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Actuaries' Carbon Collaboration

Acting on climate solvency

Carbon Solvency

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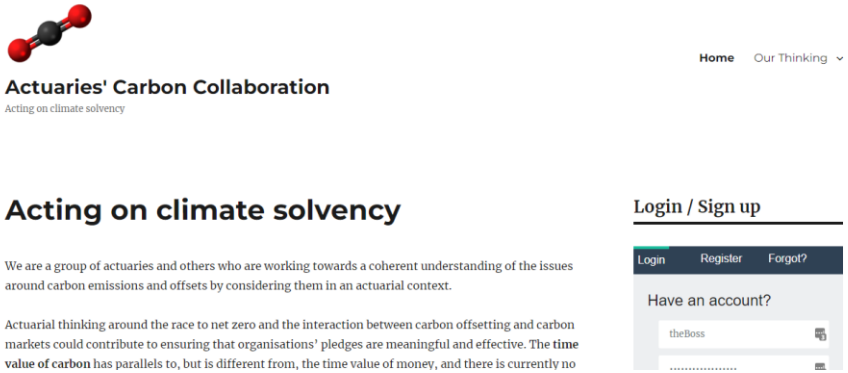
06 July 2022

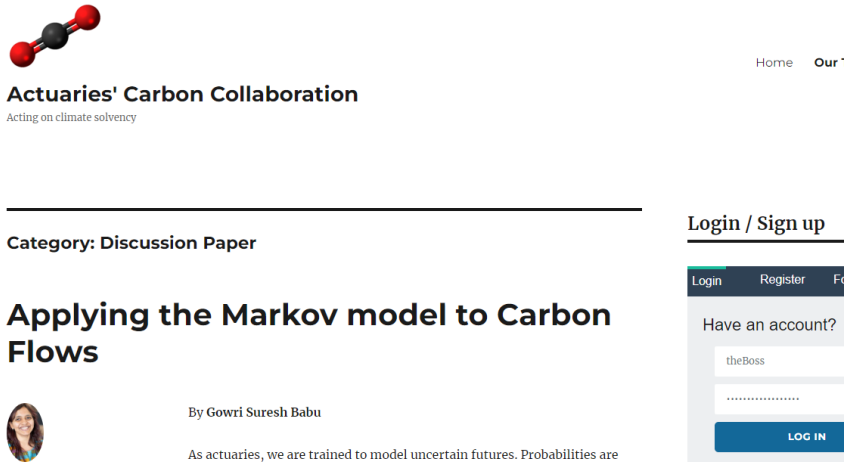
Content

- 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/





