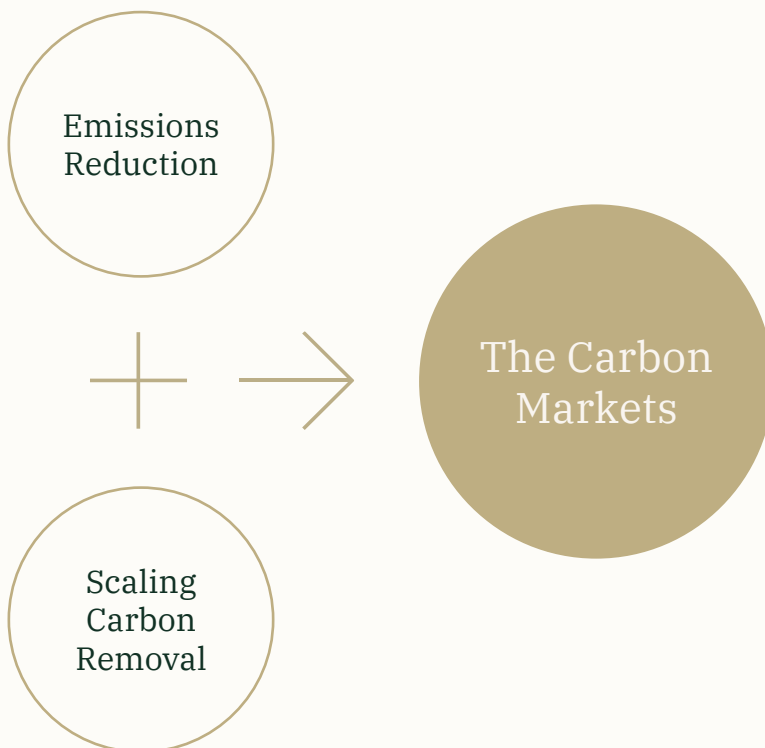
Summary

To reach global temperature targets, we must scale carbon removal methods whilst rapidly reducing our emissions

The gap between the proposed amount of carbon dioxide removal and the amount of carbon dioxide removal required to meet the Paris Agreement temperature targets could be between 0.9-2.8 Gigatonnes of CO₂ per year (GtCO₂/yr) in 2030 and 1.8 - 6.9GtCO₂/yr in 2050 (Smith et al (2023) *The State of Carbon Dioxide Removal*).

The carbon markets are a mechanism to manage emissions and drive finance towards carbon projects.

In 2023, the major compliance carbon markets were expected to reach a total value of over \$800 billion (Bloomberg NEF, 2023). Whilst the Voluntary Carbon Market was valued at \$2 billion in 2022 (Morgan Stanley, 2022), and forecast to rise to \$100 - \$250 billion by 2030 and over a trillion by 2050 (Barclays, 2023 and Bloomberg, 2023).

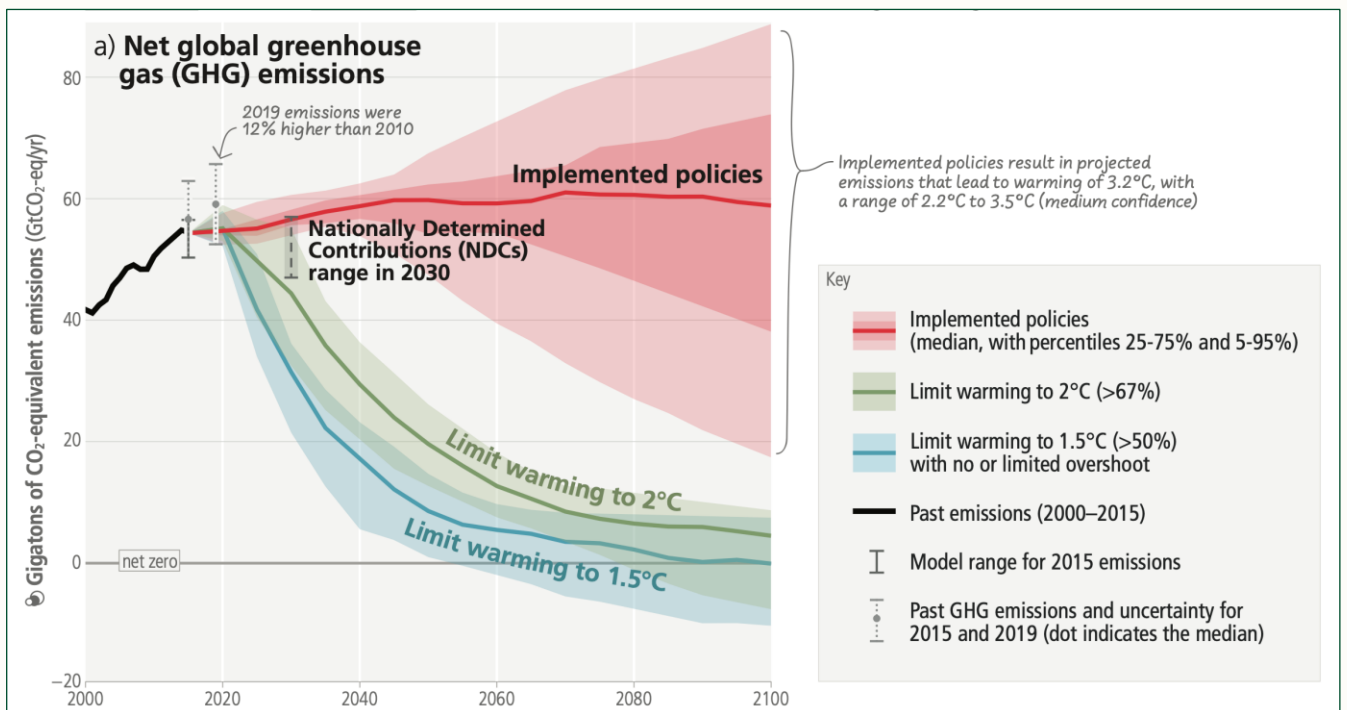


Carbon Markets 101

2.1 Nipping it in the Bud: Emissions Reduction

As climate change accelerates and global temperatures continue to rise, reducing global emissions and reaching net zero have become a necessity. In 2015, 196 countries adopted the Paris Agreement – a legally binding international treaty on climate change. Its overarching goal is to hold ‘the increase in the global average temperature to well below 2°C above pre-industrial levels’ and pursue efforts ‘to limit the temperature increase to 1.5°C above pre-industrial levels’.¹

To reach these temperature targets, significant emissions reductions are required across all sectors. Many organisations have taken active steps towards these targets. For example, over 4,000 companies have set Science Based Targets, under the Science Based Targets Initiative (SBTI), adopting ‘a clearly-defined path to reduce emissions in line with the Paris Agreement goals.’² Some emissions are challenging to reduce due to factors such as cost, control or available technology. These are termed as ‘hard-to-abate’ and make up around 30% of global emissions.³



A visual representation of the emissions reductions required for us to meet global temperature targets of 1.5 and 2 degrees Celsius.

Source - IPCC (2023)

[Climate Change 2023 Synthesis Report: Summary for Policymakers](#)

¹ UNFCCC (2023) [The Paris Agreement](#)

² SBTI (2023) [Science Based Targets](#)

³ Energy Transitions Commission (2018) [Mission Possible: Reaching net-zero carbon emissions from harder-to-abate sectors](#)

Carbon Markets 101

2.2 Clearing the Air: Scaling Carbon Removal

Alongside significant emissions reductions, we must also remove carbon dioxide that already exists in the atmosphere. According to the Intergovernmental Panel on Climate Change (IPCC), Carbon Dioxide Removal (CDR) is necessary for us to prevent global temperature rise.¹ CDR includes nature-based projects, such as afforestation or reforestation, alongside engineered solutions, such as direct air capture (DAC). According to The State of Carbon Dioxide Removal report, CDR methods are currently removing 2,000 MtCO₂ per year.²

Currently, there is a gap between proposed levels of CDR and the amount required to meet the Paris Agreement temperature targets. If we remain on the same trajectory, across all three Paris-relevant scenarios, in 2030 there could be a gap between 0.9-2.8 GtCO₂/yr and in 2050, 1.8-6.9 GtCO₂/yr.² To put this into perspective, 1 tonne of CO₂ is the equivalent of an average gasoline-powered passenger vehicle driving 2,564 miles.³ To reach 1 Gigatonne, this journey would be repeated 1 billion times. 6.9 GtCO₂ exceeds the amount emitted from the production, transport and processing of global oil and gas in 2022 (5.1 billion tonnes of CO₂e in 2022).⁴ Therefore, closing this gap requires significant scaling of carbon removal projects.

