
Time for change: perspectives on low-carbon electricity and the impact on SA's competitiveness

André de Ruyter

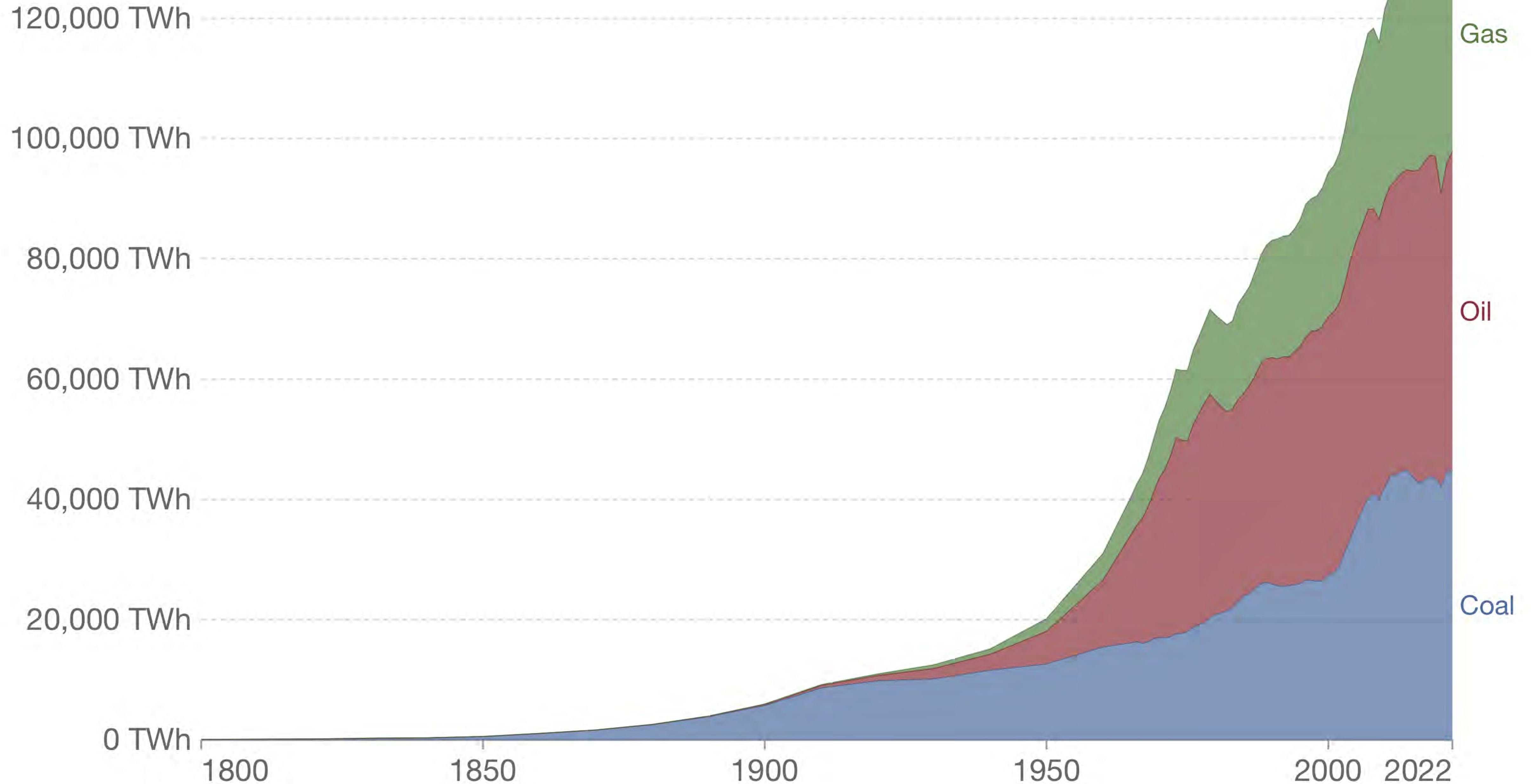
Carbon capture - 300 million years ago

- ❖ Carboniferous era of 60 million years from the end of the Devonian to the beginning of the Permian
- ❖ Global temperatures on average 20° at start of era
- ❖ CO₂ concentrations at 8x current levels
- ❖ By end of era average temperatures had dropped to 12° degrees, and CO₂ levels to current levels
- ❖ Humanity is now releasing millions of years of captured carbon in the space of a century by burning fossil fuels
- ❖ The Carboniferous cooling is being reversed

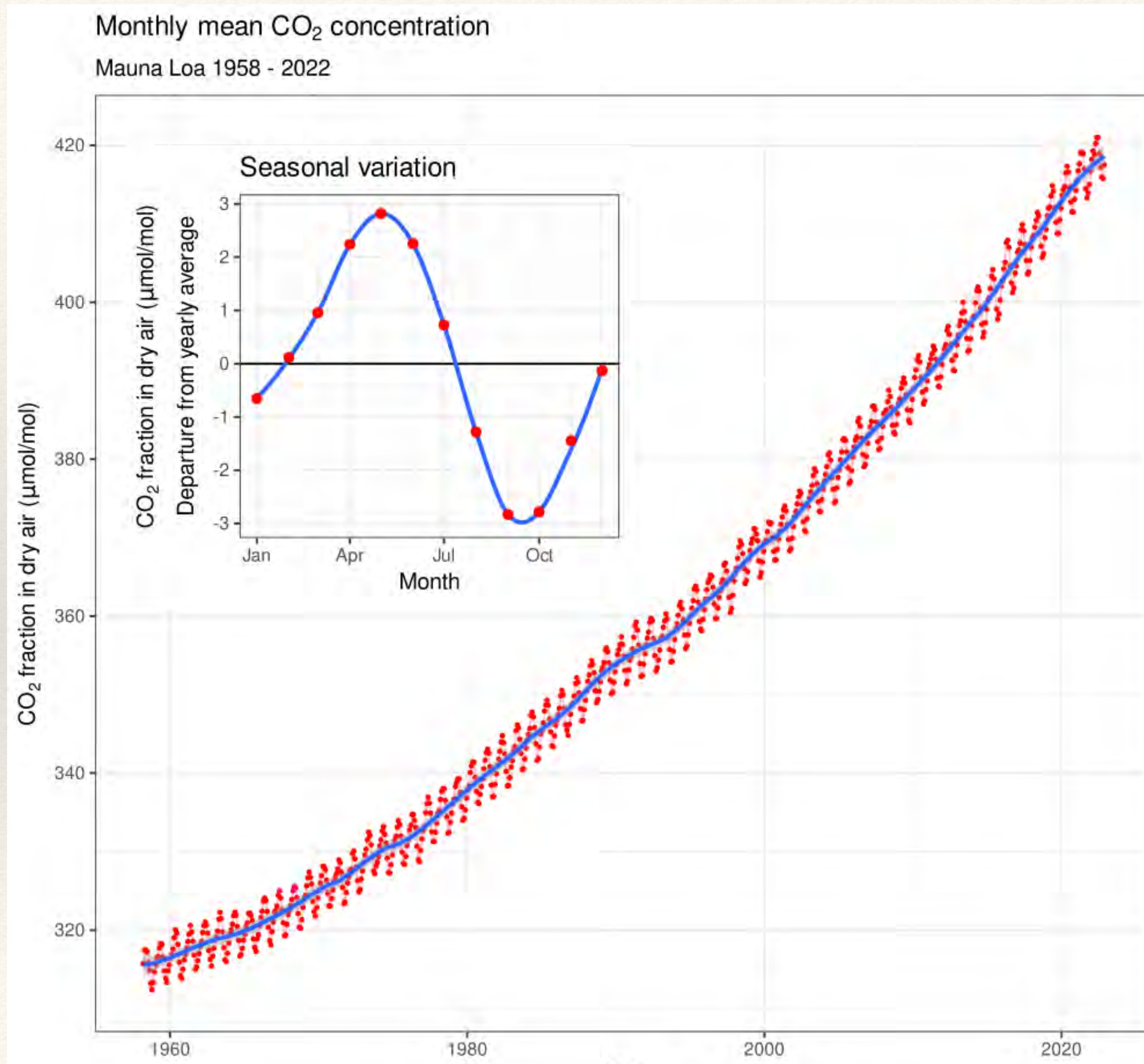


Global fossil fuel consumption

Global primary energy consumption by fossil fuel source, measured in terawatt-hours (TWh).