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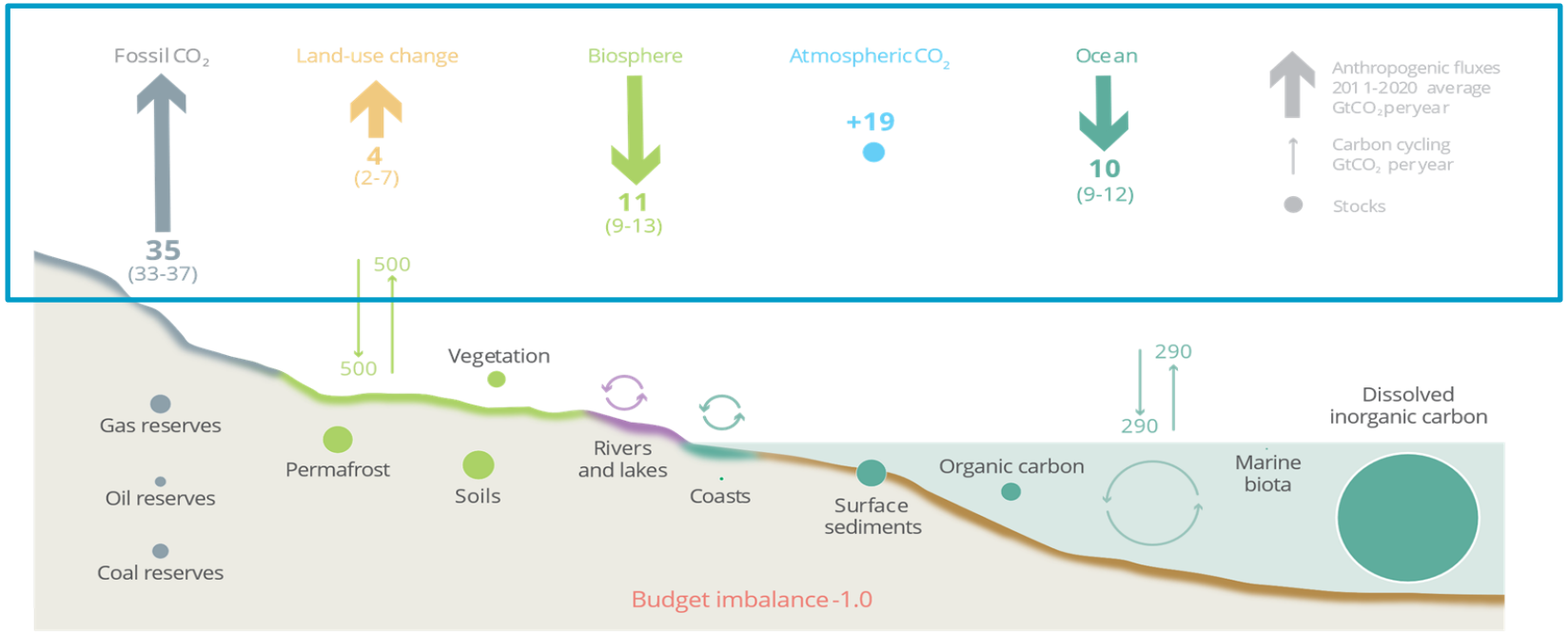
GHG emissions vs. cashflows



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

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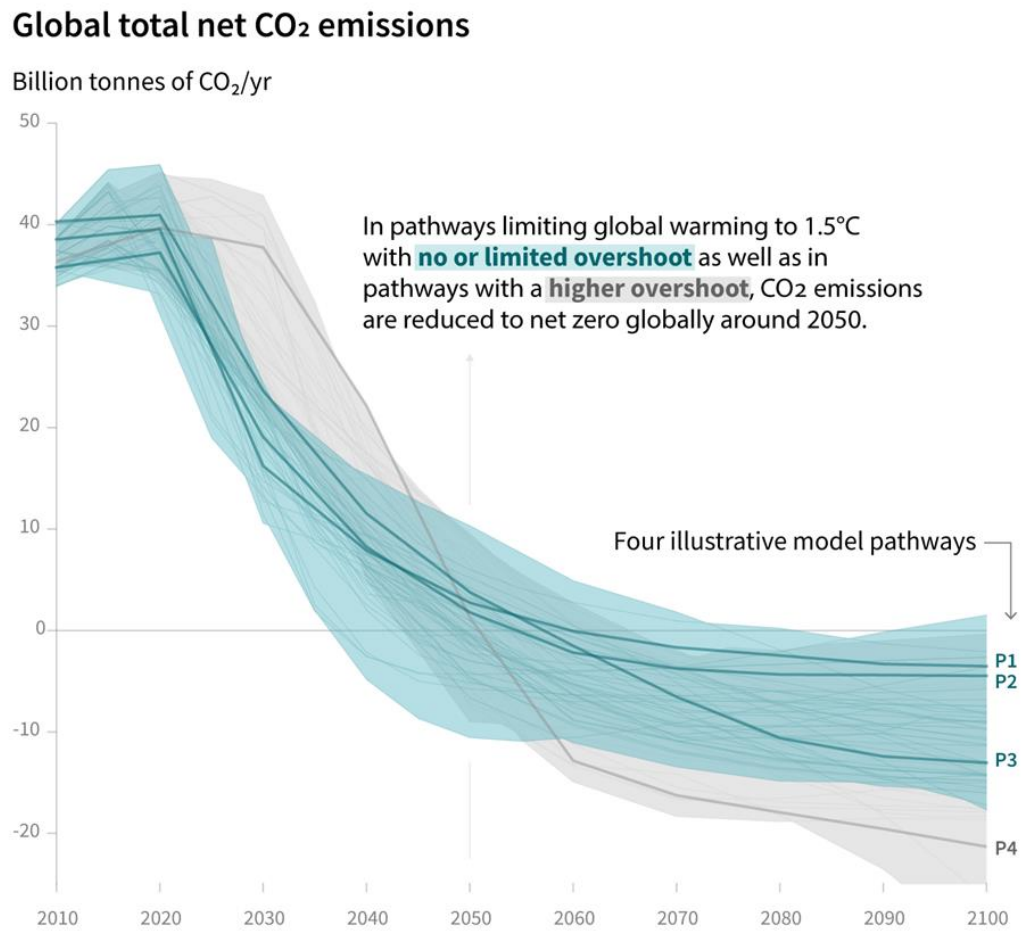
Global net zero

