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# Climate Change – Implications for actuaries

IFOA Resource & Environment Board

04 October 2018



# Agenda

- Is climate change relevant for actuaries?
- What are the risks?
- Are they material?
- Are they coming into regulation?
- Are they imminent?
- Questions
- Taking action

Sponsorship  
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Progress  
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Shaping the future  
Networking  
Professional support  
Enterprise and risk  
Learned society  
Opportunity  
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Support

# Exam questions

## 1. Current impacts of climate change

- a. What is the impact of climate related risks (physical, transition & liability) on your business strategy?
- b. What methods are you using to assess the likelihood and impact of these climate risks?
- c. What is your current assessment of the potential impact of climate change on your investment portfolio including your approach to managing 'stranded assets'?
- d. What are your planned changes to your business strategy in response to climate change?

## 2. Long-term impacts of climate change

- a. What is your assessment of long-term impact of climate change on your business strategy and how do you think climate change risk might impact your business by 2030?

## 3. Climate change risk management

- a. How do you incorporate climate change risk into your risk management framework?
- b. What thresholds, tolerances and management reporting do you have for climate change?
- c. How do you manage the impact of climate change on your balance sheet?



# Objectives

## After this session we hope you:

- Understand why climate change is relevant for actuaries
- Understand what the key risks (and opportunities) might be
- Have been updated on regulatory developments
- Are confident about what next steps to take



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# Is climate change relevant for actuaries?



# The Reliability Objective for Actuarial Work

**“Users for whom actuarial information is created should be able to place a high degree of reliance on that information’s relevance, transparency of assumptions, completeness and comprehensibility, including the communication of any uncertainty inherent in the information.”**

Source: “FRC, Framework for FRC Actuarial Standards, December 2016 ”



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# Assumptions and Uncertainty

**Known 'truths' it would be farcical to list as assumptions**

- Gravity is constant
- Earth orbits the sun
- The climate is stable
- And so on...



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# Assumptions and Uncertainty

Known 'truths' it would be farcical to list as assumptions

- Gravity is constant
- Earth orbits the sun
- The climate is **NOT** stable

Changes to these assumptions introduce uncertainty...

- hence the IFOA Risk Alert in May 2017





# IFOA Risk Alert – Climate Change Risks

- 2015: Mark Carney describes 3 categories of risk arising from climate change, these being **physical, transition and liability risks**.
  - These risks were further outlined by the UK actuarial profession in a [risk alert](#) to all UK actuaries in May 2017.
1. **Physical Risks – eg increased frequency & severity of extreme weather events**
    - the risks arising from potential degradation to physical assets; e.g. property damage, disruption of resource availability, supply chain interruption for providers and their services.
  2. **Transition Risks – eg stranded assets**
    - 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 varying levels of financial and reputational risk to insurers, pension funds and other institutional investors from the potentially rapid reduction in the market value of, or income generated by, assets.
  3. **Liability Risks – eg getting sued for failing to include a material financial risk in actuarial advice**
    - depending on the types and coverages of insurance or assets invested in, risks could arise if third parties have suffered damage or losses from the effects of climate change and seek compensation.





