

## Modelling (re) insurance climate reserves

*As a working party we are working through how to best support the profession in understanding the impact of climate change on reserves. Any and all feedback you have after implementing the material below will be well received.*

*This is a non-peer reviewed paper issued by working party members to promote ideas and stimulate discussion amongst reserving actuaries and other interested readers. We would like to encourage readers to test out the ideas set out in this paper and provide feedback to the working party on their experiences.*

*This work comprises the thoughts of individual working party members and does not necessarily reflect the views of all working party members. Nor does it reflect the position of the IFoA, nor the employers of the authors. Readers choosing to apply approaches and ideas set out in this paper do so at their own risk. The authors, working party and IFoA do not accept any responsibility for any loss suffered by any party arising from reliance placed on this paper.*

The future landscape of climate change related claims is uncertain. It may be entirely different for different lines of business and even for different portfolios of the same type of business. However, it is important that we have an informed means of assessment of different lines of business and exposures that may impact our books, whether qualitative or quantitative in nature.

We have found that the best way to do this is to split climate change into different categories of risk and then consider the impact of each risk on individual lines of business. In this post we set out how to do this and what to think about as well as go through a few examples for selected lines of business for a hypothetical insurer. As the working party works through additional lines of business these will be added to the VLE.

There are several ways of categorising climate change risk but the most common is to split it into Physical, Transition and Liability Risks. More information on each of these categories is in Figure 1.

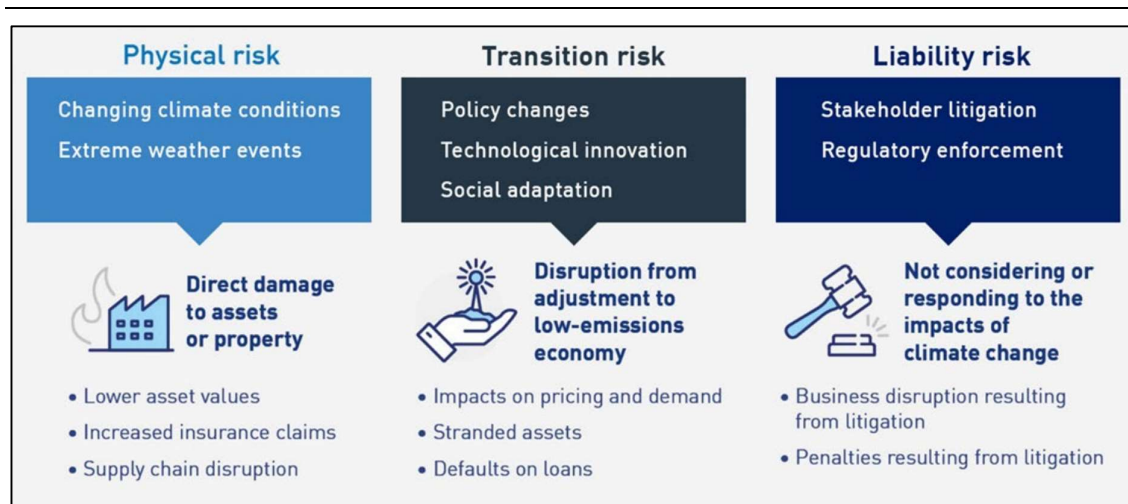


Figure 1: Climate Change risks (APRA: [https://www.apra.gov.au/sites/default/files/2022-11/Information%20Paper%20-%20Climate%20Vulnerability%20Assessment%20Results\\_0.pdf](https://www.apra.gov.au/sites/default/files/2022-11/Information%20Paper%20-%20Climate%20Vulnerability%20Assessment%20Results_0.pdf))

While this is a useful high-level framework, we have found that (like all taxonomies) when considering lines of business that have been impacted by a given type of risk, it be necessary to further subdivide these risks. This is because the types of claims that affect each line of business differ, and whether an insurance policy will respond to a given claim type will vary by line of business. Examples of more granular subdivisions are:

- Physical Risks can be subdivided into Acute and Chronic impacts of climate change.
- Liability Risks can be subdivided into Mitigation, Adaption and Regulatory/Governmental claims<sup>1</sup>:
  - Mitigation: Claims stemming from past or future harm done by the insured’s emission of greenhouse gases, contributing to global warming or that seek to prevent future GHG emissions.
  - Adaptation: Claims arising from a failure to plan for or adapt to the effects of climate change. Many cases that we have identified as “silent climate” may fall into this category, as often climate change does not need to be flagged for a claim to be successful.
  - Governance/regulation: Regulatory breaches, disclosure errors or greenwashing claims.
- Transition Risks can be subdivided into Social impacts and Asset changes.

