BeZero

Insuring Nature-based Solutions in the UK

howden Blackford.

Foreword

Nature-based Solutions have the potential to provide up to 30% of the global climate mitigation required to limit global warming to 1.5 degrees (UN Global Compact).

To do so, there will need to be significant investment. In the UK alone, £3bn of funding has been allocated to climate change solutions that protect and restore nature and biodiversity (UK Government)

As with any growth market, this represents a huge opportunity for the insurance industry.

Insurance has a significant role to play in society's journey to a low-carbon future both by de-risking companies' and industries' transition to low-carbon energy sources and in helping to increase people's confidence behind the removal of carbon from the atmosphere.

This report provides practical, insightful guidance on how we might use the huge pool of untapped modelling skills, data and capacity of the insurance market to help with the solutions to the challenges of tomorrow.

Charlie Langdale
Head of Climate Risk & Resilience, Howden

Key Takeaways

Nature-based solutions (NbS) have a large role to play in meeting climate goals and have the potential to help arrest the loss of biodiversity, both in the UK and globally. Here, we assess the role the insurance industry can play in helping NbS markets scale, and the huge market opportunity that could flow from it.

(1) Insurance schemes are proving effective in restoring and protecting green infrastructure. Building on that success in NbS and carbon markets will come with underwriting challenges.

(2) Voluntary carbon markets may be a $50 billion+ industry by 2030. Insurers can help to make that happen and create a new insurance market worth at least $1.3 billion globally.

(3) In the absence of regulation, insurers can kick-start the opportunity by expanding from adjacent markets and insurable risks, partnering with investors, and leveraging technology.

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Executive Summary

Nature-based Solutions - role in meeting Net Zero

Meeting Net Zero targets by 2050 in the UK and elsewhere, will certainly require active reductions in greenhouse gas (GHG) emissions. But it is unlikely that will suffice and a key complementary strategy will be investing in the planet's carrying capacity via Nature-based Solutions (NbS). NbS are activities that result in the sustainable management and restoration of our ecosystems. Indeed there are no scenarios where deforestation or ecosystem degradation can occur simultaneously to successful climate action.

NbS - an emerging new asset class

The stark awareness that NbS is a crucial element of global mitigation strategies can be verified by its transition to a major new asset class - some estimates predict Nature-Based Solutions (NbS) to generate $800 billion in annual revenues by 2050. The insurance sector has a major role to play in achieving that transition: by employing the industry's expertise in risk management and risk transfer; by providing capital in its role as a long-term investor; and aiding the development of new markets through innovation and partnerships.

Insurance and NbS

Globally, insurance's role in NbS is becoming established and attracts support from academics and policy makers. In fact, insurances for ecosystems are already being used. In Mexico, an insurance scheme collects and manages funds for reef maintenance and repair. There are also many examples showing that restoration and conservation of natural ecosystems are an effective means of coastal protection from storm damage. Legislative initiatives are also gathering momentum.

Institutional support for NbS rising in the UK

In the UK, the changing regulatory backdrop is putting ecosystem conservation and restoration more central to subsidy and land management policy. Incentives for afforestation and peatland restoration are the most prominent boosters to NbS. But there is growing interest in alternative forms of NbS, particularly linked to agriculture. Infrastructure to support these developments is emerging. Regulatory codes are multiplying to serve a range of NbS beyond the more established woodland and peatland codes, including for soil carbon, hedgerows and rewilding. Other initiatives are looking at harnessing carbon sinks in marine and coastal ecosystems, such as seaweed, kelp and sea grasses.

More rigorous contractual standards are being established which is helping to address the legal uncertainties associated with long term obligations.

The development of robust insurance mechanisms can further alleviate concerns from buyers and sellers when entering carbon arrangements.

Challenges to insurers entering NbS markets

Insurance products aimed at NbS markets have been slow to take off. The key challenges include a lack of regulatory support and the difficulty of developing underwriting models without the benefit of material loss history and performance data. Negative feedback loops are another potential obstacle, as climate change impacts that are already evident alter the risk profile of different landscapes. The good news is that efforts to achieve greater standardisation and regulation are gaining momentum - in particular through initiatives such as the Taskforce for Scaling the Voluntary Carbon Markets. Meanwhile, private sector innovations are also multiplying in the carbon and natural capital markets, raising the bar for transparency and accountability.

What insurers can offer the NbS and carbon markets

Insurance solutions can provide purchasers or sellers of carbon credits with protection against either the non-delivery or reversal of carbon stocks. Such reversals could be 'voluntary', or 'avoidable' due to project mismanagement, negligence or fraud, misrepresentation or error by the project owner or verifier, premature termination of a project, or unanticipated change in land use. Insurance can also cover involuntary or unavoidable reversals i.e. those due to force majeure or natural catastrophe events. Insurance claims could be settled either by replacing the insured credits with equivalent credits from a comparable project or with monetary compensation. In the latter case, the emergence of voluntary carbon futures markets (e.g. CBL GEO and AirCarbon's CET) provides a useful pricing benchmark for insurers to use.

$1-2 billion market opportunity for insurers

Financially, there is a huge market potential for insurance products related to NbS over the coming decade. With the voluntary carbon market set to become a $50 billion industry by 2030 according to industry research, we estimate the associated insurance industry could be worth $1.3 billion globally and up to $2-4 billion in blue sky scenarios. Practically, the insurance sector has a strong incentive to support existing customer bases in agriculture, finance and industry as they look to expand into or finance the emerging markets for carbon and NbS. And in the longer term successfully addressing the climate change challenge will also reduce climate adaptation risk for the sector.

Routes to market

To grasp this opportunity, insurers will need to innovate but can also leverage know-how and experience from existing business models and markets. We see a variety of strategies insurers can adopt to stimulate and grow NbS insurance solutions. Adjacent markets such as timber or crop insurance and existing insurable risks (professional liability, natural catastrophe) provide a natural starting point, and could be bolstered via partnerships with established players using pilot schemes and sidecar investments. Working with the banks and investment houses financing long-term projects, would enable insurers to benefit from the due diligence undertaken by those investors in return for credit insurance.

