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Pensions, Risk and Investment conference 2016


**Climate change - a classic risk management
problem**

Nico Aspinall – Chair - IFoA Resource and
Environment Board
Sandy Trust

06 June 2016



Breathing

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Climate Change – A Classic Risk Management Problem

Classic Risk Management Problems



Application to Climate Change



YOUR problem with climate change

ALL

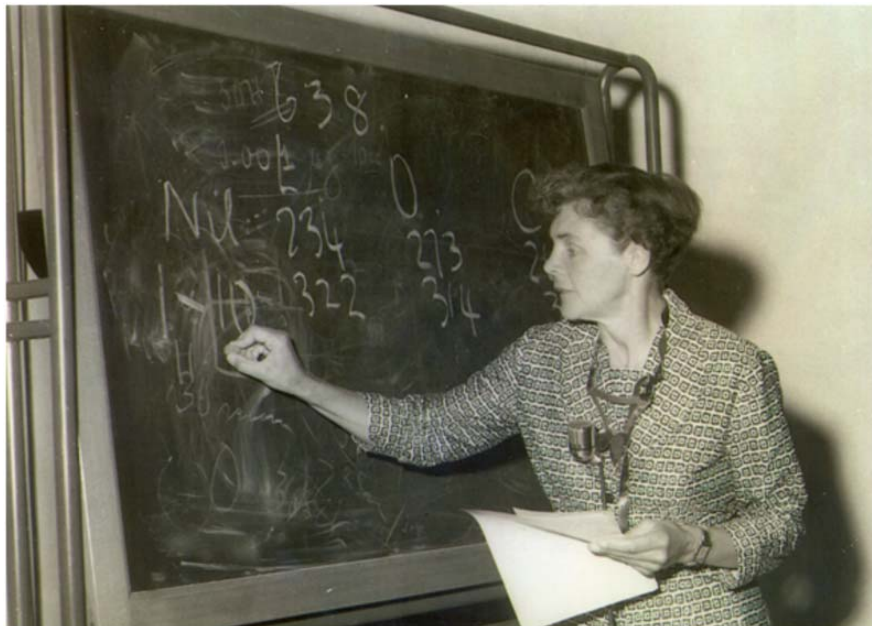
Taking Action



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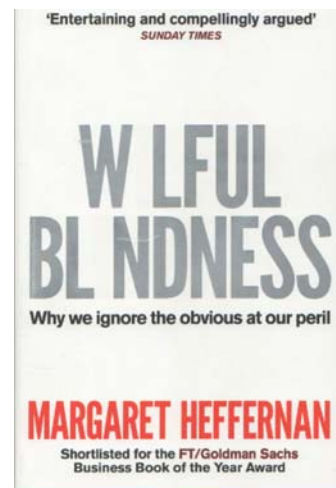
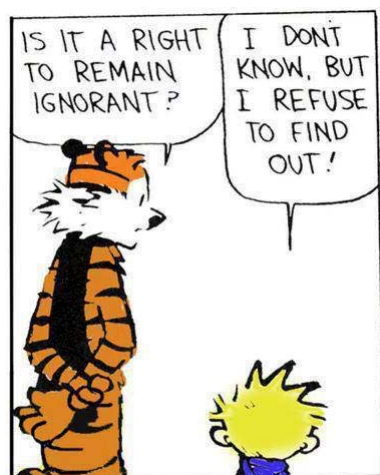
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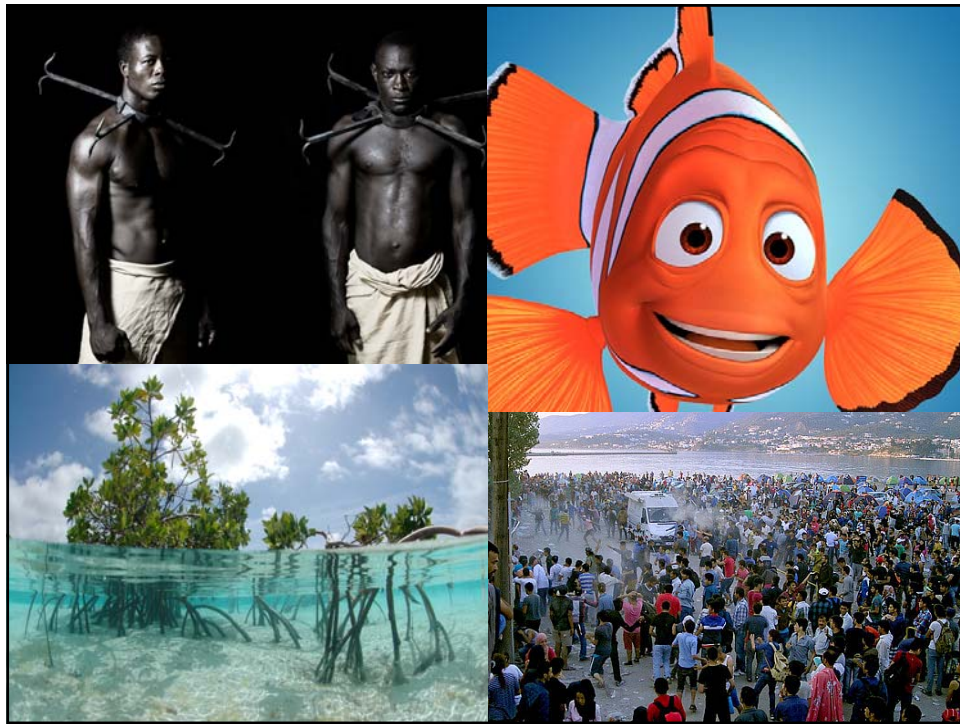
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THE problem with risk management?

