

**BREAKTHROUGH**  
INSTITUTE

**CarbonBrief**  
CLEAR ON CLIMATE

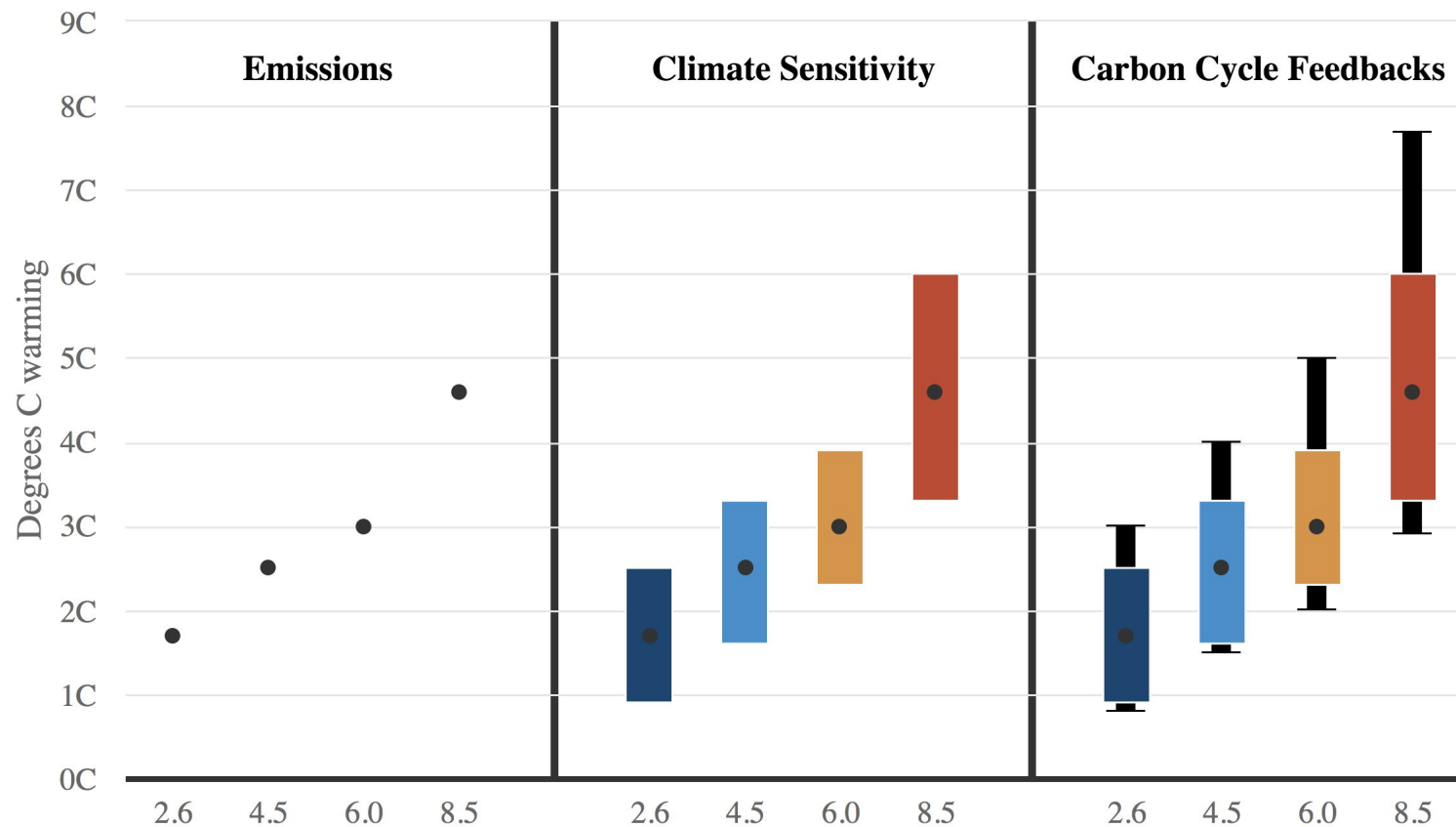
**BERKELEY EARTH**

**The Magnitude of the Challenge:**  
Where we are headed and what's needed to  
meet Paris Agreement goals

