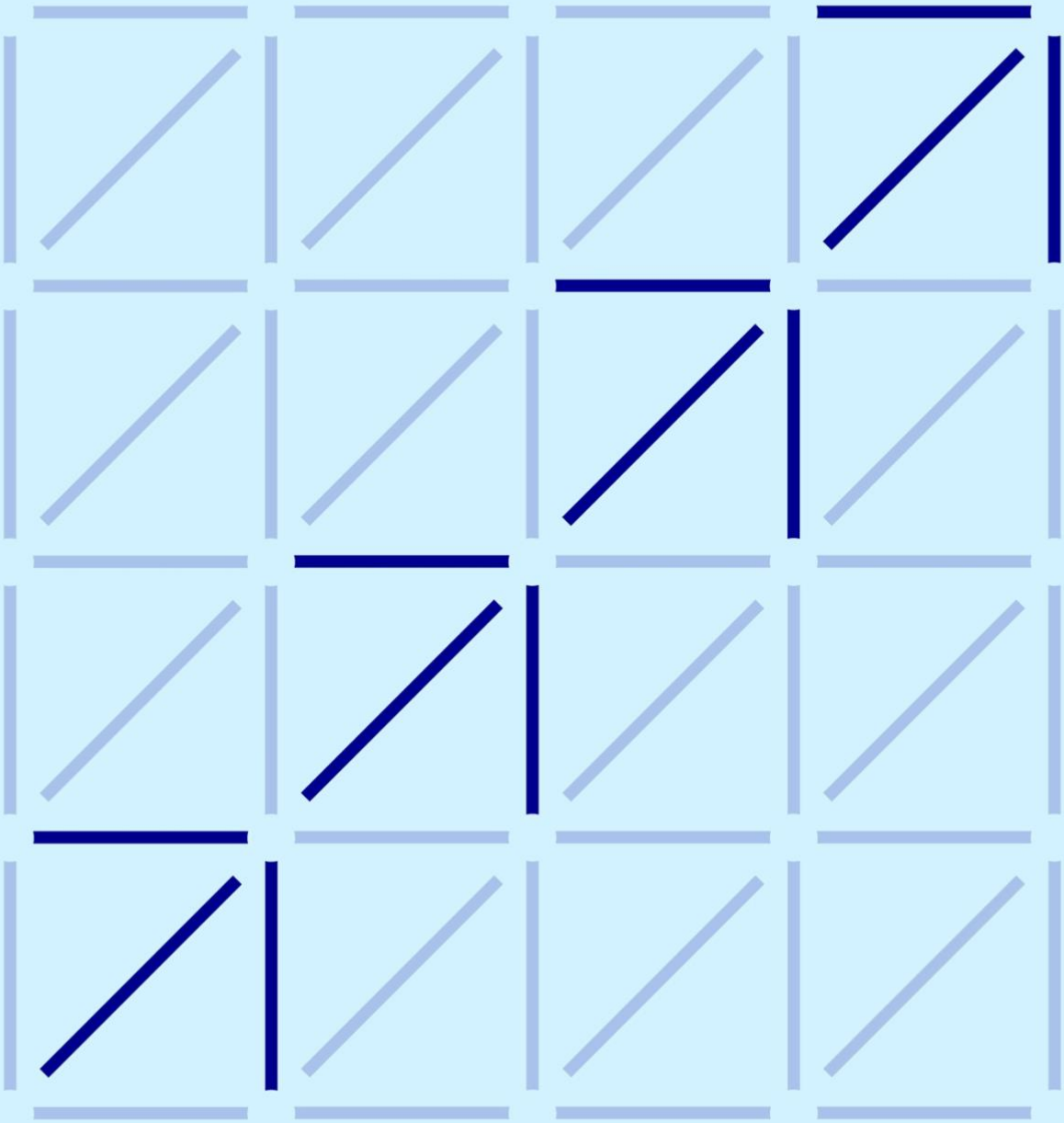

Climate Change & Insurance

Transition risks on the insurance industry

19 May 2026

POLICY PAPER

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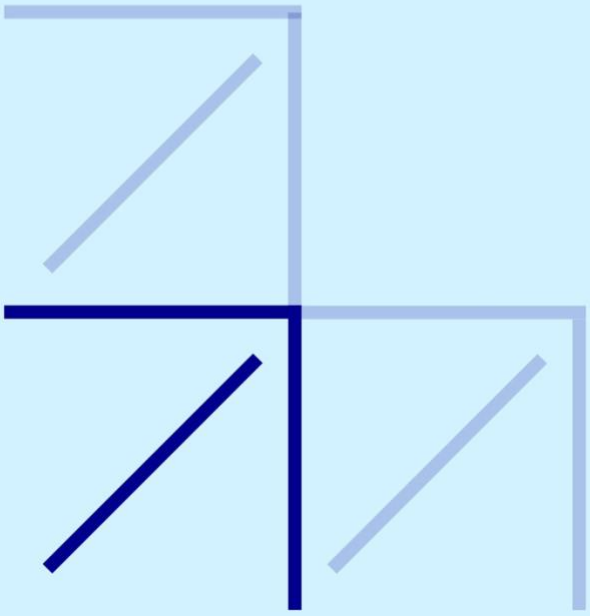

Acknowledgements

This paper is the second in a three-part comprehensive assessment of climate change on the insurance sector, and the third publication in GAIP's Climate Change series. Co-authored by Yao Lei and Zhan Xiong Yeo, it builds on GAIP's earlier work, Too Hot to Insure and Beyond Protection.

We thank CEO Min Hung Cheng for her guidance, and the NTU research team for developing the comprehensive mind map of climate change on the insurance sector on which this work builds. We are also grateful to GAIP's regulators, industry partners and experts across Asia who generously shared their insights during the drafting process. Their contributions have strengthened the clarity and relevance of this report.

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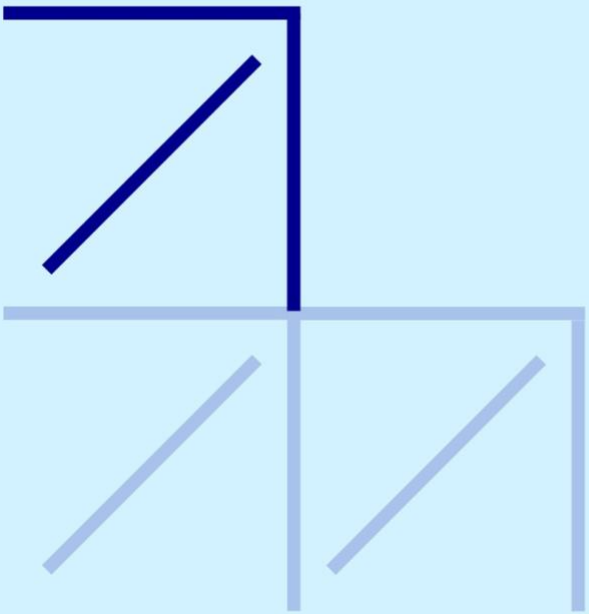

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Executive Summary

Transition risks refer to the disruptions and structural shifts that arise as the world moves toward a low-carbon economy. They emerge from changes in technology, policy, markets, consumer behaviour and investor expectations. While these shifts are necessary to avoid worsening physical risks, they also create adjustment pressures that test the viability of insurers' business models.

Technology and infrastructure transitions are accelerating. The rapid expansion of renewable energy, electric mobility and digitalisation is creating new insurable assets and new operational vulnerabilities. Insurers must expand technical expertise, redesign products and refine models to price emerging risks while managing legacy exposures that may become stranded.

Policy and regulatory shifts are reshaping incentives. Carbon-pricing regimes, disclosure mandates and emissions-reporting requirements are increasing compliance demands and altering the risk and value profiles of both insureds and insurers' investment portfolios. Early adjusters can access transition-finance opportunities, whereas late adjusters face rising credit, market and operational risks.

Consumer preferences are shifting. Demand for low-carbon products, transparent sustainability claims and environmentally aligned services is prompting insurers to develop new offerings, such as sustainability-linked products and prevention-based services. These innovations depend on credible metrics, clear methodologies and robust data.

Investor expectations are evolving. Capital is moving away from high-emission activities toward credible transition strategies. As institutional investors themselves, insurers face heightened portfolio volatility and increasing scrutiny of their transition plans. Aligning underwriting and investment activities becomes critical to safeguarding solvency and maintaining market confidence.

