BERMUDA MONETARY AUTHORITY

# 2021 CLIMATE RISK EXPOSURE SURVEY REPORT

May 2022




## Bermuda Insurance Market Climate Change Survey Report

This report summarises the results of a climate risk exposure survey (survey) conducted by the Bermuda Monetary Authority (Authority or BMA), focusing on the Bermuda insurance industry (industry). The content of this report is a result of analysis carried out by the BMA on climate risk exposure data from a 2021 survey of insurance groups and commercial insurers (Class 4, Class 3B, select Class 3A, Class E, Class D and select Class C). The report outlines statistics, findings and challenges.

## About the Authority

The Authority was established by statute in 1969. Its role has evolved over the years to meet the changing needs of Bermuda's financial services sector. Today it supervises, regulates and inspects financial institutions operating in the jurisdiction. It also issues Bermuda's national currency, manages exchange control transactions, assists other authorities with the detection and prevention of financial crime, and advises Government on banking and other financial and monetary matters.

The Authority develops risk-based financial regulations that apply to the supervision of Bermuda's banks, trust companies, investment businesses, investment funds, fund administrators, money service businesses, corporate service providers, insurance companies, digital asset businesses, and digital asset issuances. It also regulates the Bermuda Stock Exchange and the Credit Union.

This publication is available on the BMA website www.bma.bm.

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## Acronyms

| | |
|---|---|
| Authority or BMA | Bermuda Monetary Authority |
| Climate risk | Used interchangeably to mean climate change-related risk |
| Insurers | Life and P&C Insurers and Reinsurers |
| ESG | Environmental, Social and Corporate Governance |
| Industry | Bermuda insurance industry |
| LT | Long term insurers and reinsurers (life) |
| NACE | Nomenclature statistique des activités économiques dans la Communauté européenne, which is the statistical classification of economic activities in the European Community |
| Nat Cat | Natural Catastrophe |
| P&C | Property and Casualty insurers and reinsurers |
| RCP | Representative Concentrated Pathways, adopted by Intergovernmental Panel on Climate Change (IPCC); RCP 4.5 is described by the IPCC as an intermediate scenario. Emissions in RCP 4.5 peak around 2040, then decline. |
| SIF | Sustainable Insurance Forum |

# Definitions

**Physical risks** are risks that arise from the physical impact of climate change. They include acute physical risks such as weather-related events, resulting in increasing property damages or through subsequent events such as disruption of global supply chains or resource scarcity. They may also manifest as chronic physical risks including longer-term changes in the climate, such as temperature changes and rising sea levels, biodiversity loss and changes in agricultural productivity, which may result in increasing ill effects on health, affecting morbidity and mortality patterns.

**Transition risks** are risks that arise from the transition to a low-carbon economy. These may lead to reassessment of asset values in climate-sensitive sectors. Transition risks may be motivated by policy changes, market dynamics, technological innovation or reputational factors and may be amplified through an unorderly process.

# 1. Executive Summary

### a. Survey Purpose

The 2021 survey is a follow-up to a survey conducted in 2020 specific to climate change. While the 2020 survey was solely qualitative, the 2021 survey sought to obtain first indications about the industry's long-term climate change risk exposures based on several relatively simple quantitative metrics. The survey also ventured to forge a view of climate change risk's potential future strategic implications for the industry. Besides the quantitative information, the Authority also sought to identify the status of the market, including industry's challenges and best practices. Sharing this information is expected to encourage the insurance sector to further develop quantitative methods and expand qualitative assessments. There were 104 groups and commercial legal entities (classes E, D, 4, 3B, and select 3A and C) who participated in the survey. This report consolidates and summarises the key messages, themes and findings from those responses. Financial data used was based on the year 2020.