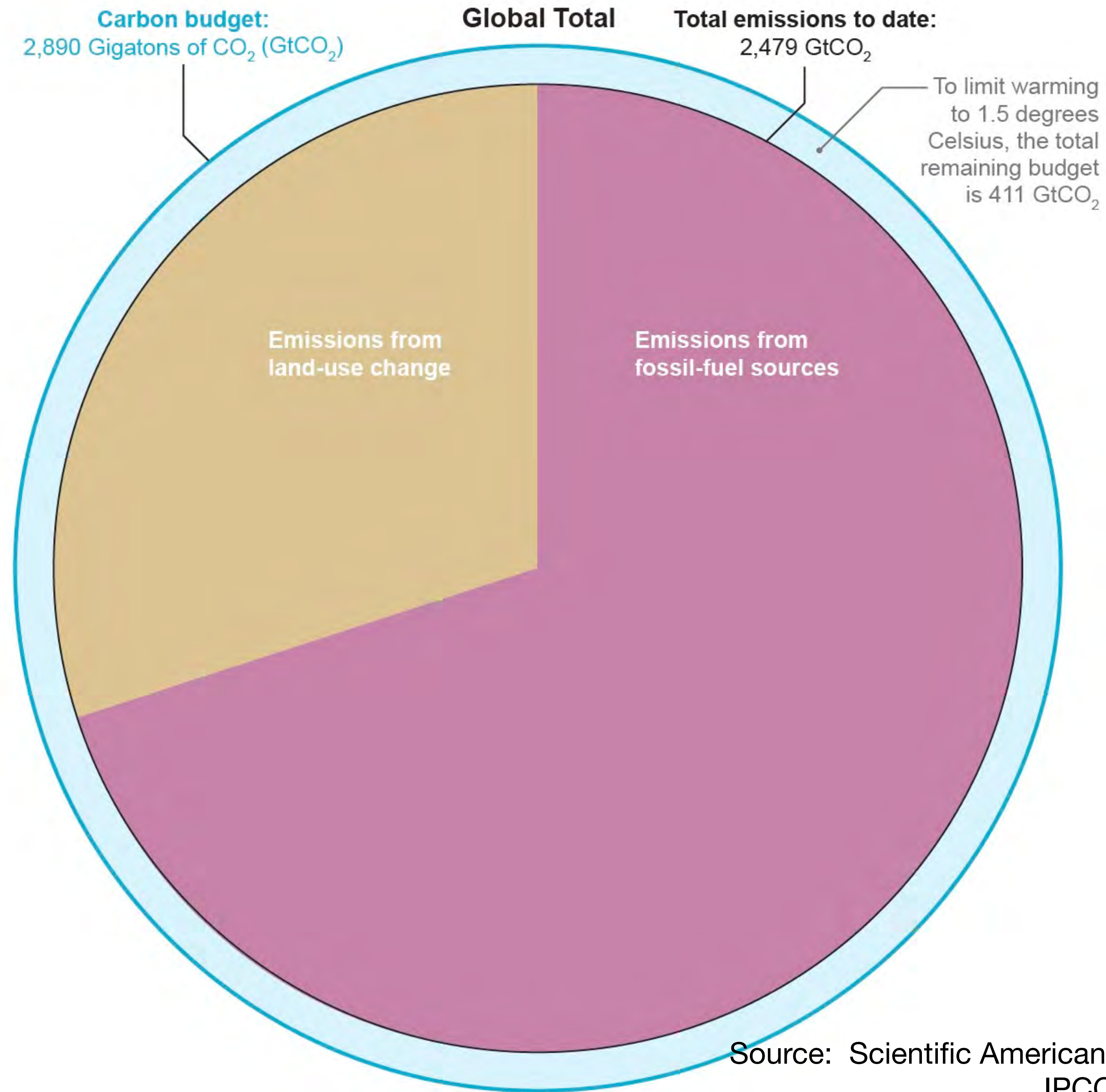


CO₂ concentrations continue to increase



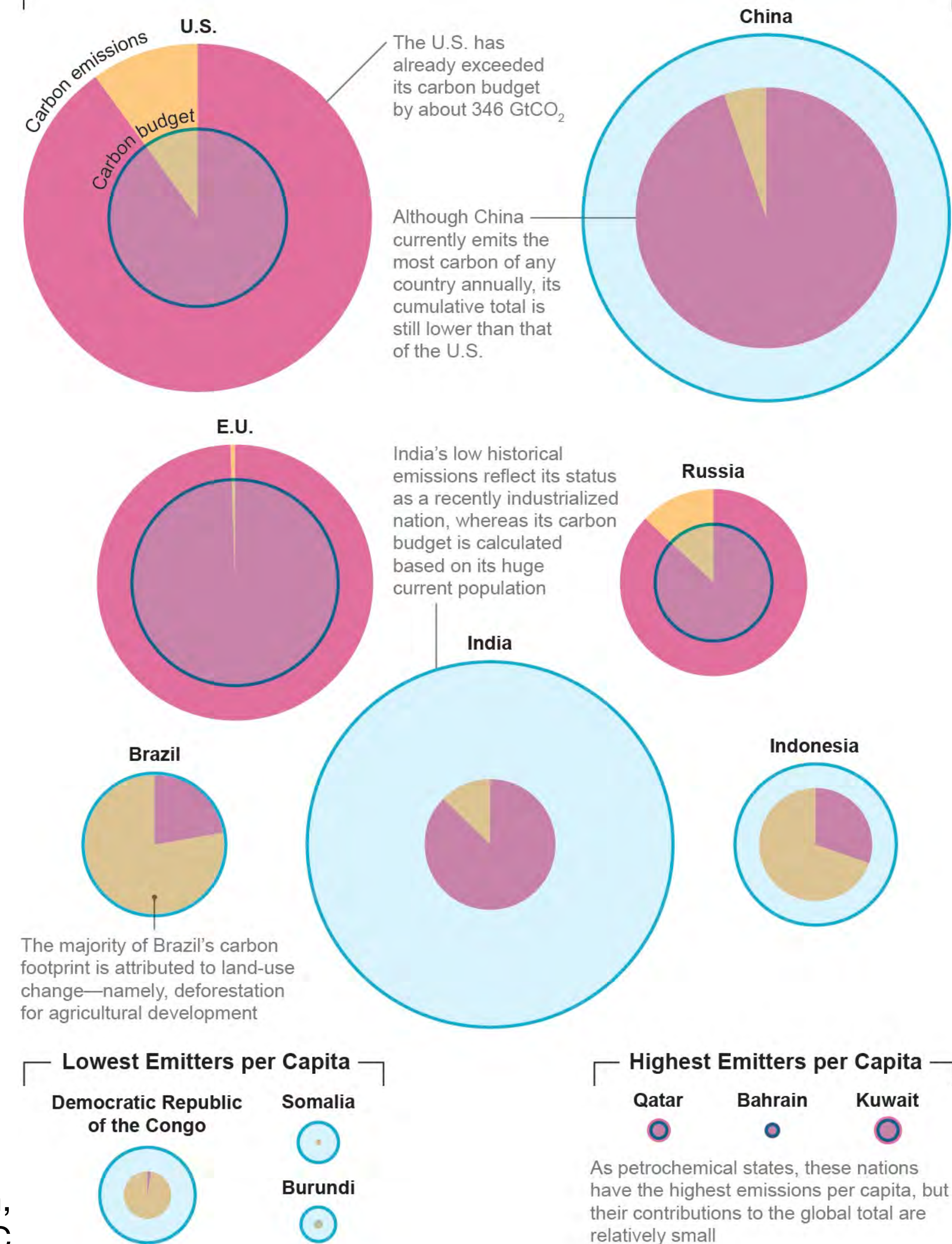
Carbon budget almost depleted

- IPCC calculated that between 1850 and 2019, we emitted about 80% of the CO₂ for a 50–50 chance of meeting 1.5 degrees C
- We can only emit 500 Gt of carbon by 2030
- Current rate of emissions is 40 Gt/a, but emissions are still increasing
- Carbon budget will likely be depleted by 2030
- Reductions are required - but by whom?



