



International
Energy Agency
Secure
Sustainable
Together

World Outlook Energy 2015

London, 10 November 2015

The start of a new energy era?

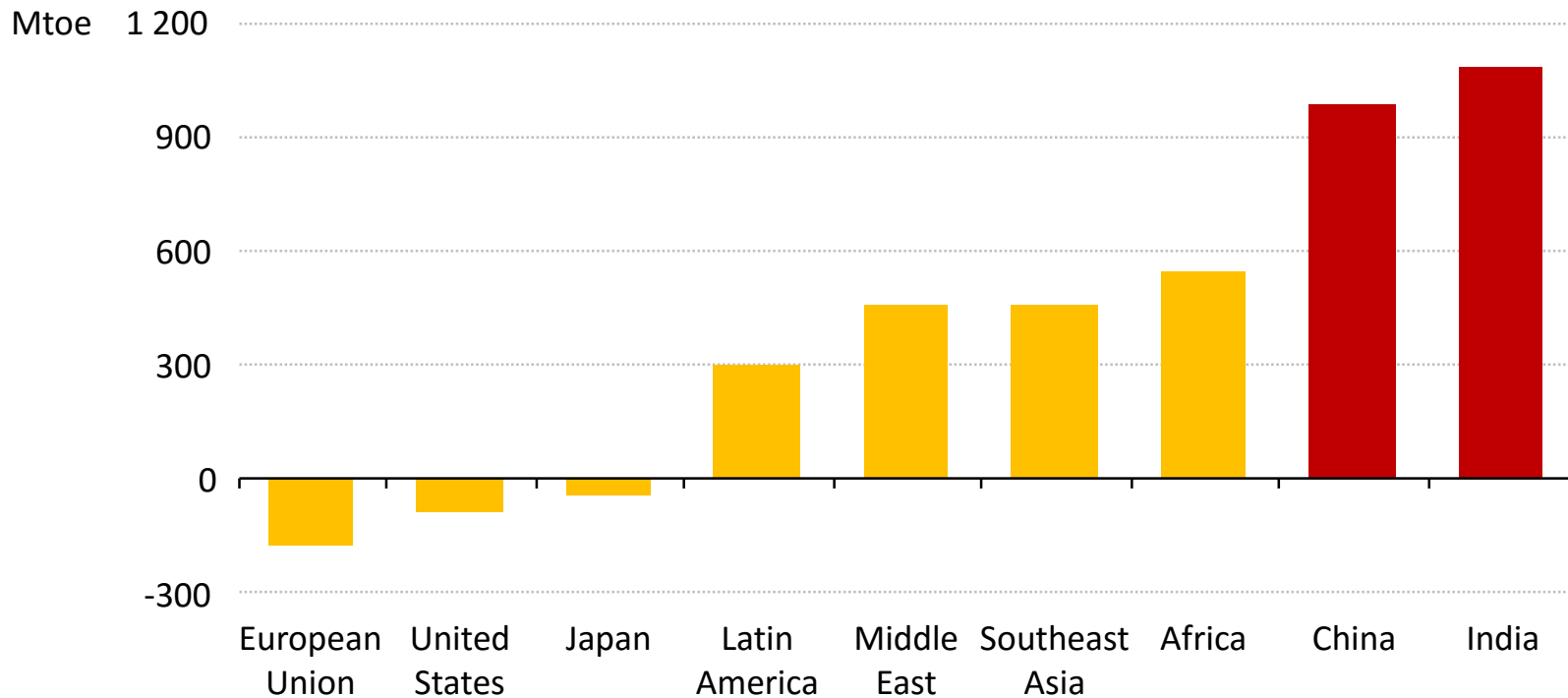
- **2015 has seen lower prices for all fossil fuels**
 - *Oil & gas could face second year of falling upstream investment in 2016*
 - *Coal prices remain at rock-bottom as demand slows in China*

- **Signals turn green ahead of key Paris climate summit**
 - *Pledges of 150+ countries account for 90% 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?**