Successful insurance products already in use globally and in compliance offset markets increasingly provide templates for insurers to follow. Mechanisms to help aggregate smaller landowners will be particularly important to open up NbS opportunities and offset markets beyond large landowners and corporates. Over time, technological advances should also facilitate improved data collection and risk management for insurers.

Introduction

Introduction

Insuring natural resources is not a novel concept and has already been implemented in cases where the economic value of the resource is tangible. For instance, crops - a vital terrestrial natural resource - have insurances against an array of perils such as flood damage, fires and storms. An important difference between crop insurances (and more broadly, natural resource insurances) and conventional types of insurance such as casualty insurance is that the correlation between individual losses can be raised by systemic weather effects (Miranda & Glauber 1997). In the UK, the scope of such insurances is evolving to match new considerations of economic liabilities for different crop types (Lycetts 2019).

The concept that a natural resource can be valued and have an economic liability is not new, and the services our natural ecosystems provide is already widely understood. The change has to come in recognizing that carbon is an asset and to meet the ambitious carbon reduction goals outlined within the Paris Agreement and the UKs' own Net Zero target by 2050, there are two complementary strategies:

(1) Emission Reduction & Technology based carbon dioxide removals - Working at scale to apply the advancements in technology within the fields of energy generation and efficiency, waste management, industrial carbon capture, carbon storage etc.

(2) Nature Based Solutions (NbS) - NbS are activities that result in the sustainable management and restoration of our ecosystems, often increasing the carbon carrying capacity of these ecosystems.

Conservation and a novel carbon-focussed management of our natural ecosystems is imperative to meet climate goals. Multilateral initiatives such as the UN Decade of Ecosystem Restoration provide further impetus for NbS. There are no scenarios where deforestation or ecosystem degradation can occur simultaneously to positive climate action. The stark awareness that NbS is a crucial element of global mitigation strategies can be verified by its transition to a major new asset class - Nature-Based Solutions (NbS) could generate $800 billion in annual revenues by 2050 (Vivid Economics/Inevitable Policy Response 2020). Within NbS, the roles of soil sequestration and sustainable land-use through improved agroforestry techniques are receiving legislative attention. For example, in the USA, programs focussing on soil sequestration such as those within the departments such as the National Institute of Food and Agriculture and the Economic Research Service have received funding to expand adoption of soil health practices and associated research (Omnibus Bill, 2020).

Insuring Natural Infrastructure

Insuring Natural Infrastructure

An empirical comparison of financial investments supporting NbS that act as coastal defenses such as mangroves, coral reefs and wetlands versus grey infrastructure such as sea walls reveals that conservation funding is less than a mere 3.5% of the total spend on grey infrastructure (McCreless & Beck 2016). Interestingly, restoration data from the coasts of Vietnam demonstrate that conservation efforts are an effective means of coastal protection from storm damage (World Bank, 2016). Similarly, on the other side of the planet, a study performed in partnership with the insurance sector which applies industry-standard models indicates that marsh wetlands in the northeastern U.S. avoided damages greater than $625 million during Hurricane Sandy (Narayan et al 2016). Therefore, a reallocation of funding towards NbS and the development of novel investment and insurance strategies for NbS is warranted. De-risking NbS via an insurance infrastructure will also lead to a reduced reliance on philanthropic donations and concessional funding.

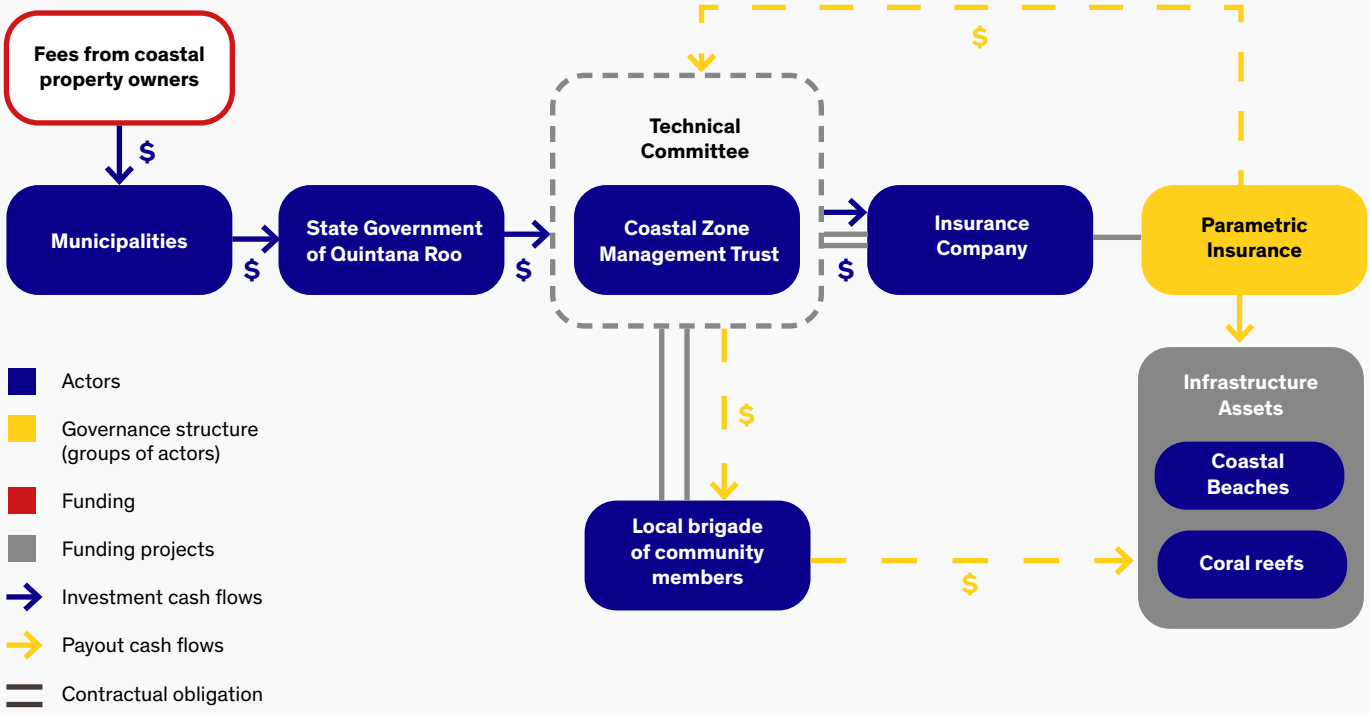
Natural landscapes and ecosystems such as wetlands offer effective Nature based Solutions against flood risks and storm damages. Concomitantly, they also sequester carbon and can be part of our climate action strategies. Financing these ecosystems and sustainable land-use will define the efficacy of climate change mitigation. Image was acquired and distributed according to CC0 licensing rules.