At a national level, carbon budgets are very different

- US and EU have exceeded their budget
- Three lowest emitters are in Africa
- Carbon market rules preclude accessing carbon credits to fund RE projects
- Reductions are required - but by whom?

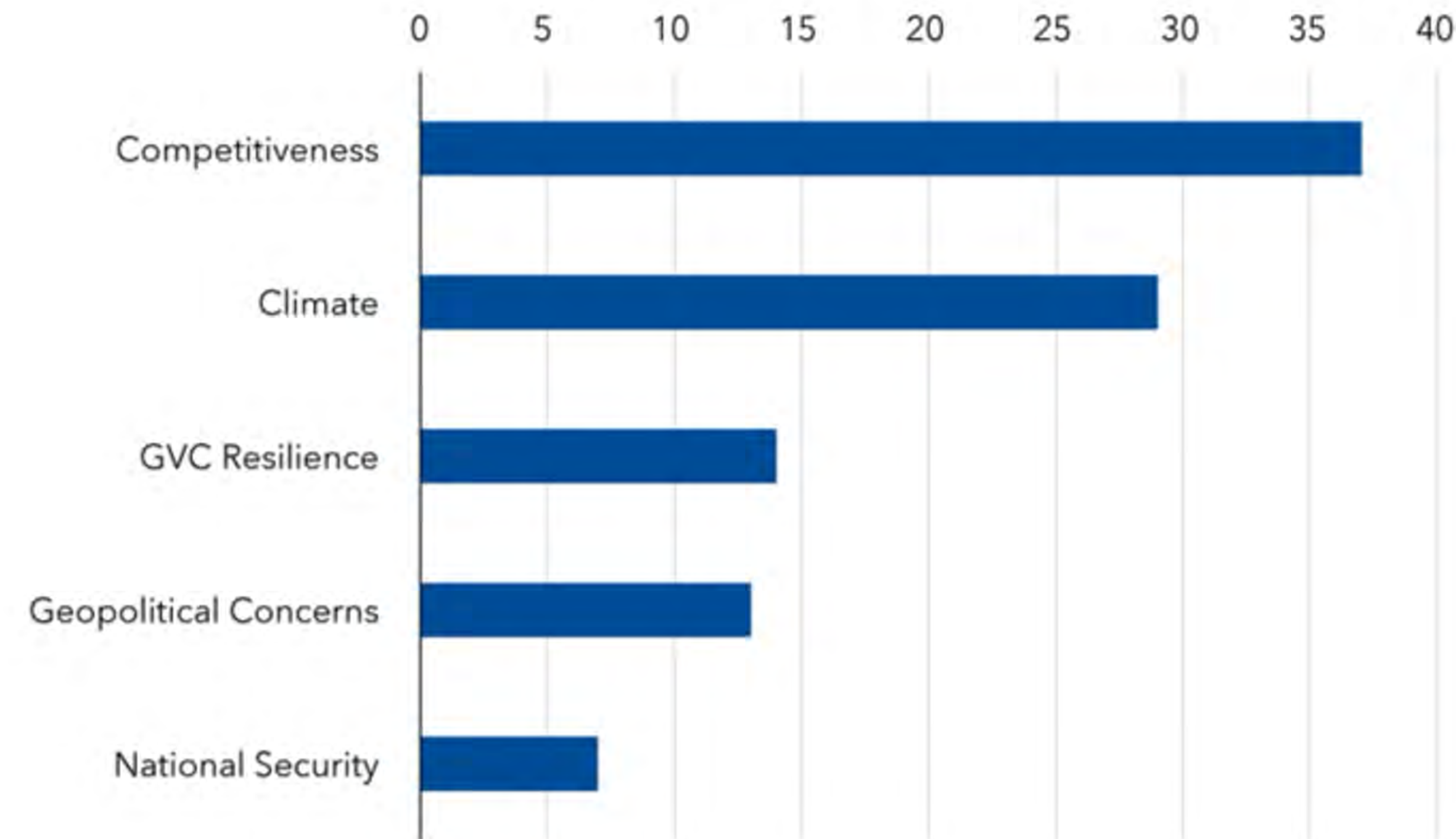


Source: Scientific American, IPCC

Rich countries need to reduce emissions

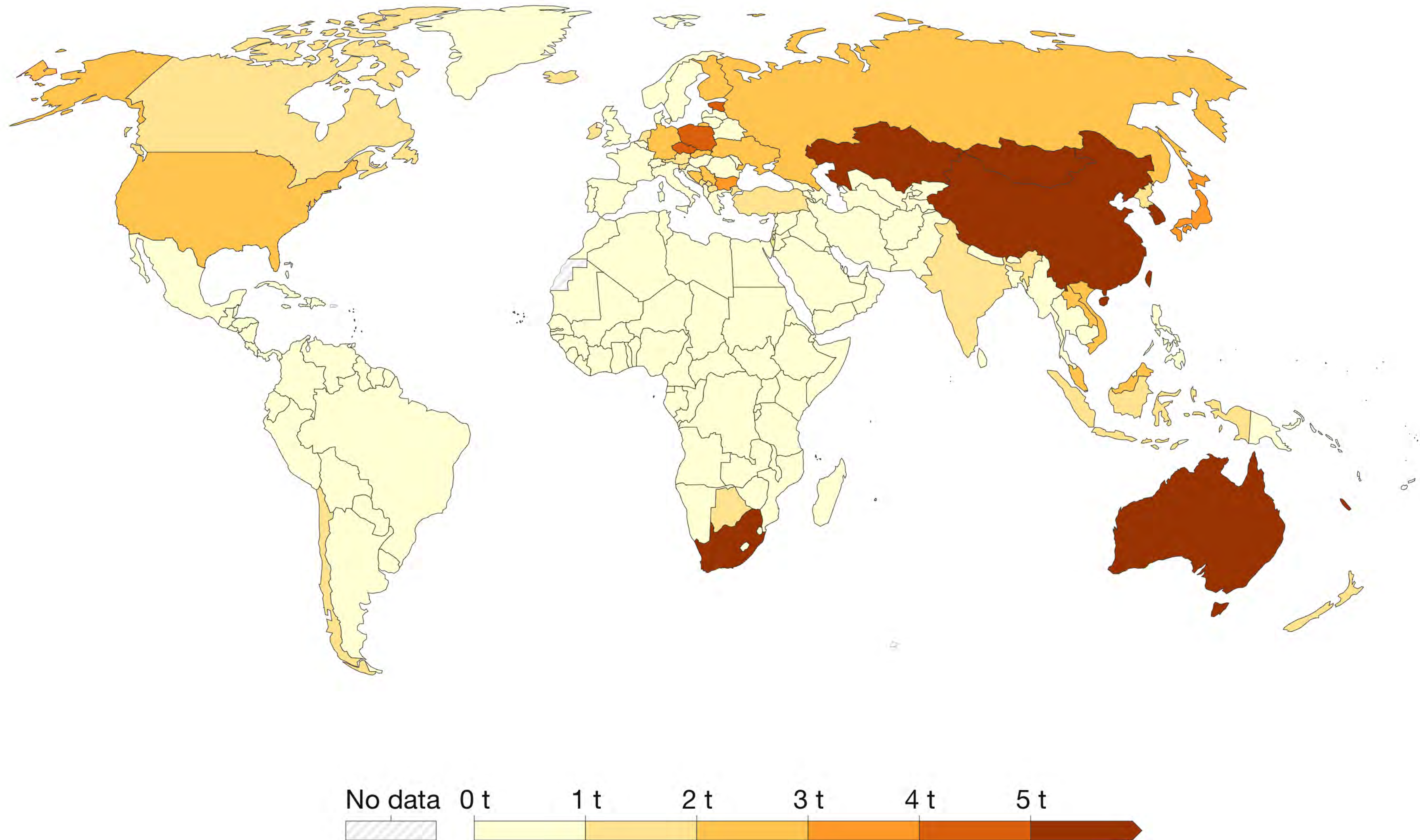
- ❖ Developed countries are imposing carbon taxes, emission trading schemes or cap-and-trade schemes to reduce emissions and impose a cost on carbon
- ❖ European Union most advanced with a carbon price of EUR80/tonne (SA at EUR3/tonne, with numerous exceptions)
- ❖ Carbon leakage presents a threat to jobs in countries with emission taxes or costs - manufacturers will relocate to areas with more lax emissions
- ❖ In response, the EU introduced Carbon Border Adjustment Mechanism (CBAM) in October 2023
- ❖ CBAM will add an import duty at the border of the EU to impute a price to the cost of carbon contained in the imported goods
- ❖ US Congress considering four draft laws with similar scope, enjoying bipartisan support
- ❖ Inflation Reduction Act is industrial policy aimed at climate change - very aggressive import duties and subsidies
- ❖ Canada, Japan and others are considering similar taxes to CBAM
- ❖ WTO intervention unlikely, in spite of appeals

Share of distortionary industrial policy measures by motive
(percent)



Source: Evenett and others (2024); IMF staff calculations.
Note: Cumulative stock of measures for 2023. For measures with multiple motives, each motive is given equal weight.