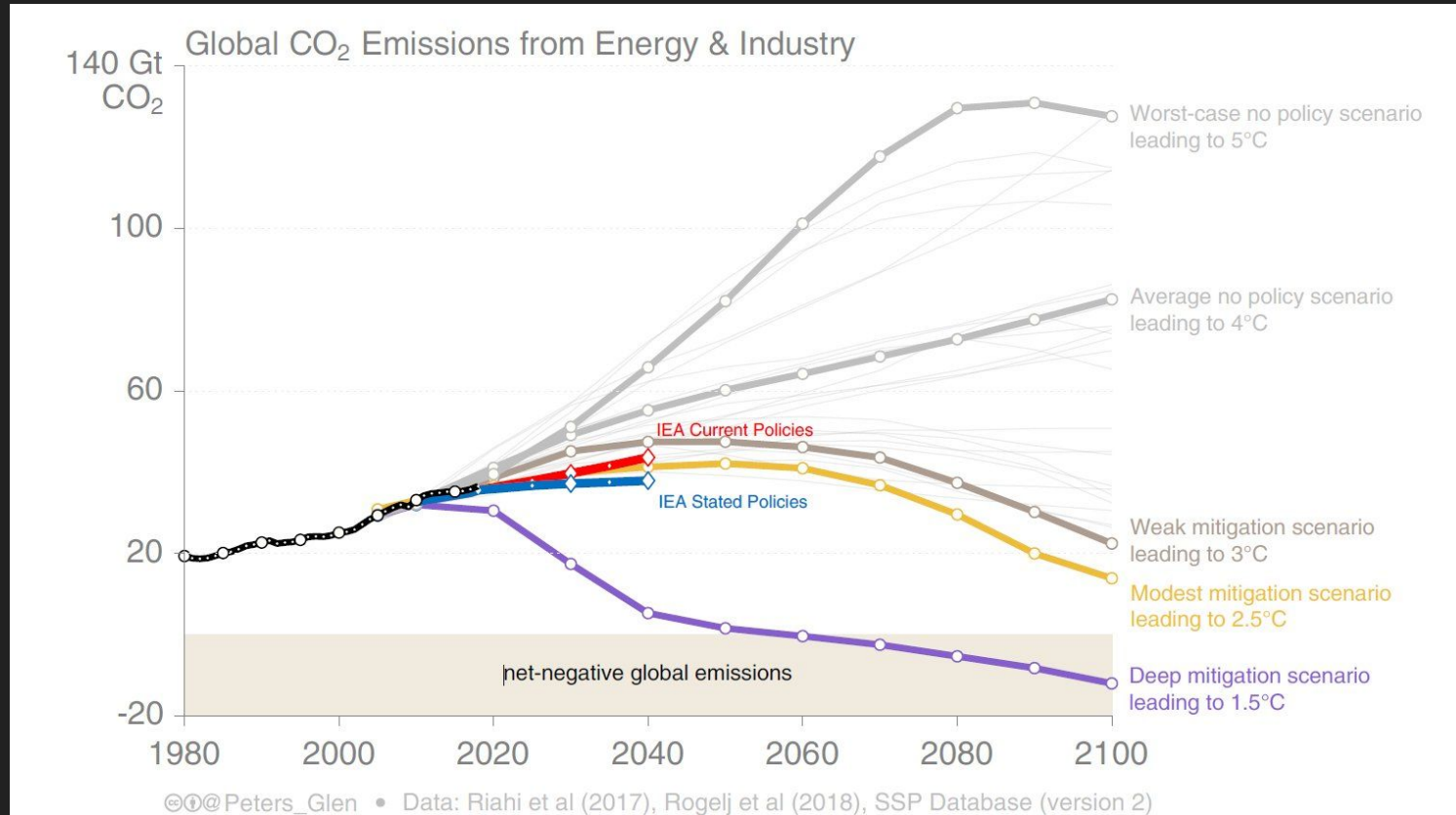
Zeke Hausfather  
February 25<sup>th</sup>, 2021

# Three sources of uncertainty in projecting future warming

End of century warming (2091-2100) compared to preindustrial (1861-1899) in CMIP5 models

