

Foundation Future Leaders Conference

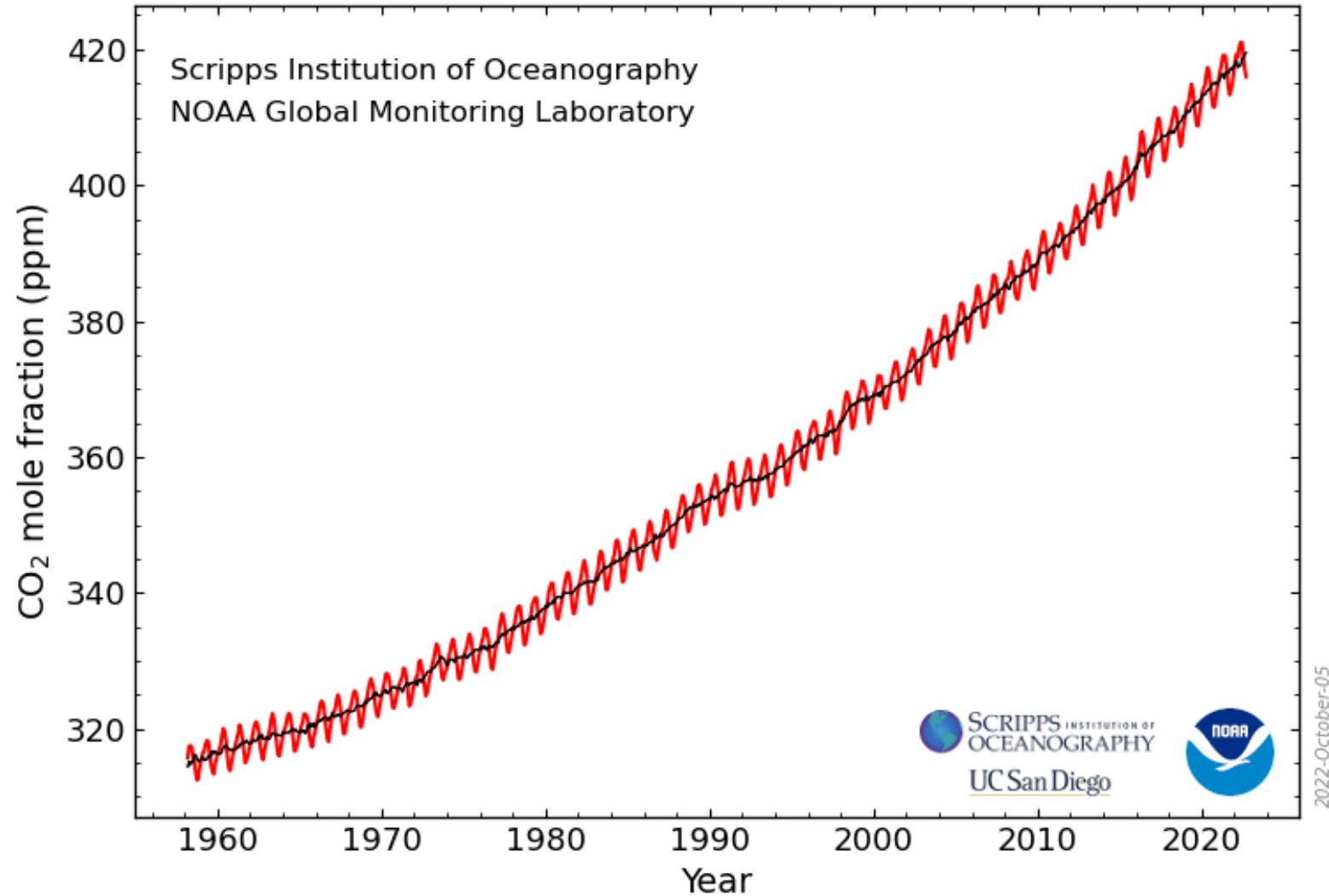
The Challenge of Climate Change

Brian Hoskins

**Chair, Grantham Institute - Climate Change and the Environment, Imperial College London
Professor of Meteorology, University of Reading**