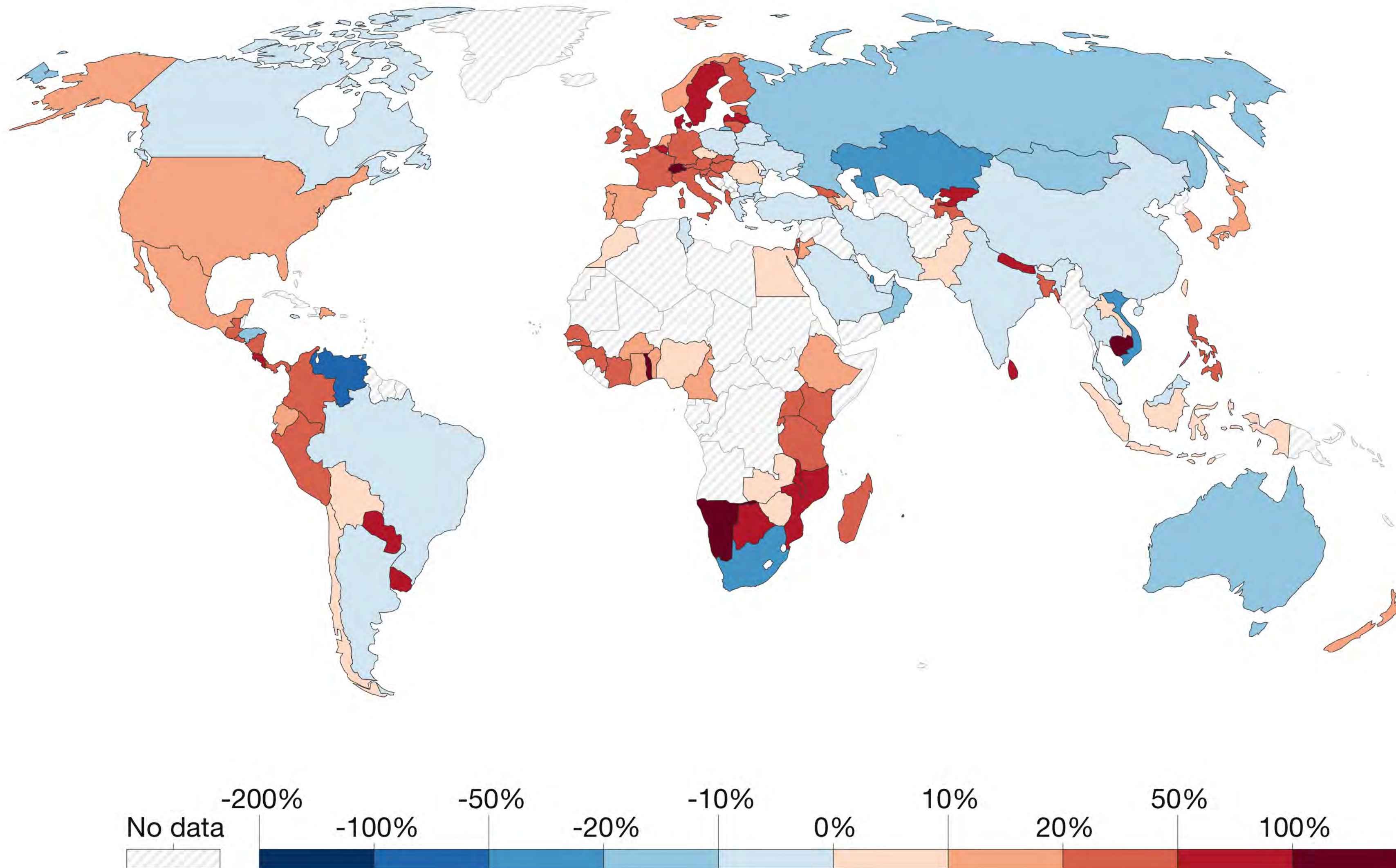
SA one of the most carbon-intensive in the world



Source: Global Carbon Budget (2022); Gapminder (2022); UN (2022); HYDE (2017); Gapminder (Systema Globalis)
OurWorldInData.org/co2-and-greenhouse-gas-emissions • CC BY

SA is a very large exporter of carbon

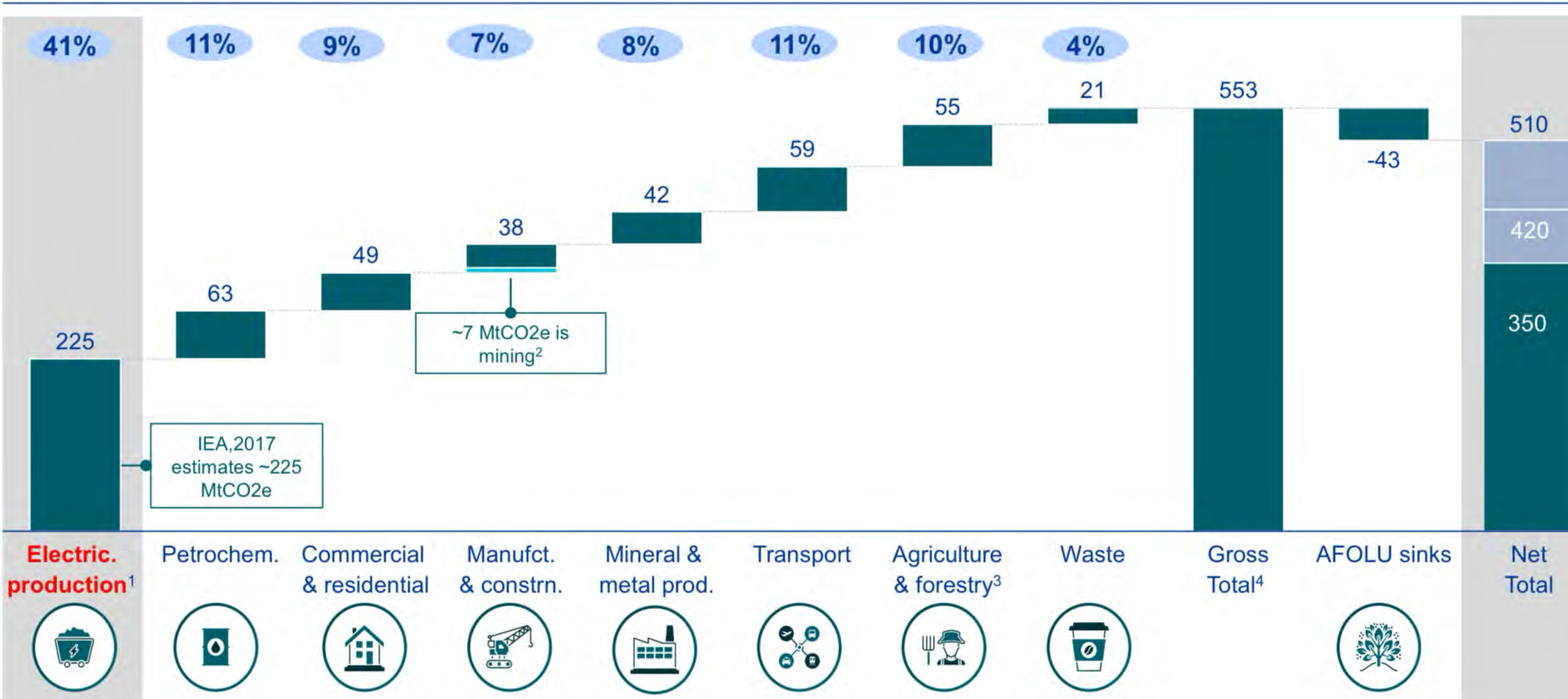
This is measured as emissions exported or imported as a percentage of domestic production emissions. Positive values (red) represent net importers of CO₂. Negative values (blue) represent net exporters of CO₂.