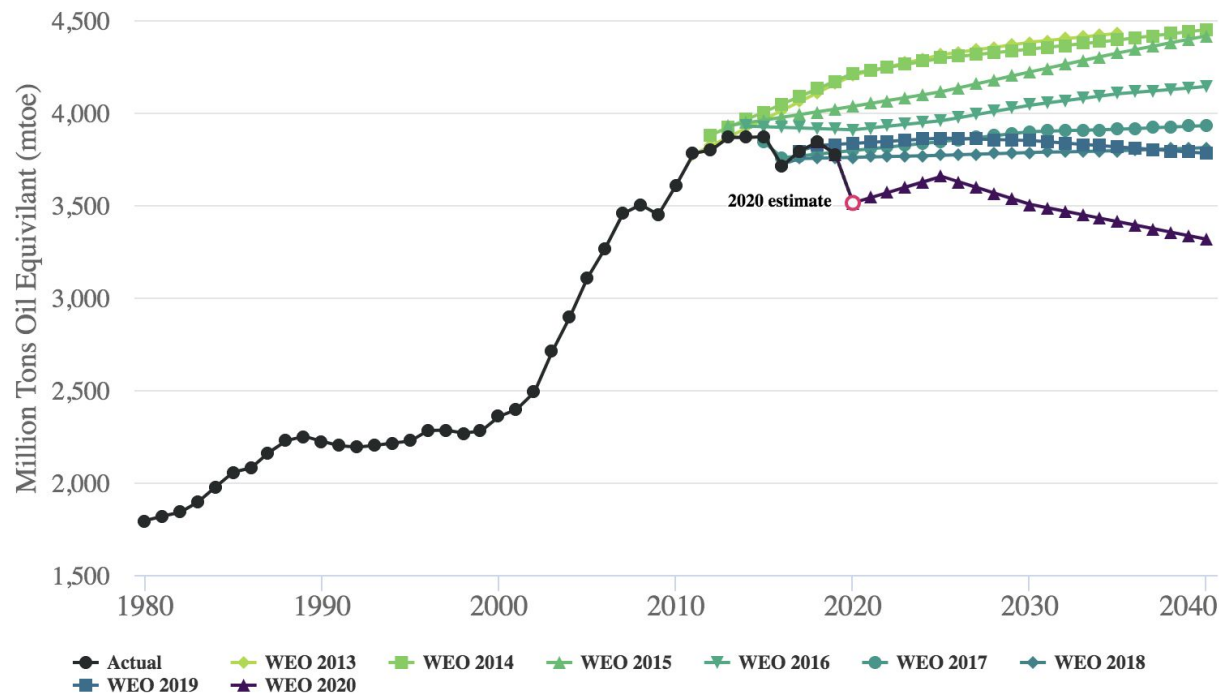


# What is likely going forward?



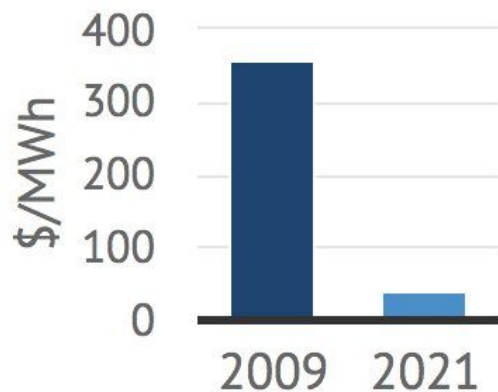
# Global coal use has peaked and is in structural decline

