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World Outlook Energy 2015

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Høvik, 15 December 2015

The start of a new energy era?

■ 2015 has seen lower prices for all fossil fuels

- *Oil & gas could face second year of falling upstream investment in 2016*
- *Coal prices remain at rock-bottom as demand slows in China*

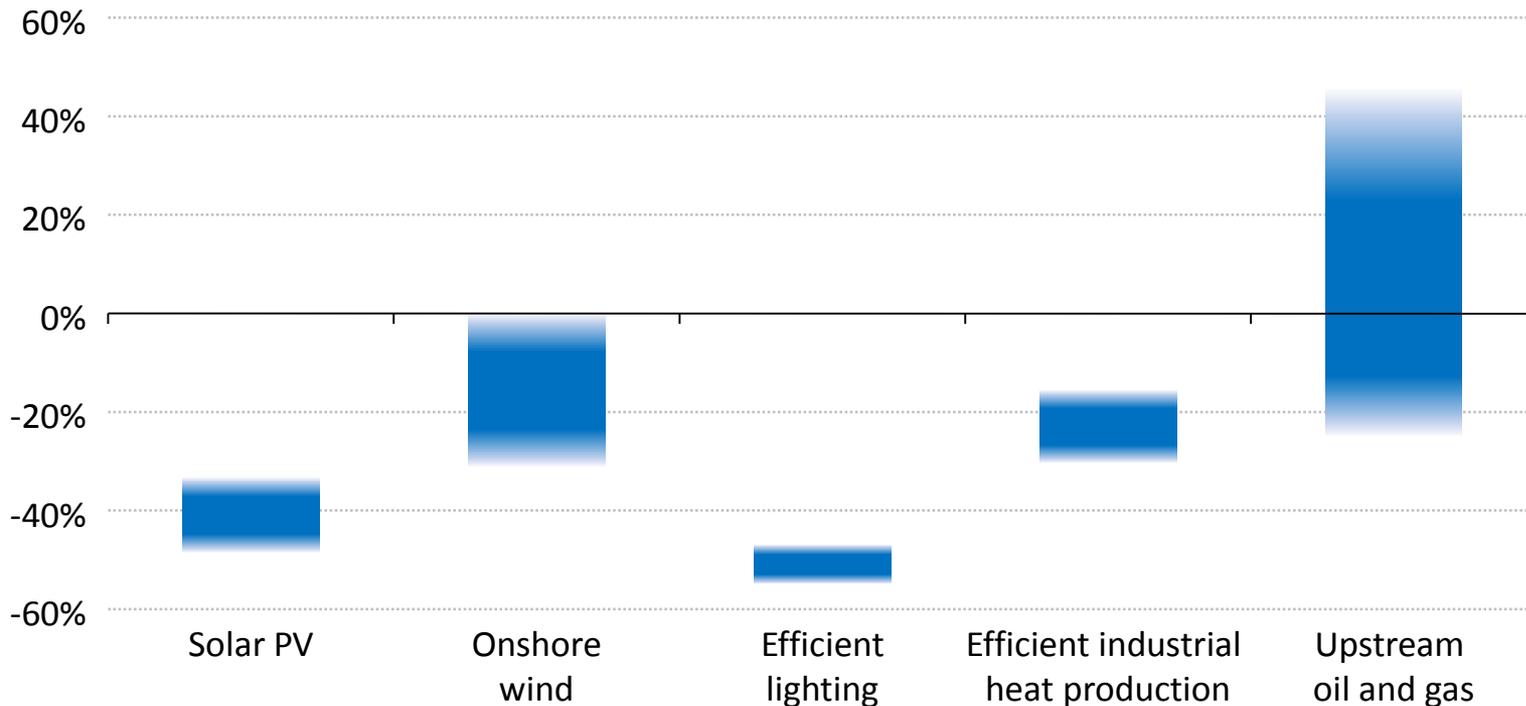
■ Signals turn green with the Paris Agreement

- *Pledges of 180+ countries account for 95% of energy-related emissions*
- *Renewables capacity additions at a record-high of 130 GW in 2014*
- *Fossil-fuel subsidy reform, led by India & Indonesia, reduces the global subsidy bill below \$500 billion in 2014*

■ Multiple signs of change, but are they moving the energy system in the right direction?