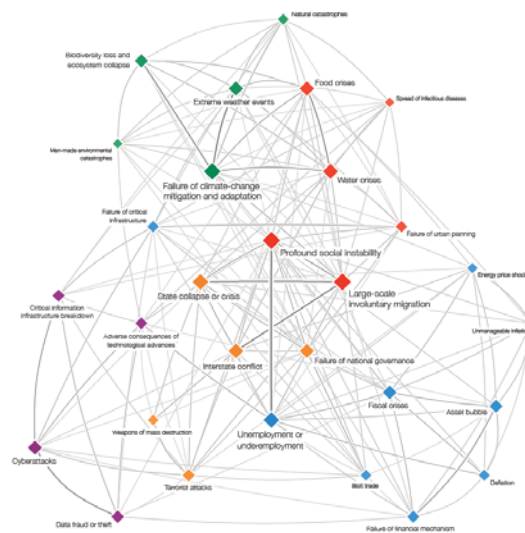


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Risk interconnectedness



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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Climate Change – A Classic Risk Management Problem

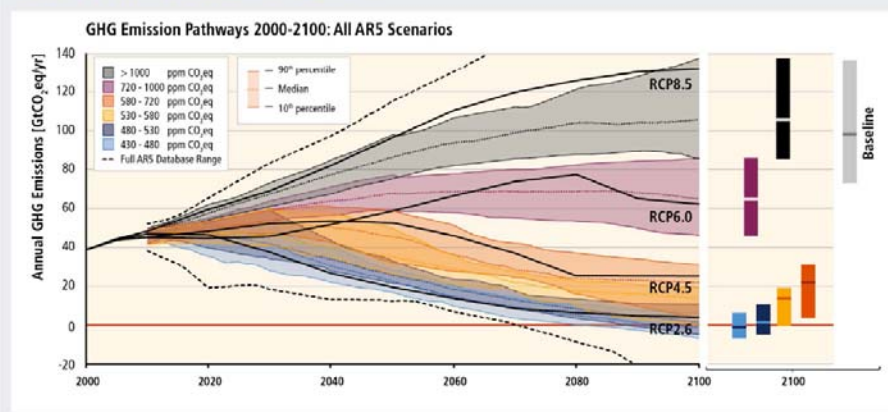
Application to Climate Change



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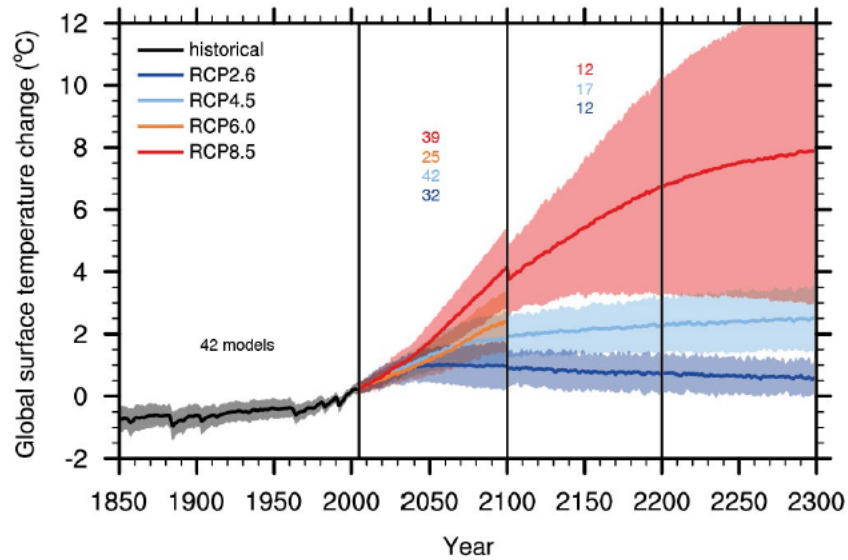
Figure 1: Emissions scenarios reviewed in the Fifth Assessment Report of Working Group 3 of the IPCC. Scenarios are grouped according to their CO₂ equivalent concentrations in the year 2100 (see colour legend).^{ix} Source: IPCC Fifth Assessment Report Working Group III Figure 6.7²



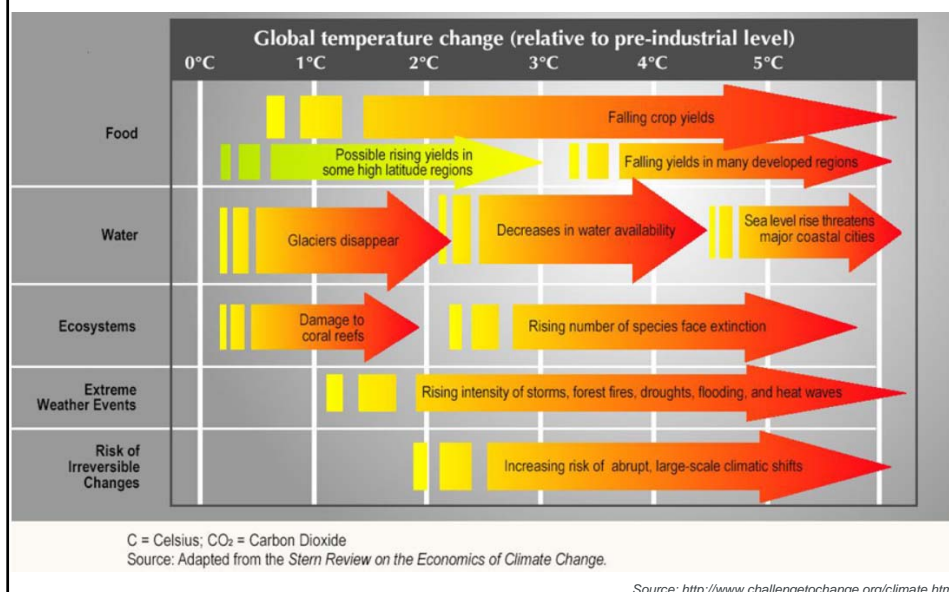
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Source: Climate Change – A Risk Assessment

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

Projected impacts of climate change



Climate Change – A Classic Risk Management Problem

YOUR problem with climate change

ALL



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Your problem with climate change

Implications for DB
Pensions?

Implications for risk
and return

Reinsurers?

Economic Models



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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.
 - C. As fossil fuels become more limited, costs of healthcare grow to the extent that the NHS reduces the service available to pensioners. Mortality increases slow and reverse meaning that many pension schemes are over-funded
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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Personal



We're powered by
Good Energy
100% renewable electricity



**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!



Contact preferences

Select the information you would like to receive and your preferred method of contact.