The case for insuring nature has already been made by academics and policy makers (Kousky & Light 2019). In fact, insurances for ecosystems are already being trialled. In Mexico, hurricane impacts caused its Caribbean coast $8 billion in damages and the role that coral reefs play in dampening wave energy prior to shore impact was immediately realised.

Following this, the world's first insurance policy for a natural ecosystem was created and is managed by Coastal Zone Management Trust, which will collect and manage funds for reef maintenance and repair. This insurance policy will protect the region's billion dollar tourism industry and actively enable ecosystem restoration where current legislation is inadequate for rapid efforts (Kousky & Light 2019). The policy is based on parametric cover, where payouts are triggered by weather metrics such as wind speeds hitting certain thresholds.

Cash Flow Profile for Quintana Roo's Parametric Insurance Policy for Coral Reefs

The insurance market has also been interacting in other ways with NbS. For example, in the USA, parties employing risk-reducing actions against floods can receive discounts on their insurance premiums and natural spaces are high-scoring risk-reducing actions (Colgan et al 2017). Legislation has also started to test the ways in which insurance markets can work with natural infrastructure. A US Senate Bill filed in 2018 directs the Californian state insurance commissioner to identify and recommend strategies by which investments in natural infrastructure can be promoted to reduce the risks of climate change (Senate Bill 30, 2018). In this way, it becomes clear that insurance markets are key to de-risking and can play a role in attracting investments for an emerging NbS market.



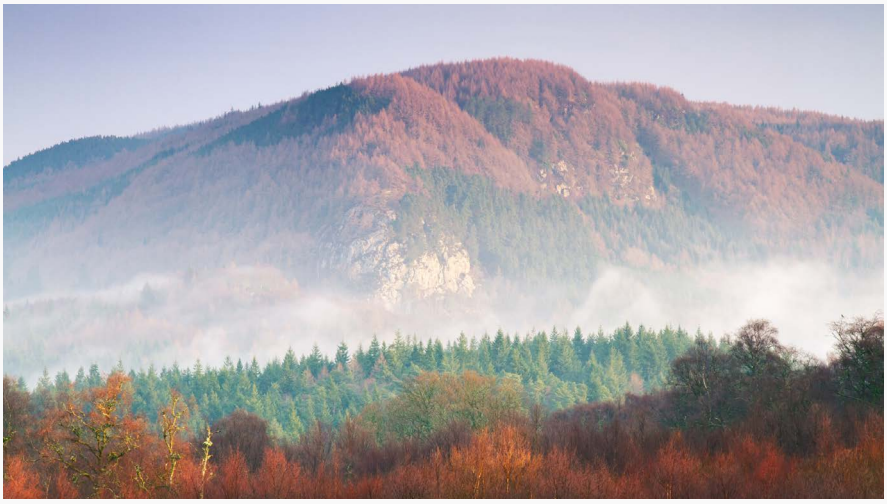
Source: World Resources Institute, 2021

Scope and trends of Natural Capital in the UK

Scope and trends of Natural Capital in the UK

Having left the European Union, the UK government has pledged to shake up agricultural policy in England & Wales, with the shift from the Common Agricultural Policy to Environmental Land Management via a scheme of “public funds for public goods” beginning in 2024. Scotland and Northern Ireland are also developing future models, which are expected to shift some funding criteria towards sustainability. The introduction of Natural Capital income via NbS projects and linking capital flows to conservation is vital for combatting the twin challenges of climate change and biodiversity loss.

The Committee on Climate Change (CCC) forecasts that land use changes will need to add 69–123Mt of additional carbon mitigation potential by 2050. Woodland creation in 2020 reached the highest level seen since 2003 at approximately 13,500 ha p.a., despite the disruption caused by the COVID Pandemic. However, this remains well below the UK Government’s goal of planting 30,000 ha of new forest per year. The developed nations have their own targets, with the Scottish Government doing the most and aiming to get to 18,000 ha p.a. by 2024



Peatland rehabilitation is also accelerating. Of the 2.7mha of peatland in the UK, over 2mha is in a damaged state from historical misuse and conversion to agricultural land. To date, 150k ha has been restored out of the UK Peatland Strategy’s vision of 2mha by 2040. The Scottish Government has committed to restoring 250,000 hectares of degraded peatland by 2030, with an annual target of 20,000 hectares.

Carbon sequestration (and avoided emissions) has been the easiest ecosystem service to value to date. There are liquid compliance and voluntary carbon markets and world standard programs in place in the UK through the Woodland and Peatland Carbon Code to standardise the market.

While the codes have proven successful for these specific activities, the UK CCC is also targeting 16MtCO2e GHG savings from agroforestry and low carbon farming practices. This is only the start of nature based project creation in the UK. Terrestrial NbS will play a key role. But so too will the emerging “Blue Carbon” market. The UK needs to take advantage of the world’s 12th longest coastline to make the most of its coastal and marine ecosystems.

Standardisation will be important in building trust and transparency in NbS projects and their respective markets. There are a variety of businesses and initiatives working on this problem including the Sustainable Soils Alliance development of a soil carbon code. Building this trust should support prices and start to send strong demand signals to landowners that ecosystem services need to be considered in their planning.

On the supply side, innovation is also underway. Developing contracts that fairly apportion the liabilities associated with the risk of non-delivery of carbon. Clearly outlining each party’s rights and responsibilities is integral given the long dated nature of delivery and something that hadn’t been finalised at the time the carbon codes were introduced. (Woodland Carbon Code Pending Issuance Units can be sold up front but converted to Woodland Carbon Units up to 100 years after planting).

