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Climate Change and General Insurance

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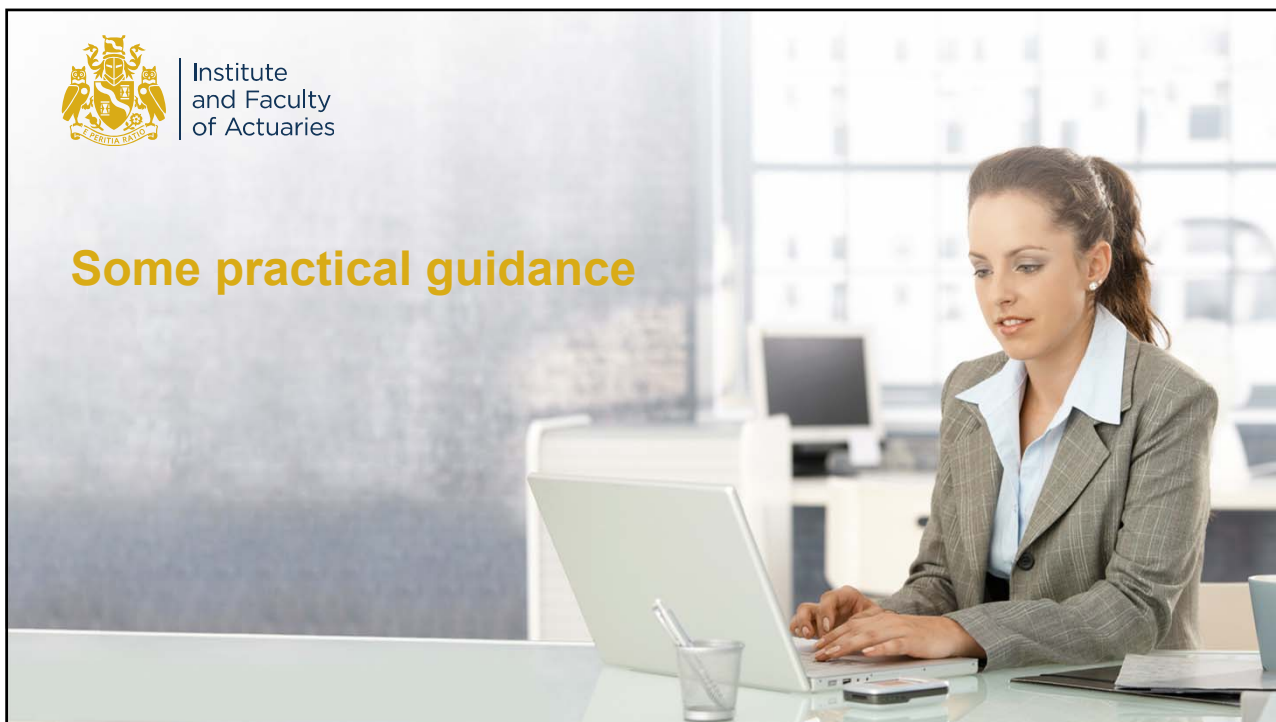


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Some practical guidance



Pricing needs to think beyond the annual renewal...

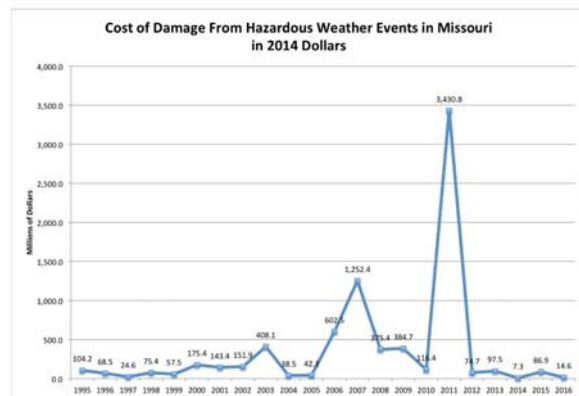
Experience and exposure rating are both reliant on extrapolating past trends...

"It may be tempting to assume that slow gradual changes in the climate will be experienced and only small differences in premiums will be needed to reflect these changes. However, acute physical risks include changes in the frequency of large cat events, where trends are difficult to identify."

(Practical Guide to Climate Change for GI Practitioners, to be published)

Pricing practitioners may need to think about:

- how climate change influences past data,
- the likely impact it has on trends, and
- the outlook for the future



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Source: mogreenstats.com

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Pricing for catastrophe risk

"Pricing practitioners may use catastrophe models to inform their assumptions about the incidence, expected value and potential variability of losses from catastrophe events. Practitioners may consider the range of climate change risks and the degree to which they are considered within the calibration of those models. Similarly, there may be new risks emerging outside the scope of the catastrophe models being used. For example, climate change may create new wildfire and subsidence risks in areas previously considered low risk, due to changed precipitation patterns including the occurrence of prolonged dry spells."

