

DE-RISKING NET-ZERO THROUGH OFFSET INSURANCE: A PROPOSAL

ABSTRACT

Trust in offsets—and the entities that depend on them to make Net-Zero claims—is at an all-time low. Many offsets currently available on the voluntary carbon market have limited monitoring, reporting and verification procedures and, consequently, low to no environmental integrity. Yet few companies can afford to invest wholly in permanent removal-based offsets, despite this being best practice. To combat these issues, this paper proposes a novel ‘Offset Insurance Product’ (OIP). An OIP provides a stop-gap measure for Net-Zero claims, with a claim only being necessary should offsets not have covered residual emissions the year in question. In this situation, insurance is a useful tool given that permanent removal options cost significantly more but are the only way to verify that emissions removals (and consequent greenhouse gas effect) are neutralised in the near term. When insurers calculate the premium to be charged for an OIP, they factor in a company’s track record delivery on their Net-Zero plans, including the types of offsets they use to remove unavoidable emissions and the extent to which they build a buffer in the form of additional removals to make up for any risk of non-permanence. An OIP could reshape the risks and incentives actors face in the offsetting sector, enhancing the due diligence performed on offsetting projects and attracting more investment in removal-based offsets in tandem. As re/insurers face significant losses caused and aggravated by climate change, they have a rational incentive to address it. The opportunity for value creation through an OIP has the potential to increase incentivisation even further. Governments, too, are pressed for ways to stimulate the alignment of financial flows with the Paris Agreement and achieve Net-Zero. As a result, an OIP stands to be a win on multiple fronts: insurers get to lessen their Scope 3 emissions and create stability for the permanent removals industry, companies are incentivised to reduce emissions, select high-quality credits and where they fail despite their best efforts, they have a safeguard against legal risks; developers of permanent removals get a degree of certainty in the near-term supply, enabling them to scale operations; and finally regulators and the general public can have added surety on the feasibility of the ‘Net’ in Net-Zero. In these ways, OIP offers an example of the innovation needed for the industry to respond to both the environmental threat and economic opportunity climate change presents.

1. Introduction

The imperative to align financial flows with the Paris Agreement has drawn support from a full range of public and private actors. As the formation of the Net-Zero Insurance Alliance (NZIA) demonstrates: the insurance industry is no exception. While many insurers have near-term targets to address their Scope 1 and Scope 2 emissions, there is a need for them to address their Scope 3 emissions— particularly their ‘insured emissions’ where the vast majority of their greenhouse gas footprint lies. To this end, the NZIA has identified a full range of measures that insurers can take to shift towards Net-Zero emissions.¹ Prior to this the insurance industry, in line with the broader financial sector, has seen the development of a number of Environmental, Social and Governance (ESG) products. However, there remains a risk that ESG products do not tangibly reshape financial flows, and more pressingly could delay this by providing a façade for positive developments. Concurrently, there is growing recognition that the ‘net’ aspect of Net-Zero is under threat due to poor quality offsets being used to counterbalance entities’ emissions of entities through the voluntary carbon market. This outcome is due to a wide differential in quality of offsets available. Avoided emissions and emission reductions offsets tend to have a lower price point than conventional and novel removal offset making them the most accessible option to many carbon credit purchasers. Yet, they tend not to have the same environmental integrity as more permanent removal options. Due to a lack of demand, superior removal options remain prohibitively expensive to all but the most willing actors. Consequently, suppliers of such offsets have not yet been able to scale their operations as rapidly as needed to meet the 1300x fold increase in novel offsets needed by 2050.² Moreover, there remains a temporal disjunct between the purchase of offsets through a carbon credit and the determination of an entity’s actual emissions levels in a given year. Often entities find after the fact that they did not meet their emissions reductions levels (and subsequently under purchased credits to counterbalance residual

¹ Net-Zero Insurance Alliance (2022) *Insuring the net-zero transition: Evolving thinking and practice*. UNEPFI.

² Smith, S. M., Geden, O., Nemet, G. F., Gidden, M. J., Lamb, W. F., Powis, C., Bellamy, R., Callaghan, M. W., Cowie, A., Cox, E., Fuss, S., Gasser, T., Grassi, G., Greene, J., Lück, S., Mohan, A., Müller-Hansen, F., Peters, G. P., Pratama, Y., Repke, T., Riahi, K., Schenuit, F., Steinhauser, J., Strefler, J., Valenzuela, J. M., Minx, J. C. (2023) *The State of Carbon Dioxide Removal - 1st Edition*.

emissions) and/or that they relied on poor quality credits did not offset emissions as intended. While such a finding damages organisational credibility, with unfolding climate risk disclosures in major markets, it could soon also carry legal risks for entities if they fail to deliver their Net-Zero commitments in a specified year.

The corporate veil masking the use of poor-quality carbon credits was recently pierced in popular media by an intensive investigation by journalists.³ One of the headline findings of this investigation was that more than 90% of rainforest carbon offsets offered by a carbon credit provider were worthless.⁴ While the results of this expose were not a surprise to experts tracking carbon credits, they provided a shock to the Voluntary Carbon Market, with credit prices declining. If carbon credits can be viewed as an asset, the Guardian investigation resulted in a significant devaluation. Naturally, questions were raised in response about the extent to which due diligence should have factored in on the part of companies. Such due diligence is essential in any investment, particularly one that attracts considerable moral (and environmental) hazards. While on paper carbon credits backed up by offsets are fungible, in practice they are not. This is due to the type of offsets available— there is a spectrum of avoidance-based and removal-based offsets—which are accompanied by a kaleidoscope of risks in terms of reaching Net-Zero. Insurers are primed to understand such risk and insure companies against it. It is clear we cannot ‘offset’ our way to Net-Zero using credits that do not represent real emissions reductions. It is also evident that the current incentives inbuilt into the regulatory and voluntary standard setting do not adequately encourage the purchase of the highest quality of credit—permanent removal storage options remain expensive. The Oxford Offsetting Principles outlines the need to transition to high-quality removals but that the market lacks stabilisation and investment support is needed.⁵ Similarly, given that the warming potential of greenhouse gas emissions is non-linear, one tonne of carbon dioxide offset now is worth considerably more than one offset in 2049. This asymmetry requires

