



The Global Energy Outlook and the Increasing Role of India

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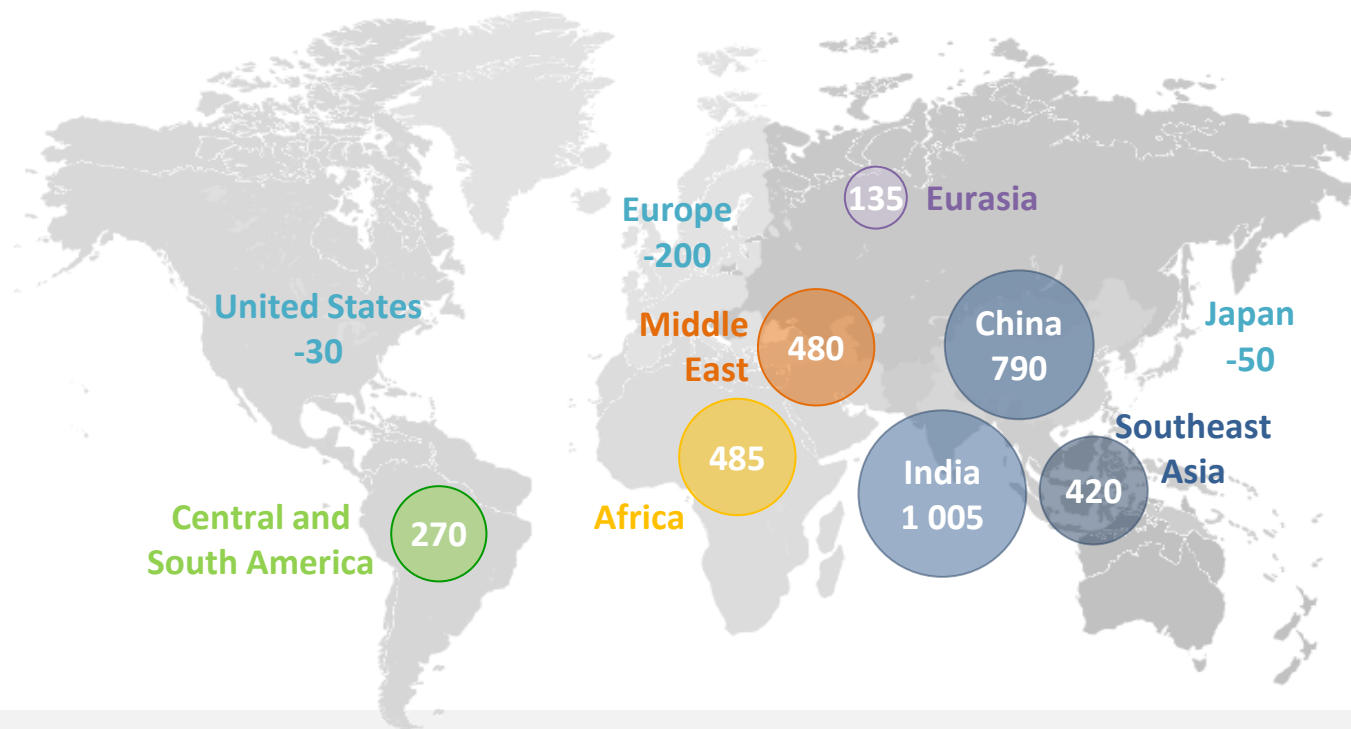
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- Four large-scale upheavals in global energy set the scene:
 - **India** moves to centre stage and **China's** new drive to “make the skies blue again” is recasting its role in energy
 - The **United States** is turning into the undisputed global leader for oil & gas
 - **Solar PV** is on track to be the cheapest source of new electricity in many countries
 - The future is **electrifying**, spurred by cooling, electric vehicles & digitalisation
- These changes brighten the prospects for affordable, sustainable energy & require a reappraisal of approaches to energy security