For each Risk type and class of business it is worth considering:

<sup>1</sup> For more information on this split see: Martin Lockman, *Modelling Climate Litigation Risk for (Re)Insurers*, Sabin Center for Climate Change Law (July 18, 2023) Available at: [https://scholarship.law.columbia.edu/sabin\\_climate\\_change/201](https://scholarship.law.columbia.edu/sabin_climate_change/201)

- Is there likely to be any impact? Are the effects expected to arise in claims frequency and/or claims severity? Or is the position unclear?
- What specific risks could impact the claims experience?
- Is there anything that can be done now? E.g. analysis of the back book.
- Is there any external data source that you can cross-reference against your portfolio and use as a monitoring tool? E.g. monitoring the overlap of policyholders and litigations in the Sabin Center Database<sup>2</sup>
- If an adjustment may need to be made to the reserves, what type of adjustment is needed? E.g. uplift to an allowance for a particular type of claim or specific allowances for certain policyholders/types of policies.
- Could anything be changed to avoid these claims in the future? E.g. wording and exclusion changes, changes to mix of business etc.
- Finally, what is the likely size of the impact? This doesn't have to be an amount/percentage, but it is likely worth using a RAG rating or similar.

The results of this analysis will help you to rank risks for senior management and boards and provide outputs that are likely to be useful to other areas of the business. It may therefore be sensible for the workload to be shared across different functions.

### **Example qualitative review**

The examples below describe an imaginary insurer for the purposes of indicating the level of descriptive detail that might be prepared. Readers should adapt them to their own company. A detailed analysis was performed for D&O and Property classes of business in our 2023 paper<sup>3</sup>.

#### **1. Environmental Liability**

##### **a) Physical Risk:**

*Impact:* Potential for some increase in claims frequency

Potential for increases in accidental spills due to more extreme weather conditions. For example, pipes carrying toxic materials may fail from the effects of extreme weather (i.e. freeze, heat expansion, sea water corrosion etc) more often than has historically been the case.

Carrying out a geographic trend analysis may pick up if this is happening in certain regions. Then, a check should be made to determine whether the pricing team takes such regional variation into account when setting rates. If they are, then no adjustment to the IELRs may be justifiable. Conversely, it may be necessary to carry out a such an analysis and adjust reserving IELRs in some regions. It may also be

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<sup>2</sup> Climate Change Litigation Databases - Sabin Center for Climate Change Law:  
<https://climatecasechart.com/>

<sup>3</sup> <https://vle.actuaries.org.uk/course/view.php?id=1684>

worth raising with the pricing team as something to watch and a process enhancement to introduce.

*Rating:* Green (but check if picked up in pricing trend analysis)

**b) Liability Risk:**

Mitigation

*Impact:* Potential for some additional large claims.

If CO<sub>2</sub> is seen as a pollutant, there is a chance that claims could come in for greenhouse gas (GHG) emissions.

A review of back book policy holders should be carried out to see if there are any GHG emitters on the book. If there are such exposures, then a review of wording on these policies should be carried out to understand if pollutant is a well-defined term. Can the cover be limited to accidental spills and contamination, with losses arising from the deliberate emission of GHGs being legitimately excluded?

It is worth noting that there are already cases where insurance companies are being sued for denying claims where the wording is not tight (e.g. Aloha Petroleum Ltd. v. National Union Fire Insurance Co. of Pittsburgh<sup>4</sup>).

Even where the wording appears to be tight, will social attitude changes undermine the effectiveness of assumed insurer defences? We may want to monitor the effectiveness of pollutant and pollution exclusion language used in the market over time, and potentially hold an allowance for such tail-events.

Worth ensuring that in the future there is a strict definition in policy terms.

*Rating:* Amber (may be green after the above analysis)

Adaption

Liability from the Physical Risk claims referred to above could be impacted here.

Regulatory/Governmental

It is unclear if there would be any impact from this.

**2. Professional Indemnity**

**a) Physical Risk:**

It is unclear if there would be any impact from this.

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<sup>4</sup> <https://climatecasechart.com/case/aloha-petroleum-ltd-v-national-union-fire-insurance-co-of-pittsburgh/>

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**b) Liability Risk:**

Mitigation

It is unclear if there would be any impact from this.

Adaption

*Impact:* Potential for an increase in claims frequency for certain professions.

Architects, Quantity Surveyors, Engineers and other similar professions may be impacted by “silent climate” claims. These types of claims will likely not mention climate change explicitly but are as a result of the changing climate. For example, an Architect or Quantity Surveyor may be sued for negligence for not considering the foreseeable physical changes to the local climate as a result of climate change, e.g. advising the use of the wrong type of foundation because the flood maps used were out of date.

It is important that trend analysis is undertaken, and the causes of any changes are understood.

As these litigations will likely not mention climate change explicitly it is unlikely that any climate change exclusions would hold up for these claims.

*Rating:* Amber (may be green if not covering certain professions.)

Regulatory/Governmental

*Impact:* Potential for some increase in claims frequency.

There may be additional requirements for professionals around climate change which may result in an increase in claims, especially while these are being implemented and individuals are trying to understand what these mean for their work.

Ensuring that there is an understanding of the professional requirements of each profession covered and tracking any changes to these should highlight if there is likely to be any impact to the claims experience. This will be useful for both the reserving and pricing teams and so it will likely be worth sharing the burden of keeping this up to date. It may be something that the pricing team already takes this into account when setting rates. If they are, then no adjustment to reserving assumptions may be justifiable. Conversely, it may be worth adjusting reserving IELRs for particular professions if the requirements for the profession change.

*Rating:* Green (but check if picked up in pricing analysis)