



decisions with confidence

Decarbonisation - How are we tracking?

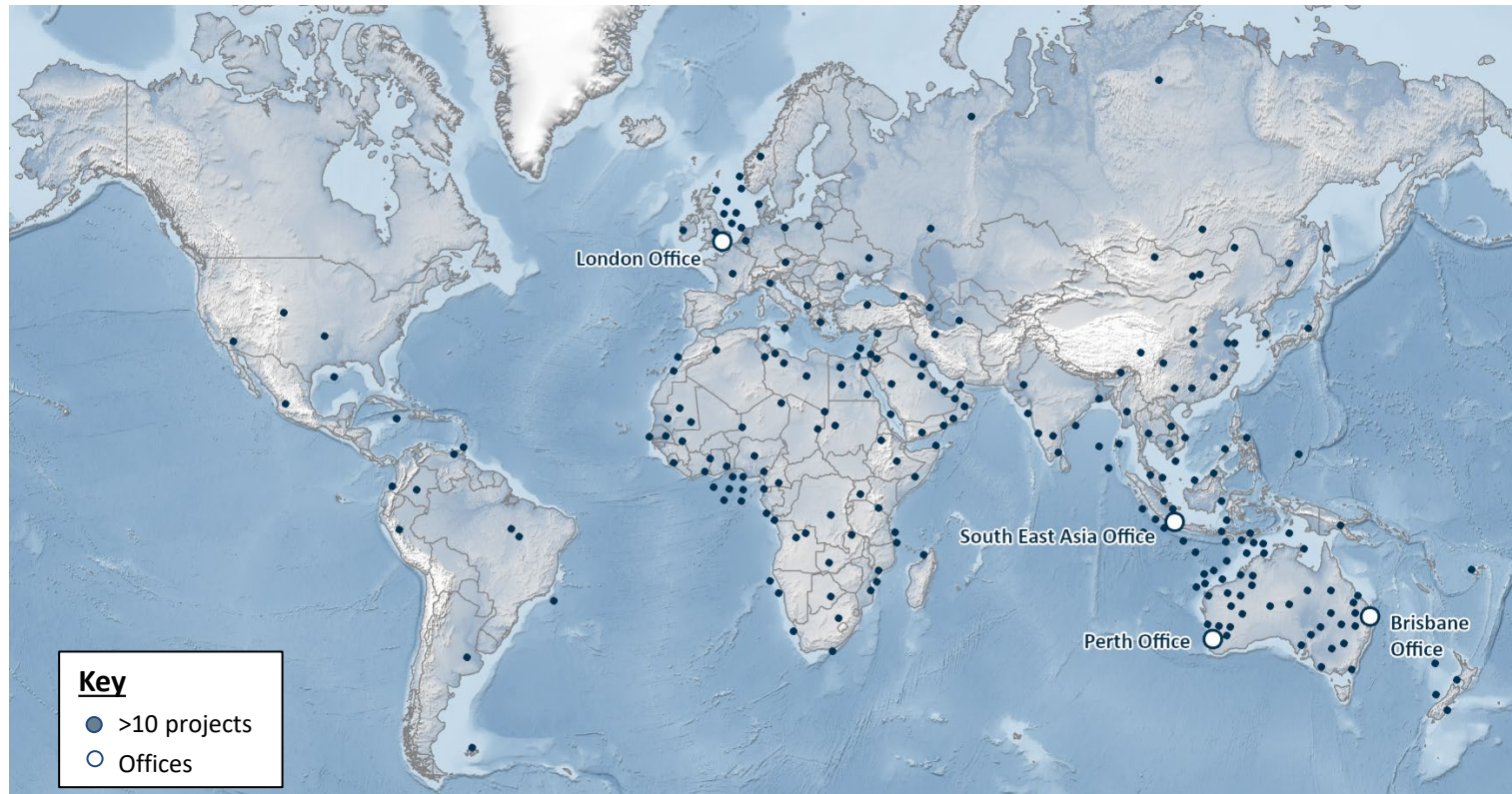
H₂o_{pe}, H₂y_{pe}, CH₄o_{ices} and CO₂n_{sequences}



