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Momentum Conference December 2016

Climate change - a classic risk management problem

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Sandy Trust - IFoA Resource and Environment Board



11 November 2016

Climate Change: Managing Risk and Uncertainty

Policy Briefing

2015

Summary

The risks associated with climate change are wide-ranging and could have major economic, political, social and financial impacts. The Institute and Faculty of Actuaries (IFoA) is deeply concerned by these issues and supports efforts to address climate risks. Based on the work of climate scientists and climate policy experts, and our own expertise in managing risk and uncertainty, we conclude that:

1. Climate change is a risk management problem

– current climate policy is based on an understanding of what is expected to occur, when in fact there is substantial risk that future temperatures could be more extreme. If society is to understand and avoid a worst case scenario, the scale and likelihood of extreme scenarios should be a prominent element in climate policy.

2. The cost of delay is high and early action on emissions will improve future options – failure to take timely action on emissions is likely to lead to more costly and disruptive remedial action at a later date, as well as earlier and more severe climate impacts. Early reductions in global emissions also allows more time for more effective adaptation to future adverse climate impacts.

3. Continuous assessment and dynamic management should be central aspects of climate policy – there is considerable uncertainty about the precise nature and timing of climate change impacts. The IPCC's 2°C consistent carbon budget is not guaranteed to achieve its goal; it only has a 2/3 probability of limiting temperature rises to 2°C. Governments should ensure that climate risk is continually assessed to reduce uncertainty and new information and insights are used to inform policy responses.

4. Action is needed to address market failures

– governments also need to recognise their role in correcting market failures, for example, by pricing the negative externalities of greenhouse gas emissions. Effective policies for pricing carbon, and compulsory and standardised disclosure of climate risks, will allow markets to respond rationally and systematically to climate change.

5. Policymakers and financial institutions need to balance multiple timeframes – current approaches to policy and investment decisions tend to place a higher value on the short-term, potentially at the expense of future generations. Both policymakers and financial institutions need to consider the time horizons on which they are basing decisions and how their decisions may affect future generations.

The IFoA recognises the serious risk that climate change poses to society. Actuaries are ideally placed to work with governments, business and other stakeholders to help better understand the long-term consequences of climate change, and help develop policy options to respond to these risks. The IFoA will continue to work with stakeholders to help address climate change risk through further research and will continue to contribute to the public debate on climate change in the coming years.

November 2015

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Classic Risk Management Problems



Application to Climate Change



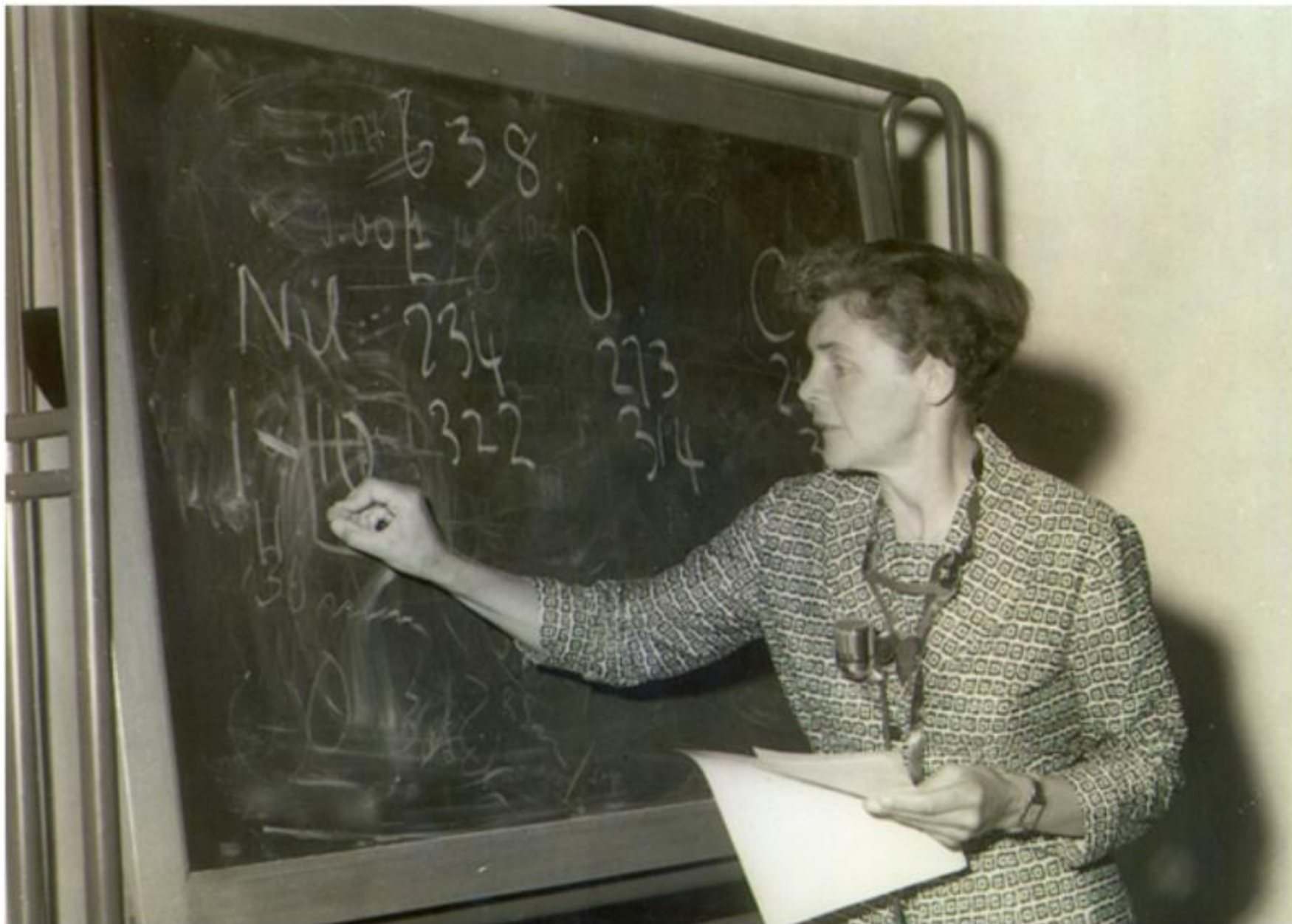
YOUR problem with climate change

ALL

Taking Action



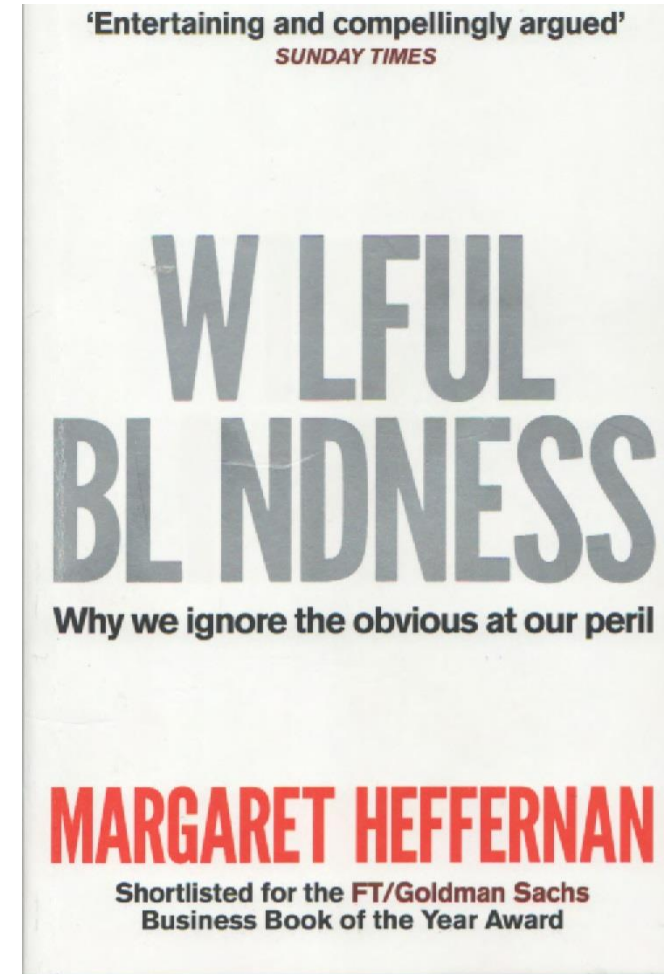
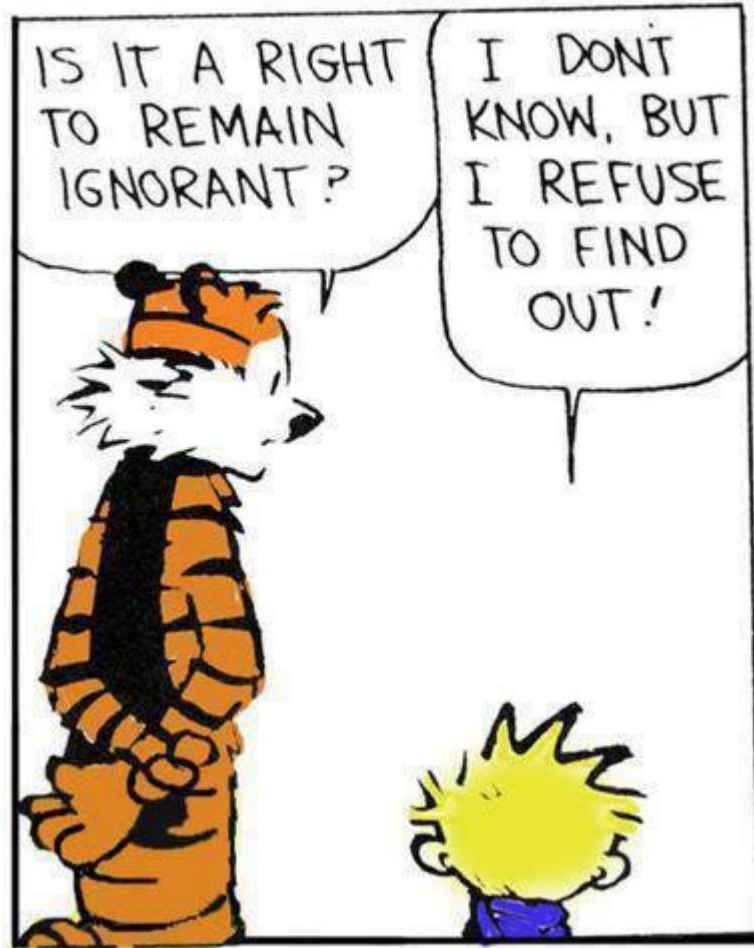
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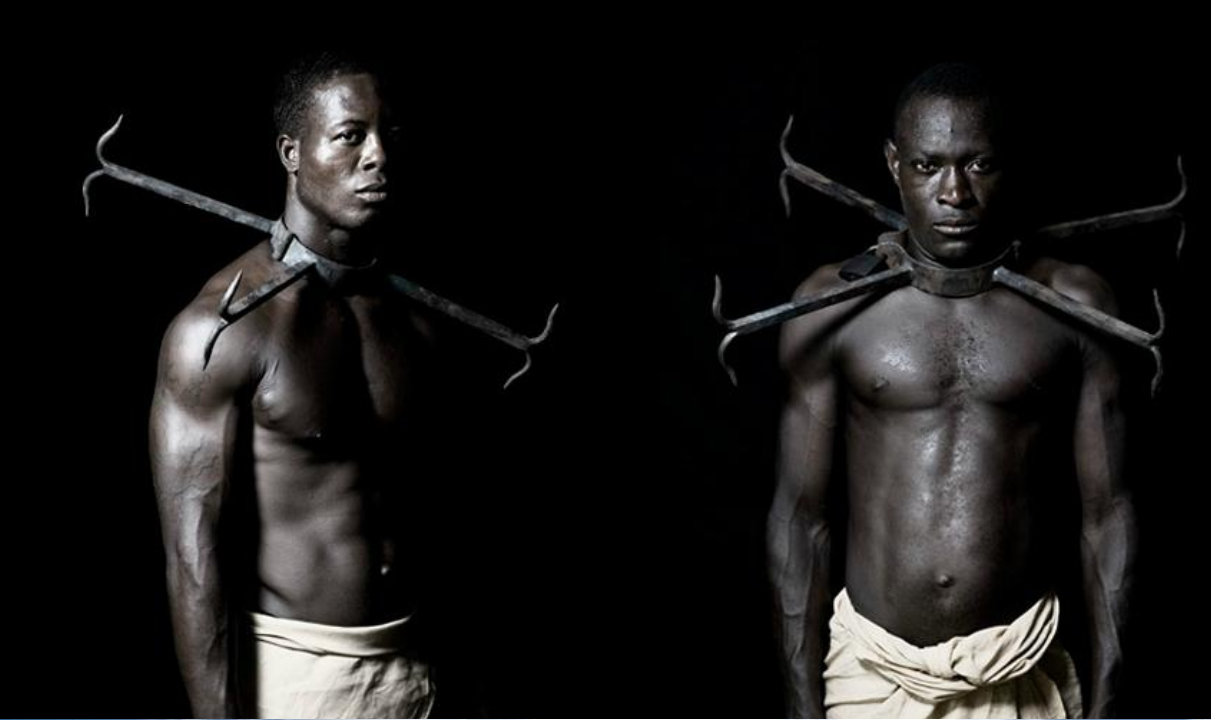