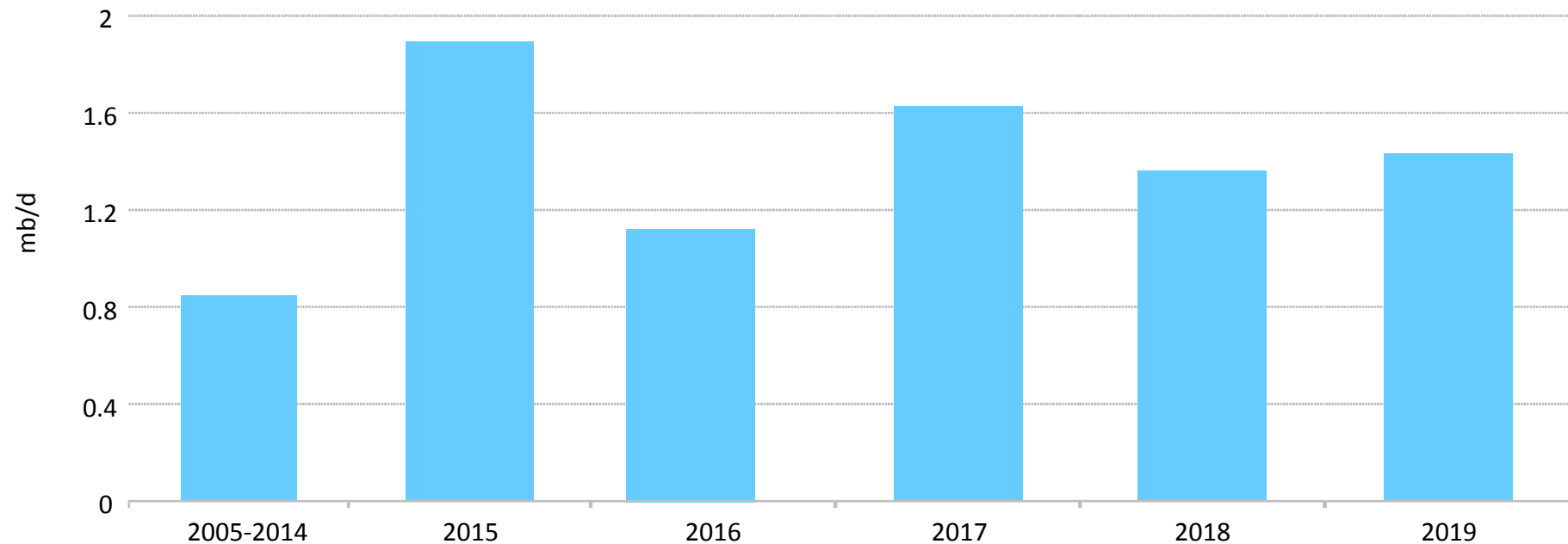
India takes the lead as China's energy growth slows

Change in energy demand, 2016-40 (Mtoe)



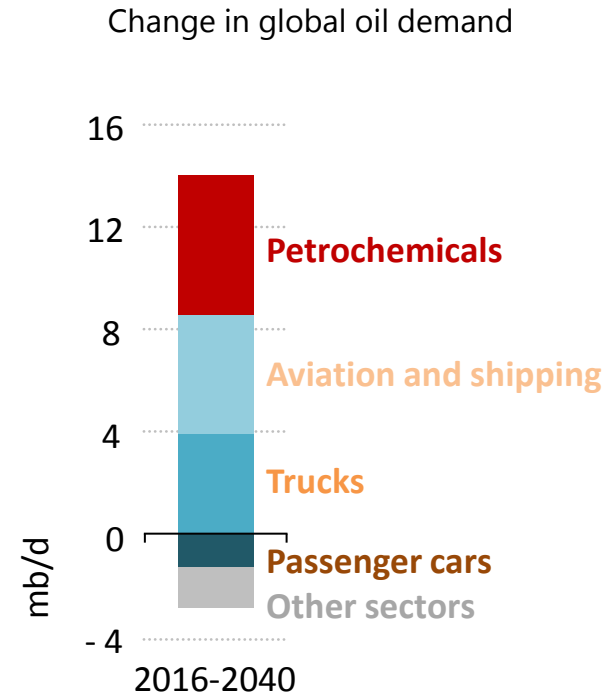
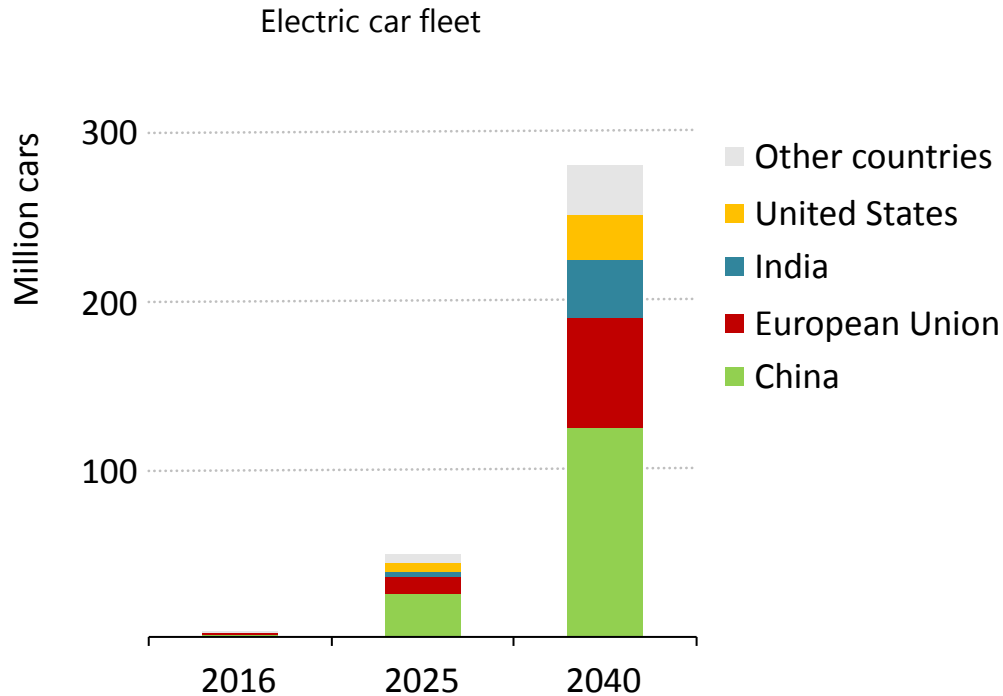
Old ways of understanding the world of energy are losing value as countries change roles.

