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A Practical Guide to Climate Change for GI Practitioners

Mark Rothwell

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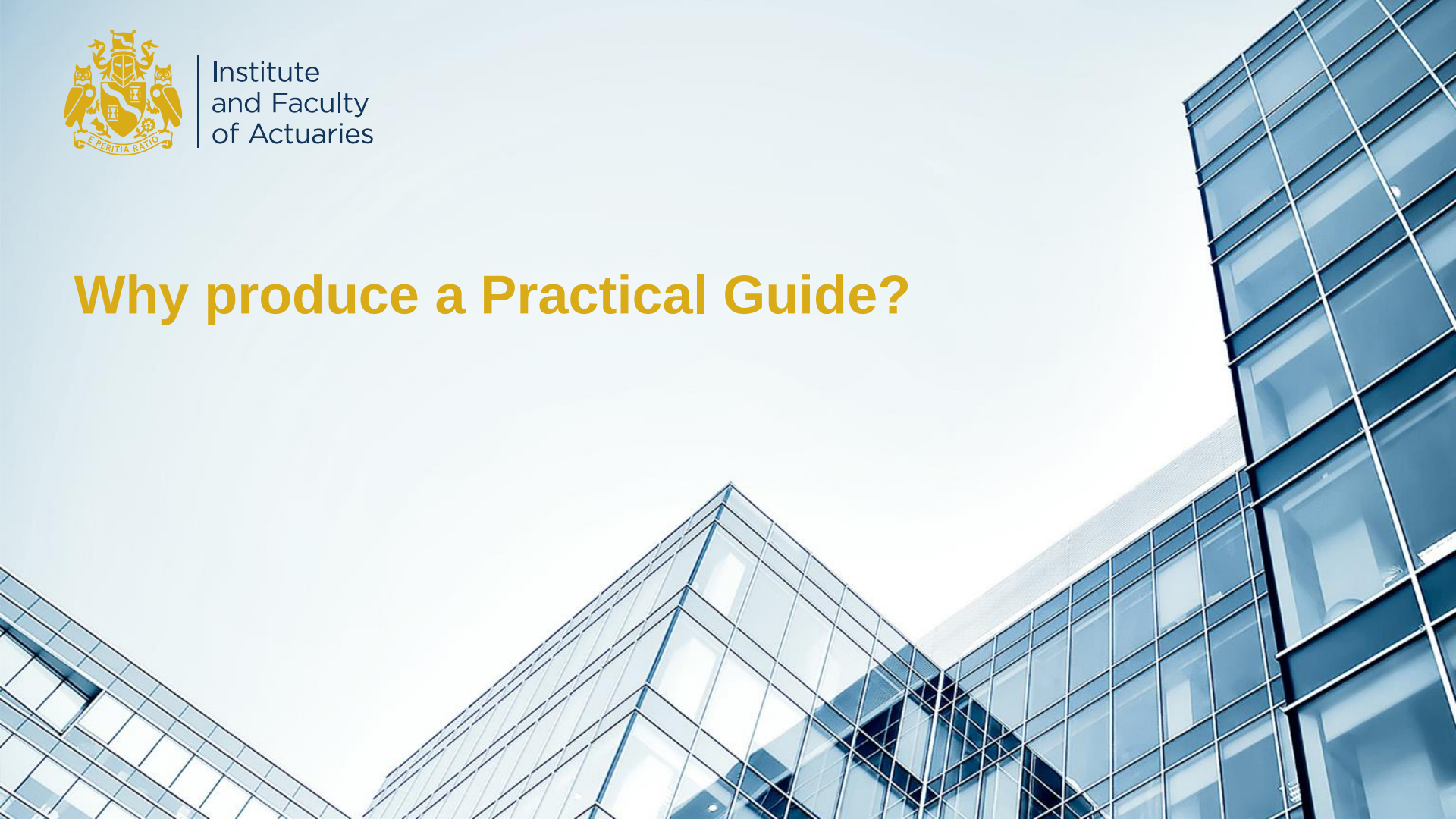
Why produce a Practical Guide?



Survey

- Are you aware of the risk alert on Climate Risk the IFoA issued in 2017?
- Are you aware of the Task-Force on Climate-related Financial Disclosures (TCFD) and their recommendations?
- Do you think that climate change poses risks to the organisations you work for or advise?