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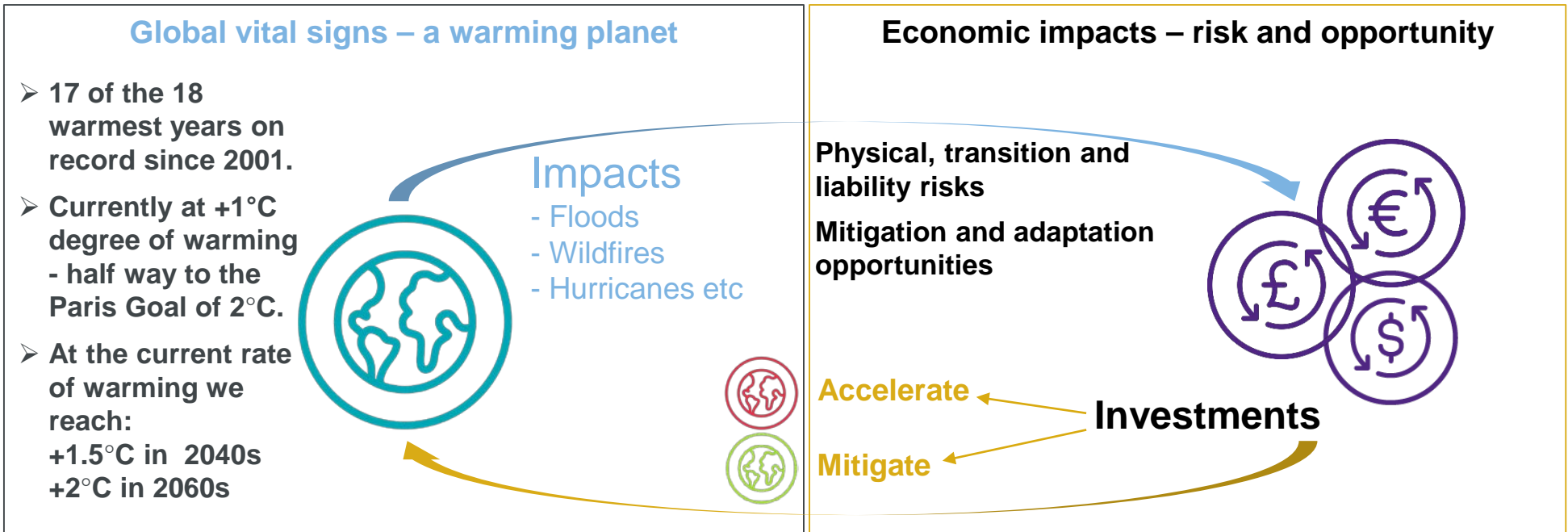
# Climate change risks



MESSAGE FROM  
ANTARCTICA

Emily Shuckburgh + Chris Houghton

# There is a complex interaction between physical climate risk and economic impact



## What about China?

China is the biggest global investor in renewables and updated the constitution of the communist party to introduce 'ecological socialism'. One reason for this is that China is the country most exposed to sea level rise.

## What about America?

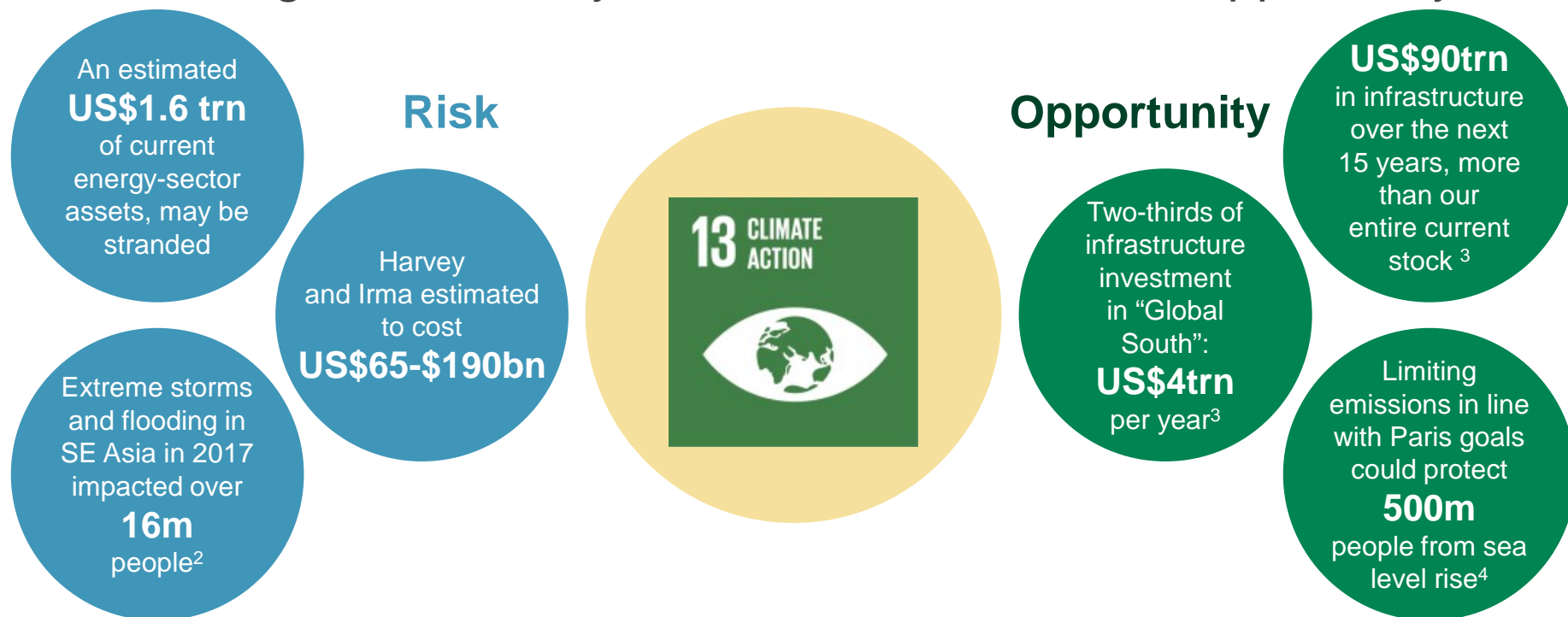
Within America, states, cities and big companies are all striving hard to de-carbonise – Trump's policies are clearly unhelpful but there is significant momentum and action in the United States.