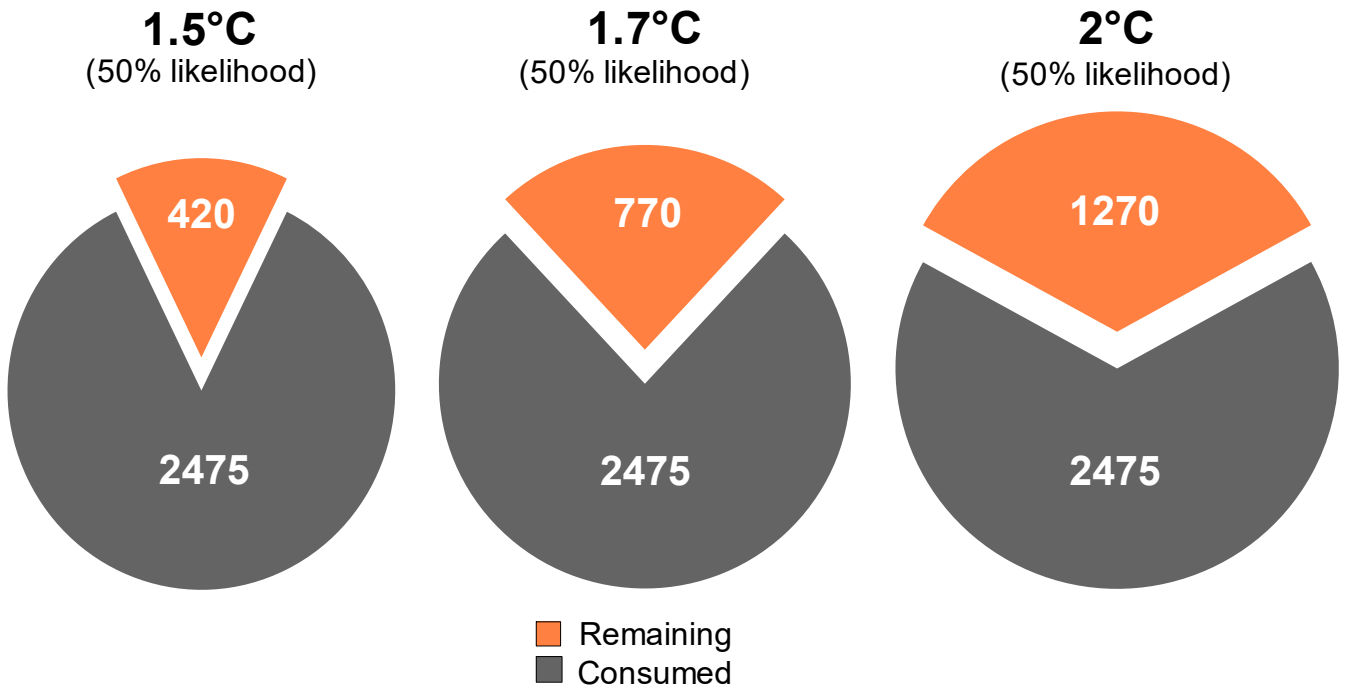
- Global net zero by 2050 is necessary but not sufficient on its own
- Essentially a flow-based milestone for a stock-based goal