Information gaps continue to constrain decision making. Fragmented disclosures, inconsistent ESG ratings and limited visibility into climate-sensitive exposures weaken risk assessments and distort capital allocation. Progress toward standardised reporting is underway but remains uneven across jurisdictions.

Together, transition risks are reshaping expectations on what insurance covers, how portfolios are valued and how capital is deployed. They test the sector's ability to remain profitable, maintain investor confidence and play its role as a long-term stabiliser in an economy undergoing rapid decarbonisation.

This paper provides a structured assessment of transition risks affecting the insurance sector. It forms the second part of a three-paper assessment of climate-related risks, alongside one paper focused on physical risks and a final paper that synthesises physical and transition risks, summarises their implications across the insurance ecosystem, and sets out strategic considerations for insurers, reinsurers, insurance brokers, regulators and policymakers.

Introduction

Transition risks refer to the disruptions and structural shifts associated with the global move toward a low-carbon economy. As defined by the International Association of Insurance Supervisors (IAIS), these are "risks arising from disruptions and shifts associated with the transition to a low-carbon economy" [1]. They include policy, technological, market, and behavioural changes that emerge as countries and industries make efforts to decarbonise. While such efforts are vital to mitigate future physical risks, they also generate adjustment costs that reverberate across the economy[2].

In practice, transition and physical risks are closely interlinked but distinct. Efforts to reduce emissions, such as renewable energy adoption, carbon pricing or electrification, help mitigate long-term physical losses but often increase short-term transition risks, including technological obsolescence and stranded assets. A just transition, in which no one is left behind in this economic shift, remains a guiding principle for many national strategies[3].

This paper examines transition risks and the structural adjustments they impose on the insurance sector. It forms part of a three-paper climate-insurance assessment, alongside a paper focused on physical risks and a concluding paper that consolidates insights from both physical and transition dimensions, evaluates their implications for insurance-sector resilience, supervisory priorities and long-term financial stability, and sets out considerations for market participants and public authorities.

According to the IAIS, there are five main drivers of transition risks for the insurance industry:

1) Changes to infrastructure and technology use
2) New government policies to reduce greenhouse gas emissions
3) Changing consumer preferences
4) Changes in investor perception
5) Lack of information on climate-sensitive exposures

This paper follows a structured framework to examine each driver, its macroeconomic consequences and its relevance to insurance-sector resilience[4].

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[1] International Association of Insurance Supervisors. (2021). *The impact of climate change on the financial stability of the insurance sector*. https://www.iaisweb.org/uploads/2022/01/210930-GIMAR-special-topic-edition-climate-change.pdf

[2] Bank of England. (2019). *Discussion Paper: The 2021 biennial exploratory scenario on the financial risks from climate change*. https://www.bankofengland.co.uk/-/media/boe/files/paper/2019/the-2021-biennial-exploratory-scenario-on-the-financial-risks-from-climate-change.pdf?la=en&hash=73D06B913C73472D0DF21F18DB71C2F454148C80

[3] Committee for Development Policy (CDP). (2023). *Just transition**. United Nations. https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/CDP-excerpt-2023-1.pdf

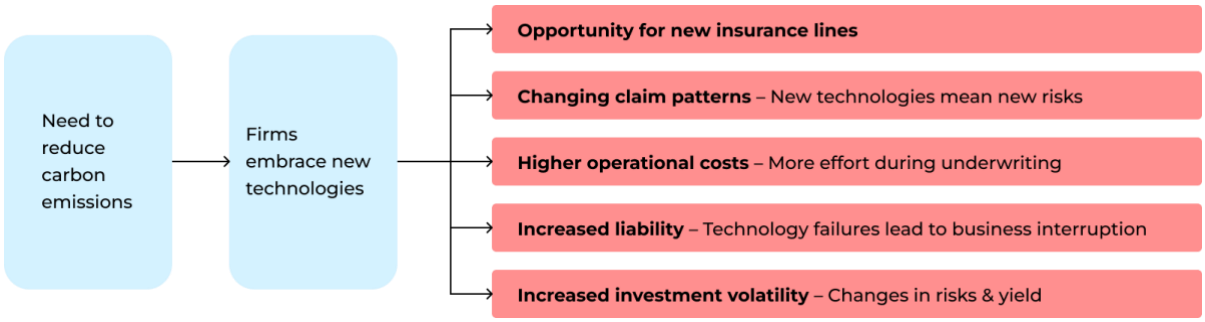
[4] Semieniuk, G., Campiglio, E., Mercure, J.-F., Volz, U., & Edwards, N. R. (2021). Low-carbon transition risks for finance. *WIREs Climate Change*, *12*(1), e678. https://doi.org/10.1002/wcc.678

Changes to Infrastructure / Technology Use:

A transition toward a low-carbon economy involves behavioural and process changes across individuals, corporations and communities. Corporates play a central role in reducing emissions through the adoption of cleaner technologies, from renewable energy and energy-efficient manufacturing to adopting electric vehicles (EVs) in their delivery fleets. Such transitions often involve significant upfront investments that can raise production costs and in turn, consumer prices.

As companies explore newer infrastructures and technologies, they also face operational risks such as business interruption, technology underperformance and cost overruns. These changes alter the overall risk profiles, with implications for insurable exposure to both credit and market risks[5].

Figure 1. Changes to Infrastructure / Technology Use



Potential increased revenue streams via innovation

Emerging technologies present insurers with opportunities to expand revenue through tailored products and services that help companies manage new operational risks. As companies invest in renewable energy and other low-carbon innovations, they face complex and unfamiliar exposures that require specialised coverage. This creates scope for insurers to develop products that integrate risk assessment, technical expertise and comprehensive protection across the project lifecycle.

Examples include Sompo, one of Japan's largest multiline insurers, which has developed a suite of products and services for the renewable-energy sector that combine coverage, risk management and technical expertise. Its "ONE SOMPO WIND Service[6]" offers offshore

[5] Bank for International Settlements. (2021). *Climate-related risk drivers and their transmission channels*. https://www.bis.org/bcbs/publ/d517.pdf

[6] Sompo. (n.d.). *Initiatives to Reduce Environmental Burden and Services for the Offshore Wind Power Sector*. Sompo Holdings. Retrieved December 23, 2024, from https://www.sompo-hd.com/en/csr/action/community/content5/

wind power operators an integrated package that includes risk assessment from construction through operation, as well as comprehensive insurance covering accidents, breakdowns and repair costs. It also includes clauses for accident investigation and preventive safety measures, helping reduce recurrence risk and maintain operational continuity. Allianz[7] similarly provides dedicated Natural Resources Insurance for renewable energy infrastructure, including wind, solar, and battery storage. Coverage spans both the construction and operational phases, offering protection against operational all-risk physical damage, business interruption, and contractors' or erection all-risk events, including third-party liability and delay in start-up. These initiatives demonstrate how insurers can generate new premium streams, expand technical capabilities and act as strategic partners in advancing corporate decarbonisation and low-carbon innovation.

Changing claim patterns from insuring greener technologies

New technologies can alter the frequency and severity of insurance claims. Green buildings, for example, may feature vegetated or “green” roofs that improve insulation and biodiversity. However, these structures can also increase fire susceptibility and structural load due to accumulated rainwater, depending on their designs, affecting a building’s stability and requiring new underwriting considerations[8] [9] [10] [11]. Premium adjustments, higher deductibles and revised coverage terms may be needed to address these design-specific vulnerabilities. Similarly, electric vehicles (EVs) reduce emissions but are costlier to insure due to the high price and limited standardisation of battery systems and electronic components. Limited actuarial data on repair costs further complicates pricing and risk modelling.