³ Patrick Greenfield (2023) *Revealed: more than 90% of rainforest carbon offsets by biggest certifier are worthless, analysis shows* [Online] The Guardian <https://www.theguardian.com/environment/2023/jan/18/revealed-forest-carbon-offsets-biggest-provider-worthless-verra-aoe> [Accessed 2 February 2023].

⁴ *Ibid.*

⁵ University of Oxford (2020) *The Oxford Principles for Net Zero Aligned Carbon Offsetting*. University of Oxford.

intervention. While regulators have taken steps towards mandatory climate, this paper outlines a tool that can be employed in parallel: an Offset Insurance Product (OIP).

2. Primer

Insurance can play a crucial role in the climate governance transition. Understanding this role requires a primer on aligning financial flows with the Paris Agreement, including its forerunner in ESG investing. As will be shown, insurers play a unique role in addressing climate change.

2.1 Aligning Financial Flows with the Paris Agreement

Article 2(1)(c) is one of three long term goals of the Paris Agreement. The Paris Agreement ‘aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty’. Alongside goals for mitigation and adaptation, it aims to do this through Article 2(1)(c) which calls on parties to make ‘finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development’. While this goal was a first for the international climate change regime, it was preceded by a focus on Environmental, Social and Governance (ESG) investing. ESG related products and portfolios have been in vogue for several years. They emerged as part of broader trend towards awareness of ESG issues, and growing consciousness of corporate responsibility in those areas. Compared to traditional products, ESG-related products are characterised by their co-benefits they offer for society for environment and/or society. In tandem with other forms of corporate social responsibility, the advent of such products also led to enhanced sustainability reporting of a company’s internal and external activities. The maturation of ESG financial flows (including insurance) has led actors to shift from screening portfolios for negative externalities to portfolio steering towards positive impacts whilst, of course, maintaining

a focus on risk selection to enhance profitability.⁶ Indeed, 2012 saw the introduction of the Principles for Sustainable Insurance (PSI), a voluntary framework that has now grown to 144 signatories representing 33% global premiums.⁷ Under ESG investments, climate change is just one consideration out of an array of issues. However, with the signing of the Paris Agreement, climate change came to the fore for financial institutions, in particular through the focus on Net-Zero.

Net-Zero has spurred a wide-range of developments. Development of a range of mandatory climate disclosures in jurisdictions including the United Kingdom, New Zealand, United States are an example of this. Net-Zero targets have even become an explicit part of many tendering processes. For instance, the Biden Administration instituted a requirement that providers of government contracts worth US \$50 million and over have to set a Science Based Target (SBT) towards Net-Zero. In tandem with climate disclosure required through the United States' Securities and Exchange Commission, this could create a legal requirement to disclose company progress towards a Net-Zero target, including the use of offsets. The United Kingdom government also requires Net-Zero commitments from companies it procures from. Given this market trend, the announcement of Net-Zero plans can drive the stock price higher.⁸ Therefore, many companies adopt net-zero targets voluntarily.

It is not just market access or performance that climate conditionality is important for, consequences for failing to progress towards a claimed Net-Zero target could see repercussions for directors and officers. For instance, the European Commission has proposed that its Unfair Commercial Practices Directive is updated to require Net-Zero claims to demonstrate “recognised excellent environmental performance” or potentially

⁶ Bailey, R., Bice, A., Wittenberg, A., Lasius, R., and Bhargava, A. (2023) *Insurance and Sustainability Opportunities for 2023*. [Online] Oliver Wyman. <https://www.oliverwyman.com/our-expertise/insights/2023/jan/insurance-and-sustainability-opportunities-for-2023.html> [Accessed 2 February 2023].

⁷ United Nations Environment Programme Finance Initiative. [Online]. UNEP-FI. <https://www.unepfi.org/insurance/insurance/signatory-companies/> [Accessed 12 February 2023].

⁸ Riggs, F. (2023) *Solving The Climate Crisis Investment Conundrum: Green As A Service?*. [Online] <https://www.forbes.com/sites/forbestechcouncil/2023/02/09/solving-the-climate-crisis-investment-conundrum-green-as-a-service/?sh=177e6f7b2893> [Accessed 6 February 2023].

face a penalty.⁹ Concurrently there is a growing trend of shareholder activism on the part of both public and private investors. Such activism spans the gamut from individual investor to some of the most significant funds in the world. In January 2023 year, the Chief Governance and Compliance Officer of Norges Bank Investment Management, a fund which manages more than 13tn Norwegian kroner (£1tn), said that it was preparing to vote against the re-election of at least 80 company boards for failing to set or hit environmental or social targets, including Net-Zero.¹⁰ It is therefore clear that companies face external and internal pressures to align their financial flows with Net-Zero. That said, there remains a lack of information for many investors to make robust decisions. Hence the need for further disclosure and stocktaking as to the extent of a company's progress towards Net-Zero. Nevertheless

2.2 Role of insurance

The insurance industry is set up to address risks as an absorber of financial shocks.¹¹ It is a foundational aspect of the broader financial market as access to insurance affects access to capital for a wide range of other entities. That said, it is not just insurers and reinsurers as risk carriers, that can play a role addressing climate change. Insurance marketplaces such as Lloyd's of London, brokers, and supporting institutions—such as associations have respective roles.¹² Climate can increasingly be seen as a central issue for those in the insurance industry from an 'enterprise risk management' (ERM) perspective as it cuts across their domains of underwriting, asset management and corporate governance.¹³ Until very recently there had been 'virtually no work' done on how to climate-aligned insurance.¹⁴ This is because the link between financial actors is more tenuous than actors that directly finance entities. Therefore, PCAF suggests the

⁹ Laine, A., Ahonen, HM., Pakkala, A., Laininen, J., Kulovesi, K., Mäntylä, I. (2023) *Guide to good practices for voluntary carbon markets*. Government of Finland, p 123.