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

Carbon budget

The remaining carbon budget to limit global warming to 1.5°C , 1.7°C and 2°C is shown below.
This 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

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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?? Versus 50% over 30 years??
- Valuing and accounting for carbon – revenue account and balance sheet
- Stochastic modelling, risk capital, planning and risk management

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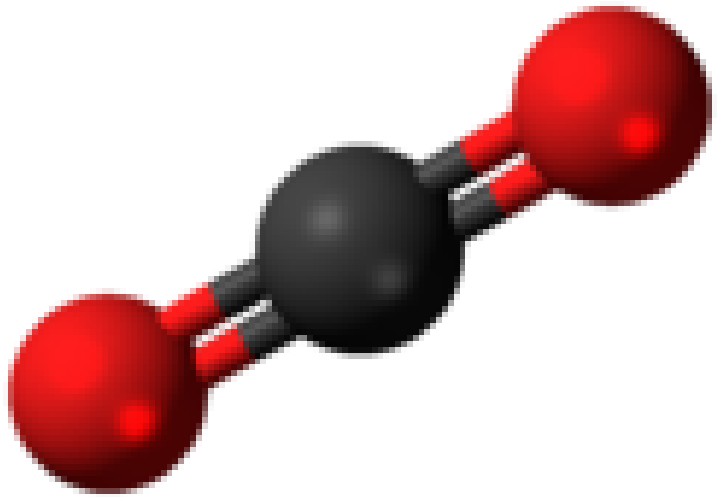
Insights from the ACC

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



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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.”

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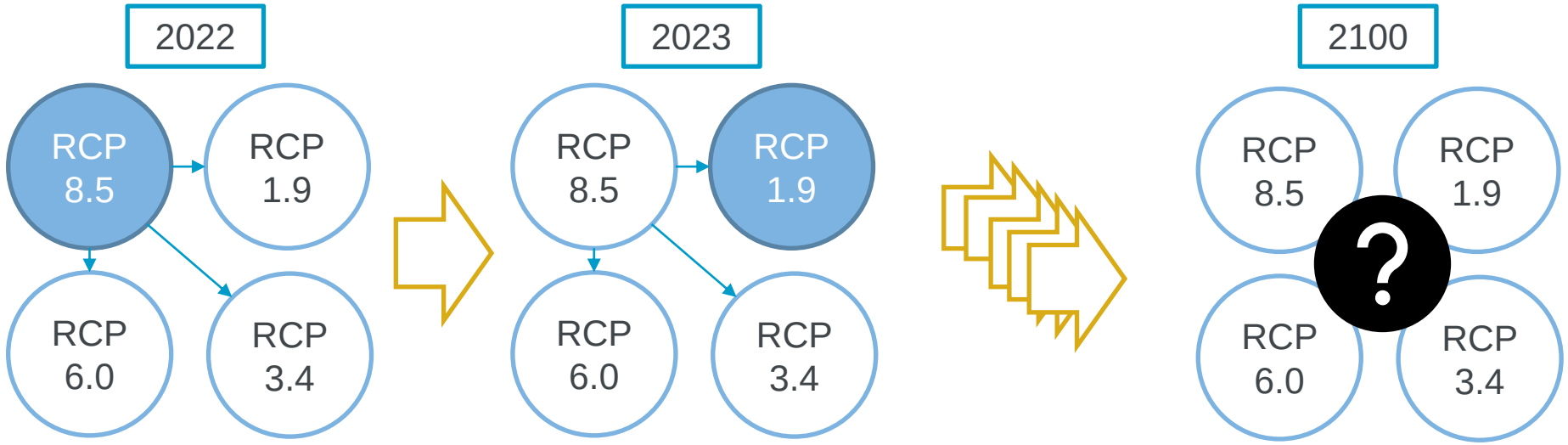
Applying actuarial skills: Markov model

