

Economic and environmental urgency of transitioning the global economy

Climate models are underestimating risk

The impacts of extreme weather events and changes in climate

A threat dialling back emission targets

Dr Dimitri Lafleur, Chief Scientist, ACCR
dimitri.lafleur@accr.org.au

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Climate models in financial services are underestimating risk

- Extreme weather, sea-level rise, mass migration not taken into account
- Models assume markets are perfect
- Cannot handle deep uncertainty, intergenerational distribution

Institute and Faculty of Actuaries

University of Exeter

The Emperor's New Climate Scenarios

Limitations and assumptions of economic models

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Routledge
Taylor & Francis Group

OPEN ACCESS

The economics of immense risk, urgent action and radical change: towards new approaches to the economics of climate change

Nicholas Stern and Joseph Stiglitz in collaboration with Charlotte Taylor
London School of Economics, London, UK & Columbia University, New York, NY, USA

ABSTRACT
Designing policy for climate change requires analyses which integrate the interrelationship between the economy and the environment. We argue that, despite their dominance in the economics literature and influence in public discussion and policymaking, the methodology employed by Integrated Assessment Models (IAMs) rests on flawed foundations, which become particularly relevant in relation to the realities of the immense risks and challenges of climate change, and the radical changes in our economies that a sound and effective response require. We identify a set of critical methodological problems with the IAMs which limit their usefulness and discuss the analytic foundations of an alternative approach that is more capable of providing insights into how best to manage the transition to net-zero emissions.

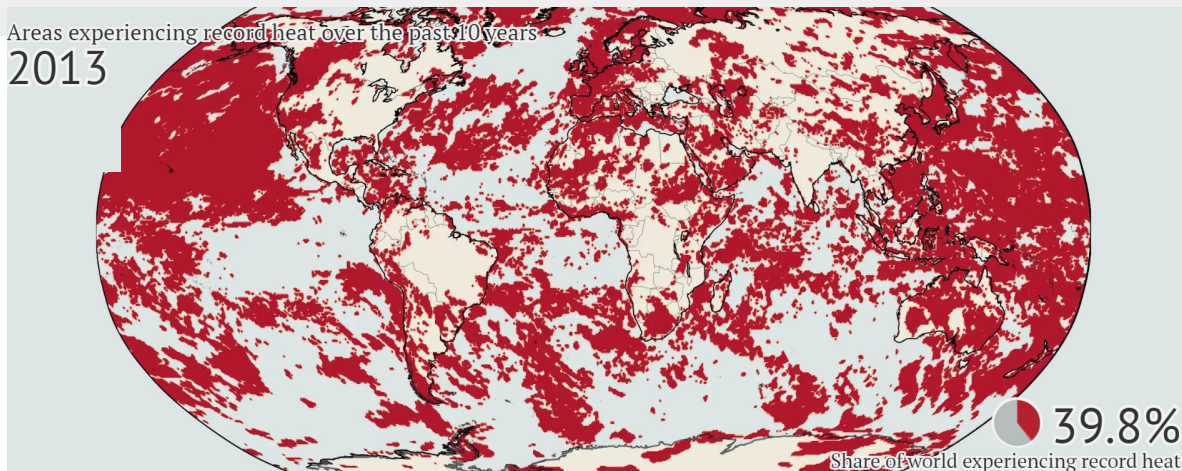
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KEYWORDS
Climate change; extreme risk; market imperfections; climate policy; integrated assessment; social welfare

2023

The impacts of extreme weather events and changes in climate

Areas experiencing record heat over the past 10 years.



Connectivity of tipping points



- | | | |
|---|--|--|
| A. Amazon rainforest
Frequent droughts | D. Boreal forest
Fires and pests changing | H. Permafrost
Thawing |
| B. Arctic sea ice
Reduction in area | F. Coral reefs
Large-scale die-offs | I. West Antarctic ice sheet
Ice loss accelerating |
| C. Atlantic circulation
In slowdown since 1950s | G. Greenland ice sheet
Ice loss accelerating | J. Wilkes Basin, East Antarctica
Ice loss accelerating |