Hello Louise

[Near you](#)

[Practice areas](#)

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My practice area newsletters

- ☒ Enterprise Risk Management practice
- ☐ Finance & Investment practice
- ☒ General Insurance practice
- ☐ Health & Care practice
- ☒ Life practice
- ☐ Pensions Practice
- ☒ Resource and Environment



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Questions

Comments

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Appendix 1

Sources of further information

Enterprise
 Sponsorship
 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/prs/documents/supervision/activities/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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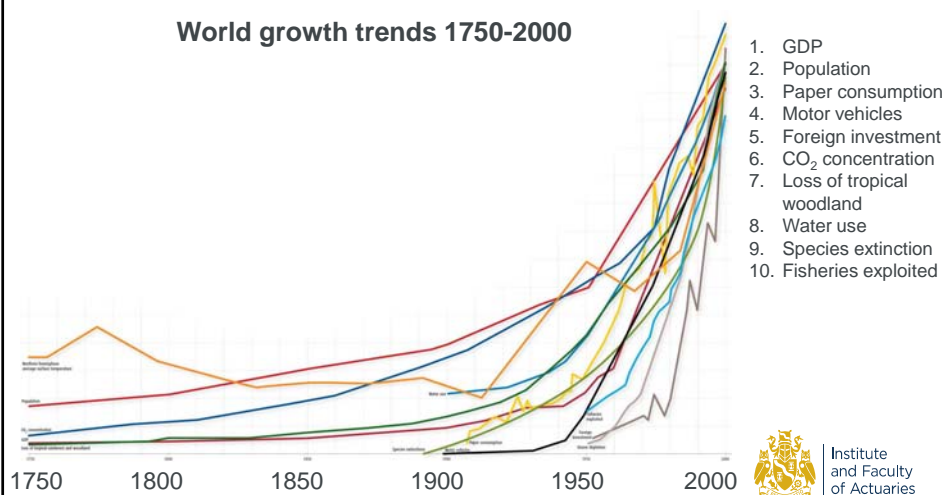
Appendix 2

Supplementary material

Artise
 Sponsorship
 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

We live in an exponential world

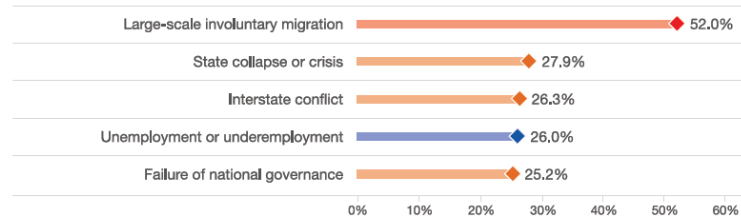
World growth trends 1750-2000



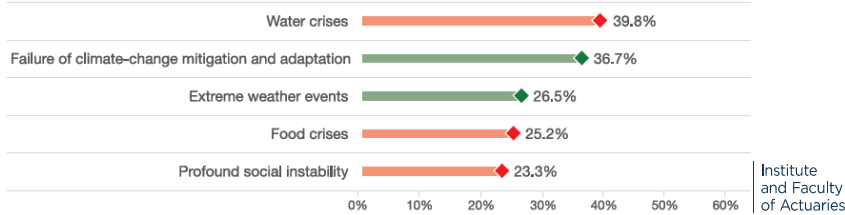
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WEF: Top 5 global risks of highest concern

For the next 18 months



For the next 10 years



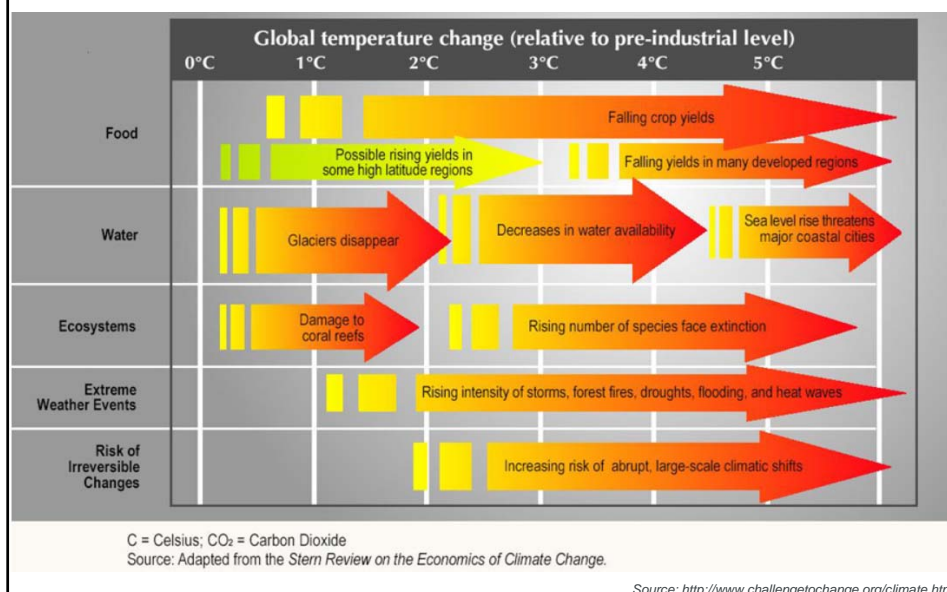
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Source: [World Economic Forum, Global Risks Report \(2016\)](#)