Global oil demand remains robust



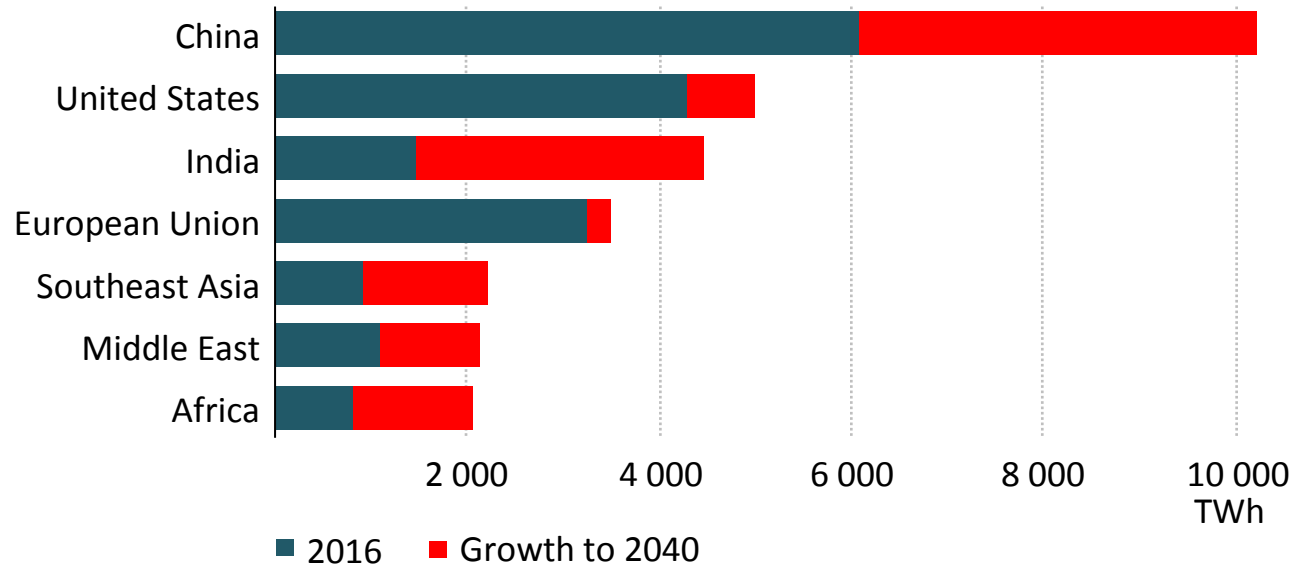
Global oil demand is set to rise by 1.4 mb/d in 2019, with China and India accounting for almost half of the increase; Petrochemicals are becoming increasingly important drivers of oil demand

EVs are in the fast lane, but oil demand still keeps rising



Electric cars are helping to transform energy use for passenger cars, slowing the pace of growth in global oil demand: however, trucks, aviation, shipping & petrochemicals keep oil on a rising trend