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# Are climate risks material?

- Financing sustainability – a once in a civilisation opportunity?



Sources:

1 Carbon Tracker, Mind the gap: the \$1.6 trillion energy transition risk, March 2018

2 Four Twenty Seven, Deutsche Asset Management, Measuring Physical Climate Risk in Equity Portfolios, November 2017

3 New Climate Economy, The Sustainable Infrastructure Imperative, October 2016

4 Climate Central, Mapping Choices: Carbon, Climate and Rising Seas, November 2015



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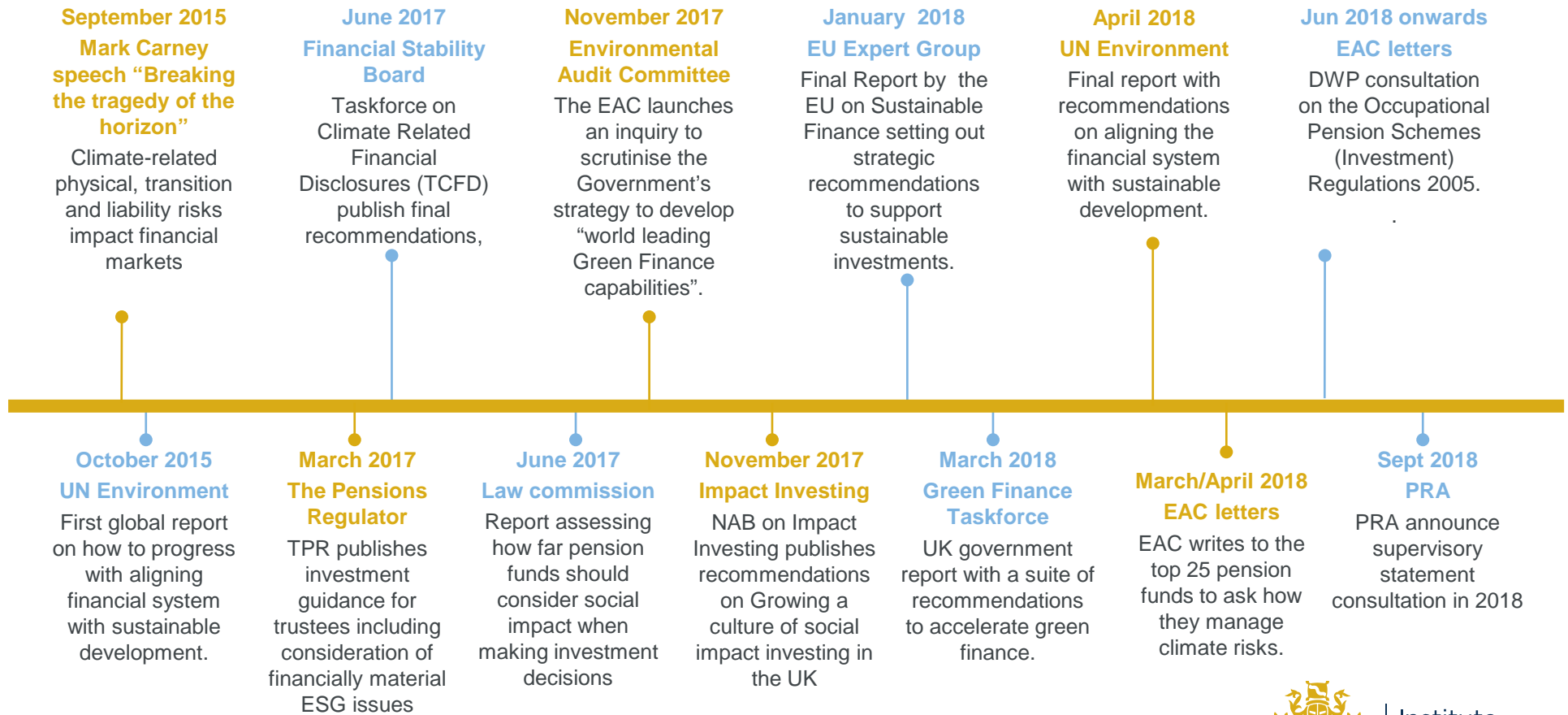


