



To gas or not to gas

A tale of an unsung sustainable energy driver

Outline



Setting the scene: Motivation



Socio-economic perspective



Technical perspective



Environmental perspective



Case study: Africa



Conclusion

Motivation

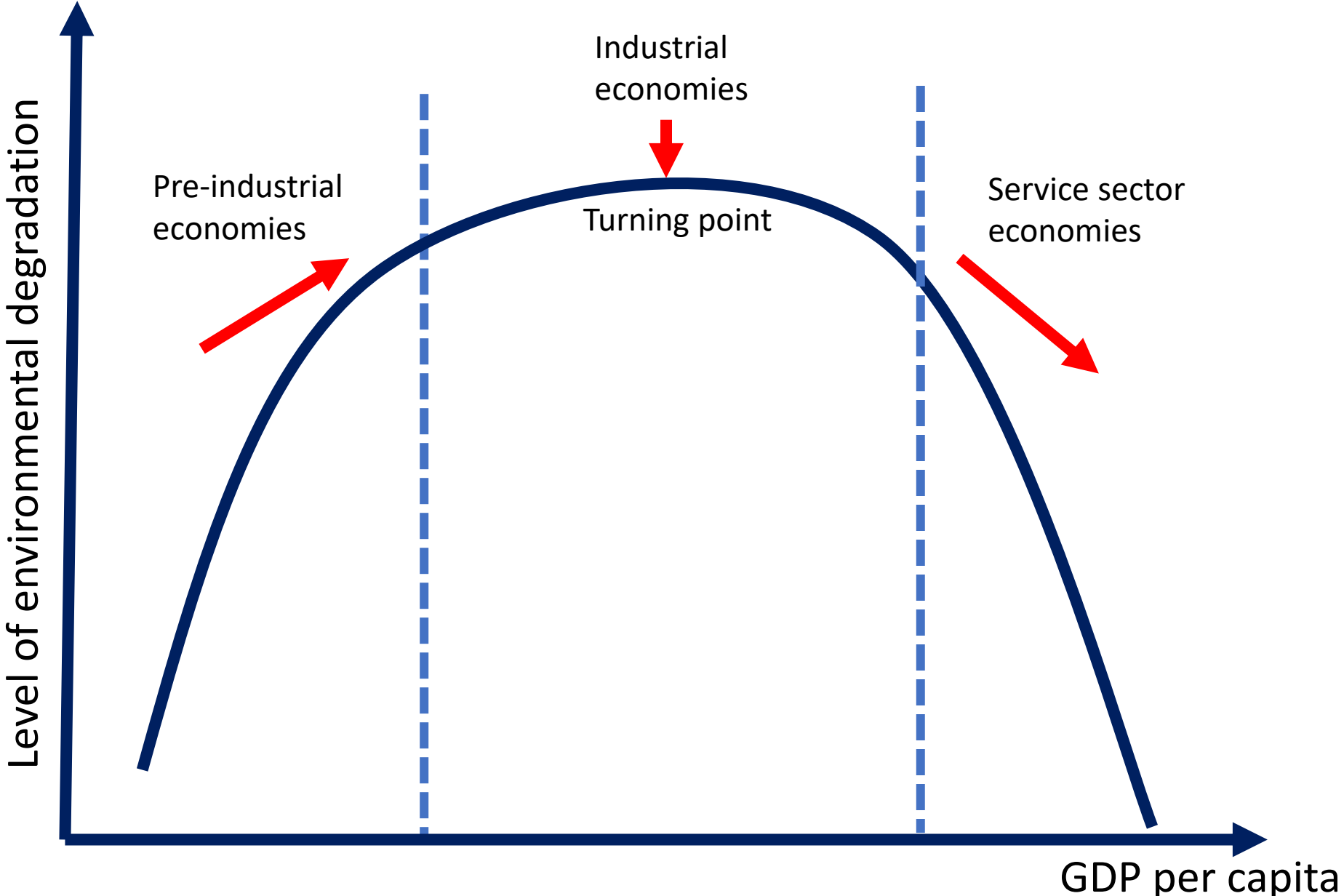
The pivotal role of gas in driving the sustainability agenda is often brushed aside, especially with regards to developing economies in the global south that are energy hungry and in need of rapid economic growth.