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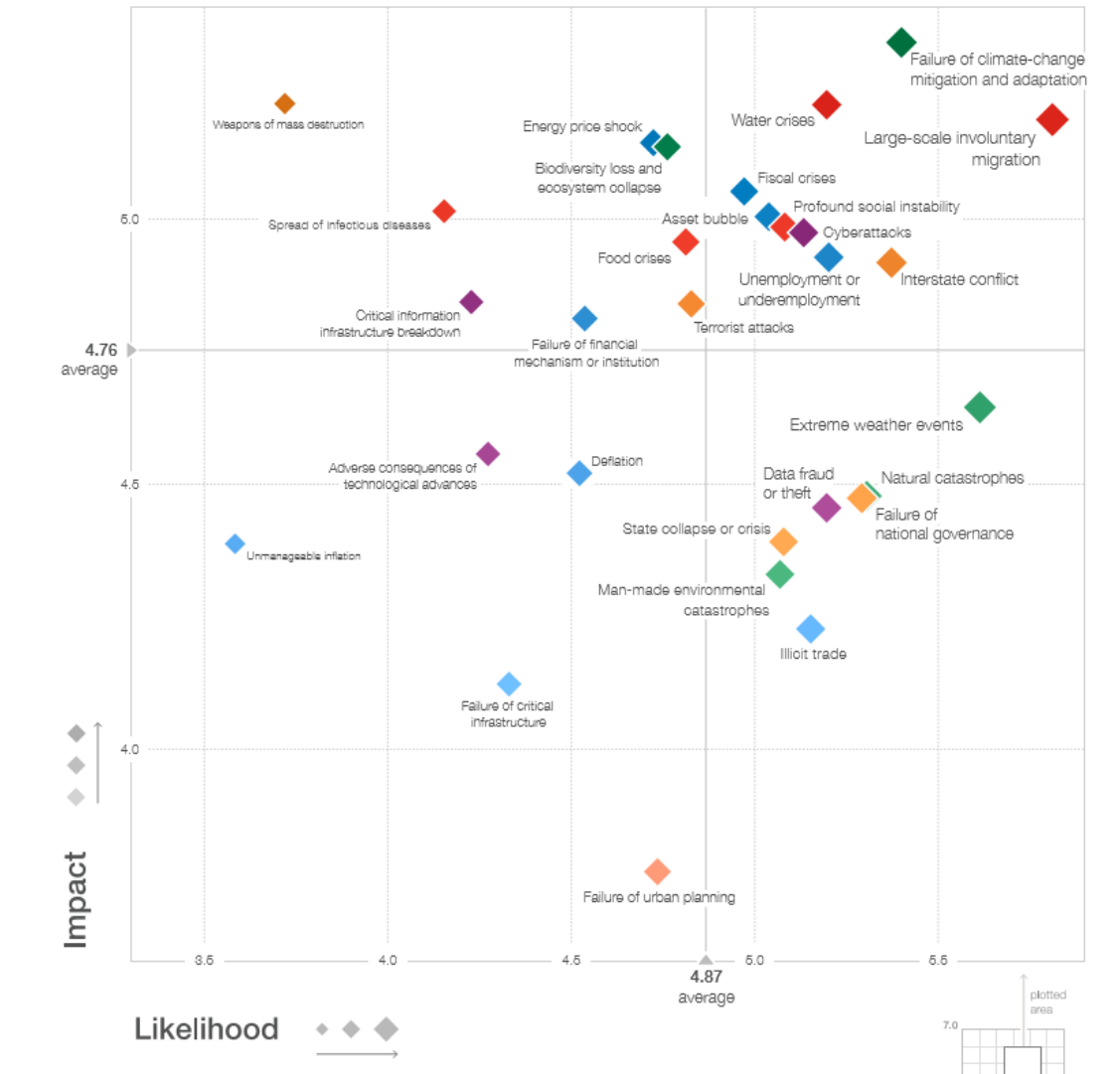
THE problem with risk management?



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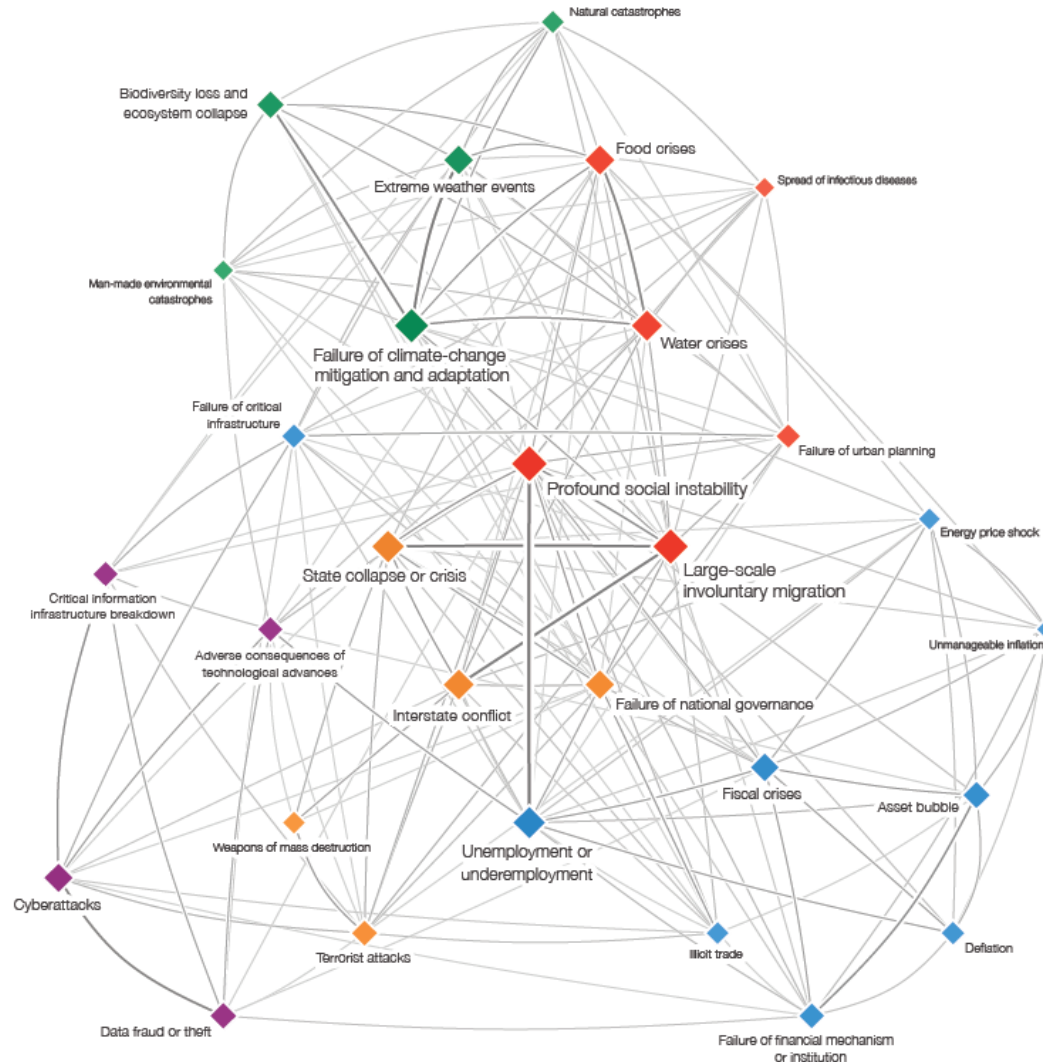


Global Risk Landscape 2016



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Risk interconnectedness



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Application to Climate Change



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Global Goals



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The challenge of climate change

“This Agreement ... aims to [hold] the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C”

The Paris Agreement, 12 December 2015

“the carbon budgets associated with a 2°C threshold demand profound and immediate changes to the consumption and production of energy.”