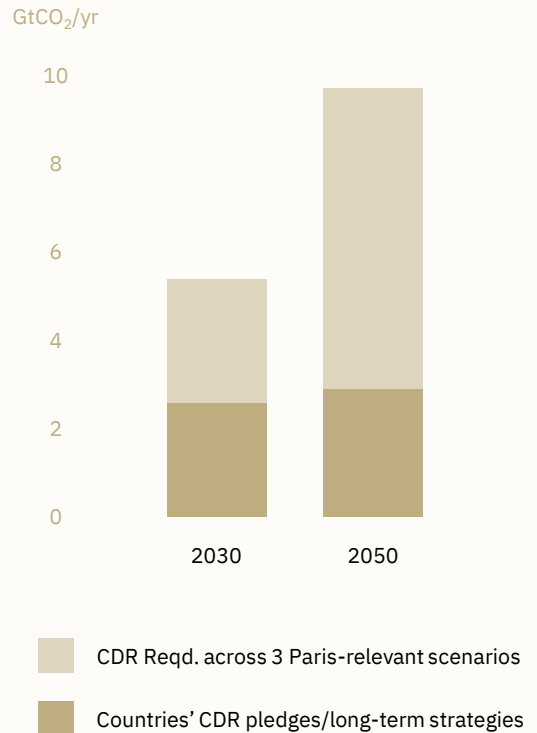


Figure B: The gap between proposed levels of CDR and those required for us to meet the Paris Agreement Temperature Targets

Source –Smith et al (2023)
[The State of Carbon Dioxide Removal](#)

1 IPCC (2023) [AR6 Synthesis Report: Climate Change](#)
2 Smith et al (2023) [The State of Carbon Dioxide Removal](#)
3 US EPA (2024) [Greenhouse Gas Equivalencies Calculator](#)
4 IEA (2023) [Emissions from Oil & Gas Operations in Net Zero Transitions](#)

Carbon Markets 101

2.3 A Tale of Two Markets: Compliance & Voluntary

Carbon markets are trading systems where carbon credits or allowances can be bought and sold. The two main types of carbon market are the Voluntary Carbon Market (VCM) and Compliance Carbon Markets. The markets' purpose is to lower emissions and drive capital towards carbon projects.

Carbon projects either reduce, avoid, or remove carbon from the atmosphere:

- Carbon Reduction: A project which reduces the amount of carbon that would have been otherwise emitted into the atmosphere. For example, cookstoves.
- Carbon Avoidance: A project which prevents carbon from entering the atmosphere. For example, avoided deforestation.
- Carbon Removal: A project which actively removes carbon from the atmosphere. For example, direct air capture.

Carbon avoidance and reduction projects make up most of the VCM. According to Climate Focus' Voluntary Carbon Market Dashboard, in January 2024 there were 4,916 registered projects within the VCM. The three largest project types were Nature-based solutions, Renewable Energy and Household Devices (such as cookstoves).¹

Once a carbon project has received initial financing and demonstrated a positive resulting action, under relevant guidance, it can be issued carbon credits. One carbon credit represents one tonne of carbon dioxide equivalent (or 'CO₂e') which has been avoided, reduced, or removed from the atmosphere.

Credits produced by these projects can be sold to provide a source of finance for the project and its developers. These credits can then be bought and used ('retired') by organisations to achieve their environmental targets. A credit can be used by an organisation in multiple ways, depending on their environmental goals. For example, it could be used as a method to provide finance to support climate initiatives outside of the company's value chain or to offset residual, hard-to-abate emissions.

Carbon Markets 101

2.3 A Tale of Two Markets: Compliance & Voluntary

There are multiple types of projects which avoid, reduce, or remove carbon from the atmosphere. Carbon projects also bring significant co-benefits, such as improved water quality, increased biodiversity, and socio-economic benefits to local communities.



Forestry

Afforestation (removal): the establishment of new forests

Reforestation (removal): replanting a forest

REDD (avoidance): reducing emissions from deforestation and forest degradation

Improved Forest Management (avoidance/removal): Managing forests in a way which improves sequestration

Agroforestry (removal): incorporating forestry into farming landscapes

Forestry projects make up 35% of all credit issuances to date in the VCM, making them the largest sector ([BeZero Carbon, 2023](#)). According to [The State of Carbon Dioxide Removal \(2023\)](#), $2,000 \pm 900$ MtCO₂ per year comes from CDR methods on land (including ARR & IFM). These projects also increase biodiversity by protecting habitats; avoid soil degradation; purify water; and create job opportunities.

Current Mitigation of forestry removal methods: $2,000 \pm 900$ MtCO₂/yr.¹
Mitigation Potential of forestry removal methods: ARR: 0.5-10 GtCO₂/yr. Agroforestry: 0.3-9.4 GtCO₂/yr¹



Blue Carbon

Blue Carbon (avoidance/removal): Carbon Projects which can be found in ocean or coastal environments, such as mangroves and seagrass.

Mangroves can protect coastal communities from extreme weather events, filter water, improve livelihoods, provide new revenue streams & long-term job growth in coastal communities, and enable sealife to thrive ([Global Mangrove Trust, 2023](#)).

Current Mitigation: 0.01 MtCO₂/yr from DAC, ERW, and Blue Carbon combined¹
Mitigation Potential: <1 GtCO₂/yr¹



Enhanced Rock Weathering

Enhanced Rock Weathering (removal): Spreading crushed rock on land, increasing the rate of the rock weathering process which naturally sequesters and stores carbon.

Novel CDR methods, such as ERW, must expand 30-fold by 2030 and 1,300-fold by mid-century, for us to meet global temperature targets. In the UK, by 2050, ERW could deliver a net carbon removal of 6-30Mt CO₂ per year, representing 45% of the atmospheric carbon removal required nationally to meet net-zero targets ([Kantzas et al, 2022](#)). It brings co-benefits such as increased crop yields and rural job opportunities.

Current Mitigation: 0.01 MtCO₂/yr from DAC, ERW, and Blue Carbon combined¹
Mitigation Potential: 2-4 GtCO₂/yr¹

¹ Smith et al (2023)
[The State of Carbon Dioxide Removal](#)

Carbon Markets 101

2.3 A Tale of Two Markets: Compliance & Voluntary



Biochar

Biochar (removal): Heating biomass in a pyrolysis machine creates biochar, which can be applied to land or materials to store the contained carbon.

Applying biochar to the soil can improve water and nutrient retention, increasing crop yields by 10-42%. ([Carbonfuture, 2023](#)). Equally, the pyrolysis process generates co-products including heat and energy.

Current mitigation: 0.5 MtCO₂/yr*
Mitigation Potential: 0.3 – 6.6 GtCO₂/yr*



DAC

Direct Air Capture (DAC(S)) (removal): An engineered project which captures and filters carbon from the air and pumps it underground to be stored.

DAC can be applied anywhere and takes up limited space/land-use. As an engineered solution, it can also create job opportunities including engineering roles.

Current Mitigation: 0.01 MtCO₂/yr from DAC, ERW, and Blue Carbon combined¹
Mitigation Potential: 5-40 GtCO₂/yr¹



BECCS

Bioenergy with Carbon Capture and Storage (removal): BECCS involves capturing carbon from the process of biomass generating energy (bioenergy) and storing it, typically underground

BECCS has the potential to remove 20-70 MtCO₂/year by 2050 in the UK. It also provides an opportunity for 18,000 jobs to be created, in the UK alone, for construction and operation of BECCS plants ([Ricardo Energy & Environment, 2018](#))

Current Mitigation: 1.82 MtCO₂/yr¹
Mitigation Potential: 0.5-11 GtCO₂/yr¹



Cookstoves

Cookstoves (avoidance/reduction): These projects replace traditional equipment with cookstoves, to either improve the fuel efficiency or switch the fuel used – reducing or avoiding the production of emissions.

Globally, unsustainable harvesting and incomplete biomass combustion contribute an estimated 1.9-2.3% of global emissions ([Clean Cooking Alliance, 2022](#)). Four million people die every year from illnesses associated with smoke from cooking, more deaths than malaria and tuberculosis combined ([Abatable, 2023](#)).

Cookstoves can reduce fuel use by 30-90% (Abatable, 2023) - providing significant co-benefits including: avoiding emission from forest degradation and reducing threats to biodiversity (as fewer trees are cut for fuel); improving clean air; increasing women's safety; enabling sustainable livelihoods; improving food security, amongst many others (Clean Cooking Alliance, 2022).