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Projected impacts of climate change



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)

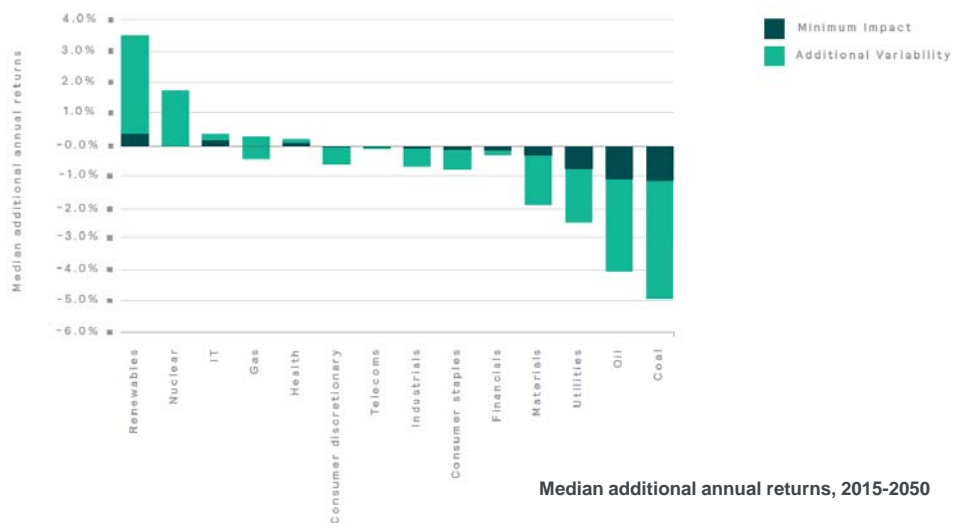


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Source: [The Economist Intelligence Unit \(2015\) "The cost of inaction"](#)

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Climate impacts will vary significantly by industry sector



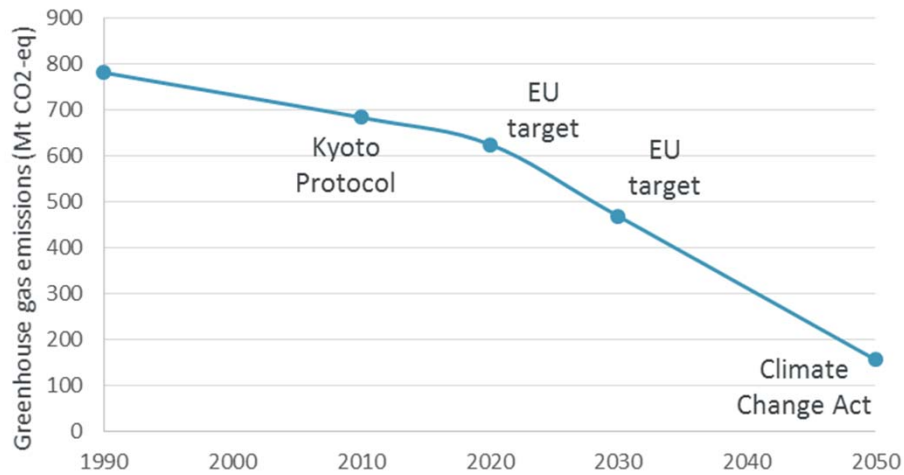
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Source: [Mercer \(2015\) "Investing in a time of climate change"](#)

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Climate change targets imply economic transformation