Kevin Anderson, Professor of Energy and Climate Change, December 2015



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Figure 1: Emissions scenarios reviewed in the Fifth Assessment Report of Working Group 3 of the IPCC. Scenarios are grouped according to their CO₂ equivalent concentrations in the year 2100 (see colour legend).^{ix} Source: IPCC Fifth Assessment Report Working Group III Figure 6.7²

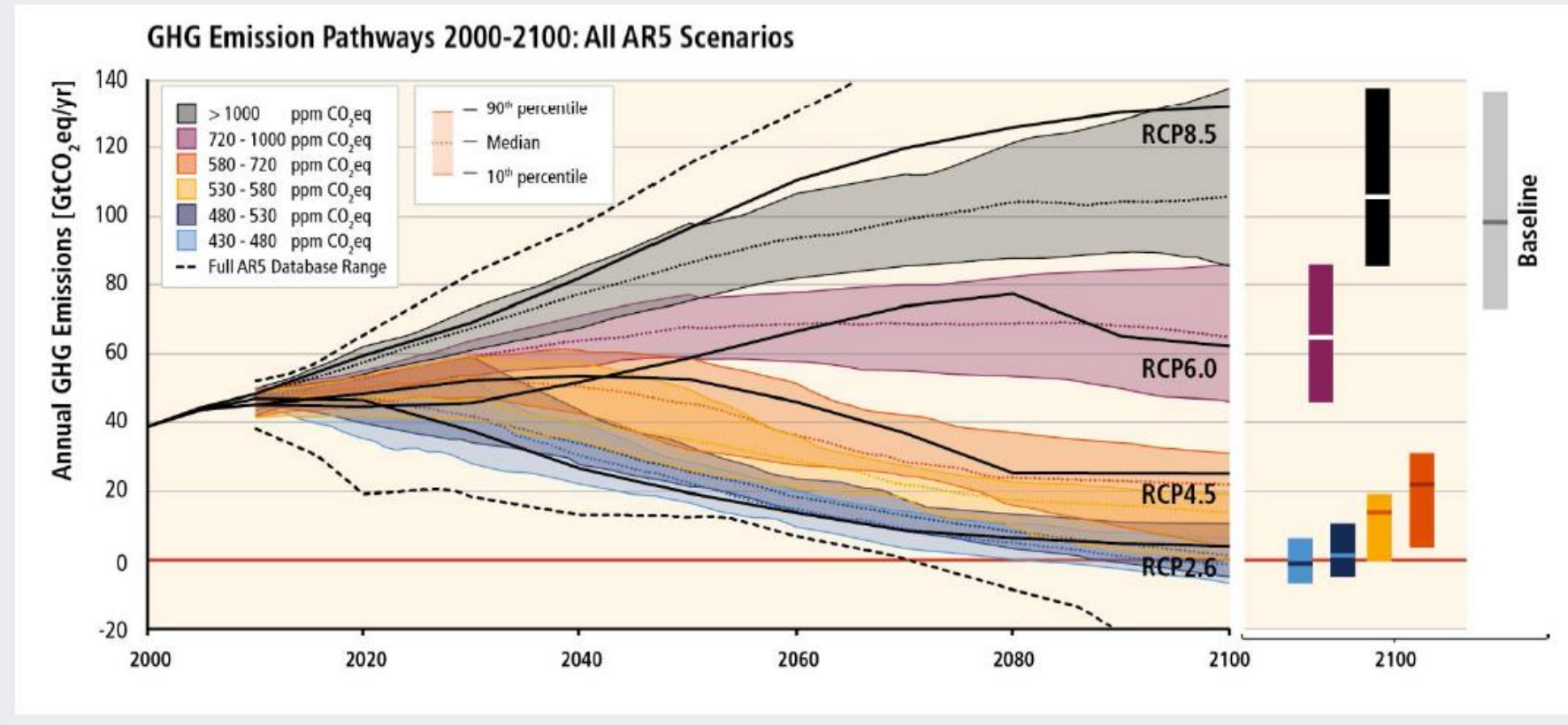
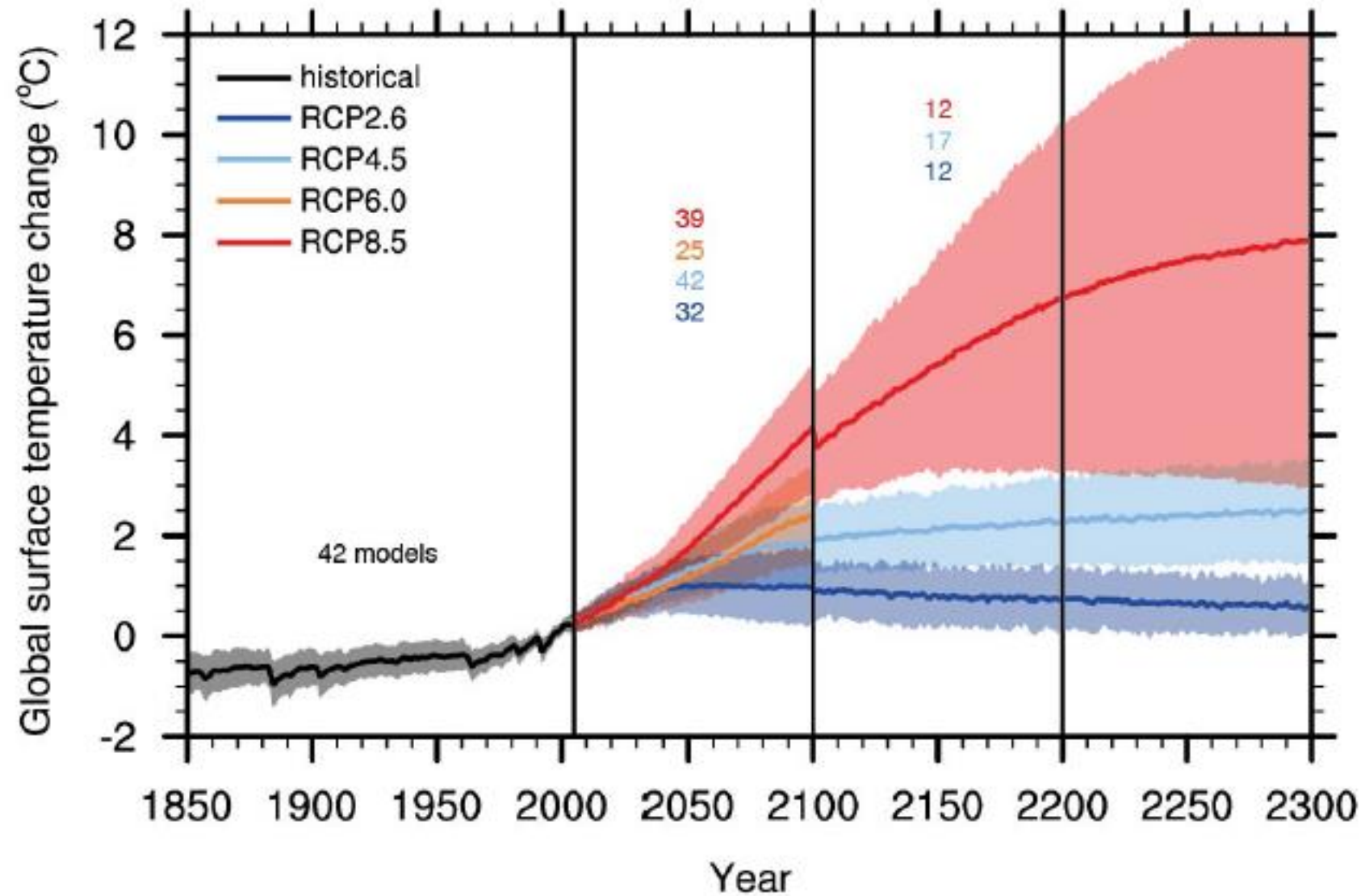
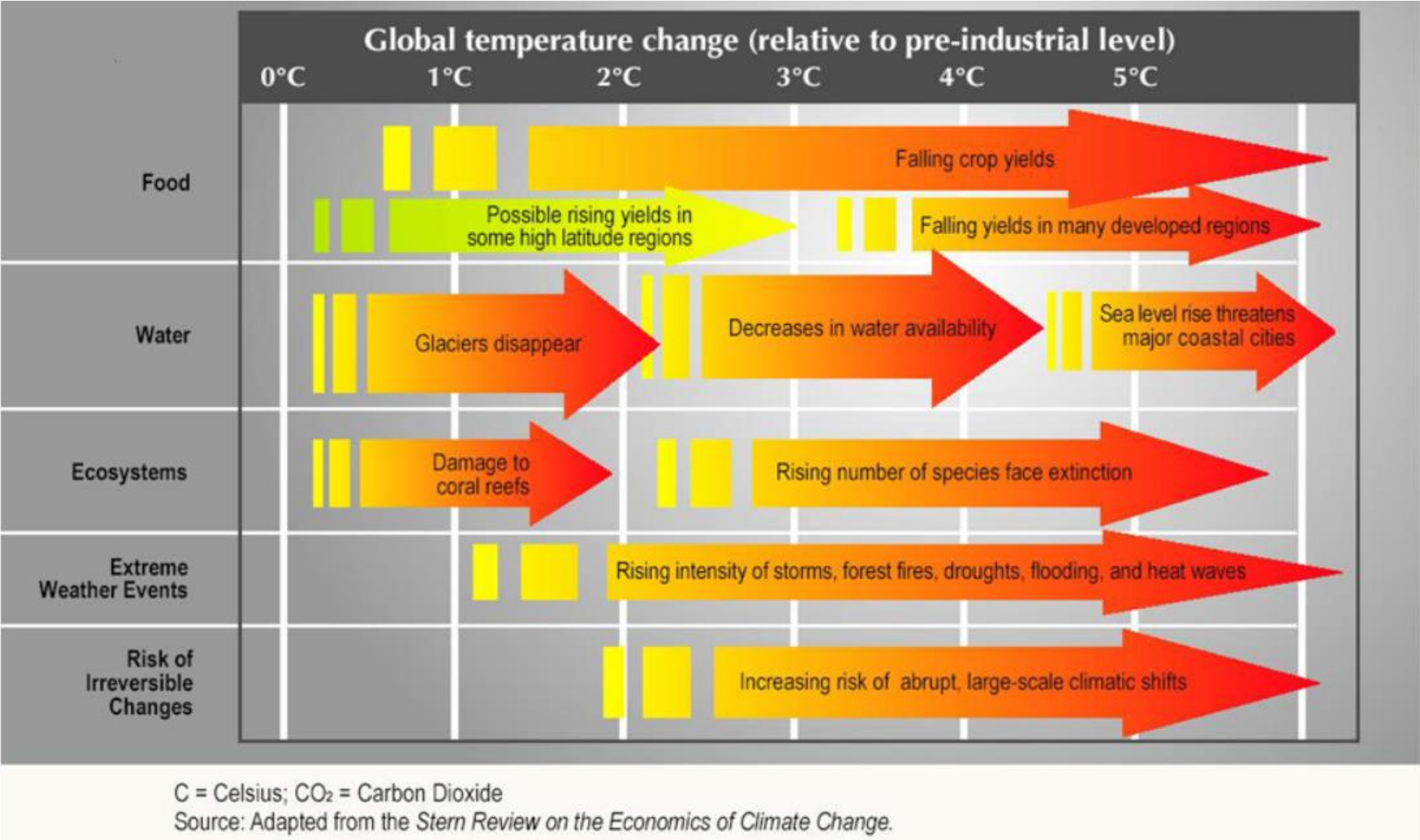


Figure 8: A risk that increases over time: climate change^{i, 15}



Projected impacts of climate change



Your problem with climate change

**Implications for DB
Pensions?**

Reinsurers?