Are wind/solar sources enough to power emerging economies' growth

How does relying on gas affect our chances of staying below 2 degrees of warming

How do we balance energy & wealth justice in terms of growth (especially in the global south) vs survivability?

Socio-economic perspective: The Kuznets curve



Remark

84% of the global population live in low- and middle-income countries that are set on a development path paved by industrialization

The near-term low-energy targets in IPCC scenarios limiting warming to 1.5 is too generic

Energy demand reduction calls must trade off development needs

Technical perspective

- Energy reliability
 - Intermittency
 - Flexibility
 - Peak demand

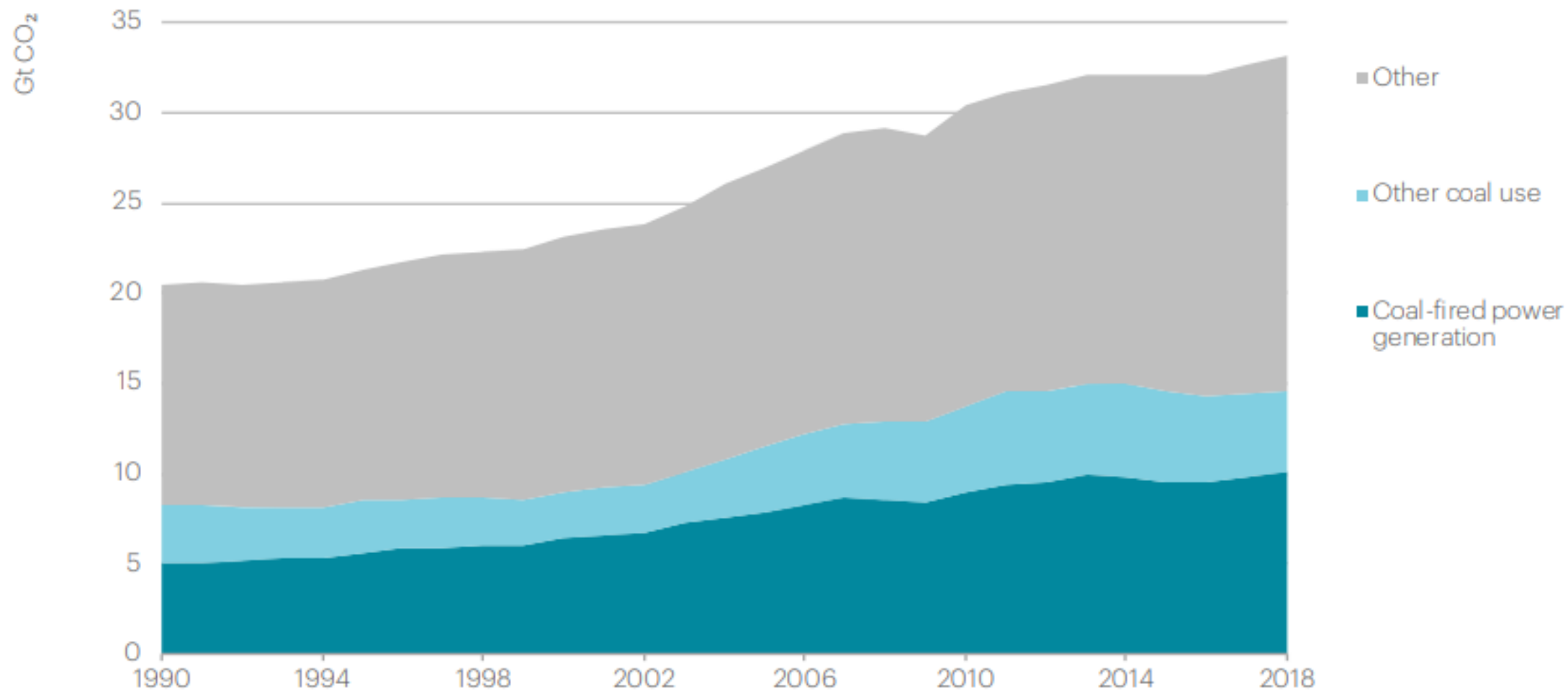




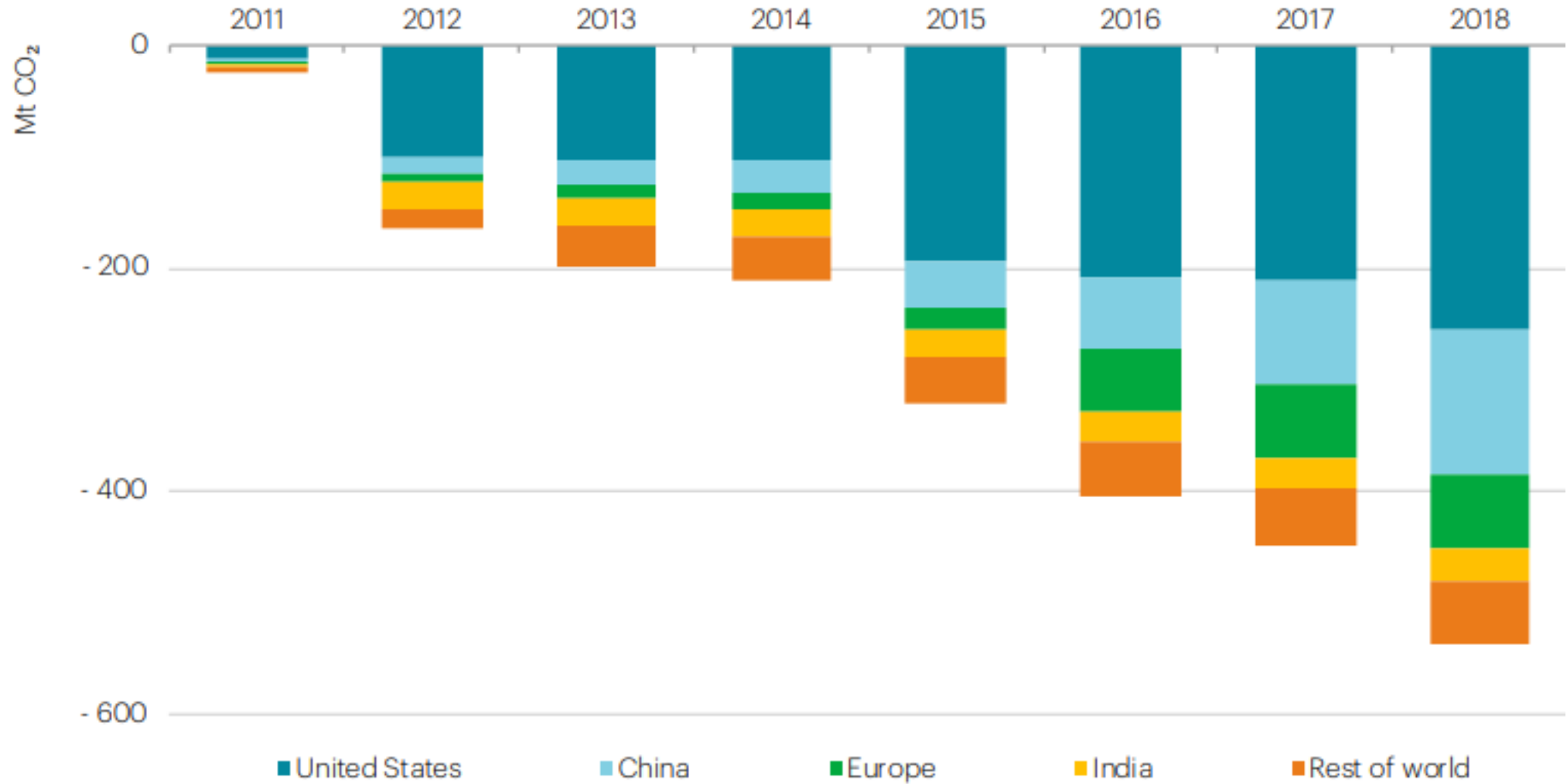
Environmental perspective

- Replacing coal
 - Gas as a transition fuel
- **GHG emissions**
 - Life-cycle: extracting, producing, transporting and burning.
 - Natural gas consists mainly of methane (CH_4)
- Air quality
 - Emits lowest NO_x , SO_x than other fossil fuels