Policies spur innovation and tip the balance towards low-carbon

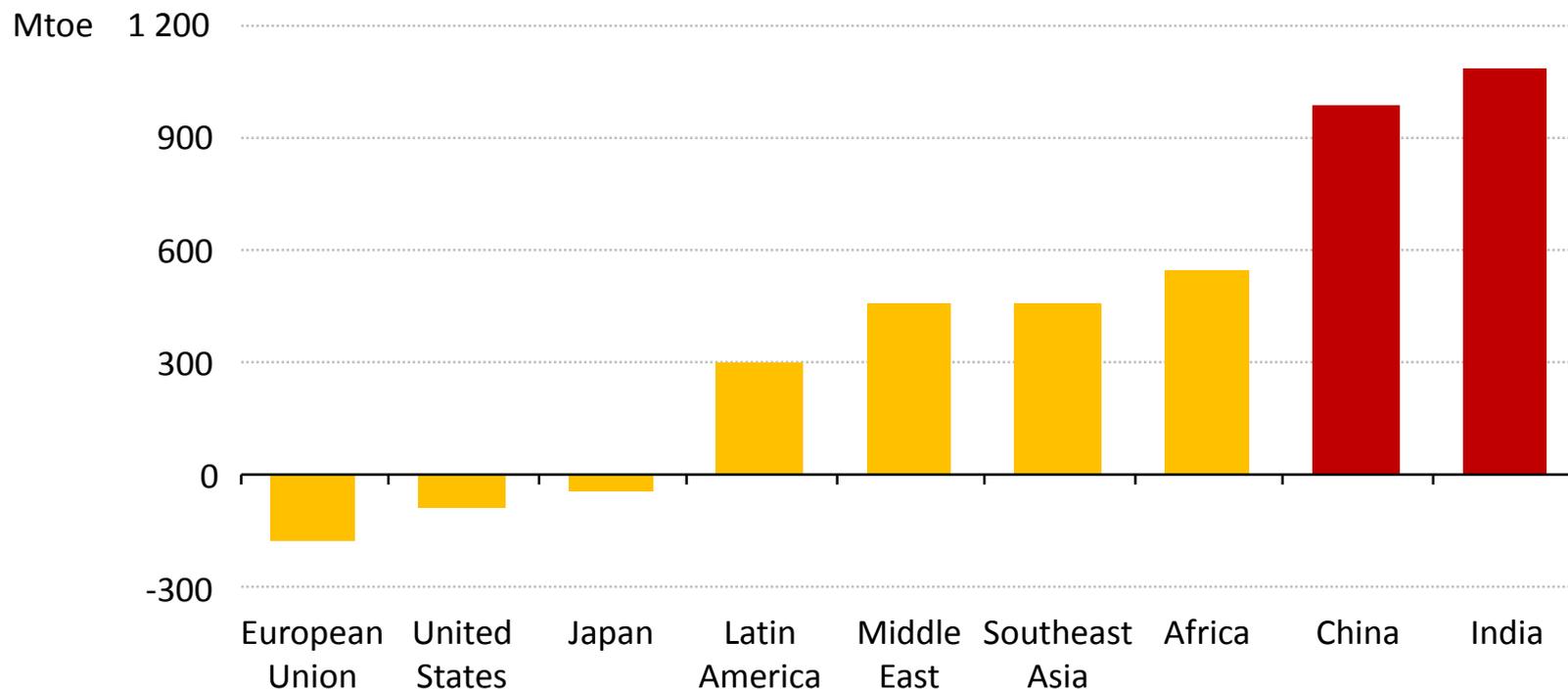
Costs in 2040 for different energy sources/technologies, relative to 2014



Innovation reduces the costs of low-carbon technologies & energy efficiency, but – for oil & gas – the gains are offset by the move to more complex fields