Who we are



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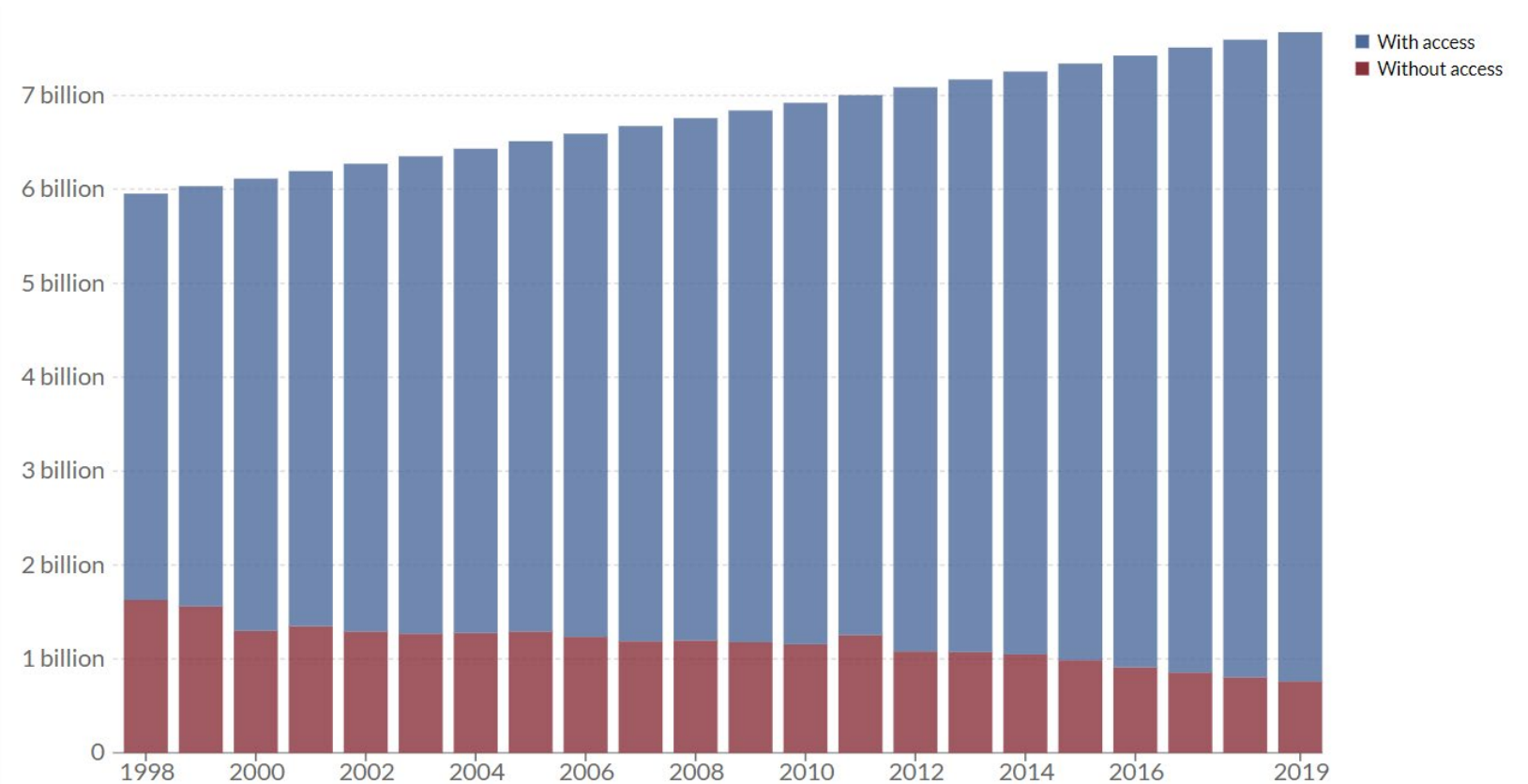
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Energy Security – nearly a success?

In 2015 the number of people without electricity fell below 1 billion for the first time since the world population exceeded 1 billion (1805).