[7] Allianz Commercial. (n.d.). Natural resources insurance – Energy insurance. https://commercial.allianz.com/solutions/energy-insurance.html

[8] Department for Communities and Local Government. (2013). *Fire Performance of Green Roofs and Walls*. https://assets.publishing.service.gov.uk/media/5a7c506340f0b6321db385b5/130819_SW3529R_-_Issue_3_-_Green_Roofs_and_Walls_Project_web_version_v3.pdf

[9] Swiss Re. (2020). *Sustainability Series: Green Roofs*. Swiss Re. https://corporatesolutions.swissre.com/dam/jcr:db15a873-f374-462d-878a-58f495a13467/RES-green-roofs.pdf

[10] FM Global. (2007). *Green Roof Systems*. https://www.greengridroofs.com/wp-content/uploads/2018/01/Factory-Mutual-Green-Roof-System-1-35-2007.pdf

[11] Alabady, H. S., & Ghazaleh, S. N. A. (2017). Green Building Insurance. *Journal of Law, Policy and Globalization*, *66*(0), 137. https://www.iiste.org/Journals/index.php/JLPG/article/view/39376

Higher operational costs from insuring greener technologies

Data collection and monitoring are critical for underwriting emerging risks, but these processes can be expensive. Partnerships between insurers and technology providers can lower such costs. Tesla, for example, integrates telematics directly into its vehicles to offer usage-based insurance that reflects real-time driving behaviour[12]. Such an embedded data approach reduces administrative costs and frictions while enhancing the accuracy of pricing models. It also enables a feedback loop that supports both risk management and technology improvement.

Emerging underwriting challenges in renewable energy

As insurers and reinsurers seek to support the low-carbon transition, they are encountering practical underwriting challenges in their renewable energy portfolios that extend beyond changing claim patterns and rising data costs. While these portfolios are growing rapidly, their risk profiles are proving different from initial expectations. Higher-than-anticipated and more volatile loss ratios are emerging, driven by inverter failures, turbine breakdowns, and delays caused by supply chain bottlenecks. According to WTW's Renewable Energy Market Review 2025, geopolitical, supply chain and weather-related risks rank as top concerns for renewable energy companies[13].

In response, underwriters are tightening terms, reducing line sizes and placing greater emphasis on independent technical assessments. As Allianz notes, underwriting often only starts six weeks before insurance cover incepts, at which point options are limited to price and wording; early involvement at the feasibility or FEED stage allows risk engineers to guide decisions on location, design, and standards that remain insurable over the long term[14].

Limited historical loss data for newer technologies increases pricing uncertainty and capital strain, especially when model assumptions diverge from actual performance. Aon highlights that limited historical data for new technologies, such as battery energy storage, further complicates risk assessment and pricing. WTW's survey found that 57% of

[12] Tesla. (n.d.). *Tesla Real-Time Insurance | Tesla Support*. Tesla. Retrieved January 3, 2025, from https://www.tesla.com/support/insurance/tesla-real-time-insurance

[13] WTW, Renewable Energy Market Review 2025 (July 9, 2025) https://www.wtwco.com/en-id/insights/2025/07/renewable-energy-market-review-2025

[14] Allianz, Insuring the Energy Transition: Engineering for Renewables (December 19, 2025) https://www.allianz.com/en/mediacenter/news/articles/251219-how-allianz-supports-the-energy-transition.html

renewable energy companies listed risk engineering requirements as a top obstacle to transferring clean energy risks to the insurance market.[15]

There is also a tension between the desire to support the transition and the need to maintain financially sustainable underwriting, since traditional fossil fuel assets often still have more predictable claims experience and longer actuarial track records. One example of this is with offshore wind projects, where Aon observes major challenges in maintaining profitability amid high production costs and unprofitable construction risks[16]. These dynamics are influencing capacity allocation, underwriting appetite and the overall economics of transition-related lines of business.

Evolving approaches to carbon-intensive sectors

For more carbon-intensive sectors, underwriting approaches are evolving rather than simply defaulting to exclusion. Many insurers are not exiting immediately but are applying tighter conditions, stronger risk improvement plans, and stricter timelines on transition commitments. Some are moving away from blanket exclusions and towards more nuanced, project-level assessments so that they can support credible transition efforts while limiting exposure to the worst-performing assets. Pricing, attachment points, and capacity limits are also being used more actively to manage deteriorating or high transition-risk segments. This approach allows insurers to remain engaged with transitioning sectors while managing downside risk, though it requires more sophisticated risk assessment capabilities and closer engagement with policyholders on their decarbonisation pathways.

Increased liability from more business disruption claims

Early adoption of emerging technologies comes with uncertainty. New systems may fail, underperform or become obsolete before their expected lifespan, exposing insurers to unanticipated business interruption claims that existing policy frameworks were not designed to absorb. Battery Energy Storage Systems (BESS) offer a direct illustration of this risk. As BESS capacity has expanded rapidly on the back of global decarbonisation commitments, insurance claims have begun materialising, which may catch underwriters without sufficient loss history or pricing models to respond adequately. The consequences of this data gap were made tangible by the Moss Landing BESS facility in California, where repeated overheating incidents culminated in a major fire in early 2025, resulting in a

[15] Aon, An Insurer Roadmap for Navigating the Energy Transition https://www.aon.com/en/insights/articles/reinsurance-roadmap-for-energy-transition
[16] Ibid

reported US$900 million insurance claim[17]. As the pace of climate technology deployment accelerates, insurers that rely on conventional policy language and legacy underwriting assumptions may risk becoming liable for losses that were neither anticipated nor adequately priced at inception.

Increased investment volatility and shrinking yields from changing risk profiles

The financial impact of transition risks extends beyond underwriting to insurers' investment portfolios. High initial costs and performance volatility in new technologies can reduce firms' profitability, raise default risks and trigger credit downgrades. These ripple through financial markets, causing yield shocks and valuation losses for institutional investors such as insurers[18]. Operating under risk-based capital frameworks, credit rating downgrades of held assets can trigger higher capital charges, as these frameworks typically impose progressively higher requirements for lower-rated holdings. When bond ratings fall, insurers may need to liquidate affected positions or hold additional capital to maintain solvency ratios, creating forced selling pressure and potential realised losses. As a result, insurers may have fewer options to maintain appropriate asset-liability matching without increasing portfolio risk. This may create a challenge as insurers might be compelled to (i) seek alternative asset classes that offer suitable duration profiles to match liabilities, (ii) take on more investment risk and hold additional reserves, or (iii) accept lower returns and adjust pricing for future policies. The effect is more significant for life insurers, whose long-duration liabilities require careful matching of asset and liability cash flows over extended time horizons.

In 2023, investment results represented a substantial share of selected major reinsurers' earnings before interest and tax (EBIT). While 2023 was a particularly favourable year for investment returns, and these figures represent only major reinsurers rather than the broader insurance industry, the data provides a general sense of the impact that capital market conditions could have on earnings. The contribution of investment income to EBIT can vary significantly across years; for example, many insurers incurred investment losses in 2022, while in benign catastrophe years, underwriting profits constitute a larger share of earnings.

[17] Gallagher, Battery Energy Storage Systems (BESS): Risk Trends and Insurance Implications, AJG Australia, April 2025, https://www.ajg.com/au/news-and-insights/battery-energy-storage-systems/
[18] Cohn, C. (2020, July 29). Insurers walk tightrope of risky corporate credit. *Reuters*. https://www.reuters.com/article/business/insurers-walk-tightrope-of-risky-corporate-credit-idUSKCN24U1OA/

Table 1: Selected Reinsurers' Investment Results vs EBIT (2023)

	Munich Re (in EUR millions)	Swiss Re (in EUR millions)	SCOR SE (in USD millions)	Hannover Re (in EUR millions)
Investment Results*	€ 5,535	€ 4,115	$ 922	€ 1,636
% of EBIT	94.3	80.0	67.5	80.6

Source: 2023 annual reports of respective companies.

* *Investment results refer to investing in financial instruments and non-financial instruments. It is not inclusive of finance income from insurance contracts. This shows the sector's potential reliance on stable investment yields and the balance-sheet stress from transition-induced volatility.*

Changes in Government Policies

Governments play a pivotal role in accelerating the shift to a low-carbon economy. Policies, from carbon taxes to energy diversification, create incentives for cleaner production and more sustainable consumption. These measures influence both corporate strategy and consumer behaviour, while reshaping the risk landscape for insurers and investors. Mandatory carbon-reporting regulations and emissions-reduction targets increasingly drive disclosure and accountability. For instance, studies have shown that consumers reduce their food-related carbon footprint when presented with product footprint labels[19] [20]. These behavioural linkages illustrate how policy tools can indirectly influence insurance demand and risk profiles.

Different countries have different roadmaps and policies to aid in lowering greenhouse gas emissions. In Asia, initiatives such as Vietnam's energy diversification and the adoption of carbon taxes in Singapore and Thailand reflect varying national strategies to support mitigation efforts.