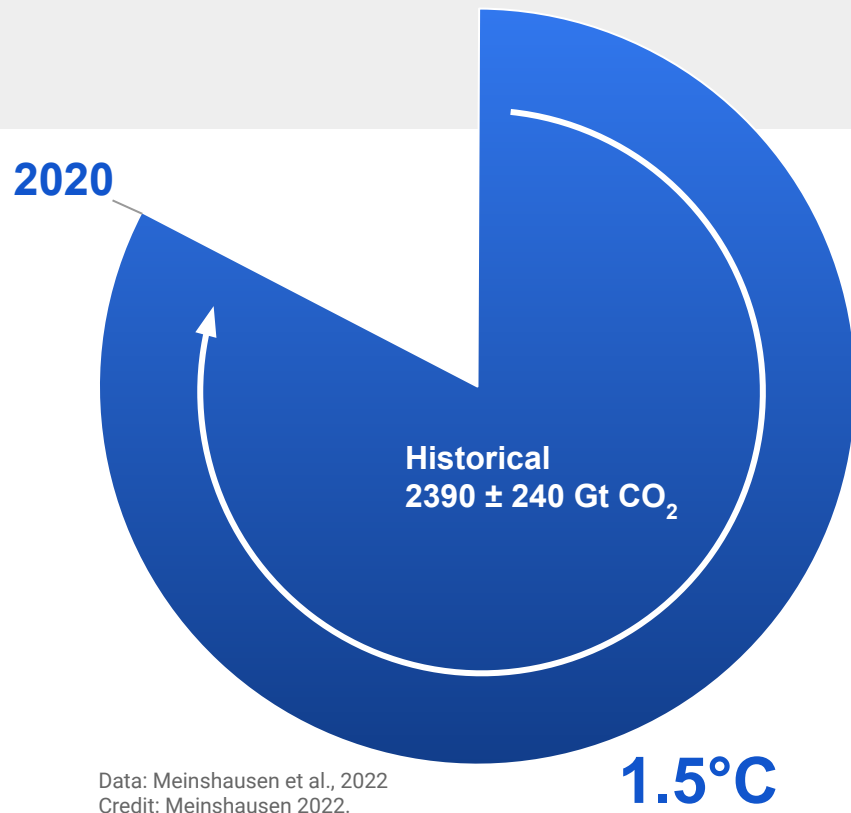
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Left: Areas experiencing record heat over the last 10 years. Credit: CarbonBrief, 2023

Right: from Lenton, T. et al., 2019, [Climate tipping points – too risky to bet against](#)

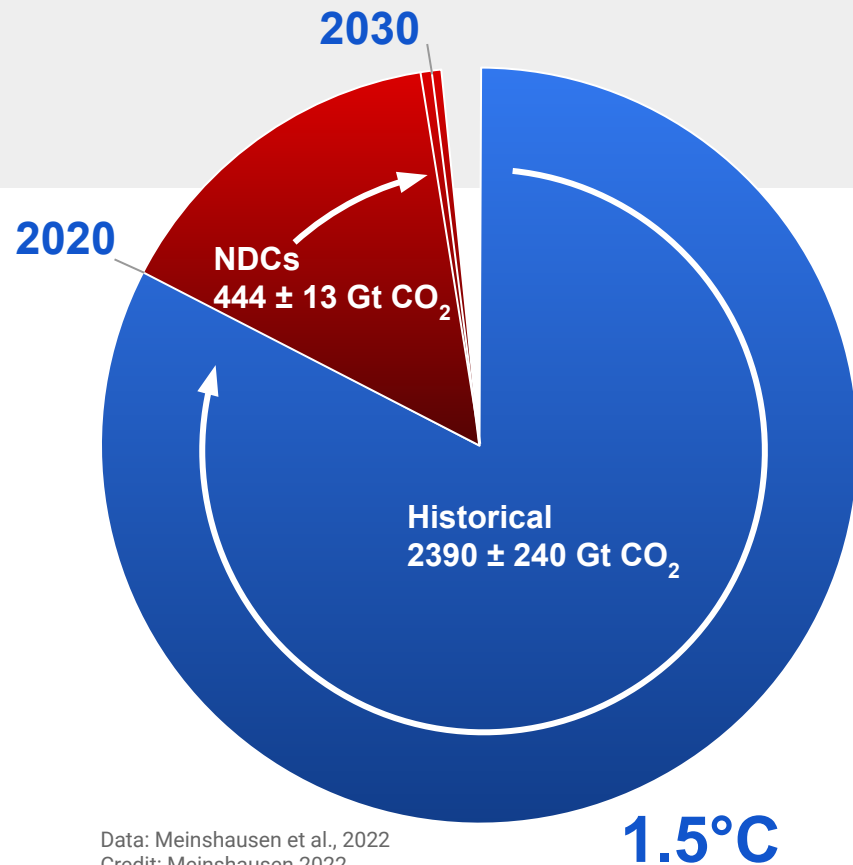
The remaining carbon budget

- Historical emission have consumed 2390Gt CO₂ of the remaining 1.5C carbon budget



