

# The halfway point to net zero emissions

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# We are at the halfway point of a 60-year transition

International climate action started in about 1990 and must lead to global net zero emissions by about 2050

- First IPCC assessment 1990
- UNFCCC 1992
- GEF climate finance from 1994

Long-term progress must be maintained through good times and bad

- Political cycles (e.g. US presidencies)
- Economy cycles (e.g. global financial crisis)
- Geopolitical events (e.g. Covid, Ukraine war)

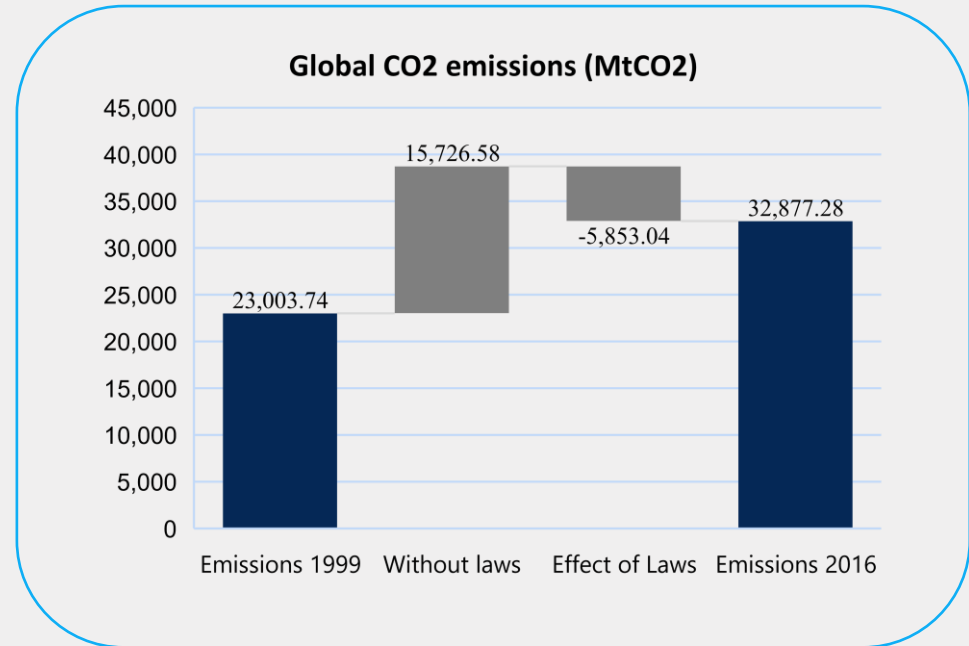


# Outline

1. The first half of the net zero transition
2. The second half of the net zero transition

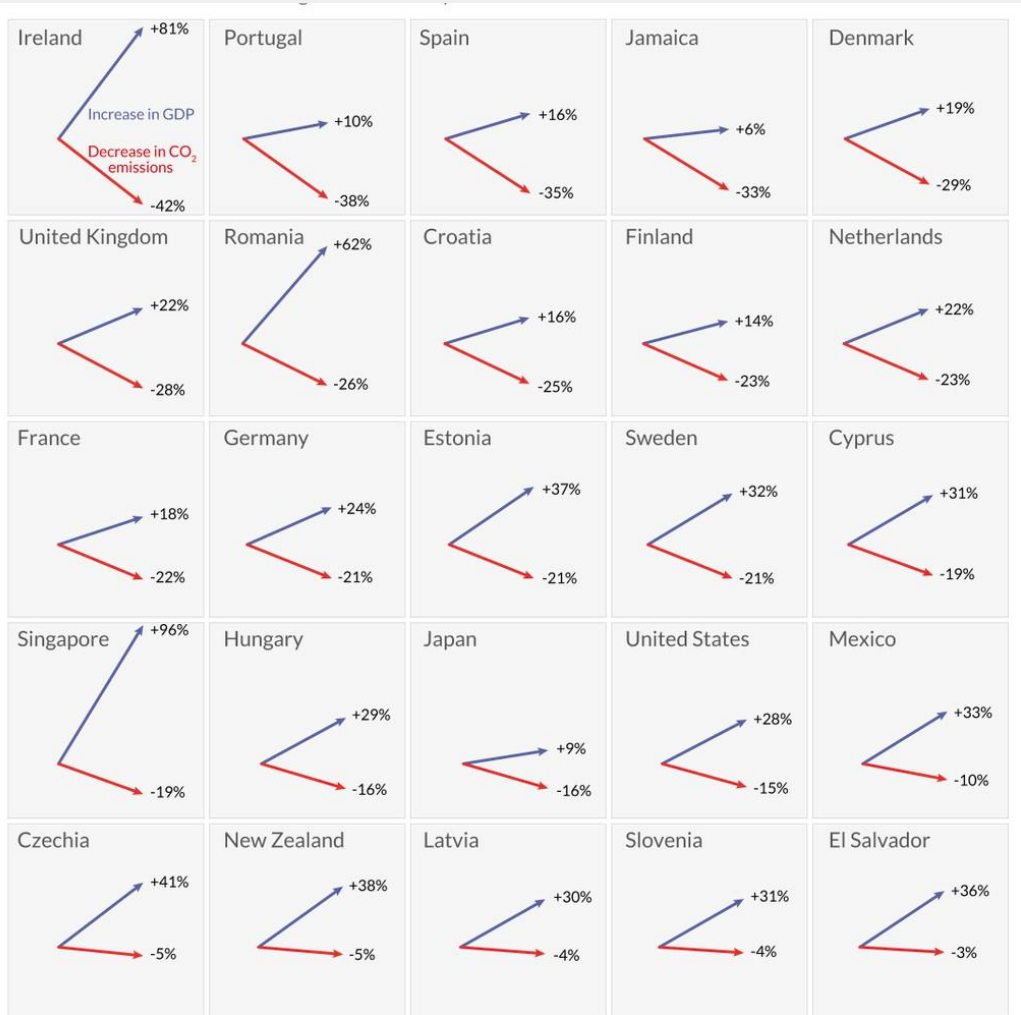
# Climate policy is making a difference, though not enough

- In 2016, global climate policy and legislation has saved ca. 5.8 GtCO<sub>2</sub> (see chart)
  - ca the US annual output
- Cumulatively, between 1999 and 2016 global climate policy and legislation has saved ca 38 GtCO<sub>2</sub>