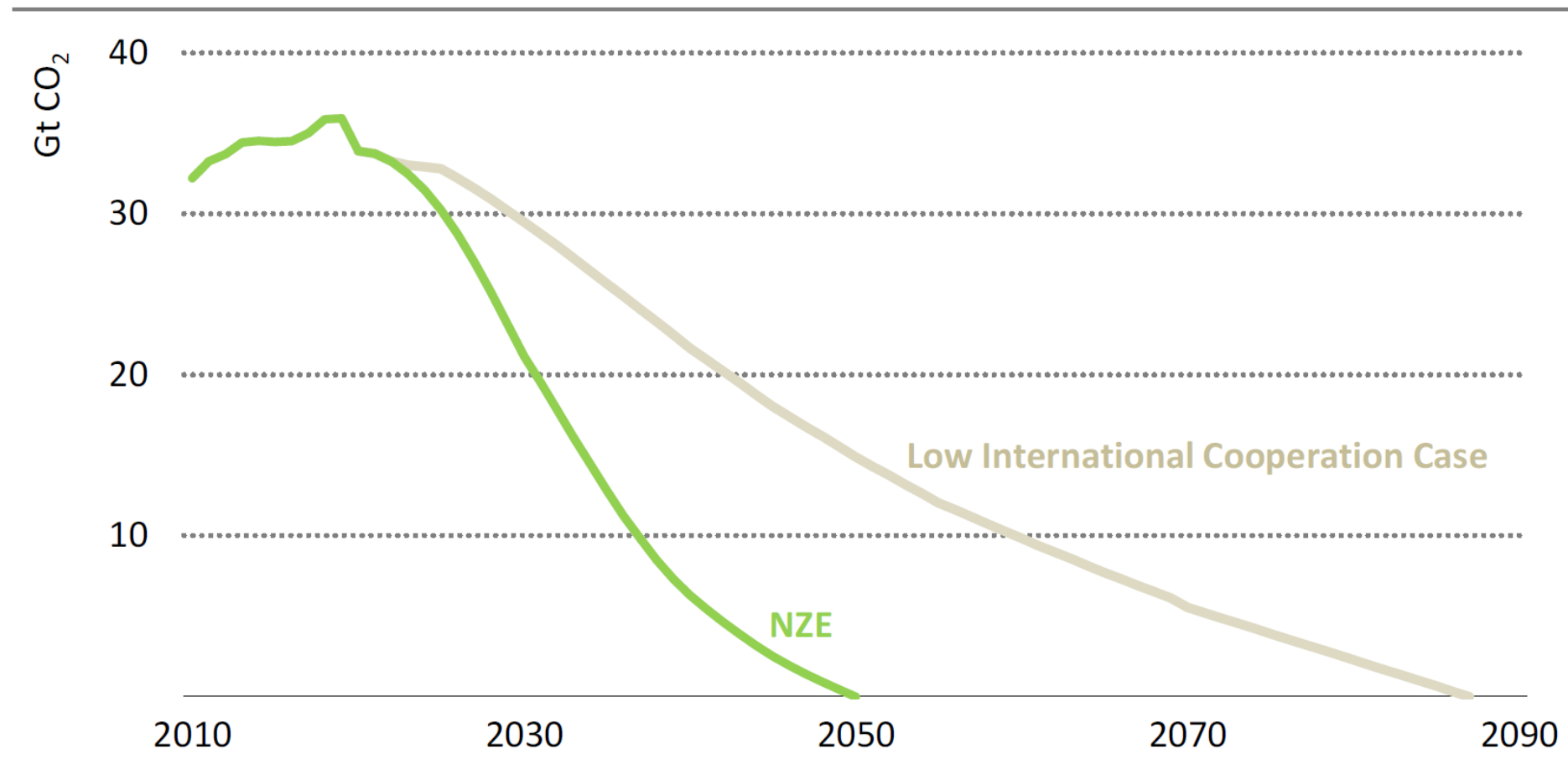
- For most of the 19th century 100% of the world's population lived without electricity.
- During the 20th century this figure fell steadily.
- At the turn of this century around 20% of the world's population did not have access to electricity.
