2023 INTERNATIONAL CONGRESS OF ACTUARIES

BRIDGE TO TOMORROW

28 MAY – 1 JUNE 2023 · SYDNEY

Actuaries Institute Australia

IAA AAI International Actuarial Association
Association Actuarielle Internationale

Climate Solvency

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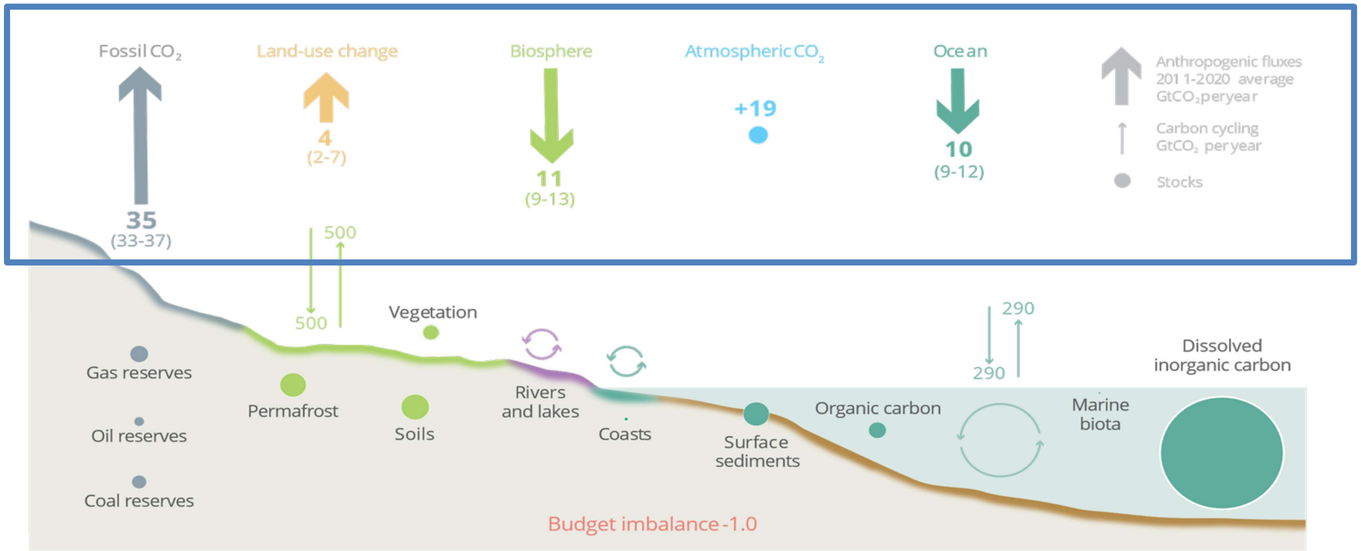
Content

- What is the ACC?
- Why are GHG emissions like cashflows?
- What insights have we gained?
- What do we want to achieve?

What is the Actuaries' Carbon Collaboration (ACC)?

- Working towards a coherent understanding of the issues around carbon emissions and offsets by considering them in an actuarial context
- Has around 15 members
- Experienced actuaries and young students, architects, environmental specialist…
- https://carbon.ifoagroups.org.uk/

GHG emissions vs. cashflows



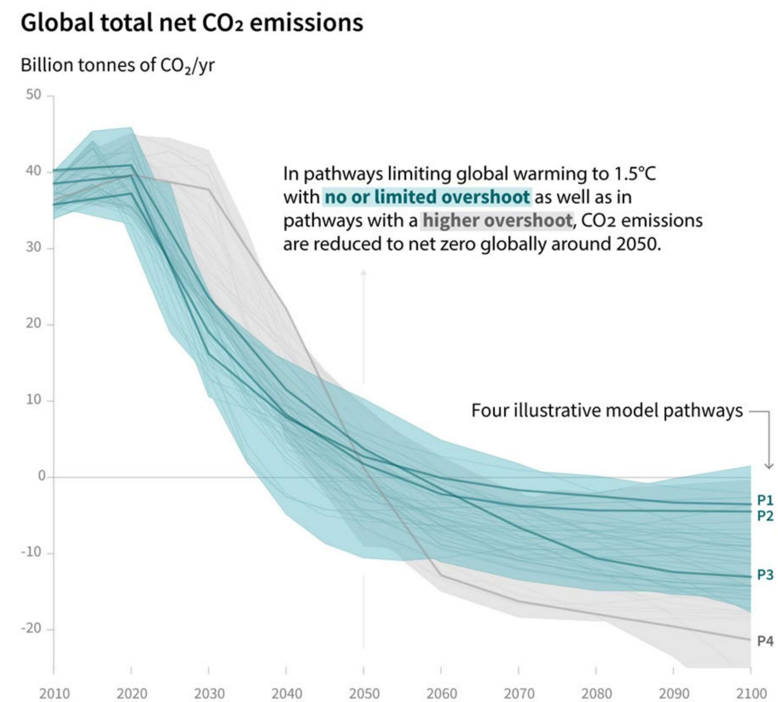
Perturbation of the global carbon cycle caused by anthropogenic activities,
global annual average for the decade 2011–2020 ($GtCO_2$/yr)