Global Coal Use – Actual and WEO Forecasts from 2013-2020

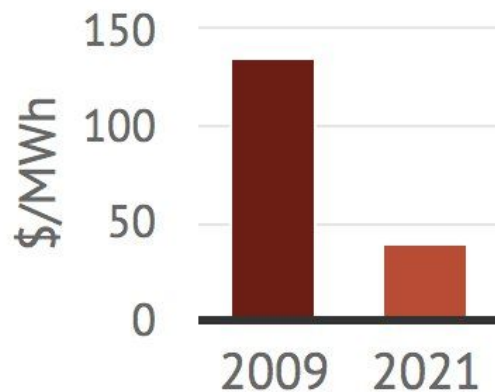


# Clean energy has become cheap

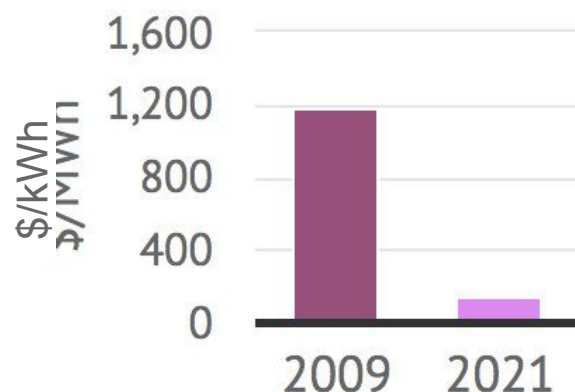
Solar



Wind



Batteries

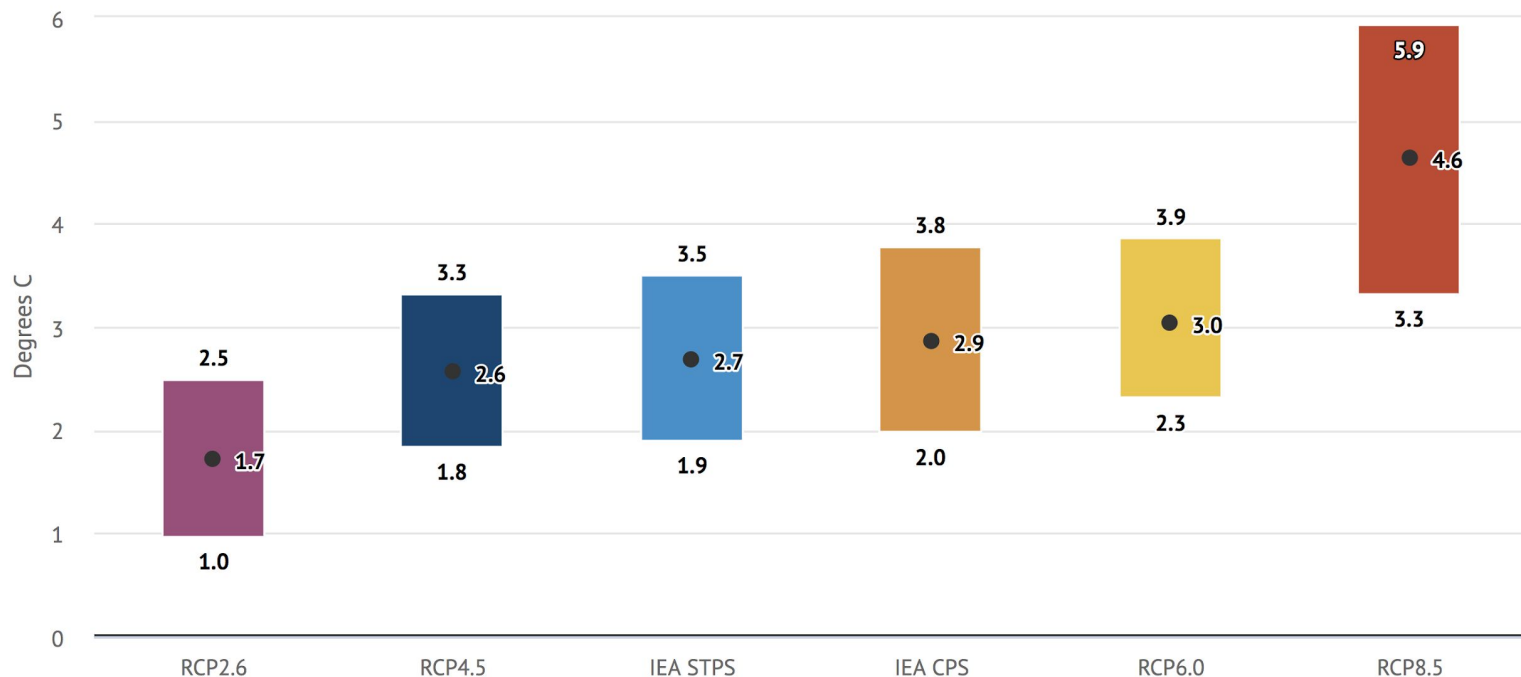


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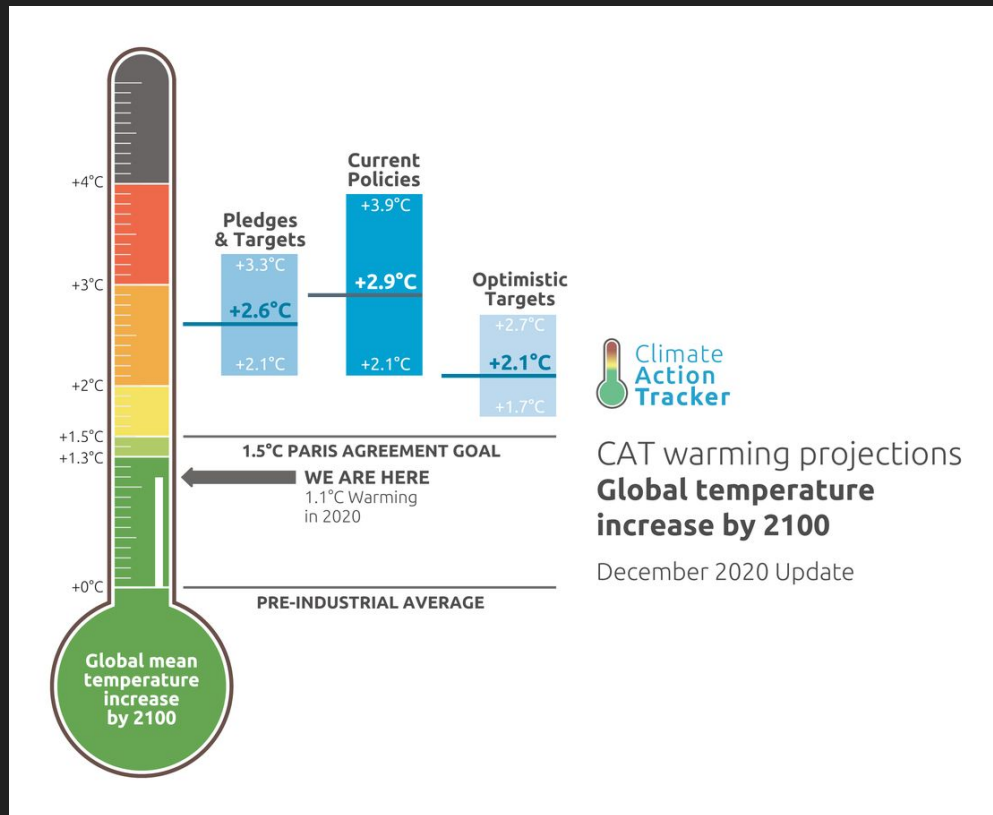
# Current policies results in around 3C warming

Warming in RCP and IEA scenarios between 1880-1900 and 2090-2100.