Demand growth in Asia – the sequel

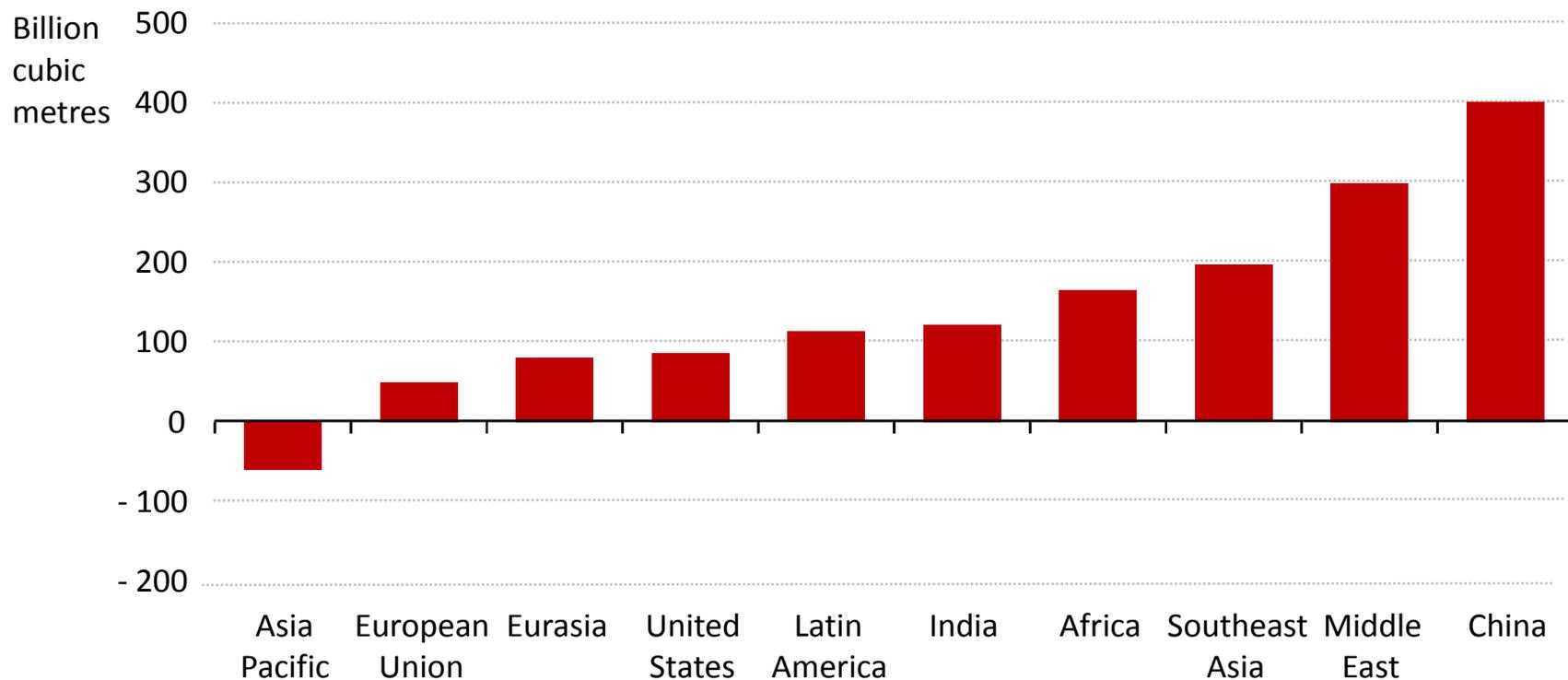
Change in energy demand in selected regions, 2014-2040



By 2040, India's energy demand closes in on that of the United States, even though demand per capita remains 40% below the world average