The remaining carbon budget

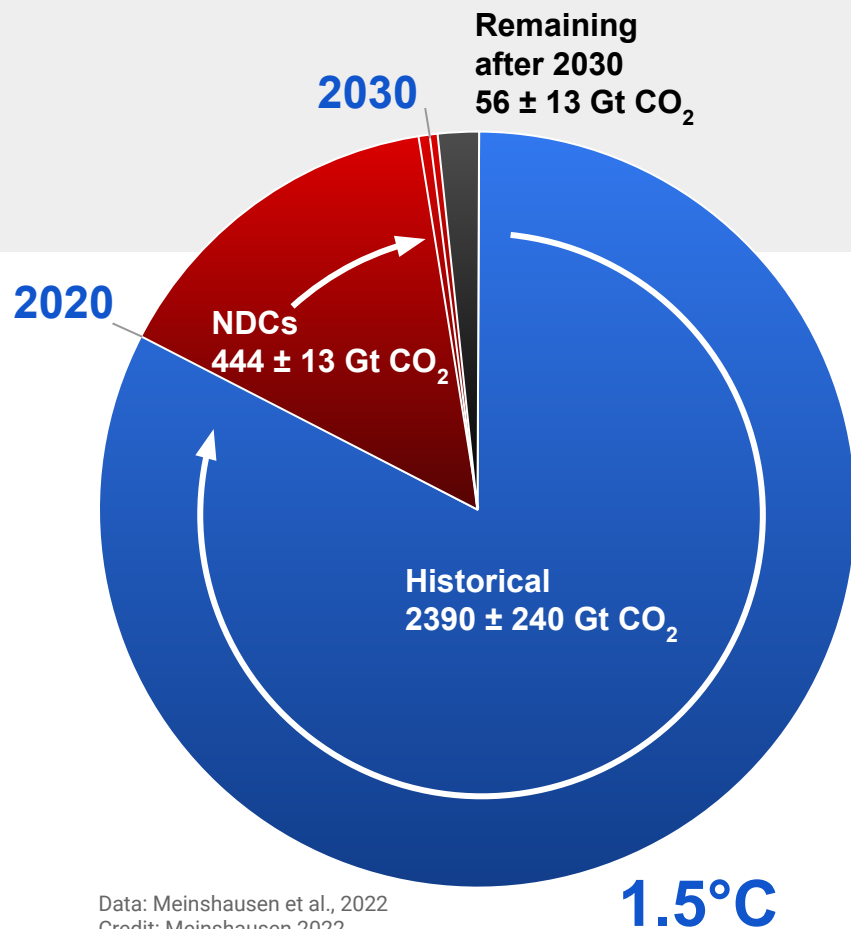
- Historical emission have consumed 2390Gt CO₂ of the remaining 1.5C carbon budget
- Pledges and net-zero targets consume 444Gt CO₂ to 2030



Data: Meinshausen et al., 2022
Credit: Meinshausen 2022.

The remaining carbon budget

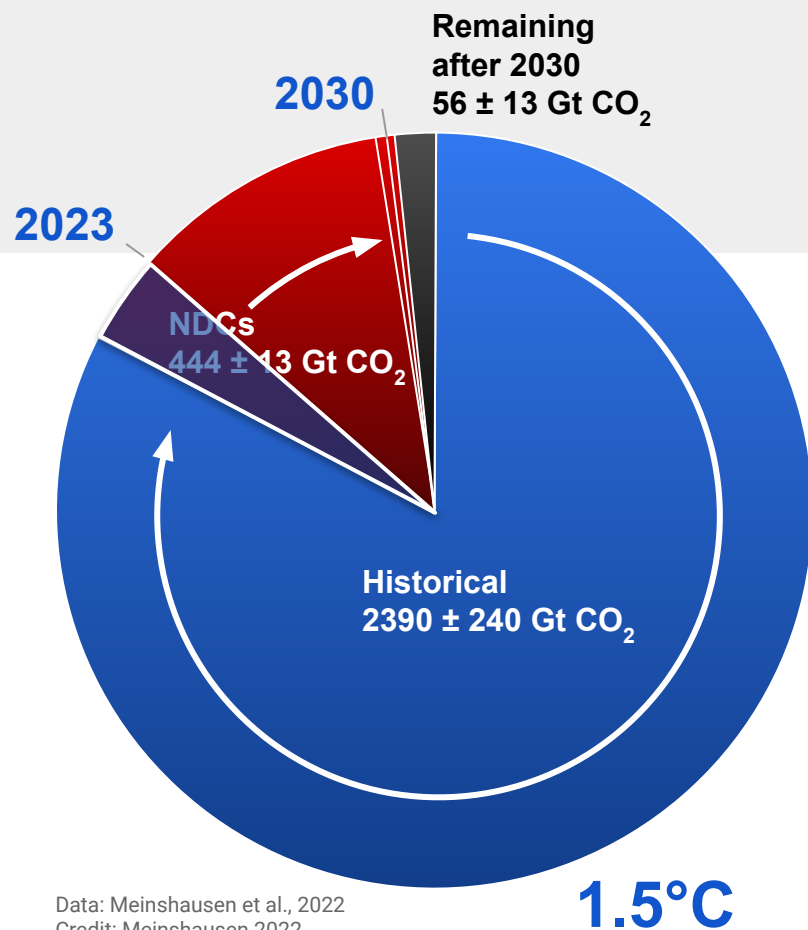
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Credit: Meinshausen 2022.