IEA scenarios are extended through 2100 by assuming constant CO2 emissions after 2040.



# New net-zero commitments get us down close to 2C

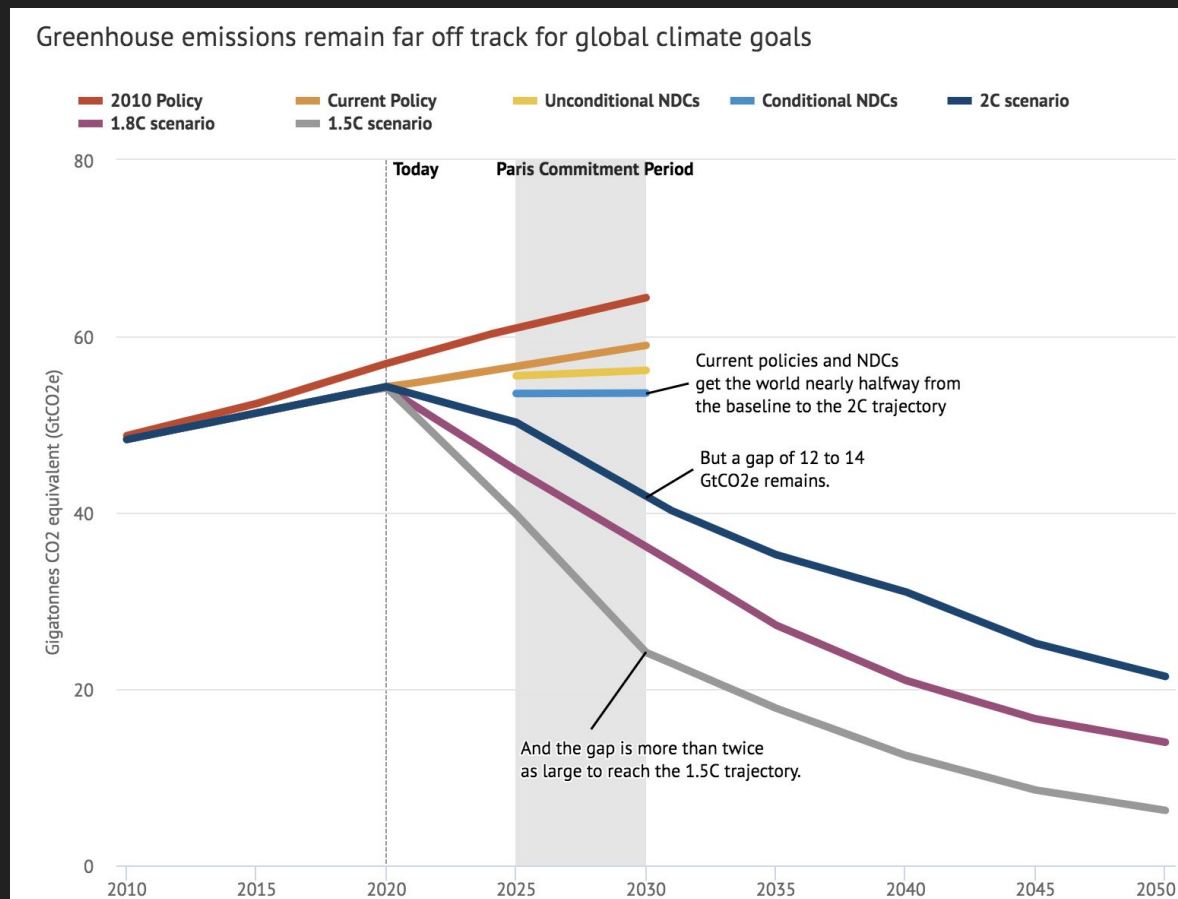


Climate Action  
Tracker, 2020

However, commitments in many countries yet to be translated into short-to-medium-term policy