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# Regulatory Developments

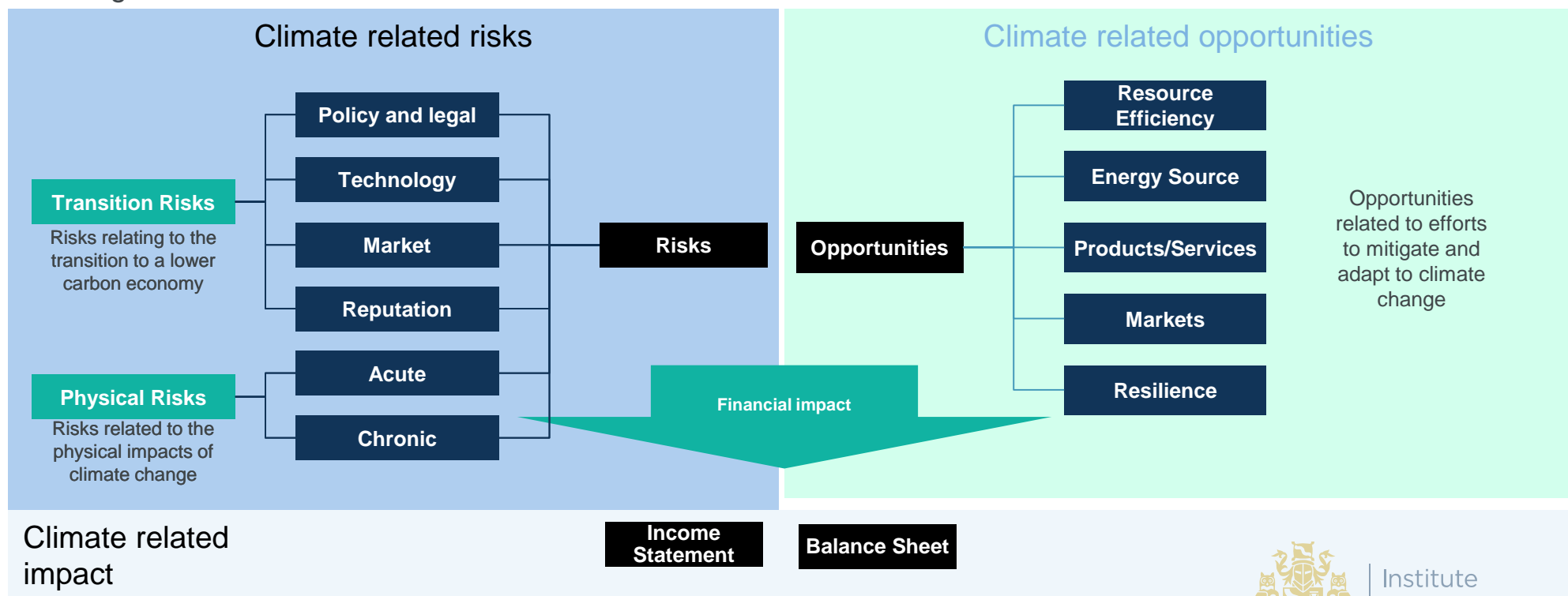


# Some regulatory and policy developments



# Climate-related risks, opportunities and financial impact (TCFD)

The Financial Stability Board's Task Force on Climate-related Climate Financial Disclosures (TCFD) provides a high level framework for considering climate related risks and opportunities, as detailed in the diagram below