Demand growth in Asia – the sequel

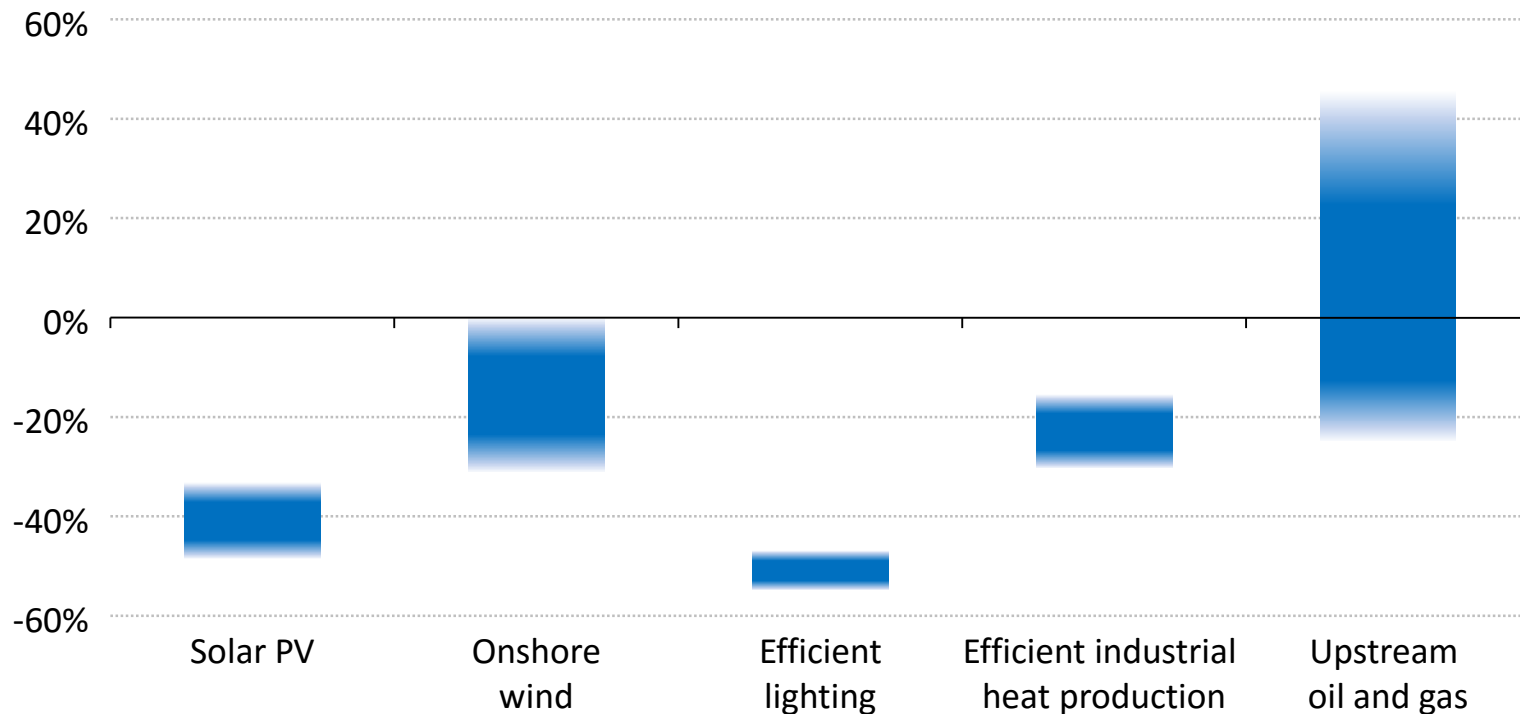
Change in energy demand in selected regions, 2014-2040



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

Policies spur innovation and tip the balance towards low-carbon

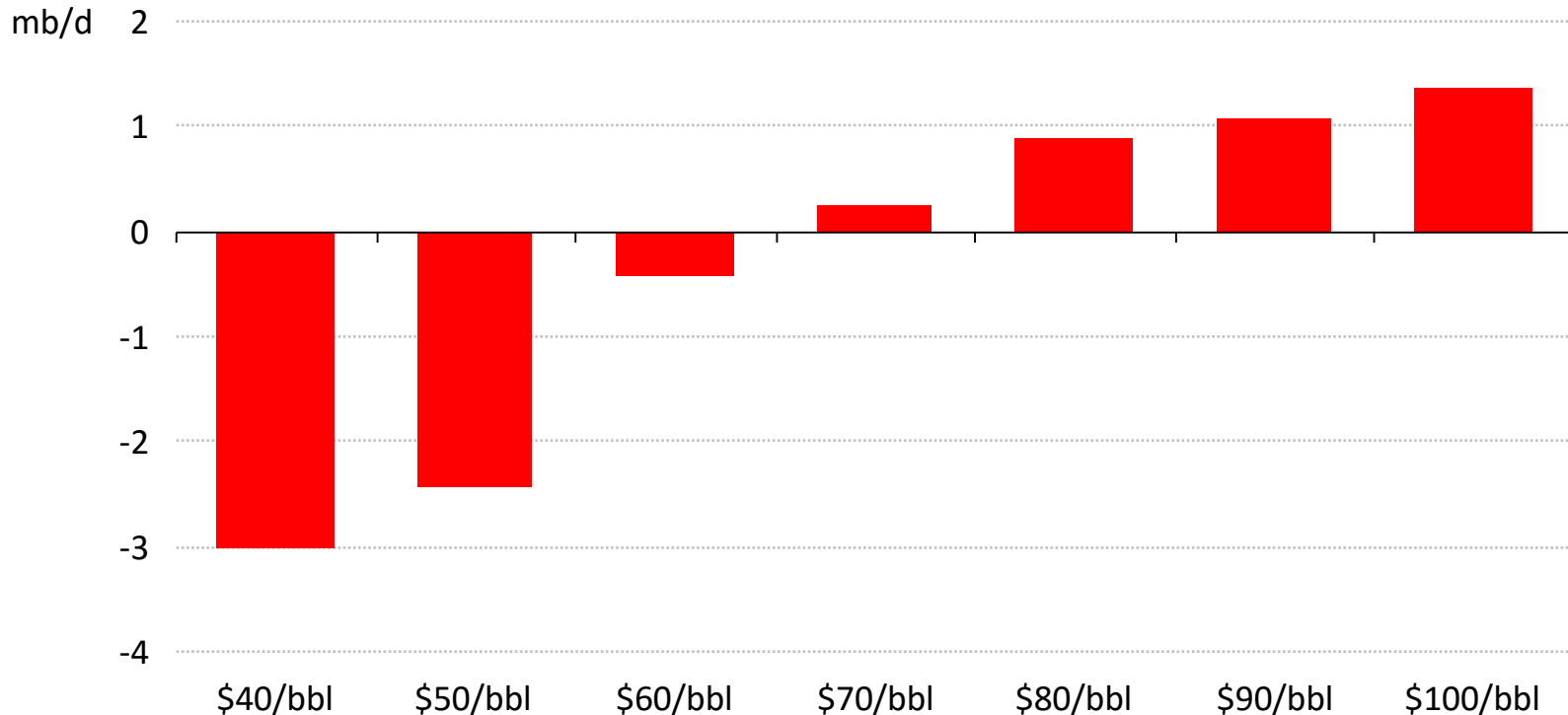
Costs in 2040 for different energy sources/technologies, relative to 2014