Electricity generation by selected region

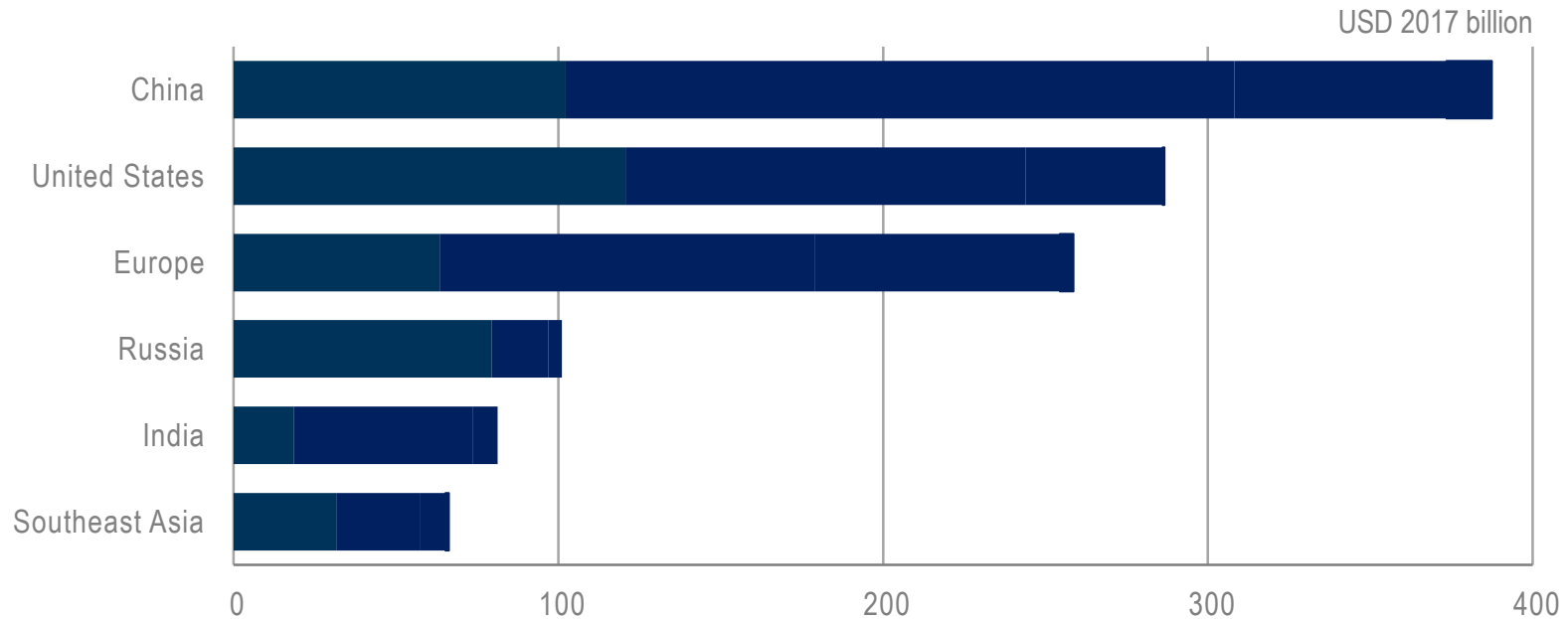


India adds the equivalent of today's European Union to its electricity generation by 2040.

India is now one of the top destinations for energy investment, but more is needed