Resilience of gas demand growth varies by region

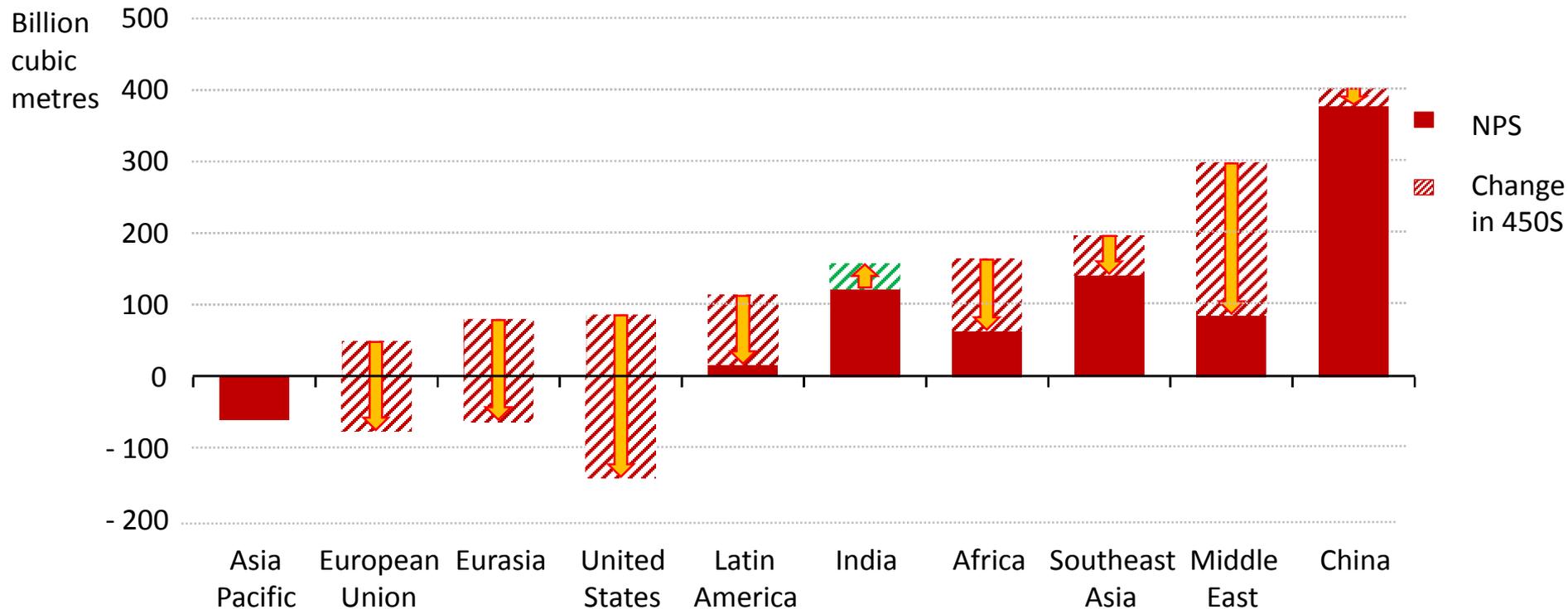
Change in gas demand in selected regions between 2014-2040 in NPS



Developing Asia accounts for almost half of the rise in global gas demand in NPS.

Resilience of gas demand growth varies by region

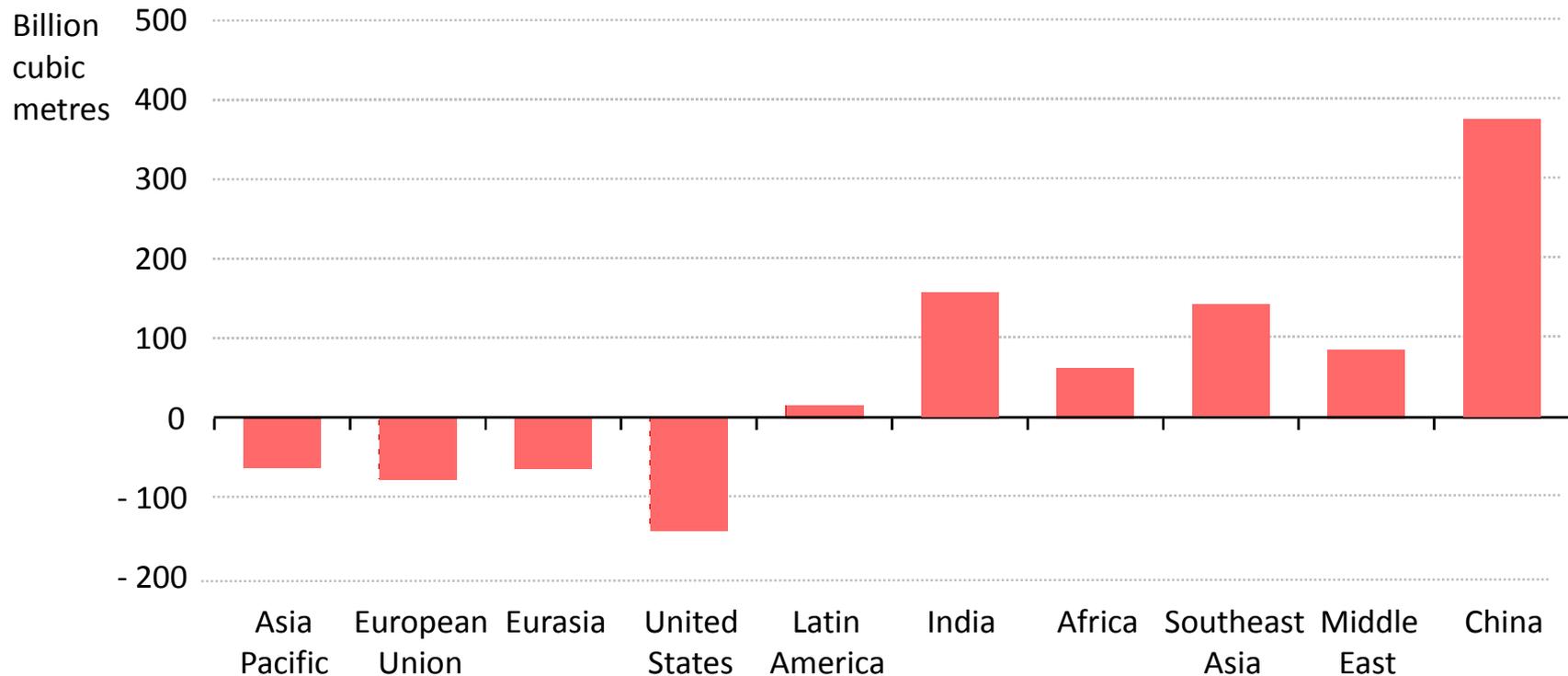
Change in gas demand in selected regions between 2014-2040 in 450S