- By applying a Markov model, we can assess the impacts on where we may end up by 2100

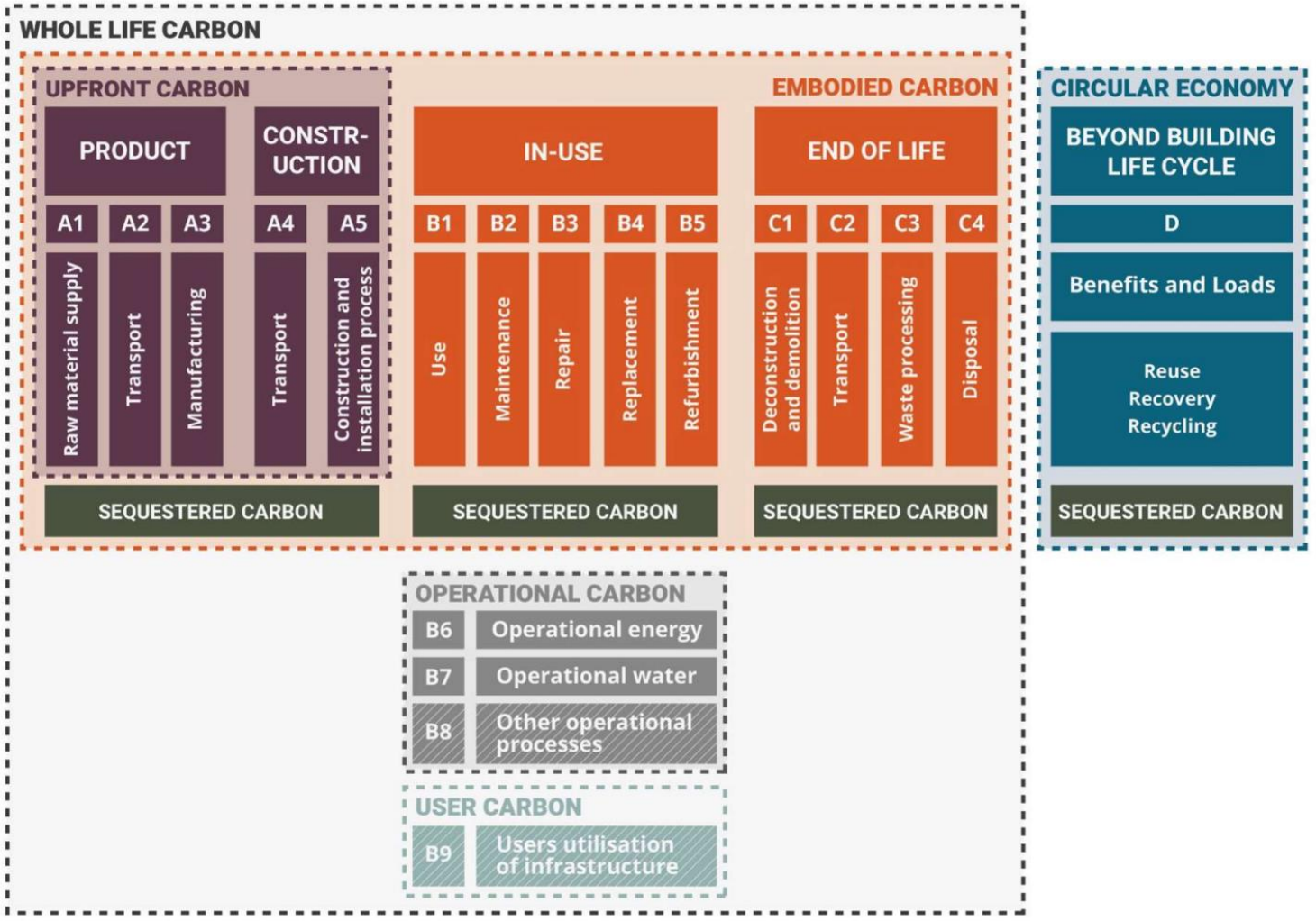


Applying actuarial skills: Time value of carbon

- Discounting calculations assume ergodicity – i.e., no irreversible changes occur
  - Most financial processes are non-ergodic
  - Social changes are non-ergodic (social time preference rate)
- Discounting calculations are functions of time
  - Value of carbon depends on the state of the carbon budget