  - ca one year of global output
- In comparison, remaining carbon space is 420-770 GtCO<sub>2</sub>



Note: Emissions for 1999 and 2016 are the observed carbon emissions in MtCO<sub>2</sub>. Emissions “without laws” are calculated from the estimated counterfactual emissions path. The “effect of laws” is calculated as the difference between observed actual emissions and estimated counterfactual emissions. Source: Eskander and Fankhauser, *Nature Climate Change* 2020

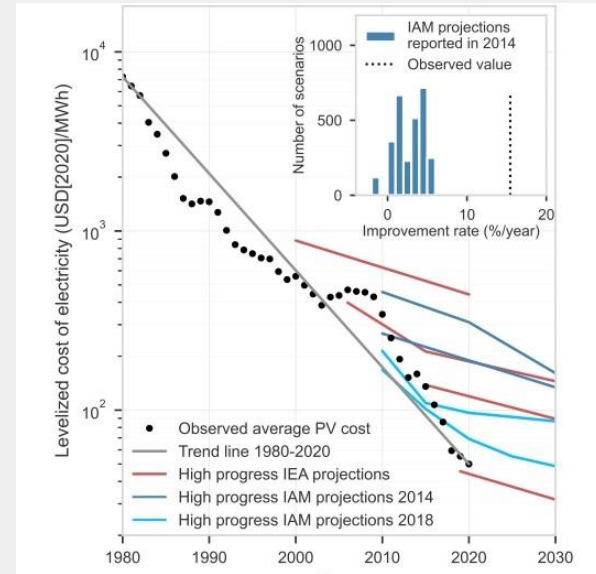
Climate action has not affected prosperity (or competitiveness)



# We have reached key social and technological tipping points

- Important clean technologies are at or close to cost parity
  - This trend is likely to continue
- There is broad public and policy consensus on the need for net zero
  - Especially young people, but also the economic establishment
  - Influential critics remain
- The climate is changing fast too