SA Reserve Bank is worried about CBAM

	Scenario 1 All countries impose carbon border tax similar to CBAM		Scenario 2 All countries impose carbon border tax covering all sectors	
Total GDP	2030 -0.3%	2050 -0.9%	2030 -1.8%	2050 -9.3%
Total employment	2030 -64 000	2050 -351 000	2030 -581 000	2050 -3 999 000
Total exports	2030 0.0%	2050 0.1%	2030 0.6%	2050 -10.1%%

SA's carbon intensity mostly in electricity

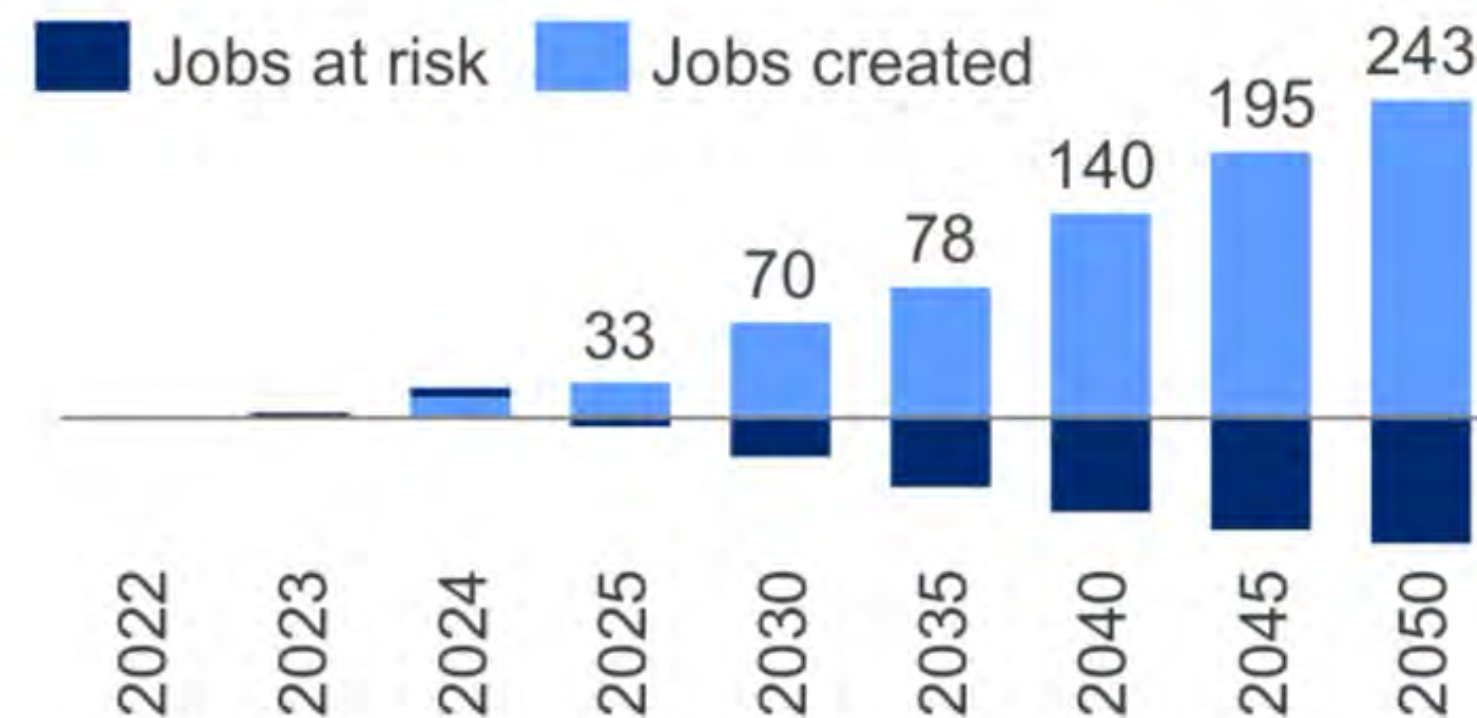


South Africa had a plan...

Net jobs created by 2035



Cumulative net jobs created by 2050



Local economy and global competitiveness



Taking advantage of **existing grid capacity** in the region, brings **invaluable investment**



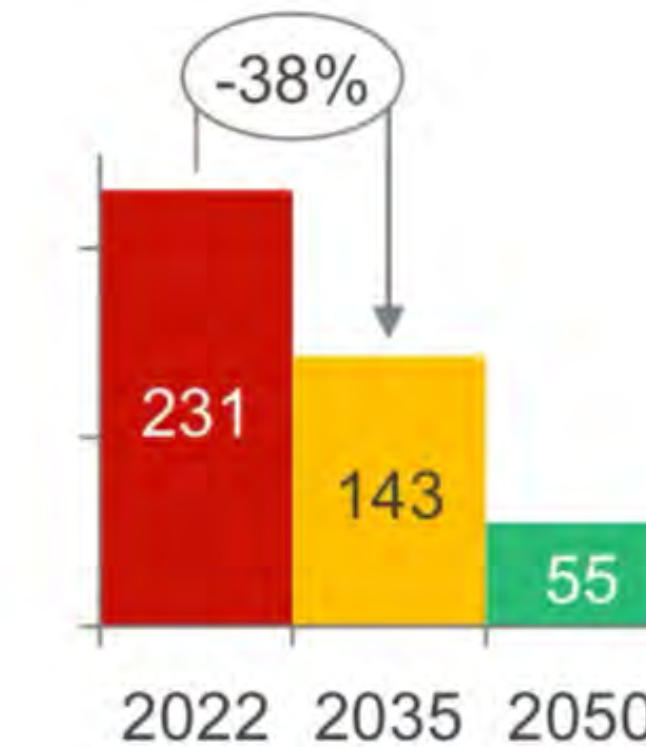
Carbon taxes avoided protecting competitiveness of South African exports and protecting tourism, local manufacturing and trade



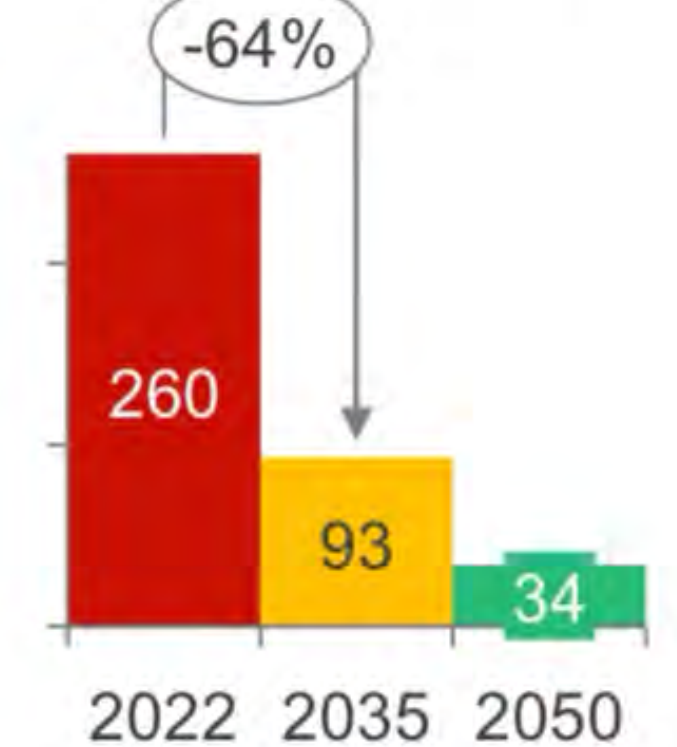
New industries and local manufacturing born from transition due to opportunities in the renewables value chain