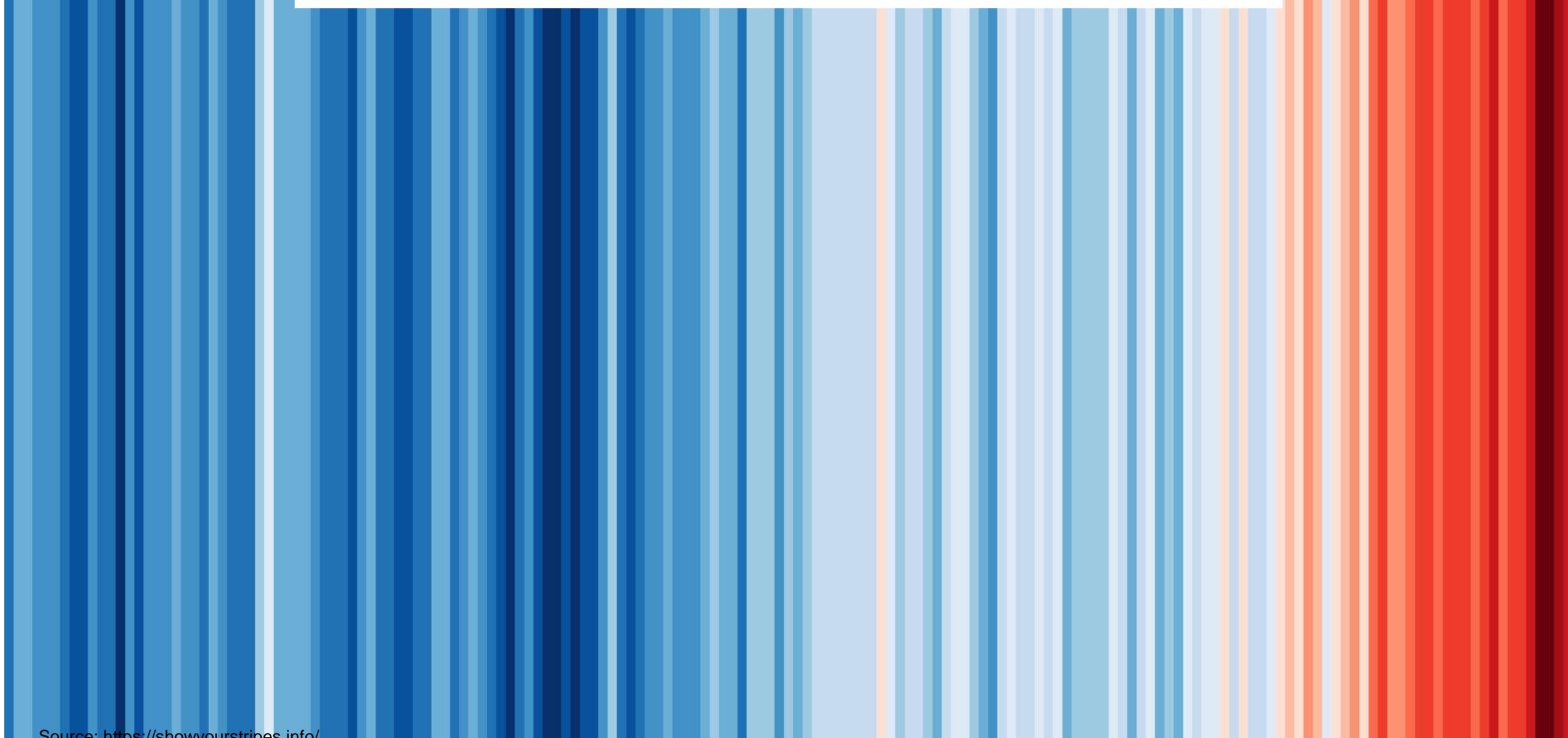
Measured Atmospheric Carbon Dioxide

Mauna Loa, Hawaii



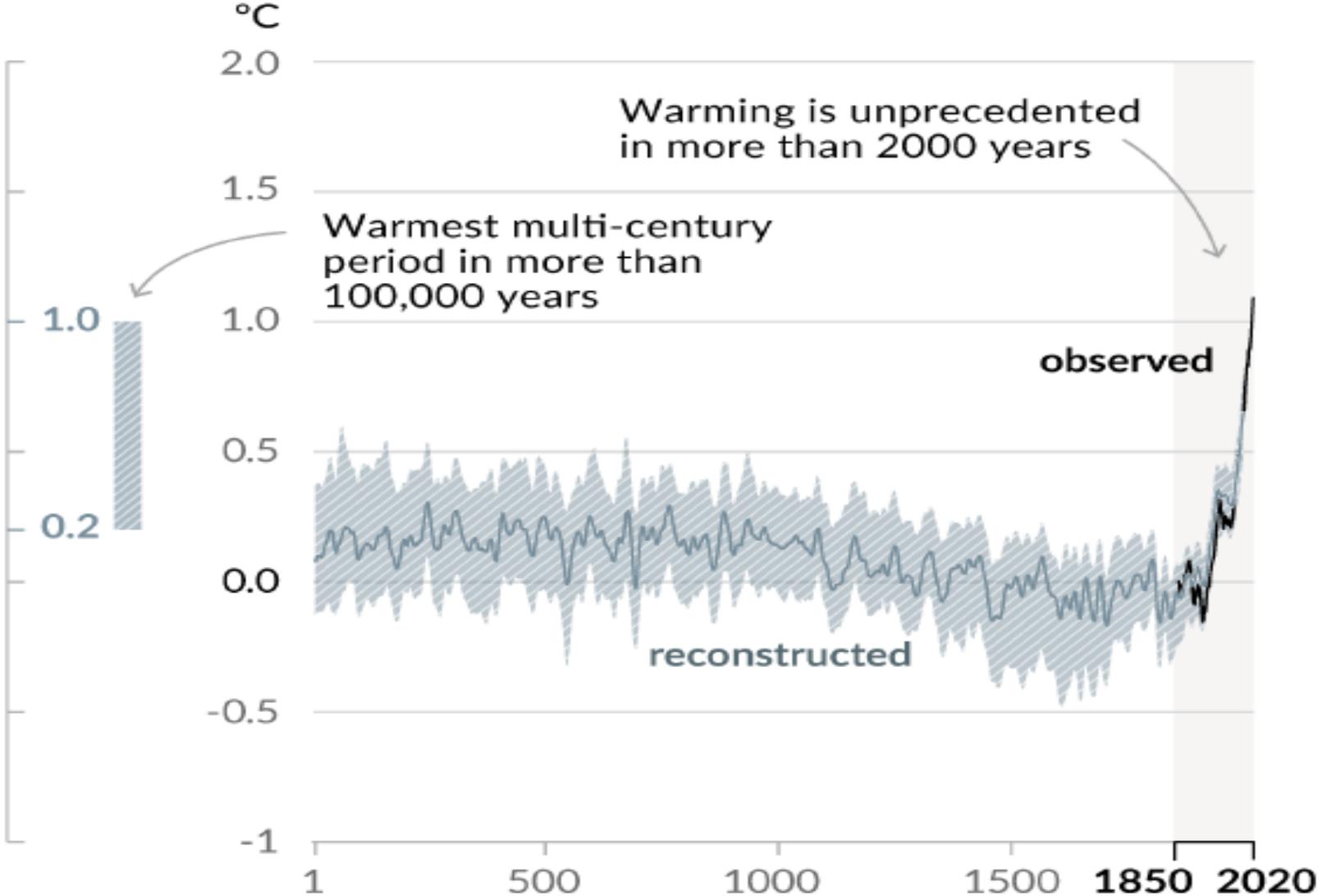