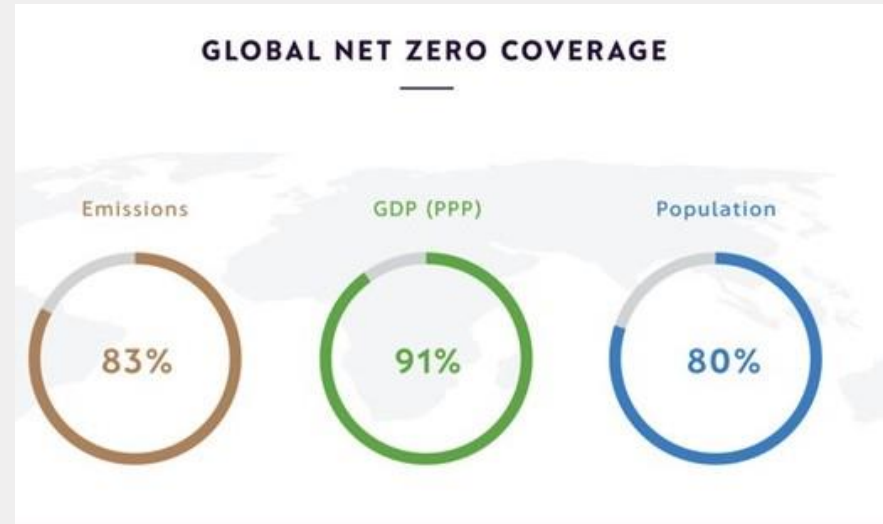
The pace of progress has been consistently underestimated



Source: Way et al., Empirically grounded technology forecasts and the energy transition. *Joule*, 2022.

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Source: Net Zero Tracker, <https://zerotracker.net/>

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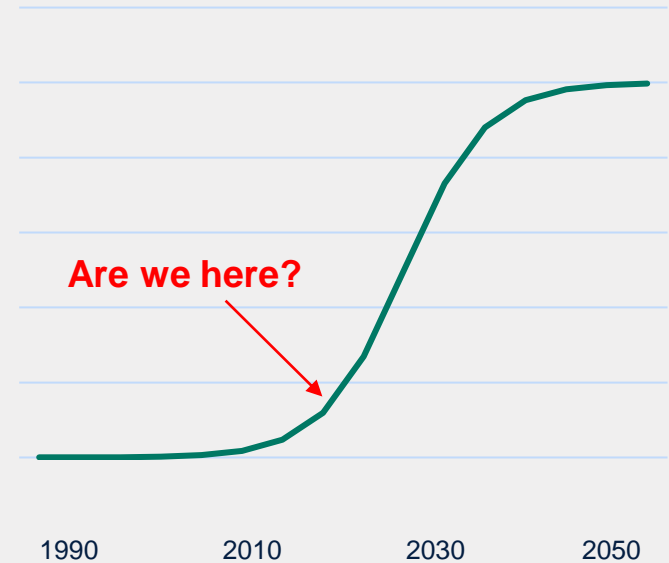
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## Net zero competitiveness

Economic growth prospects depend more on green competitiveness (a la US IRA) than brown protectionism (a la CBAM)

- No evidence of leakage / competitiveness effects so far
- The international playing field should become increasingly level
- Most high-carbon sectors have stepping stones to low-carbon opportunities



# The future of fossil fuels

There is no room for unabated fossil fuels in net zero

- The carbon in fossil fuel reserves exceeds the global carbon budget multiple times (CarbonTracker)
- The committed emissions of existing power stations more than use up the carbon allocation of the power sector (Pfeiffer et al 2018)

But do we phase out fossil fuels or the carbon in fossil fuels?





## Just transition

Total job numbers are unlikely to be affected, but short-term disruptions are likely as skills requirements change

- Enhanced skills for existing jobs (e.g., more cognitive, problem-solving skills)
- Existing skills in higher demand (e.g. electrical engineers)
- Few new job categories (e.g. fuel cell engineers)

Most skills can be learned “on the job”. However, there are few good models of successful transitions for high-carbon hotspots

# Thank you

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