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Is climate change real?

- It is tempting to get drawn into this as being the actuarial question – it's not.
- There is overwhelming scientific opinion that man-made climate change is happening, but you can still find opinions against as well.
- The real actuarial question is whether there is a material chance that the climate will change, and what the consequences could be – this is climate risk.

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Professionalism and Climate Risk

TAS require that actuaries use assumptions and models that are fit for purpose and communicate material risks and uncertainties to clients

(Financial Reporting Council, 2017).

… so we'll aim to:

- outline how climate risk can represent a material risk to general insurers
- highlight the implications for actuarial advice
- provide practical suggestions to help practitioners meet their professional obligations

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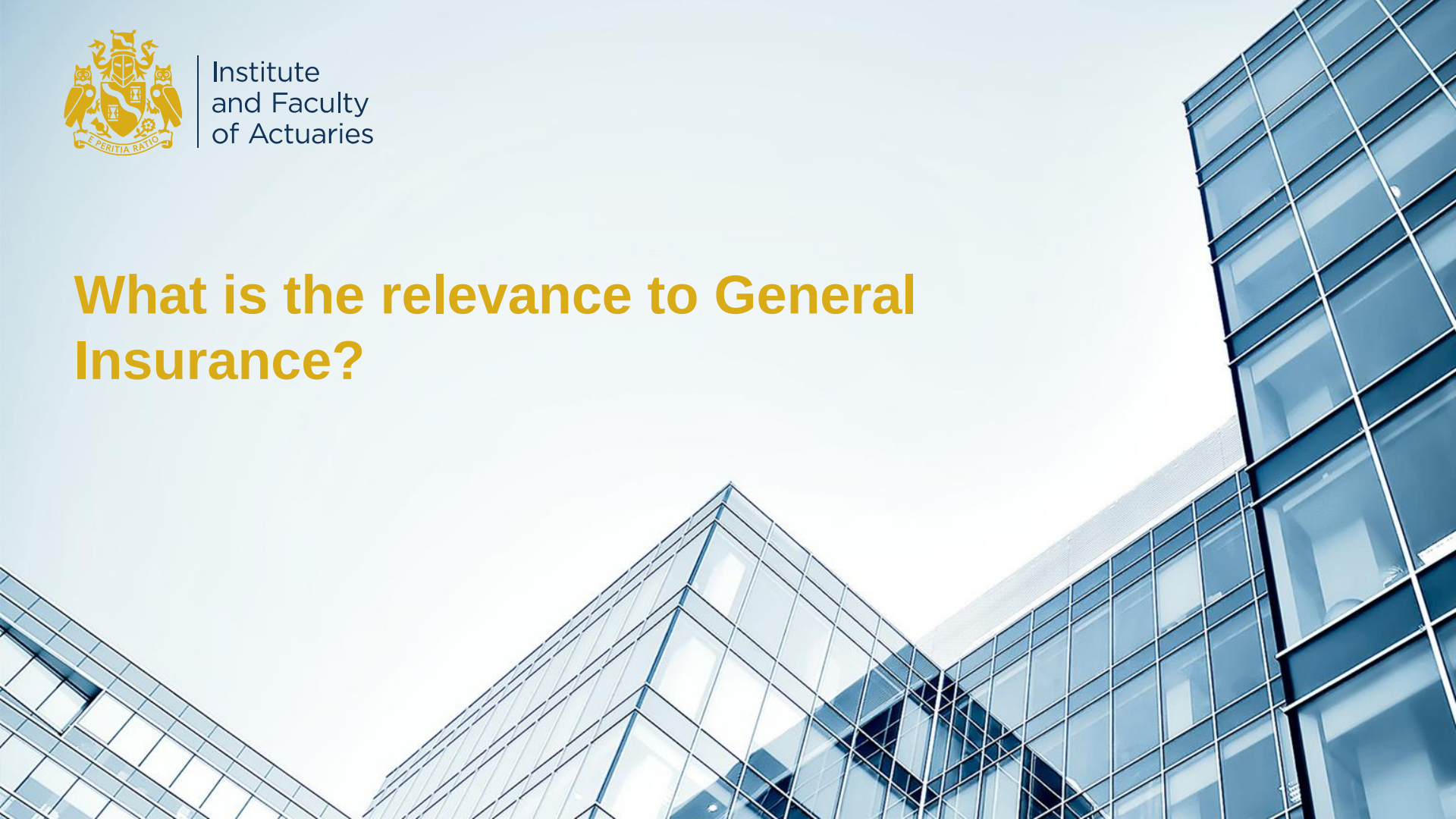
What is the relevance to General Insurance?