For Property and Casualty (P&C) insurers, the survey assessed the impact of climate change on general business underwriting stress scenarios (physical risk) and investment portfolio allocation of climate-relevant assets (transition risk). Whereas, for Long-Term (LT) insurers, the assessment focused on investment portfolio allocation of climate-relevant assets only. Subsequently, the results capture the industry as a whole, inclusive of groups, P&C and LT entities, as significant differences were not detected between these classifications. The summary, therefore, does not delineate these further into licence classes. Additionally, all data displayed is on a weighted average basis unless otherwise stated.

Qualitative considerations were also explored in the survey, looking into strategic implications from transition and physical risks, as well as the degree of green underwriting (P&C only) currently present within the industry.

### b. Limitations – Data and Methodology

Data quality is essential to ensure that outputs generated are reflective of actual themes and risk exposures present. In order to ensure the most effective use of information collected that generates value-added observations, the BMA had to carefully scrutinise the data provided, resulting in a need to exclude some of the data. Part of this is attributed to inherent limitations in data, such as inconsistency in the completion of data among insurers, selective completion of sections and lack of sufficient granularity to provide details as requested (especially on the investment side). Given this and due to the high importance of this area, the BMA would like to urge the industry to place an increased level of care in providing the highest and most accurate data possible and to increase their capabilities and knowledge with respect to climate change-related data collection and methodologies.

In addition, it has to be considered that methodologies are still evolving, especially in areas of accurate allocation of investments, quantification of transition risk and capabilities of vendor models to model climate risk scenarios comprehensively. For the transition risk of investments, the allocation of different investments to one sector (e.g., power generation) is a simplification, which does not fully reflect the fact that transition risk might vary depending on the issuer. For physical risk, a constraining factor is the application of an immediate stress test on Natural Catastrophe (Nat Cat) loss exposures instead of a longer-term scenario analysis, ignoring management actions, exposure changes over time and the limitations of the still-evolving vendor models to capture all climate-related developments and perils under certain climate scenarios. This

could lead to an underestimation of loss exposures under physical risk scenarios. In addition, secondary impacts of climate change, for example, macroeconomic impacts, which could lead, for instance, to extraordinary inflation on losses, are currently not considered.

Despite these limitations, the issues were found not to be pervasive, and the BMA was able to derive important themes, trends and lessons from the survey.

### c. Key Messages

The survey demonstrated that climate change continues to be a high priority for the industry, with strides made in this area to varying degrees. A majority of companies expressed a definitive commitment to continued risk assessment and significant attention paid to a transition to low-carbon operations.

For P&C insurers, physical risk is the most significant driver of climate risk-related exposures due to the nature of risks underwritten in Bermuda, particularly Nat Cat exposures. The industry has, over the years, developed high modelling expertise for short-term Nat Cat events. Nevertheless, modelling of mid to long-term physical climate risk is still under development. It will be important for industry to develop modelling capabilities in this area, including a long-term view, and to assess the suitability of available vendor models. This is particularly important in light of the evolving impact of inflation, which, in combination with increasing physical climate change risk, has the potential of materially impacting the industry, effects of which may or may not be easily absorbed by pricing increases.

From the asset perspective (transition risk), while not negligible, there is limited exposure to what is currently considered carbon-intensive assets. Transition risk is carefully considered in the strategic decisions of an increasing number of companies, with many expressing that Environmental, Social and Corporate Governance (ESG) criteria have found their way into the asset management processes. This exercise also highlighted challenges due to a lack of universally agreed and comprehensive definitions for classifying assets for climate risk purposes. Therefore, it was difficult for some insurers to classify investments into the requested categories, and it is noted as an area for further development.

Finally, with regards to green and carbon-intensive underwriting, there is limited exposure to high-carbon-intensive sectors and still a small but steadily increasing green underwriting activity.

The **overall assessment** is that the exercise was beneficial in identifying challenges around data and methodologies, quantifying and qualifying exposures, and encouraging all companies to focus continuously on the assessment and risk management of climate change risk.