Global Temperatures 1850 – 2021

Climate Stripes, Ed Harrison, University of Reading



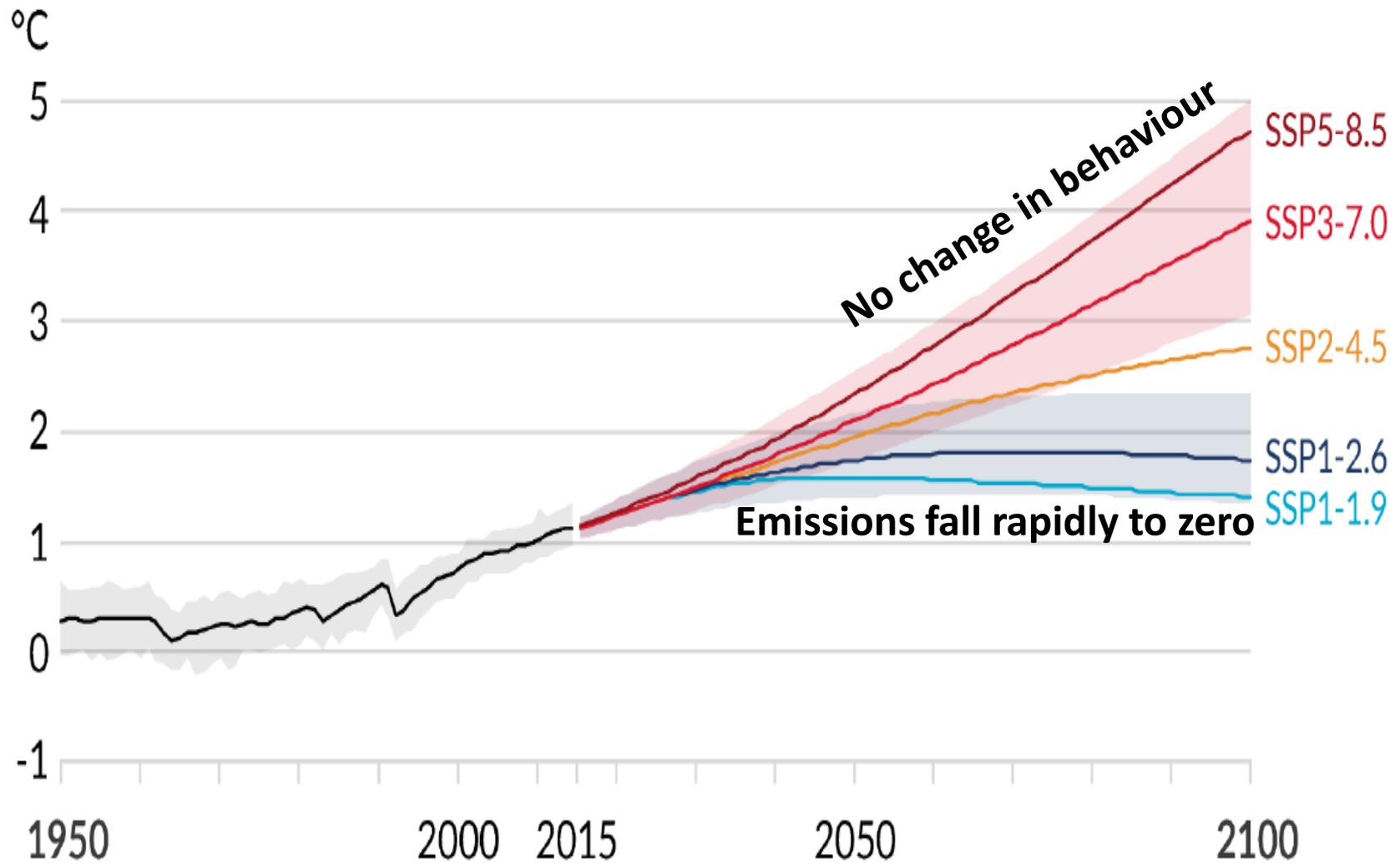
Global Temperatures in the past 2000 years