Energy investment in selected markets, 2017

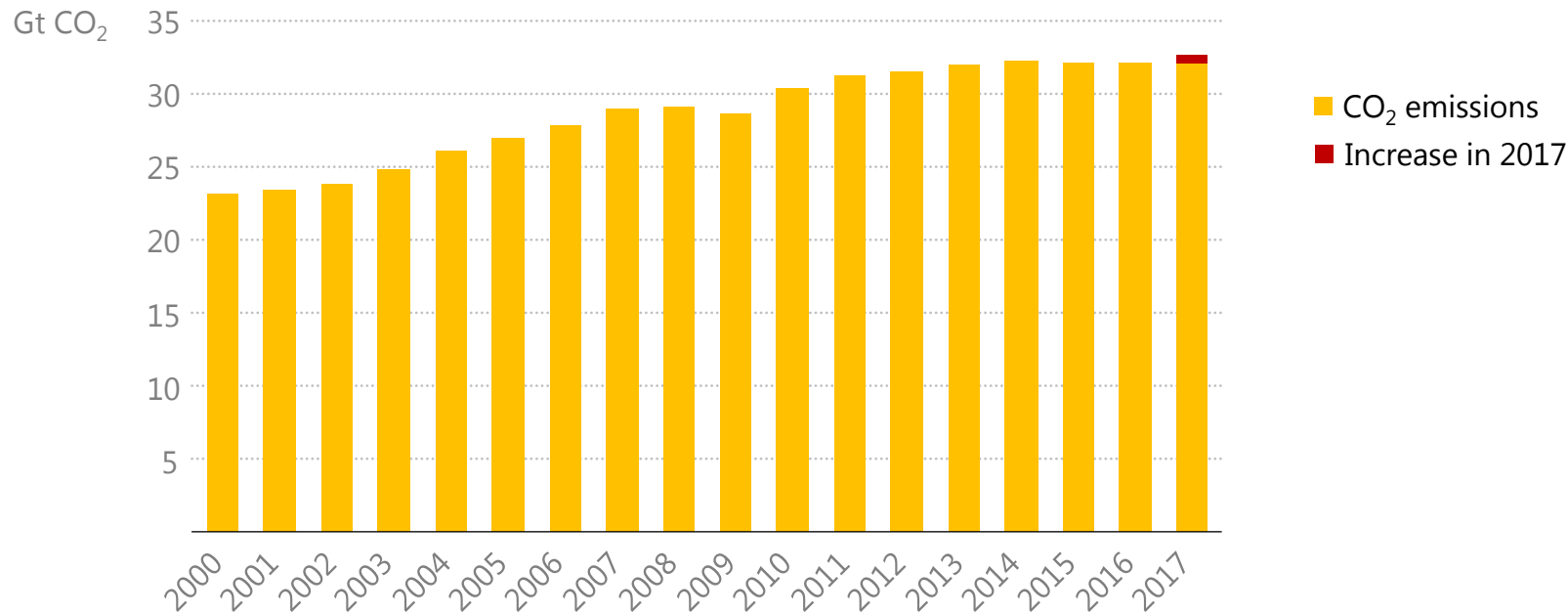


Energy investment in India amounted to over \$80 billion in 2017, driven by renewables and electricity grids. With 18% of the global population, but less than 5% of total investment, the region urgently needs to increase spending.

After plateauing for 3 years, global emissions are on the rise again



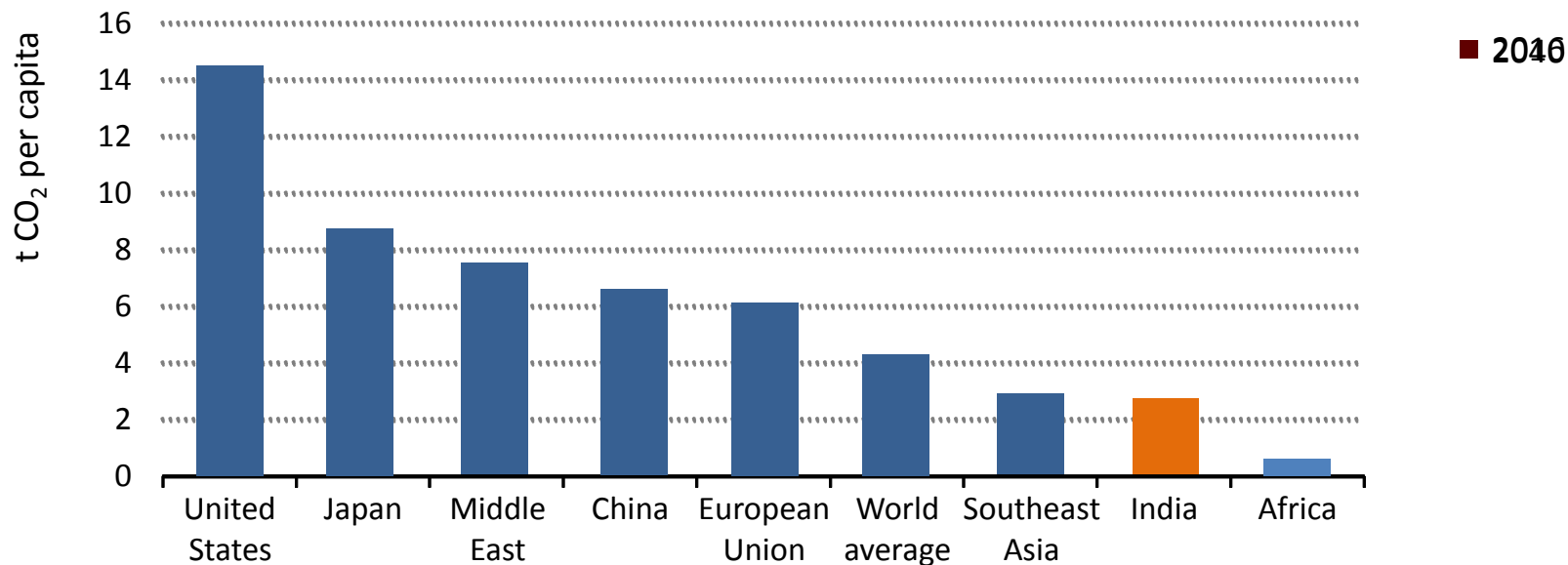
Global energy-related CO₂ emissions



After remaining flat for 3 years, global CO₂ emissions rose again in 2017, to an all-time high

India's per capita emissions remain well below the world average.