Current Mitigation: 163.4 million credits issued in the VCM ([VCM Dashboard, January 2023](#))
Mitigation Potential: 95 – 165 MtCO₂/yr ([Whiteman et al, 2018](#))

¹ Smith et al (2023)
[The State of Carbon Dioxide Removal](#)

Carbon Markets 101

2.3 A Tale of Two Markets: Compliance & Voluntary

There are two key types of carbon market – Compliance and Voluntary*:

Characteristic	Compliance	Voluntary
Regulated	Yes	No
Size per annum (\$ Billion)	800 (2023e)	2 (2022)
Key Buyers	Energy Intensive/ High-emitting industries	Corporates, Investors
Mechanism	Tax, Cap & Trade	Voluntary Green Financing
Types of credit	Allowances	Voluntary Carbon Credits

Carbon markets have multiple uses and benefits, including but not limited to ¹:

- 1 Enabling organisations to offset hard-to-abate, residual emissions which could not otherwise be addressed.
- 2 Climate revenue stream for emerging and developing economies, enabling global decarbonisation and climate financing.
- 3 Opportunities for early stage CDR technologies and natural carbon sinks to secure financing, enabling them to scale at the rate required to meet global temperature targets.
- 4 Significant co-benefits such as biodiversity increase or social benefits. Therefore, the markets can help to support wider sustainable development goals globally.

* As explained later in the report, there are certain markets which can be deemed as a hybrid between voluntary and compliance markets. For example, the market emerging under Article 6 of the Paris Agreement will have a unique combination of both compliance and voluntary action.

¹ Barclays Special Report (2023) Voluntary Carbon Markets: Close to tipping point – potential for \$250bn market in 10 years' time

Carbon Markets 101

2.3 A Tale of Two Markets: Compliance & Voluntary

2.3.1 Polluter Pays: The Compliance Markets

Compliance Carbon Markets are regulated markets which are typically in place to reduce emissions from heavy-emitting industries. The 30 Compliance Markets worldwide cover nearly 20% of global Greenhouse Gas (GHG) emissions.¹ The major Compliance Carbon Markets were expected to reach a total value of over \$800 billion in 2023.²

Usually, the Compliance Markets follow a carbon tax or cap-and-trade system. The latter works by setting a cap on the number of emissions which can be generated by the industries covered by the market. Each entity has a set number of 'allowances' which they must forego to cover their annual emissions. If they have spare allowances these can be kept or traded with other parties.³ One of the most prominent cap-and-trade systems is the EU Emissions Trading System (ETS) which covers around 45% of the EU's greenhouse gas emissions.⁴ Other significant emissions trading schemes include those in China, California, and the UK.

Certain crediting schemes can also be viewed as Compliance Markets. For example, the CORSIA scheme (Carbon Offsetting and Reduction Scheme for International Aviation), which will require all international flights to be subject to offsetting from 2027. This crediting scheme allows voluntary credits to be used for compliance purposes.⁵ Therefore, the line between Compliance Markets and VCM becomes slightly blurred.

Equally, an emerging market is that which is governed by Article 6 of the Paris Agreement. This will be an international market, whereby countries can trade authorised carbon credits, as a mechanism to achieve their Nationally Determined Contributions (national climate targets set under the Paris Agreement). This market could be viewed as a Compliance Market. However, it has significant overlaps with the VCM, as carbon credits created in the VCM may be used under the emerging Article 6.4 mechanism. Following an incomplete decision at COP28, we expect this mechanism to begin functioning following COP29. Equally, Article 6 frameworks have been led by the voluntary market participants and standards. Thus, some see it as a hybrid.⁶

The convergence of the VCM and Compliance Carbon Markets is a complex and ongoing discussion. From looking at the market and its current trajectory, it seems convergence is inevitable but will take a significant amount of time. For now, Eve Tamme, a carbon markets expert, states that "there is no perfect way to divide the carbon markets...Going forward, keeping emissions trading systems and carbon crediting mechanisms separate is a good start".⁶

¹ Bloomberg (2022) [Five things you need to know about global carbon markets](#)
² Bloomberg NEF (2023) [Global Carbon Markets Get Bigger Even as Trading Dips](#)
³ Deloitte (2023) [Understanding the Compliance & Voluntary Carbon Trading Markets](#)
⁴ Environment Protection Agency (2023) [The EU Emissions Trading System](#)
⁵ IATA (2023) [CORSIA Fact Sheet](#)
⁶ Eve Tamme (2023) [Converging VCM and Compliance Markets](#)

Carbon Markets 101

2.3 A Tale of Two Markets: Compliance & Voluntary

2.3.2 Extra Credit: The Voluntary Carbon Market

The VCM is a rapidly developing market which, unlike compliance markets, is not regulated. Instead, the market is guided by non-governmental standards, which set guidelines and act as a pseudo-regulator in the absence of formal regulation.

In the VCM, organisations can voluntarily purchase and retire carbon credits. It is a large ecosystem of players, including:

Buy-side:

- Corporates who may be buying credits to address their residual emissions
- Investors who want exposure to carbon as an asset class

Supply-side:

- Project developers and proponents who own/execute carbon projects

Sell-side:

- Such as brokers, exchanges and marketplaces who buy, sell, and trade credits.

Enablers :

- Standards that set guidelines for the projects and validate and verify carbon credits, as well as registries, auditors, credit ratings and insurance bodies. These organisations work alongside, and provide services to, buy-side, sell-side, and supply-side entities to enable their activities within the market.

In 2022, the VCM was valued at \$2 billion. ¹

Are Insurers involved in the VCM?

Many insurers are actively participating in the VCM, purchasing credits to meet their own net zero strategies. There are multiple insurance and reinsurance companies listed as collectively retiring over 400,000 carbon credits in 2022 ([Allied Offsets, 2023](#)). Swiss Re was one of the founding buyers in the [NextGen CDR Facility](#), a collaboration which brings together global buyers to scale up carbon removal technologies.

Carbon Markets 101

2.4 Claims-Made: How are the markets used?

Engagement with the carbon markets is only an element of an organisation's wider environmental sustainability strategy. It does not replace significant emissions reductions, but instead works in tandem to help organisations meet their environmental targets.

An Ecosystem Marketplace Report assessed the climate-related behaviour of companies purchasing voluntary project-based carbon credits for their own use compared with companies that are not engaged in the VCM. The report found that VCM buyers were 1.8 times more likely than non-buyers to be decarbonising year-on-year and also demonstrated more positive behaviour towards emissions targets and disclosures.¹ There are multiple reasons why individuals and organisations engage in the carbon markets:



Regulation

- A company may fall under a compliance scheme. These are typically high-emitting industries that need to meet their regulatory requirements to continue operating and/or avoid paying high fines.

Offsetting

- Organisations may voluntarily buy credits to offset their hard-to-abate residual emissions and reach environmental targets. They do this to uphold public commitments and maintain their social license to operate.

Climate Contributions

- Organisations may wish to purchase credits as a means to provide investment to support climate action which falls outside of the company's physical value chain ('beyond value chain'). In this instance, credits will not be used to offset emissions.

Investment Opportunities

- Investors see carbon as a significant new asset class, both for speculative and strategic investments, across both nature-based and engineered solutions.

¹ Ecosystem Marketplace (2023) [2023 All in on Climate: The Role of Carbon Credits in Corporate Climate Strategies](#)

3. Premiums with a Purpose: The Role of Insurance

Summary

There are a range of risks associated with the carbon credits, including those to the organisation, physical asset and intangible asset. The key risks include: non-delivery, reversal, counterparty, political, reputational, and invalidation.

Risks can occur at various stages of a project lifecycle and can impact multiple market participants including project developers, corporate buyers, and intermediaries.

Insurance is a key risk mitigation tool for those risks which are high severity but low frequency.

Insurance brings four key benefits to the market: A balance between traditional risk management practices and innovation; a stamp of confidence; a detailed assessment of carbon project risk; encourage market participants to take risks.

There is increasing demand for insurance within the market, which was highlighted at COP28. Multiple insurance companies are providing solutions to the market, to address this demand.



Premiums with a Purpose: The Role of Insurance

3.1 What are the Risks Associated With Carbon Credits?

Engaging in the carbon markets brings risk. There are shifting standards around the quality of carbon credits and what constitutes the right end usage. There are also inherent risks that come with nature-based solutions and new technologies. For example, the risk that pest or disease damages a forest or that an engineered project does not receive the required permits. Some of the key risks associated with carbon projects can be found below:

Risk	Description
Non-Delivery	The risk that the credits expected/promised from a project are not delivered in part or in full.
Reversal	The risk that carbon captured by a project may be re-released into the atmosphere. This risk is most significant for forestry and land-use projects, for example if a forest burns down. Engineered solutions could suffer a reversal, for example if carbon stored underground leaked.
Counterparty	The risk that parties within the transaction may default on the contract and not fulfil their obligations. This can be a particular concern within the VCM, as it is an unregulated market with a large number of small companies in a wide range of jurisdictions. A lack of standardised contracts can exacerbate this risk.
Invalidation	The risk that the carbon credits or an entire project are invalidated, for example due to a fraudulent or negligent act, a significant reversal of carbon dioxide back into the atmosphere or a significant shift in methodology.
Political	The risk that a host country may alter its regulations, impacting the carbon project, transaction or sale of credits. This is an emerging risk, in particular for Article 6 markets.
Reputational	The risk that an organisation may suffer reputational damage due to factors such as the credit used or claims used/end-use of the credit.
Price	For companies that trade or invest in carbon credits, market prices can be turbulent. For companies that use carbon credits to meet net zero targets, price poses a wider risk. If a corporate is forced to replace carbon credits due to invalidation, it takes on a potentially uncapped future liability by being forced to replace those credits at unknown future prices.