Additionally, the development of robust insurance mechanisms can further alleviate concerns from buyers and sellers when entering carbon arrangements. The timber market already has a mature (if underutilised) insurance market. Historically, take up of timber insurance has been low in the UK and around the globe for a number of reasons (University of Edinburgh 2017).

Real and perceived unaffordability for landowners has been driven by high transaction costs and imperfect information making assessments difficult for insurers. Overcoming challenges in affordability, making schemes robust and relevant for carbon and other ecosystem services should also help spur landowners to consider NbS projects as viable alternatives to traditional land uses.

Much like Peatlands, soil carbon stocks have been damaged through human activity. Over the last 150 years, global soil carbon stocks have declined 50% (Keenor et al 2021). Even so, soil organic carbon stocks are triple that of what is held in the atmosphere, therefore, increasing and protecting these stocks is vital for climate stabilisation.

In the UK, soils store over 10 billion tonnes of carbon in the form of organic matter, roughly equal to 80 years of annual UK greenhouse gas emissions (Environment Agency 2019). A variety of threats, such as erosion and compaction, are degrading soils at a cost of over £1bn annually.

Soil carbon projects have come in a variety of forms.

- Regenerative agriculture
- Agroforestry
- Biochar (used as a soil additive)
- Avoided conversion of grasslands

Soil carbon is one of the fastest growing sectors of the nature-based economy. Much of this activity has been focused on the vast, scaleable farms in the USA and Australia. The US is mulling the creation of government backed soil carbon funding for farmers and landowners. While the Australian Government's Clean Energy Fund already supports the creation of soil carbon projects (Carbon Pulse 2021).

There is transformation underway in the UK, however, much of this has been privately driven to this point. A variety of startups have created methodologies with integrated monitoring. But there is also an initiative underway from the Sustainable Soils Alliance to standardise a scheme and fold it into the existing UK government backed carbon schemes (UK Farm Soil Carbon Code).

One concern that has been raised over the viability of soil carbon schemes is the permanence. Soil organic carbon (SOC) is inherently more variable than other NbS sectors such as forestry, with greater impact of climatic conditions on the drawdown or stability of SOC. Insurance products could decrease the risk associated with soil carbon permanence and decrease mandatory buffer volumes.

UK Forestry Insight, Blackford

There are currently 3.2 million hectares of forestry in the UK, of which approximately 2.3 million is privately owned. Carbon stock in UK forests is estimated to have increased from around 3.2 billion tonnes of carbon dioxide equivalent in 1990 to 4 billion tonnes of carbon dioxide equivalent in 2020.

There are well established insurance products available to the UK private forestry market – providing financial protection of growing timber assets against perils such as fire and storm. Most policies tend to be on an 'agreed value' basis – set by current timber market values and potential yield.

Historically, insuring only the value of the timber stands (and the potential extraction/associated costs) has been sufficient for the woodland owner, but there is scope to consider a separate insurance product for the carbon investor (and/or the forest owner) that offers financial protection for the extra asset class – the carbon production and storage within the plantations.

In the event of growing timber loss or damage by fire or storm, a carbon investor could potentially no longer make any claim on their carbon holding (as it would no longer exist). Furthermore, a fire and reafforestation disturbance could well create a negative carbon position. In such instances, a real carbon reduction could have a detrimental impact on investor brand reputation and incur a financial penalty linked to the voluntary carbon market, binding heritable title deed restrictions, or any associated regulations.

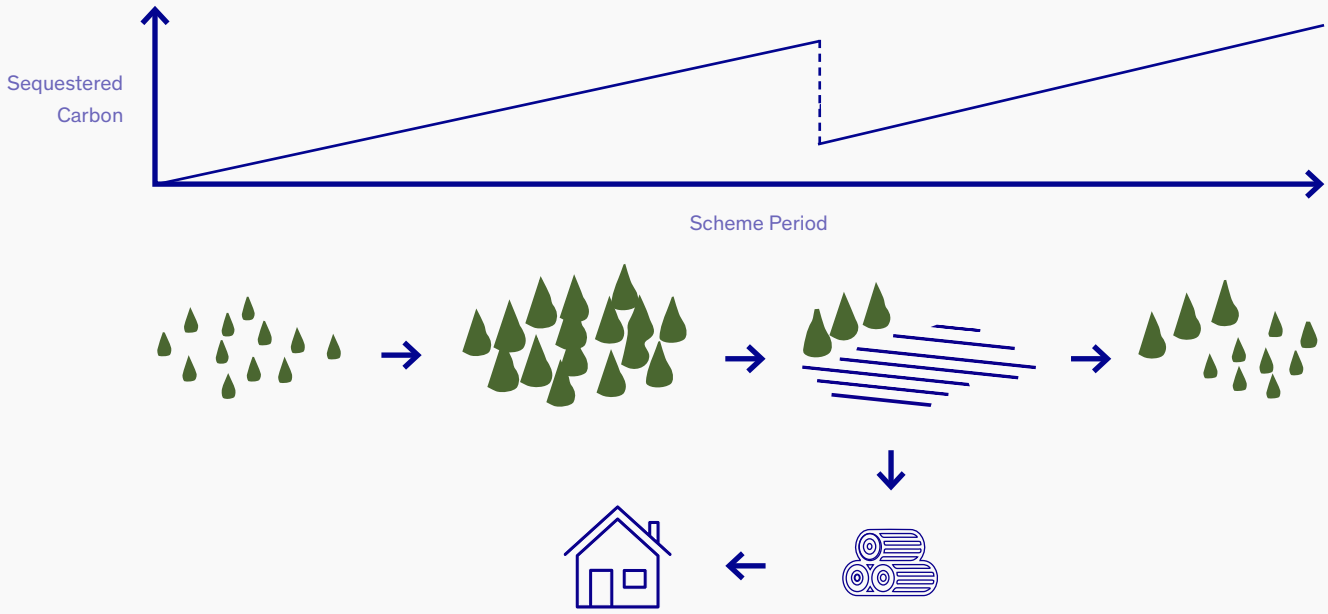


Figure 1 – Carbon sequestration mechanism illustration

Figure 1 shows how the amount of carbon sold to an investor is sequestrated over the lifetime of a project. The UK Woodland Carbon Code scheme has in-built modelling of the amount of carbon which will be sequestered in a specific scheme. This includes for periodic harvesting, and some buffering for natural mortality, afforestation soil impacts and other factors. Investors do not therefore own the carbon which is fixed into any harvested timber and leave the site, but instead they own a nominal amount of carbon, essentially assessed as a “futures” asset at the start of the scheme. Verification of the performance of the growing forest is done at set intervals by third-party verifiers, who use recognised techniques to measure the growing stock on the contracted scheme or area.