The budget imbalance is the difference between the estimated emissions and sinks.

Source: NOAA-ESRL; Friedlingstein et al 2021; Canadell et al 2021 (IPCC AR6 WG1 Chapter 5); Global Carbon Project 2021

Global net zero

- Global net zero by 2050 is necessary but not sufficient on its own
- Essentially a flow-based milestone for a stock-based goal



Source: IPCC Special report: [Global Warming of 1.5C (SR15 SPM)]

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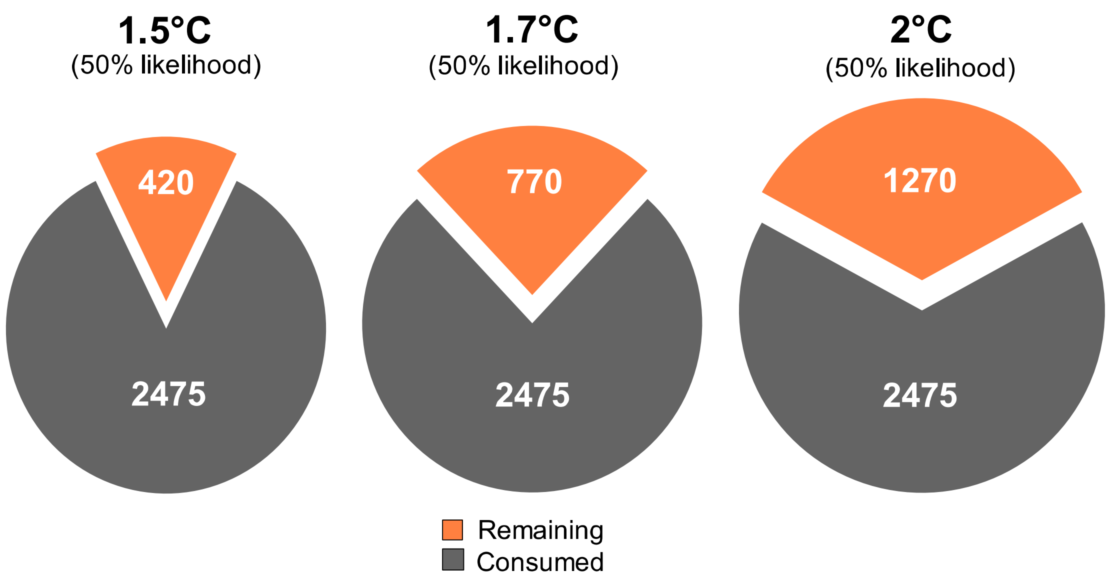
Carbon budget

The remaining carbon budget to limit global warming to 1.5°C , 1.7°C and 2°C is equivalent to 11, 20 and 32 years at the current rate.



Quantities are subject to additional uncertainties e.g., future mitigation choices of non-CO_2 emissions
Source: IPCC AR6 WG1; Friedlingstein et al 2021; Global Carbon Budget 2021

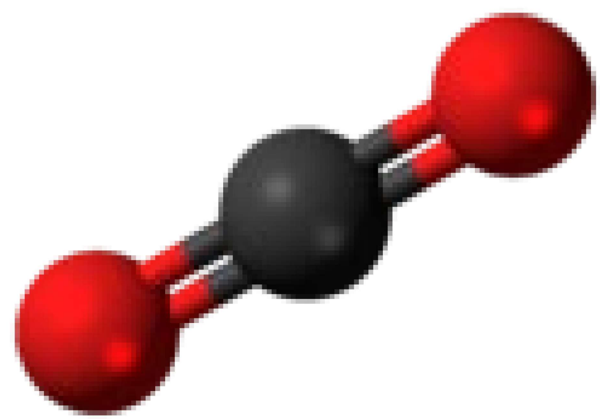
Carbon solvency

- Carbon (and other GHG) emissions and absorptions mirror asset and liability cashflows
- What kind of buffer? 0.5% probability over 1 year = 14% over 30 years?? Or 50% over 30 years??
- Valuing and accounting for carbon – revenue account and balance sheet
- Stochastic modelling, risk capital, planning and risk management

https://carbon.ifoagroups.org.uk/applying-insurance-solvency-skills-to-climate-solvency-how-actuaries-can-step-up-to-the-climate-emergency/