Premiums with a Purpose: The Role of Insurance

3.1 What are the Risks Associated With Carbon Credits?

There are a range of risks associated with carbon projects and the carbon markets. These cover organisational risks, risks to physical assets (such as to machinery) or intangible assets (such as the carbon credit itself).

Risks can occur at various stages of a carbon project lifecycle. The risks faced by a party at the concept stage of a project differ from those present once the project is issuing credits. For example, financing may be a key risk at the concept stage. However, once a project is issuing credits, financing may be less of a concern and instead the key risk is that a reversal event could occur. Likewise, these risks can be faced by multiple market participants, from project developers to investors to marketplaces.

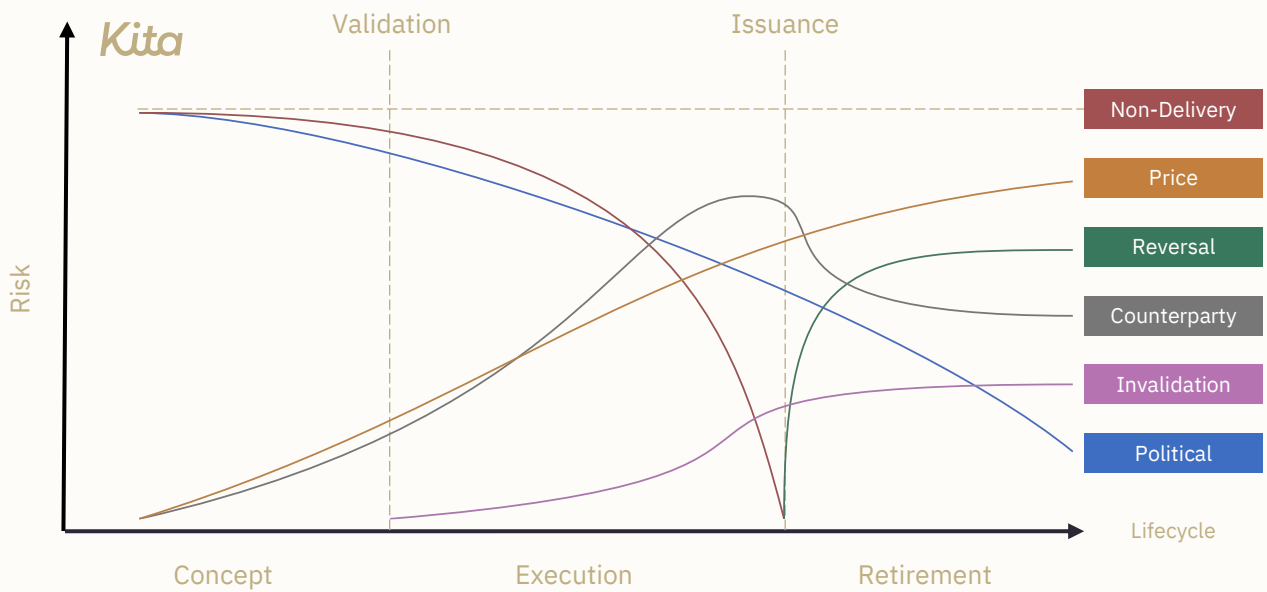


Figure D: The key risks associated with carbon projects, plotted against the carbon credit lifecycle.

Premiums with a Purpose: The Role of Insurance

3.2 How Can Insurance Provide Risk Mitigation?

Risks can be managed in a range of ways. The approach taken often depends upon the severity and frequency of the risk.

Currently, within the carbon markets, those risks which are high-severity but low-frequency are being transferred between market participants. For example, managing reversal risk via mechanisms such as buffers, or delivery risk via the use of contractual agreements. These mechanisms are logical but are not always the most efficient. They can result in barriers to entry and, at times, risk is being held by a party that is not best placed to hold the risk. Insurance can help to de-risk the market and reduce barriers to entry, by acting as a creditworthy third party to whom risk can be transferred.

Insurance for the carbon markets is a concept which has been discussed since the early 2000s. However, due to the long-term nature of carbon risks, lack of data, and varying landscape (particularly within the VCM) the markets still suffer from an insurance protection gap. Insurers have started to innovate with novel insurance products tailored to the unique risks associated with the market. By mitigating the risks associated with carbon credit transactions, insurance reduces barriers to entry and unlocks capital flows into carbon projects, enabling them to scale.

Emerging insurance products are both available on an indemnity or parametric basis depending on the risk appetite and relevant risks/triggers that are of particular concern for insureds. Section 3.4 shows a selection of current product offerings, with many more currently in development across the market. Indemnity coverage protects broad risks such as those shown in Figure D against losses incurred. Parametric coverage target specific triggers, such as wildfire, using developing remote-sensing and analytics indexes.

Insurance can provide four key benefits to the market:

1. A balance between traditional risk management practices and innovation - enabling improved access to finance to scale carbon projects.
2. A stamp of confidence - risk management and regulatory expertise, honed over decades, can bring confidence to the market and its participants.
3. Detailed assessment of carbon project risk - highlighting areas of concern across the market and project types, where wider risk management improvements are required.
4. Encourage market participants to take risks - insurers take on responsibility when things go wrong, giving market actors the freedom to take risks which are necessary to release capital and scale carbon projects and their associated benefits.¹

“The power of insurance is to enable things that otherwise would not be possible.” –
Charlie Pool, Howden

¹ BeZero Carbon and Kita (2023) [Three pillars of integrity](#)

Premiums with a Purpose: The Role of Insurance

3.3 The Markets are calling and I must go:

Demand for Carbon Insurance

The risks within the carbon market impact market participants on the buy-side, supply-side, and sell-side. There is high demand for a plethora of insurance products that meet the needs of a range of market participants.

3.3.1 COP28

During COP28, insurance was a key topic of interest. King Charles III, in his opening speech, mentioned that the insurance sector will play a “vital role in incentivising more sustainable approaches and providing an invaluable source of investment to reduce the risks we face”.¹ The importance of insurance to scale the carbon markets was reiterated by multiple organisations. At the Digital Innovation Pavilion, Verra, Aon Climate, and Context Labs recognised that insurance will be a requirement to grow the carbon markets to scale.²

The International Organization of Securities Commission stated - “Insurance companies will be an important stakeholder in the future... [they] may help to create trust in these markets by covering risks along the value chain of the VCMs.” They reiterated that “insurance solutions would need to be bespoke, attending to the different industries and sectors involved in the VCMs”.³

The opportunity for innovative insurance mechanisms was also apparent. Six major standards announced their collaboration, with goals to pursue measures to extend the durability of carbon stocks, “in particular through innovative insurance mechanisms”.⁴ Likewise, the CrossBoundary Group Carbon Finance Playbook highlighted that “Insurance is an important risk mitigation tool for large-scale projects in most industries, yet it is underutilised for carbon projects today”.⁵

Thus, the need and opportunity for insurance in the carbon markets has become ever more apparent.

3.3.2 Market Demand for Insurance

“As with any physical/infrastructure asset, insurance will be an essential tool required to provide stability and confidence to investors and carbon credit offtakers. At Vertree we have seen first-hand how our clients are increasingly discerning and looking for risk mitigation technologies to support their activities in the carbon markets. Therefore, carbon insurance products have the potential to remove one of the key barriers to entry and support the scaling of the carbon markets, which we see as essential for tackling the urgent climate crisis.”

— David Costa-D’Sa, Vertree Partners

“Both insurance and carbon ratings are crucial pillars of integrity in the voluntary carbon market. To grow the industry on a gigatonne scale, carbon insurers like Kita and ratings agencies like BeZero need to work hand in hand to de-risk projects and in turn give market participants the confidence to invest.”

— Ted Christie-Miller, BeZero Carbon

“Insurance products will play a key role in growing confidence in the carbon removal market and we look forward to collaborating with the ecosystem on this much needed innovation. Quantifying and pricing risks is needed to build buyer trust and accelerate market growth, which is critically needed to remove 220 gigatons of carbon by 2050.”