- In 2019 that figure fell below 10%.



Source: Calculated by Our World in Data based on data published by the World Bank

OurWorldInData.org/energy • CC BY

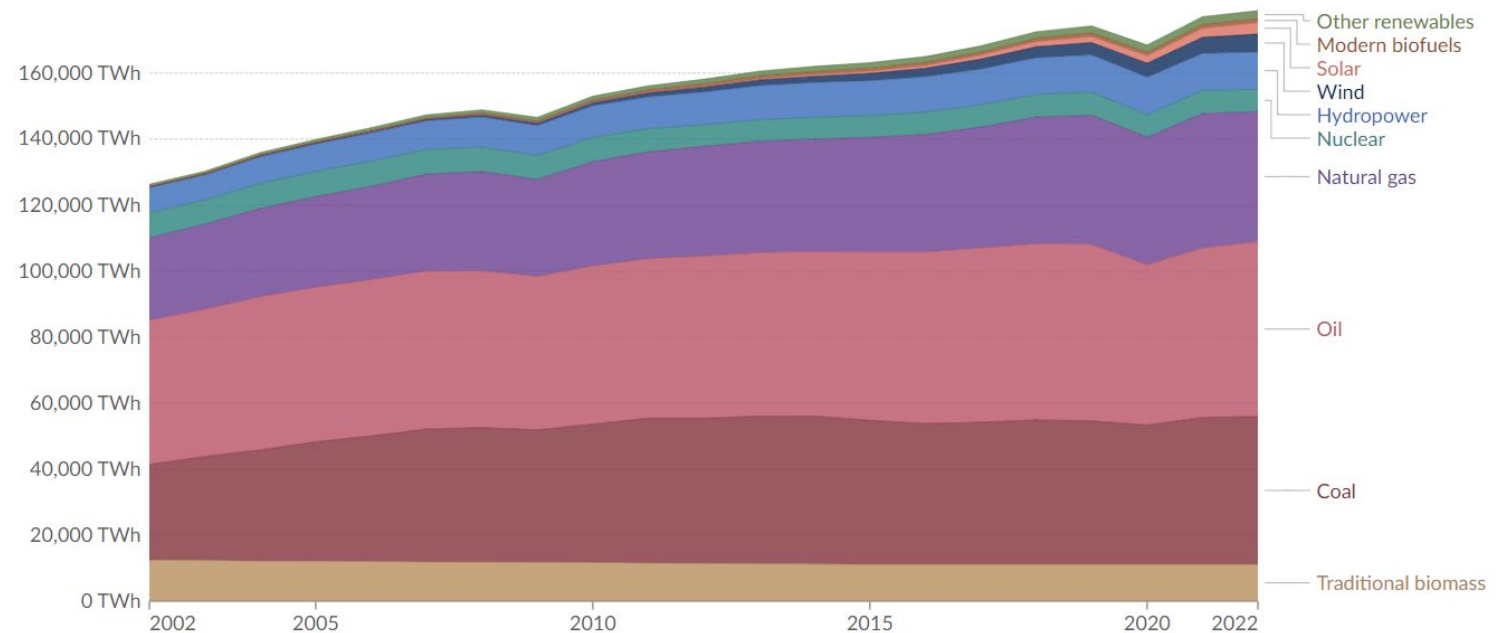
Global energy-related CO₂ emissions in the net zero pathway and Low International Co-operation Case