IPCC WGp1 AR6



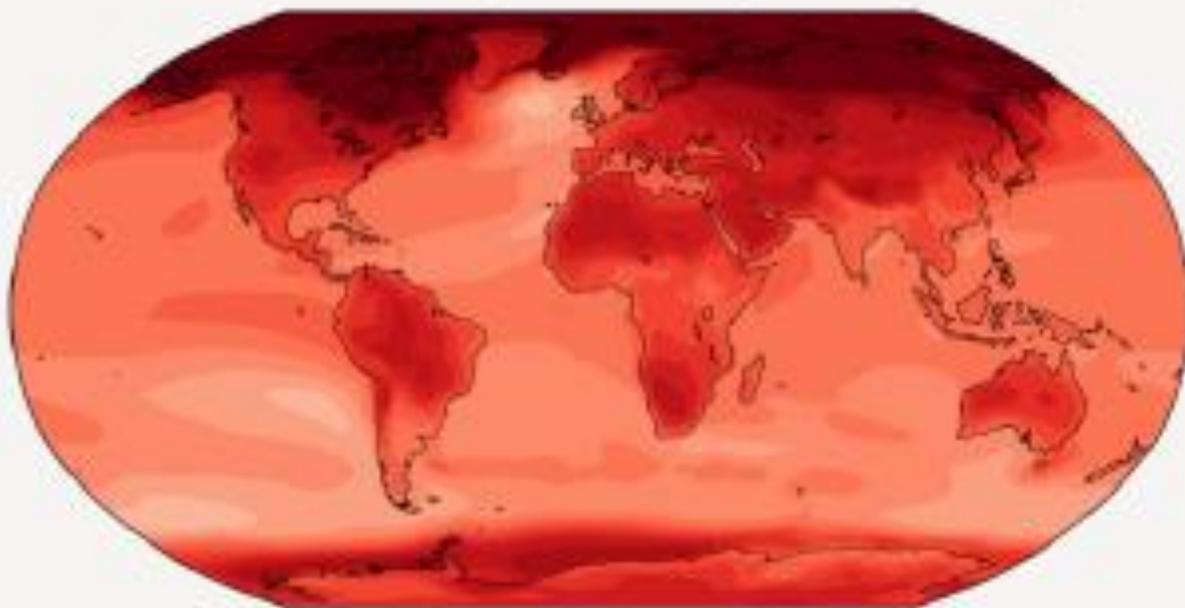
The Future?