The remaining carbon budget

- Historical emission have consumed 2390Gt CO₂ of the remaining 1.5C carbon budget
- Pledges and net-zero targets consume 444Gt CO₂ to 2030
- Leaving 1-1.5yr after 2030 at current emission rates
- We consumed 120Gt in 2020-23.
- The remaining carbon budget is possible much smaller than we think (Foster et al., 2022)



Data: Meinshausen et al., 2022
Credit: Meinshausen 2022.

A threat that emission targets are dialled back

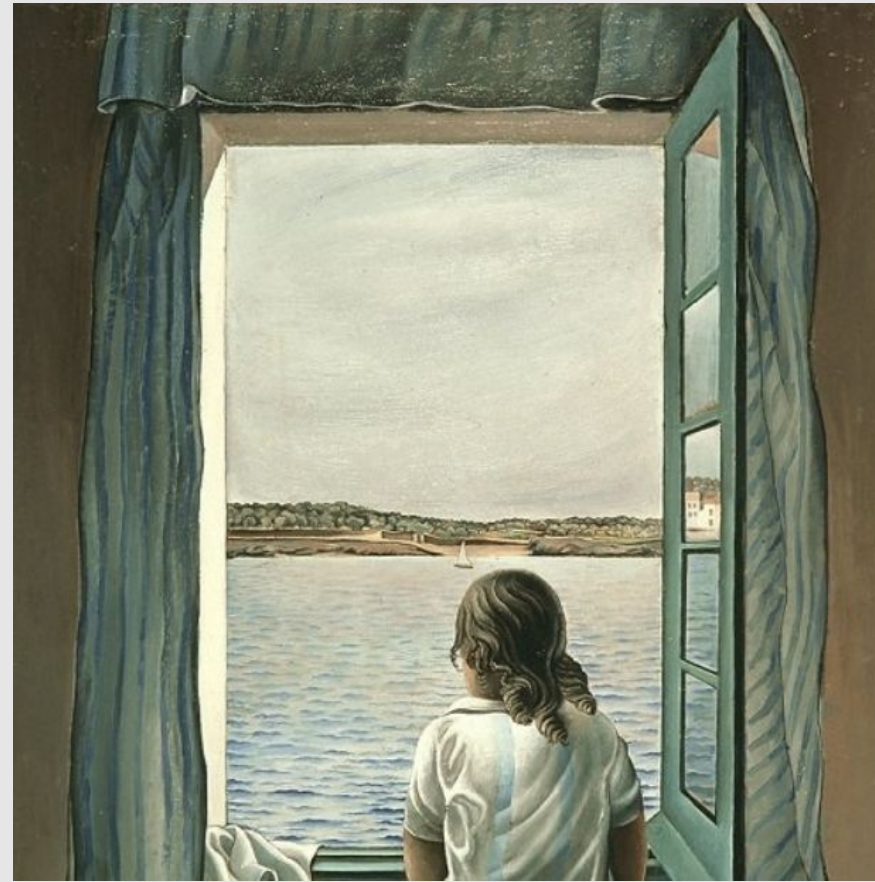
- Companies are not going to change their business portfolios voluntarily
- Dialing back emission reduction targets is delaying absolute emission reduction



Net zero ambition
progress update

March 2023

Shrinking window for a transition that protects long-term value



S. Dalí – Figura en una finestra