Choices: What is happening with energy consumption

In the last 20 years....

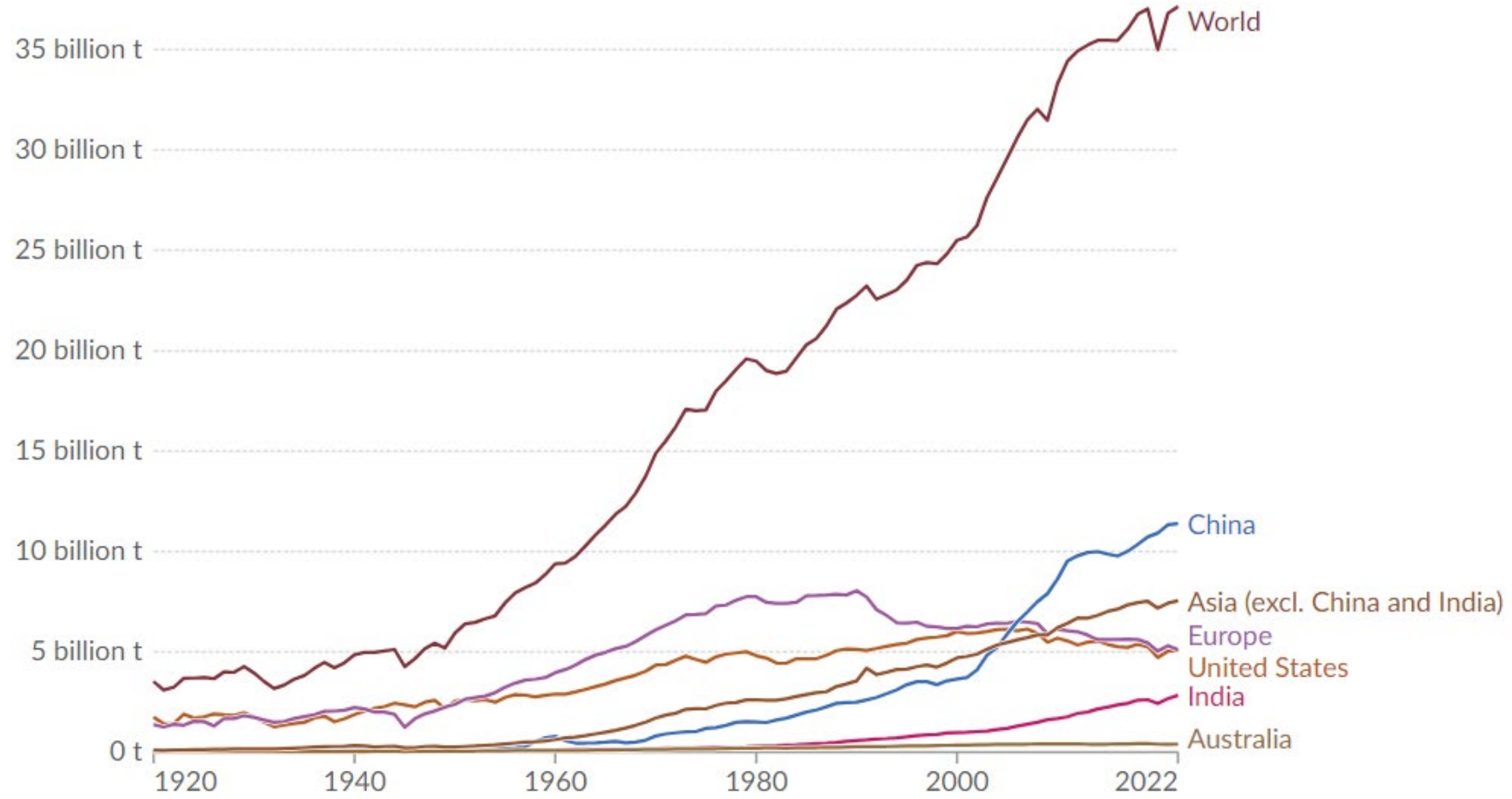
- Energy consumption increased by 42%
- Wind increased 36 times (3,500%)
 - 153 TWh to 5,500 TWh
- Solar increased by 690 times (68,000%)
 - 5 TWh to 3,500 TWh
- Hydro increased by 47%
 - 7,600 TWh to 11,300 TWh
- Gas increased by 57%
 - 25,700 TWh to 40,000 TWh
- Oil increased by 20%
 - 43,700 TWh to 53,000 TWh
- Coal increased by 55%
 - 29,000 TWh to 44,900 TWh