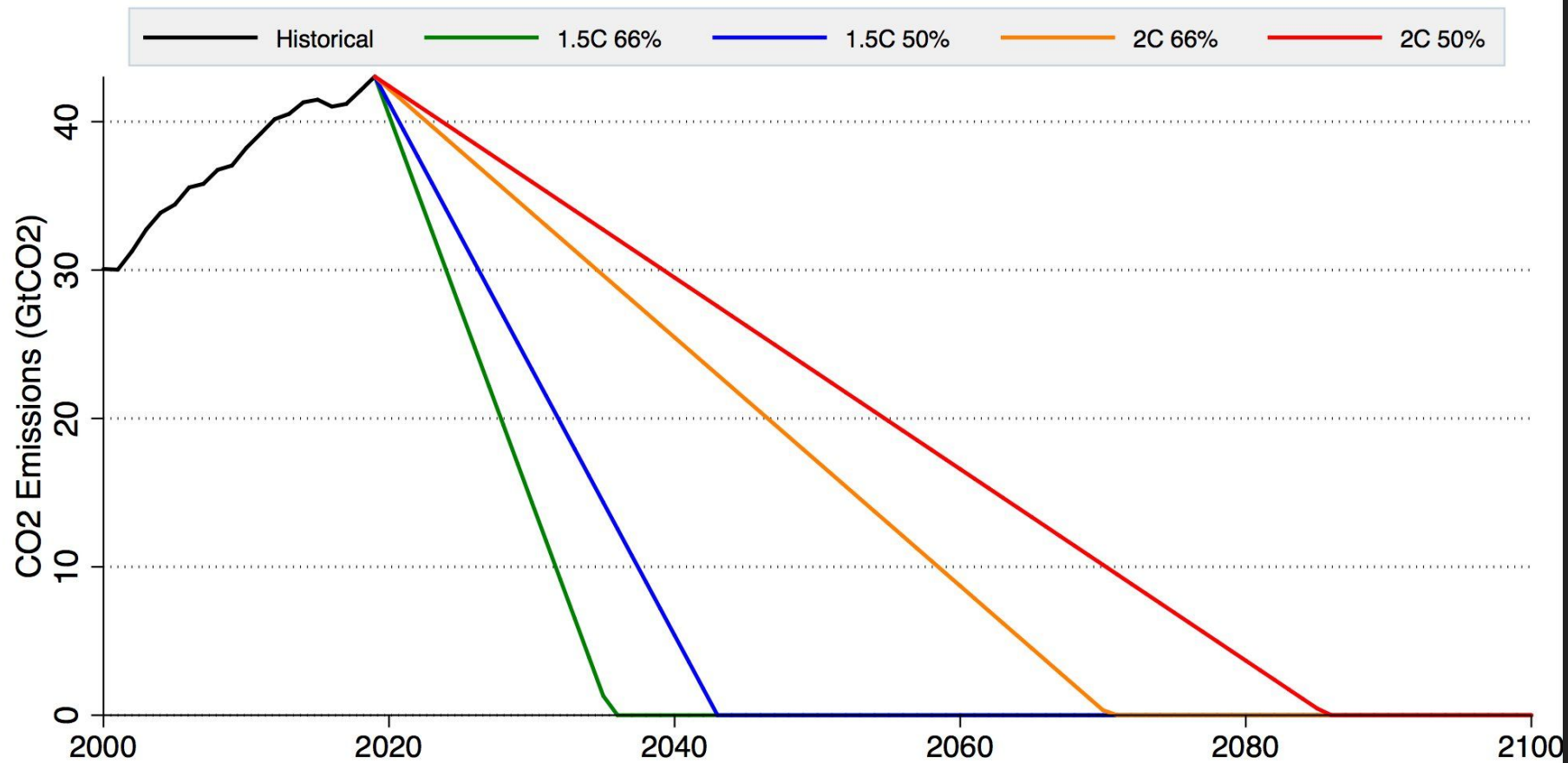


# Large gap between near-term commitments and <2C

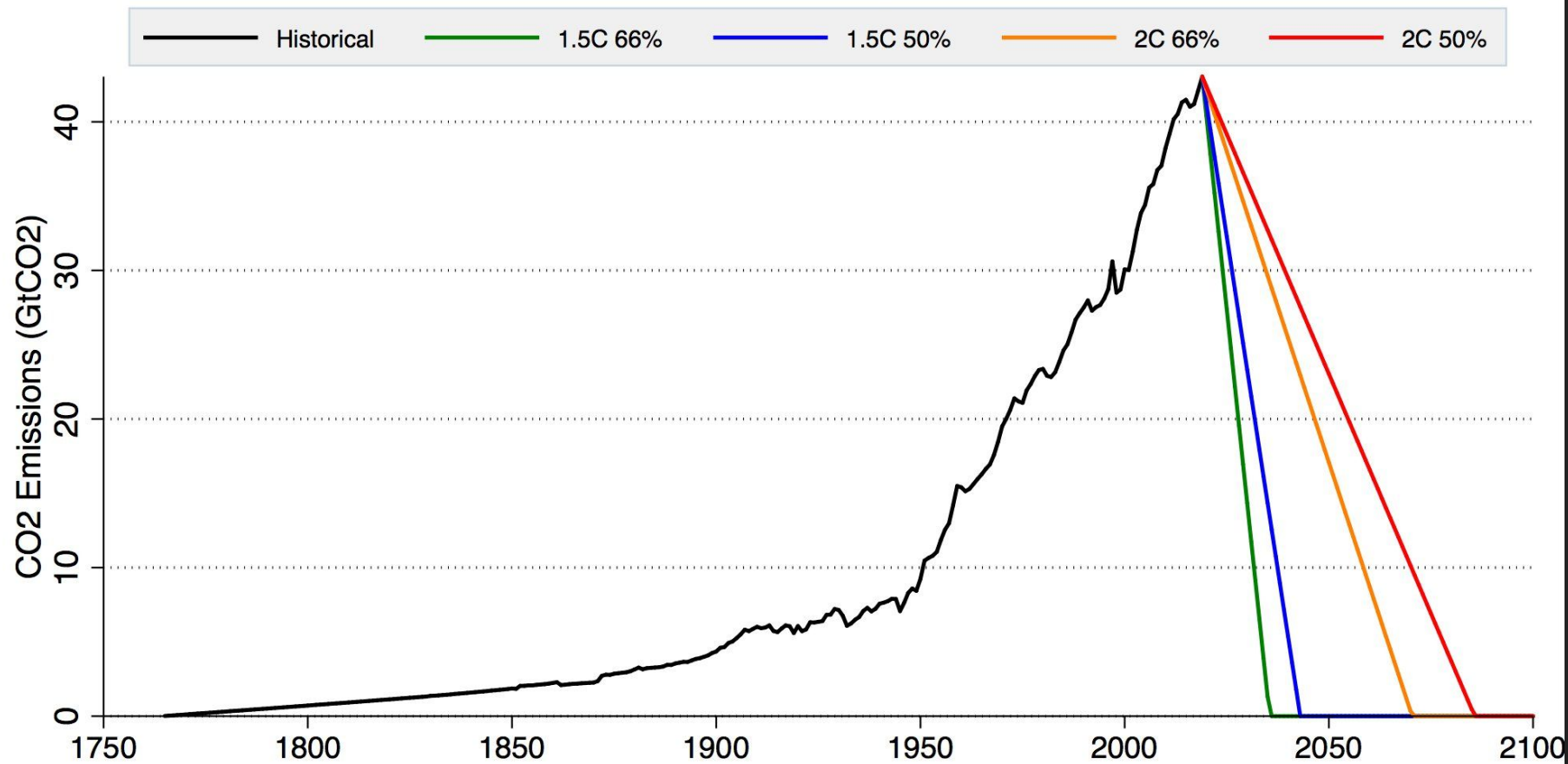