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

A new balancing item in the oil market?

Change in production (2015-2020) of US tight oil for a range of 2020 oil prices



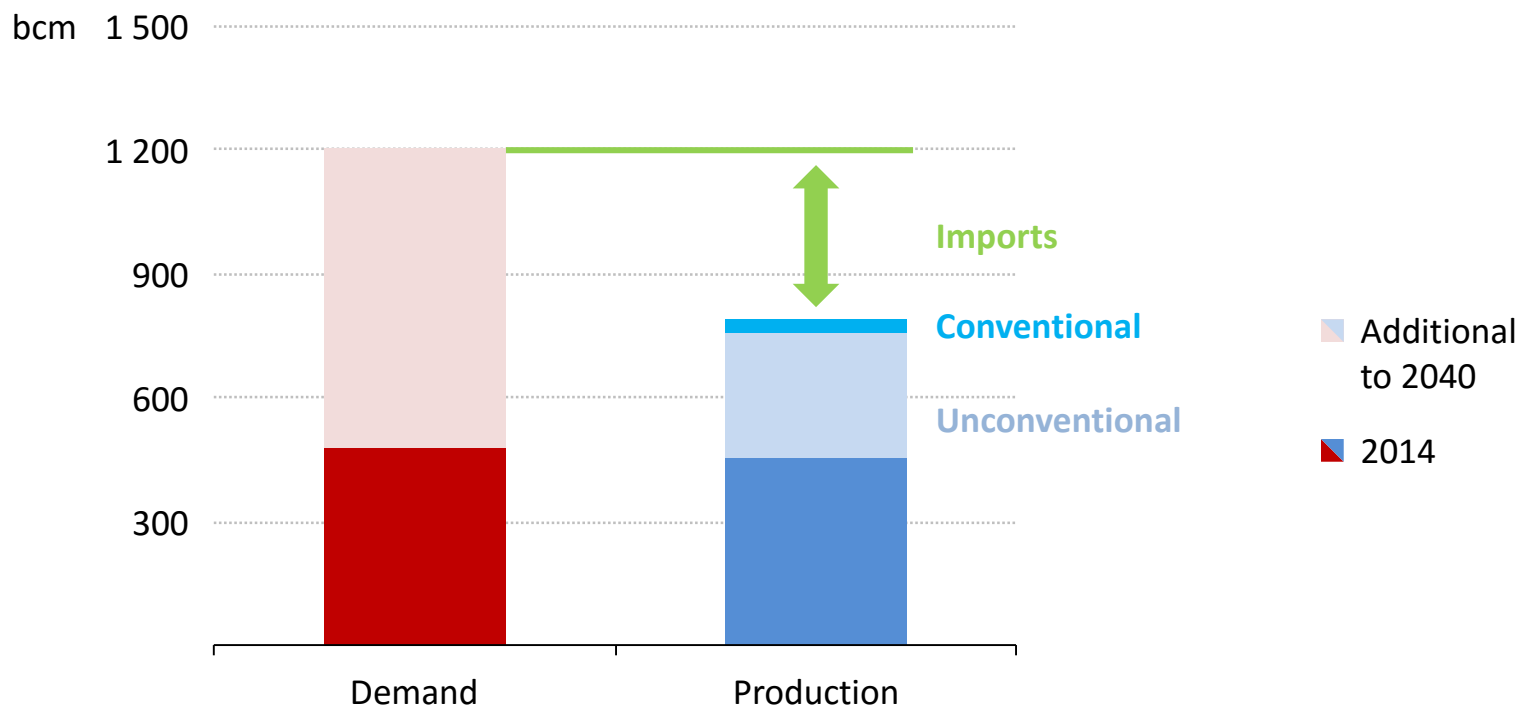
Tight oil has created more short-term supply flexibility, but there is no guarantee that the adjustment mechanism in oil markets will be smooth

If oil prices stay lower for much longer: what would it take, what would it mean?