**Implications for risk
and return**

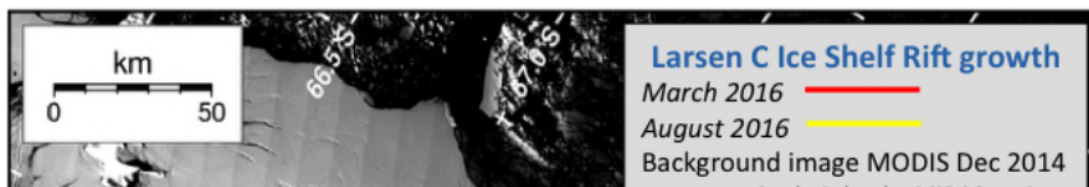
Economic Models



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A widening 80 mile crack is threatening one of Antarctica's biggest ice shelves

By **Chris Mooney** August 22 



Exxon Mobil Corp

[+ Add to myFT](#)

New York state attorney-general widens ExxonMobil probe

Eric Schneiderman to look into reporting of asset valuations by oil company



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Each group to discuss one scenario

- A. 100,000 km² piece of the Ross ice shelf breaks free from continental Antarctica and melts over a summer. Global sea levels rise by 1m in one year and downtown New York and London experience inundation. Scientists proclaim the critical instability of the West Antarctic Ice Shelf, estimated to contain a further 5m of sea level rises.
 - B. In a landmark ruling the High Court in London rules that BP bares part of the liability for the property damage to the island nations arising from climate change, paving the way for all fossil fuel producers to be sued. Estimates of the total liability due exceed the balance sheets of the producing companies.
-
- 1. When would your advice incorporate these facts?
 - 2. Would it alter your valuation of assets, liabilities or both, and how?
 - 3. Is the event in any way foreseeable by actuaries?
 - 4. Could you be liable if this event is not included in your advice in advance of it occurring, could you be liable if it was?

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Taking Action



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Taking action



Climate change ✓ Added

HSBC’s UK pension scheme to invest £1.85bn in eco-friendly fund

Pressure mounts on large investors to protect portfolios from climate change risks



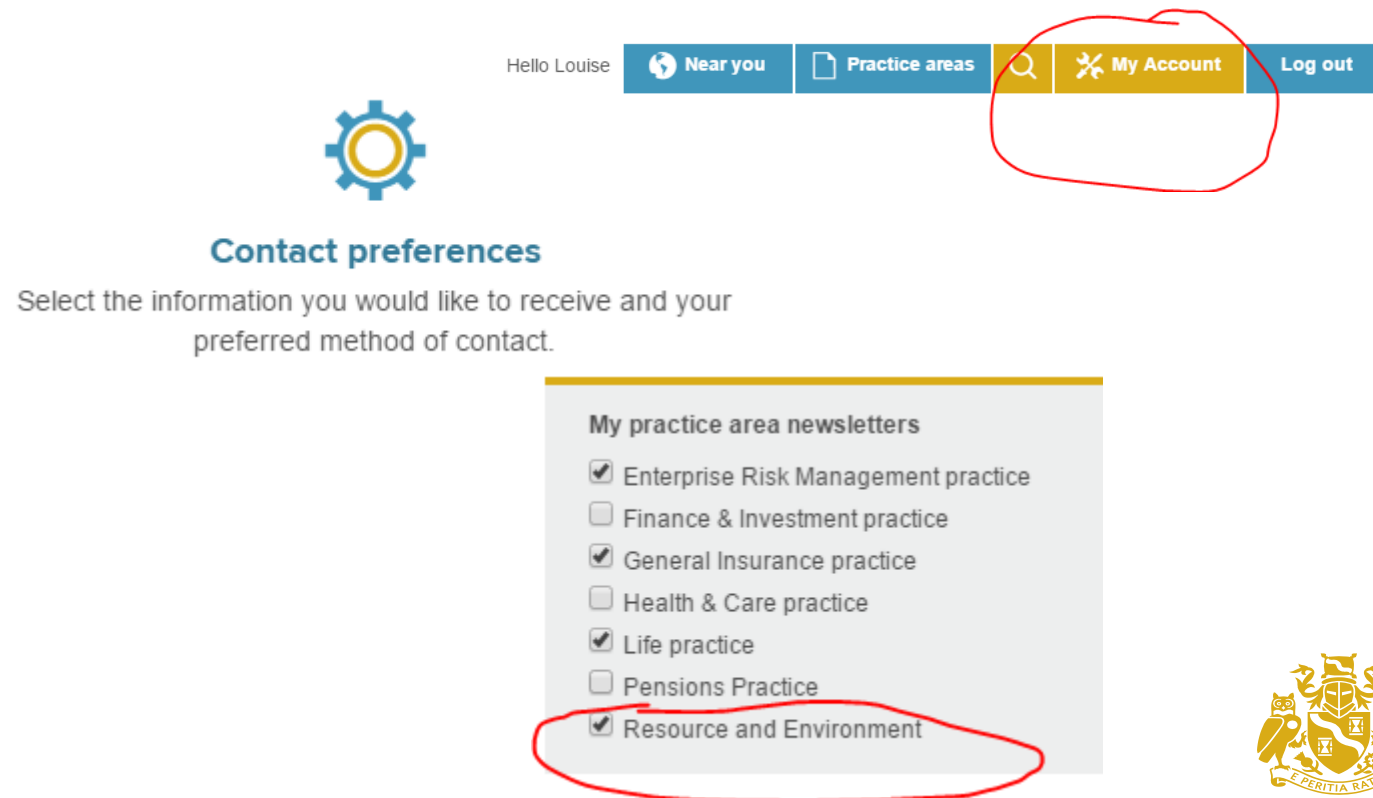
Professional duty of care?



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What you can do

- Think about these things in your daily life
- Sign up to the R&E newsletter
- Suggest!
- Volunteer!



Hello Louise

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- ☒ Life practice
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Questions

Comments

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Appendix 1

Sources of further information

ertise
ponsorship
Thought leadership
Progress
Community
Sessional Meetings
Education
Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
Journals
Support

IFoA Resource and Environment links

- Sign up for the Resource and Environment newsletter:
<http://www.actuaries.org.uk/news-and-insights/newsletters#Resource%20and%20environment>
- Climate change policy briefing (2015):
<http://www.actuaries.org.uk/news-and-insights/media-centre/media-releases-and-statements/risk-management-approach-essential>
- Commissioned research on Limits to Growth (2013):
<http://www.actuaries.org.uk/documents/resource-constraints-sharing-finite-world-evidence-and-scenarios-future>
- Literature reviews:
 - Sustainability and the financial system (2015)
<http://www.actuaries.org.uk/documents/sustainability-and-financial-system-review-literature-2015>
 - Climate change and resource depletion (2011)
<http://www.actuaries.org.uk/documents/climate-change-and-resource-depletion-challenges-actuaries-review-literature-2011>
 - Climate change and resource depletion (2010)
<http://www.actuaries.org.uk/documents/climate-change-and-resource-depletion-review-literature>



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Further reading

- World Economic Forum – Global Risks Report
<http://reports.weforum.org/global-risks-2016/>
- IPCC AR5 Synthesis Report - Key points and questions
<https://www.gov.uk/government/publications/ipcc-5th-assessment-report-synthesis-report/key-points-and-questions-ipcc-ar5-synthesis-report>
- PRA - The impact of climate change on the UK insurance sector
<http://www.bankofengland.co.uk/pradefra0915.pdf>
- Mercer – Investing in a time of climate change 2015
<http://www.mercer.com/services/investments/investment-opportunities/responsible-investment/investing-in-a-time-of-climate-change-report-2015.html>
- Kay Review – UK equity markets and long-term decision-making
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/253454/bis-12-917-kay-review-of-equity-markets-final-report.pdf
- Law Commission - Fiduciary Duties of Investment Intermediaries
<http://www.lawcom.gov.uk/project/fiduciary-duties-of-investment-intermediaries/>





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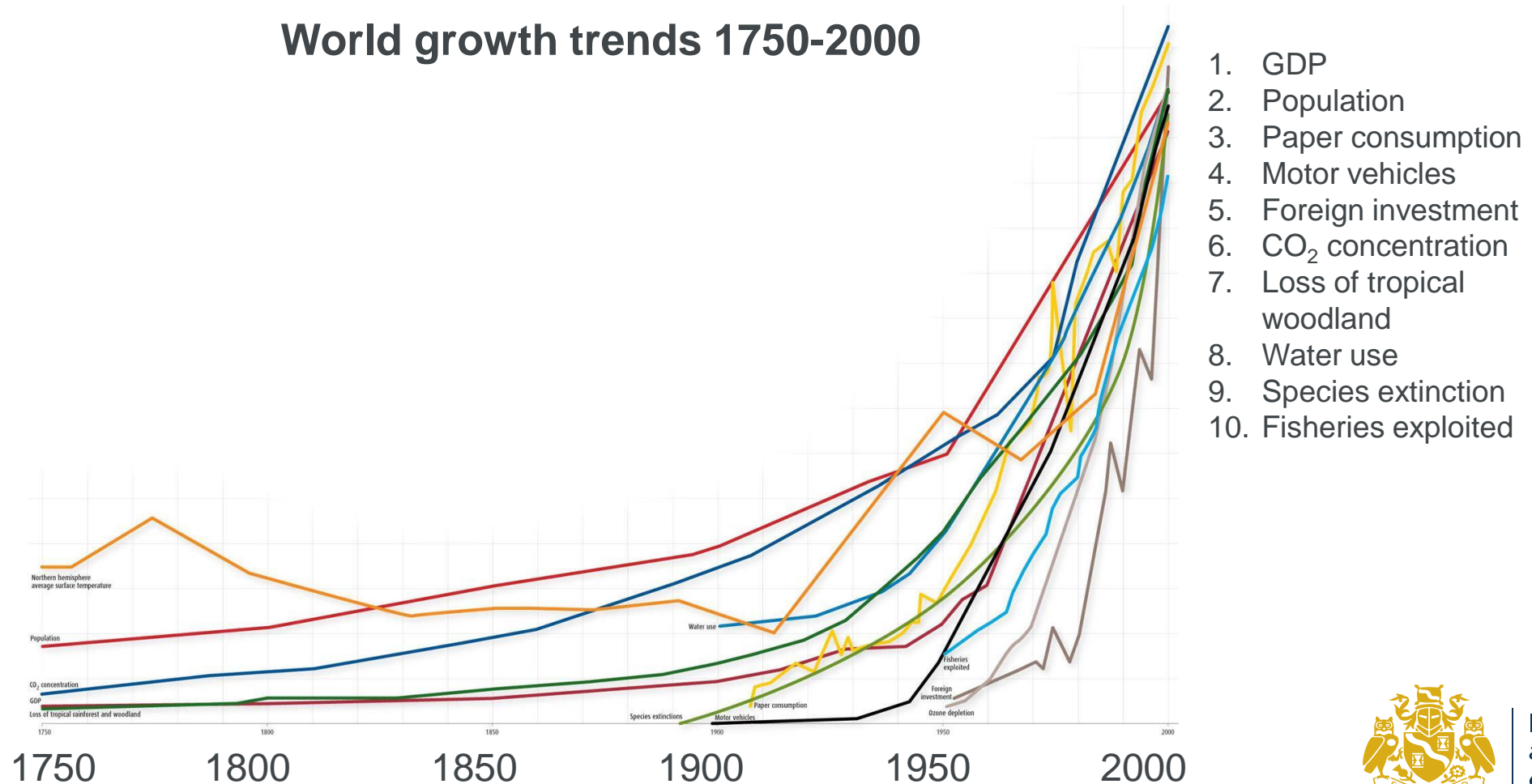
Appendix 2