What is Climate Risk?

- Mark Carney broke climate risk into three areas:
  - Physical risk
  - Transition risk
  - Liability risk
- These include many long-term risks, so it is tempting to fall back on the argument that we mostly deal with annually renewable contracts but may well happen sooner than you think, particularly transition risks, but….

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Decisions based on future uncertainty

- Change Job?
- Move to a new city?
- Raise a family?

- Select a price for an uncertain insurance risk?
- Recommend an appropriate reserve?

Climate change is another source of uncertainty

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Physical Risk

"The first-order risks which arise from weather-related events, such as floods and storms. They comprise impacts directly resulting from such events, such as damage to property, and also those that may arise indirectly through subsequent events, such as disruption of global supply chains or resource scarcity." – PRA, 2015

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Examples of Physical Risks to General Insurers

- Changing patterns of windstorm events leading to higher or lower frequencies of windstorm events and the potential for increased severity.
- Increased cost of surface water or riverine flood events in those geographies that experience rainfall increases or increased intensity of rainfall.
- The potential for increased impacts from coastal flooding as sea levels rise.
  - For example, Lloyd's of London estimated that sea level rise contributed an additional 30% to the cost of storm surge losses in New York when the remnants of Hurricane Sandy struck the city in 2012 (Lloyd's of London, c. 2014).
- The potential for increased frequency and severity of freeze events in some locations.
- The potential for increases in wildfire events or subsidence damage in areas that experience drier and/or warmer conditions.
- Changes in crop failure rates as weather conditions change or become more volatile.
- The potential for social unrest in areas impacted by water scarcity.
- The potential for mass migration as a result of climatic effects.

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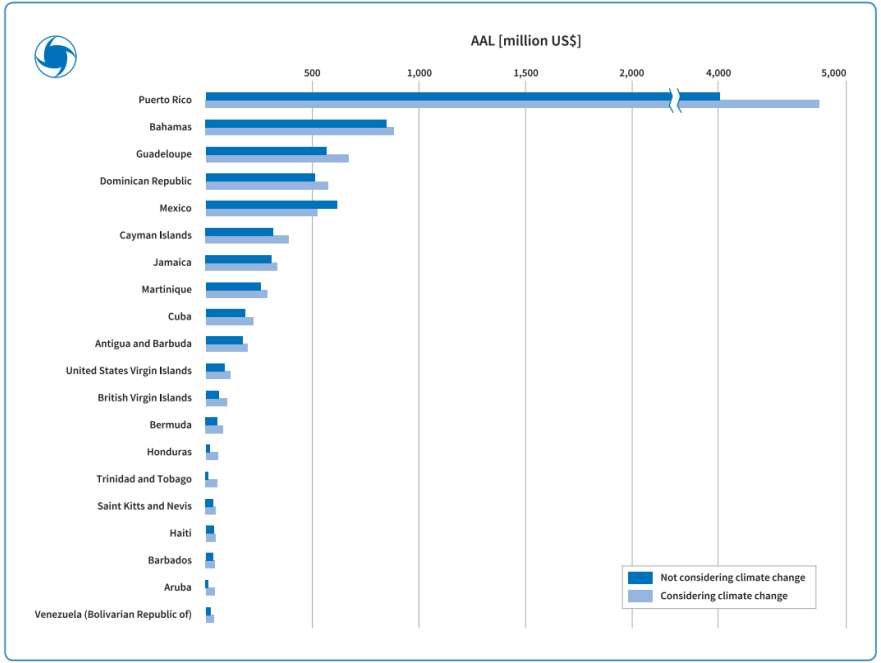
Impacts will vary by location

For example, the 2017 UNISDR Global Assessment Report on Disaster Risk Reduction highlighted the low level of confidence in inferring long term trends.