- Much more resilient non-OPEC supply & higher output from a stable Middle East could hold the oil price close to \$50/bbl until the 2020s
- Oil importers gain, each \$1/bbl reduction is \$15 billion off import bills; major window of opportunity to press ahead with subsidy reform
- If lower prices persist for decades, reliance on Middle East oil gets back to 1970s levels; risk of a sharp market rebound if investment falls short
- Lower prices could undercut essential policy support for the energy transition: weaker incentives mean 15% of efficiency savings are lost
- Reduction in revenues to key producers & boost to global oil demand growth make a prolonged period of lower prices progressively less likely

The big opportunities & uncertainties for natural gas are in Asia

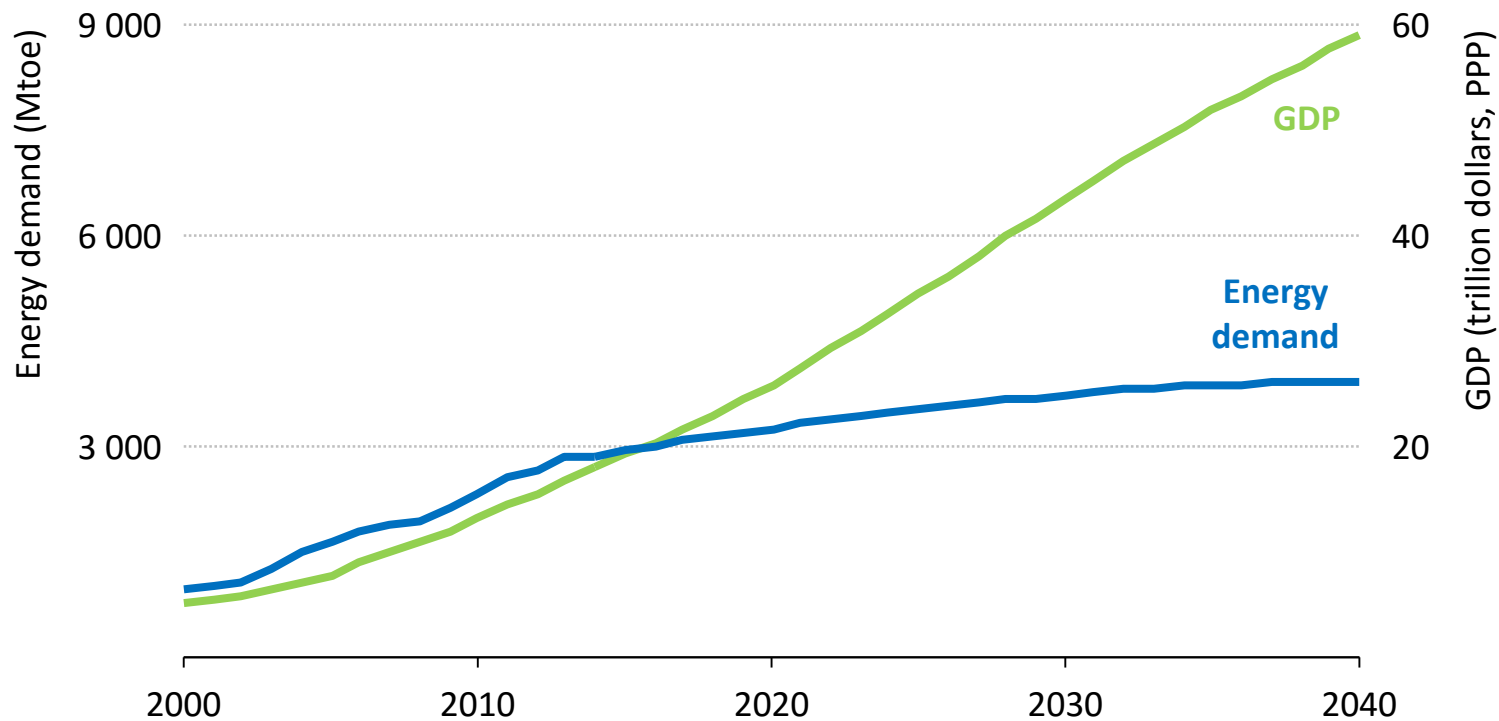
Natural gas demand and supply in developing Asia, 2040



Developing Asia accounts for almost half of the rise in global gas demand & 75% of the increase in imports, but gas faces strong competition from renewables & coal