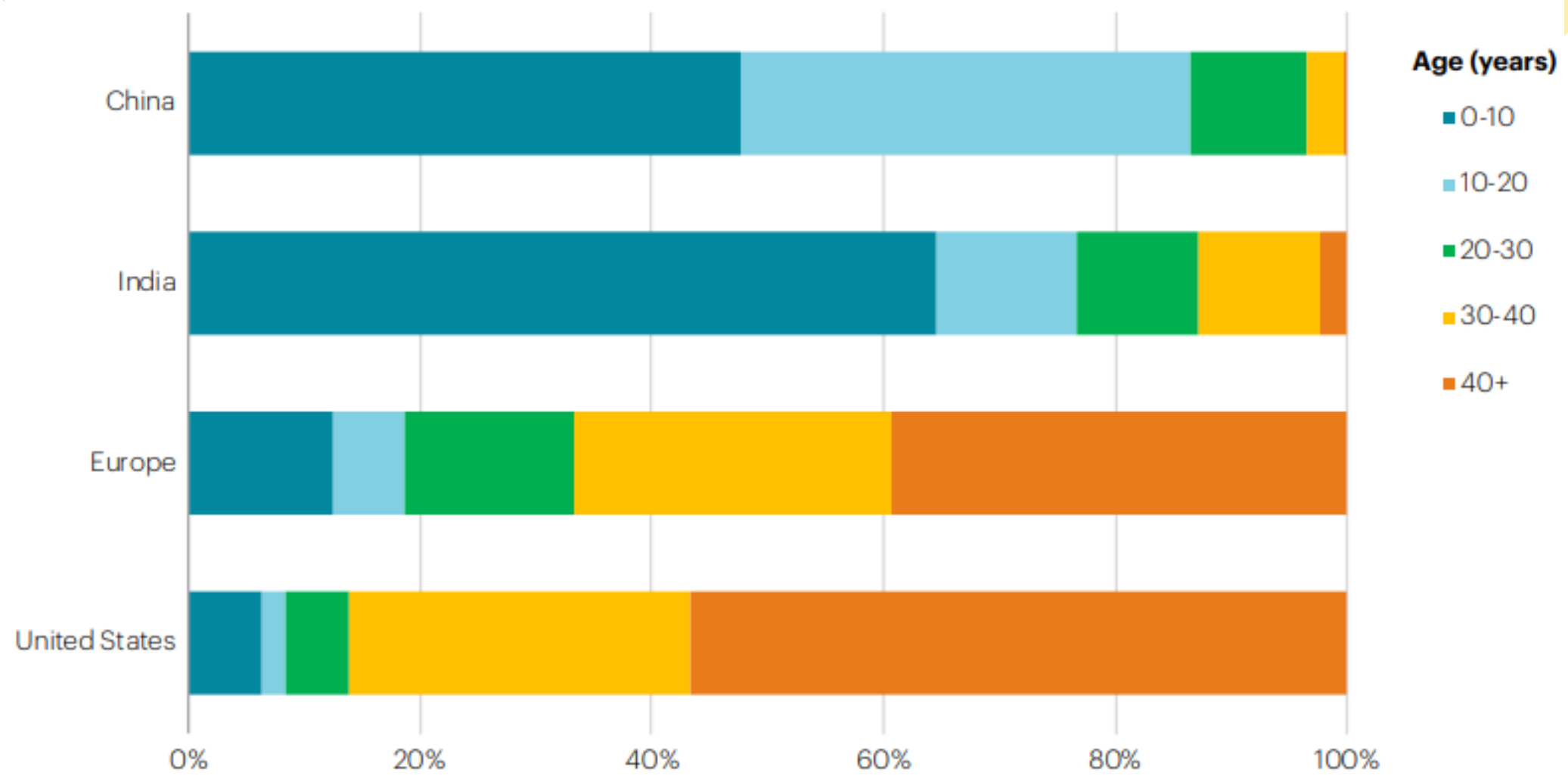
Global energy-related CO₂ emissions



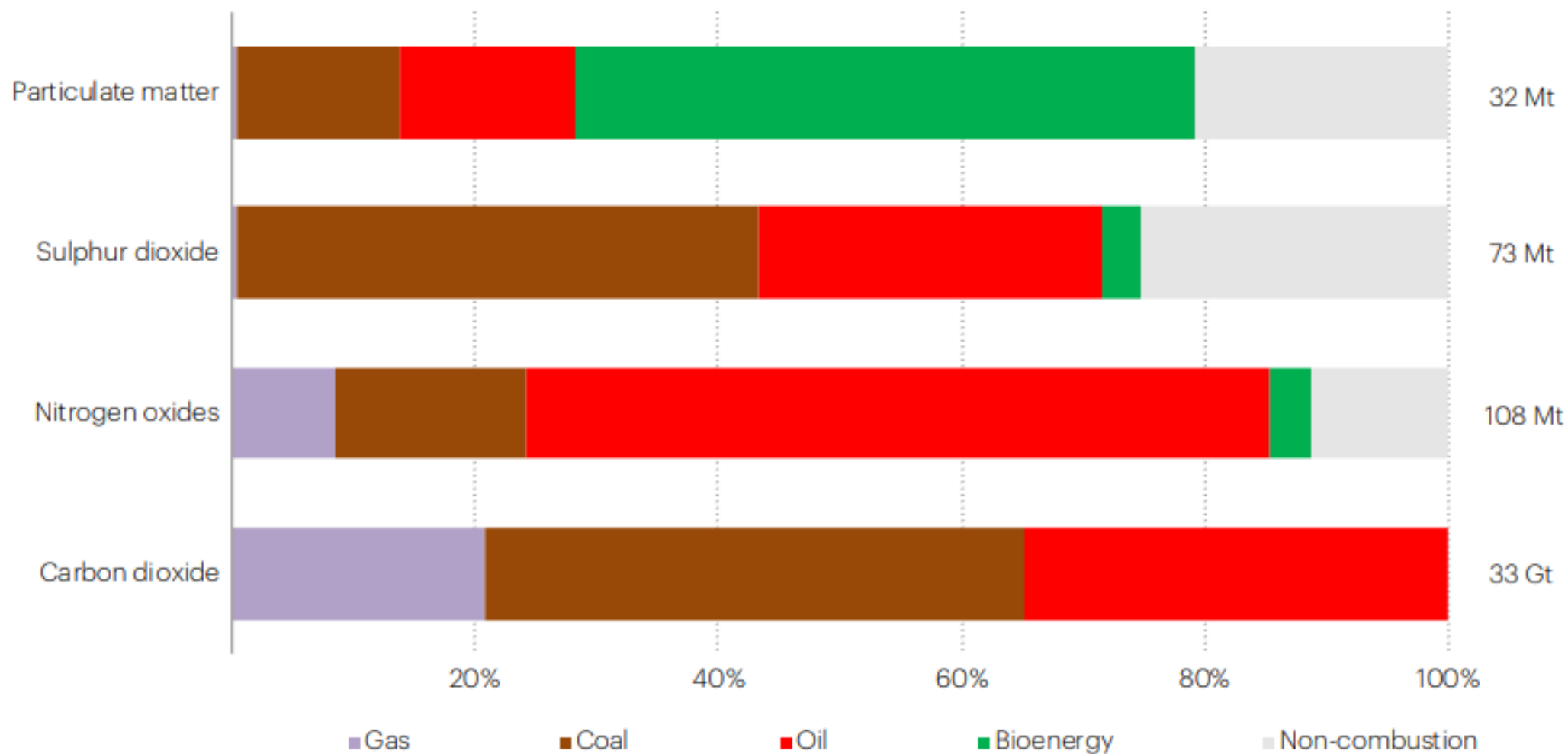
CO₂ savings from coal-to-gas switching by region compared with 2010



Share of coal-fired plants in selected countries/regions by age



Share of gas in total energy-related emissions of selected air pollutants (2015) and CO₂ (2018)