Source: FSB TCFD, Recommendations of the Task Force on Climate-related Financial Disclosures, June 2017



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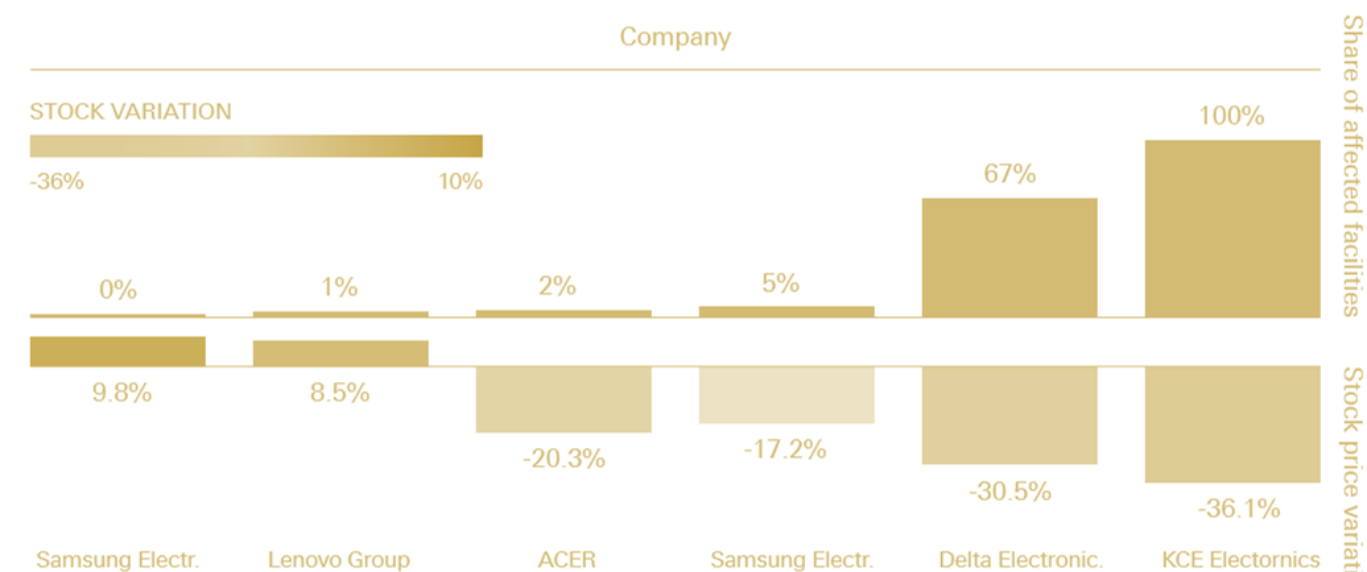
# Examples



# Physical risk example – financial impact correlation to asset geography

In 2011, Thailand experienced the worst flooding it had experienced for 50 years and with annual precipitation expected to increase by up to 50% over most land regions in the area, the forward looking risk is significant.

Physical risk analysis – asset location and equity price impact



Source: Four Twenty Seven, Deutsche Asset Management, Measuring Physical Climate Risk in Equity Portfolios, November 2017.