However, it then showed potential scenarios whereby annualised losses from hurricanes may increase for most countries in the Caribbean region but might reduce for Mexico.



(Source: CIMNE-INGENIAR, 2014.)

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Transition Risk

"The financial risks which could arise for insurance firms from the transition to a lower-carbon economy. For insurance firms, this risk factor is mainly about the potential re-pricing of carbon-intensive financial assets, and the speed at which any such re-pricing might occur. To a lesser extent, insurers may also need to adapt to potential impacts on the liability side resulting from reductions in insurance premiums in carbon-intensive sectors."– PRA, 2015

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Examples of Transition Risks to General Insurers

- Loss of market value and/or investment income within investment portfolios, where investments are exposed to the risk of stranded assets.
- Changes in motor liability risks posed by a move away from fossil fuels.
- Changes in commercial risks from new or different manufacturing processes in a decarbonised world.
- Pressure from authorities, investors or customers to:
  - disinvest from carbon-intensive sectors,
  - increase investments in the renewable energy sector,
  - withdraw insurance support from projects and companies in carbon-intensive sectors,
  - provide more detail disclosure of climate change vulnerability.
- New emerging risks from a switch to alternative energy sources

"Transitioning to a lower-carbon economy is likely to entail extensive policy, legal, technology, and market changes and depending on the nature, speed, and focus of these changes, transition risks may pose varying levels of financial and reputational risk to organisations." – TCFD ,2017

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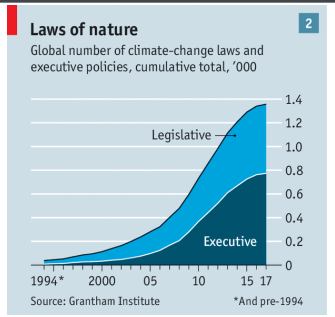
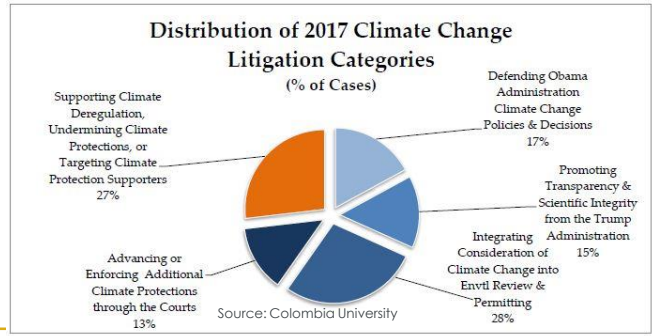
Liability Risk

"Risks that could arise for insurance firms from parties who have suffered loss and damage from climate change, and then seek to recover losses from others who they believe may have been responsible. Where such claims are successful, those parties against whom the claims are made may seek to pass on some or all of the cost to insurance firms under third-party liability contracts such as professional indemnity or directors' and officers' insurance."– PRA, 2015





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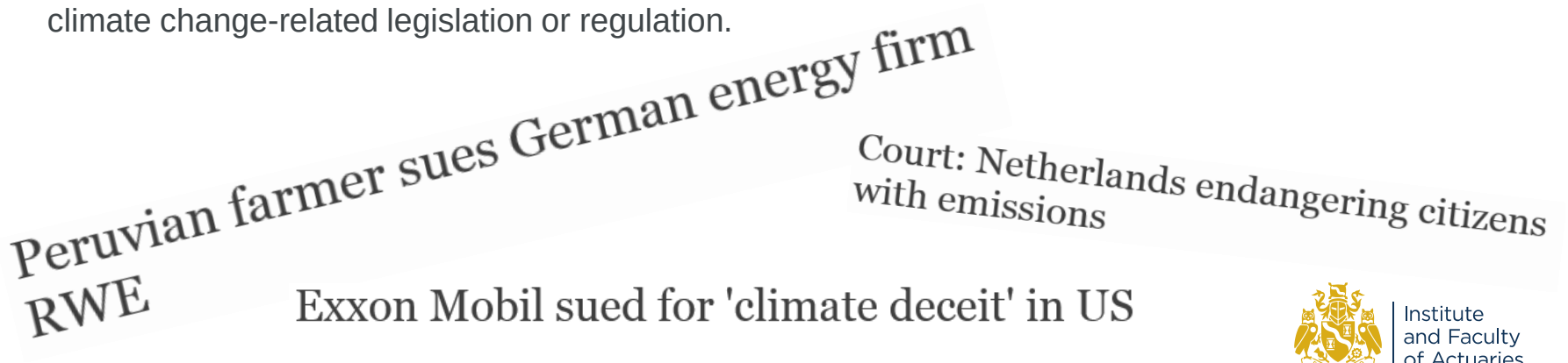
Examples of Litigation that may generate Liability Risks