(Practical Guide to Climate Change for GI Practitioners, to be published)



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... and new risks



Transition Risks, for example:

"Storing large amounts of energy, whether it's in big batteries for electric cars or ..., is still a young field. It presents challenges, especially with safety."
(Irfan, 2011)

Liability Risks,

London School of Economics highlighted several US municipality-lead lawsuits against fossil fuel companies alleging liability for public nuisance, failure to warn, design defect, private nuisance, negligence, and trespass. (Grantham Research Institute on Climate Change and the Environment, 2018)

... and alternative levers to manage the risks coming onto the books.

For example. underwriting rules may need to be adapted.



Reserving for chronic and acute physical risks

What existing chronic (high frequency) or acute (high impact) weather- and climate-related drivers of insurance claims might be affected by climate change? For example:

- will freeze-related claims frequencies on household and motor policies reduce or lie within a wider range?
- will the incidence and extent of flooding or windstorm events increase with changed weather patterns, or will there be an increased tendency for clustering of events?
- are there any leading indicators, based on physical (weather and climate) rather than financial (claims) data, that could provide more insights?
- are these physical effects largely short-term in their impact, and therefore less subject to uncertainty beyond the original period of exposure?
- what changes, in response to climate-change, such as changes in agriculture practices and investment in physical resilience, might impact future claims costs?



Reserving for transition risks



What shifts in economic activity, supply chains, business practices and consumer behaviour might impact the underlying exposures?

- will existing carbon-based industries receive lower investment and move to higher risk practices? For example, Paris City Council has urged European (re)insurance companies to stop supporting the coal industry (Insurance Business Magazine, 2018).
- for new and emergent technologies, how can changes in the distribution of risk be anticipated in the reserving processes (e.g. will electric cars be slower and safer with more safety features, or silent and more dangerous with more risk of battery fires?)
- what leading indicators, based on investment trends (e.g. volumes in different energy subsectors, the use of electric vehicles and investments in energy efficiency) could capture the rate of transition to a lower-carbon economy and its likely make-up?



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Reserving for liability risks



For professional indemnity and other relevant classes, practitioners may need to consider the nature of the exposure:

- are policies on a claims-made or losses-occurring basis, the latter being more exposed to latent claims?
- are there existing court cases, reflected in the current reserves or that are relevant to the existing reserves, that could indicate likely trends for the future?
- applying the three broad liability headings of "failure to mitigate", "failure to adapt" and "failure to disclose" what claims might arise against these business classes?
- for longer tail classes of business, to what extent might the emergence of climate change impacts, say on investors' propensity to sue under Directors & Officers (D&O) policies or for physical asset owners to sue under Architect & Engineer policies, be spread over time and subject to greater uncertainty?



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Catastrophe modelling in 2 dimensions...

General Insurance practitioners may wish to consider the implications of climate change and catastrophe modelling in two dimensions:

Extent to which catastrophe models capture present-day climate risk.

- Models have been calibrated using historical events, and therefore implicitly account for climate change trends, but
- Models calibrated on long historical records may not adequately represent the present-day risk, which may have been modified by climate change

Quantification of future climate risks through catastrophe models.

- **Short Term:** do recent claims reflect the view of risk provided by the model?
- **Medium Term:** may need to work with catastrophe modellers to develop sensitivity tests.
- **Long Term:** provide information to help in designing evolving business strategies



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Reinsurance as a mitigant

The higher frequency and severity of extreme weather events, as well as increased chronic physical risks, will increase the cost and importance of reinsurance protection for insurers.

“Climate change is in fact warming not just the Earth but also the oceans and one of the reasons why the expectation of future hurricanes is so high is that last years' three hurricanes together—the \$135 billion of losses—are a one-in-10-year event not a one in a 100-year event. We see the possibility for a repetition of these kinds of losses in the foreseeable future.”

(John Dacey, Swiss Re CFO, 2018)



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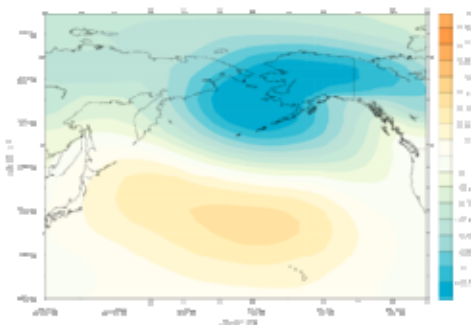
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Reinsurance and teleconnections

Reinsurers that have global portfolios also need to be concerned with the impact of climate change on teleconnections and how this could result in outsized losses.