Projections of temperature rise

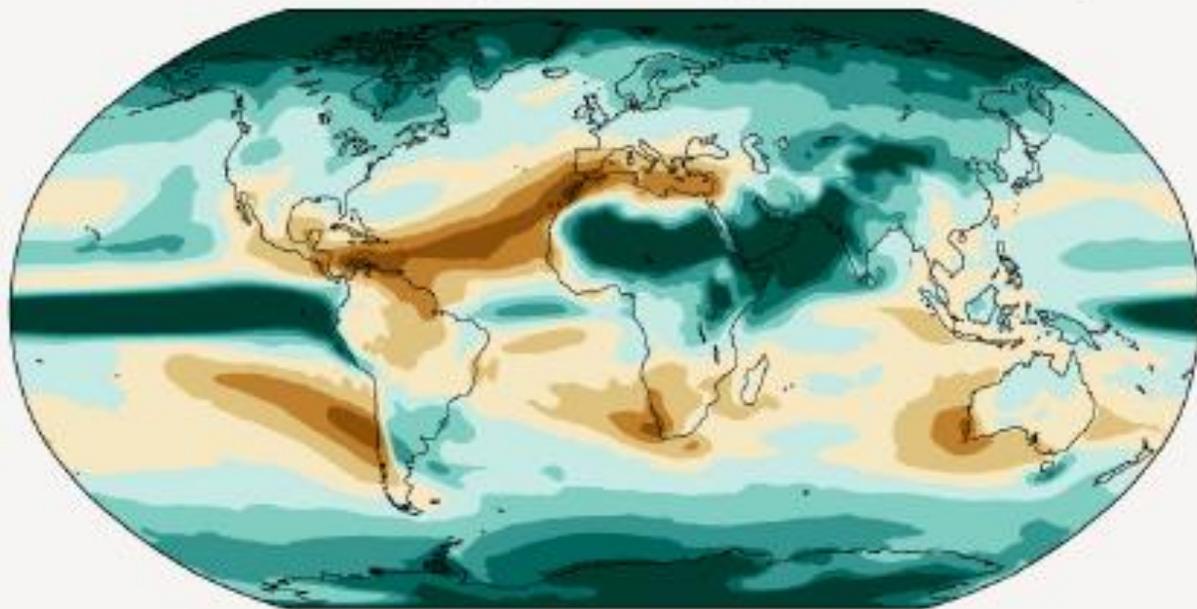


Projected Average Annual Changes at 4°C

Temperature



Precipitation

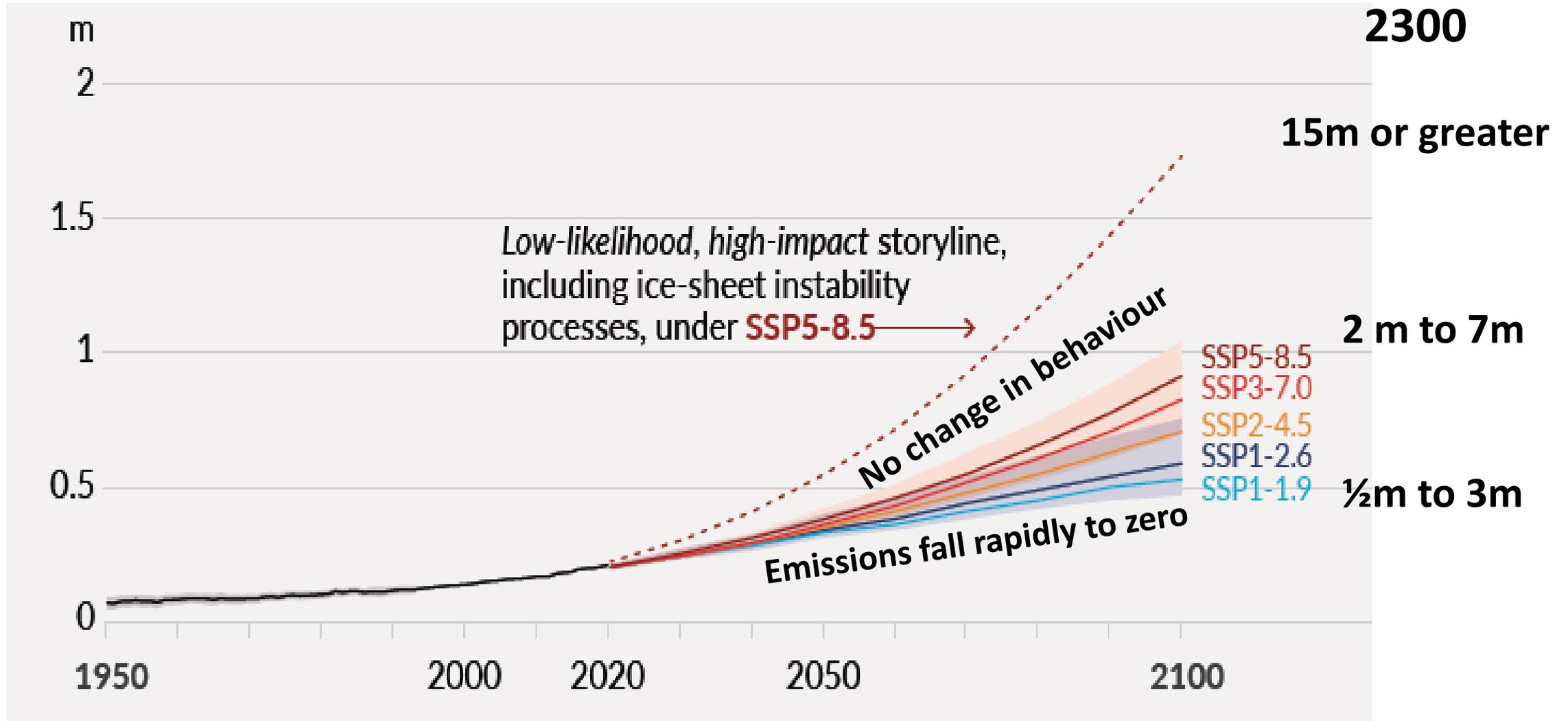


0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 --->

<--- -40 -30 -20 -10 0 10 20 30 40 --->

← Drier Change (%) Wetter →

Global mean sea level relative to 1900



“Tipping Points”

Possibility of jumps or relatively rapid changes in the Earth System:

reduction in West Antarctic Ice Sheet

switch off of Atlantic Overturning Circulation

large release of methane from melting tundra

....

Possible Human Tipping Points due to

rising sea level

too hot to work

staple crops failing

repeated droughts or floods

....

Adapting to climate change

The **devastation** caused by weather/climate events that have been made possible or more likely by climate change is evidence that **there has been little adaptation to a changing climate.**

This problem of **lack of adaptation** is found in **developed & developing countries**, but in the latter it can be crippling.

Depending on our emissions, in some cases
adaptation could be practically impossible.

Wider Context

- growing world population
- increased demand for food, water & energy
- urbanisation
- changing diet
- the biodiversity crisis

Sustainable Development Goals agreed at UN Sep 2015



United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP)

COP21 Paris 2015

- **Paris targets: Temperature rise less than 2°C; ambition not more than 1.5 °C**
- **Nationally Determined Contributions to GHG emission reduction (NDCs) given**
- **Reassessment of NDCs every 5 years**
- **Actual rules for targets vague and confusing**

COP26 Glasgow Nov 2021

Overall, COP26 achieved as much as realistically expected, with some pluses and some minuses.

The crucial tests of all the words spoken and promises made are:

- **Will the global greenhouse gas emission curve reach a maximum by the middle of this decade and be falling rapidly in 2030?**
- **Are the developed countries now going to give substantial help to developing countries to cope with climate change and to pursue low carbon growth?**

COP27 Sharm-el-Sheikh, Egypt 6-18 Nov 2022

Intergovernmental Panel on Climate Change (IPCC)

6th Assessment Report

Working Group 1 Report, Nov 2021

“Unless there are immediate, rapid, and large-scale reductions in greenhouse gas emissions, limiting warming to 1.5°C will be beyond reach.”

Working Group 2 Report, Feb 2022

“The scientific evidence is unequivocal:

climate change is a threat to human wellbeing & the health of the planet.

Any further delay in concerted global action will miss

a brief & rapidly closing window to secure a liveable future.”