- Failure to mitigate: If insured parties are being held responsible for the physical impacts of climate change, such as through emissions of greenhouse gases, and will be accountable for the losses.
- Failure to adapt: If insured parties have not sufficiently accounted for climate change risk factors in their acts, omissions or decision-making.
- Failure to disclose or comply: If insured parties have not sufficiently disclosed information relevant to climate change, have done so in a manner that is misleading, or have otherwise not complied with climate change-related legislation or regulation.



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Impact on Key Areas of Focus

Pricing and Underwriting Examples

Challenges	Examples	Options
Insurers will need to understand the allowance for climate change within their models.	Catastrophe models may make some allowance for climate change, but insurers may want to recalibrate them to their own experience.	Consider the range of climate change risks and the degree to which they are considered within the calibration of those models.
There may be relatively little historic data to base projections, or to discern a trend.	There may be relatively little history of climate related litigation and its outcomes. However, there is an increasing trend in cases being brought before the courts.	Consider the range of possible outcomes and make suitable allowances.
It may be necessary to look at alternative sources of data.	Potential issues with pricing “Weather Index Insurance” were highlighted by Daron & Stainforth, 2014.	Consider multiple sources of climate information, and acknowledgement their associated biases and errors.
Underwriting rules may need to be adapted for climate change.	As sea levels rise, some coastal areas may become uninsurable. Withdrawing cover from such areas will pose wider social and reputational issues	Remember that pricing is only one lever to manage the climate risks coming onto an insurer’s books.

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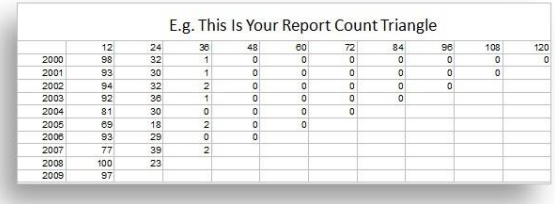
Reserving Examples



E.g. This Is Your Report Count Triangle

	12	24	36	48	60	72	84	96	108	120
2000	98	32	1	0	0	0	0	0	0	0
2001	93	30	1	0	0	0	0	0	0	
2002	94	32	2	0	0	0	0	0		
2003	92	36	1	0	0	0	0			
2004	81	30	0	0	0	0				
2005	69	18	2	0	0					
2006	93	29	0	0						
2007	77	39	2							
2008	100	23								
2009	97									

Challenges

Most reserving techniques place some reliance on past experience.

Can we identify the climate-related drivers that might affect claims frequency or severity?

For emerging technologies, how can changes in the distribution of risk be anticipated in the reserving processes?

To what extent might the emergence of climate change impacts be spread over time and subject to greater uncertainty?

How might failure to mitigate, failure to adapt and failure to disclose impact on claims costs?

Examples

Climate change may alter the mix and development of claims.

Will the incidence and extent of flooding events increase with changed weather patterns?

Will electric cars be slower and safer with more safety features, or silent and more dangerous with more risk of battery fires?

How might investors' propensity to sue under Directors & Officers policies change over time?

Options

Consider whether climate uncertainties would affect future claims costs.

Practitioners are encouraged to present their impact analysis in the form of potential scenarios, from which deterministic "Actuarial Best Estimates" may be selected.

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Across both Pricing and Reserving, could consider….

