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Resource & Environmental Issues: Practical Guide for Pensions Actuaries

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Background

- Climate Change and resource constraints
- Risk Alert
- Task Force on Climate-related Financial Disclosures
- Resource and Environment Issues: A practical guide for pensions actuaries

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Climate change and resource constraints
The headlines

- Warming of the climate is "unequivocal" (IPCC Fifth Assessment Report – 2014)
- Paris COP21:
  - Goal of keeping below 2°C average global temperature rise
  - Aspiration to keep to 1.5°C
  - "Non-binding commitments"
- We live in a finite world: constraints on key resources represent a significant risk to future growth. The global economy is due to double within the next 10 to 20 years: addressing these constraints are not requirements of a distant future.

"If progress continues at the same pace as the last 10 years then the transition risks for companies and investors could well crystallise within the next 10 years."

Professor Lord Stern*, May 2017

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* Author of 2006 Stern Review: The Economics of Climate Change.
http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/sternreview_index.htm

Risk Alert: Climate-Related Risks, 12 May 2017

Actuaries should ensure that they understand, and are clear in communicating, the extent to which they have taken account of climate-related risks in any relevant decisions, calculations or advice.

- **All actuaries should consider how climate-related risks affect the advice they are providing.**
  - Eg : All investors should consider the potential implications of climate-related risks on their invested assets...Institutions with long-term liabilities (e.g. life insurers, re-insurers and pension funds) should evaluate and manage the impact of changing patterns of temperature and disease on mortality.
- In particular**, [IFoA] asks members to consider the relevance of climate-related issues in relation** to:
  - **Physical risks** – the risks arising from potential degradation to physical assets
  - **Transition risks** – depending on the nature and speed of mitigation and adaptation policies and requirements by governments and regulators related to climate change…transition risks may pose…risk to pension funds from the potentially rapid reduction in the market value of, or income generated by, assets. For example … "stranded assets"
  - **Liability risks[1]** – risks could arise if third parties have suffered damage or losses from the effects of climate change

  Further, institutions exposed to mortality and morbidity risks through life and health policies may experience an altered claims profile due to climate change.
- **Further info:** TCFD Webinar, A Practical Guide for Pensions Actuaries, North American climate risks

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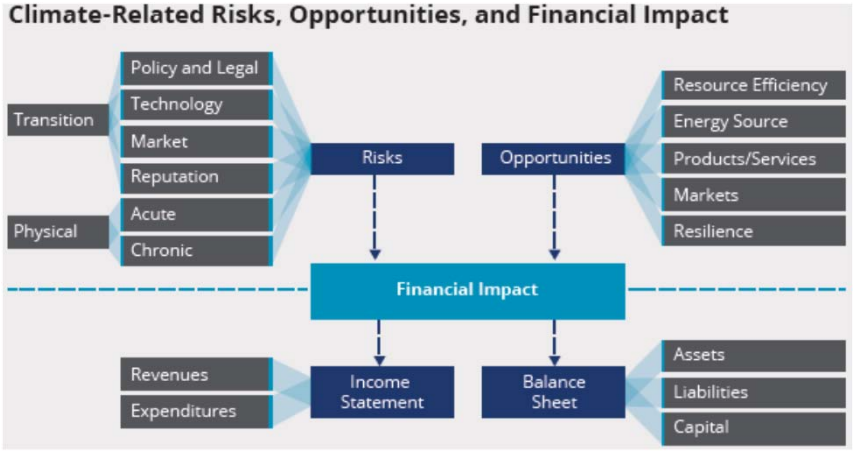
[1] This risk grouping is from the PRA report, *The Impact of Climate Change on UK Insurance Sector*, September 2015. In the report, Liability risk defined as those liability risks could arise from parties who have suffered loss and damage from the physical or transition risks from climate change seeking to recover losses from others who they believe may have been responsible.