Energy Institute - Statistical Review of World Energy (2023), Smil (2017) - with major processing by Our World in Data

Consequences: Global emissions have continued to climb over several generations and it's unclear that we have yet peaked

- Annual CO₂ emissions (excl. land-use)

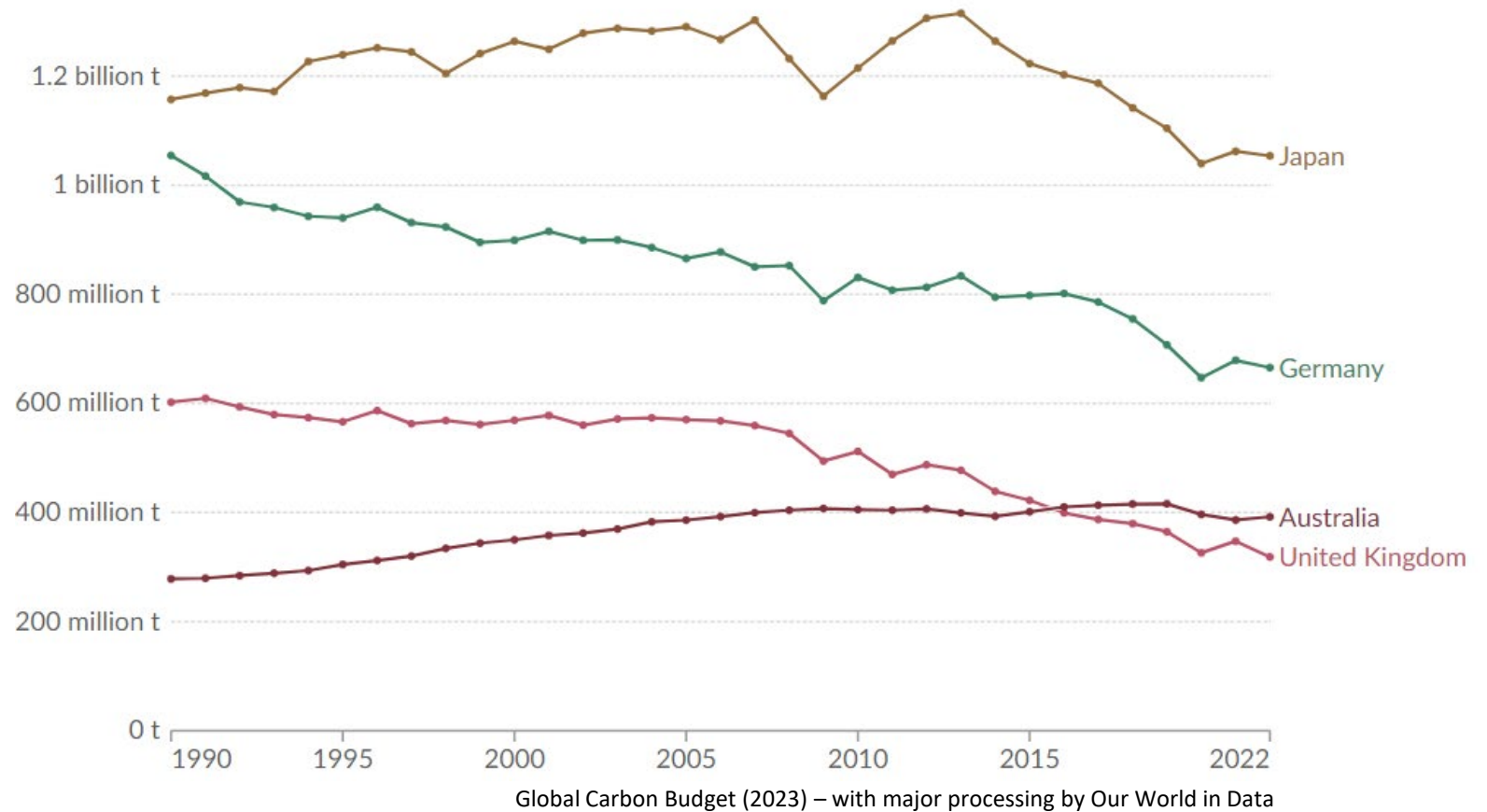


Global Carbon Budget (2023) – with major processing by Our World in Data

The developed world is lowering emissions...slowly

Australia has lowered emissions but hasn't lowered its emissions as much as some..

- Australia is starting to reduce emissions, but it lags most of the rest of the developed world