A new chapter in China's growth story

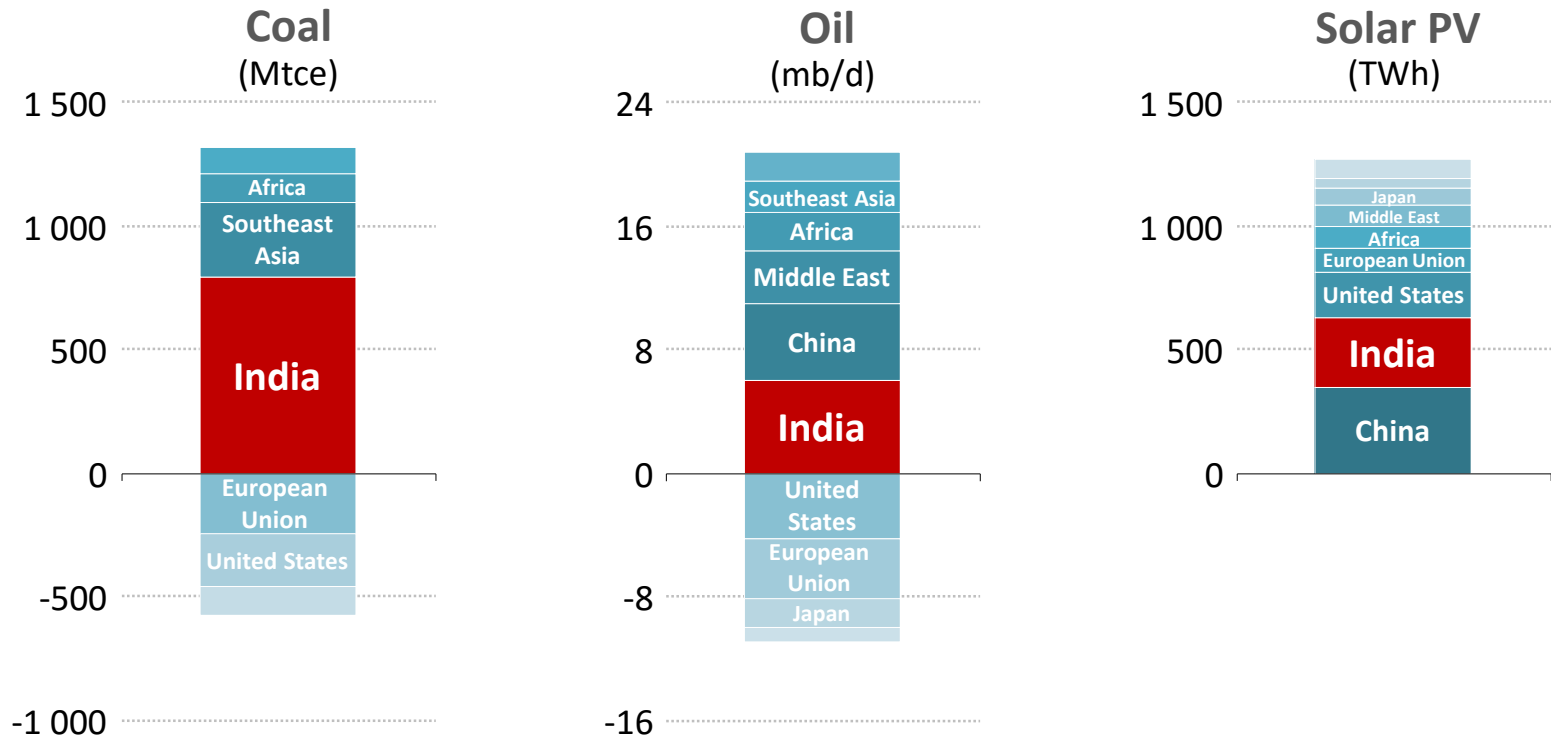
Energy demand in China



Along with energy efficiency, structural shifts in China's economy favouring expansion of services, mean less energy is required to generate economic growth