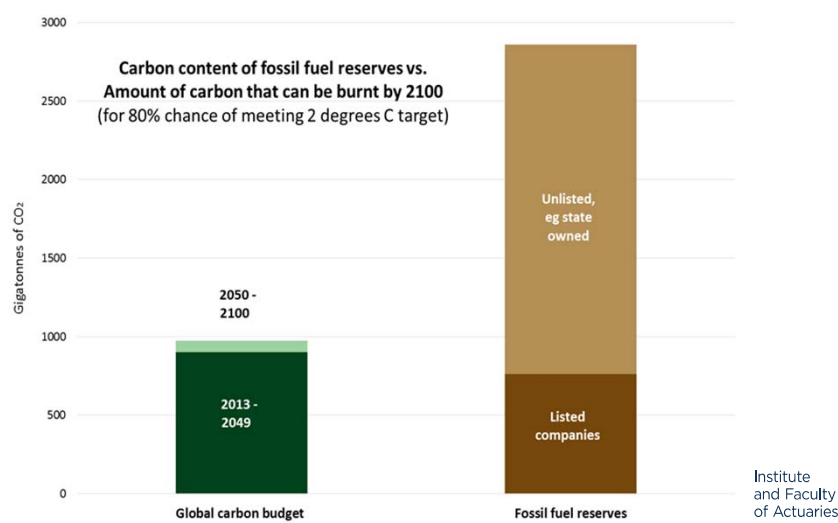
UK greenhouse gas emission targets



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Fossil fuel assets risk becoming stranded

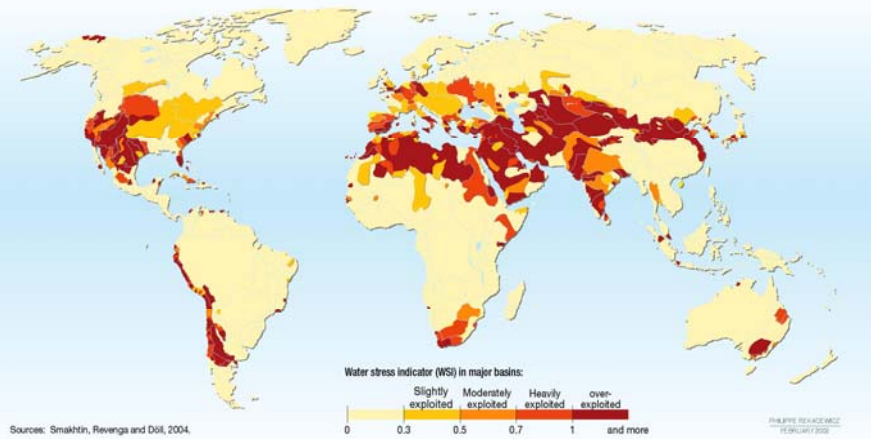


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Source: <http://www.carbontracker.org/report/wasted-capital-and-stranded-assets/>

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Water scarcity is an increasing concern

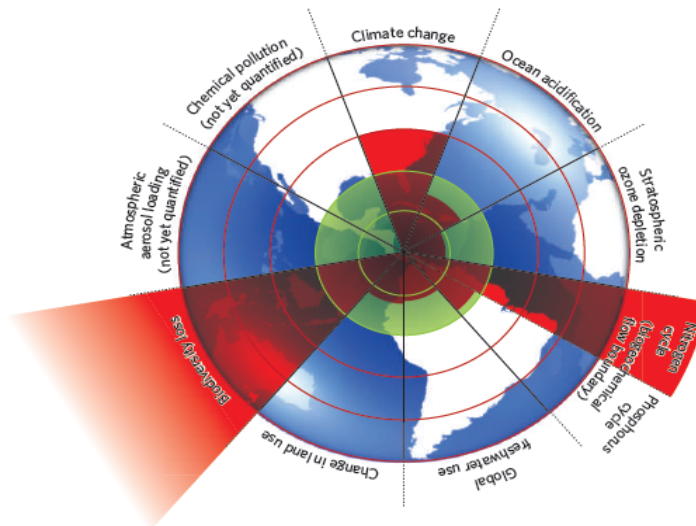


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Source: <http://www.unep.org/dewa/vitalwater/jpg/0222-waterstress-overuse-EN.jpg>

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Planetary boundaries are already being exceeded