Developing Asia accounts for almost half of the rise in global gas demand in NPS. But in 450S developed regions decline with more modest growth seen elsewhere

Resilience of gas demand growth varies by region

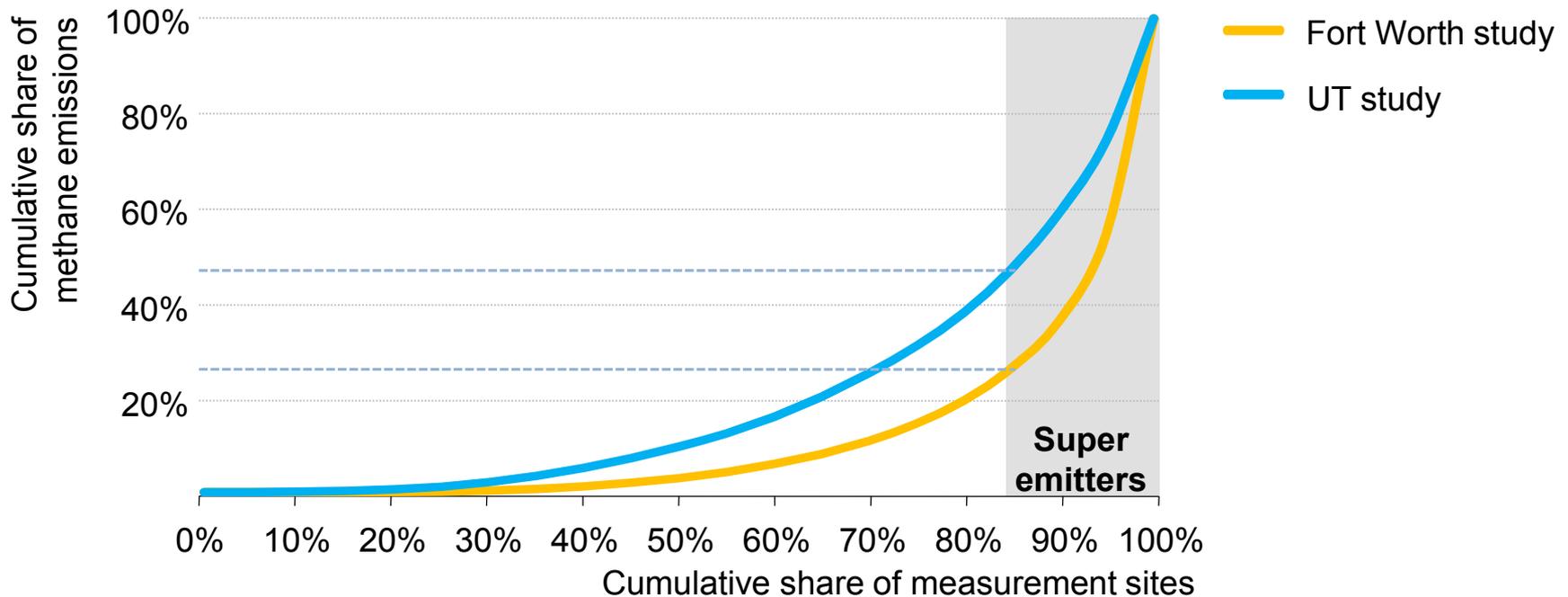
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Developing Asia accounts for almost half of the rise in global gas demand in NPS. But in 450S developed regions decline with more modest growth seen elsewhere