A catastrophic loss, e.g. a fire at age 20 in a coniferous plantation could render the stored carbon completely destroyed, and even create a negative balance. Carbon investors would then need to see the scheme remodelled, with an inherent delay, or seek to find an alternative source of sequestered carbon.

The WCC scheme does build in some allowances for losses, with 20% of the estimated claimable carbon from each project being added to a risk buffer which can be drawn upon in case of any losses of verified carbon credits from a project, and some voluntary carbon market operators will have mechanisms to cater for such events, but the risks will be real for many investors as the market expands and the price of carbon rises.

Another factor to take into account is mis-management - where livestock or deer are allowed to enter a young forest and cause browsing and fraying damage. Pests and diseases are also an increasing threat, and not normally insurable (in the UK). The long time periods of these schemes, especially ones where there are no planned commercial timber outputs (i.e. mainly broadleaved conservation plantations), means the time for risk exposure is prolonged.

This young and growing market is currently subject to an intense degree of interest but also to a thorough degree of stakeholder scrutiny. There may be more additionality and validation and verification controls added to the Woodland Carbon Code scheme in the future, and there is scope for more use of remote sensing technology to assist with the quality of verifications. High net worth individuals and corporate and institutional investors will be seeking to have risks mitigated where possible, and this gives the potential for suitably structured insurance mechanisms on behalf of the carbon purchasers.

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Savills UK | Spotlight: The Forestry Market – April 2021

Barriers to Developing a NbS Insurance Market

Barriers to Developing a NbS Insurance Market

For the insurance sector, carbon and its associated climate impacts can present a real opportunity. It can provide a means to source and credit sustainable investments and NbS can offer long-term attractive returns. The development of a NbS insurance market will likely require landowner or legislative intervention. However, prior to this, it will be important to identify and acknowledge the risks faced by this new market.

A key risk that this new market of the insurance sector will likely face is negative feedback loops. This is the risk that the event(s) for which a NbS insurance policy would cover for will likely become more common as a result of the greenhouse gasses already emitted and their climate change impacts (Kousky & Light 2019). To overcome this, climate change related risks will need to be evaluated in-depth to gauge pricing. Another challenge this market might face is barriers to adoption. For the insurance sector of another natural resource - timber, adoption barriers were significant in part due to the high premiums (Zhang & Stenger, 2014). In fact, timber insurance is an example of a market that has benefited from landowner intervention. The highest adoption is in Scandinavian countries which have active forestry landowners associations that either establish a mutual company which offers insurance or seek bid offers from insurance companies (Zhang & Stenger, 2014).

Creating insurance solutions for NbS and offset markets also entails significant underwriting challenges. A lack of loss history and performance data is the major impediment to modelling expected losses and pricing insurance appropriately. NbS also involve exposures to very long-term liabilities - the time scales often extend over many decades. Particularly challenging is the risk of reversals in carbon storage inherent in natural ecosystems (e.g. from weather events or the spread of pathogens). Insurance tends to be better suited to short-term protection, i.e. perhaps providing rolling cover year to year. Such approaches need to be arranged so that these longer-term challenges can be addressed.

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Regulation may eventually help to build the foundations on which insurance solutions can be built. Regulatory structures can help define triggers for exposures and loss events. That has been evident in compliance offset markets such as California where insurance products have been introduced. For now, the voluntary carbon markets lack much robust regulation. However, efforts to achieve greater standardisation and regulation are gaining momentum - in particular through initiatives such as the Taskforce for Scaling the Voluntary Carbon Markets.

Private sector initiatives are also multiplying in the sector and such innovations are also raising the bar for transparency and accountability in offset markets. Carbon exchanges are driving the financialisation of the market with the launch of futures markets in 2021 and the use of tokenisation (e.g. Air Carbon Exchange). Monitoring solutions are becoming more accessible including newer sampling and remote sensing technologies that should make carbon measurement more effective and scalable. Assessment tools are also gaining traction including the The BeZero Carbon Markets platform and Rating (see box).

The BeZero Carbon Markets Platform & Modelling Underwriting Risks

BeZero Carbon Markets (BCM) is a tech climate platform providing data & research analytics into certified carbon projects.The BCM is powered by a proprietary methodology called the BeZero Carbon Rating (BCR), the first risk-based framework for assessing carbon efficacy that can be applied to any carbon credit project (whitepaper available here).

The BCR is a research view designed to support all carbon market participants: brokers (sellers), corporates (buyers), institutions (investors), and project developers (creators). Our aim is to help scale the voluntary carbon market by driving fungibility and transparency. The function and objectives of the BCR therefore have lots in common with the role of insurers in carbon markets. Many of the same risk factors that drive the BCR coincide with elements of the underwriting assessment for a carbon project.
The BCM platform also provides access to quantitative analytics such as comparisons of predicted versus reported project emissions and other measures of performance.

How the BeZero Carbon Rating works

Projects are rated from A to AAA+ under the BCR with the final rating based on a weighted average of our risk factor scores. There are 6 risk factors: 1) Additionality, 2) Over-Crediting, 3) Permanence, 4) Leakage, 5) Policy environment, and 6) Perverse Incentives. Additionality is the highest weighted factor (50%), followed by Over-Crediting (20%) but the BCM platform is flexible such that users can re-interpret the components to tailor their project risk assessments.