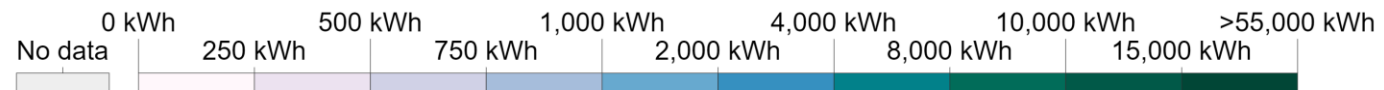
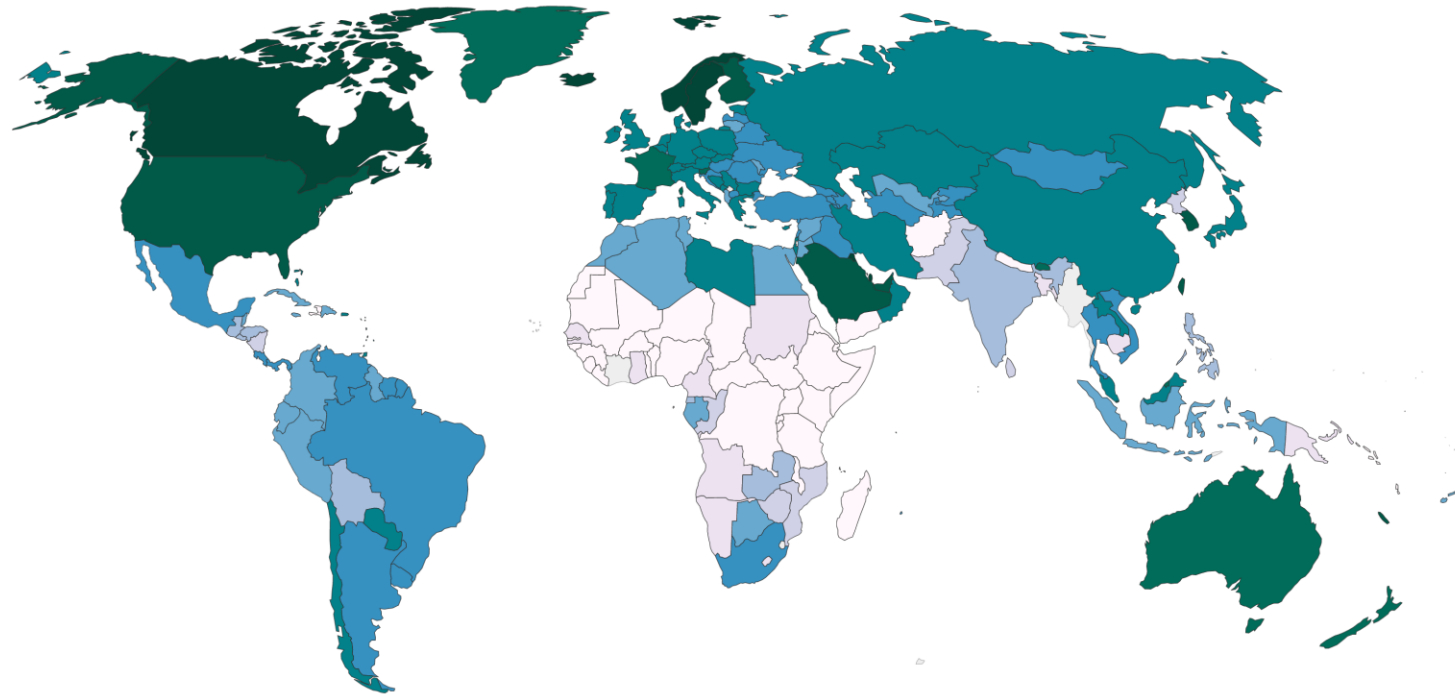
Case study: Africa

- A technology or innovation cannot be separated from its social context
- Most future emissions will come from low-middle income countries that are energy hungry



Per capita electricity consumption

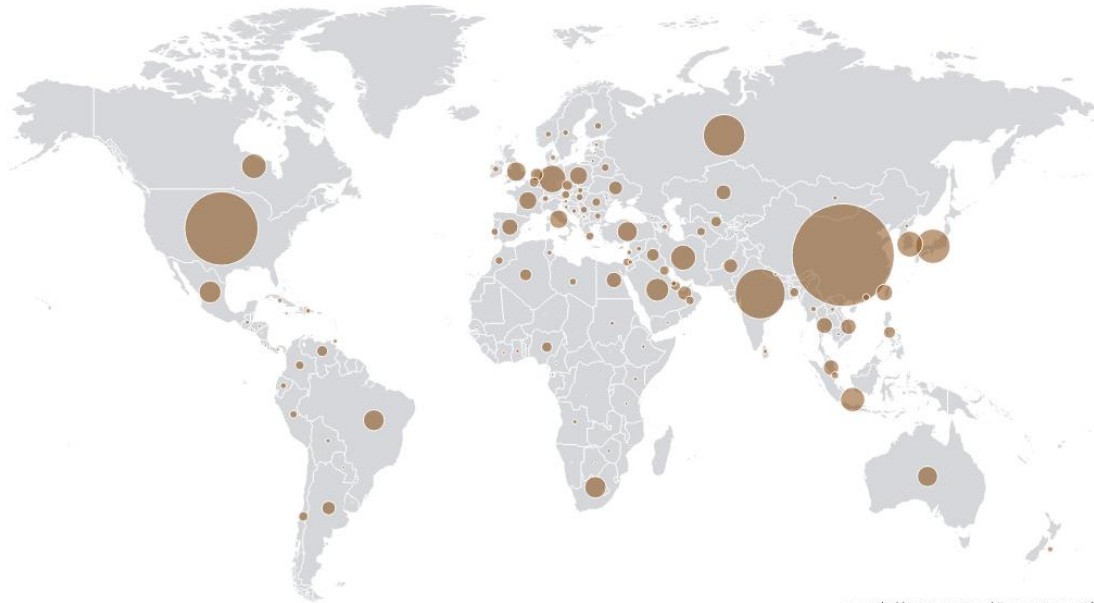
Average annual electricity consumption per capita, measured in kilowatt-hours (kWh) per year.