Supplementary material

ertise
ponsorship
Thought leadership
Progress
Community
Sessional Meetings
Education
Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
Journals
Supporti

We live in an exponential world

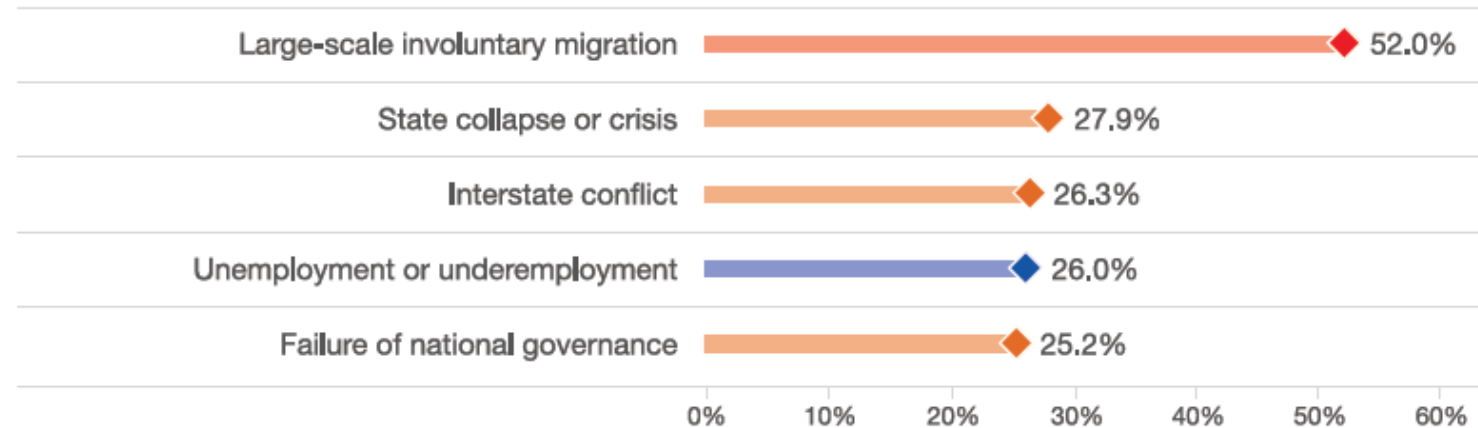
World growth trends 1750-2000



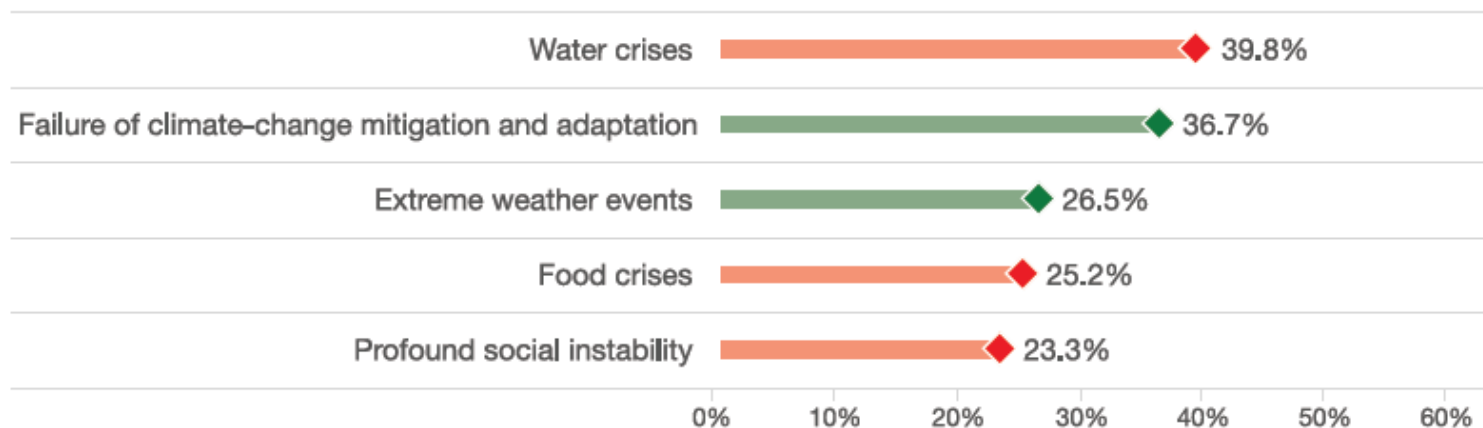
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WEF: Top 5 global risks of highest concern

For the next 18 months

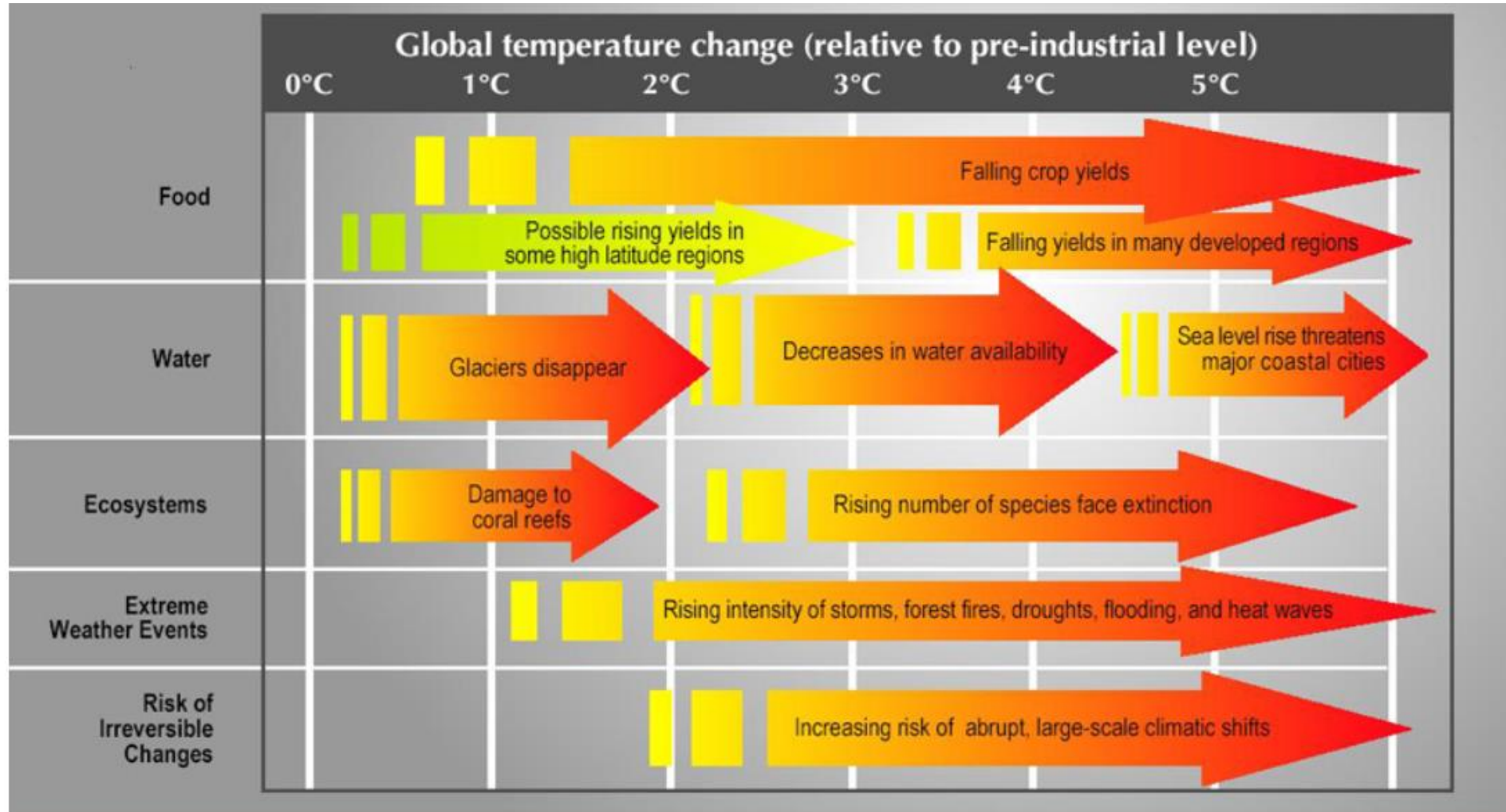


For the next 10 years



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Projected impacts of climate change



C = Celsius; CO₂ = Carbon Dioxide

Source: Adapted from the *Stern Review on the Economics of Climate Change*.

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Limiting temperature rises to 2°C is expected to give better financial outcomes