Health and environmental improvements

Carbon emission
MtCO₂e



Annual water usage
Billion litres



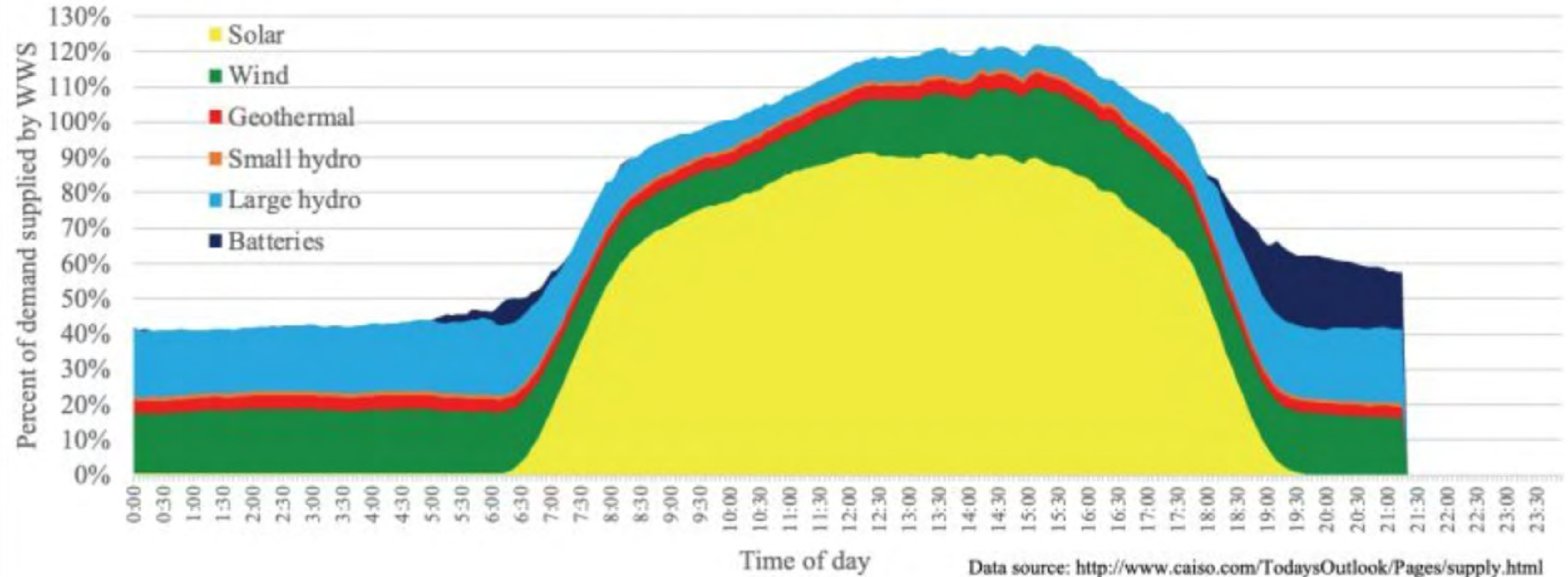
By 2035:

- **Thousands of lives improved as less people fall ill** from air pollution, reduction in energy poverty
- ~50% reduction in CO₂, **66%** reduction in SO₂ emissions; **58%** for PM
- ~170bn litres of water previously used for power generation can be **made available for agricultural uses**

IRP 2019 compliant, therefore official government policy

But we need baseload... seriously?

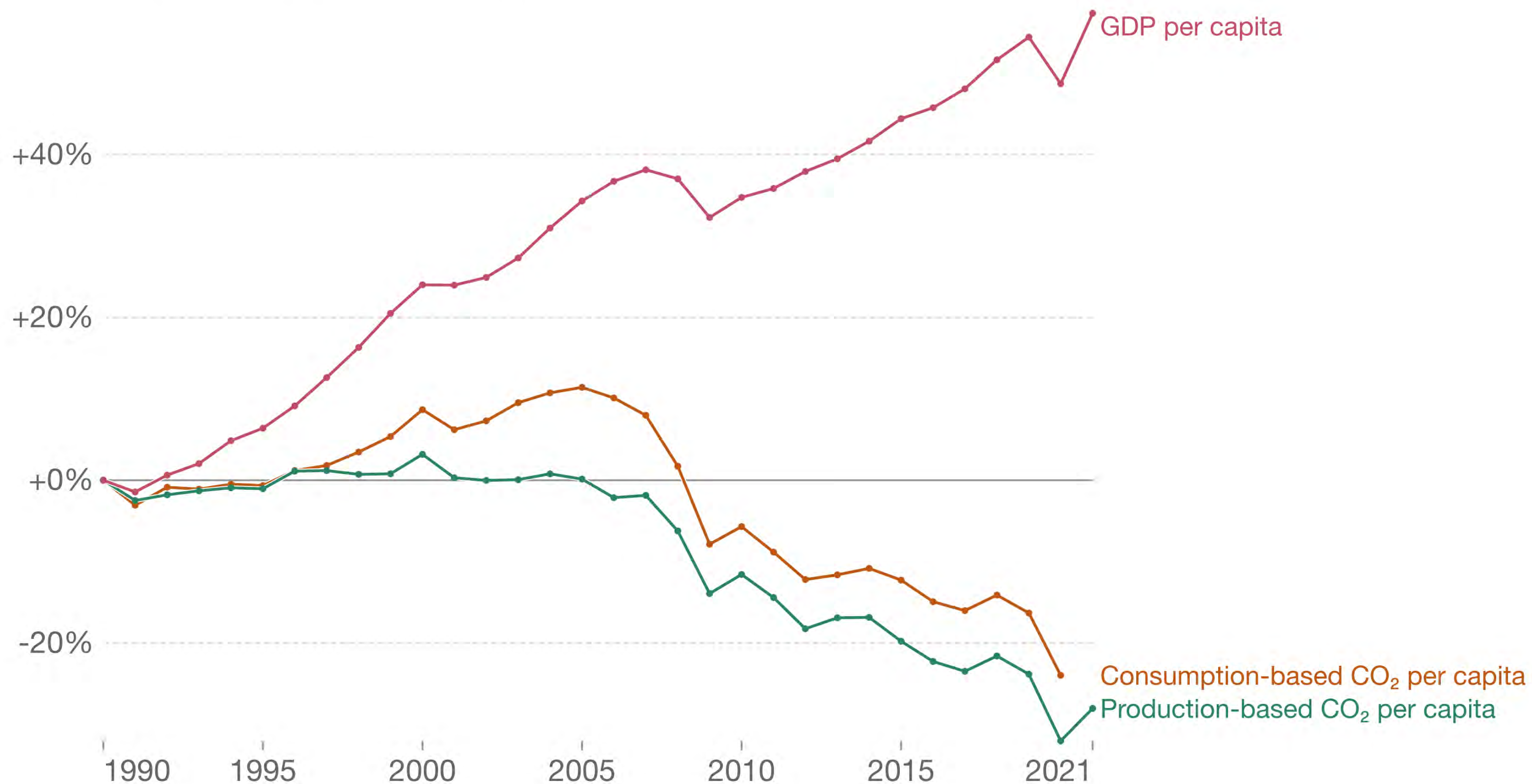
Tue. Apr. 23, 2024



Moving away from fossil fuels will kill our economy! (Or will it?)

Change in per capita CO₂ emissions and GDP, United States

Consumption-based emissions¹ are national emissions that have been adjusted for trade. This measures fossil fuel and industry emissions². Land use change is not included.



Source: Data compiled from multiple sources by World Bank, Global Carbon Budget (2022); Gapminder (2022); UN (2022); HYDE (2017); Gapminder (Systema Globalis)