Insights from the ACC

- Call to arms
- Collaborations
- Applying actuarial skills
- Educational pieces
- Prototypes



Call to arms

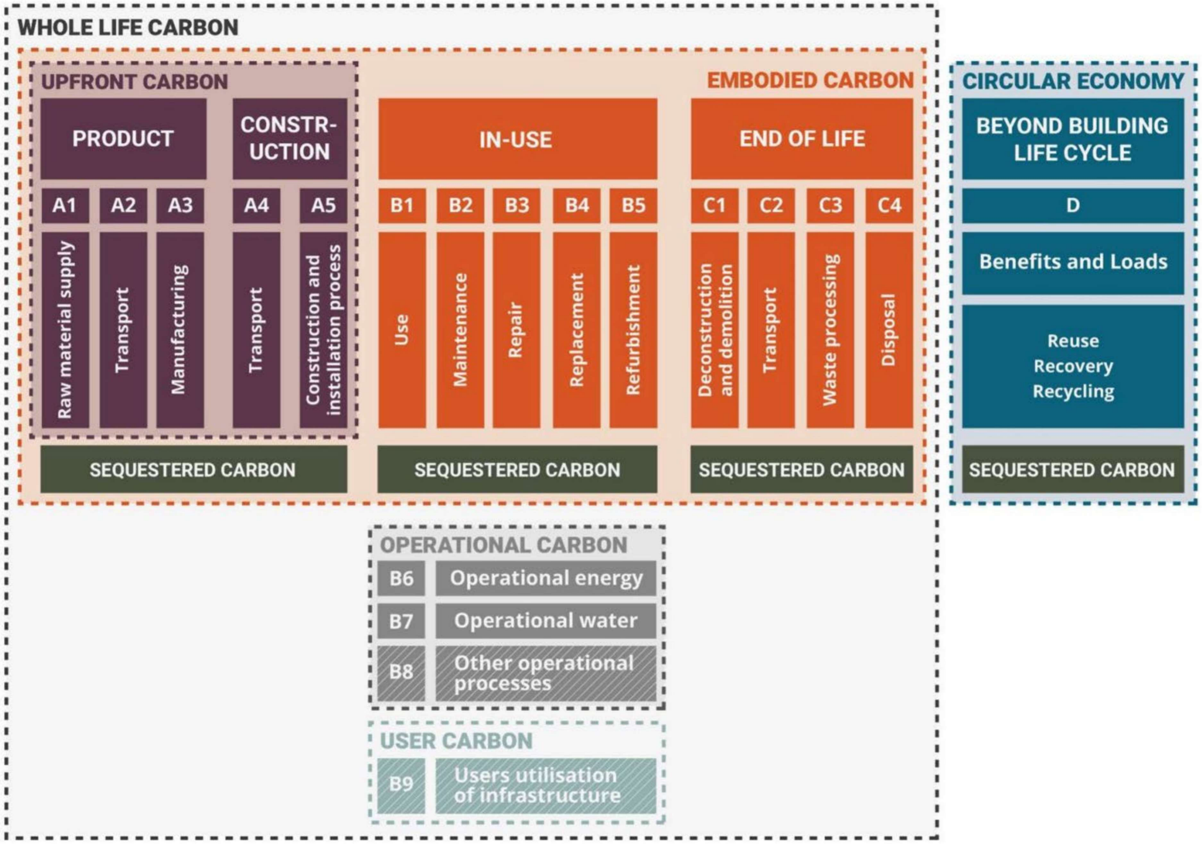
- Actuaries can and need to step up to the climate emergency
- Our insurance skills are applicable to climate solvency
- Actuaries have strong influence in insurance companies

"[It] is time to use our deep and wide insurance expertise as a springboard to the field of GHG accounting and climate solvency. Actuaries could and should play a key role with other professionals including climatologists, economists, engineers and scientists."