The BCM and Underwriting Risks

(1) Developer performance
A key insurable risk is project developer performance. The BCR assesses such risk by adopting a combined top-down and bottom-up assessment. Using a waterfall approach, the BCR creates a top-down view of the risks a project faces from the level of accreditation down to the country. This information is then interpreted alongside project level analysis - including project performance and interrogating project assumptions.

(2) Regulatory and political risks
The BCM process evaluates how effective regulations are, what the trends of compliance are, and what applicable laws and regulations might make a project non-additional. Political and institutional instability is captured in different aspects of the BCR under two risk factors. First Permanence, where tenure and land-use rights are considered and second, Policy, where governance, and policy implementation are considered.

(3) Non-permanence risk.
Reversal risk whether voluntary or involuntary is captured under the Permanence score. We assess the depth and relevance of the non-permanence risk assessment completed and activities employed to promote longevity (eg. renewing tenure rights). Our score is based on likelihood to meet the project defined commitment period whether 20 or 100 years.

With regard to voluntary reversal i.e. risks such as negligence, mismanagement, even fraud, we can say that certain methodologies or project policies incorporate more or better safeguards against such eventualities - e.g. measures such as the REDD+ Cancun Safeguards. Typically, this would be captured in our Permanence & Policy scores (and also Leakage if any management measures were specifically looking to address leakage risk). Our analysis of country risk and property rights assessments would capture some of the variance related to these issues too - mis-management is a factor we do come across in literature pertaining to certain regions/countries.

Insuring Nature-based Solutions - A Compelling Opportunity

Insurance and Nature-based Solutions - A Compelling Opportunity

Nature-based carbon offsets are set to be a vast growth area of the future. A recent report from the UN's Principles for Responsible Investment claims that the nature-based offsets market could generate $800 billion in annual revenues by 2050, equivalent to $1.2 trillion today in NPV terms (UNPRI).

Due to these expected growth rates, there are significant opportunities for the insurance sector to play a part in shaping, supporting and scaling the industry. It is not enough for the industry to reduce emissions, in order to meet the ambition set by policymakers, it will need to close the gap by actively removing carbon from the atmosphere. Insurers can play a proactive and positive role in driving the growth and financialisation of NbS.

Insurance as a catalyst for scaling the Voluntary Carbon Markets

First, the insurance sector can help professionalise the offset industry. It is no secret that the industry is something of a "wild west" market. Researchers at the nonprofit CarbonPlan recently discovered that $400 million worth of offsets had been sold in California without absorbing a single ton of CO2 (Carbon Plan). Another recent study by Compensate found that 90% of offsets fail to deliver or come with damaging side effects for local communities (Compensate). The insurance industry could play a crucial role in helping the industry turn a corner, improving transparency and credit quality.

Second, the sector can drive a flight to higher quality in the offset market. As aforementioned in the text, there is a mixed quality of offsets on the market. At its core, the insurance sector evaluates risk in order to facilitate insurance contracts. If the sector grasps the nettle that is the voluntary carbon market, it can deploy those same expertise and analytical rigour to increase standards of delivery, transparency and risk management. This can help drive market preference for higher quality credits, causing corporations to be held accountable to their Net Zero strategies and reducing the atmospheric carbon dioxide burden of the world in the process. Improved pricing of risks should also support price differentials favouring those projects that better manage and mitigate such risks. That can help drive capital to projects with more impact and less risk of failure.

Third, the sector could support risk allocation and attract more capital to the nature-based offset market. Current barriers to investment in the voluntary carbon market include: high levels of uncertainty, a track record of historical failures and a general lack of development. Insurance solutions can help to de-risk such investments and allocate various risks more appropriately. Insurers could use their risk knowledge to price downside risks such as fraud or natural catastrophe appropriately, and can help to distribute such risk exposures into the securitisation and reinsurance markets.

Fourth, there is a potential opportunity for insurers to scale up access to the voluntary market among smaller landowners, by supporting organisations which aggregate carbon credits such as carbon exchanges and carbon farming companies. In this way, the sector can contribute to increased democratisation of the offset markets, supporting small-scale suppliers of nature-based carbon credits, such as farmers and landowners looking to rework their business model for a more sustainable future.

Sizing the potential insurance market opportunity

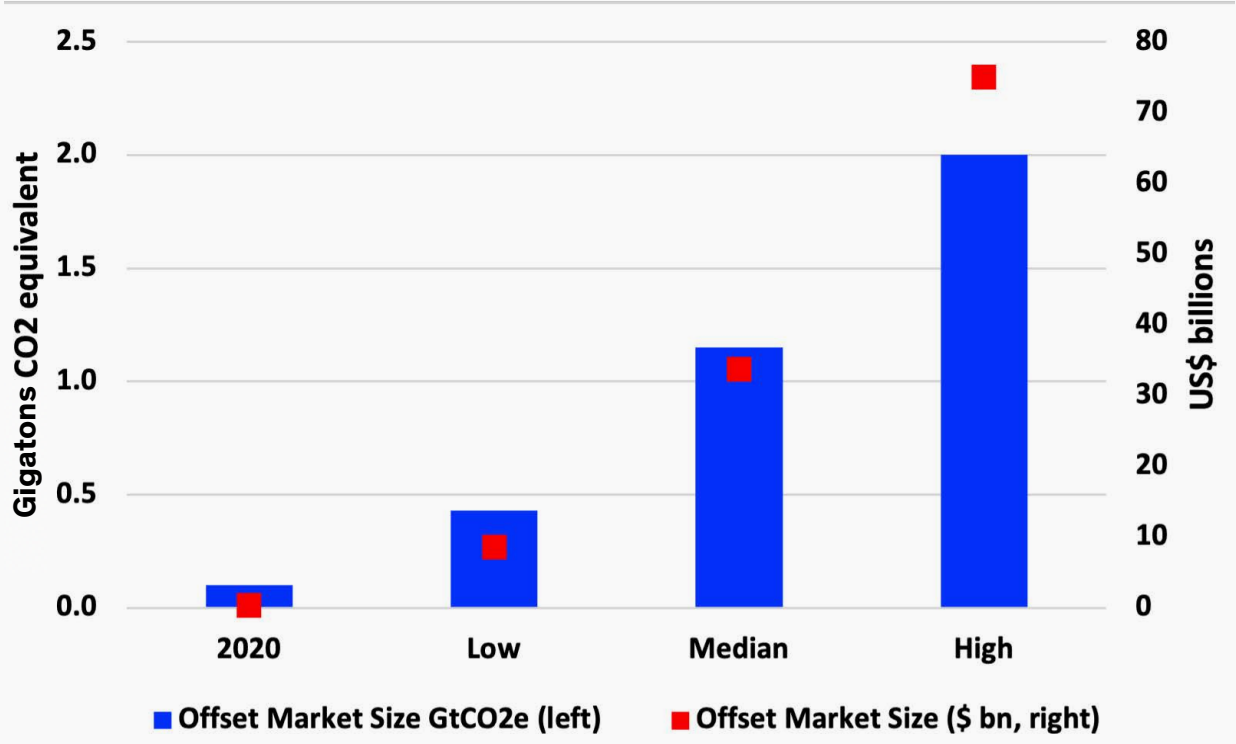
There is an enormous market opportunity for the sector in the nature-based carbon market. The voluntary carbon offset market is forecast to grow from around $1 billion today to between $13 billion - $50 billion (Shell/BCG 2021 , McKinsey 2021, Trove 2021). Mark Carney, in his role as co-founder of the Taskforce for Scaling the Voluntary Carbon Market has suggested the market needs to scale to as much as $100 billion by 2030 to ensure a successful translation to Net Zero (FT).