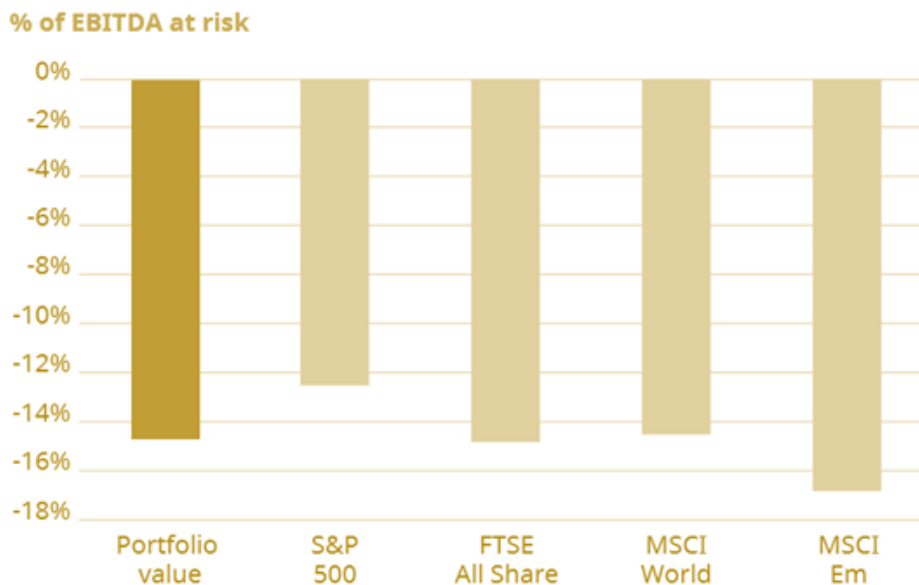


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# Transition risk assessment – materiality – US coal crash and carbon price impacts

Over the five-year period to 31 December 2014, the Dow Jones US Total Market Coal Sector delivered a -76% return compared with a 69% return for the Dow Jones Industrial Average<sup>1</sup>. With known fossil fuel reserves greatly exceeding the carbon budget, what are the implications for the balance sheets of companies holding those reserves?

Transition risk analysis – materiality assessment of introduction of a \$50/tonne carbon price



Sources:  
1 2° Investing Initiative, All Swans Are Black In The Dark, February 2017  
2 Schroders, Climate Change: redefining the risks, September 2017.



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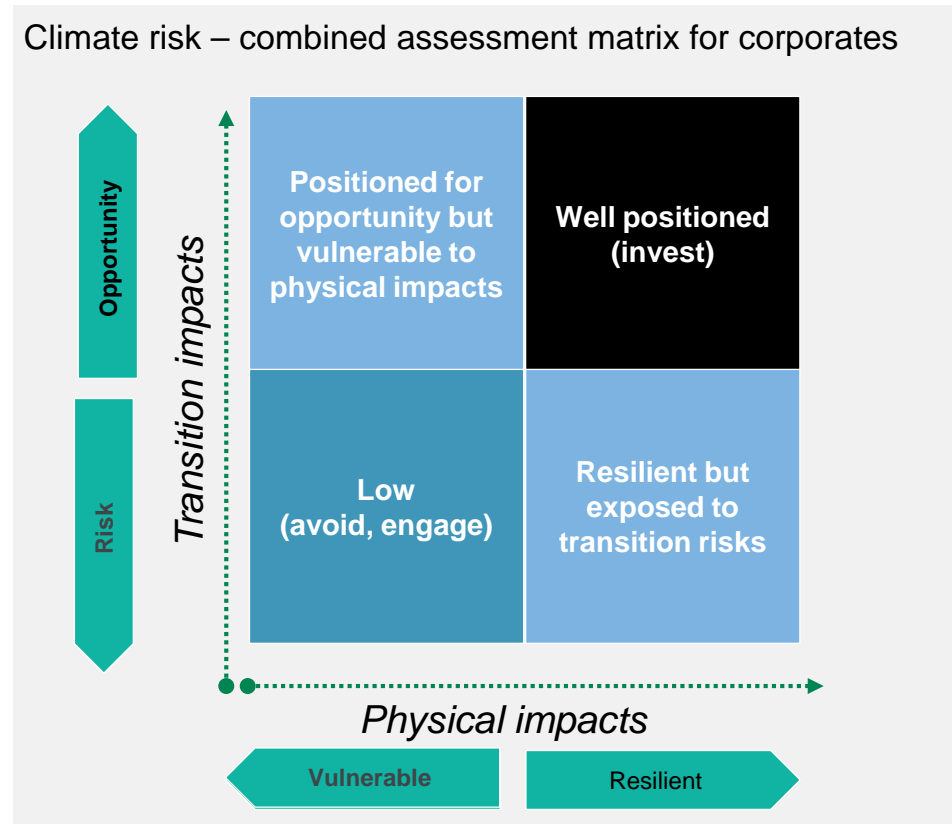
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# Next Steps