Collaboration

- Building industry's framework for 'whole of life carbon'
- Familiar challenges regarding product life cycle, data, models

https://carbon.ifoagroups.org.uk/comment-on-the-wlcn-leti-riba-framework-for-assessing-the-carbon-emissions-of-buildings/



Applying actuarial skills

- Time value of carbon – is discounting appropriate?
- Using a Markov model to simulate where we could end up by 2100
- Fairness when allocating carbon budget

https://carbon.ifoagroups.org.uk/time-value-of-carbon/ https://carbon.ifoagroups.org.uk/applying-the-markov-model-to-carbon-flows/
https://carbon.ifoagroups.org.uk/sharing-remaining-carbon-emissions-what-is-fair/

Education

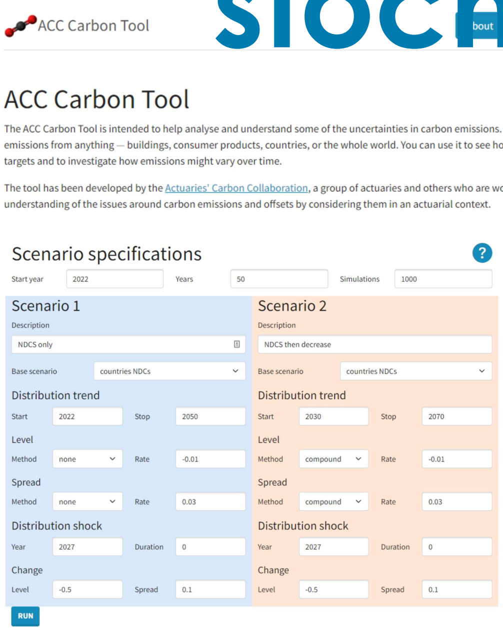
- Carbon credits – how they work, what the concerns are
- Trees – what the problems are with relying on them
- What does net zero actually mean in practice for companies, products and the world

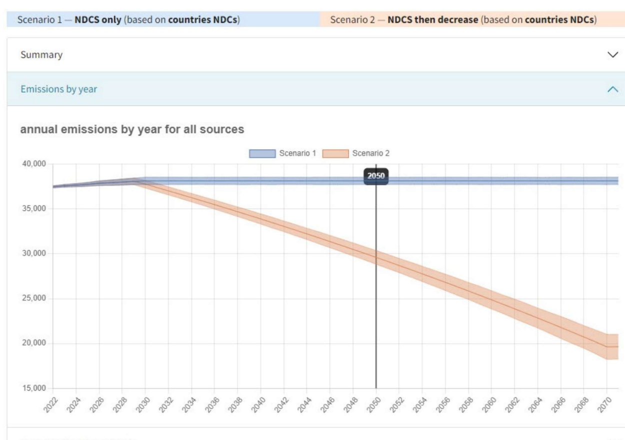
https://carbon.ifoagroups.org.uk/introduction-to-carbon-credits/ https://carbon.ifoagroups.org.uk/trees-and-negative-carbon/
https://carbon.ifoagroups.org.uk/what-does-net-zero-mean/

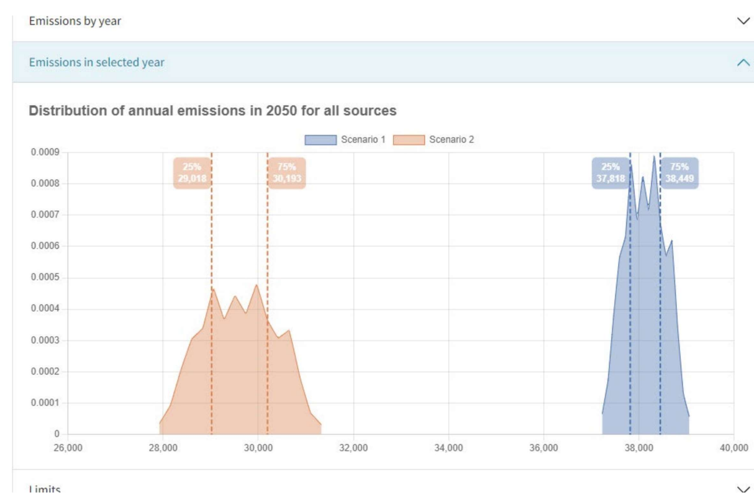
Prototype: stochastic carbon emissions

- Gap identified for need to assess impact of decisions on achieving emissions targets
- Visualisation tool can be applied to planet, country, organisation, product, …

Prototype: stochastic carbon emissions







https://carbontool.ifoagroups.org.uk/

What do we want to achieve?

- Aims:
  - Credibility
  - Help people understand the consequences
  - Building towards thought leadership
- Key spheres of influence

- Key strengths:
  - Dealing with uncertainty
  - Modelling
  - Data
  - Collaboration
  - Identifying inconsistency