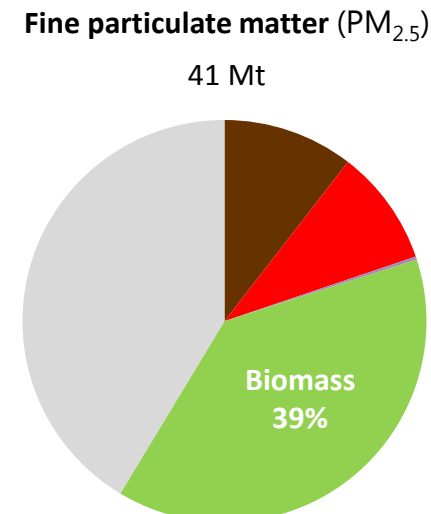
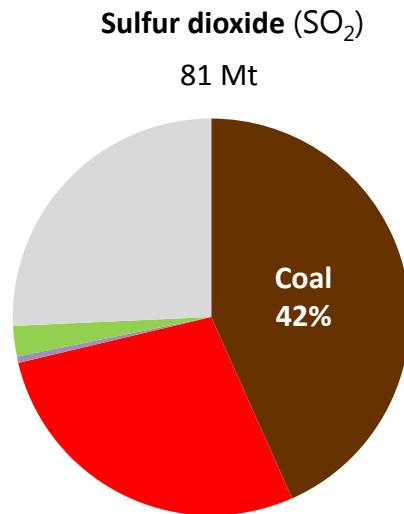
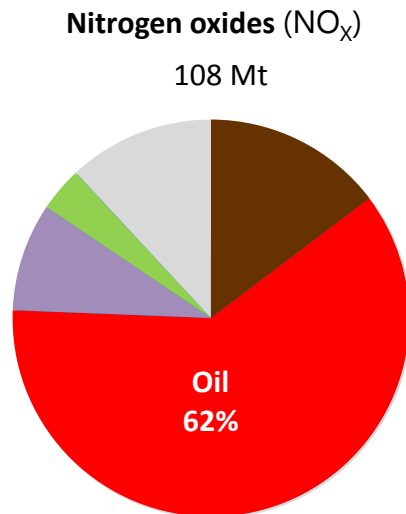
CO₂ emissions per capita



India emissions continue to grow, but per capita emissions remain among the lowest in the world.

Air pollution is an energy problem

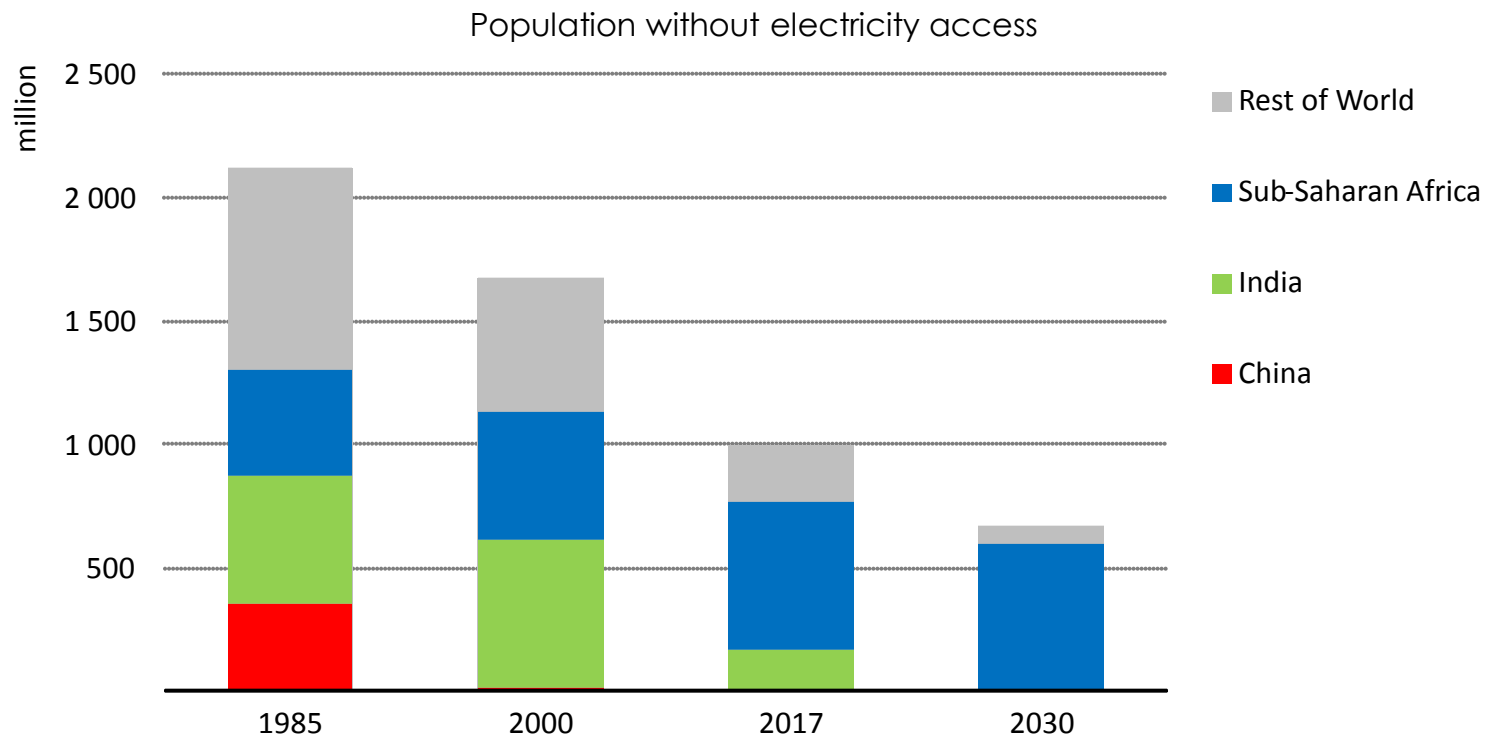
Pollutant emissions, 2015



■ Coal ■ Oil ■ Gas ■ Bioenergy ■ Other

Energy is the leading source of all major air pollutants; Premature deaths due to outdoor air pollution currently stand at around 3 million per year