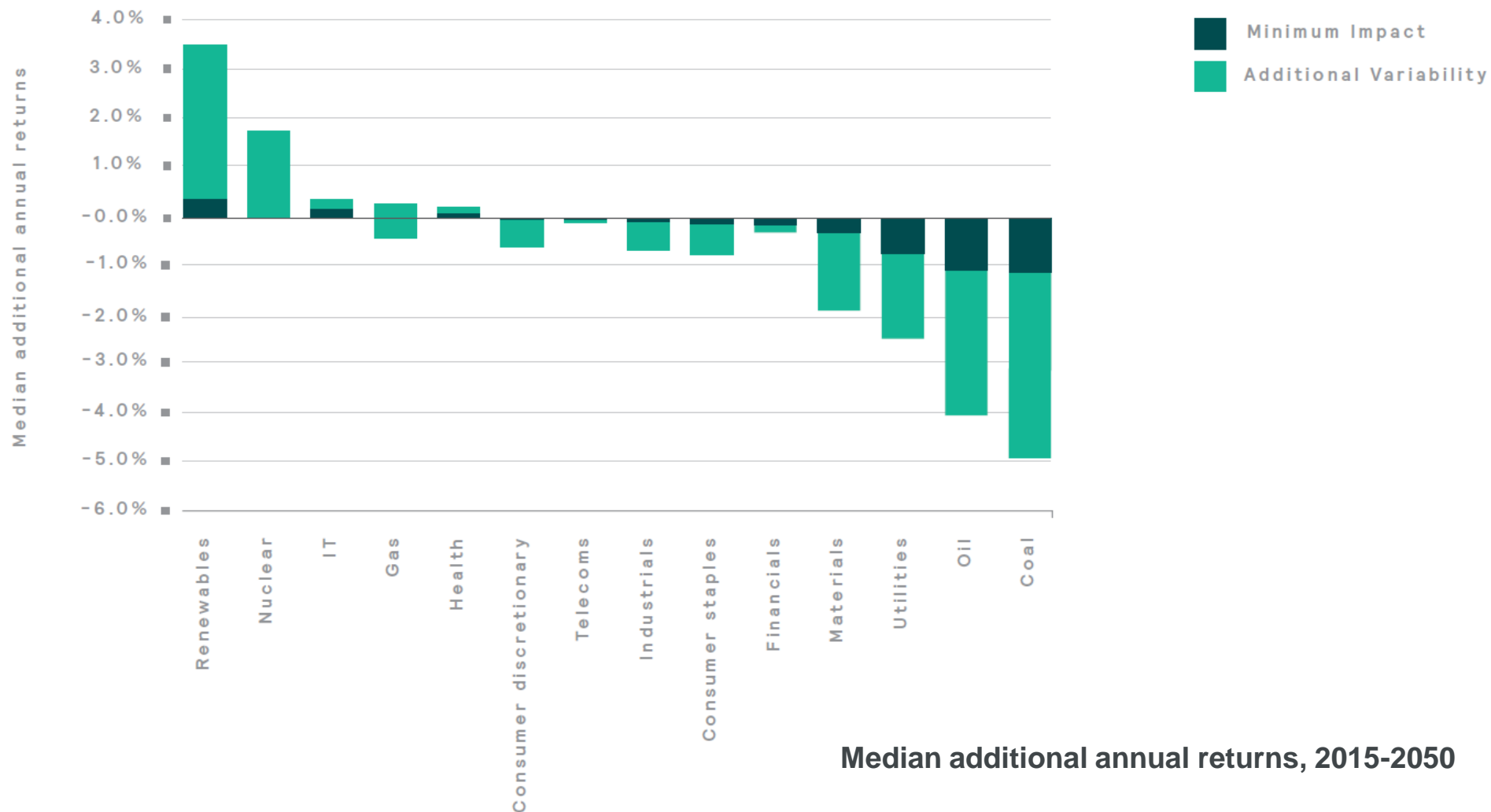
VaR due to climate change	Value at Risk*			Percentage reduction in risk is warming is kept within 2°C		
	Mean (average)	5°C	6°C	Mean (average)	5°C	6°C
Present value from the perspective of a private investor	US\$4.2trn	US\$7.2trn	US\$13.8trn	50%	63%	76%
Present value from the perspective of a government	US\$13.9trn	US\$18.4trn	US\$43.0trn	57%	71%	85%

*Value at Risk over the period to 2100 as a result of climate change to the total global stock of manageable financial assets (quantified in 2015 at US\$143trn)



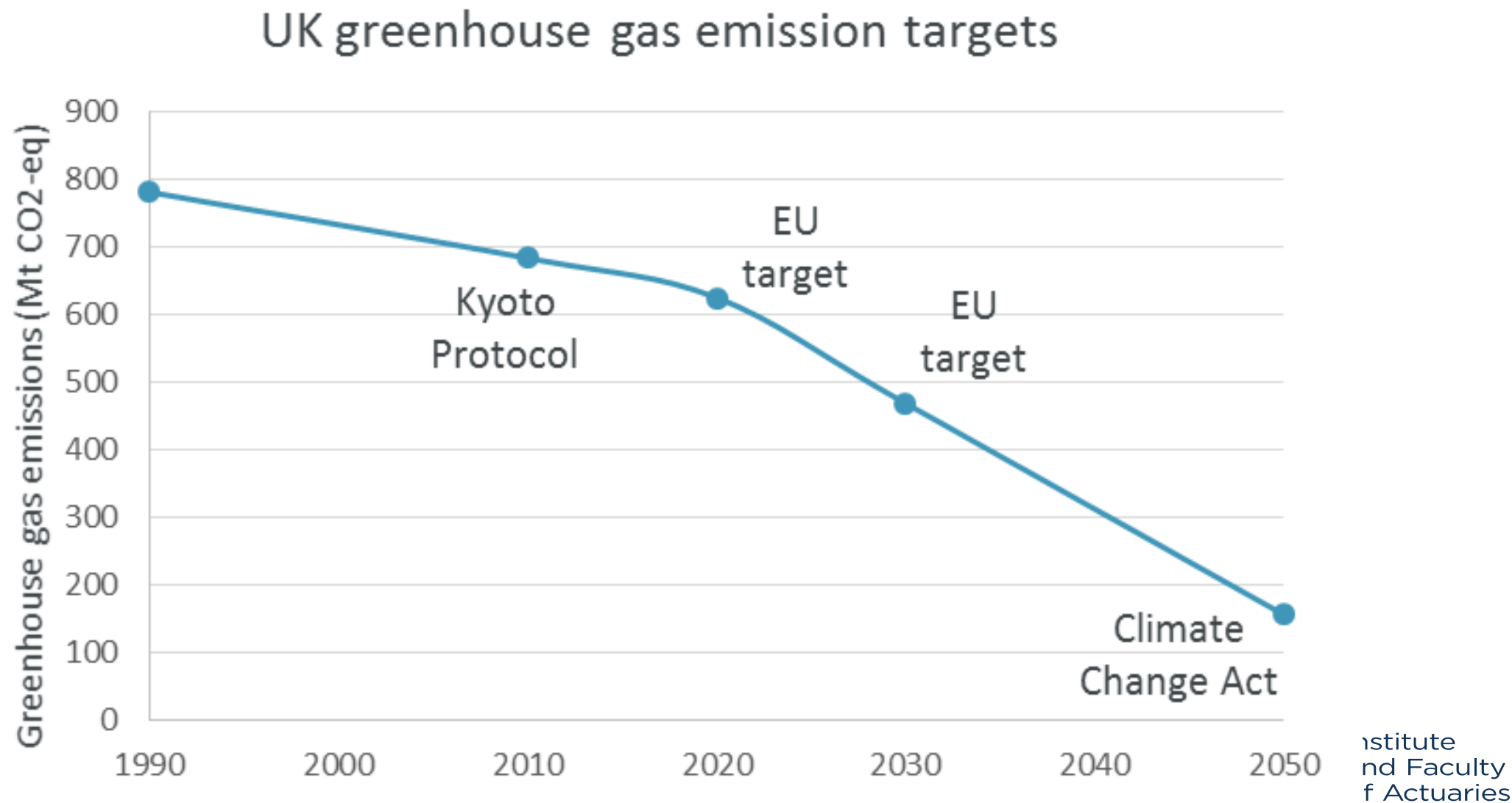
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Climate impacts will vary significantly by industry sector