# 2. Physical Risk Exposures

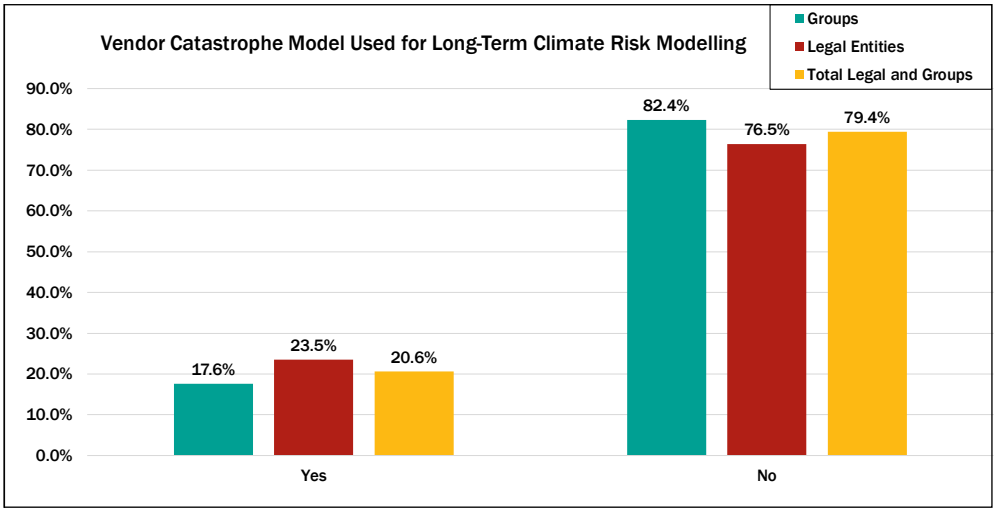
### a. Methodology/Approach

The approach to physical risk concentrated on quantifying the effects of climate change on insurance risks associated with the increased severity and frequency of climate-related catastrophes. In assessing these exposures, companies were asked to perform an immediate stress and assess climate change-related impacts on most material perils, such as Hurricane, Flood, Wildfire and Convective Storms, separately and in totality. Insurers were instructed to use the event sets from the various modelling firms that correspond to Representative Concentrated Pathways (RCP) 4.5 and a medium-term horizon compared to current baseline exposure to Nat Cats. Vendor providers have continuously worked on additional capabilities to model long-term climate scenarios beyond the existing Nat Cat modelling capabilities.

### b. Results

#### Model Use

The gathered information demonstrated that, while almost all insurers use vendor models for modelling Nat Cat risk, the majority of insurers (77% to 82%) do not yet utilise additional capabilities of vendor catastrophe models for long-term climate-related risk exposure projections. Due to this, most insurers used the fall-back solution provided by the BMA to determine climate risk changes, which is based on RCP 4.5 medium-term (10-15 year time horizon). To provide added context, the fall-back solution to determine climate risk changes based on RCP 4.5 is simplified and does not take into consideration specific geographic features by region that could be more/less affected by climate change.