Working Group 3 Report, Feb 2022

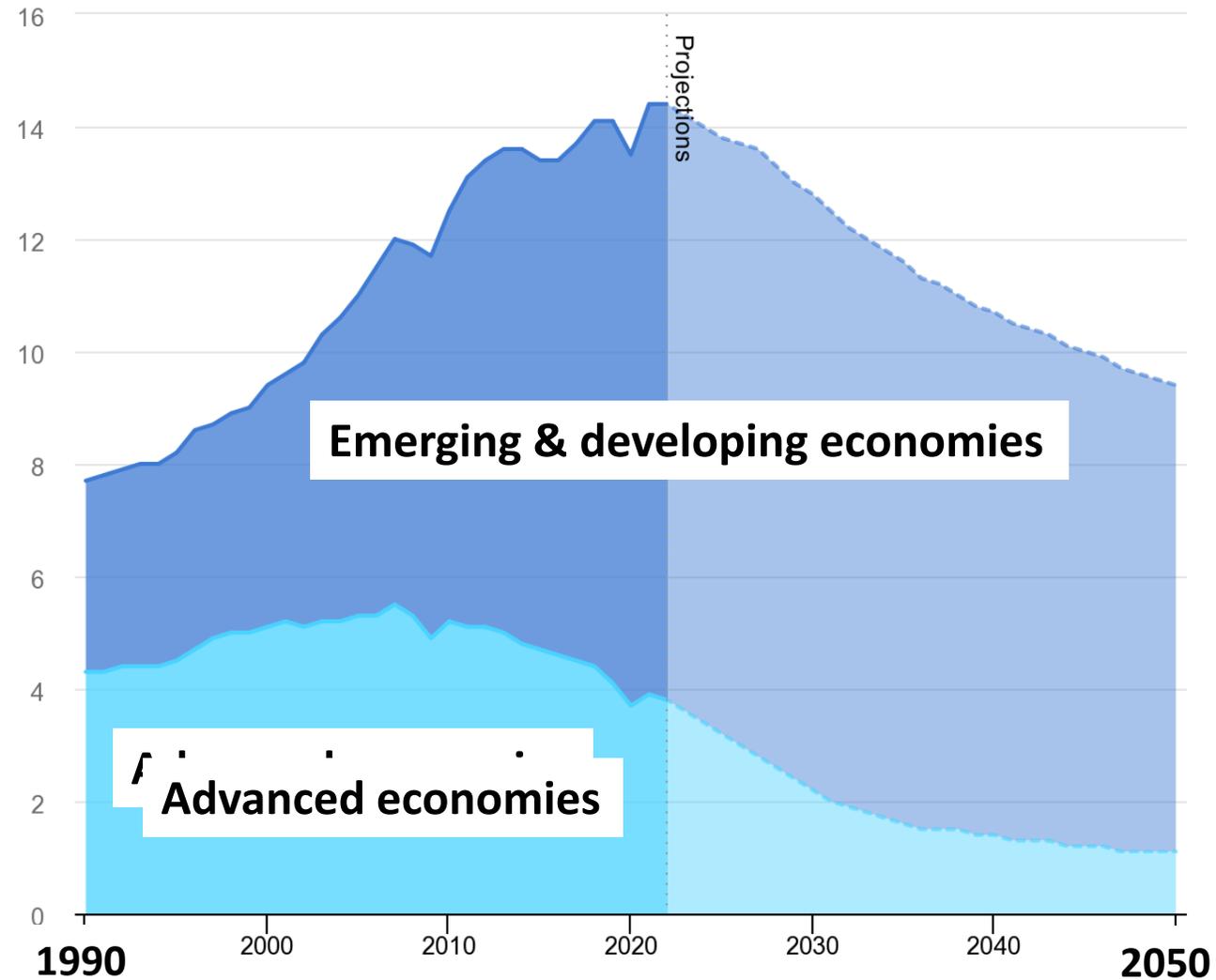
“The evidence is clear: the time for action is now.

We can halve emissions by 2030.”

“It’s now or never.”