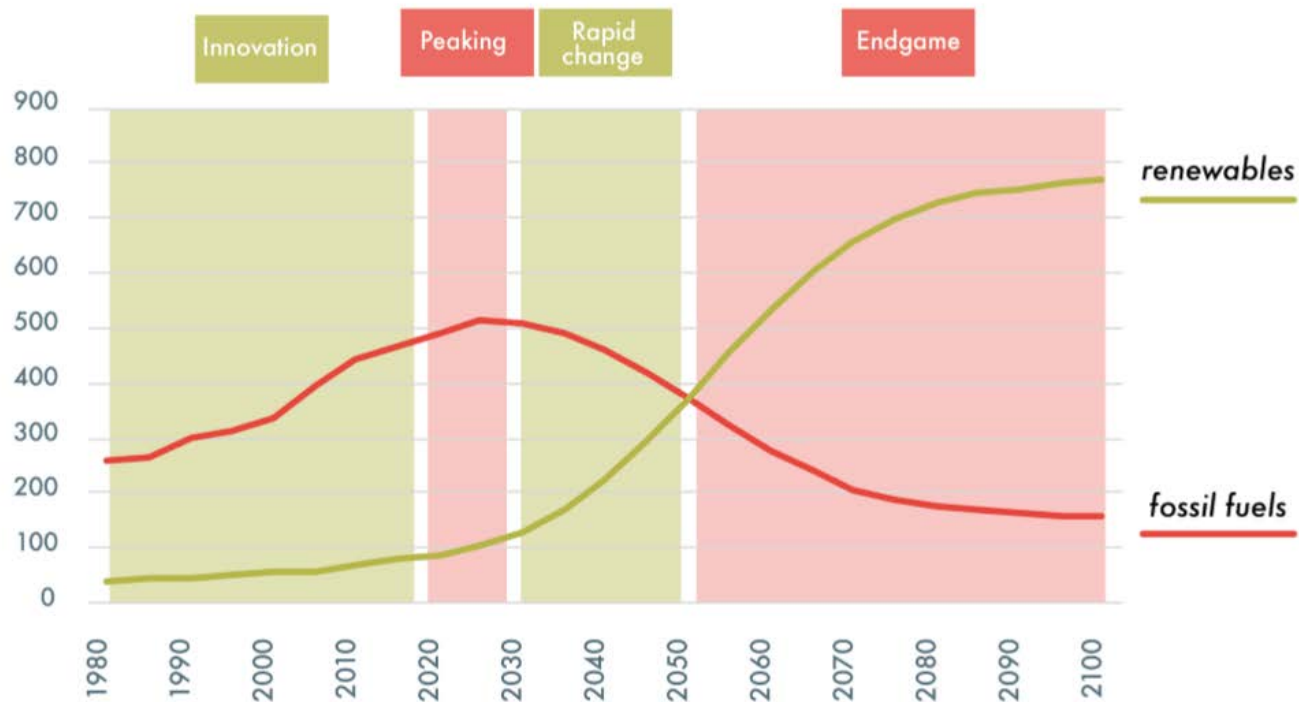
# Working towards a combined assessment

In order to fully understand the impact of climate change risks on your own business and portfolio, a combined assessment is required.



# Timing of transition risk

Total primary energy (EJ)



Source: Carbon Tracker, 2020 vision: why you should see peak fossil fuels coming, September 2018



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# Questions

# Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.



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# Moving forwards – Understand, Assess, Act

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Climate change is complex and nuanced but there are a number of practical steps which can be taken, summarised as:



## Understand

Build an understanding of the implications, the opportunities and the policy and regulatory environment – understand how this impacts your business model, where you sit against peers and how to progress.



## Assess

Appoint an appropriate owner for climate risk and undertake an assessment to quantify the potential impacts for the business, taking into account both physical and transition risks.

Develop an implementation plan and incorporate into current change portfolio.



## Act

Steps 1 and 2 allow action to be taken, informed by robust financial analyses, to integrate climate appropriately into the overall strategy of the firm.

This will necessarily be an iterative process, with data, methodologies and industry practices evolving rapidly, as indeed are the underlying risk drivers.