¹⁰ Neate, R. (2023) World's biggest investment fund warns directors to tackle climate crisis or face sack. [Online]. The Guardian. <https://www.theguardian.com/business/2023/feb/03/worlds-biggest-investment-fund-warns-directors-to-tackle-climate-crisis-or-face-sack> [Accessed 5 February 2023].

¹¹ Net-Zero Insurance Alliance, *ibid.* at 7.

¹² *Ibid.* at 12.

¹³ *Ibid.*

¹⁴ *Ibid.* at 7.

‘follow the risk’ principle is more apt to understand the climate linkage of climate change, instead of the ‘follow the money’ principle.¹⁵ Even though insurance proceeds are not a financial contribution (investment or loan), the funds received on a claimed response can still be used to fund economic development of a country, this is not the primary purpose. Nevertheless, insurers have a relationship with companies in both liability (insurance) and an asset (investment) forms.¹⁶ Insurers can also be considered institutional investors who can and do engage with their investee companies.¹⁷ In this way they face form a part of financial supply chains that have the potential to shape emissions pathways in a number of ways.

Insurers and those that work for them are alive to the risks for climate change given the interconnection between risk and climate change. Climate change worsens natural hazards and other catastrophes that may affect an insured asset. In turn, impacts of climate change are factored into models which calculate premiums in relevant areas. In this way, they help to illustrate the exposure of an insurer (and reinsurer in turn) to the risks posed by climate change. However, in areas of the world most affected by climate change, there is increasing emphasis placed on the potential for insurers to build resilience. Rather than disbursing funds in the wake of a natural disaster as part of the recovery, there have been some pilot models where the same funds are disbursed prior to a claim event—enabling recipients to enhance their resilience and ultimately lower subsequent harm.¹⁸ Within the insurance industry, actuaries have indicated significant interest in appreciating climate risks for insurance and expanding the range of metrics to judge such risks. Nevertheless, there remains blind spots in actuarial analysis given that the areas considered most relevant to Net-Zero claims tend to be motor, property, agriculture sectors.¹⁹ In this way the industry appears to focus on climate as an impact that affects insured entities, rather than the impact caused from entities they insure. However, mitigation goals of Net-Zero cut-across all lines of business. How insurers

¹⁵ *Ibid.* at 8.

¹⁶ *Ibid.*

¹⁷ Particularly in life insurance lines of business. *Ibid.* at 18.

¹⁸ Reference

¹⁹ Stefan, R. and Agarwal, V., ‘Net Zero and offsets – How to make it work?’ GIRO, Liverpool, United Kingdom November 2022.

approach climate risks may be changing. Indeed, for the first-time specialist ESG roles are being advertised for in leading markets.

That said, there is recognition that insurers can do more to address align financial flows with the Paris Agreement. NZIA was founded at the G20's Climate Summit in 2021 and has since grown from a membership of eight insurers and reinsurers, to 29 – representing 15% of world premium volume globally.²⁰ It is convened by the United Nations Environmental Program Finance Initiative (UNEPFI) and stands as part of the broader Race to Zero, which boasts a membership of +10,000 entities that have committed to Net-Zero. The NZIA is also an example of a smaller subset of Net-Zero focused financial industry-based groups that focused on groups such as asset owners, investors, asset managers, investment consultants, and banks, among others.

Despite laudable progress in setting up the NZIA, many of its members have only just begun their Net-Zero transition planning, including assessing their own climate risk. Thus far this has principally been on the climate contribution of their internal (Scope 1 and Scope 2) value chain emissions. However, it is the Scope 3 emissions where the majority of an insurer's value chain emissions lie. Indeed such 'insured emissions' could amount to some 700x of their Scope 1 and 2 emissions.²¹ As defined by the UN Environment Programme's Principles for Sustainable Insurance Initiative (PSI), 'Net-Zero Insurance' approaches cover four pillars. First, insurers can reducing greenhouse gas emissions in their activities in a manner commensurate with reaching 1.5°C low or no-overshoot scenario– both in the short term (2030 or sooner) and long term (2050).²² Second, they can support the real-economy transition to Net-Zero through their insurance underwriting portfolio.²³ Third, they can embed net-zero commitments in business practices by setting internal net-zero targets and developing external policies for to support delivery of net-zero goals.²⁴ Fourth, they can disclose of Net-Zero activities

²⁰ AXA (NZIA Chair), Allianz, Aviva, Generali, Munich Re, SCOR, Swiss Re and Zurich Insurance Group were founding members.

²¹ CDP (2020) The Time to Green Finance- CDP Financial Services Disclosure Report 2020.

²² *Ibid.* at 27.