Size of the Voluntary Carbon Market 2030

To model the potential size of the market for carbon credit insurance, we have considered the size of the underlying offset market, penetration of demand for insurance products, and the size of premiums paid proportional to the value of the underlying offset market. In practice many market participants will look for insurance cover to roll over for multiple years following the purchase of a carbon credit. Since we model the premium value as a share of the transaction value at purchase, and don't model future renewal premiums, we err on the side of higher premiums at the outset. In our modelling, estimates for premiums range from 10% of the nominal value of underlying carbon credits to 20%.

The potential insurance market size globally is $1.3 billion at the midpoint of our estimate range. This range assumes a 25% penetration for insurance solutions and premiums worth 15% of nominal offset values each year. Those estimates assume the expansion in the voluntary carbon market achieves the mid-range of estimates - about $34 billion. If the market scales more quickly to $50 billion or more the potential insurance market could exceed $2 billion. If the right steps are taken now, the sector can seize substantial dividends from the voluntary offset market.

Size of the Voluntary Carbon Market 2030



Source: BeZero Carbon amalgamation of estimates from McKinsey, Trove, Shell/BCG

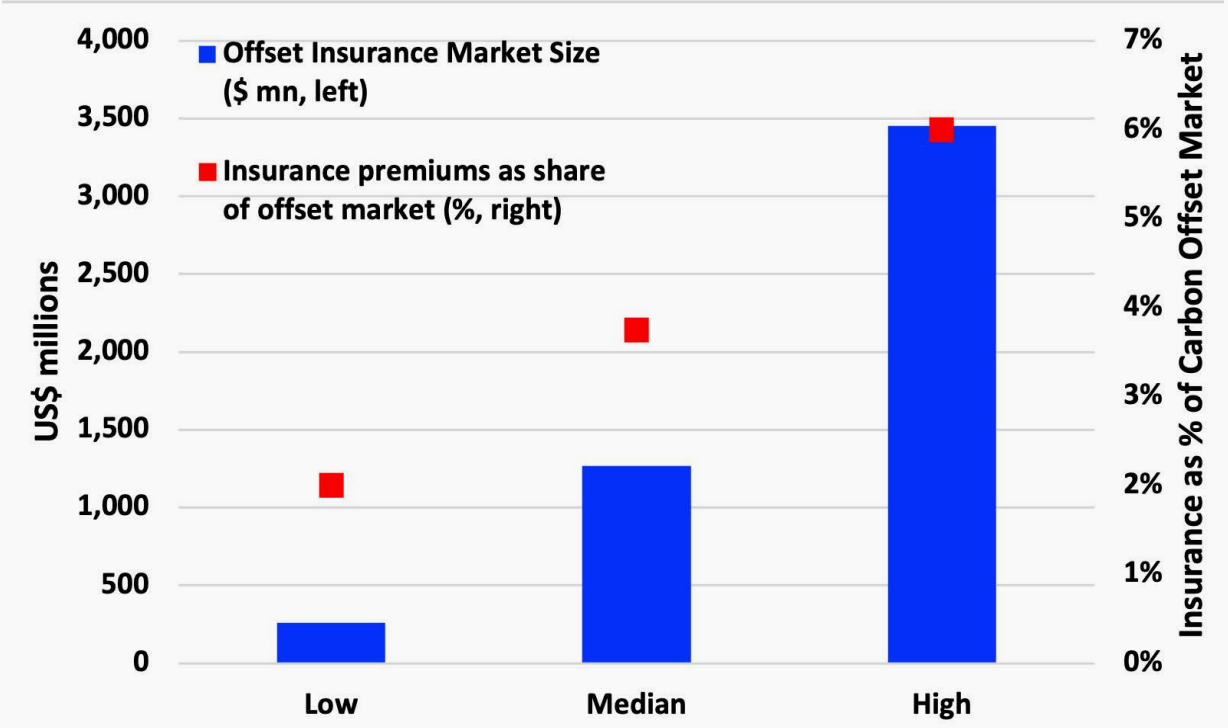
Size of the Voluntary Carbon-linked Insurance Market 2030

The blue sky scenario could see a voluntary carbon insurance market size globally of up to $3.5 billion in 2030. This would combine an offset market worth over $50 billion and a 30% penetration for insurance coverage, and combined premiums worth 20% of nominal offset values that year.

On top of the revenue opportunity, the changing climate poses a significant risk to assets insured by the sector. A robust and effective offset market can meaningfully contribute to keeping global warming well below two degrees (Mckinsey 2020). Sector participation in the market, and its consequential professionalisation and improvement, can therefore reduce climate adaptation risk for the sector.