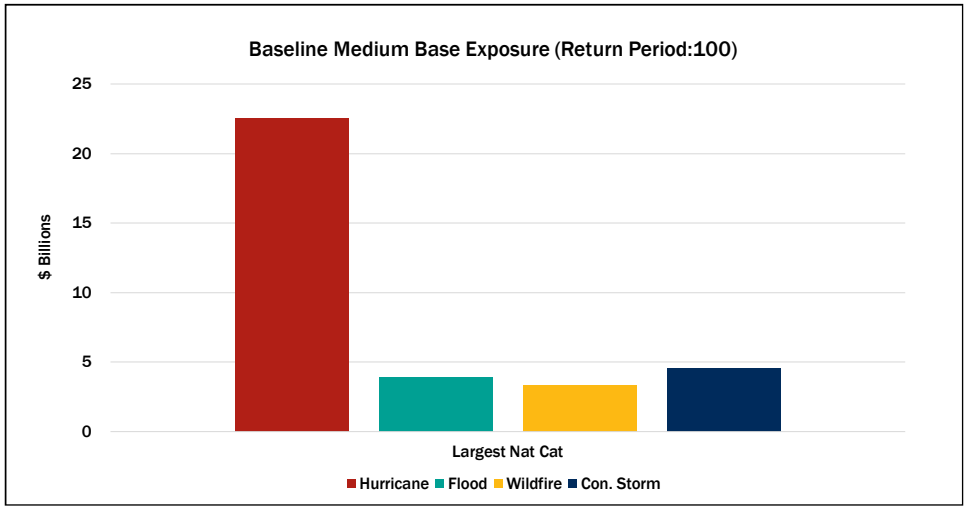



Source: BMA

#### Medium-Term Effects of Climate Change on Nat Cats

The results specific to physical risk also denote medium-term effects of climate change. The graph below demonstrates that the largest Nat Cat exposure of Bermuda-based insurers is Hurricane by a significant margin, followed by Convective Storm and Flood to a similar degree. This is important to note as due to Hurricane being the largest Nat Cat exposure for majority of P&C insurers, the projected ~21% increase in

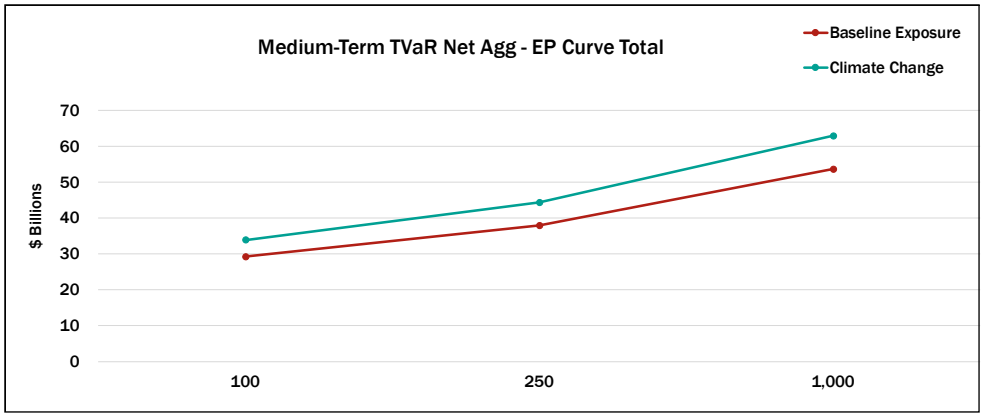
medium-term 1-in-100-year event is significant and poses a real threat of material impact to insurers, an effect that can be further compounded by increasing global inflation if not adequately measured, managed and addressed (e.g., via pricing increases).




Source: BMA

| Medium-Term Tail Value at Risk (TVaR) Net Aggregate (Agg) – Exceedance Probability (EP) Curve Hurricane | | | |
|---|---|---|---|
| Return Period | Baseline Exposure ($ millions) | Climate Change ($ millions) | % Change due to Climate Change |
| 100 | 22,527 | 27,188 | 20.7% |
| 250 | 30,470 | 36,981 | 21.4% |
| 1,000 | 45,100 | 54,223 | 20.2% |

The graph displays the sum of TVaRs for all insurers, that have been included after data validation, for all perils specified. The below demonstrates a relatively stable increase (ranging between 16-17%) in climate change exposures over the medium term, across a range of return periods (100, 250 and 1,000 year events).




Source: BMA

# 3. Transition Risk Exposures

### a. Methodology/Approach

The approach to quantifying transition risk was to collect data on insurers' exposure to climate (policy) relevant sectors in their investment portfolios, utilising Nomenclature statistique des activités économiques dans la Communauté européenne (NACE) mapping to aid the insurers in classifying their existing assets. Insurers were additionally provided with examples (non-exhaustive) of mapping adapted from work completed by various international regulatory bodies. As virtually all insurers are exposed to transition risk in their investment portfolios to varying degrees, the survey focused on quantifying the extent of existing exposures and assessing the magnitude of a potential risk, as this type of climate change risk has the potential to crystallise very quickly and unexpectedly.