²³ *Ibid.*

²⁴ *Ibid.*

through a range of stakeholders.²⁵ Notwithstanding this guidance, there remained confusion about what the NZIA specifically tasked re/insurers with. This led to the development of a target-setting protocol that was released at the World Economic Forum’s Annual Meeting in Davos in January 2023. The NZIA launched this protocol in order to facilitate ‘NZIA members to begin to independently set science-based, intermediate targets for their respective insurance and reinsurance underwriting portfolios in line with a net-zero transition pathway consistent with a maximum temperature rise of 1.5°C above pre-industrial levels by 2100’.²⁶ The Science Based Targets Initiative, for instance, has developed guidance for underwriting portfolios that indicates a menu of these pathways available for re/insurers to decarbonise:²⁷

1. Overarching emission reduction targets
2. Sectoral decarbonisation targets (SBTI method)
3. Portfolio coverage targets (SBTI method)
4. Focused engagement targets
5. Re/insuring the transition targets

Current members of NZIA have until July 31 2023 to comply with the protocol. In saying this, the NZIA clearly outlines that the expectations it sets for its members must be seen within the broader commitments of governments, industry actors and intermediaries, cautioning that if the decarbonisation efforts of others lag, then insurers might not be able to achieve their commitments either.²⁸

As a leading insurer states “to fully grasp this opportunity, the insurance industry must change some of its mindset to formulate a consistent forward-looking pricing model for new risks.”²⁹ Despite its risk exposure, the insurance industry has been somewhat slow to adapt to the various risks posed by climate change. Consequently, there is an ongoing

²⁵ *Ibid.* at 27.

²⁶ Reference

²⁷ *Ibid.* at 6.

²⁸ *Ibid.* at 6.

²⁹ Aon (2023) 3 Ways the Insurance Industry can accelerate Net Zero by Facilitating Capital [Online]. Aon. <https://www.aon.com/insights/articles/2023/3-ways-insurance-industry-can-accelerate-net-zero-by-facilitating-capital> [Accessed 2 February 2023].

need to build expertise in GHG mitigation techniques and how this shapes risk exposure as companies and sectors transition to net-zero, including their use of offsets.³⁰

2.3 Offsets

The Kyoto Protocol came into force 25 years ago; cementing carbon markets as a climate mitigation tool. Since, carbon credits have been bought and sold as part of both mandatory (regulatory) and voluntary market schemes. Offsets are defined by the IPCC as a “reduction in emissions of carbon dioxide or other greenhouse gases made in order to compensate for (“offset”) an emission made elsewhere”.³¹ If employed as part of Net-Zero standard setting offsets should only be used to offset residual emissions that are not able to be removed. From a mitigation perspective it is far more effective to reduce value-chain emissions than it is to employ offsets. Indeed, offsets have highly variable characters, qualities and permanence ranges.

The most popular offsets to date have been avoided emissions credits, a class of credits predicated on avoiding an emission in an external value chain. Examples of these include protecting forests due to be cut down or reducing emissions from the use of traditional cooking devices by replacing them with devices that more cleanly burn. However, the comparatively low price-point of such offsets when compared to their permanent counterparts comes at the cost of concerns over their environmental integrity. For instance, by including credits from projects were not found to offer avoided emissions, including forests already protected from deforestation.³² Even if effective, they may operate on a short timescale, much shorter than needed to avoid global temperature rise.

³⁰ Net-Zero Insurance Alliance, Insuring the net-zero transition, *ibid.* at 10.

³¹ IPCC (2018). IPCC meetings go carbon-neutral [Online]. [https://www.ipcc.ch/2018/06/15/ipcc-meetings-go-carbon-neutral/#:~:text=A%20carbon%20offset%20is%20a,%E2%80%9D\)%20an%20emission%20made%20elsewhere](https://www.ipcc.ch/2018/06/15/ipcc-meetings-go-carbon-neutral/#:~:text=A%20carbon%20offset%20is%20a,%E2%80%9D)%20an%20emission%20made%20elsewhere). [Accessed 12 February 2023].

³² Grantham Research Institute on Climate Change and the Environment (2023) Insurance: responding to climate impacts and rewarding resilience [Online] <https://www.lse.ac.uk/granthaminstitute/insurance-responding-to-climate-impacts-and-rewarding-resilience/> [Accessed 3 February 2023].

The low-price point of such offsets also disincentivises reducing in-house emissions.³³ There is also a risk of substitution—where a different forest is cut down or more fuel stoves are used, negating any effect from a cleaner model being used— which can negate any end emissions avoided. Indeed, avoided emissions credits, at best, only result in a zero-sum of emissions. As a result, if there are weaknesses in project design, avoided emissions credits can quickly lead to real emissions increases. This is notwithstanding the valuable co-benefits in terms of the gambit of Sustainable Development Goals they offer as co-benefits. The other major category of offsets is removals. Removals can be grouped into two main categories: biological and technological or differentiated by the type of removal they employ (geological, terrestrial, oceanic or product-based). Biological removals could result from projects that plant new trees or restore wetlands. Technological removals, by contrast, may involve chemical could in processes like Direct Air Carbon Capture and Storage (DACCS) or the mineralization of carbon dioxide. Removals also vary in permanence. Biological stocks last as long as the lifespan of a species and may be shortened through exposure to storm, fire or other hazards. By contrast, mineralising carbon dioxide may result in permanence for thousands of years. Both biological and technological-based removals face constraints and thus are limited in nature. We simply do not have enough inputs to remove all emissions through any one source. Nevertheless, removals remain the only way to reach Net-Zero. At the same time, many technological options have not been scaled to meet the need required- requiring an exponential scaling up.³⁴ As a result, the VCM has failed to deliver a truly ‘net-zero’ instrument.³⁵ Moreover, the supply of permanent removal options continues exceeded demand.³⁶ With the impending operationalisation of Article 6 carbon market regimes under the Paris Agreement, addressing the quality of offsets is a key issue- including to what extent integration of the Paris-led carbon market can integrate with the voluntary carbon market.