Vietnam's Diversification from Coal to Natural Gas and Renewable Energy

In 2023, Vietnam launched the Power Development Plan 8 (PDP8) to support its commitment to achieve net-zero emissions by 2050. The plan aims to reduce reliance on coal while expanding renewables such as wind, biomass and solar energy[21]. By 2030, hydropower and wind are expected to account for 19.5% and 18.5% total energy mix, respectively, lowering coal's share from 30.8% in 2020 to 20% in 2030[22]. These policies signal long-term commitment and enhance investor confidence, both being key factors for insurers assessing project viability.

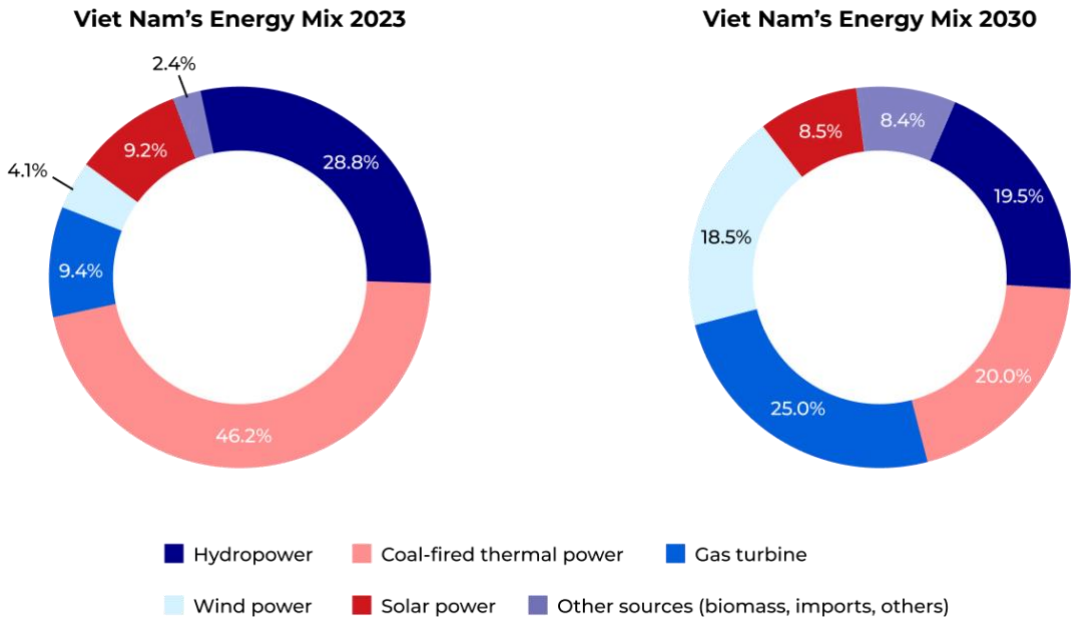
[19] Rondoni, A., & Grasso, S. (2021). Consumers behaviour towards carbon footprint labels on food: A review of the literature and discussion of industry implications. *Journal of Cleaner Production*, *301*, 127031. https://doi.org/10.1016/j.jclepro.2021.127031

[20] Beyer, B., Chaskel, R., Euler, S., Gassen, J., GROßKOPF, A.-K., & Sellhorn, T. (2023). How Does Carbon Footprint Information Affect Consumer Choice? A Field Experiment. *Journal of Accounting Research*, *62*(1), 101–136. https://doi.org/10.1111/1475-679X.12505

[21] Viet Nam Energy Partnership Group. (2024). *Approving the plan to implement the national power development planning for 2021—2030 period, with a vision toward 2050*. Viet Nam Energy Partnership Group. https://vepg.vn/wp-content/uploads/2024/05/262_QD-TTg_607766_EN.pdf

[22] Vu, K., & Guarascio, F. (2023, May 23). *Vietnam's $135 billion power plan for 2030*. World Economic Forum. https://www.weforum.org/stories/2023/05/vietnam-pdp8-power-plan-for-2030/

Figure 2 – Vietnam's Energy Mix, 2023 vs 2030



Carbon Taxes in Singapore and Thailand

Singapore introduced a carbon tax in 2019, initially set at S$5 per tCO_2e and scheduled to rise to S$25 from 2024 and S$50-80 by 2030[23]. These taxes currently cover facilities with annual greenhouse gas emissions of over 25,000 tCO_2e and will be applied to a portion of their emissions depending on the allowance awarded to each company. To encourage efforts to reduce carbon emissions locally, the proportion of emissions that can be offset using international carbon credits is capped at 5%.

Thailand approved a carbon tax of 200 baht (US$5.88) per tCO_2e which focussed on oil products such as gasoline, jet fuel and diesel[24]. However, it was noted that this tax is embedded in the existing oil tax and is not meant to increase costs for the affected industries.

For insurers, these policies can indirectly affect underwriting and investment. Carbon taxes raise operating expenses and may pressure creditworthiness of high-emission firms, potentially reducing their insurance purchasing capacity and elevating counterparty risk for insurers.

[23] National Climate Change Secretariat of Singapore. (n.d.). *Carbon Tax*. Retrieved January 28, 2025, from https://www.nccs.gov.sg/singapores-climate-action/mitigation-efforts/carbontax/
[24] Sriring, O., & Thaichareon, K. (2025, January 21). *Thai cabinet approves collection of carbon tax*. Reuters. https://www.reuters.com/sustainability/thai-cabinet-approves-collection-carbon-tax-2025-01-21/

Increased regulatory and legal risks

Rapid policy implementation can lead to legal disputes and enforcement challenges. Litigation related to climate change has doubled since 2017, reaching 2,180 cases worldwide in 2022, with 17% in developing countries[25]. High litigation and settlement costs translate into elevated credit and market risks. A notable case is PG&E Corporation, which filed for bankruptcy in 2019 after facing US$30 billion in potential liabilities from the California wildfires [26] [27]. The company's US$11 billion settlement with insurers was substantially below the US$20 billion claimed, illustrating the difficulty of enforcing subrogation and the resulting higher claims burden for insurers[28]. Such large-scale defaults highlight the potential for transition policies to trigger systemic shocks across insurance and financial markets.

Rising compliance burden

Governments worldwide are strengthening climate-related disclosure requirements. The EU Corporate Sustainability Reporting Directive (CSRD), effective 2023, mandates large firms to disclose greenhouse gas emissions across Scopes 1-3 and encourages use of the Partnership for Carbon Accounting Financial (PCAF)[29] [30]. The UK Streamlined Energy and Carbon Reporting (SECR) framework, the US SEC Climate-Disclosure Rule, California's SB 253 and the Singapore SGX Sustainability Reporting Guidelines follow similar principles with differing timelines and thresholds, see the details below.

[25] United Nations Environment Programme (UNEP). (2023b). *Climate litigation more than doubles in five years, now a key tool in delivering climate justice*. https://www.unep.org/news-and-stories/press-release/climate-litigation-more-doubles-five-years-now-key-tool-delivering

[26] Baker, D., & Rosten, E. (2019, January 22). After PG&E's Climate-Driven Bankruptcy, Who's Next? *Bloomberg.Com*. https://www.bloomberg.com/news/articles/2019-01-22/why-a-pg-e-bankruptcy-could-change-climate-calculus-quicktake

[27] Peltz, J. F. (2019). *PG&E to file for bankruptcy as wildfire costs hit $30 billion. Its stock plunges 52%*. Los Angeles Times. https://www.latimes.com/business/la-fi-pge-bankruptcy-filing-20190114-story.html

[28] Sarkar, A. (2019). PG&E settles wildfire claims with insurers for $11 billion. *Reuters*. https://www.reuters.com/article/business/pge-settles-wildfire-claims-with-insurers-for-11-billion-idUSKCN1VY1FN/

[29] European Commission. (2024). *Corporate sustainability reporting*. https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

[30] Partnership for Carbon Accounting Financial (PCAF). (2022). *Insurance-Associated Emissions*. https://carbonaccountingfinancials.com/files/downloads/pcaf-standard-part-c-insurance-associated-emissions-nov-2022.pdf

Table 2: Overview of Carbon Emission Reporting Regulations

	Regulation /Rule	Scopes Covered	Implementation and Coverage
European Union	Corporate Sustainability Reporting Directive (CSRD)	Scope 1, 2 & 3	Phased in reporting from financial year 2024 for companies already subject to Non-Financial Reporting Directive (NFRD). This is followed by other large companies (including non-EU listed) in financial year 2025 and listed SMEs (including non-EU listed) in financial year 2026[31]. Non-EU companies generating annual revenue above EUR 150 million or those with branches and subsidiaries that meet the requirements will also be required to comply[31].
United Kingdom	Streamlined Energy and Carbon Reporting (SECR)	Scope 1, 2 & 3	Began with financial year starting from 1st April 2019 and requires companies that satisfy at least 2 of the following conditions to comply[32] [33]: I. Turnover of at least £36 million II. Balance sheet of at least £18 million III. More than 250 employees
United States	SEC Climate-related disclosure	Scope 1 & 2	Rule was stayed on 4 April 2024 due to litigations[34] [35]. Scope 3 reporting was dropped due to complaints by businesses[36]. It was proposed for large, accelerated filers (LAFs) and accelerated filers (AFs) to report scope 1 and 2 emissions[37].