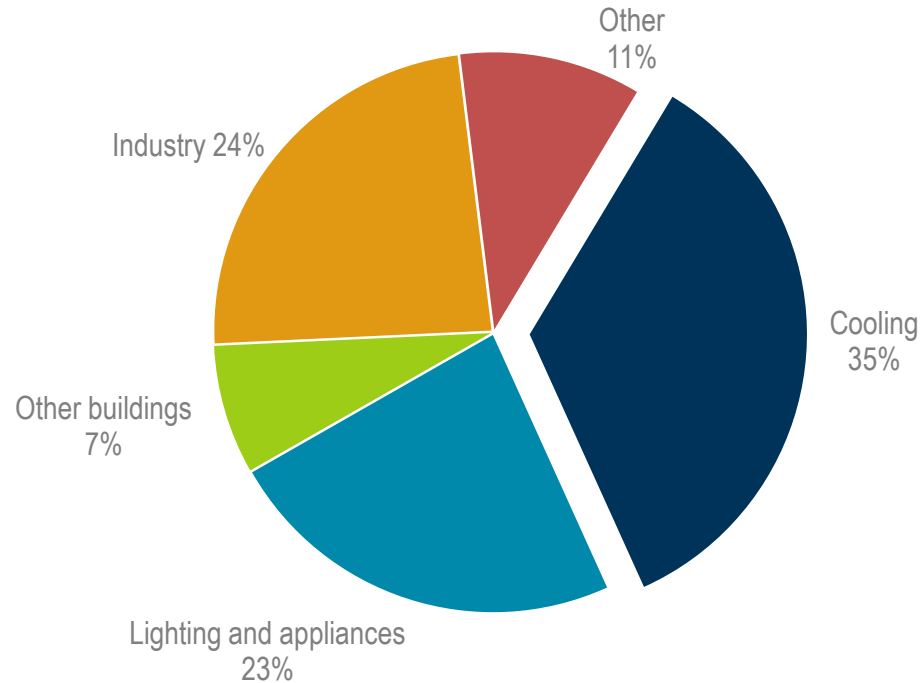
Electrification success in India, but work to do in sub-Saharan Africa



Led by India, many countries are on track to achieve full electrification by 2030, but – despite recent progress – efforts in sub-Saharan Africa need to redouble

Air conditioning is driving electricity demand higher

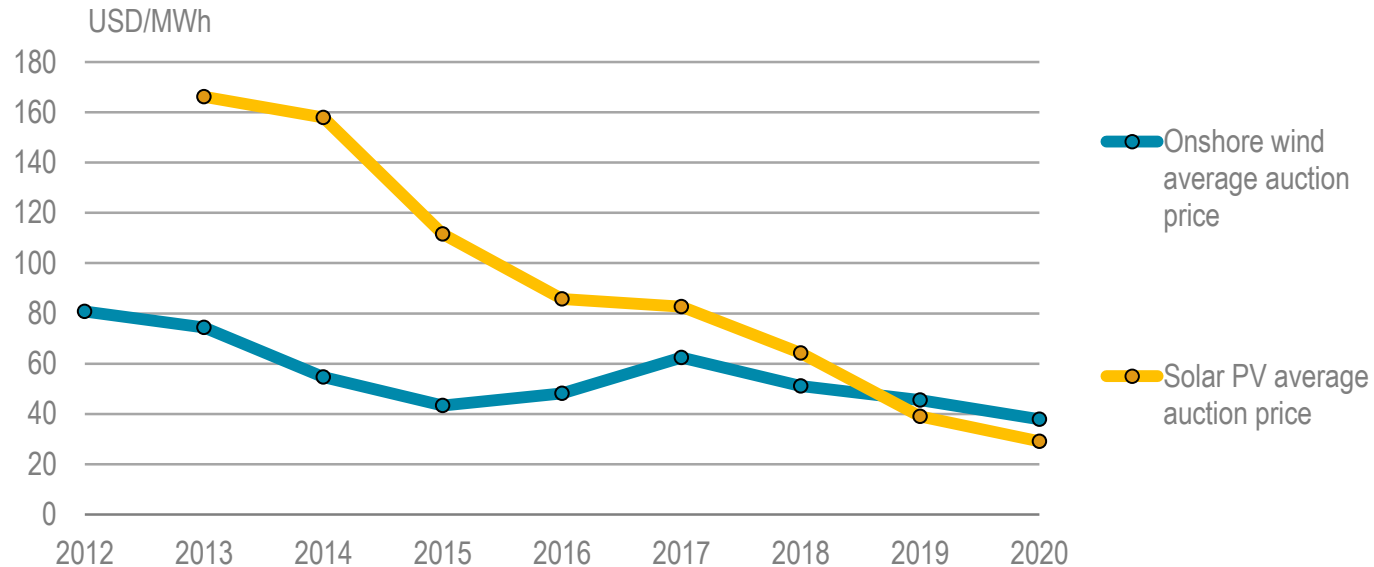
Share of final electricity demand growth to 2050 in India