3. Offset Insurance

³³ Mitchell-Larsen, E. and Allen, M., (2022) ‘Prosets: a new financing instrument to deliver a durable net zero transition’, *Climatic Change*, Vol.174, Art.15, p. 5.

³⁴ State of CDR

³⁵ Mitchell-Larsen, E. and Allen, M., *ibid.* at 10.

³⁶ *Ibid.* at 10.

There both risk and opportunity involved in the use of offsets, and consequently inbuilt into the Net-Zero paradigm. On the one hand, the advent of offsets to reduce unabatable emissions, helps companies address their climate-impact in the round. Yet, the use of poor-quality offsets or overreliance on offsetting in general (at the expense of in-house greenhouse gas reductions) could risk progress towards the aims of the international climate law architecture: to avert dangerous levels of global warming. As a leading insurer states “today, forward-thinking insurance companies are driving the global economy by originating solutions that safeguard businesses, governments and communities”.³⁷ This includes “matching capital to risk where it is needed”.³⁸ As outlined above, there is a need for participants in the voluntary carbon market to focus on removals, as opposed to other forms of offsetting that currently exist. Just as insurance is a prerequisite for driver registration, a regulator may also impose conditionality on the use of removals that also involves insurance.³⁹ In this, insurers have a role in providing a “reasonable expectation of permanent sequestration” for a defined contract period.⁴⁰ One option comes in the form of an OIP.

³⁷ Aon, *ibid.*

³⁸ *Ibid.*

³⁹ Mignone, B.K., Hurteau, M.D., Chen, Y., and Sohngen, B. (2009) ‘Carbon offsets, reversal risk and US climate policy’, *Carbon Balance and Management*, Vol. 4, No.3, p 2.

⁴⁰ Sedjo, R.D., Marland, F.G. (2003) ‘Inter-trading permanent emissions credits and rented temporary carbon emissions offsets: some issues and alternatives’, *Climate Policy*, Vol.3, Issue 4, pp 435-444 at 440.

3.1 Design and operation of an OIP

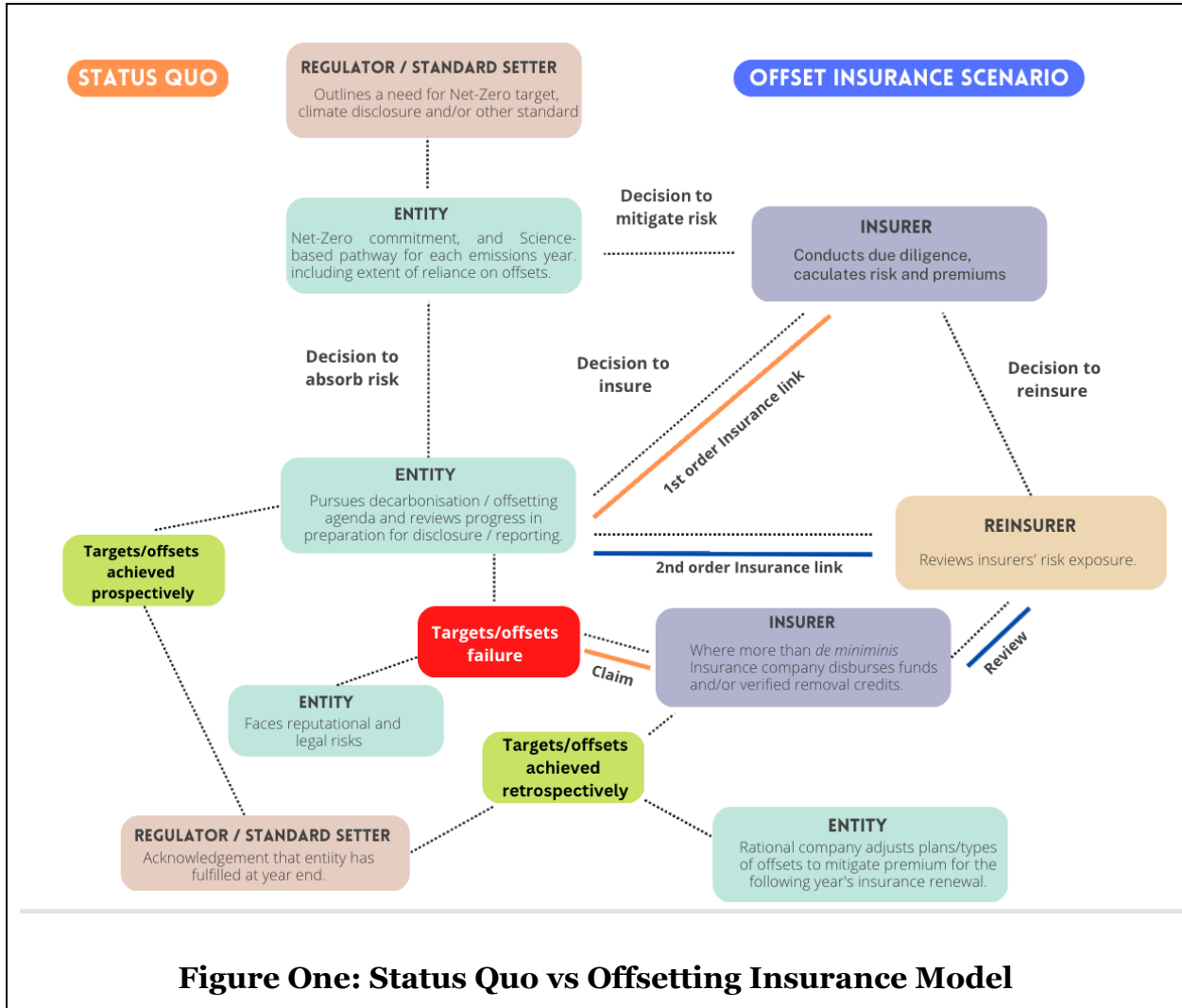


Figure One displays the design and operation of an OIP. On the left, it outlines the current status quo where a company absorbs the reputational and legal risk of not meeting Net-Zero commitments. The new value chain proposed by OI is presented on the right. As is clear, both pathways start with a regulator or standard setter outlining the need for a net-zero or equivalent and outlining certain conditions. While one set by a regulator may be directly legal requirement in future, it could also define market access to contracts. Similarly, even though a standard may be voluntary, it could also be a legal obligation if, through climate disclosures- there is a risk of misrepresentation and attendant liability. An entity then makes a commitment to Net-Zero either directly in a given year, and over