Reducing methane emissions is key

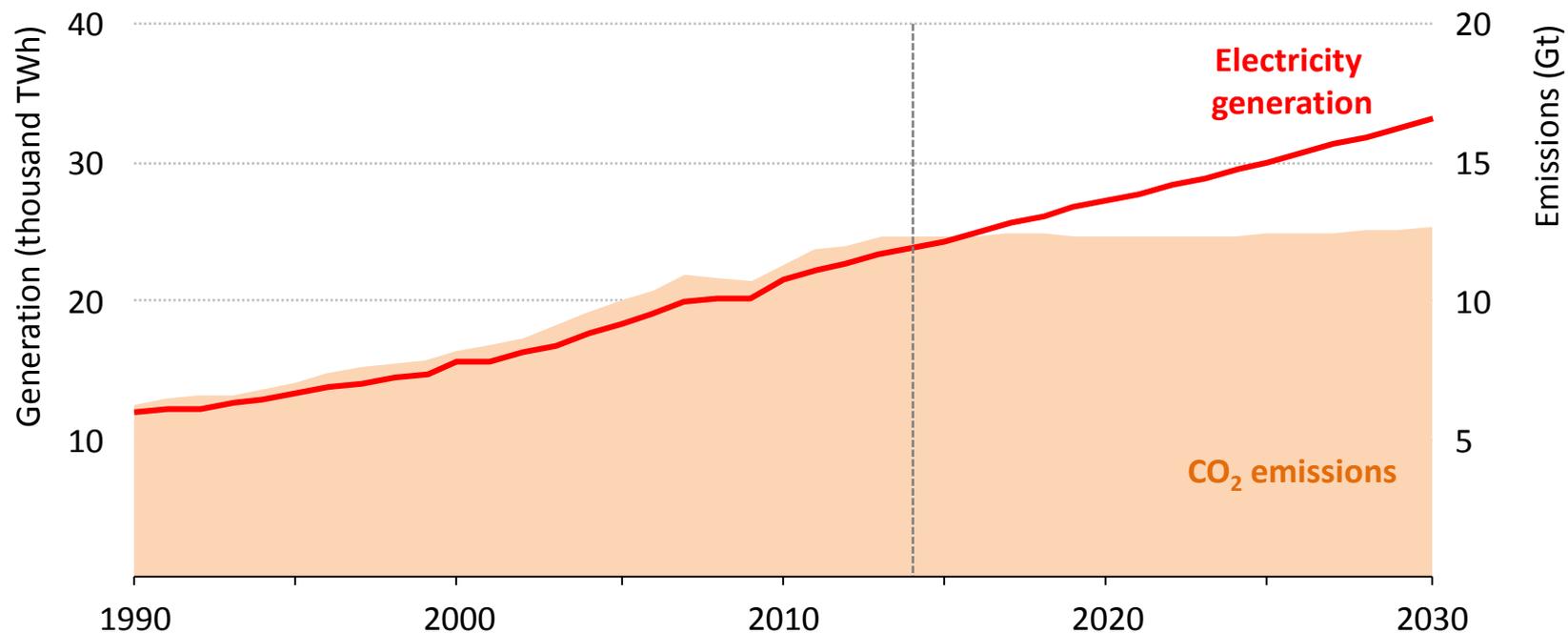
Methane emissions are dominated by small number of super-emitters



Around 80 Bcm methane is lost directly to the atmosphere every year from oil and gas operations. A key pillar of decarbonisation is reducing this by 75% by 2030.

Climate pledges decouple power sector emissions from electricity demand

World electricity generation and related CO₂ emissions



The share of low-carbon power generation grows to almost 45% in 2030 so that power emissions remain flat, while electricity demand grows by more than 40%

- **China's transition to a more diversified & much less energy-intensive model for growth re-shapes energy markets**
- **The power sector is leading the charge to decarbonise and the balance is shifting towards low-carbon technologies**
- **The energy transition is underway with the Paris Agreement laying the foundation for meaningful progress**
- **Prospects for natural gas remain bright even under a 2 °C future but cannot be taken for granted**
- **Reducing methane emissions from upstream operations is a key pillar towards keeping the window to 2 °C open**



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