- The UK has reduced its reliance on coal from 40% to less than 2% in the last decade.
 - Gas steady (~40%)
 - The UK has also reduced demand by 15% (energy efficiency measures)
- Australia now emits more than the UK but has only 40% of the population



How are we tracking against the 2016 Paris Agreement...

The Climate Action Tracker (CAT) – not for profit project tracking measures and actions.

- No country compatible with Paris
- 9 small emitters “almost sufficient”
- Most countries “insufficient”



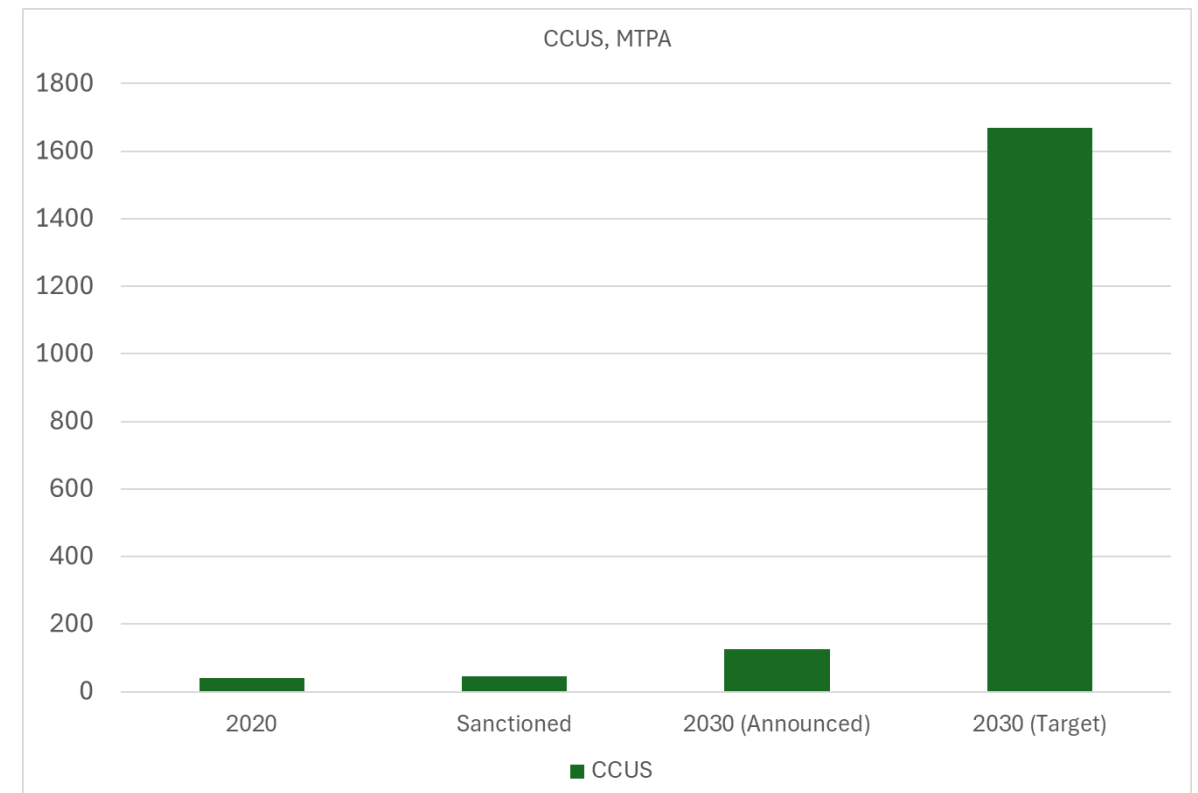
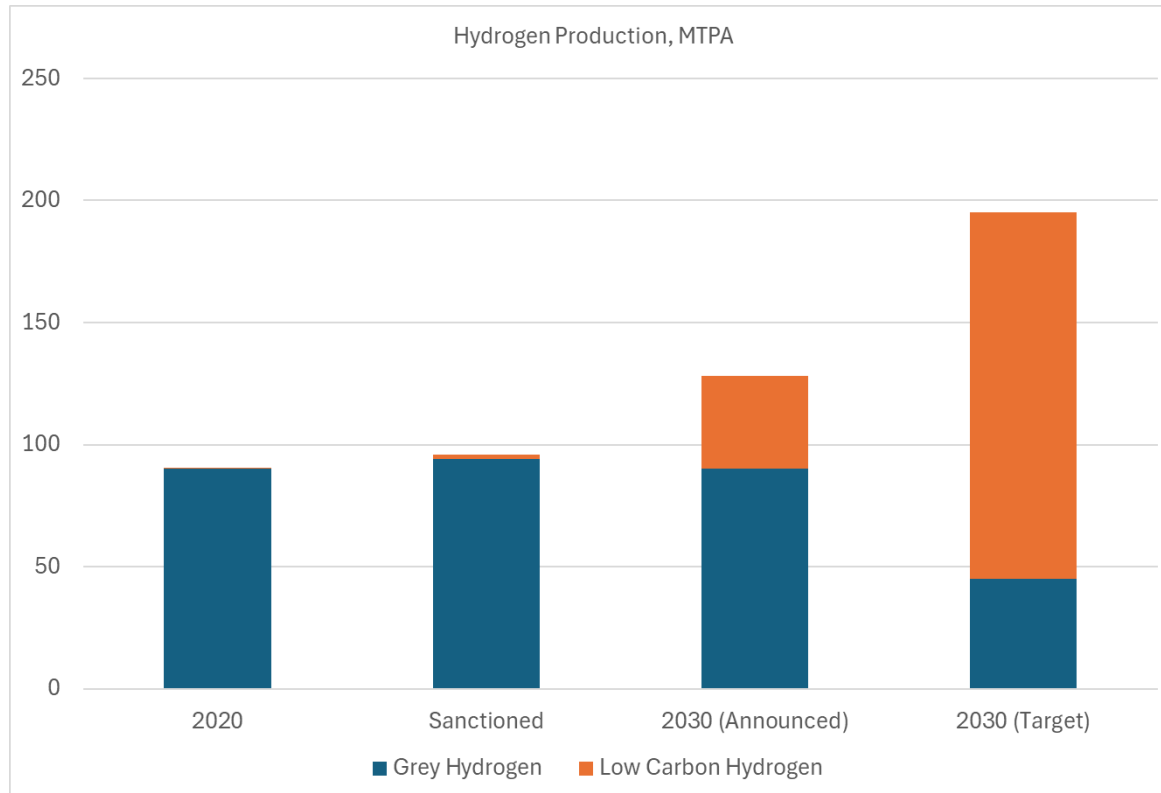
Climate Analytics and NewClimate Institute April 2024
Copyright: Climate Action Tracker