India moving to the centre of the world energy stage

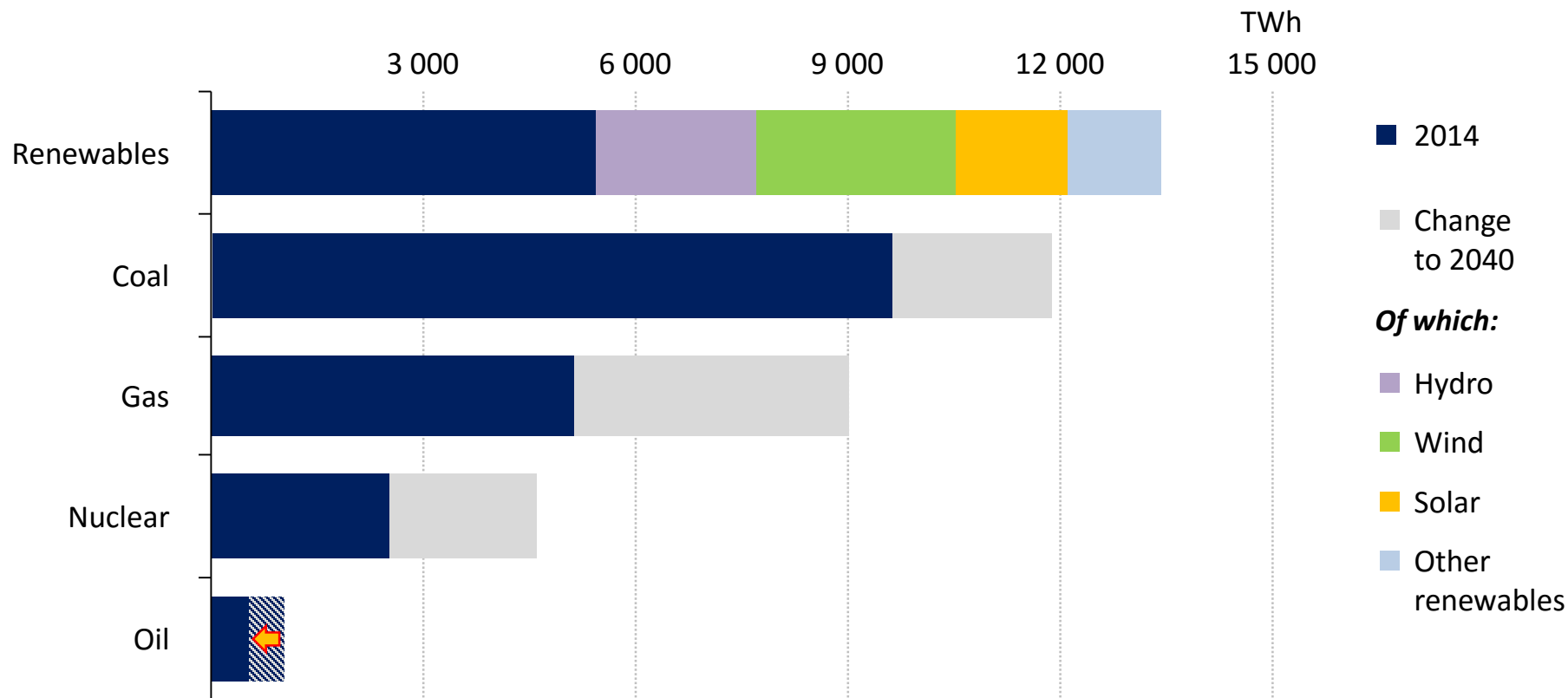
Change in demand for selected fuels, 2014-2040



New infrastructure, an expanding middle class & 600 million new electricity consumers mean a large rise in the energy required to fuel India's development