[31] European Commission. (2023). *Questions and Answers on the Adoption of European Sustainability Reporting Standards*. European Commission. https://ec.europa.eu/commission/presscorner/detail/en/qanda_23_4043

[32] Legislation.gov.uk. (2018). *The Companies (Directors' Report) and Limited Liability Partnerships (Energy and Carbon Report) Regulations 2018*. https://www.legislation.gov.uk/uksi/2018/1155/made

[33] PWC. (n.d.). *Streamlined Energy & Carbon Reporting: Ensuring your compliance with the new reporting requirements*. PwC. Retrieved January 3, 2025, from https://www.pwc.co.uk/services/audit/non-financial-assurance/streamlined-energy-and-carbon-reporting.html

[34] Vanderford, R. (2024). SEC Accepts Pause on Its Climate Rule. *Wall Street Journal*. https://www.wsj.com/articles/sec-accepts-pause-on-its-climate-rule-b2afe8d9

[35] PWC. (2024). *SEC adopts climate-related disclosure rules*. https://viewpoint.pwc.com/dt/us/en/pwc/in_briefs/2024/assets/ib202402.pdf

[36] Khan, Y., & Vanderford, R. (2024). The SEC Watered Down Its Climate Reporting Requirements. Here's What That Means for Companies. *Wall Street Journal*. https://www.wsj.com/articles/the-sec-watered-down-its-climate-reporting-requirements-heres-what-that-means-for-companies-d3dd55b0

[37] SEC. (2024). *SEC Adopts Rules to Enhance and Standardize Climate-Related Disclosures for Investors*. Securities and Exchange Commission. https://www.sec.gov/newsroom/press-releases/2024-31

California	Climate Corporate Data Accountability Act (California SB 253)	Scope 1, 2 & 3	Phased in reporting starting in 2026 for scope 1 and 2 and 2027 for scope 3[38] [39]. Companies operating in California with total annual revenues exceeding US$1 billion are required to comply[3839].
Singapore	SGX Sustainability Reporting	Scope 1 & 2	Listed companies are required to comply from financial year 2025 and have to also comply with climate-related requirements in the IFRS Sustainability Disclosure Standards[40]. Scope 3 reporting timeline was being reassessed, with prioritisation for larger companies to potentially start in 2026[41].
Others	IFRS S2	Scope 1, 2 & 3	Adopted where mandated by national regulators[42].

Collecting and verifying emission data is labour-intensive, particularly for multinational insurers operating under multiple regimes. The related compliance costs can be significant – for example, global spending on the transition to IFRS 17 was estimated at US$21–27 billion, illustrating the potential magnitude of compliance costs[43]. Climate-disclosure mandates may generate similar cost pressures as insurers adjust governance structures, data systems and reporting processes

Policies such as “carbon taxes” raise operational costs and can erode the creditworthiness of carbon-intensive companies. Banks, viewing these firms as riskier borrowers, may increase the cost of debt or tighten lending. Consequently, companies with constrained cash flow may reduce insurance spending, lowering demand for corporate, group or property-and-casualty coverage.

[38] California Legislative Information. (2023). *SB-253 Climate Corporate Data Accountability Act.* California Legislative Information. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202320240SB253

[39] GHG. (2023). *STATEMENT: California’s Climate Corporate Data Accountability Act Requires Companies to Disclose Greenhouse Gas Emissions by 2026*. Greenhouse Gas Protocol. https://ghgprotocol.org/blog/statement-californias-climate-corporate-data-accountability-act-requires-companies-disclose

[40] SGX. (2024). *Sustainability Reporting*. Singapore Exchange. https://www.sgx.com/sustainable-finance/sustainability-reporting

[41] Boo. (2024). Companies to report greenhouse gas emissions starting FY2025: SGX. *The Straits Times*. https://www.straitstimes.com/business/companies-to-report-greenhouse-gas-emissions-starting-fy2025-sgx

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Impact on Insurance and the Broader Economy

Regulatory compliance and carbon pricing can help reshape insurance demand and investment strategies. In emerging markets, the World Bank highlights limited climate-related lending and the need to deepen capital and insurance markets to mobilise transition finance, indicating policy shifts can influence product demand and capital allocation[44]. As the World Bank paper underscores, underdeveloped capital and insurance markets in these economies amplify transmission channels that affect insurers on both sides of the balance sheet: on the underwriting side, clients facing carbon-cost-driven balance-sheet stress may reduce coverage or default on premiums; on the asset side, stranded-asset write-downs and credit deterioration in carbon-intensive portfolios can erode investment returns and increase default risk.

Supervisory guidance further notes that transition risk can reduce profitability and market valuations in carbon-intensive firms, with knock-on effects for life insurers and pension funds' long-duration investments, while early movers that finance low-carbon projects and innovate coverage can benefit from growth in clean-energy and sustainability-linked sectors[45].

Social Dimensions and the "Just Transition"

While emission-reporting policies primarily target large corporates, their effects cascade to smaller firms through Scope 3 reporting. SMEs often lack resources to track emissions, risking exclusion from supply chains and financing opportunities. This could potential limit their access to insurance products and reduce their competitiveness and income. Similarly, companies divesting from high-carbon clients may unintentionally widen the protection gap. As an example, should employers consequently reduce group health or life coverage or underinsure equipment, workers—who are often in vulnerable positions—could face greater exposure to potential loss and financial hardship, making it more difficult to design socially inclusive policy and ensure a just transition.

[44] World Bank. (2024, August 29). Financial sector at a crossroads in emerging markets: Climate risks and financing gaps demand action (press release). https://www.worldbank.org/en/news/press-release/2024/08/29/financial-sector-at-a-crossroads-in-emerging-markets-climate-risks-and-financing-gaps-demand-action

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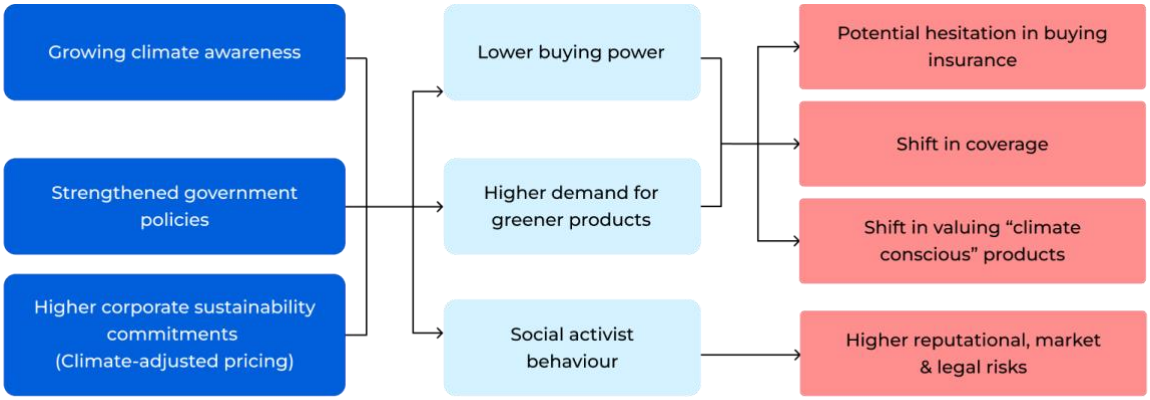
Changes in Consumer Preferences:

Shifting consumer preferences are becoming a major force in the global transition to a low-carbon economy. Growing climate awareness, strengthened government policies and corporate sustainability commitments are changing how households consume, save and invest. These changes in turn influence business performance and prompt adaptation to new consumer preferences.