The integration of the insurance sector into the voluntary carbon market is not just imperative for the stability and future of the market, but it also presents a suite of opportunities for the industry to find new revenue streams.

Size of the Voluntary Carbon-linked Insurance Market 2030



Source: BeZero Carbon incorporating data from McKinsey, Trove, Shell/BCG

Innovations & Routes to Market

Innovations & Routes to Market

To tap into the market potential of insuring NbS, the insurance sector will need to innovate but can also leverage know-how and experience from existing business models and markets. Partnerships with large and experienced entities and other financial institutions can also address fears over the immaturity of the market and lack of loss data.

(1) **Existing insurable risks**
Several categories of risk pertinent to NbS already have established insurance coverage provided in multiple contexts under Property & Casualty business lines. Firstly, exposures to negligence and fraud can be addressed through the use of professional and public liability covers. Natural perils such as wind, fire and disease can be readily modelled and are a core element of traditional property lines. Political risk is somewhat more specialist but not uncommon in developing countries.

(2) **Adjacent markets**
Insurers can use data and experience in existing linked markets to adjust cover to underwrite NbS where carbon or conservation credits mimic the characteristics of linked activities. Essentially substituting carbon as the focus of coverage for timber or crop insurance.

(3) **Partnerships**
Many corporations, public bodies and conservation groups are investing in scaling NbS. Partnering with bigger and more experienced entities to pilot insurance tools is one way for the sector to address the immaturity of the market. Partnerships can also facilitate sharing of knowledge, data and commercial experience between insurers and the brokers, exchanges, large developers, information service providers and investors operating in ecosystem markets.

(4) **Project finance**
Collaborating with financial institutions in the project finance sector would enable insurers to benefit from the due diligence undertaken by investors. This could be the case where the investor is financing an NbS project via long term offtake agreements called Emissions Reduction or Carbon Removal Purchase Agreements (ERPA / CRPA). In such a case, the insurer could provide credit coverage against default events.

(5) **Experience internationally and in compliance markets**
Insurance markets for NbS are very nascent for sure and activity levels are still very modest in the UK currently. However, there are more and more examples internationally, and from insurance products that serve the regulated carbon markets. Carbon farming insurance products are in use in markets such as New Zealand and Australia. Invalidation insurance products are available under California's carbon cap and trade program (see case study below). The Insured is the underlying project entity with the owner of the offset being the loss payee. This allows the offset to be traded without limitation in the future.

(6) **Aggregation schemes**
Mechanisms to help aggregate smaller landowners will be particularly important to open up NbS opportunities and offset markets beyond large landowners and corporates. Mutualising risk has led to effective insurance solutions in markets such as timber and agricultural crops, spreading risks and reducing costs for participants. Insuring pools of offsets could be particularly effective for aggregating farmers in soil carbon schemes. Schemes of this type are already in operation in the more established soil carbon markets in the US (e.g. Indigo). In the UK context such initiatives will be important, if NbS and offset opportunities are to succeed beyond the largest land owners.

(7) **Technological advances**
Advancements in technology and monitoring tools including remote sensing, drone technologies, machine learning and modern sampling techniques (e.g. eDNA) mean the challenges, imprecision and costs associated with monitoring NbS are falling with time. This can facilitate improved data collection and risk management for insurers.

Case Study: Carbon Offset Invalidation Insurance

Energy and climate finance risk company, Parhelion, were approached by a client in the energy sector concerned that the carbon offsets they had bought were at risk of invalidation. Working in collaboration, Howden and Parhelion developed a product that provides coverage against the risk of carbon offsets, purchased under the California carbon cap and trade scheme, being invalidated by regulators. The insurance product covers the replacement cost of the offsets and protects the client from invalidation from the following exposures:

(1) Material overstatement of greenhouse gas reductions

(2) The project does not comply with environmental regulation at the time of the credit issuance

(3) Double-counting of offsets

The insurance policy not only guarantees the offset credits against invalidation (thereby securing their value), it also increases the liquidity of the Californian market.

Howden are now extending this to create a market in the voluntary carbon offset space.

Howden believe that there will be huge demand and opportunity for a similar insurance product globally for buyers of carbon offsets to add a layer of security and certainty to ensure that the projects they are backing are actually absorbing the volume of carbon they promise to.

Contributors

Howden

Howden, is a leading provider of (re)insurance brokerage, risk consulting and employee benefits advice. It is headquartered in the UK and comprises businesses across Europe, Asia, Africa, Latin America and the Middle East. Established in 1994, today Howden employs more than 6,500 people worldwide. Together with network partners aligned to its specialty-led proposition, Howden operates in more than 90 territories.

Howden's Climate Risk and Resilience team combines creativity, a passion for ESG, and deep experience of the inner workings of the insurance and financial markets. Curbing global warming is a daunting task. To hit the 1.5°C target, entire industries will need rethinking. Wherever major change is happening, insurance has a part to play. The team has three main aims: helping organisations with the transition to a low carbon world, unlocking funds for disaster relief to increase the speed and impact of humanitarian response to those most in need, and providing risk transfer for the rapidly growing carbon market.

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Blackford

Blackford is an insurance brokerage, with offices in Aberdeen, Edinburgh, Glasgow and London. Their team of insurance consultants develop long-term relationships with UK businesses and private clients by providing simple, concise and professional insurance advice. Specialist areas include Natural Resources, Construction & Engineering, Technology, and Professional & Financial Risks.

Blackford's Natural Resources team advise on risks associated with renewable energy projects, forestry, land, and onshore / subsea energy and decommissioning.

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BeZero Carbon

BeZero Carbon is a London-based climate solutions company founded in April 2020. Our 40-strong team combines expertise across climatic and earth sciences, sell-side research, data and technology, engineering, and public policy. Drawing on skills from a range of industries enables BeZero to offer innovative climate-related products and services. Our goal is to deliver prosperity via climate action.

BeZero as a business

We support clients via BeZero Carbon Markets, a data and analytics platform for the Voluntary Carbon Market, and through decarbonisation and natural capital solutions. We believe blending technology with technical expertise delivers effective climate solutions for our clients, helping them to make smarter decisions on climate action.

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