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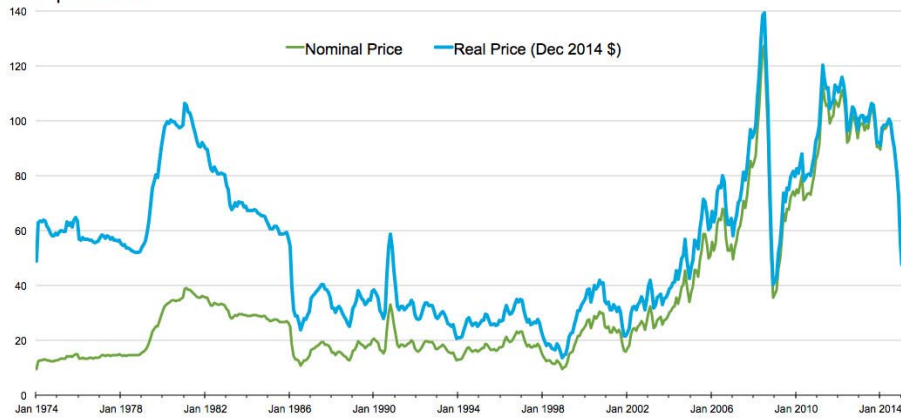
Source: [Rockstrom et al. "A safe operating space for humanity", Nature 2009](#)

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Energy prices are uncertain and volatile

Monthly Imported Crude Oil Price

Dollars per barrel

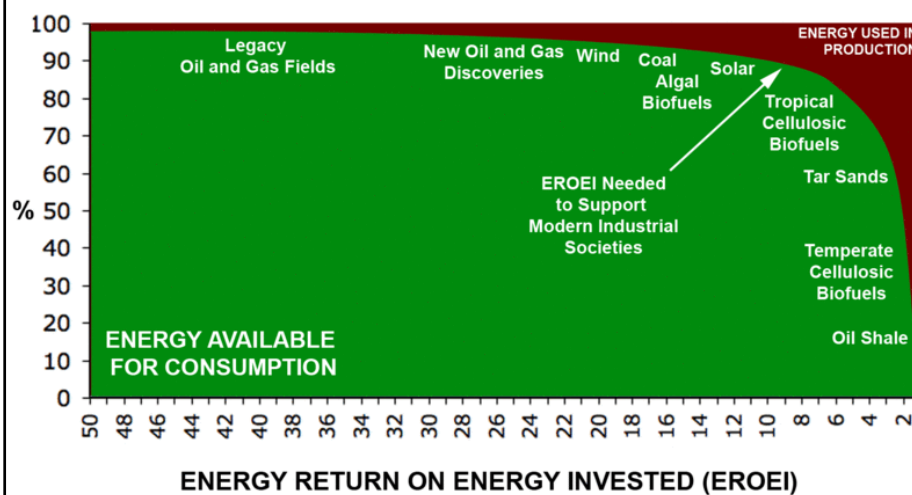


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Source: http://www.huffingtonpost.com/2015/01/13/crude-oil-price-chart_n_6463054.html

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Trend towards lower quality energy sources

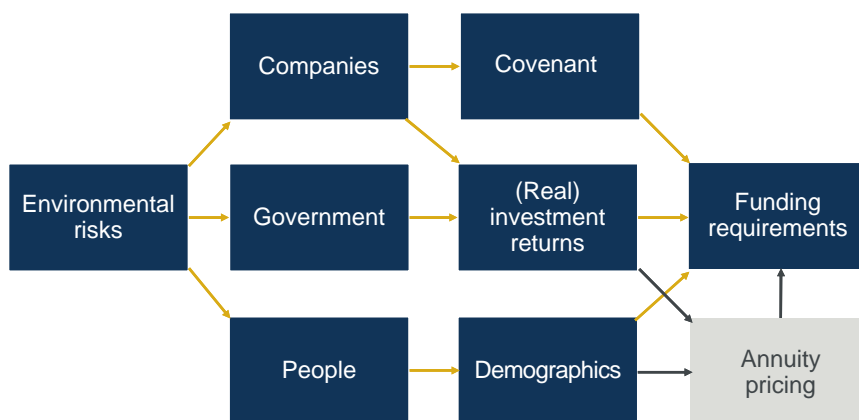


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Source: http://en.wikipedia.org/wiki/File:Net_energy_cliff.gif

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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

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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”