The climate policy-relevant sectors included in the data collection were those that are most likely to be materially affected by climate change and, in particular, transition risk. The sectors include:

- Fossil-fuel
- Power generation/utilities
- Energy-intensive (manufacturing and mining: basic industry, materials/metals)
- Transport
- Agriculture and food security
- Real estate

For each sector, aggregate investment data was requested for the following asset class breakdown:

- Equities - EQ
- Rated fixed income - FI (e.g., rated corporate bonds)
- Unrated fixed income (e.g., unrated loans)

Definitions as follows:

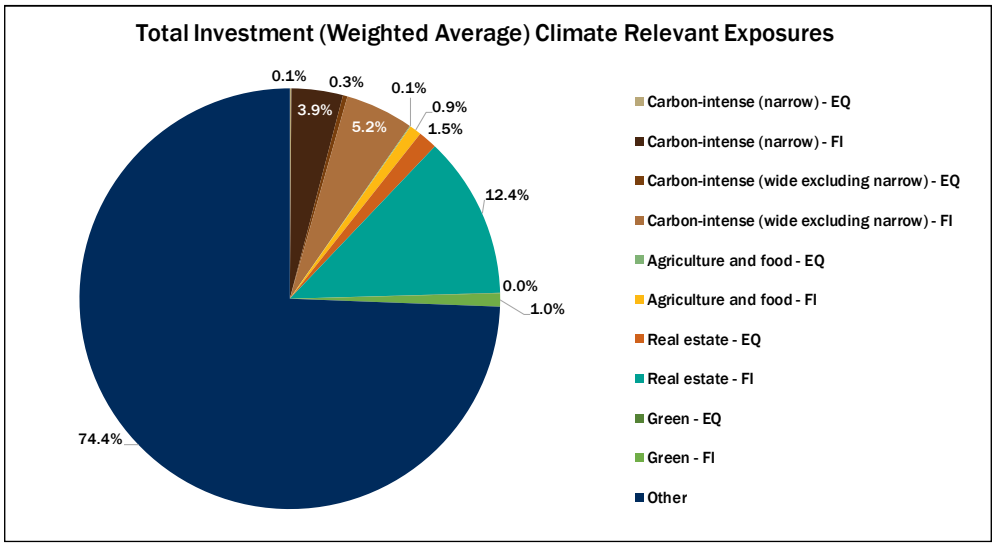
- Carbon-intensive (narrow) = Fossil fuel, power generation (coal, oil and gas)
- Carbon-intensive (wide) = Carbon-intensive (narrow) + energy intensive, transport (excluding electric vehicle)
- Green = Renewables + transport (electric vehicle)
- Climate-relevant = Carbon-intensive (narrow) + carbon-intensive (wide) + green + agriculture and food security + real estate

### b. Results

The results obtained demonstrated that while exposure on asset-side to transition climate risk is not significant, it is also not negligible for Bermuda-based insurers. Overall, the market has a moderate exposure to carbon-intensive assets (weighted average of 9.7%) and climate-relevant assets (25.6%). Additionally, the following exposures were also noted:

- Minimal exposure to carbon-intensive equity (0.1% narrow, 0.5% wide)
- Small to moderate exposure to carbon-intensive fixed income (4.0% narrow, 9.2% wide)
- Overall minimal exposure to green assets (equity 0.04%, fixed income 1.0%)

Exposures on average were found to be of investment-grade credit quality.




Source: BMA

The category "Other" (74.4%) contains all other investments not allocated to the above mentioned categories, which going forward will be further scrutinised. These might, for example, contain investments where exposure to climate risk is not direct, but could be affected by secondary impacts of climate risk. Furthermore, it is important to note that allocation of different counterparts to one sector, for example, fossil fuels and power generation together, does not fully recognise the differences between counterparties, which might be at different stages of managing their business to successfully transition to net-zero and might carry a different transition risk. Companies should perform a more detailed analysis and derive risk management actions that are tailored to their own portfolio.