— Marta Krupinska, CUR8

¹ King Charles II (2023) [A speech by His Majesty The King at the opening of COP28, Dubai, U.A.E](#)

² Climate Chain Coalition (2023) [Insurance + dMRV: Managing Risk and Enhancing Trust in the VCM](#)

³ IOSCO (2023) [Voluntary Carbon Markets Consultation Report](#)

⁴ IETA (2023) [COP28 INDEPENDENT CREDITING PROGRAMME JOINT STATEMENT](#)

⁵ CrossBoundary Group (2023) [Carbon Finance Playbook: Demystifying the Capital Raising Projects For Nature-Based Carbon Projects in Emerging Markets](#)

Premiums with a Purpose: The Role of Insurance

3.4 Gigatonnes Guaranteed: The Carbon Insurance Landscape



- Parametric Solutions for de-risking investment in voluntary carbon market projects, Specific triggers using independent and trusted geospatial intelligence and remote sensing monitoring to payout based on specific perils impacting project performance.
- Examples of coverage include Biomass Loss Coverage, Deforestation Alert Coverage and Extreme Weather Event coverage, covering climatic perils impacting risks related to project performance, delivery, and permanence.
- Parametric is well suited to address gaps in coverage for global carbon markets, especially surrounding climate risks that impact project performance and are needed to de-risk project investment and help carbon markets properly scale and mature.



- Set to be the world's first insurance company with a carbon credit balance sheet, CarbonPool will write insurance contracts that pay out in credits, rather than in cash.
- To do this CarbonPool will invest its own capital in high quality carbon credits on an ongoing basis to enable it to pay client claims.
- CarbonPool has already been pre-underwriting a range of projects that are producing carbon dioxide removal credits, and will provide in-kind insurance protection against project delivery risk (a shortfall in carbon credits actually produced versus what was planned), permanence (the reversal of the carbon sequestered from the atmosphere due to natural catastrophe or technological breakdown), and accidental emissions (e.g. carbon capture interruption due to technology or machine breakdown).
- The company's clients are corporates, investors and carbon credit project developers who are investing in carbon credits and need certainty that those credits will be delivered and that the carbon stays sequestered. The company provides bespoke risk assessment for its clients, assessing the underlying climate, weather, human and technology risks associated with projects in their portfolios.



XL Insurance

- Excess Emissions Insurance:
- EEI covers your vessel's carbon emissions in the event of a fortuity (covered by our AXA XL UK & Lloyd's Marine Hull policy). It functions by contributing to premium carbon removal and avoidance projects for the additional emissions impact caused by course deviations such as port of refuge, port of repairs, picking up spares or other reasonable reasons (subject to a valid hull policy claim).
- Unlike traditional insurance, where you'd be offered a cash payout, the indemnity is provided as voluntary carbon credits equivalent to the excess emissions emitted.

Premiums with a Purpose: The Role of Insurance

3.4 Gigatonnes Guaranteed: The Carbon Insurance Landscape

DESCARTES

- Descartes covers the wildfire risk of forestry-based carbon credit projects to protect project operators against potential reverse emissions and loss of credits.
- The solution utilizes advanced satellite imagery to detect burnt areas in the pre-selected forestry plantations and indemnifies based on the pre-agreed values per hectare within weeks of the loss occurrence.
- Descartes' parametric solution can be adapted to cover the current value of trees, as well as the projected value of future tree growth to issue carbon credits, helping investors and managers hedge their risk exposure in an effective manner.

HOWDEN

- Howden worked with carbon finance business, Respira International, and Nephila Capital, a leading investment manager specialising in reinsurance risk, to develop a carbon credit invalidation insurance solution to increase confidence in the Voluntary Carbon Market.
- The product was developed in partnership with Respira and Nephila by Howden, who were advised by climate risk finance company, Parhelion. It was incubated through the product innovation work stream on the Insurance Task Force of the Sustainable Markets Initiative.
- The product, which is wrapped around books of independently-verified, high-quality carbon credits, provides cover for third-party negligence and fraud.

Kita

- Kita is the carbon insurance specialist. Kita develops bespoke carbon insurance products that safeguard the quality and performance of carbon transactions. By reducing risk, carbon insurance channels investment towards high-quality carbon projects, enabling them to scale at the pace needed to address the climate crisis.
- Kita is a coverholder at Lloyd's of London, underwritten by Chaucer Group, Munich Re and Renaissance Re.
- Kita's core product is Carbon Purchase Protection Cover, protecting buyers of forward-purchased carbon credits and investors against non-delivery.
- Kita also offers protection against Abandonment & Insolvency for pre-validation projects and Fraud & Negligence cover for post-issuance credits.
- All Kita's insurance policies can provide claims repayment in cash or in like-for-like carbon credits.

Premiums with a Purpose: The Role of Insurance

3.4 Gigatonnes Guaranteed: The Carbon Insurance Landscape



- Oka, The Carbon Insurance Company™ (Oka) is a full-stack insurance carrier and Lloyd's syndicate. Oka Syndicate 1922 was approved to begin underwriting on January 1st 2024.
- Their flagship carbon-credit insurance solution Carbon Protect™ provides buyers with financial compensation in the event of unforeseeable and unavoidable post-issuance risks. Their policy pays out in the event of invalidation or reversal by the registry, which could arise in the event of any of the following scenarios:
- Invalidation happens when certified emission reductions are cancelled or impaired, usually due to non-additionality, over-crediting, project fraud, adverse impacts, etc.
- Reversal happens when removed or avoided carbon is re-released into the atmosphere, usually due to natural catastrophe or human-induced activity, such as logging.
- Targeting the post-issuance phase of the credit lifecycle, Oka works with large sellers to embed insurance at the point of sale. By wrapping issued credits with insurance – which functions much like a stamp or marker of premium quality – they make them more valuable for sellers and more attractive to corporate buyers, who may otherwise be deterred from engaging with the VCM due to unaddressed risks.
- Protected by Oka, one credit purchased will always represent one metric ton of carbon removed. By upholding accounting integrity in the unregulated VCM, they instil confidence in and drive capital towards climate investments.



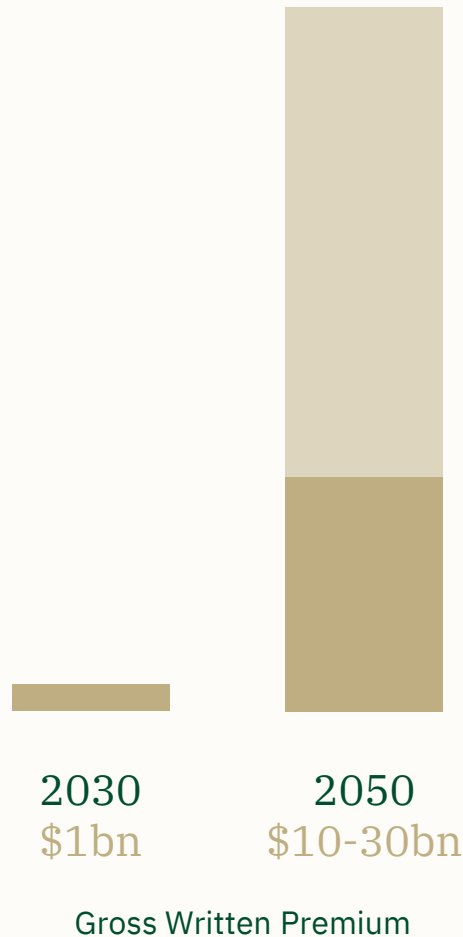
we²sure
BUILDING BETTER TOGETHER

- We2Sure, is a game-changing environmental InsurTech leading the way in building trust and security in the carbon marketplace. Through sophisticated insurances, rigorous risk assessments, and meticulous scrutiny of carbon credit production, We2Sure is revolutionizing sustainability. They combine an innovative blend of financial engineering, insurance expertise, and data science, powered by proprietary advanced MRV+ Real-Time Asset Management platform, the Carbon Actuator.
- Carbon Credit Certificate Insurance: an embedded protection solutions providing assurance against potential threats such as Fraud, Theft, Duplication, and Re-issuance which aligns with the latest EU certification framework.
- Carbon credit production parametric insurance: compensates the amount of physical reduction in carbon sequestration due to forestry natural perils, fire and/or landownership change of use or confiscation (Governments, forestry management companies, and investors in forestry funds).
- Corporate sustainability insurance: ensure the environmental sustainability of your business by offsetting your unexpected carbon usage with the cost of retiring carbon credit certificates.