specific emissions scopes or alternatively a science-based pathway to reach it at a specified future point in time. At this juncture, it must decide on its approach to reach its commitment. An entity could choose to reduce all emissions in house, or alternatively deem a proportion to be made up with offsets. If the latter, then depending on resourcing, it may procure a range of credits directly from suppliers or via third-party intermediaries. In either case, when an entity reports its tally of emissions vs removals at the end of the accounting period, it will be evident whether their promised target was reached. Entities that overshoot their emissions goals for the year—either by failing to reduce value-chain emissions directly or through inadequate use of offsets—could trigger a claim for an OI pay-out in the form of monies to purchase permanent removal credits, or a transfer of such credits if their insurer holds a stock of them. On the insurer's side, such a claim would then be followed up as part of the policy renewal cycle, thereby affecting the premium paid for next year. It is suggested that offset insurance policies would likely require overshoot to be more than de minimis. Similarly, there should also be an agreed policy maximum, which if exceeded prompts a penalty payment. This is to ensure there remains incentives for entities themselves to diligently research, purchase and monitor their use of offsets. Offset insurance also plays a role in assuming liability should a seller of removals go out of business.⁴¹ In this way, OI stands to legitimise Net-Zero claims and create demand for permanent removals in line with best practice. While the OIP model put forward here focuses on the purchasers of carbon credits, another form could be available to suppliers of offsets, including those that store carbon once removed.

3.2 Opportunities

The ongoing economy-wide transition to Net-Zero necessitates a host of changes core to insurance underwriting and risk management.⁴² The insurance industry is highly annualised, as are science based targets on the way to Net-Zero. This alignment could work in tandem to reinforce the importance of determining action on an individual year basis. Insurance presents one of the best ways to manage the risks of abatement projects

⁴¹ Sedjo and Marland, *ibid.* at 440.

⁴² Net-Zero Insurance Alliance, *Insuring the Net-Zero Transition*, *ibid.* at 22.

and ensure a stable and efficient carbon market.⁴³ Managing these risks requires developing expertise on the potential and end deployment of emissions technologies. This will, in turn, aid in the design of insurance products to manage risks from such technologies.⁴⁴ In this way, insurers can present a unique value proposition to assist businesses in the Net-Zero transition.⁴⁵ The opportunity to create a new product to help align with broader ESG had already proven to be a feature of financial institutions. For insurers as a subset of financial institutions, OIP likewise offer the unique benefit of adding a product (and thus profit) while enhancing their climate profile. In this way, implementing an OIP could be used as an example of insurers demonstrating their commitment to aligning financial flows with the Paris Agreement. As already outlined, insurers face many orders of exposure to climate change. Therefore, in offering products that assist in the transition indirectly aids in their own utility from an asset perspective.⁴⁶ The creation of new markets could also incentivise some insurers to withdraw insurance capacity where the climate risks of an asset, industry or client outweigh the benefit of offering such insurance.⁴⁷

OIP also stand to stimulate high-quality information on the use of offsets amongst insured entities. Through risk research, analytics and modelling, insurers already factor in estimates of climate risk into their premiums.⁴⁸ To establish the market for OIP an insurer must understand its clients' emissions profiles better. A necessary step in gaining OIP is an overview of the client's disclosure of its Scope 1-Scope 3 emissions and use of offsets to date. To ensure the insurer is not taking on inordinate risk in offering an OIP, there is an incentive for them to develop and build on best practice innovations in modelling emissions profiles and (increasingly) the effectiveness of offsets. A corollary of this work to ensure knowledge of the emissions profiles of its clients is that an insurer can better quantify the 'insured emissions' element of its own Scope 3 emissions. This is already an advance on current models, especially when insured emissions are estimated to be 700x

⁴³ *Ibid.* at 10.

⁴⁴ *Ibid.* at 29.

⁴⁵ *Ibid.* at 22.

⁴⁶ *Ibid.* at 16.

⁴⁷ *Ibid.* at 30.

⁴⁸ *Ibid.* at 16.

of its Scope 1 and 2 emissions.⁴⁹ At the same time, there is an incentive for companies to be as forthright as possible in disclosing their use of offsets, as an OIP contract could include a penalty excess for exceeding a maximum level of coverage- and an additional premium added to future renewal years. Evidence of the need for such coverage is provided by disclosure trends within securities commissions.⁵⁰ The need to understand climate disclosure effectively has driven technological advances too, for example, NASDAQ, who recently applied a machine-learning technique to assess and analyse the climate elements of thousands of corporate reports.⁵¹ On the other, corporates face growing legal risk and at the very least, uncertainty should they fail to disclose, or provide an incomplete or underestimate of their emissions profile and how much of it is sequestered. OIP can also help implement the nascent Article 6 carbon markets under the Paris Agreement, and the extent to which the system promotes environmental integrity.⁵²

As more entities set Net-Zero targets, and the removal technology grows, premiums will likely go down over time. This means that OIPs will likely see continued growth over time as an insurance product. Similarly, as the technology underlying permanent removals becomes less risky, companies will be better equipped to assess the opportunities net-negative technologies present.⁵³ While not a long-term solution to the need to switch to permanent removals, demand for OIP is likely to continue to grow to the extent it offers a stabilising force to the volatile–yet invaluable–offset market.