Source: Our World in Data based on BP Statistical Review of World Energy & Ember (2021)

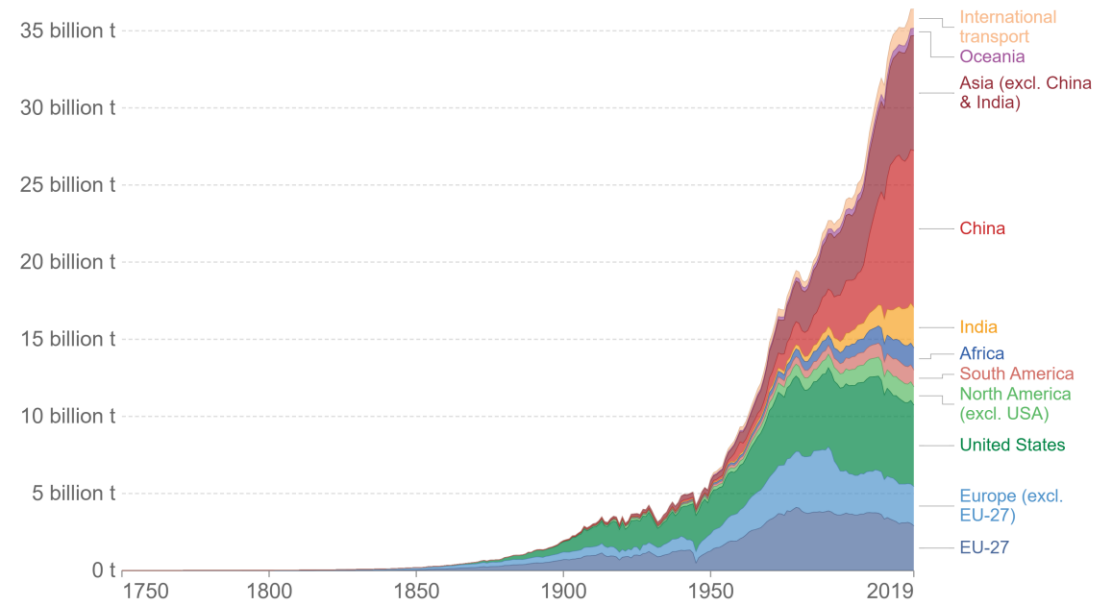
OurWorldInData.org/energy • CC BY

CO2 emissions (MtCO2) (2018)



compiled by International Energy Agency (*)

Annual total CO2 emissions, by world region



Source: Our World in Data based on the Global Carbon Project OurWorldInData.org/co2-and-other-greenhouse-gas-emissions • CC BY
Note: This measures CO₂ emissions from fossil fuels and cement production only – land use change is not included. 'Statistical differences' (included in the GCP dataset) are not included here.



An unsung
hero

- Natural gas as Africa's energy transition accelerator
 - Scenario of African union Agenda 2063 to expand electricity supply by 600 GW and demand to exceed 1700 TWh
 - Gas can be a good partner to hydropower and RE integration
 - In best case scenario, future capacity will be split 60% to RE and 30% to gas (from under 5%)



Conclusion

- Carbon-price is key to unlocking gas potential
 - Need gas to meet the challenges of energy access, capacity expansion, diversification and decarbonization of Africa's energy sector
 - Gas offers a baseload fuel to complement the rapid uptake of RE in Africa
 - “Natural gas is at the centre of the people, planet and prosperity agenda”
- 