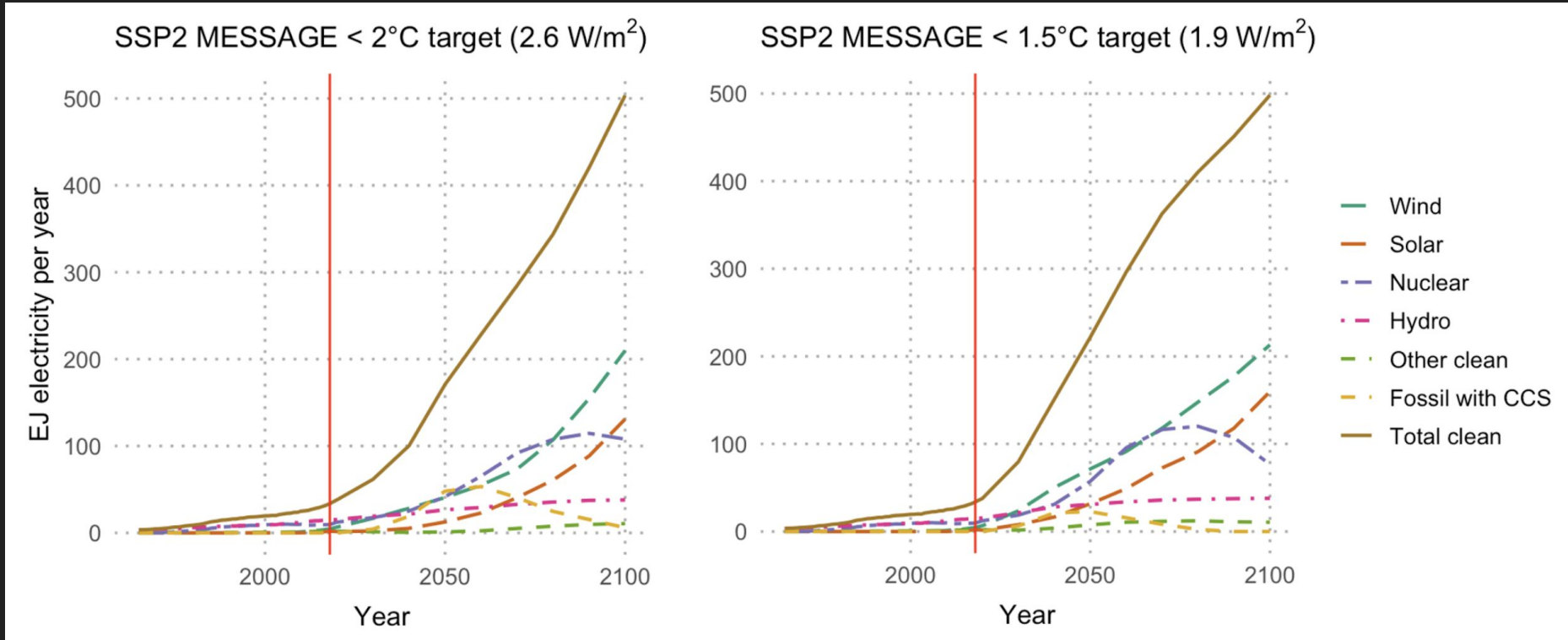
## Simplified Emissions Pathways for Climate Targets