4. Gross Written Carbon: Opportunity, Value, Challenges and the Way Forward

Summary

- The Voluntary Carbon Market (VCM) was valued at \$2 billion in 2022 and is estimated to grow to between \$10–\$250 billion by 2030. Some organisations estimate that it will exceed a value of \$1 trillion by 2050.
- In 2023, the value of the global Compliance Carbon Markets was estimated to be over \$800 billion.
- We estimate by 2030 that GWP could be up to \$1bn annually and by 2050 could be up to \$10-30bn annually, underwritten across the industry.
- Key Challenges: Significant risks which are yet to be addressed; shifting market; lack of data; lack of confidence; market education.
- Overcoming the challenges: Data Collection; Strengthening current risk management mechanisms to improve market confidence; Working with the wider market; making it easy for clients; Working alongside other insurance companies.



Gross Written Carbon: Opportunity, Value, Challenges and the Way Forward

4.1 The Value of the Voluntary Carbon Market

In 2022, the Voluntary Carbon Market (VCM) was valued at \$2 billion.¹ Abatable, a carbon intelligence and procurement platform, estimated that in 2022, \$10 billion worth of deals took place.² This suggests that investment into the market was approximately five times the value of the carbon credits issued.

Over the last couple of years, the VCM has faced increased scrutiny, leading to a lack of confidence in the market. This was reflected by a drop in carbon credit volumes and prices over the course of 2023. Consequently, the market has been valued by some at a lower level. For example, Barclays estimated a value of £500 million.³ However, despite criticism, many have remained positive about the market.

New additions to the market in 2023, including guidance from the Voluntary Carbon Market Integrity Initiative (VCMII) and the Integrity Council for the Voluntary Carbon Market (ICVCM); insurance; ratings; and new market standards, are enabling confidence to grow. Therefore, despite a tumultuous period, expected growth of the market remains optimistic. This was supported in December 2023 when, according to Clear Blue Markets Data and MSCI, a record number of retirements across the VCM's major registries were made.⁴

According to a Barclays Special Report, the VCM could grow to \$250 billion by 2030.³ Various organisations have made predictions of VCM growth in 2030, ranging from \$10 billion to \$250 billion. It is difficult to make market size predictions, partly due to the complexity, rapid evolution, and convergence of the markets. However, despite varying values, the lowest forecasts still see the market grow fivefold. Equally, long term predictions are optimistic - with some expecting the market to exceed a trillion dollars by 2050.⁵

The VCM currently covers most of the credits sold by carbon dioxide removal (CDR) projects. According to McKinsey, based on expected delivery of announced CDR projects, it is estimated that the CDR market could reach \$40-\$80 billion by 2030.⁶ As the CDR industry continues to scale, due to its overlaps with the VCM, it is likely that this will also encourage the market's growth. Likewise, the predicted convergence of the voluntary and compliance markets will also help to stimulate growth.

For further information about the growth of the VCM please see section 4.3.

¹ Morgan Stanley (2023) [Carbon Offset Market Growth](#)

² Abatable (2022) [What happened in the VCM in 2022 and where it will go in 2023](#)

³ Barclays Special Report (2023) Voluntary Carbon Markets: Close to tipping point – potential for \$250bn market in 10 years' time

⁴ ClearBlue Markets (2023) [LinkedIn Post](#); MSCI (2024) [2023 VCM In Review: Carbon Markets at an Inflection Point](#)

⁵ [BCG \(2023\)](#); [Morgan Stanley \(2023\)](#); [McKinsey & Company \(2021\)](#);

[Credit Suisse \(2022\)](#); [Bain & Company \(2024\)](#); [ICVCM \(2022\)](#); [Barclays \(2023\)](#); [Bloomberg \(2023\)](#);

⁶ [McKinsey Sustainability \(2023\) Carbon Removals: How to scale a new gigaton industry](#)

Gross Written Carbon: Opportunity, Value, Challenges and the Way Forward

4.2 The Value of the Compliance Carbon Markets

In 2023, the value of the global Compliance Carbon Markets was estimated to be over \$800 billion.¹ The Compliance Markets are closely tied to policy change and geopolitical tensions. Therefore, their size and growth can fluctuate depending on external factors and environment.

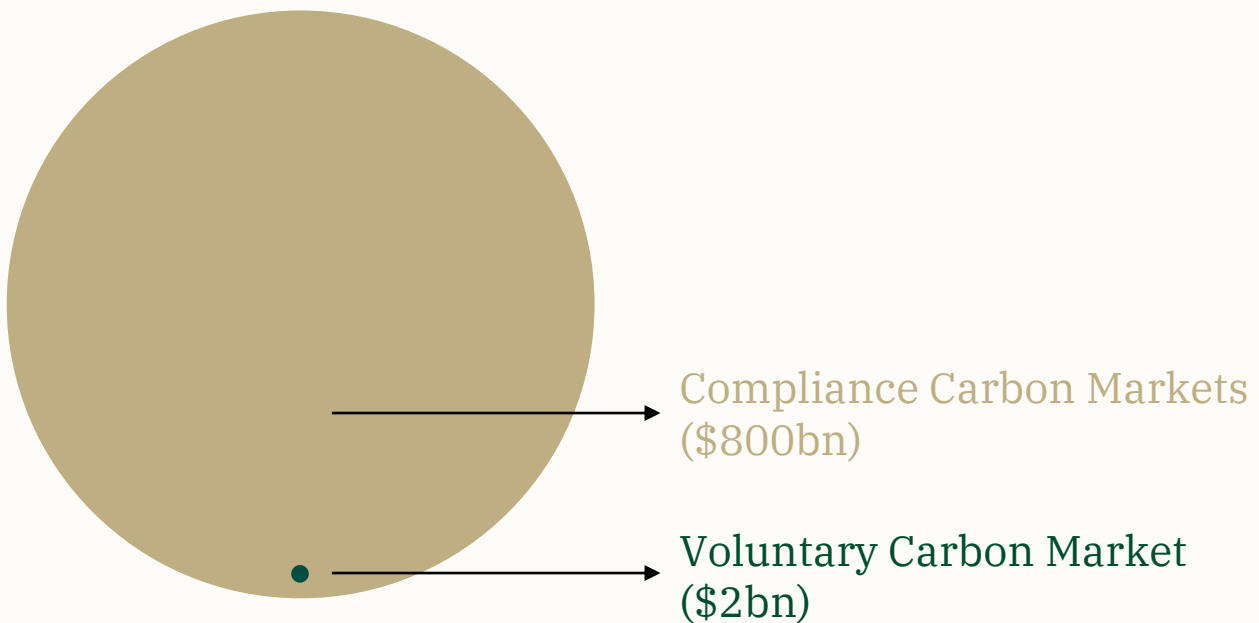


Figure E: A proportional representation of the value of the Compliance Carbon Markets (2023 estimate) compared to the value of the Voluntary Carbon Market (2022 estimate).

Gross Written Carbon: Opportunity, Value, Challenges and the Way Forward

4.3 When, not if: The Insurance Total Addressable Market

The carbon markets present a significant new business opportunity for the insurance industry, comparable to the growth and evolution of the cyber insurance market. As they scale, the insurable risks will grow in tandem.

Mapping VCM growth forecasts, adjusting for insurance penetration and applying conservative composite insurance product rates (both for existing general insurance products and new carbon insurance coverages) we estimate by 2030 that GWP could be ~\$1bn annually and by 2050 could be ~\$10-30bn annually, underwritten across the industry.

To reach these forecasts, our methodology starts with the VCM sizing estimates from leading financial institutions and consultants (see Figure F), which show a broad yet bullish distribution. Then we modelled conservative estimates for both insurance penetration and pricing. We assumed penetration will start low (<5%) and then rise steadily in the years to 2030 (~10-30%), before reaching a more mature steady state towards 2050 (~30-50%). Conversely, we assumed insurance pricing will start high (~1-10%) as the industry factors in an uncertainty load, which will then steadily dissipate (to ~1-5%) as emerging loss trends crystallise, industry understanding and risk appetite increase, and available (re)insurance capacity increases. These assumptions were validated across a range of industry experts to reach estimated market size ranges over time.