Power is leading the transformation of the energy system

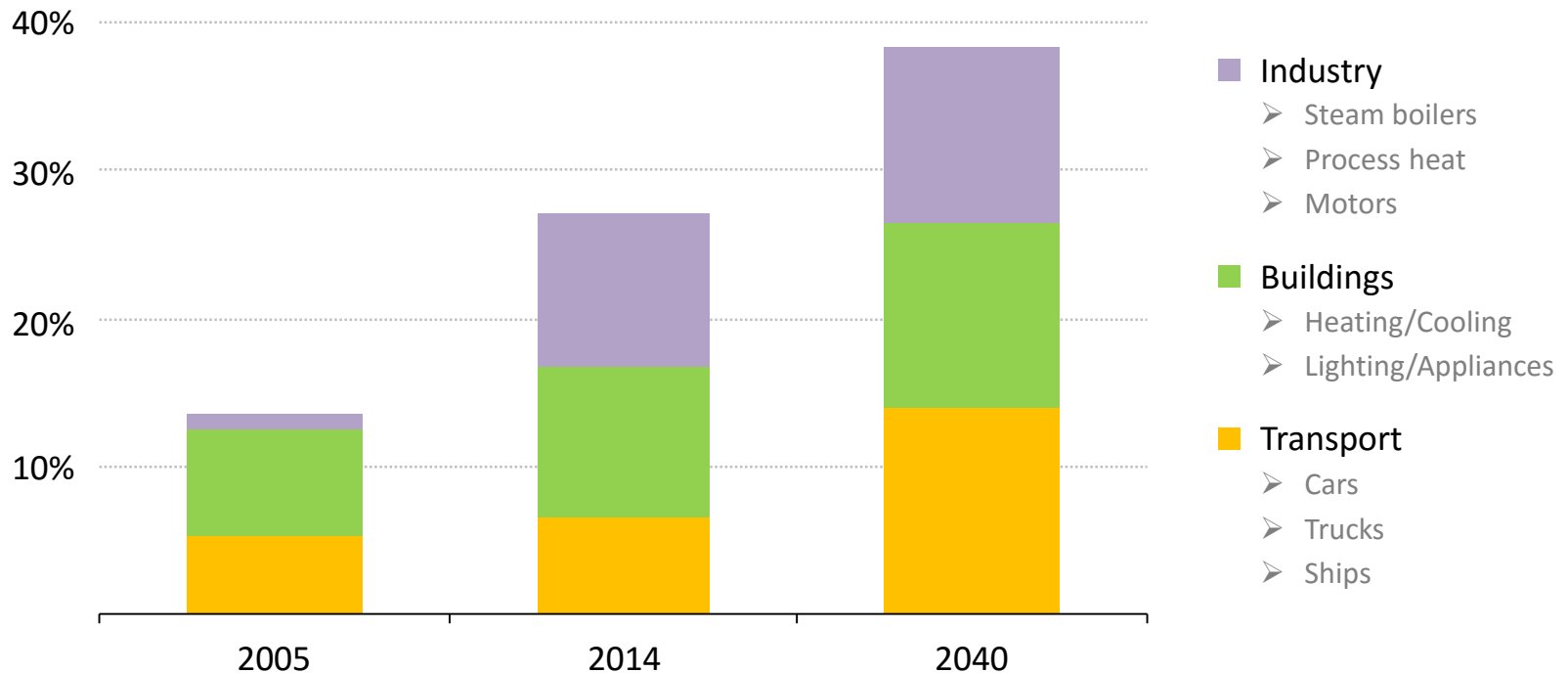
Global electricity generation by source



Driven by continued policy support, renewables account for half of additional global generation, overtaking coal around 2030 to become the largest power source

Efficiency measures on the rise, but significant potential still exists

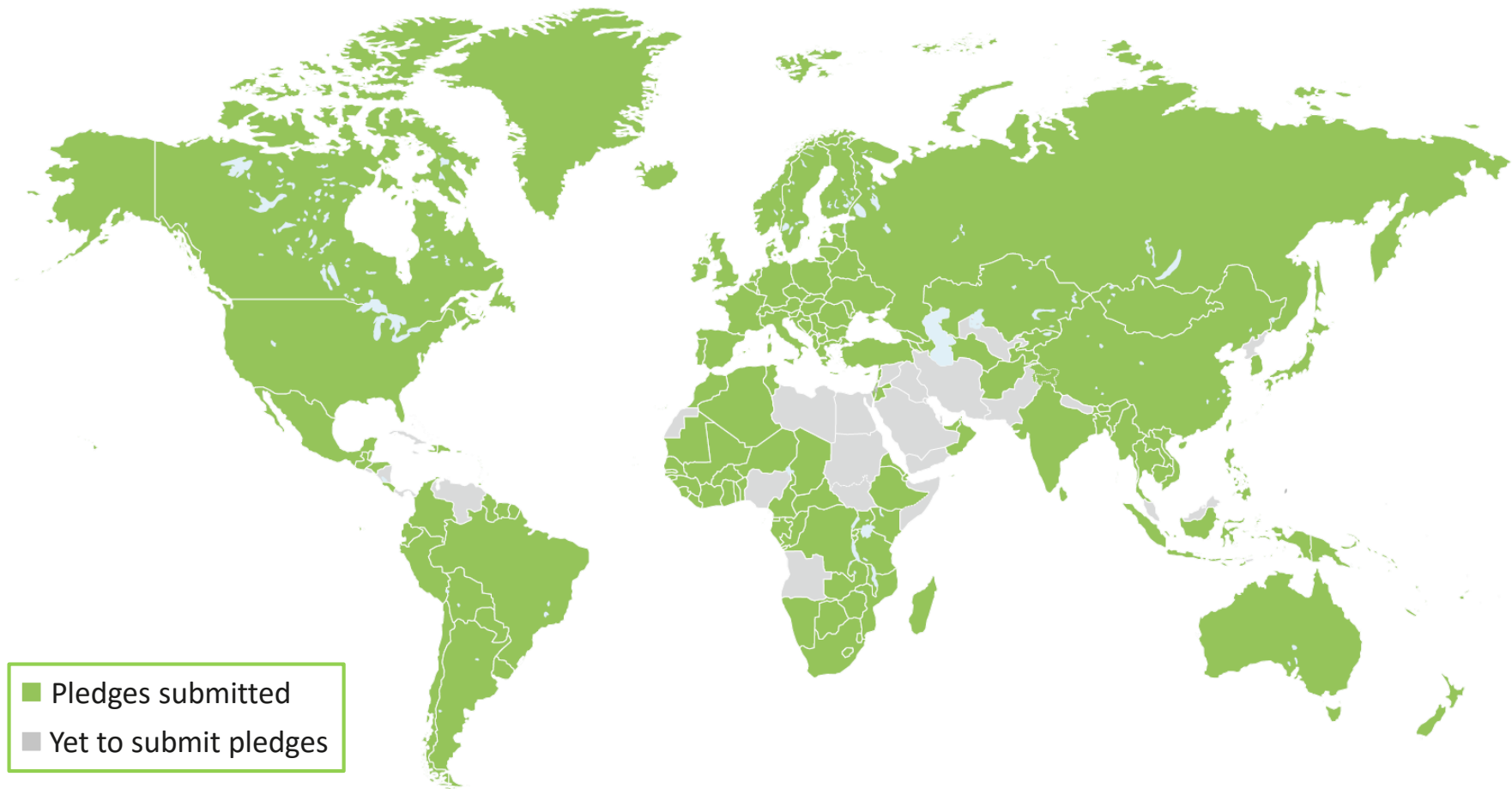
Share of global mandatory efficiency regulation of final energy consumption