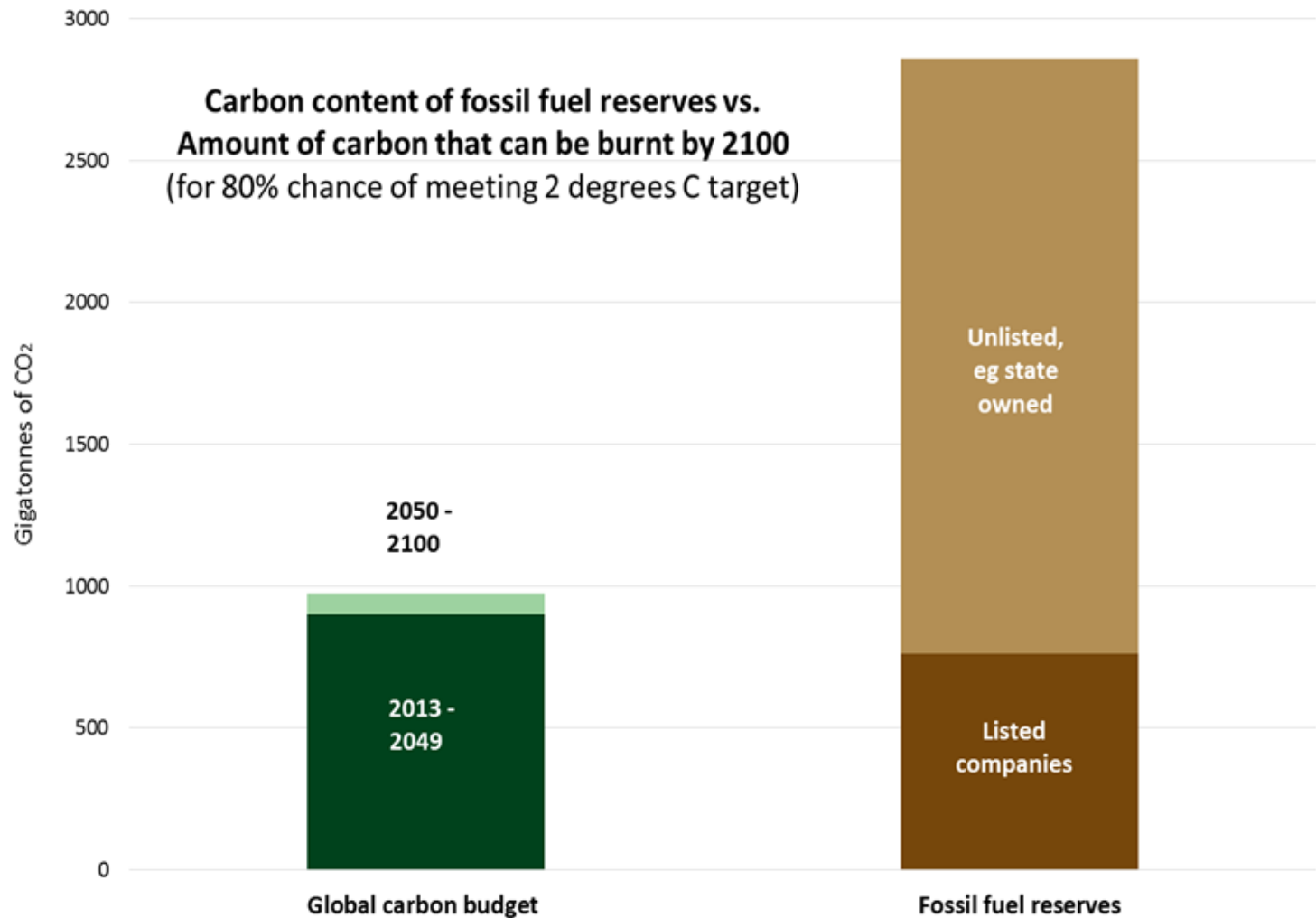


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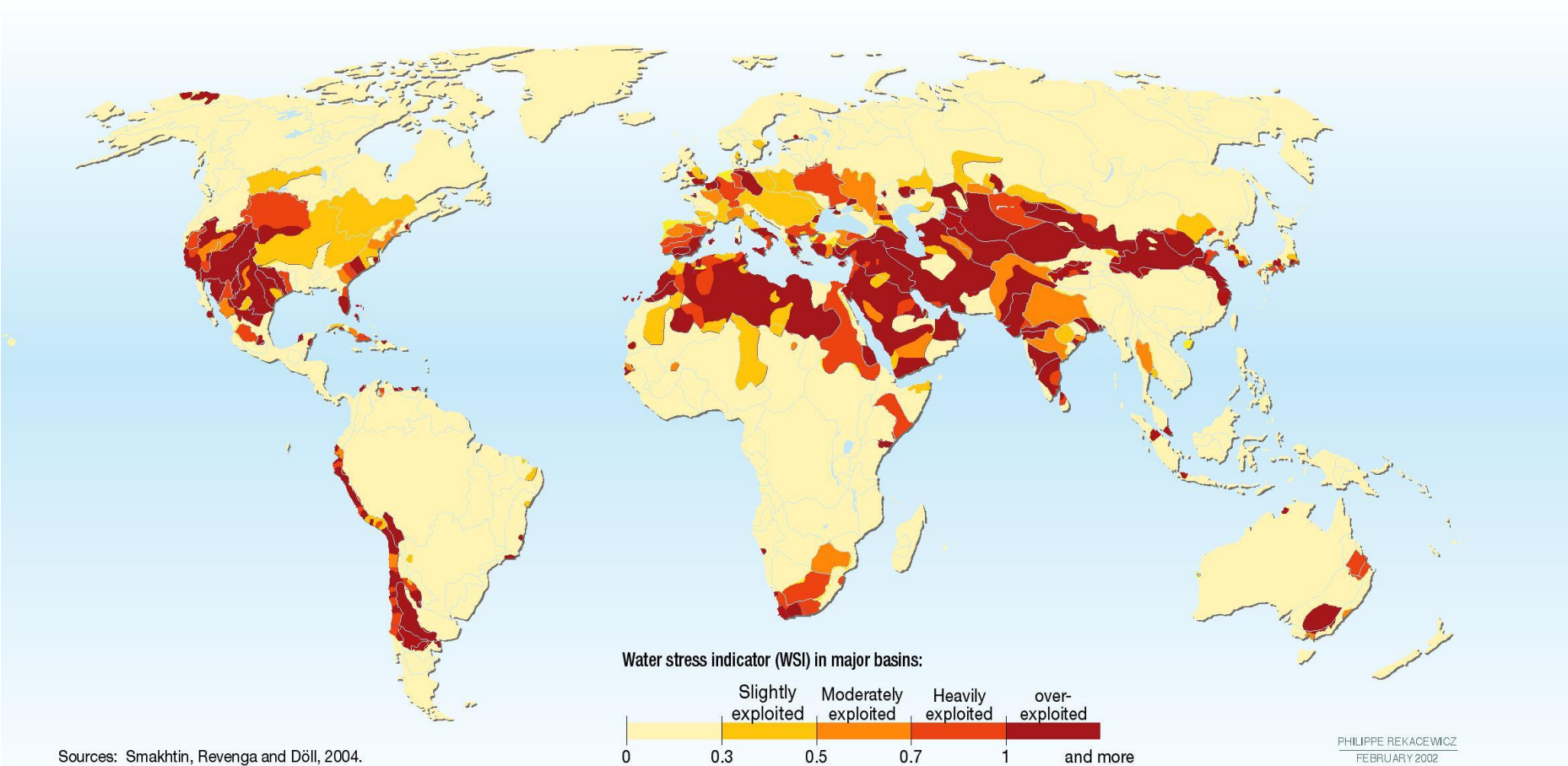
Climate change targets imply economic transformation



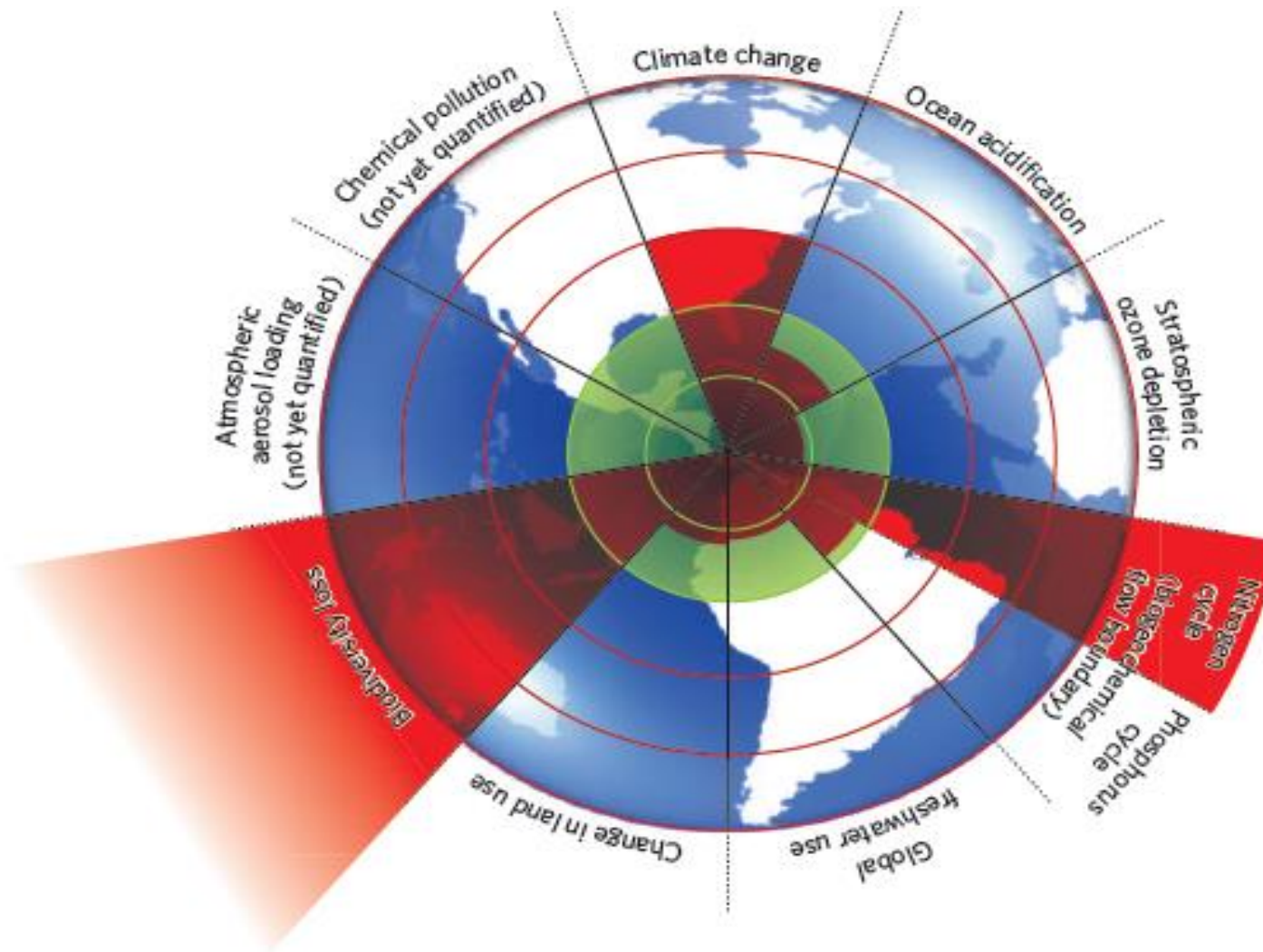
Fossil fuel assets risk becoming stranded



Water scarcity is an increasing concern



Planetary boundaries are already being exceeded

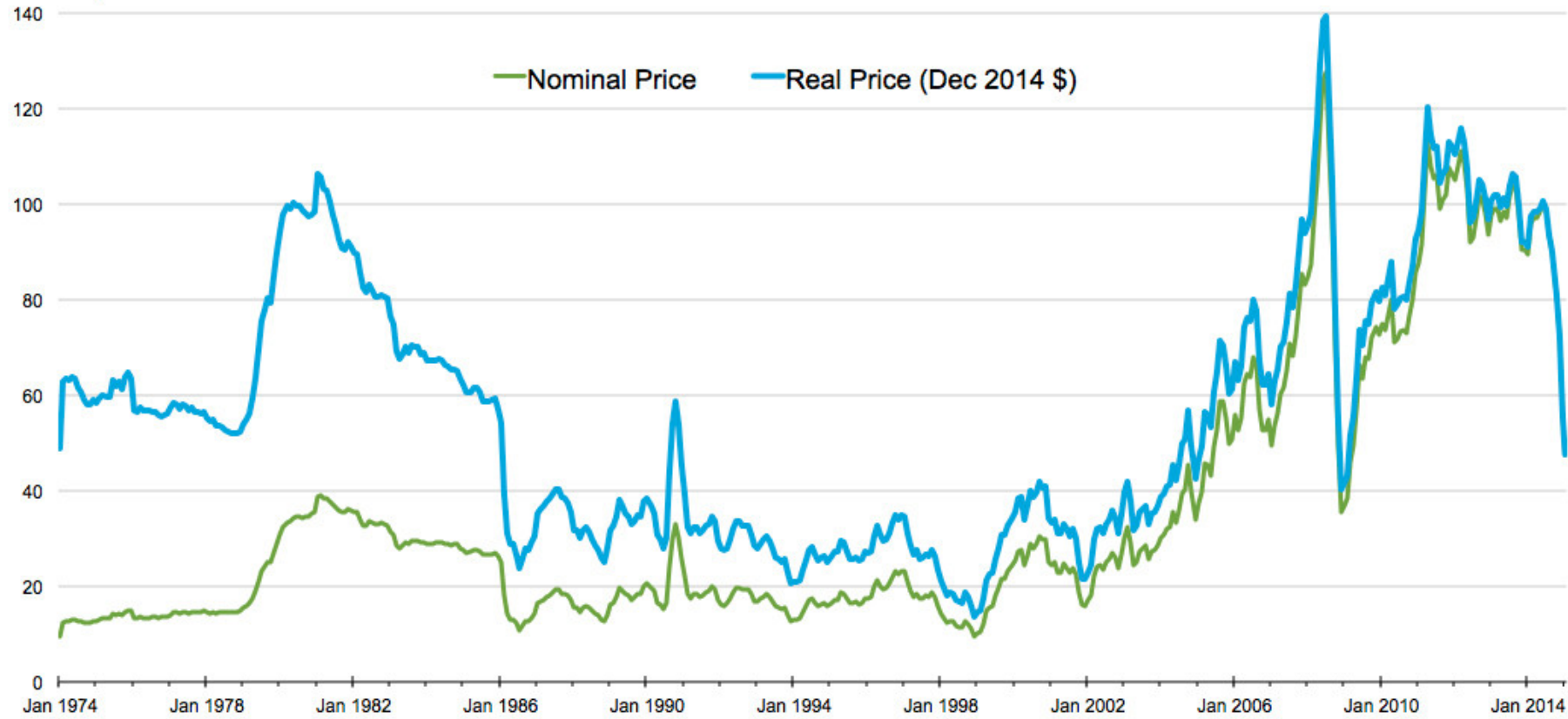


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Energy prices are uncertain and volatile