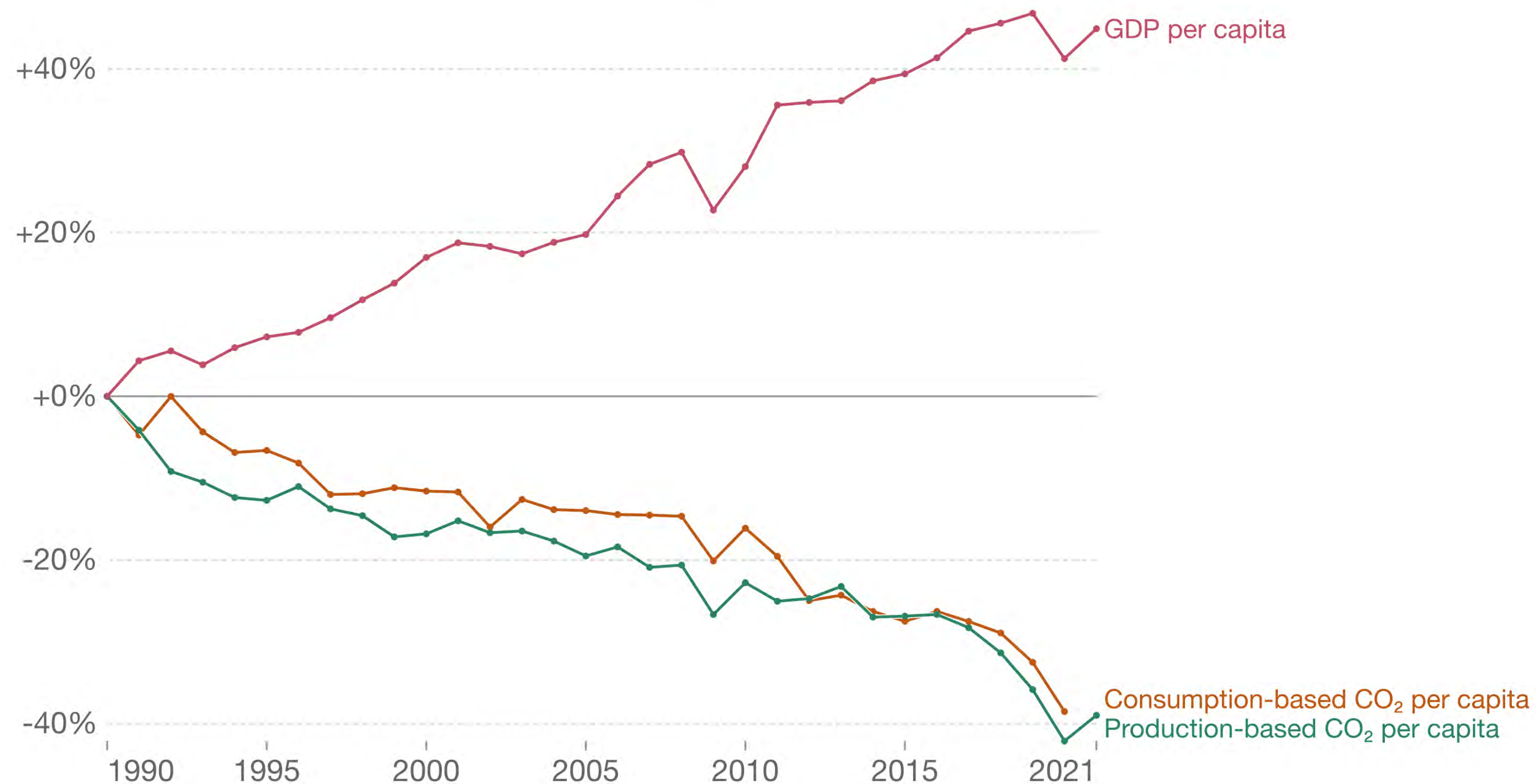
Note: GDP figures are adjusted for inflation.

OurWorldInData.org/co2-and-greenhouse-gas-emissions • CC BY

Moving away from fossil fuels will kill our economy! (Or will it?)

Change in per capita CO₂ emissions and GDP, Germany

Consumption-based emissions¹ are national emissions that have been adjusted for trade. This measures fossil fuel and industry emissions². Land use change is not included.



Source: Data compiled from multiple sources by World Bank, Global Carbon Budget (2022); Gapminder (2022); UN (2022); HYDE (2017); Gapminder (Systema Globalis)

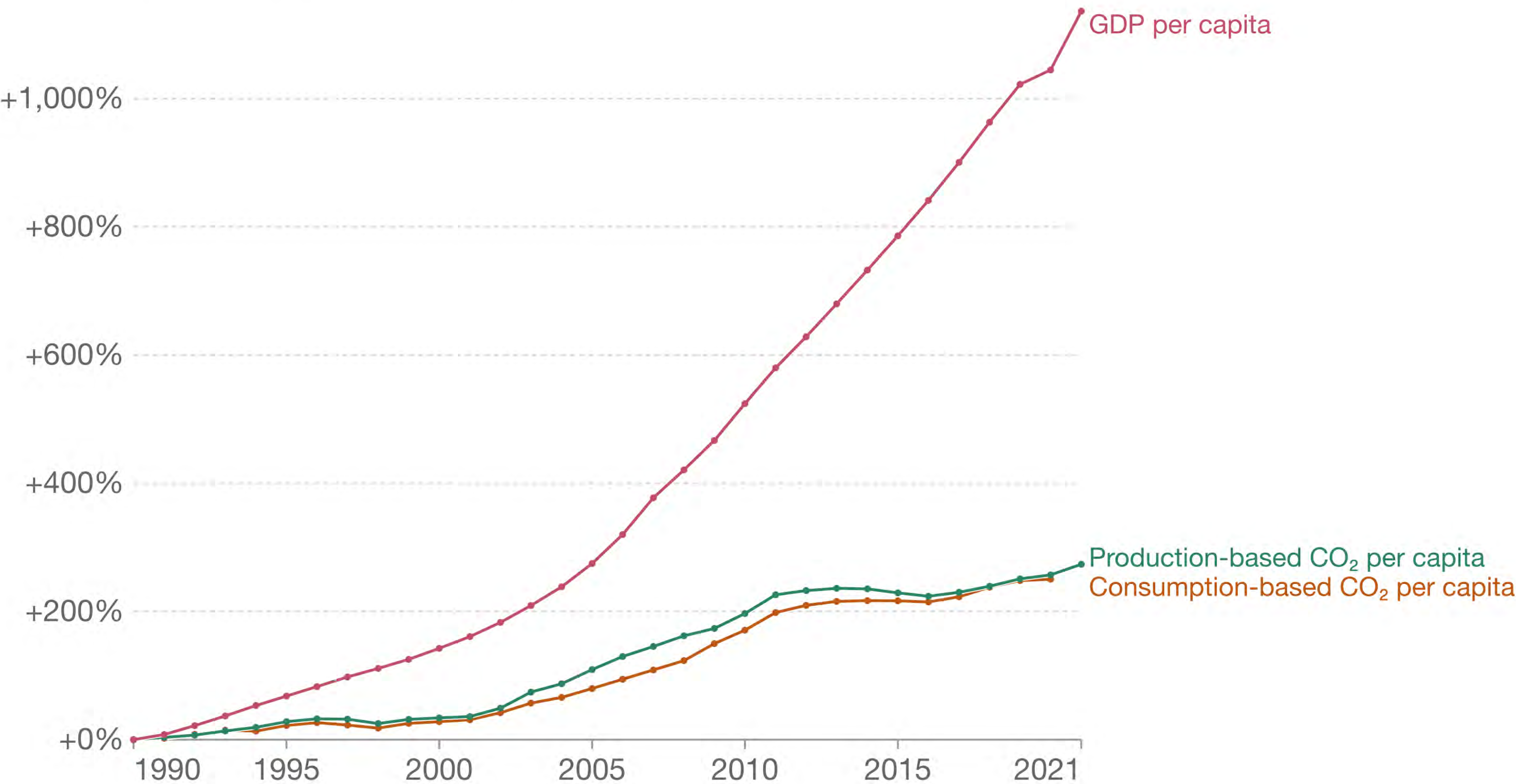
Note: GDP figures are adjusted for inflation.

OurWorldInData.org/co2-and-greenhouse-gas-emissions • CC BY

Moving away from fossil fuels will kill our economy! (Or will it?)

Change in per capita CO₂ emissions and GDP, China

Consumption-based emissions¹ are national emissions that have been adjusted for trade. This measures fossil fuel and industry emissions². Land use change is not included.