3.3 Risks

⁴⁹ CDP, *ibid.*

⁵⁰ U.S. Securities and Exchange Commission (2023) *Climate and ESG Risks and Opportunities* [Online] <https://www.sec.gov/sec-response-climate-and-esg-risks-and-opportunities> [Accessed 23 February 2023]. ; The Board of the International Organization of Securities Commissions (2022) *Voluntary Carbon Markets Discussion Paper*. OICU-IOSCO.

⁵¹ Nasdaq (2023) AI-powered Study Benchmarks Climate Reporting Across Whole Market [Online] <https://www.nasdaq.com/articles/ai-powered-study-benchmarks-climate-reporting-across-whole-market> [Accessed 13 February 2023].

⁵² Net-Zero Insurance Alliance, *Insuring the Net-Zero Transition*, *ibid.* at 29.

⁵³ Microsoft, for example, seek to remove their historical emissions since 1970. Microsoft (2023) Carbon Dioxide Removal [Online]. Microsoft. <https://www.microsoft.com/en-us/corporate-responsibility/sustainability/carbon-removal-program> [Accessed 25 February 2023].

There are of course limitations with OIPs. For starters, there may be difficulty establishing the initial market for such insurance. The need to set Net-Zero targets remains voluntary for companies, despite company access to certain markets sometimes being predicated on adopting and/or showing progress towards one. Unless the company is under particular scrutiny and suffers legal or serious reputational risks in relation to offsetting, there may not access such insurance without regulatory compulsion. Moreover, while supply of quality removals currently outstrips demand, in the coming years supplies of high-quality removals may be put under pressure. In order to secure enough high-quality removal credits in coming decades, requires investment in the near-term to scale current projects so they are ready for delivery at the necessary time. Such investments may require longer-term investments than insurers are used to therefore requires insurers to “work with new and existing capital providers to increase appetite for longer-term risks.”⁵⁴ Removals may shift from low-hanging (and more cost effective) removals to high-hanging (and more cost extensive options). At the same time, we cannot offset our way to Net-Zero, and there is danger in relying too much on removal technologies which are not yet scaled. Perhaps the greatest risk of OIP being offered is that it seeks to add a degree of legitimacy to the role of removals in reaching Net-Zero. There is a risk that OIP are seen to lessen the likelihood outcome of robust outcomes. This is why the ultimate economics of value-chain emissions reduction and offsetting matters—including the heavy fiscal penalty incurred if the offsets purchased by a company are severely deficient in reaching their Net-Zero targets. Similar to the emergence of the derivative offset markets, there is also a question of whether adding more actors to the value chain of emissions reductions removes the market from where it needs to be.

At present there is also a relative paucity of data with which re/insurers can determine risk against.⁵⁵ Insurers may be hesitant to first engage in this market given the information gaps and asymmetries currently present. In this sense, even a high use of novel removals may not reduce insurable risks as novel technology would initially have little or no data or claims history attached to it.⁵⁶ This may mean it could take some time

⁵⁴ Aon, *ibid.*

⁵⁵ Sedjo and Marland, *ibid.* at 440.

⁵⁶ Net-Zero Insurance Alliance, *Insuring the Net-Zero Transition*, *ibid.* at 16.

for premiums to stabilise due to trial and experimentation of OIPs. Similarly, because the relationship between insurer and insured relationship differs from that of an investor and investee, insurers may be reticent to engage insurers in the climate impact elements of its business.⁵⁷ At the same time, it may not be in the company's interest to fully disclose a chequered past using poor-quality offsets. As a result, the advent of OI, like any new product, may take time to grow. Due to these risks, OIPs are not a silver bullet, and instead should be seen as one of many policies insurers can deploy in aid of the Paris Agreement.

4. Discussion

Many Net-Zero commitments of companies are built on shaky foundations, just as insurers would step in to offer premium earthquake-related insurance, there is an equal opportunity for them to provide stable ground for Net-Zero pledges. As of 2023, over 800+ companies currently have Net-Zero pledges, many of which are some of the largest in the world.⁵⁸ At the same time, it is doubtful that most companies are currently on track to achieve them as progress on most Net-Zero targets remains murky.⁵⁹ Climate disclosure- either mandatorily imposed by regulation or voluntary- have the potential to transform this. Yet, it is clear that companies do not yet possess the capacity to fulfil their Net-Zero targets. At the same time, there remains uncertainty amongst regulators as well, about the impact of mandating Net-Zero targets. OI can address these risks and opportunities unique to offsets, in a way that utilises companies' profit-maximising and risk-minimising aspects objectives. and the insurance companies backing them up. Furthermore, it reinforces precisely how as Mark Carney terms, "climate change can be the biggest economic opportunity of our times".

Indeed insurers have also begun to offer a variety of carbon insurance products to capitalise on this opportunity.⁶⁰ On the lower risk end of the spectrum are products

⁵⁷ Net-Zero Insurance Alliance, *Insuring the Net-Zero Transition*, *ibid.* at 26.

⁵⁸ Net-Zero Tracker (2023) [Online] <https://zerotracker.net/> [Accessed 1 March 2023].

⁵⁹ ECIU and Oxford University (2023) *Net Zero Stocktake 2022*. Net-Zero Tracker.