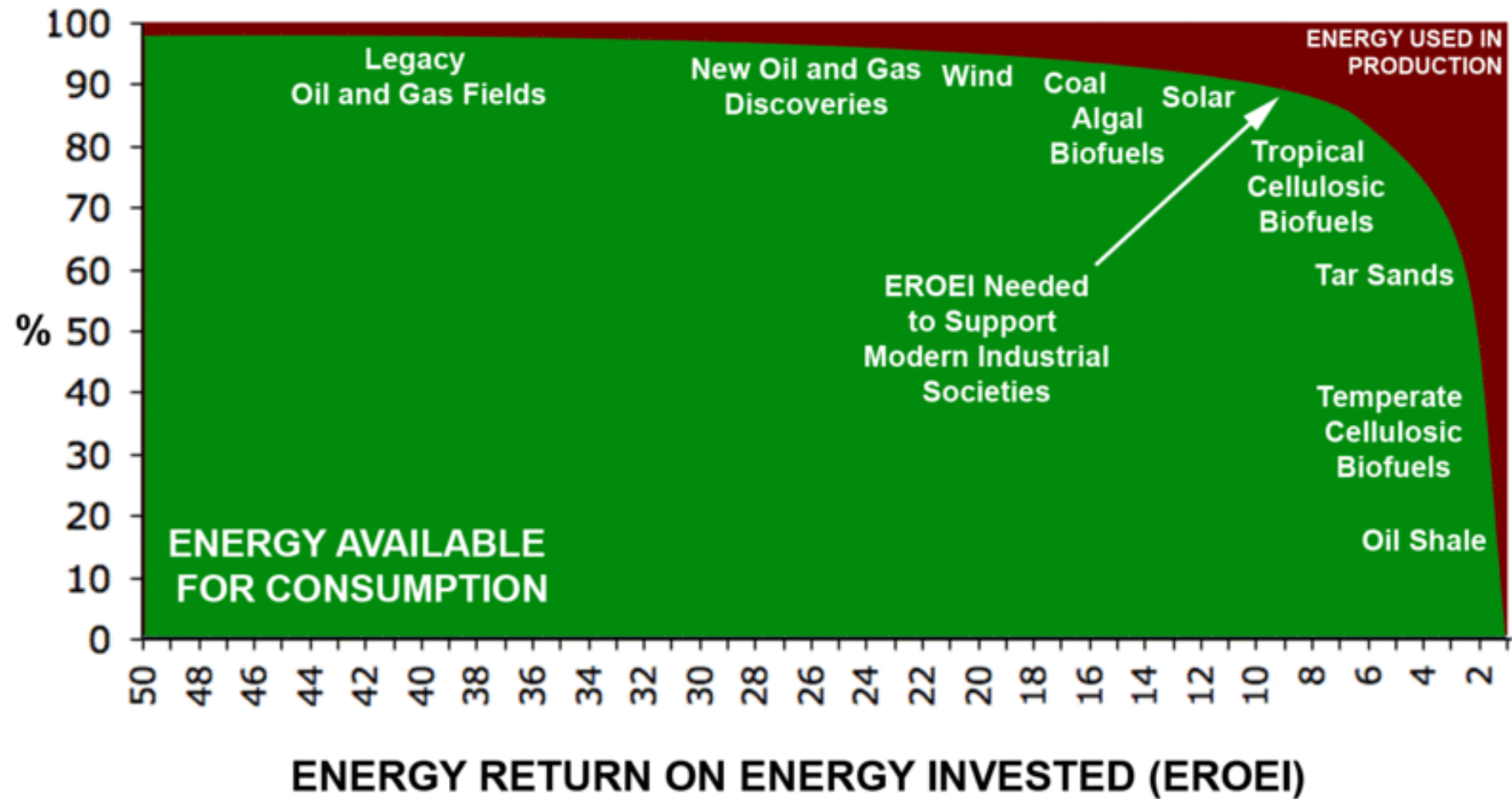
Monthly Imported Crude Oil Price

Dollars per barrel



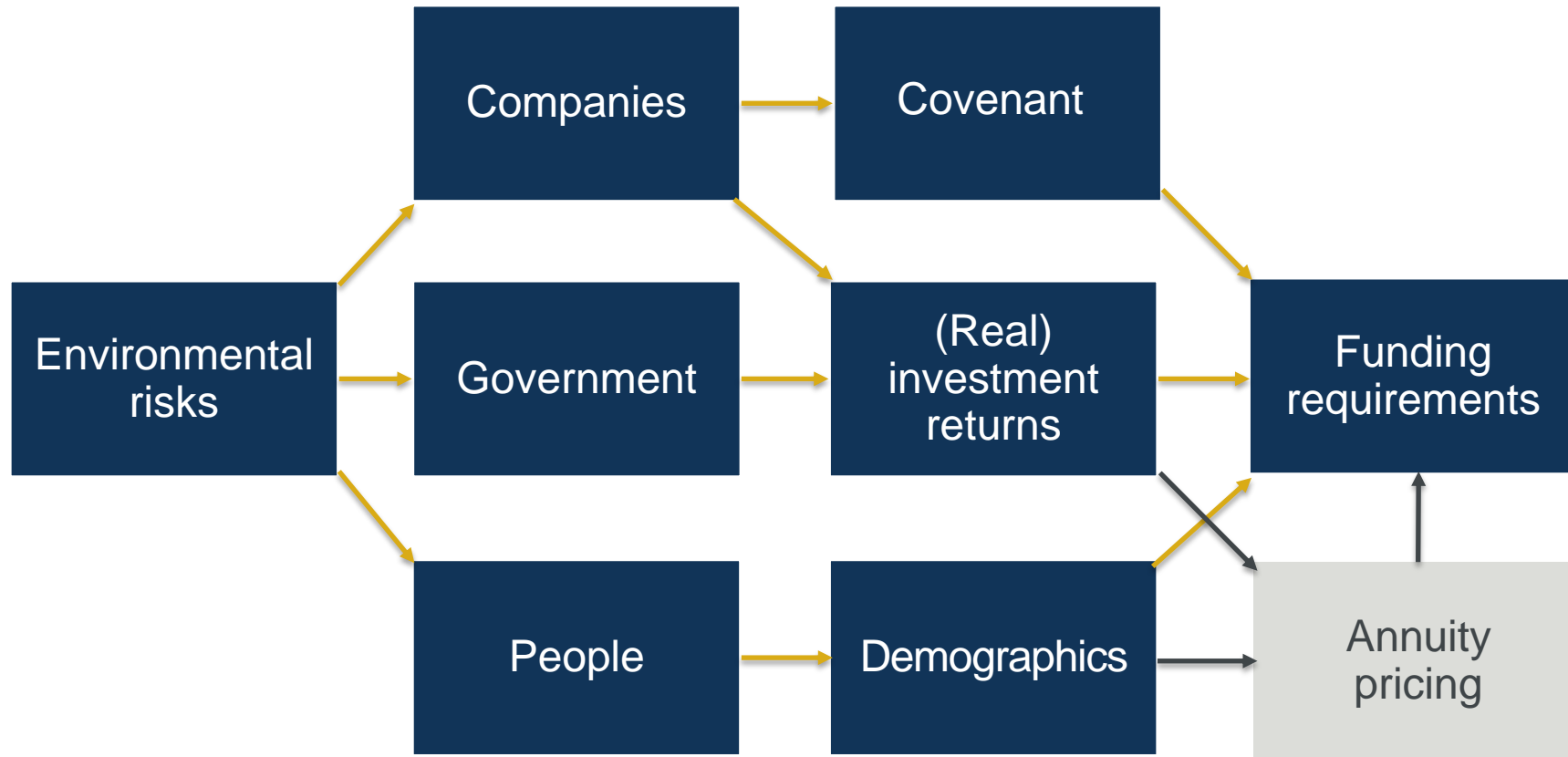
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Trend towards lower quality energy sources



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Schemes are exposed to environmental factors through investment, covenant & demographics



Simplified – more complex in practice!



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Managing environmental risks can improve financial performance

A recent review of sustainability research found that:

- 90% of the cost of capital studies show that sound sustainability standards lower the cost of capital.
- 88% of the studies show that solid sustainability practices result in better operational performance.
- 80% of the studies show that stock price performance is positively influenced by good sustainability practices.

Source: Clark, GL, Feiner, A, and M. Viehs. (2015) "From the Stockholder to the Stakeholder: How Sustainability Can Drive Financial Outperformance." http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2508281



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Responsible investment

“Responsible investment is an approach to investment that explicitly acknowledges the relevance to the investor of **environmental, social and governance (ESG) factors**, and the long-term health and stability of the market as a whole. It recognises that the generation of **long-term sustainable returns** is dependent on stable, well-functioning and well governed social, environmental and economic systems.”

Source: UN Principles for Responsible Investment

Stewardship

“Stewardship aims to promote the **long term** success of companies in such a way that the ultimate providers of capital also prosper. Effective stewardship benefits companies, investors and the economy as a whole.”

Source: FRC Stewardship Code



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Law Commission has clarified “fiduciary duty”



“IS IT ALWAYS ABOUT THE MONEY?”

Pension trustees’ duties when setting an investment strategy: Guidance from the Law Commission

BACKGROUND

- 1.1 In July 2012, Professor Kay published a review of the UK equity market. Among other things he noted concerns that

some pension fund trustees equated their fiduciary responsibilities with a narrow interpretation of the interests of their beneficiaries which focused on maximising financial returns over a short timescale and prevented the consideration of longer term factors which might impact on company performance, including questions of sustainability or environmental and social impact.¹

- 1.2 One of Professor Kay’s recommendations was that the Law Commission should review the legal concept of “fiduciary duty” to address uncertainties and misunderstandings on this issue.

- 1.3 In March 2013, the Government asked the Law Commission to examine the fiduciary duties of investment intermediaries. A central concern was the legal duties of pension trustees when they make investment decisions. In particular, how far may (or must) trustees consider interests beyond the maximisation of financial return, such as questions of environmental and social impact, and the ethical views of their beneficiaries?

- 1.4 This short document summarises the Law Commission’s conclusions on these issues. For a full statement, readers are directed to the Law Commission’s final Report, in particular Chapter 6.² The Report follows a Consultation Paper, published in October 2013.³

DUTIES OF PENSION TRUSTEES

- 1.5 The legal duties of pension trustees derive from at least three sources.

The trust deed

- 1.6 The starting point is the trust deed. Looking at the deed, trustees should ask: what is the purpose of the investment power we have been given, and how can we use that power to promote the purpose of the trust?

¹ J Kay, *The Kay Review of UK Equity Markets and Long-Term Decision Making: Final Report* (July 2012) para 9.20.

² *Fiduciary Duties of Investment Intermediaries* (2014) Law Com No 350. This is available at http://lawcommission.justice.gov.uk/areas/fiduciary_duties.htm. The Report was laid before Parliament on 30 June 2014 and published on 1 July 2014.

³ *Fiduciary Duties of Investment Intermediaries* (2013) Law Commission Consultation Paper No 215.