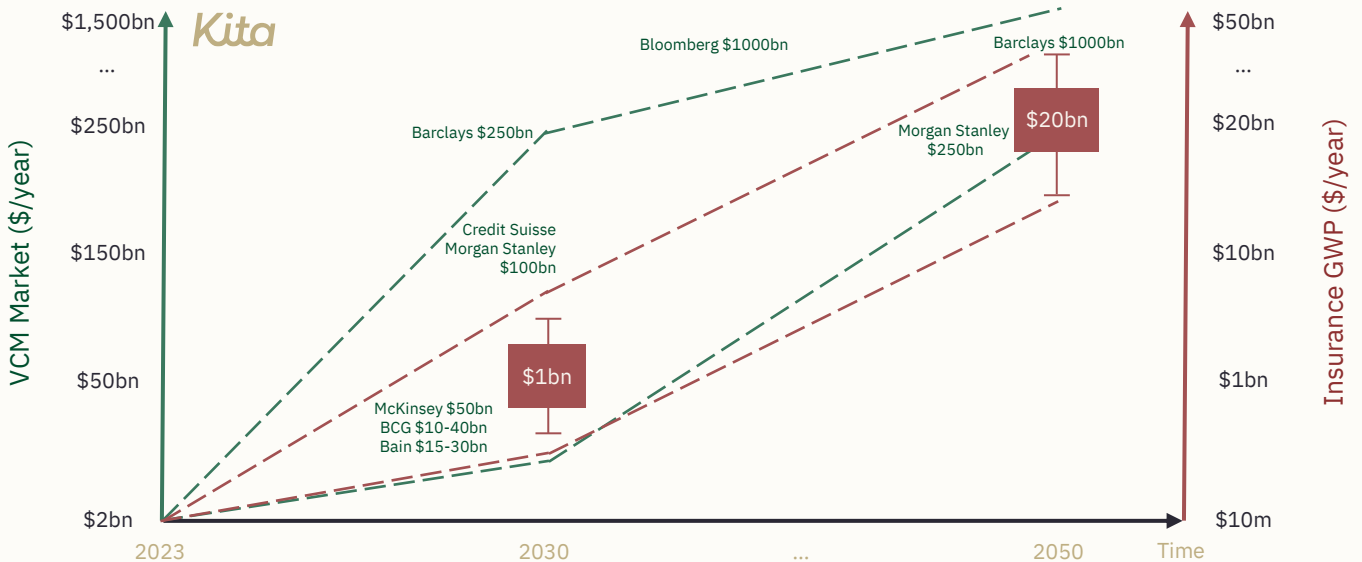


Figure F: The Insurance GWP Opportunity, plotted against the VCM Market Growth
 Adapted from the LinkedIn post by [Giancarlo Savini](#) / Using data from Morgan Stanley, BCG, McKinsey & Company, Credit Suisse, Bain & Company, ICVCM, Barclays, Berenberg, and Bloomberg / diagram not to scale / includes all P&C lines plus bespoke carbon credit policies / annual credits only.



“We estimate by 2030 that GWP could be ~\$1bn annually and by 2050 could be ~\$10-30bn annually, underwritten across the industry.”

Gross Written Carbon: Opportunity, Value, Challenges and the Way Forward

4.3 When, not if: The Insurance Total Addressable Market

The GWP opportunity represents a composite sector view, covering both specialist insurance for carbon credits, as well as the traditional lines required for carbon projects and businesses active in this space (i.e. construction/operational, property, casualty, financial lines, marine, etc.). Although we too are bullish on the long-term opportunity for the insurance industry, we consciously applied a conservative approach: We discounted both the impact of potential regulation mandating insurance, as well as the integration of the compliance and voluntary markets – if these do indeed happen, it would produce a much larger estimate; and we derived insurance potential from the estimated annual carbon credit market, not the additional investment required to produce these credits themselves (a potential ~3-5x multiple, if applied on top).

The principal driver behind these market forecasts is the critical need to protect all existing natural capital and also surpass 5-10 billion tonnes of annual carbon removal by 2050 and beyond – not only to reach and maintain net zero, but to also reverse the global temperature rises we have seen and shall continue to see in the coming years. As such, one key variable to market size is actually a constant – the climate carbon clock is ticking.

Based on discussions with market experts the question is when, not if, this figure will be reached as it just depends on the carbon market scale-up itself – not a simple task, and one that is comparable to scaling up a new commodity industry, such as coal or natural gas, from near scratch.

As the expressions go: “It is difficult to make predictions, let alone about the future” and “The best way to predict the future is to create it” – so now it is incumbent on the insurance industry to step up and create the risk management tools and build the risk transfer capacity that the carbon markets need to meet this global climate challenge.

“The exponential growth of the carbon markets and carbon insurance is inevitable: the question is not if, but when?” – Hayley Maynard & Tom Graham, Chaucer

“..it is incumbent on the insurance industry to step up and create the risk management tools and build the risk transfer capacity that the carbon markets need to meet this global climate challenge.”

Gross Written Carbon: Opportunity, Value, Challenges and the Way Forward

4.4 Emission Impossible: The Key Challenges

There remain a number of key challenges which make it difficult for insurance to effectively and efficiently enter the carbon markets. These challenges include:

1) Incurred But Not Reported: Significant risks which are yet to be addressed

There are a number of significant risks to carbon projects which are yet to be fully understood or addressed by the insurance industry at large. For example, forestry projects are now faced with increased risk from wildfire, drought, floods, and pests, primarily due to climate change. Likewise, mangrove projects are at severe risk from sea level rise. The impacts of climate change are unpredictable, with risks rapidly increasing in frequency and severity.

Additionally, new project types present unexplored risks. For example, for direct air capture, modelling CO₂ pipeline & subterranean storage risks remains unclear. Could there be potential geological consequences, such as those we have seen with fracking?

These risks threaten carbon projects and need to be thoroughly explored and understood in order to underwrite them.

Equally, many in the market are seeking all-risk coverage. The insurance industry's understanding of the market and its risks must improve to be able to offer an all-risks policy for an affordable premium.

2) Policy Limits: The Shifting Market

From emerging regulations to changing contractual structures, this is a market where defined use cases for insurance need to evolve into a moving target. Liabilities between different market actors are still being clarified: for example, who has responsibility to make good a reversal? Equally, insurers need to determine how to value the credit for insurance purposes: should claims pay for the cost of the initial carbon credit or its replacement? In relation to these examples and many more, it is important for insurers to understand the market deeply before engaging.

This changing landscape, particularly in the VCM, is due to the fact that it is an unregulated market. This is a key concern for underwriters, with Insurance Insider quoting that –“It is the unregulated nature of the underlying marketplace that is keeping traditional insurance away from this market”.¹ Insurance markets seek a thorough understanding of every element of a market before entering. As the carbon markets have such a shifting landscape, this can be challenging and form barriers to entry.

Gross Written Carbon: Opportunity, Value, Challenges and the Way Forward

4.4 Emission Impossible: The Key Challenges

3) Board-ereaux: Lack of Data

Insurance companies rely on data patterns, to determine future events and levels of risk. The carbon markets, compared to other markets, are relatively new and thus lack historical data. Equally, due to a lack of regulation, markets have not been entirely transparent, which has led to very limited publicly-available data. Therefore, insurance companies are having to take innovative approaches to gather data and assess risk.

4) Carbon Endorsement: Lack of confidence in the market

In 2023, carbon markets faced increased scepticism and criticism. This has led to a lack of confidence in the market, with many actors being hesitant to participate - particularly on the demand-side. As insurance follows a transaction, and with smaller carbon credit volumes and fewer transactions taking place, this presents a significant challenge. Industry leads have reiterated this.

5) Planting Seeds: Market Awareness

Carbon insurance is a relatively new concept. Therefore, many market participants may be unaware that insurance exists or have a lack of understanding as to how insurance can be used as a risk management tool for carbon transactions and projects. Currently, market participants are managing risks via traditional mechanisms, such as contractual agreements, which may be ineffective or burdensome. Equally, as insurance is a relatively new mechanism in the market, existing transaction structures can be unsuitable for insurance, as insurable interests may not be clearly defined. This means, at this early stage, insurance can be a time-consuming process, as education is required and more mature transaction structures need to be developed and adopted.

Gross Written Carbon: Opportunity, Value, Challenges and the Way Forward

4.5 Seeing the Forest for the Trees: Overcoming the Challenges

1) Piercing the Canopy: Data Collection

It is clear that the market requires increasingly transparent and robust data for it to function effectively. This would not only benefit the insurance sector but also other bodies, such as ratings agencies.

Across the market, improving data has become a topic of interest. For example, increased use of digital monitoring, reporting, and verification (MRV) is taking place. These new techniques result in robust and detailed data which enables insurance companies to continuously assess risk, to create more bespoke policies and premiums. Likewise, the use of blockchain to increase transparency is being introduced.

“It is simply about weaving together strands of data that we already have and applying them in a new context” –
George Beattie, CFC

Standards, such as Verra, have taken on market feedback by adjusting their collection and provision of data from projects. This makes market data easier to gather, access and understand. Consistent data across the market will result in data patterns which are extremely beneficial for the future development of carbon insurance products.

Whilst the broader market improves, insurers can also work directly with data providers, such as MRV bodies or ratings agencies, to gather and understand the data in greater depth. They can also work with other markets, to gather data proxies. As the carbon markets present unique and rapidly changing risks, it is important for the insurance industry to be innovative.