***Energy efficiency policies are introduced in more countries and sectors;
they continue to slow demand growth but more can be done***

The coverage of climate pledges is impressive

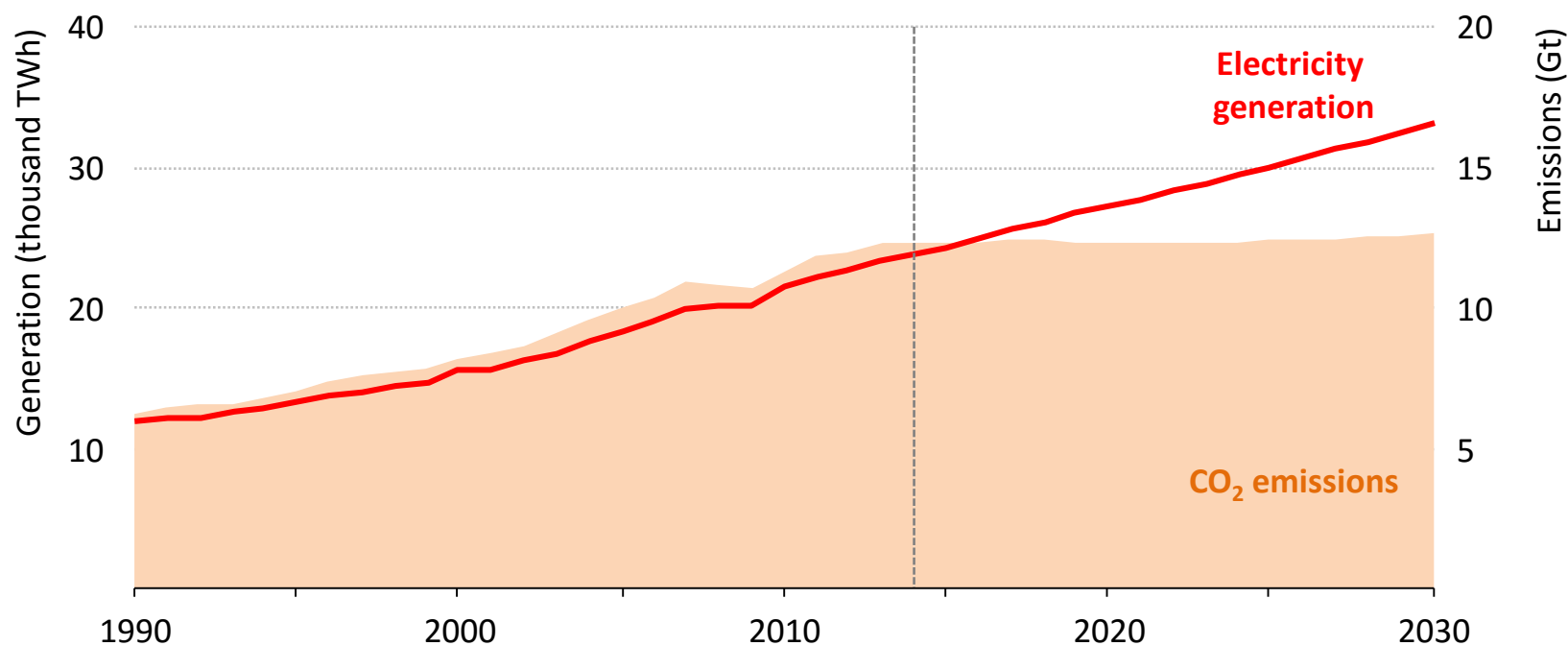
World
Outlook Energy
2015



Climate pledges for COP21 are consistent with a temperature rise of 2.7 °C, with investment needs of \$13.5 trillion in low-carbon technologies & efficiency to 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%

- **Low prices bring gains to consumers, but can also sow the seeds of future risks to energy security: no room for complacency**
- **India's energy needs are huge: there is a strong shared interest to support India's push for clean & efficient technologies**
- **China's transition to a more diversified & much less energy-intensive model for growth re-shapes energy markets**
- **The energy transition is underway, but needs a strong signal from Paris: governments must ring-fence policies against market swings**
- **With looming energy security & environmental challenges, international cooperation on energy has never been more vital**



International
Energy Agency
Secure
Sustainable
Together

World Energy Outlook 2015

www.worldenergyoutlook.org