Source: Data compiled from multiple sources by World Bank, Global Carbon Budget (2022); Gapminder (2022); UN (2022); HYDE (2017); Gapminder (Systema Globalis)

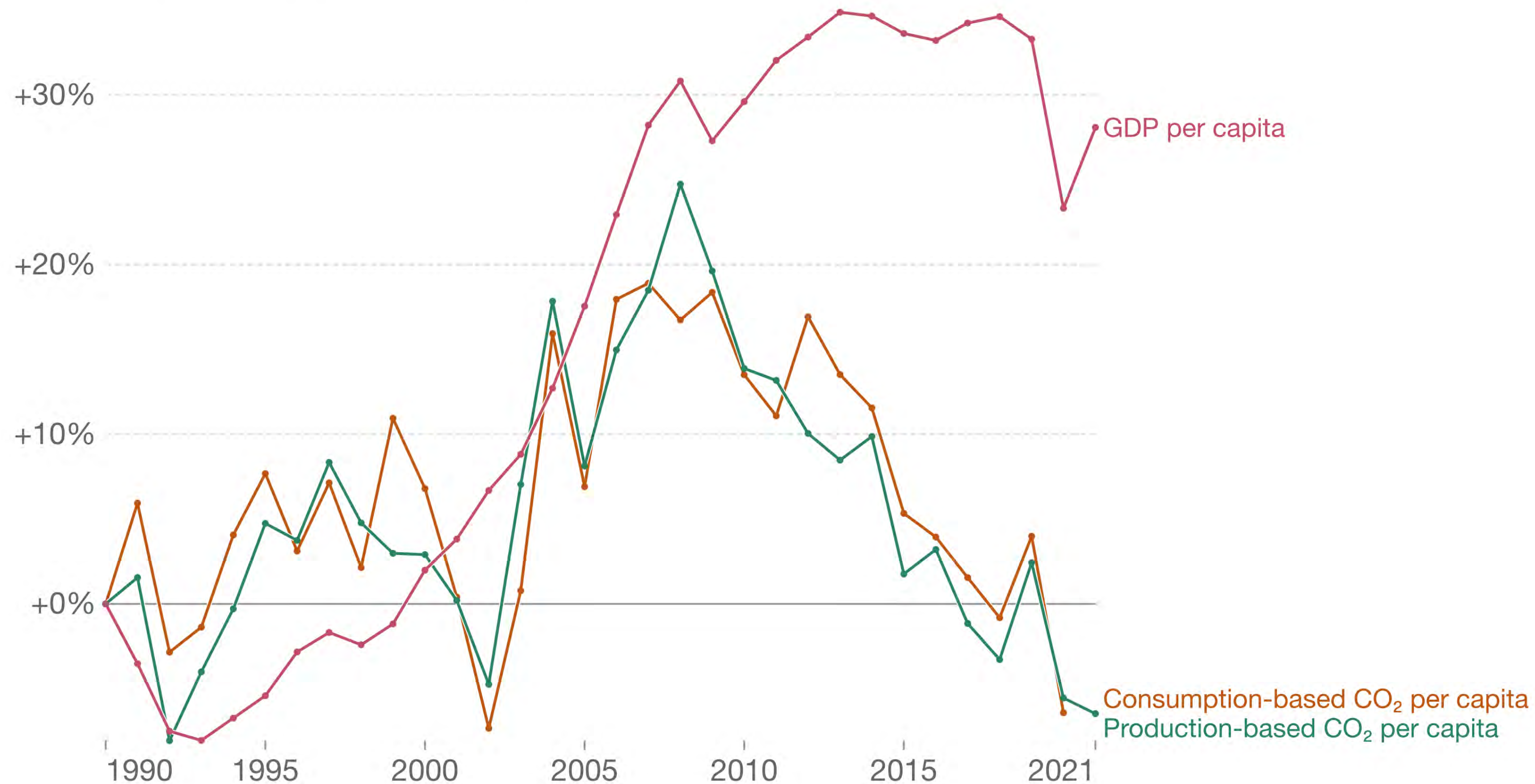
Note: GDP figures are adjusted for inflation.

OurWorldInData.org/co2-and-greenhouse-gas-emissions • CC BY

Moving away from fossil fuels will kill our economy! (Or will it?)

Change in per capita CO₂ emissions and GDP, South Africa

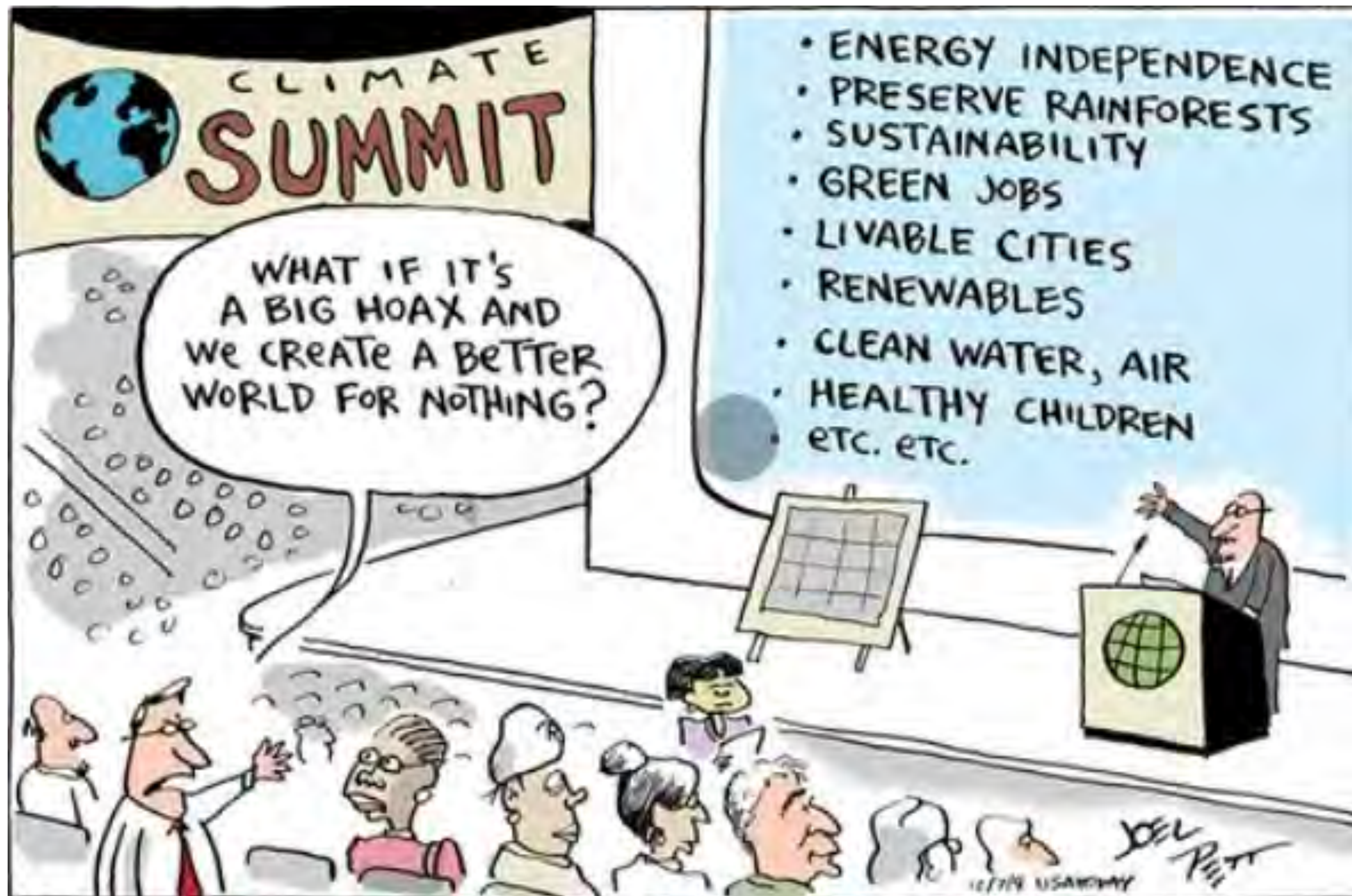
Consumption-based emissions¹ are national emissions that have been adjusted for trade. This measures fossil fuel and industry emissions². Land use change is not included.



Source: Data compiled from multiple sources by World Bank, Global Carbon Budget (2022); Gapminder (2022); UN (2022); HYDE (2017); Gapminder (Systema Globalis)

Note: GDP figures are adjusted for inflation.

OurWorldInData.org/co2-and-greenhouse-gas-emissions • CC BY



CLIMATE SUMMIT

WHAT IF IT'S
A BIG HOAX AND
WE CREATE A BETTER
WORLD FOR NOTHING?

- ENERGY INDEPENDENCE
- PRESERVE RAINFORESTS
- SUSTAINABILITY
- GREEN JOBS
- LIVABLE CITIES
- RENEWABLES
- CLEAN WATER, AIR
- HEALTHY CHILDREN
- ETC. ETC.



JOEL PITT
10/19 USA TODAY