# 4. Qualitative Assessment: Strategic Focus and Green/Carbon-Intensive Underwriting

### a. Strategic Focus

Our 2020 Climate Change Survey Report[1] demonstrated that only 41.5% of P&C and 23.3% of LT insurers implemented or planned changes to their business strategy in response to climate change. In the 2021 survey, this was further explored to determine what tangible actions are the focus for the majority of insurers.

From the table below, it is clear that for the majority of insurers, the key strategic considerations are focused on assessing investment exposures (59% of total entities); however, this varies among insurers, as some insurers (higher percentage on the LT insurers than P&C) claim to have analysed their portfolios already and assessed themselves as more advanced in this area and, therefore, not requiring as much ongoing focus. While a number of the insurers have shifted strategic efforts to reducing certain investments, the majority of the market is not yet focused on this area. This could be either because the exposure was identified as very low or the detailed assessment preparatory work has not yet been completed.

Many P&C groups and entities indicated that a number of strategic actions have already taken place with regards to the below categories, such as line of business reduction, with a number of companies shifting their underwriting portfolios to reduce Nat Cat exposures due to the increases in frequency and severity experienced by the industry. While no specific lines of business were targeted for a reduction on the physical risk side, the most prominent de-risking took place in wildfire risks (fourth largest Nat Cat in Bermuda), with insurers also expressing a desire to grow in speciality and casualty space.

On transition risk, some companies have already undertaken tangible steps in their shift to low-carbon operations, with a select few restricting or reducing coal/fossil fuel business. Many P&C insurers noted expanding new business in the renewable energy sector.

| Risk Type | Strategic Action | Total | |
|---|---|---|---|
| | | Yes | No |
| Transition | Strategic reduction of lines of business | 35%* | 65%* |
| | Risk appetite change to new markets and lines of business | 33%* | 67%* |
| | Assess investment exposure | 59% | 41% |
| | Investment reallocation | 23% | 77% |
| Physical | Strategic reduction of lines of business | 27%* | 73%* |
| | Risk appetite change to new markets and lines of business | 20%* | 80%* |

* Denotes results for P&C entities and groups only.

[1] 2020 Climate Change Survey Report

### b. Green and Carbon-Intensive Underwriting

As per the below table, there is limited concentration and dependency on carbon-intensive underwriting, with a small number (4%) of P&C insurers and groups with high carbon-intensive underwriting exposure of over 20%, with the majority (63%) of insurers with exposures of less than 5%. While dependency on sectors such as transport and agriculture is somewhat higher, green underwriting, although still a small market with low share of the overall business, is also an evolving area but strongly increasing and indicating some untapped potential for insurers.

| Sectors | Gross Premium Written | | |
|---|---|---|---|
| | **0-5%** | **5-20%** | **above 20%** |
| High Carbon Intensity | 63% | 33% | 4% |
| Transition Risk | 49% | 35% | 16% |
| Green Activity | 94% | 4% | 2% |

*Sectors with very **high carbon intensity:** fossil fuels, power generation (excluding renewable energy), energy-intensive manufacturing*

*Sectors that carry a certain **transition risk:** transport, agriculture*

*Sectors with **green activities:** energy efficiency, renewable energy, pollution prevention and control, clean transportation, water waste management, climate change adaptation, green buildings etc.*

It should be noted that while a significant number of the insurers indicated an intended reduction to certain sectors in underwriting over time, it was most times highlighted that these reductions should be gradual to support orderly transition and limit social disruptions. Similar comments were made as well on the transition risk on the investments.

# 5. Next Steps

The exercise forms part of the BMA's plan for integrating climate risk into regulation and supervision. Following the two surveys, the BMA will publish a guidance note in 2022 specific to risk management, governance and own risk and solvency assessment expectations and will work on introducing a disclosure regime for climate-related financial risks and potential enhancements of the Bermuda Solvency Capital Return filing requirements. Independent of regulatory requirements, the BMA encourages the insurance sector to focus on the topic of climate change with respect to strategy setting and continuous development of expertise in the areas of risk management, risk measurement and risk mitigation, considering the dynamic and developing nature of climate change risk.

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