Gross Written Carbon: Opportunity, Value, Challenges and the Way Forward

4.5 Seeing the Forest for the Trees: Overcoming the Challenges

2) Still Buffering: Strengthening current risk management mechanisms to improve market confidence

There are significant opportunities for insurance to influence and strengthen current risk management within the VCM. For example, Kita has explored the ability of insurance to strengthen the buffer pools which standards have in place.¹ Standards typically hold a portion of credits from each project in their buffer. This buffer can then be relied upon to replace credits, if there is a reversal. The buffers are developing as the market develops, from the integration of new mitigation mechanisms and MRV solutions, to the building of new buffers. However, there are some concerns around the integrity of the buffer system and the potential for credit contributions to decrease market liquidity.

There is an opportunity for insurance and the buffers to interlink, bringing the insurance industry's long history of risk management and portfolio construction to support resilience and build trust in the integrity of the buffer. One example could be that insurance can help to provide a smoothing strategy to manage downside risk of unexpected failure (where actual losses are higher than those modelled).

These opportunities show the capabilities of insurance to strengthen the market and work alongside existing risk management mechanisms to improve market confidence.

3) Grab a Shovel: Working with the wider market

Insurance is an underlying foundation of any market and the carbon market is no different. To regain trust in the carbon markets, it is important for insurance bodies to work alongside carbon market participants, to understand how the sector can support and drive market improvement and also to understand the key risks faced by market participants. One way to do this is through participation in working groups or coalitions or by providing feedback to public consultations.

Equally, the insurance industry needs to provide education on how and why insurance is essential for the carbon markets. By working closely with market participants, the insurance industry can help to drive further understanding of how insurance can effectively manage risk and the changes that need to be made within the market, in order for insurance to be able to make the greatest impact.

“How can insurance and other stakeholders come together to shape the narrative that will determine how the voluntary carbon market will grow and scale?” – Natalia Moudrak, Aon

Gross Written Carbon: Opportunity, Value, Challenges and the Way Forward

4.5 Seeing the Forest for the Trees: Overcoming the Challenges

4) Less Hot Air: Making it easy for clients

The carbon markets are complex and evolving. Therefore, it is important that insurance bodies have a thorough understanding of the market and its risks, to be able to support their clients in an effective manner. The easier it is for potential clients to understand, analyse, and implement insurance, the more likely it is that insurance can reach its full potential impact.

Currently, purchasing credits and subsequent carbon insurance is a bespoke process which takes time. Going forward, as insurers become more familiar with the carbon landscape, the industry must focus on making the insurance processes seamless. For example, via the use of digitisation, automation and embedded insurance coverage.

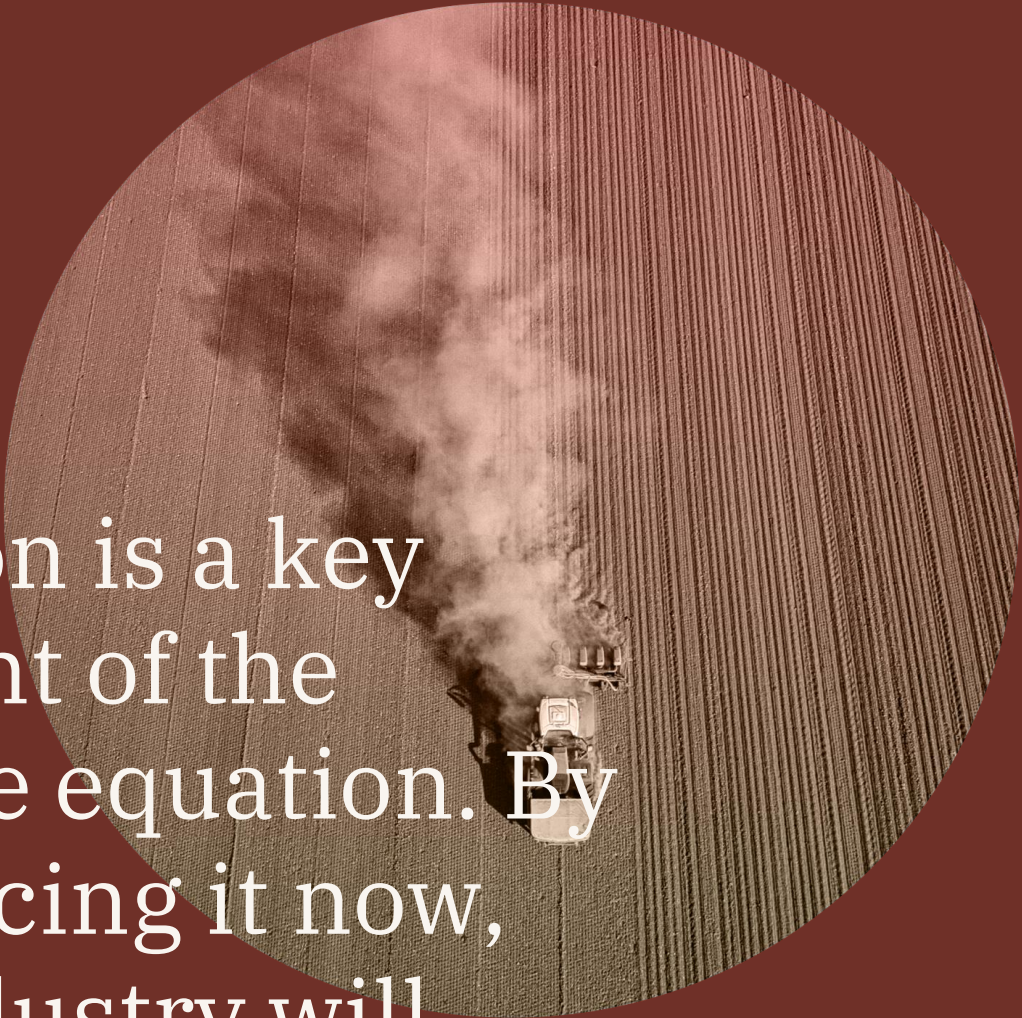
5) Carbon Dating: Working alongside other (re)insurance companies

The carbon markets carry systematic risks, especially as they are closely linked with climate change. Systematic risks cause challenges for insurance, regardless of the market. If the risk is too high, private insurers cannot handle the cost alone.

We have seen the government and private insurance sector work together to handle systematic risk, for example with flooding and terrorism (Flood Re and Pool Re). There could be a similar opportunity for carbon market participants, (re)insurers and government to work together to manage systematic risk within the carbon markets.

Outside of systematic risk, this is a new industry for the insurance sector. Therefore, there is a great deal of learning and understanding to take place. It is integral that the (re)insurance market collaborates to understand and address the risks faced by the carbon markets. There is not a one-size-fits-all solution.

“The London market is fantastically positioned to work together and syndicate risk together and that needs to happen for us to serve our clients’ needs.” – Nathalie Thong, AXA XL



“Carbon is a key element of the climate equation. By embracing it now, the industry will unlock a unique opportunity which can provide both profit and purpose.”

5. Epi-‘log’: Concluding Thoughts

The rapidly evolving carbon markets are complex, with unique risks and notable challenges. However, the existence of insurance within these markets is crucial for their exponential growth. The introduction of insurance will address risks, build confidence, and thus increase investment, enabling the markets to scale at the rate required to meet global temperature targets.

The carbon markets present a significant opportunity for the insurance industry – a total addressable market of \$1bn annual GWP by 2030 and \$10-30bn annual GWP by 2050, enough to be considered as “the next cyber”, whilst simultaneously driving emissions reductions and removals. World-leading insurers, brokers, and reinsurers have recognised this opportunity and are providing capital, products and services which are suited to the carbon markets. The insurance industry must scale these solutions, by working together to understand the market landscape, refine the product offerings, and be flexible to the carbon markets’ ever-changing needs.



As CEO of Lloyd’s of London, John Neal, said: “I genuinely, genuinely think ... climate is the biggest single opportunity the insurance industry has ever seen.”¹

Carbon is a key element of that climate equation. By embracing it now, the industry will unlock a unique opportunity which can provide both profit and purpose.

It is now down to those in the insurance industry to determine where they can make an impact – not a question of if, but when.

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Our consulting engagements span across strategy, operations, technology, transformation and M&A.

We have also built cross-industry expertise in Sustainability across the insurance sector, with an in-depth understanding of the sustainability strategy of (re)insurers across the globe. We are uniquely placed to use this expertise in our engagement with (re)insurers on their approach to sustainability.

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An aerial photograph of a river meandering through a lush green landscape. The river is a vibrant teal color, winding through dense green vegetation. The meanders are prominent, creating a complex, looping pattern. The lighting is bright, highlighting the textures of the water and the surrounding land.

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