Figure 3. Changes in Consumer Preferences



Surveys indicate that over 60 percent of consumers in Asia are willing to pay more for environmentally responsible products, while nearly half expect companies to disclose their sustainability performance[46]. This behavioural shift is reshaping business models and, by extension, the insurance industry's product design and risk landscape.

For insurers, the effect is two-fold. On the one hand, the move toward sustainable living, renewable energy use, electric mobility and lower-carbon housing, creates new insurable assets and expands opportunities in green finance. On the other, rising energy and production costs, often passed on through carbon taxes and climate-adjusted pricing, reduce disposable income, particularly in developing economies. This tension can widen protection gaps as households reprioritise essential spending over insurance coverage.

[46] NielsenIQ. (2014). Doing well by doing good. https://nielseniq.com/global/en/insights/report/2014/doing-well-by-doing-good/

Shifts in Product Lines and Market Demand

Government incentives for electric vehicles (EVs) and renewable infrastructure are transforming motor and property-insurance portfolios. China's EV subsidy programme, coupled with an extensive charging-station network, made it the world's largest EV market, with EVs representing nearly 30 percent of new car sales[47] by 2023.

This transition has led insurers to design policies that account for battery-replacement costs, software updates and fire risks linked to lithium-ion technology. Similar shifts are observed in Japan, South Korea and Singapore, where regulators encourage pay-as-you-drive and telematics-based coverage to reward safe, low-emission driving behaviour.

In property insurance, rising demand for sustainable and resilient housing has led insurers to expand "green-rebuilding" or "environmental upgrade" endorsements. For example, Chubb offers a "GreenWise® Upgrade Coverage[48]," which allows homeowners to rebuild using energy-efficient or eco-friendly materials after a covered loss, or upgrade to more rigorous "green" standards even if the house was already green-certified. Similarly, Zurich introduced its "green-building[49]" insurance product for commercial and residential projects, covering expenses unique to sustainable construction or renovation — such as LEED certification, commissioning, air-quality management, or debris recycling after a loss or during renovation. These developments reflect how insurers are increasingly aligning property coverage with sustainability and climate-resilience goals, offering options that support lower-carbon reconstruction, resource-efficient materials, and environmentally preferable practices.

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[48] Chubb. (n.d.). GreenWise® Upgrade Coverage. Chubb. https://www.chubb.com/us-en/individuals-families/products/home/greenwise-upgrade-coverage.html

[49] Zurich Insurance Group. (2025, June 11). Greener buildings: Early engagement is key for managing renovation risks. Zurich Risk Insights. https://www.zurich.com/commercial-insurance/sustainability-and-insights/commercial-insurance-risk-insights/greener-buildings-early-engagement-is-key-for-managing-renovation-risks

Reputational, Legal and Market Risks

Heightened public scrutiny and environmental activism are exposing insurers to reputational and legal risks if their portfolios remain tied to carbon-intensive industries. In the United States and Europe, civil-society campaigns such as "Insure Our Future" have forced major insurers to end coverage for coal and oil sands projects. In 2022, Lloyd's of London faced growing public scrutiny as environmental groups like Extinction Rebellion staged protests at its headquarters, demanding an end to fossil-fuel underwriting. These actions underscored how civil-society campaigns are reshaping the industry's reputation landscape[50]. Failure to align business practices with public expectations can result in customer loss, public criticism and loss of investor confidence.

Legal exposure is also rising. In the EU, climate-related class actions have expanded beyond corporates to include financial institutions accused of "greenwashing." Insurance and reinsurance companies that promote ESG credentials without adequate verification may face litigation or regulatory penalties. Consequently, transparency, independent verification and consistent sustainability disclosures are increasingly viewed as part of "core risk management" rather than corporate social responsibility.

Innovation and Product Differentiation

In response, insurers are innovating to align with new consumer values. In 2022, Singlife by Aviva launched a green-motor policy in Singapore with CO2 Connect. Initially piloted with a small EV fleet, it has since expanded into a full retail product offering a 10% discount for EV owners alongside carbon-emissions tracking via MAS's Project Greenprint ESG Registry[51]. Allianz Trade's Green2Green Surety reinvests premiums in certified green bonds to finance renewable energy projects[52].

Digitalisation further enables personalisation. Usage-based, telematics and satellite-based insurance models allow continuous monitoring of individual or corporate carbon footprints, rewarding responsible behaviour with lower premiums. Such innovations reposition insurers as partners in sustainable living, extending beyond financial protection to behavioural change and societal resilience.

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[52] Allianz Trade. (2024). *Allianz Trade Surety Green2Green*. Allianz Trade Corporate. https://www.allianz-trade.com/en_global/news-insights/news/surety-green2green.html

Changes in Investor Perception:

As climate change awareness grows among investors, attitudes toward climate risk have undergone a structural shift over the past decade. Once viewed as a reputational or ethical concern, sustainability has now become a financial determinant of long-term value. According to Morgan Stanley's report Sustainable Signals: Understanding Individual Investors' Interests and Priorities, globally surveyed individual investors indicating interest in sustainability goes as high as 77%[53]. Institutional investors are likewise integrating environmental, social and governance (ESG) factors into capital allocation decisions. Not only to manage risks but also to capture new growth opportunities. The global ESG investing market was valued at approximately US$29.86 trillion in 2024 and is projected to expand significantly over the next decade[54]. Given these trends, a continued shift of funds from carbon intensive sectors to less carbon intensive sectors can be expected.

Capital Flows and Market Performance

These evolving investor preferences are clearly reflected in global capital flows. In the first half of 2025 alone, sustainable funds attracted US$16 billion in net inflows, despite broader market volatility[55]. This continued inflow, alongside the strong relative performance of ESG strategies, underscores investor confidence in the long-term viability of sustainable assets. Performance evidence reinforces this trend. The MSCI World Selection Index (USD), formerly the MSCI World ESG Leaders Index, has consistently outperformed its parent benchmark in recent years while exhibiting lower drawdowns during periods of market stress[56]. This illustrates that integration of sustainability considerations can mitigate downside risk and improve long-term portfolio stability, a recognition particularly relevant for institutional investors such as insurers and pension funds.

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[55] Morgan Stanley Institute for Sustainable Investing. (2025). Sustainable Funds Beat Traditional Funds in First Half of 2025. https://www.morganstanley.com/insights/articles/sustainable-funds-outperform-traditional-first-half-2025

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Figure 4: Active performance of MSCI ESG indexes vs the MSCI ACWI Index

The MSCI ESG Universal Index represent an ESG-weight-tilt approach; MSCI ESG Leaders Index uses a 50% best-in-class sector approach; MSCI SRI Index uses a 25% best-in-class sector approach; and MSCI ESG Focus Index uses an optimised approach designed to maximise ESG exposure. The data shows the actual performance for each index plus back-tested performance for those indexes with less than 10 years of track record. MSCI ACWI ESG Leaders Index has been live since June 6, 2013; MSCI ACWI SRI Index since March 24, 2014; MSCI ACWI ESG Universal Index since Feb. 8, 2017; MSCI ACWI ESG Focus Index since June 25, 2018. Data from May 31, 2013, to Dec. 29, 2023. Source: MSCI ESG Research

Repricing of Climate Risk

Growing preference for sustainability is reshaping risk pricing and valuation across financial markets. Investors increasingly penalise firms with high carbon exposure or weak transition strategies through higher borrowing costs and lower equity valuations. Evidence from European corporate bond markets shows that transition risk is now visibly priced: a one-standard-deviation increase in firm emissions was associated with roughly 23 basis points wider credit spreads on average, rising to nearly 49 bps in 2022 as investor sensitivity to carbon exposure intensified[57]. Similarly, the Bank for International Settlements (BIS) found that green bonds increasingly convey a financing advantage, with issuers in carbon-intensive sectors reducing emissions more and a trading premium emerging for green instruments relative to conventional ones [58]. Financial institutions are embedding sustainability performance into financing conditions through sustainability-linked loans and transition bonds, aligning lending margins with decarbonisation progress. For insurers, these developments directly influence strategic asset allocation and solvency management. Regulatory and market expectations are increasingly shaped by the IFRS International Sustainability Standards Board (ISSB) climate disclosure framework (IFRS S2)

[57] Demski, J., Dong, Y., McGuire, P., & Mojon, B. (2025, March 11). Growth of the green bond market and greenhouse-gas emissions. BIS Quarterly Review. Bank for International Settlements. https://www.bis.org/publ/qtrpdf/r_qt2503d.htm

[58] Bank for International Settlements (BIS). (2023). Pricing of Climate Transition Risk in Bond Markets. BIS Quarterly Review, September 2023. https://www.bis.org/publ/qtrpdf/r_qt2309.pdf

and the UN Principles for Responsible Investment (PRI), signalling that transition risk now extends beyond underwriting to asset-liability management, with material implications for profitability and capital resilience.