Climate Related Risks



TCFD: areas of Climate related Risks & Opportunities

- Governance
- Strategy
- Risk Management
- Metrics and targets

Source: Recommendations of the Task Force on Climate-related Financial Disclosures, December 14, 2016

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A practical guide for pensions actuaries

- Financial
- Covenant
- Mortality
- Integrated Risk Management

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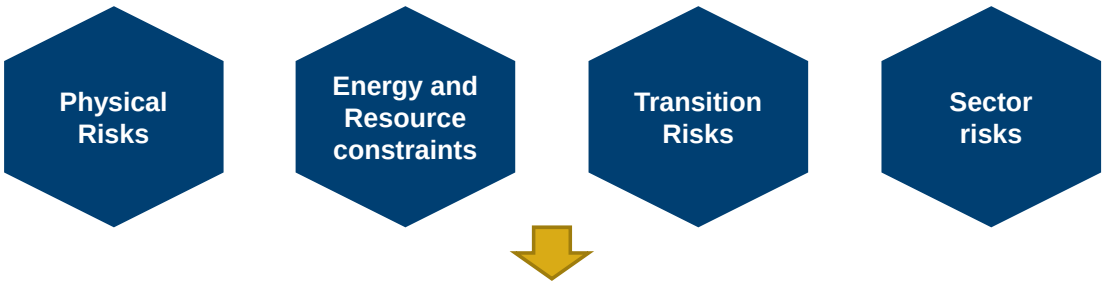
Financial - Drivers



Economic Productivity / GDP	Yields on government bonds
Inflation	Yields on index-linked bonds
Interest Rates	Yields on corporate bonds
Equity (and other growth) returns	Defaults of bonds

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Financial – Market Sentiment

Climate change will occur slowly

Direct consequences of R&E issues may be limited over the next 20 years

Prices should anticipate future expectations but do they reflect R+E risks?

"Much of the capital flowing through the economy today is blind to its environmental and social consequences, presenting long-term risks to the foundation stones of our economic success, and all this implies for investors." *Investment Leaders Group, The Value of Responsible Investment (2014).*

Market may suddenly reprice future expectations

Could easily happen within next 10 years. A CISL study "Unhedgeable Risk" (2015) illustrated an "extreme yet plausible" scenario of a fall in equity prices of 50% in one year.

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Financial – Liabilities

Increased Borrowing

Bond yields **rise** to attract the capital

Bond yields **fall** reflecting strong link between economic growth and interest rates

Lower GDP growth

But what about?

- Inflation
- Real Yields
- Annuity Terms?

Impact on Liabilities very uncertain

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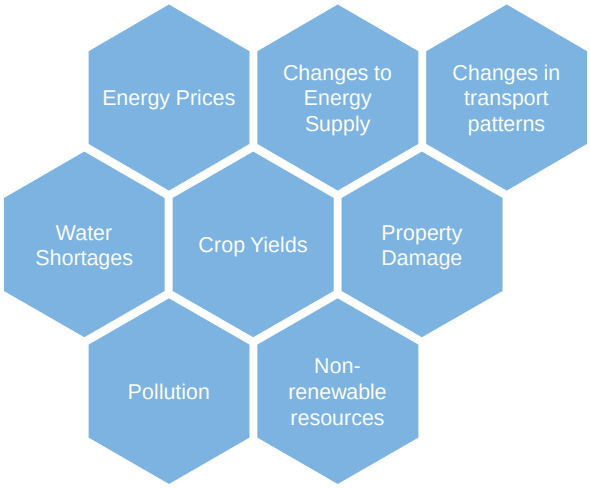
Covenant: Sources of Risk



Example (Supermarket)

- Increasing transport costs may encourage localisation of supply chains and distribution networks
- Changing transport patterns could make out-of-town stores less popular
- May face economic and legislative pressure to reduce energy use in stores and depots
- Consumers may demand greater efforts to reduce packaging and food waste throughout the supply chain
- Changing temperature and rainfall patterns may affect food availability and prices
- Ability to deliver food with lower inputs and less environmental impact may become a key factor in competitive success

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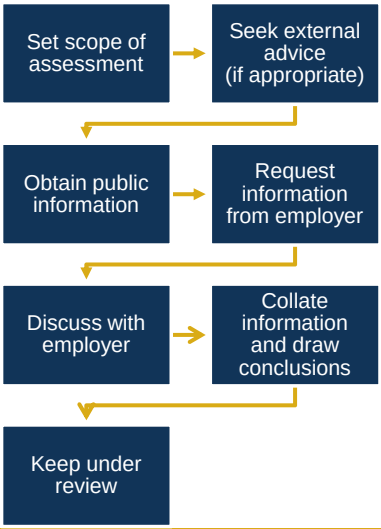
Trustee covenant assessment: process