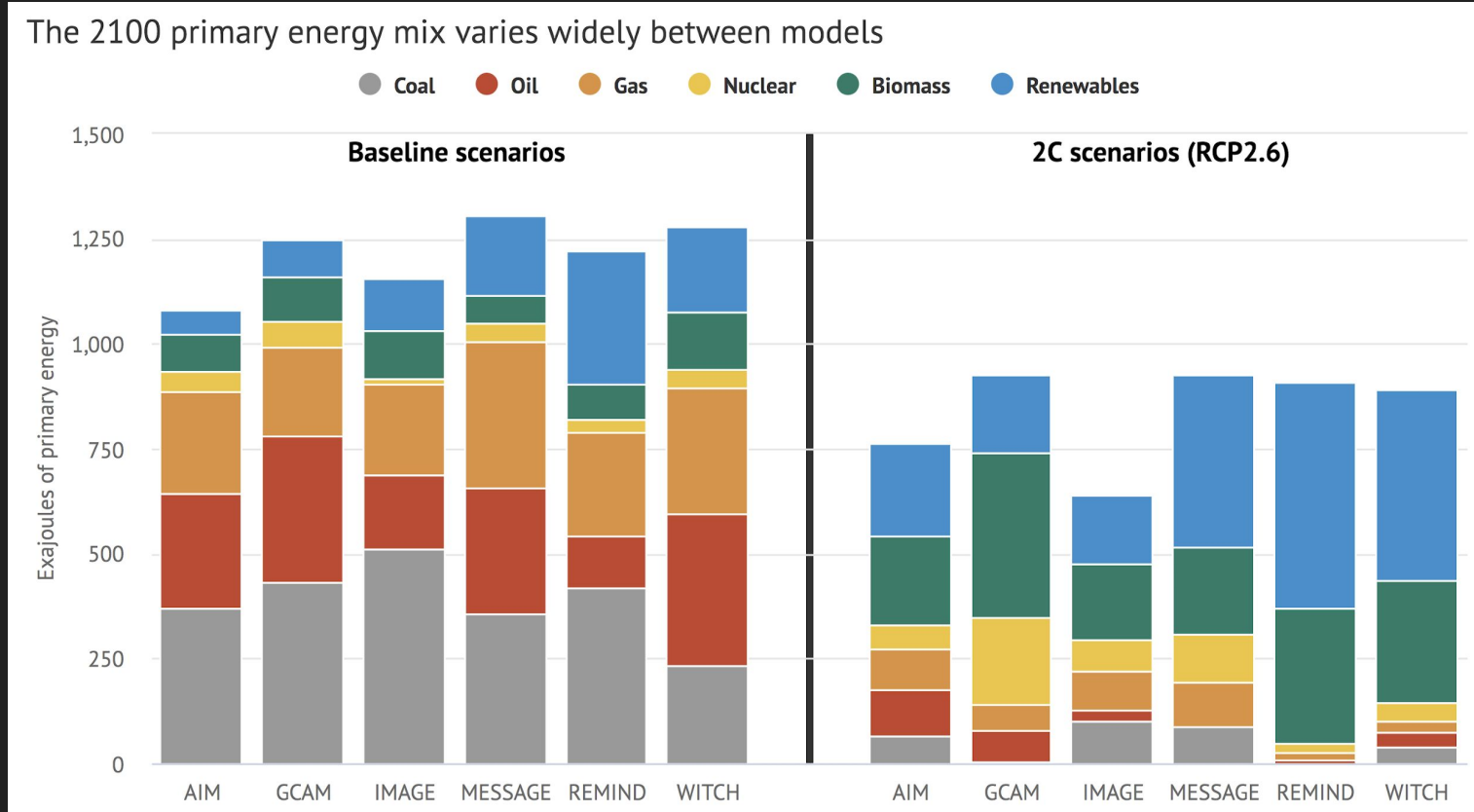
## Simplified Emissions Pathways for Climate Targets



# Planning ahead for the narwhal curve



# Many possible energy futures



# Takeaways

- High warming scenarios based on high emissions pathways have become much less plausible over the past decade due in part to successes in making clean energy cheap.
- However, the world is still on track for around 3C warming with current policies, and uncertainties in both climate sensitivity and carbon cycle feedbacks mean that we still cannot rule out 4C.
- Substantial additional emissions reductions are required to limit warming to well-below 2C, and technology will not accomplish it alone. New net-zero commitments are encouraging, but need to be supported with near-term policy.

# Thanks!

## Questions?

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