⁶⁰ Yang, J., and Luo, P. (2020) 'Review on international comparison of carbon financial market'. *Green Finance*, Vol. 2, No. 1, pp 55-74 at 65.

offering incentives for decreased automobile usage or green building practices.⁶¹ On the higher risk end of the spectrum is a product for carbon price fluctuations.⁶² An OIP and the management and climate risks it seeks to assuage also have parallels to other insurance policies a company may hold. For instance, directors' and officers' liability insurance could be engaged if a failure to achieve a Net-Zero target or undertake decisions in line with one, could translate to allegations that a company director and/or officers are not acting in the company's best interest. Similarly, companies may see claims under public liability products also increase due to climate change.⁶³ The notion of an OIP is, therefore not beyond the realms of possibility and, indeed has started to be implemented by some first-movers. A number of commonalities have been forward for the type of insurers who might be first-movers in this regard: those active in European and North American markets; who have an established history as an insurer, including new product development; and who have proven willing to experiment with low-carbon products in past.⁶⁴

Three key examples illustrate that the industry is primed to adopt OIPs. Swiss Re, headquartered in Zurich, Switzerland is one of the world's largest insurers. In 2020 Swiss Re, in collaboration with Climeworks (a removal supplier) concluded a world-first long-term (purchase agreement for removals generated by direct air capture- with a length of 10 years and value of USD 10 million.⁶⁵ In 2021 Swiss Re joined a consortium of five companies– South Pole's NextGen facility– to buy 1 million carbon removal credits from a range of projects by 2025 to help provide them with secure revenue streams and drive down the cost of the technologies.⁶⁶ These are the same removals that could be used as

⁶¹ *Ibid.*

⁶² *Ibid.*

⁶³ Zurich (2022) Thinking ahead: How climate change litigation will shape future liabilities [Online] Zurich. <https://www.zurich.com/en/products-and-services/protect-your-business/commercial-insurance-risk-insights/thinking-ahead-how-climate-change-litigation-will-shape-future-liabilities> [Accessed 12 February 2023].

⁶⁴ *Ibid.* at 65-66.

⁶⁵ Swiss Re (2021) Swiss Re and Climeworks launch partnership by signing world's first ten-year carbon removal purchase agreement [Online] <https://www.swissre.com/media/press-release/nr-20210825-swiss-re-climeworks-partnership.html> [Accessed 12 February 2023].

⁶⁶ Twidale, S. (2022) Swiss Re, UBS among founding buyers in carbon removal scheme [Online] Reuters. <https://www.reuters.com/business/sustainable-business/swiss-re-ubs-among-founding-buyers-carbon-removal-scheme-2022-05-22/> [Accessed 11 February 2023].

reserves for an OIP. At the same time, Swiss Re is making efforts to address its full Value Chain of emissions, for instance, it adopted a USD \$100 per tonne internal carbon levy, which will increase to USD 200 by 2030- including scope 3 elements such as business travel.⁶⁷ Axa, headquartered in Paris, France also followed suit. In 2021 AXA acquired a carbon credit platform, ClimateSeed. As AXA states this was part of its “overall strategy to play a part in addressing climate change” but also gave them “*deeper insight into this new area of business*” (emphasis added).⁶⁸ This is because, similarly to OI, they believe there are “ways we can design indemnity triggers that will protect clients and enable them to fulfil emissions target goals when something out of their control goes wrong”.⁶⁹ While they note the utility of this in terms of unexpected events on the corporate emissions side, for instance, a long detour caused by the blockage of a shipping canal- this could likewise be extended to the broader catch-all provided by an OIP, which includes removals not having been effective in a given year.⁷⁰ On the carbon credit supply side, Aon, has partnered with Revalue Nature, a carbon credit provider, to insure those investments against unforeseen events such as wildfires or bug infestations.⁷¹ Such developments illustrate the significant opportunity for insurers willing to innovate through OIPs.

5. Conclusion

Our world is changing world and the insurance industry is too. Insurers can play a key role in addressing the numerous transition risks we face, alternatively they risk enhancing the path dependency of heavily emissive sectors.⁷² It is here where the insurance industry stands to make its biggest contribution to the Paris Agreement goal of aligning financial flows with a low-carbon development pathway. Despite the industry making headway through the advent of the NZIA, many insurers face difficulty translating their Net-zero

⁶⁷ Swiss Re (2020) Swiss Re introduces triple-digit internal carbon levy to support transition to net-zero emissions in operations by 2030 [Online] Swiss Re <https://www.swissre.com/media/press-release/nr-20200914-swiss-re-introduces-triple-digit-internal-carbon-levy.html> [Accessed 11 February 2023].

⁶⁸ AXA (2022) Enabling the offset; what role can insurance play in offsetting emissions? [Online] Axa. <https://axaxl.com/fast-fast-forward/articles/enabling-the-offset-what-role-can-insurance-play-in-offsetting-emissions> [Accessed 15 February 2023].

⁶⁹ *Ibid.*

⁷⁰ Aon (2023) *Weather, Climate and Catastrophe Insight* at 602.

⁷² Net-Zero Insurance Alliance, *Insuring the Net-Zero Transition*, *ibid.* at 17.

commitments into action. There is concern about insurers setting Net-Zero targets without knowing how exactly they will reach them across their value chain: a feature common across many companies they insure. Addressing insured emissions requires creativity. The advent of OI is one example of such thinking. It provides the kind of product innovation the NZIA calls for whilst also building off existing precedent in the industry. At the same time, it helps the industry understand and address their customers' emissions (and use of offsets), and in turn, their own Scope 3 emissions. In this way, an OIP strikes a balance between ambition and pragmatism. This is important because the writing is on the wall for poor-quality credits and the entities who depend on them to substantiate Net-Zero claims. OI can counter this through the creation of a virtuous cycle in the implementation of Net-Zero strategies. However, it cannot stand alone. As such, it remains just one aspect of the emissions reductions required to meet the Paris Agreement's temperature goal.