- Physical Risk:
  - will freeze-related claims frequencies on household policies reduce or lie within a wider range?
  - will the incidence and extent of flooding events increase with changed weather patterns?
  - are there any leading indicators, based on physical rather than 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?
- Transition Risk:
  - will existing carbon-based industries receive lower investment and move to higher risk practices?
  - for new and emergent technologies, how can changes in the distribution of risk be anticipated
- Liability Risk:
  - are these policies on a claims made or losses occurring basis, the latter being more exposed to latent claims?
  - are there existing court cases that could indicate likely future trends
  - applying the three broad headings of "Failure to mitigate", "Failure to adapt" and "Failure to disclose“, what claims might arise against these business classes?

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Catastrophe Modelling Examples

Challenges	Examples	Options
Climate change trends may be implicitly built into catastrophe models; however these trends are not necessarily explicitly incorporated into the modelling output. Most commercially-available catastrophe models are not explicitly developed to quantify climate change risk.	Climate change impact already depicted in historic trends is difficult to be decoupled from existing catastrophe models.	Practitioners need to account for the fact that elements of climate change impact may already be depicted in the catastrophe model outputs they interpret. Careful interpretation of the results is necessary in order to obtain the information necessary. Catastrophe models could provide information that can be used for designing such evolving business strategy

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Reinsurance Examples

Challenges	Examples	Options
Demand for reinsurance may increase.	Increases in frequency and severity of windstorms could increase demand for higher vertical limits and more reinstatements.	There may be opportunities for reinsurers to expand their operations by introducing new products or expanding existing ones.
Future climate impacts may be non-linear and increasingly correlated, which will make assessments of reinsurance requirements a more complicated task.		
Reinsurance cover may become less accessible as reinsurers review their underwriting practices.		

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Investment Examples

Challenges	Examples	Options
Individual investments may each be exposed to varying amounts of climate change vulnerability.	Citigroup estimate that, even if the rise in global temperatures is to be constrained to two degrees above pre-industrial levels, the total value of stranded assets could be over $US100 trillion based on 2015 market prices.	Practitioners could: • Set out formally their approach to climate change-related risks within the investment policy·, • Arranging for a “carbon audit” of your investment portfolio to determine, • Discuss with investment managers the steps they are taking to deal with climate change.
Analysis of climate risk vulnerabilities may lead to changes in demand (and market value) of individual investments.	As “Environmental, Social and Governance” (ESG) investment strategies become more widespread, investors in may disinvest from securities issued by carbon-intensive companies,	

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Risk and Capital Management

Challenges	Examples	Options
Climate risk is likely to be a material emerging risk to many general insurers.		Assess the specific climate related issues each for short, medium and long-term horizon and their impact on capital.
Stress testing and scenario analysis can help identify climate change impacts.	TCFD make specific recommendations about the use of scenario analyses to support strategic decisions.	Consider climate change scenarios within stress and scenario plans.
Disclosures in annual reporting may need to describe climate change as an emerging risk.	ClientEarth recently made complaints to the FCA about a lack of disclosure by some insurers.	Consider making TCFD compliant disclosures.
Climate change may feature as a concern within the risk appetite of the insurer or its stakeholders and investors.	Regulators may require capital allocation choices more aligned with future needs of a low carbon economy.	Consider climate change within risk appetite discussions.
Within capital models, the uncertainty and dependencies around the modelled risk types may change.		

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Next Steps

- Re-read the IFoA risk alert
  https://www.actuaries.org.uk/news-and-insights/media-centre/media-releases-and-statements/ifoa-warns-climate-change-financial-risks
- Read the “Practical Guide to Climate Change for General Insurance Practitioners” out soon!
- Read “Climate change for Actuaries: an introduction” out soon!
- To get more background on climate science, attend the workshop “F3: Climate Change: A Survival Guide” tomorrow 10:30am
- For more on the risk alert and regulatory developments, attend the workshop “E10: Shame! Half the Room Hadn't Heard of our Climate Change Risk Alert” tomorrow 9:30am
- Join the Resource and Environment Practice Area LinkedIn Group
  https://www.linkedin.com/groups/13593694
- Volunteer to be part of the R&E Member Interest Group
  https://www.actuaries.org.uk/practice-areas/resource-and-environment/current-resource-and-environment-member-interest-group-mig
- Chat with members of the working party
  Mark Rothwell (Chair), Martin Earle, Choong Hern Ooi, James Orr, Shradha Shroff, Jianhua Siew
- Apply your new-found knowledge

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Questions

Comments

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