Getting to Net Zero requires much more than most people realise

- Universal access to sustainable energy achieved by 2030.
- Solar PV and wind are the leading sources of electricity generation (globally) before 2030.
- Major reduction (75%) in coal-fired power generation by 2030.
- Commercialisation of new technologies has to happen faster than it has ever done before
 - Less than 10 years instead of the historical 10-30 years for the most rapidly developed new technologies.
- Over 50% of passenger vehicles sold, and 30% of medium-heavy-duty trucks are electric or use hydrogen.
- There is significant behavioural change:
 - Avoid 75% of long-haul flights.
 - No flights of less than 1 hour.
 - Reduce space heating temp (3C)
 - Increase A-C temp (3C)
 - Slower driving (7km/h)
 - Share all urban car trips (or use public transport more)
 - Do not take any car trips that would take less than 10 minutes to cycle.

Commercialisation of new technologies – Hydrogen and CCUS

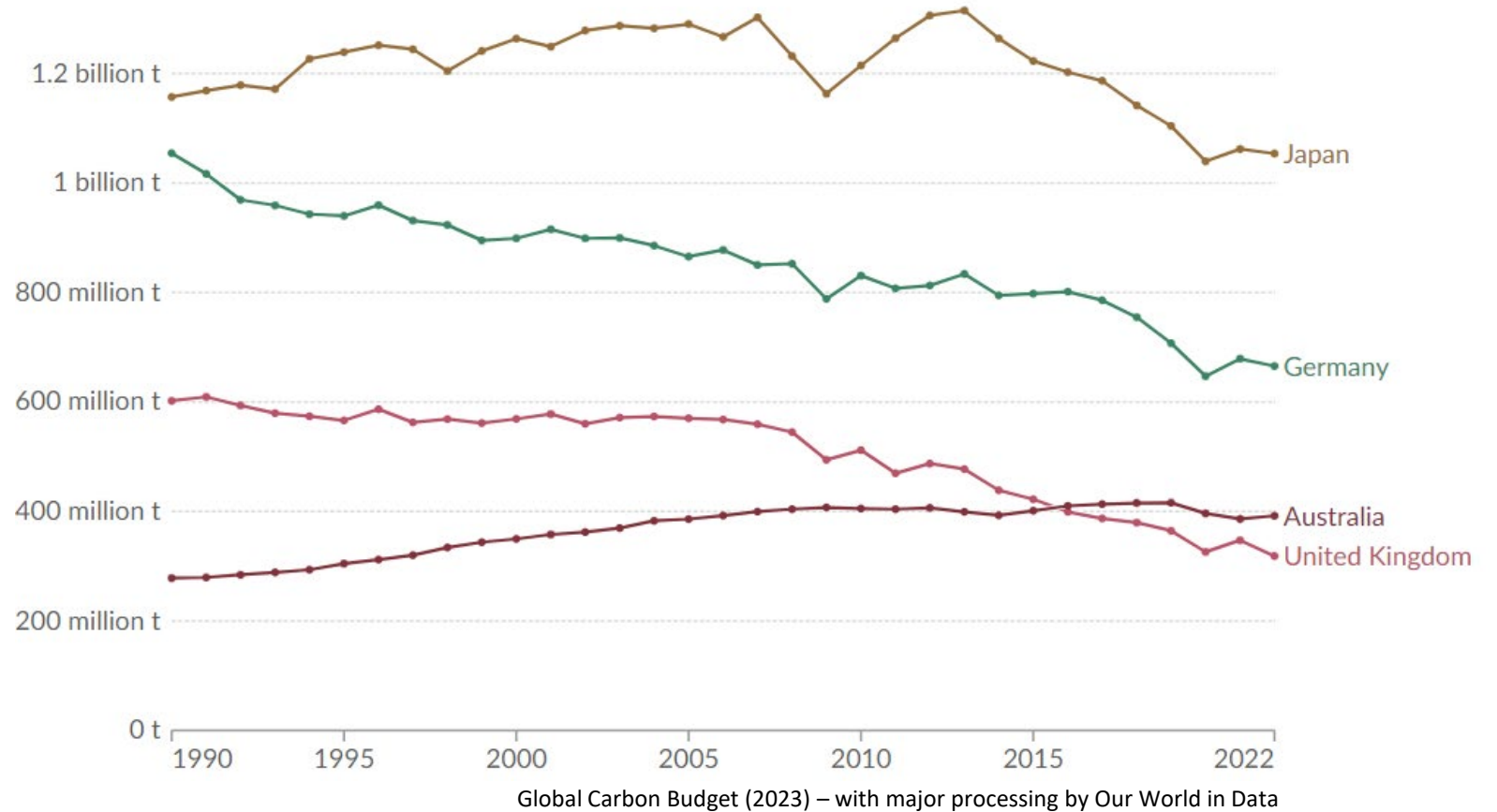
Neither Hydrogen nor CCUS are on track to meet IEA projected requirements



What can we do?


Significant reductions can be achieved relatively easily

- February 2024: the UK government announced that it was the first major economy to halve its emissions (1990-2023)
 - Renewable energy rose from 7% to ~50%.
 - Gas use remained steady
- Between 2011-2020 the UK reduced its coal-fired power generation from coal from 40% to <2%.
 - Renewable energy rose from 7% to ~50%.
 - Gas use remained steady
- Australia relies on coal for over 50% of its power generation.
 - We could halve our emissions by getting coal out of the power generation mix.



Is our message finally being heard?

- This slide was repeated 5 times in the AEMO “Draft 2024 Integrated System plan” presentation in December 2023.

 *Renewable energy connected with transmission, **firmed with storage and backed up by gas-powered generation** is the lowest cost way to supply electricity to homes and businesses throughout Australia’s transition to a net-zero economy.*



Conclusions



- This is the conclusion from a presentation entitled “Repositioning Gas in the Energy Mix” that RISC presented at APPEA in 2018

- Gas generation produces approximately half the emissions of coal generation, so simply switching from coal to gas generation has a material impact on emissions (as seen in the USA)
- Gas generation is a natural companion to renewables as it can be turned on and off and ramped up and down as the renewables generation changes.
- Gas generation is, and should be recognised as, an enabler for the integration of renewables into the grid
- Gas needs to be positively promoted as a partner for renewables
 - Maintains stability of system (intermittency of VRES)
 - Minimises emissions (Coal emits twice as much CO₂ as gas fired generation, and is not as flexible)

Promotion of a future energy mix based on renewables and gas is likely to lead to the lowest cost and least disruptive way of maximising emission reductions



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