Air conditioners could represent 35% of the growth in India's electricity demand to 2050; Currently 5% of households in India have air conditioners compared to over 90% in Japan and the US

Wind and solar PV transforming the power sector

Announced wind and solar PV average auction prices by commissioning date

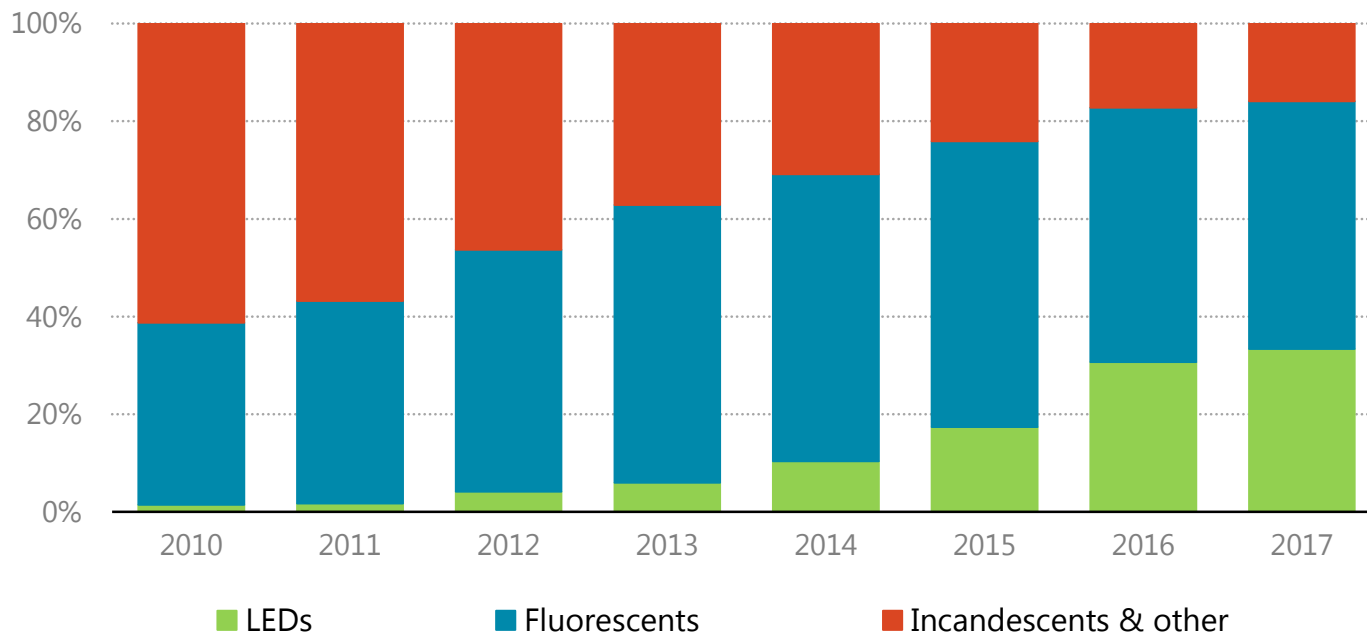


Technology progress and competition have driven down prices to record-low levels in several countries, but best-practice policies addressing system integration are critically important for future deployment

LED lighting is on track, thanks to government policy & innovation



Global residential lighting sales by type



**LEDs are on track to dominate residential lighting by around 2020;
3.3 billion LEDs were installed in 2017, underpinned by falling costs & government policy**

- **Higher oil prices** are hurting consumers & putting pressure on governments to reintroduce subsidies; crucial that any subsidies are carefully targeted
- **Energy investment is a critical issue for India** – particularly in the power sector to respond to rapid demand growth & sustainability challenges
- **Renewables & energy efficiency** can cost effectively tackle air pollution and fossil fuel imports, but need best-practice policy to lock-in investment
- **The IEA stands ready to support India** navigate its energy transition, with data, analysis, an “all fuels and technologies” approach & real-world solutions