The insurance industry's dual role

For insurers, the evolution of investor priorities toward sustainability is reshaping both market expectations and business strategy. The current practice is to manage investment and underwriting as separate functions, yet the sustainability transition highlights the need for alignment. On the investment side, portfolio allocations to carbon-intensive assets expose insurers to stranded-asset write-downs that can erode solvency buffers. On the underwriting side, continued coverage of high-emission industries generates premium revenue but concentrates transition-related liability risk. These two exposures should be aligned where possible, as an insurer that divests from fossil-fuel equities while still underwriting large coal or oil operations may face reputational inconsistency and potential regulatory scrutiny, whereas one that withdraws underwriting capacity without adjusting its asset mix may inadvertently retain the very market risks it sought to shed. Aligning investment and underwriting strategies is therefore important to maintain long-term financial stability and credibility in a decarbonising economy.

According to Aon (2024), future-ready insurers are adopting net-zero underwriting frameworks that measure and manage emissions linked to insured portfolios, connecting underwriting discipline with the same transparency and accountability expected in investment management[59]. As capital increasingly flows into low-carbon and transition-aligned assets, insurers face mounting pressure to ensure that both their investment and underwriting activities support a credible decarbonisation process.

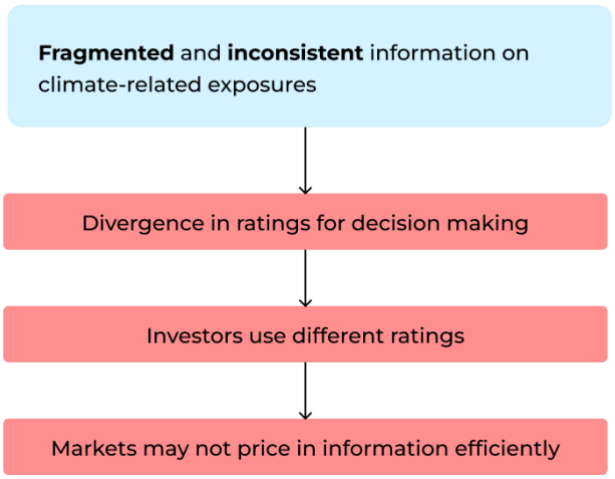
These developments coincide with the repricing of climate risk across capital markets, where higher borrowing costs for carbon-intensive firms directly influence insurers' asset valuations and solvency positions. Frameworks such as IFRS S2 and the PRI reinforce the need for disclosure and portfolio transition planning. Insurers that integrate sustainability metrics across both sides of their balance sheets can reduce exposure to transition risk, attract responsible capital and strengthen their role as catalysts of a resilient, low-carbon economy.

[59] Aon. (2024). Net-Zero Underwriting: A Future-Ready Approach to Emissions Reporting. https://www.aon.com/apac/insights/blog/default/net-zero-underwriting-future-ready-approach-to-emi

Information Insufficiency on Climate-Sensitive Exposures

While previous sections examined the impacts of technological change, policy measures, consumer preferences and investor behaviour individually, their combined effects reveal a deeper structural challenge: information insufficiency. Transition-related shifts occur rapidly across industries and geographies, and no single institution possesses complete visibility into these evolving dynamics. The accuracy of financial market reactions therefore depends on how well available data align with investor expectations.

Figure 5. Information Insufficiency on Climate-Sensitive Exposures



Information on climate-sensitive exposures remains fragmented and inconsistent. ESG scores and carbon-intensity ratings often rely on proprietary methodologies that differ significantly between providers. Research shows that correlations among major ESG rating agencies average only around 0.54 and as low as 0.38, compared with over 0.9 for traditional credit ratings[60]. This divergence results from differences in scope, weighting and qualitative assessments of environmental performance, complicating investment decisions and increasing volatility.

[60] Berg, F., F. Kölbel, & Rigobon, R. (2022). Aggregate Confusion: The Divergence of ESG Ratings. Review of Finance, 26(6), 1315–1348. https://doi.org/10.1093/rof/rfac033

Data Gaps and Rating Inconsistencies

For most investors, obtaining standardised, verifiable climate-related data remains difficult. Inconsistencies among metrics can generate contradictory signals. For example, one company may be rated "AA" on sustainability by one agency and "BBB" by another, even when the underlying data are similar. Qualitative elements such as innovation or transition strategy are often challenging to quantify, reducing comparability across firms and sectors. This lack of reliable information creates valuation distortions. When new disclosures emerge, asset prices may adjust sharply as investors re-price previously unaccounted transition risks. Empirical evidence supports this link. A study by Reboredo and Otero (2021) found that mutual fund flows were largely indifferent to carbon risk before the release of carbon-risk scores. After publication, however, funds with higher carbon risk experienced significant outflows, demonstrating that information availability directly affects capital allocation[61].

Market Volatility and Implications for Insurers

Information deficiencies amplify financial-market volatility. Uncertainty over carbon exposure or inconsistent ratings can trigger mass selloffs of carbon-intensive assets, leading to sharp corrections and reduced market liquidity. In extreme cases, some insurers may engage in pro-cyclical investment behaviour, selling assets during downturns to meet solvency requirements or rebalancing portfolios. Such actions can depress asset valuations further and increase market fragility.

These dynamics complicate asset-liability management for insurers, particularly those dependent on long-duration fixed-income portfolios. As market liquidity thins, insurers seeking to liquidate assets for claims or capital purposes may face lower returns and widening spreads. Maintaining stable investment income amid uncertain valuations becomes more challenging, underscoring the need for robust climate-risk disclosure and portfolio stress-testing frameworks.

[61] The carbon risk score (CRS) metric from Morningstar was released in 2018 which is used to rate funds based on their exposure to carbon risk. Reboredo & Otero (2021) analyzed the fund flows for mutual funds using Morningstar Direct data for one quarter before and after the disclosure of CRS information. Their dataset consisted of rated and unrated U.S. equity funds. For rated funds, they found that the disclosure of CRS information led to significant outflows from funds with higher carbon transition risk.

Reboredo, J. C., & Otero, L. A. (2021). Are investors aware of climate-related transition risks? Evidence from mutual fund flows. *Ecological Economics*, *189*, 107148. https://doi.org/10.1016/j.ecolecon.2021.107148

Progress towards standardisation, but a rocky road ahead

Momentum toward consistent climate disclosure is strengthening, though progress remains uneven. The Task Force on Climate-related Financial Disclosures (TCFD) completed its mandate in 2023, and its framework was absorbed into the International Sustainability Standards Board (ISSB). The ISSB's inaugural standards IFRS S1 sets general sustainability disclosure requirements, and IFRS S2 focuses specifically on climate-related risks and metrics. Both took effect in 2024, providing a global baseline that several jurisdictions have begun to adopt or align with.

Still, the road ahead is uncertain. Geopolitical fragmentation and the recent shifts in U.S. regulatory direction have complicated international alignment and raised compliance costs. Greater political commitment will be needed to sustain momentum. For insurers, comparable and decision-useful data are vital to strengthen underwriting, pricing and investment strategies, reducing volatility as markets internalise transition risk.

Conclusion

Transition risks are reshaping the operating environment for insurers. Five forces: changes to infrastructure and technology use, new government policies to reduce greenhouse gas emissions, changing consumer preferences, changes in investor perceptions and information insufficiency on climate-sensitive exposures, are interacting in ways that could, if left unaddressed, impact the long-term sustainability of the insurance business model.

Changes to infrastructure and technology use are accelerating transition across industries. Rapid innovation in renewable energy, electric mobility and digitalisation bring new insurable assets and emerging operational risks as well. Insurers must update technical expertise to cover evolving technologies while managing legacy exposures that may become stranded or obsolete. This requires integrating transition analytics into product design and revising risk models to capture new forms of interdependence between technology, energy and liability.