Collaboration

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



Education

Introduction to carbon credits

- Carbon markets are expected to grow rapidly
- Carbon offset vs carbon credit
- Concerns around the use of credits
- Standards developed to address concerns

Trees' role in carbon capturing

- Significant factor in achievement of global net zero
- Uncertainty about the longevity of carbon offsets associated with trees
- Net zero pledges of four oil and gas producers means "their plans alone could require an area of land twice the size of the U.K."

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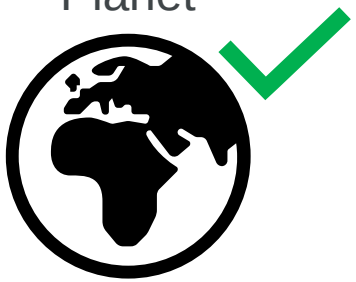
Education

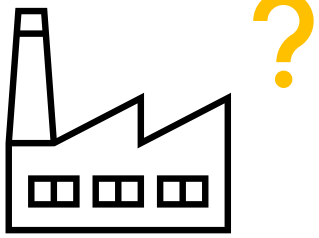
What does “net zero” mean?

Planet

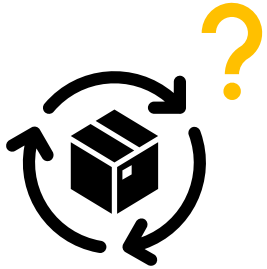


Country

Company



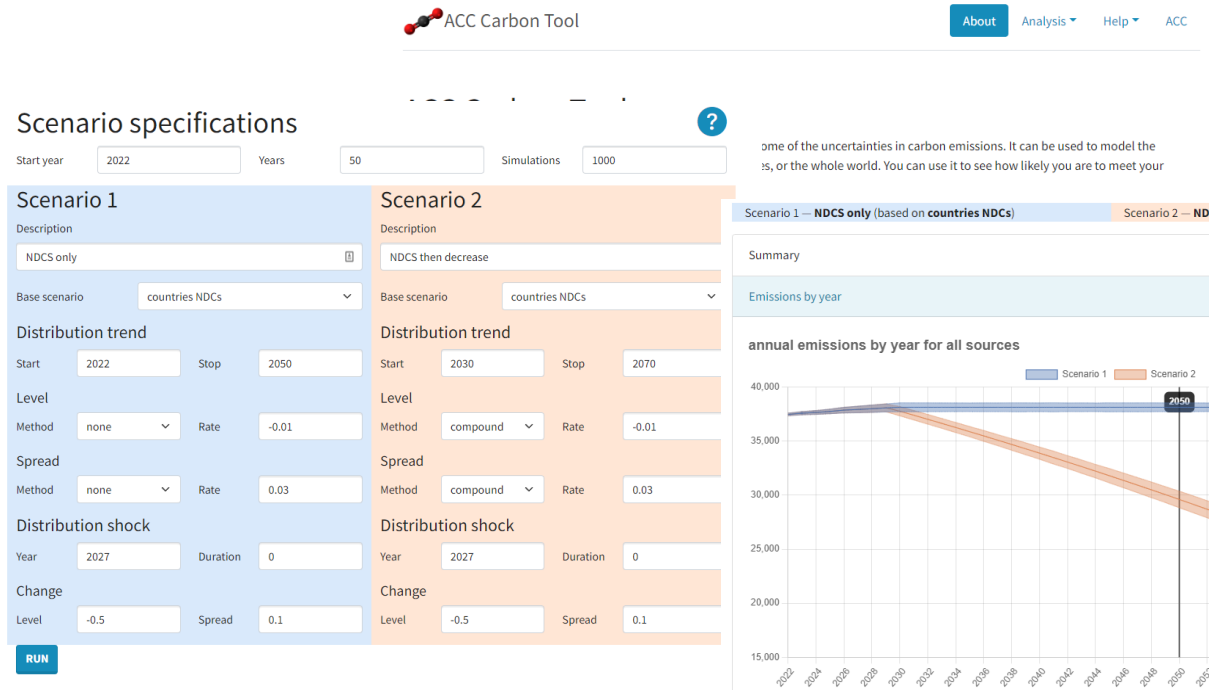
Product

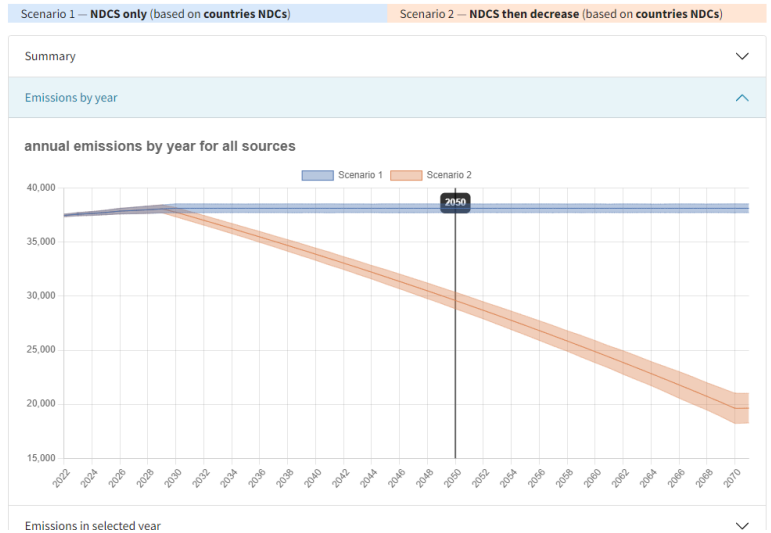


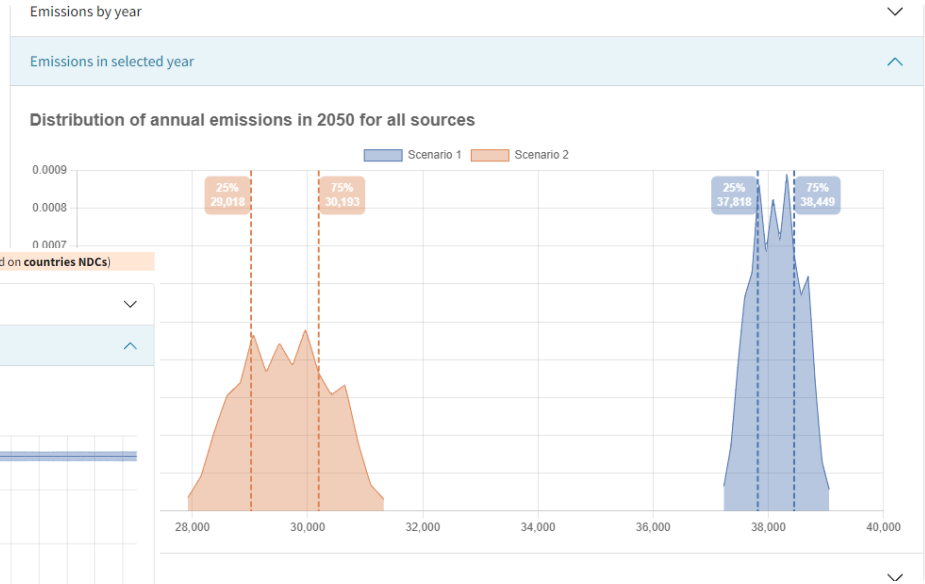
Individual

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, …







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

What do we want to achieve?

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

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

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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.