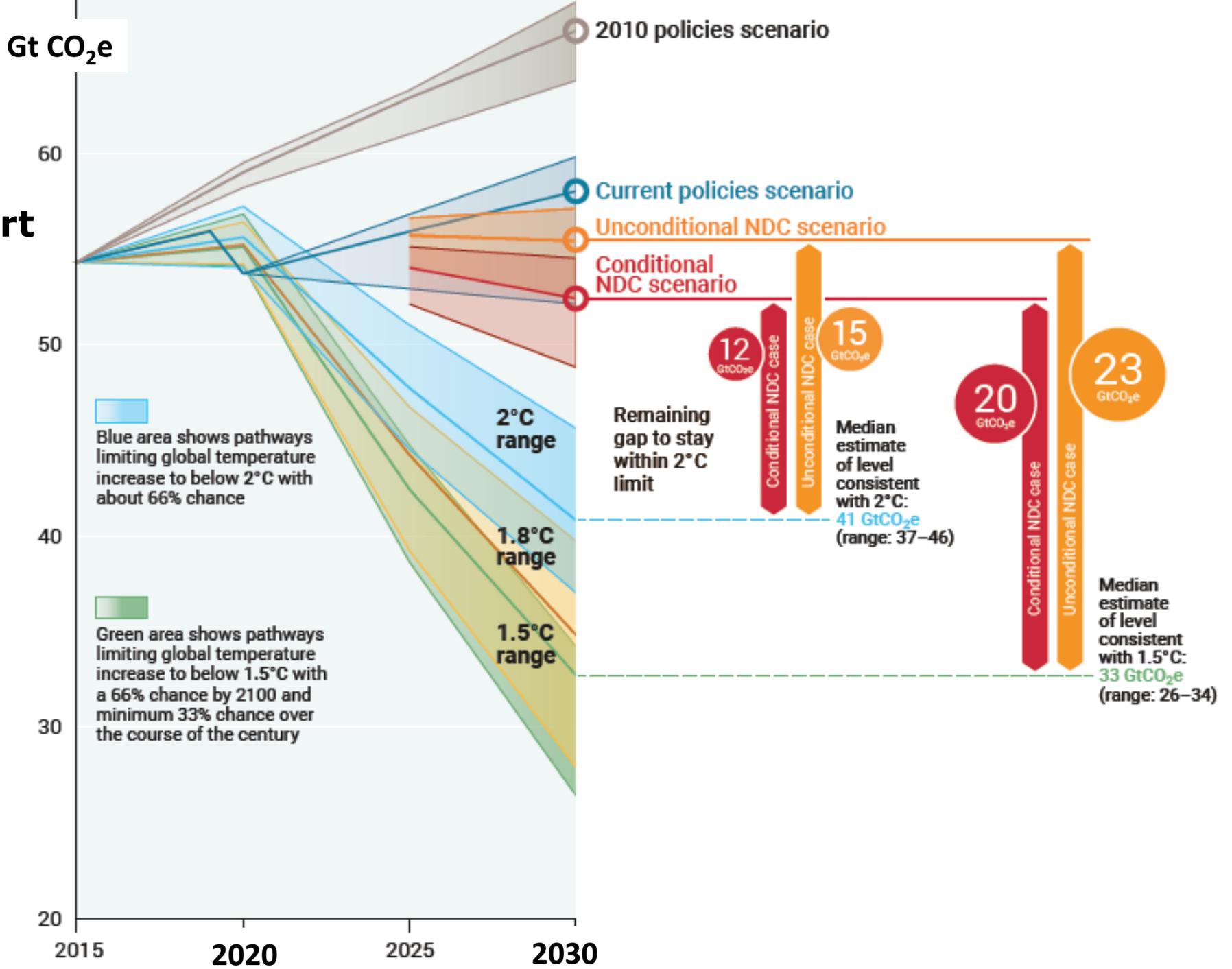
IEA 2022 World Energy Outlook

Power Sector CO2 Emissions 1990-2050



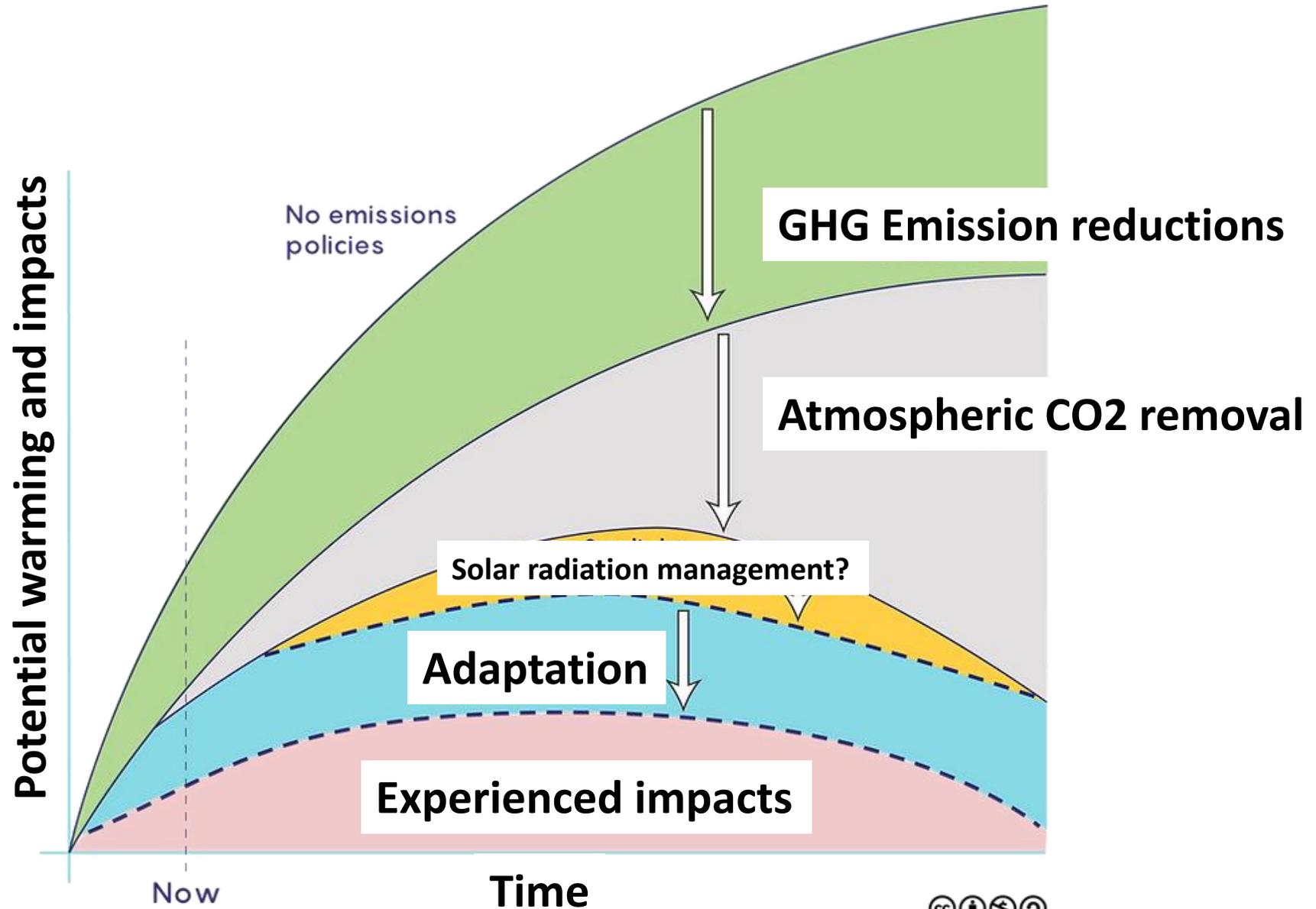
UNEP Emissions Gap Report Oct 2022

GHG emission scenarios



Possible Complimentary Approaches to Reduce Climate Impacts

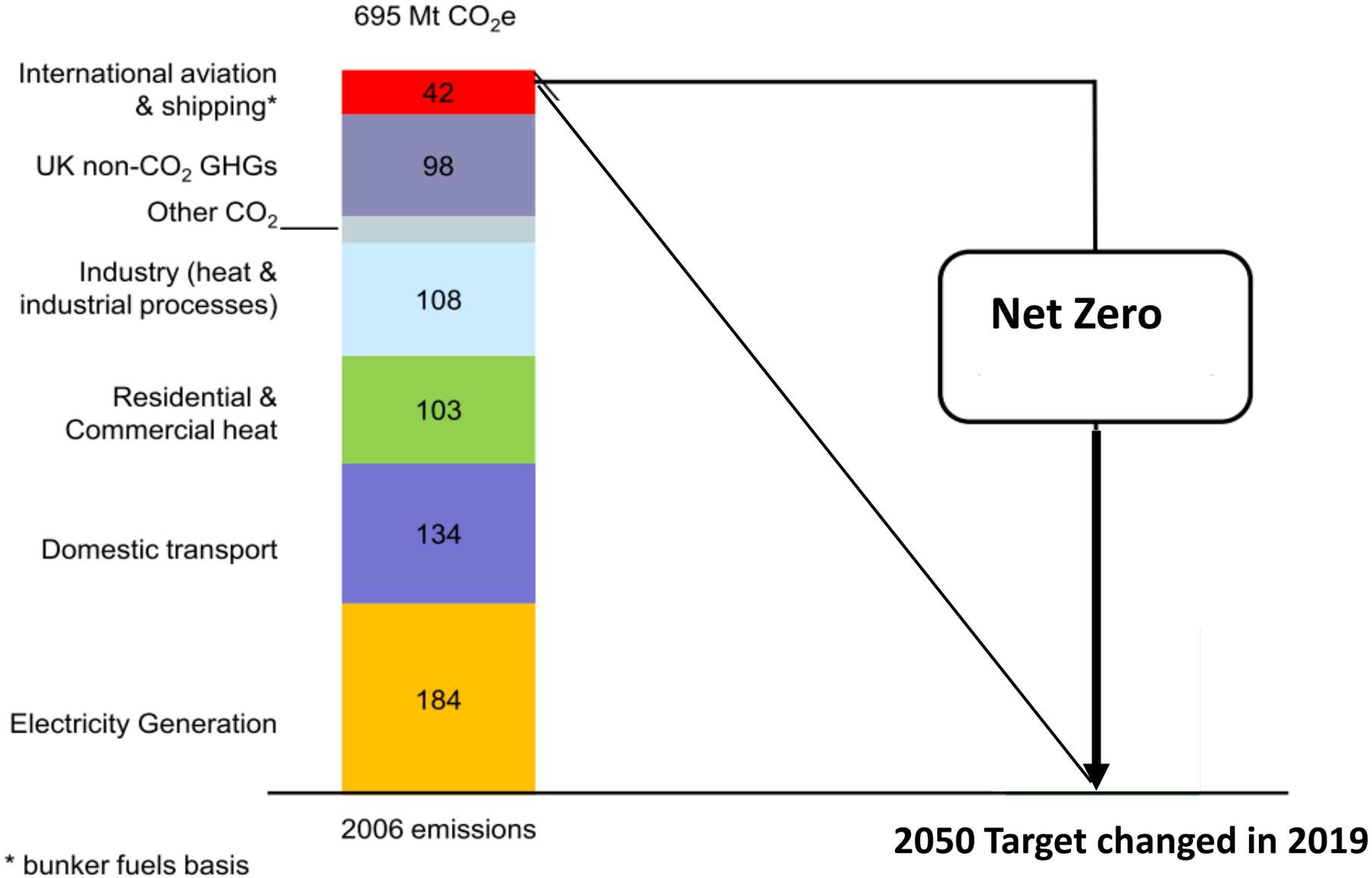
Overshoot
Commision
2022



Source: based on Long and Shepherd 2014



UK emissions by sector in 2006 & 2050 target



We can avert climate catastrophe

Will we avert climate catastrophe?

Climate change is visible & damaging

Amazing developments in technology

Sustainable technology seen as the future:

consumer demand

commercial opportunities

ideal for developing countries

Investment drive

Emission reduction commitments in most countries

Peer pressure

World leadership opportunity

Public concern & demand that the issue be tackled

Rise of populism

Selfishness of people & countries

Vested interests

Money & influence in old industries

Focus on the short-term

and on GDP growth

Economic problems

Earth rise 24 Dec 1968



The UNEP Emissions Gap Report, 9 Nov 2021

2100 WARMING PROJECTIONS

Emissions and expected warming based on pledges and current policies



Nov 2021 update