New government policies are shifting incentives and compliance expectations. Carbon-pricing mechanisms, emissions-reporting mandates and disclosure frameworks such as IFRS S2 are increasing the cost and complexity of doing business. These policies influence both the value of investment portfolios and the risk profiles of the insured. Firms that fail to adjust to tightening regulation face higher credit and market risk, while insurers that align early can strengthen resilience and gain new opportunities in transition-finance instruments.

Changing consumer preferences are reshaping demand. Growing environmental awareness is influencing the purchase of vehicles, homes and financial products. Insurers are adapting by developing sustainability-linked offerings and prevention-based services, yet these require robust data and transparent metrics to maintain credibility.

Changes in investor perception are also critical. Investors increasingly penalise firms with high carbon exposure and reward credible transition strategies. For insurers who are also large institutional investors themselves, this shift amplifies portfolio volatility and pressures capital adequacy. It is essential to manage climate risk by leveraging both insurance and investment so as to preserve long-term solvency and better investment performance.

Finally, insufficient information on climate-sensitive exposures remains a systemic constraint. Fragmented disclosure standards, inconsistent ESG ratings and data gaps undermine the reliability of risk assessments. Addressing this requires coordinated data frameworks, cross-sector collaboration and investment in analytics.

Together, these shifts mark a structural turning point for insurance, challenging traditional notions of risk, return and responsibility. They test whether insurers can remain profitable, maintain investor confidence and uphold their social role as long-term stabilisers in a changing economy. Addressing these pressures calls for strategic realignment across underwriting, investment and regulation. Insurers must embed climate considerations in core decisions, strengthen data and governance, and work with regulators to balance stability and innovation. Those that adapt early can shape disclosure standards, develop new risk-transfer tools and mobilise capital towards low-carbon and resilience-building projects.

Physical risks undermine insurability by disrupting the real economy; transition risks test viability by reshaping the financial system that supports it. Both are systemic, mutually reinforcing and central to insurers' long-term resilience. One paper in this three-part climate change and insurance series examines the physical impacts of a warming climate. This paper examines the transition pressures emerging from technological change, policy evolution, market expectations and information gaps. The final paper will integrate these strands, analysing how physical and transition risks interact, how their interplay compounds stresses across insurance and financial systems, and what strategic actions insurers, regulators and policymakers must prioritise to sustain insurability and strengthen resilience in a rapidly transforming climate economy.

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Appendix: Transition Risk Impact Tables

The following tables summarise the anticipated transition risk implications for the insurance sector, structured by market segment. These tables will also appear in the third paper of this series, on integrated physical and transition risks.

Table 1: Life & Health Insurance — Transition Risk Impacts on Revenue and Expenses

Category	Transition Risk Impacts
Revenue	**Group policies:** Carbon-intensive employers facing stranded assets or falling revenues may reduce or discontinue group life and health schemes. Insurers may also choose to exit high-carbon relationships, directly reducing premium income. **Individual policies:** Transition-related cost-of-living increases compress disposable income and reduce premium affordability. Insurers repositioning toward green products may attract sustainability-oriented customers, partially offsetting volume declines.
Expenses	**Compliance and reporting:** Expanding climate disclosure requirements increase data collection and documentation costs. Failures to comply may attract regulatory penalties. **Liability exposure:** Insufficient disclosure of climate-related risks to policyholders and investors creates growing legal exposure for life and health insurers. Directors and officers (D&O) claims linked to transition-related misstatements or greenwashing allegations can add materially to the expense profile. **Reputational positioning:** Maintaining credibility with ESG-conscious customers, investors, and rating agencies requires consistent climate commitment, transparent reporting, and alignment between stated sustainability objectives and actual underwriting and investment decisions.

Table 2: Property & Casualty Insurance — Transition Risk Impacts on Revenue and Expenses

Category	Transition Risk Impacts
Revenue	**Existing product lines:** The shift to electric vehicles, green buildings, and renewable energy infrastructure creates demand for tailored new coverages — including battery replacement, inverter failure risk, and solar installation cover. Legacy product lines in fossil-fuel-linked sectors decline, and revenue may compress during the transition between product generations. **Corporate clients:** High-carbon companies with stranded assets reduce their insured asset base or lose coverage altogether. Insurers that choose to exit fossil-fuel-linked risks accelerate this revenue decline. **Individual clients:** Affordability pressures from transition reduce premium capacity at the household level. Insurers that develop affordable green products can capture demand from sustainability-oriented customers.
Expenses	**Underwriting and claims:** Retrofitting and new technology (EVs, solar, green-certified buildings) raises rebuild values and claim amounts. More intensive renewals are needed to reflect changed risk profiles. **Compliance and reporting:** Climate disclosure obligations apply equally to P&C lines, adding data collection and regulatory filing costs. **Liability and greenwashing risk:** Insurers maintaining coverage for high-carbon activities face growing reputational and legal exposure. Misaligned sustainability claims can attract greenwashing litigation, while climate liability claims against policyholders are increasingly pursued by regulators and activist litigants, raising uncertainty in claims recovery. **Innovation:** Developing parametric products, transition-linked covers, and climate resilience incentives requires upfront modelling, data investment, and higher initial loss experience.

Table 3: Insurance Brokers — Transition Risk Impacts on Revenue and Expenses

Category	Transition Risk Impacts
Revenue	**Commission revenue:** New technology adoption creates coverage gaps (e.g. green buildings, EVs, clean energy assets) that brokers help clients navigate, generating additional commission opportunities. **Fee-based advisory revenue:** Demand for risk management and business interruption valuation services grows as companies in transition face more volatile cash flows and complex risk profiles.
Expenses	**Risk assessment:** Clients adopting new technologies and strategies develop more complex and evolving risk profiles, requiring deeper profiling and more intensive information exchange with underwriters. **Compliance:** Carbon contribution reporting obligations extend to brokers, adding measurement, documentation, and filing costs, particularly for downstream emissions. **Capability investment:** Building expertise in emerging climate risk areas — transition finance, ESG disclosure, parametric structures — may require specialist hires or in-house training.

Table 4: Reinsurance Market — Transition Risk Impacts on Revenue and Expenses

Category	Transition Risk Impacts
Revenue	**Reinsurance premiums:** Adverse selection among primary insurers (as corporate clients shed coverage) may increase cession volumes and allow reinsurers to improve terms. New product lines for transition-exposed risks generate additional premium flow. **Investment returns:** Rapid reallocation of capital between high- and low-carbon sectors creates mark-to-market volatility in reinsurers' investment portfolios, particularly in credit and equity holdings.
Expenses	**Existing product line claims:** Greener and higher-specification assets carry greater rebuild values, raising claim amounts for property and liability lines. Reinsurers face less granular data on these assets than primary insurers. **New product claims:** Novel climate-linked products carry higher initial loss volatility and limited actuarial depth, increasing uncertainty in ceded claims experience. **Innovation costs:** Developing pricing expertise for emerging risk categories — parametric triggers, transition liability, carbon credit insurance — requires specialist talent and modelling investment.

Table 5: Supervisory, Fiscal & Macroeconomic, and Social Protection — Transition Risk Impacts

Category	Transition Risk Impacts
Prudential Supervisory	**Credit risk in transition-exposed sectors:** Insurers' corporate bond holdings in carbon-intensive industries face deteriorating creditworthiness as regulatory standards tighten, raising default risk and capital charges. **Asset repricing:** Rapid policy shifts can trigger sharp mark-to-market losses in investment portfolios. Broad-based repricing may weaken sector-wide solvency positions simultaneously. **Disclosure and supervisory burden:** Expanding requirements under ISSB, IFRS S2, and regional taxonomies demand stronger supervisory data infrastructure, clearer guidance, and closer engagement with regulated entities.
Fiscal & Macroeconomic	**Labour market disruptions:** Workers in carbon-intensive industries face displacement and skills mismatches, requiring reskilling programmes and targeted social protection to ensure a just transition. **Energy price volatility:** Rapid changes in energy pricing and supply create short-term cost pressures for households and SMEs, necessitating targeted policy support. **Competitiveness:** Carbon border adjustments and industrial policy pressures require coordinated strategy to maintain economic resilience while decarbonising high-emission sectors.
Social Protection	**Evolving coverage needs:** As business models and assets evolve through the transition, new insurance products are required. Building actuarial data for accurate risk pricing in novel areas takes time, creating interim gaps in coverage availability.