- May require greater emphasis on longer term, more qualitative information about risk management and business resilience
- Risks will vary considerably between companies
- R+E and covenant expertise not typically possessed by Scheme Actuaries
- Scheme Actuaries can
  - Help formulate questions
  - Critically review answers
  - Allow for risks in funding advice

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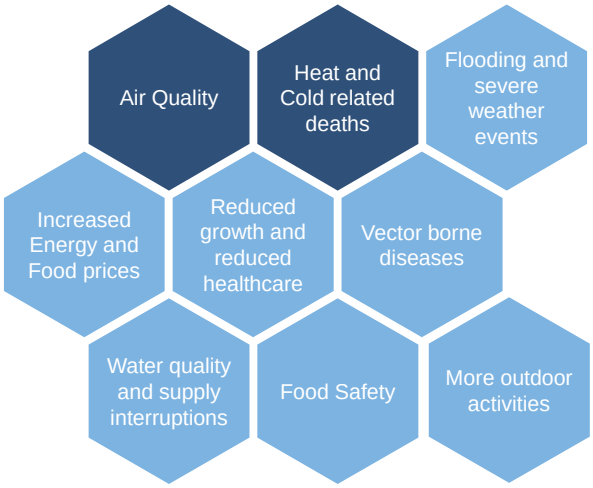
Mortality: Sources of Risk



Increasing Mortality

- Lower economic growth
- Higher energy prices
- Higher food prices

Decreasing Mortality

- Improved air quality
- Milder winters

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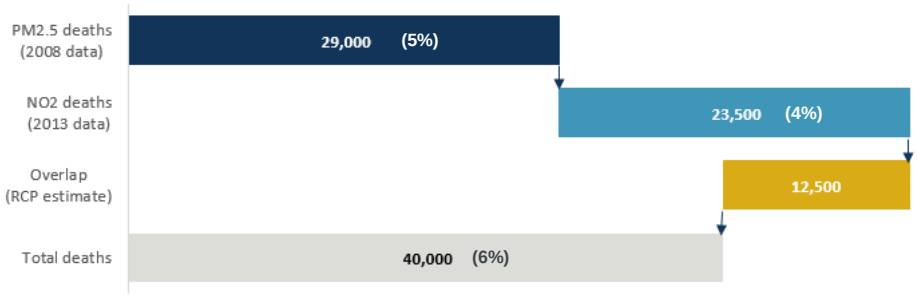
Mortality – Air Quality



Annual Mortality Impact

- May be equivalent to shortening life expectancy by 7 months
- Scope for significant improvements in next 5-10 years

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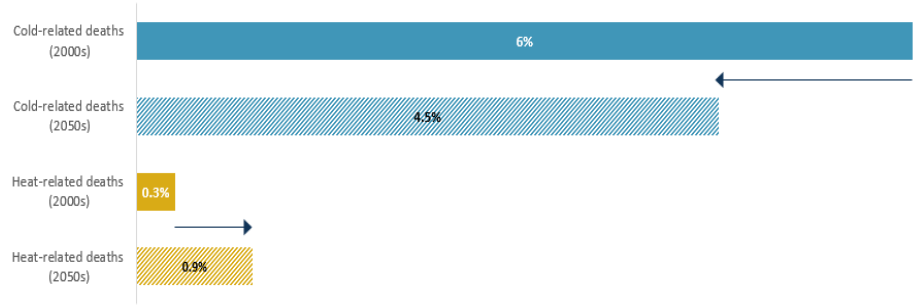
Mortality – Temperature related deaths



Annual Mortality Impact

- Less impact than air quality
- Will vary by region

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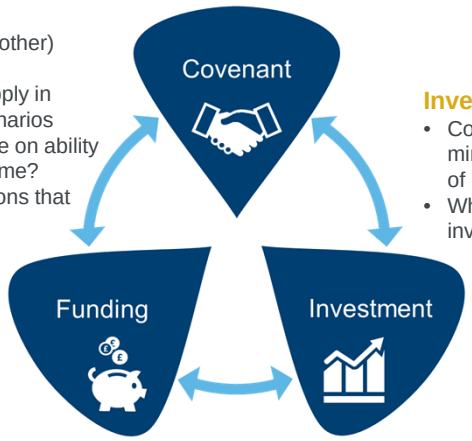
Integrated Risk Management

Covenant

- Identify climate related (and other) long-term risks
- Consider which risks may apply in different climate change scenarios
- What impact would they have on ability of Company to support scheme?
- Are there any mitigation actions that can be taken?
- Monitor KPIs



Investment

- Consider what actions can be taken to minimise risk/ maximise opportunities of R+E
- What are the potential implications for investment returns and risk?