“Teleconnection in atmospheric science refers to climate anomalies being related to each other at large distances (typically thousands of kilometres). The most emblematic teleconnection is that linking sea-level pressure at Tahiti and Darwin, Australia, which defines the Southern Oscillation.”

(Anon, 2018)



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Investment

General Insurance actuaries may wish to consider the implications of climate change for investment portfolios.

- **Physical Risks** to investment portfolios could include threats to infrastructure or real estate arising from rising sea levels or extreme weather events.
- **Transition Risks** include the possibility of a fall in the value of the shares or debt securities of carbon-intensive companies due to “stranded assets”, or legislation to deal with climate change. As “Environmental, Social and Governance” (ESG) investment strategies become more widespread, investors may disinvest from securities issued by carbon-intensive companies, leading to a fall in their price, even if their assets do not actually become “stranded”.

Alongside the “downside” risks, there may also be investment opportunities arising – investment in new technologies such as “green energy”, new infrastructure or electric cars.



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Investment considerations

There are some practical steps practitioners can take in relation to investment strategy to account for the impact of climate change:

- Setting out formally your approach to climate change-related risks within your investment policy;
- Arranging for a “carbon audit” of your investment portfolio to determine its potential exposure to climate change risks; this might include forward-looking Carbon VaR analysis;
- Asking your investment managers to detail the steps they are taking to deal with climate change.



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Risk management and capacity building

“Firms would be expected to identify, measure, monitor, manage, and report on their exposure to these [climate-related] risks. Firms should be able to evidence this in the written risk management policy, management information and board risk reports.”

(PRA SS3/19, 2019)

Where understanding, and awareness is lacking, the Risk Management function may need to consider “capacity building” within the business, e.g. providing:

- training,
- guidance,
- case studies, and
- supporting research,

with the aim of building “carbon literacy” and integrating climate change risks within the firm’s systems of governance and control.



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Risk management responses



A Risk Management function may respond to the risk from climate change by:

- Assessing the potential climate change impacts for short, medium and long-term time horizons, their impact on the firm's viability, future strategy and capital requirements.
- Incorporating climate risk within the risk register, including its classification, quantification, potential mitigants and recommended actions.
- Carrying out forward looking stress and scenario tests. The tests could aim to check the insurer's resilience to physical risks, transition risks and liability.
- Making appropriate disclosures of current and future risks such as those based on TCFD recommendations.
- Defining and assessing Key Performance Indices (KPI) to monitor exposures, and emerging trends



Capital Management

By incorporating climate change impacts into its modelling, a firm can identify potential vulnerabilities and explore the feasibility of its existing and alternative business strategies.

Non-modelled and emerging climate risk may need to be considered, for example:

- Some chronic physical effects of climate may not be captured in catastrophe models
- Existing sectors of the economy that are a source of insurance business may be severely impacted by technological or regulatory disruption.
- Climate risk may introduce “ripple effects” across different risk types and regions or lines of business. For example, climate change as a risk driver influences:
 - Excess mortality from heatwaves
 - Agriculture yields
 - Patterns of marine cargo losses



Further Information

- The PRA's paper on "[The impact of climate change on the UK insurance sector \(Sept 2015\)](#)"
- The PRA's supervisory statement [SS3/19](#) (April 2019).
- The PRA's report "[A framework for assessing financial impacts of physical climate change: A practitioner's aide for the General Insurance Sector](#)".
- The IFoA's Climate Change Working Party Report, "[Climate Change for Actuaries](#)": An Introduction".
- Actuaries Institute of Australia Climate Change Working Group's paper on [Transition Risk for General Insurers](#) (Nov 2018).
- Deutsche Asset Management's paper, "[Measuring Physical Climate Risk in Equity Portfolios](#)".
- [TCFD](#)'s final recommendations (June 2017).
- The CRO Forum's position paper on "[Insurability and Resilience in a Changing Climate](#)" (Jan 2019).
- The UN Environment Programme's draft paper on "[Underwriting environmental, social and governance risks in non-life insurance business](#)" (Feb 2019).
- The World Economic Forum's [Global Outlook](#) (Jan 2019).
- BP's [Global Energy Outlook 2019](#).
- The Global Calculator's [range of scenario data](#)
- Deep decarbonization pathways project's [range of scenarios and data](#).



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Questions?

How to get involved

- Registering your interest in Resource and Environment newsletters by logging into the Profession's website (www.actuaries.org.uk) and amending your preferences.
- Attending one of the many R&E events organised by the profession
- Joining the Resource and Environment Members' Interest Group:
<https://www.actuaries.org.uk/practice-areas/resource-and-environment/current-resource-and-environment-member-interest-group-mig>
- Volunteer to support the work of the R&E Board, its "Research and CPD" sub-committee or one of its working parties: <https://www.actuaries.org.uk/get-involved/volunteering-ifo>