Funding

- Review discount rate and Recovery Plan based on long-term covenant
- Consider impact of different climate change scenarios on funding

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Next Steps

- More detailed reports on Mortality and Covenant
- Climate Change scenarios
- What can you do?
  - Learn more about R+E risks so can discuss with clients
  - Encourage trustees to raise R+E issues with covenant adviser
  - Find out how clients are addressing R+E risks in investment processes
  - Review whether your models incorporate R+E risks adequately
  - Use scenario analysis to explore uncertainty

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Resource & Environment Working Party

Background Information: Climate Change & Paris CoP 21

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Paris COP21: What's the (big) deal?

- Anthropogenic Climate Change is happening and will have significant, damaging impacts if not addressed
- Goal of keeping well below 2°C average temperature rise
  - Aspiration to limit the increase to 1.5°C
- Global emissions will need to peak soon
  - developing countries would take longer
  - rapid reductions thereafter
  - Target zero net emissions by 2050.
- INDCs (Intended Nationally Determined Contributions) not enough
  - 5 year ratcheting up reviews

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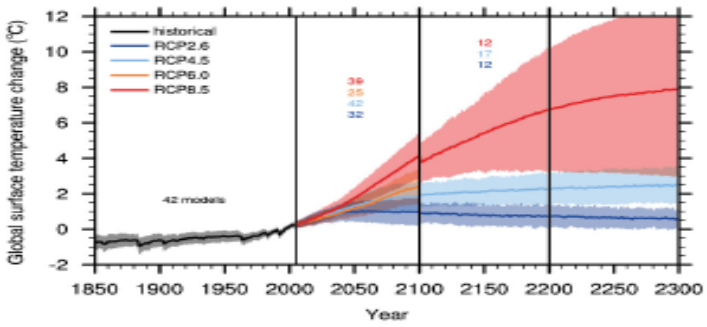
Greenhouse Gases (GHG) impact climate

But wide range of uncertainty: what does Paris mean?

Figure 4: **Time series of global annual mean surface air temperature anomalies** (relative to 1986–2005) from IPCC 5th assessment climate models. (Add 0.6°C to these numbers to compare to a pre-industrial baseline[4,5]). Projections are shown for each RCP for the multi-model mean (solid lines) and the 5% to 95% range across the distribution of individual models (shading).



3 Core Scenarios

Pre-Paris trajectory: + 5º

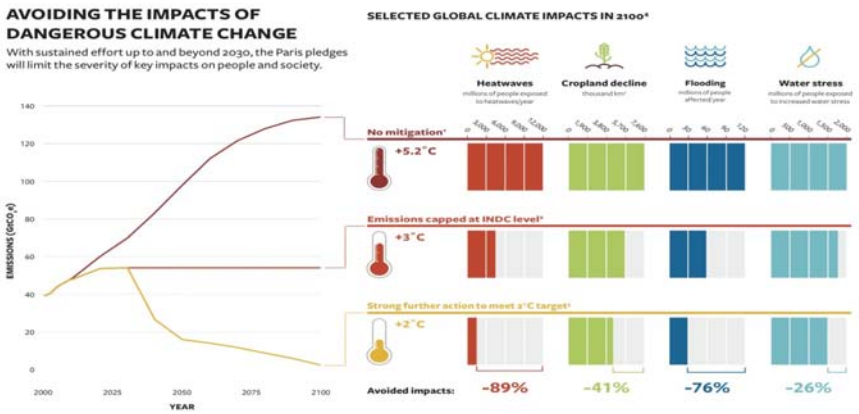
Paris Commitments: +3º

Paris aspiration: < 2º

Source: "Climate Change a Risk Assessment"(2015), Centre for Science and Policy

Temperature rise impacts exponentially

Even if 5º increase a tail risk it can't be ignored



Pre-Paris trajectory: + 5º

Paris Commitments: +3º

Paris aspiration: < 2º

- It is not just about climate change but also resource constraints.
- Water scarcity is already a problem today

 Source: http://www.avoid.uk.net/2015/01/an-updated-view-of-tipping-points-and-the-relevance-for-long-term-climate-goals-a5/