

World Energy Outlook 2013

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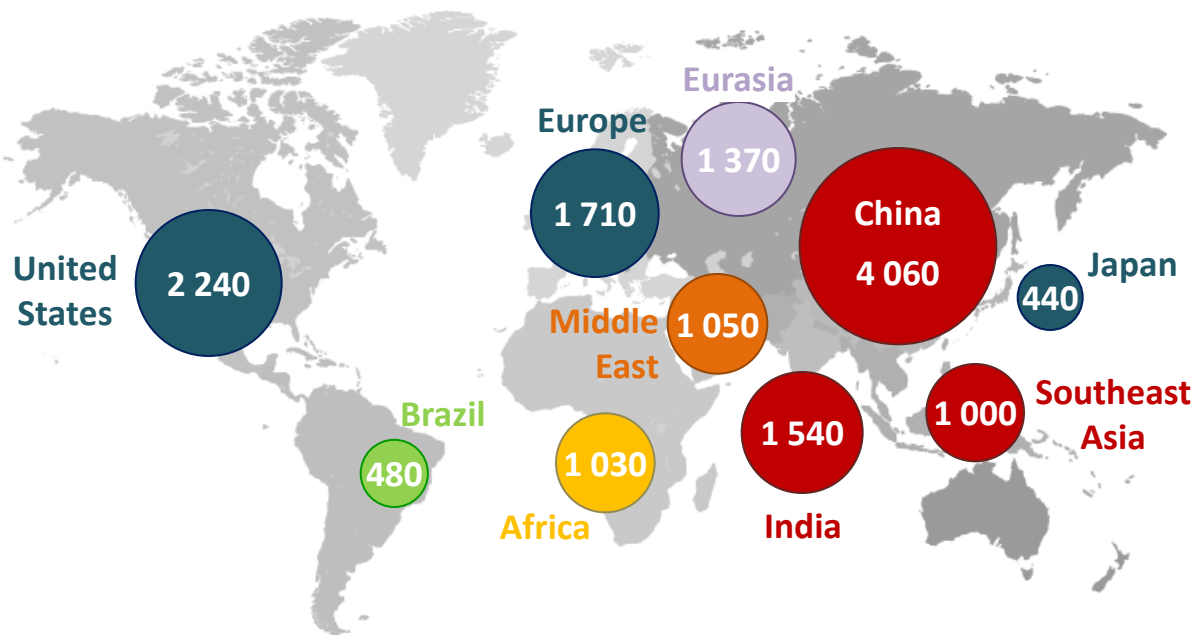
International Energy Agency

Athens, 3 December 2013

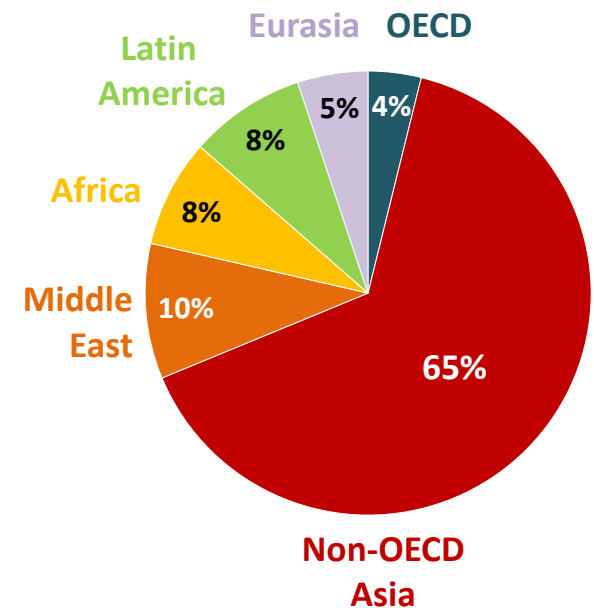
- **Some long-held tenets of the energy sector are being rewritten**
 - *Countries are switching roles: importers are becoming exporters...*
 - *... and exporters are among the major sources of growing demand*
 - *New supply options reshape patterns of trade*
- **But long-term solutions to global challenges remain scarce**
 - *Renewed focus on energy efficiency, but CO₂ emissions continue to rise*
 - *Fossil-fuel subsidies increased to \$544 billion in 2012*
 - *1.3 billion people lack electricity, 2.6 billion lack clean cooking facilities*
- **Energy prices add to the pressure on policymakers**
 - *Sustained period of high oil prices without parallel in market history*
 - *Large, persistent regional price differences for gas & electricity*

The engine of energy demand growth moves to South Asia

Primary energy demand, 2035 (Mtoe)



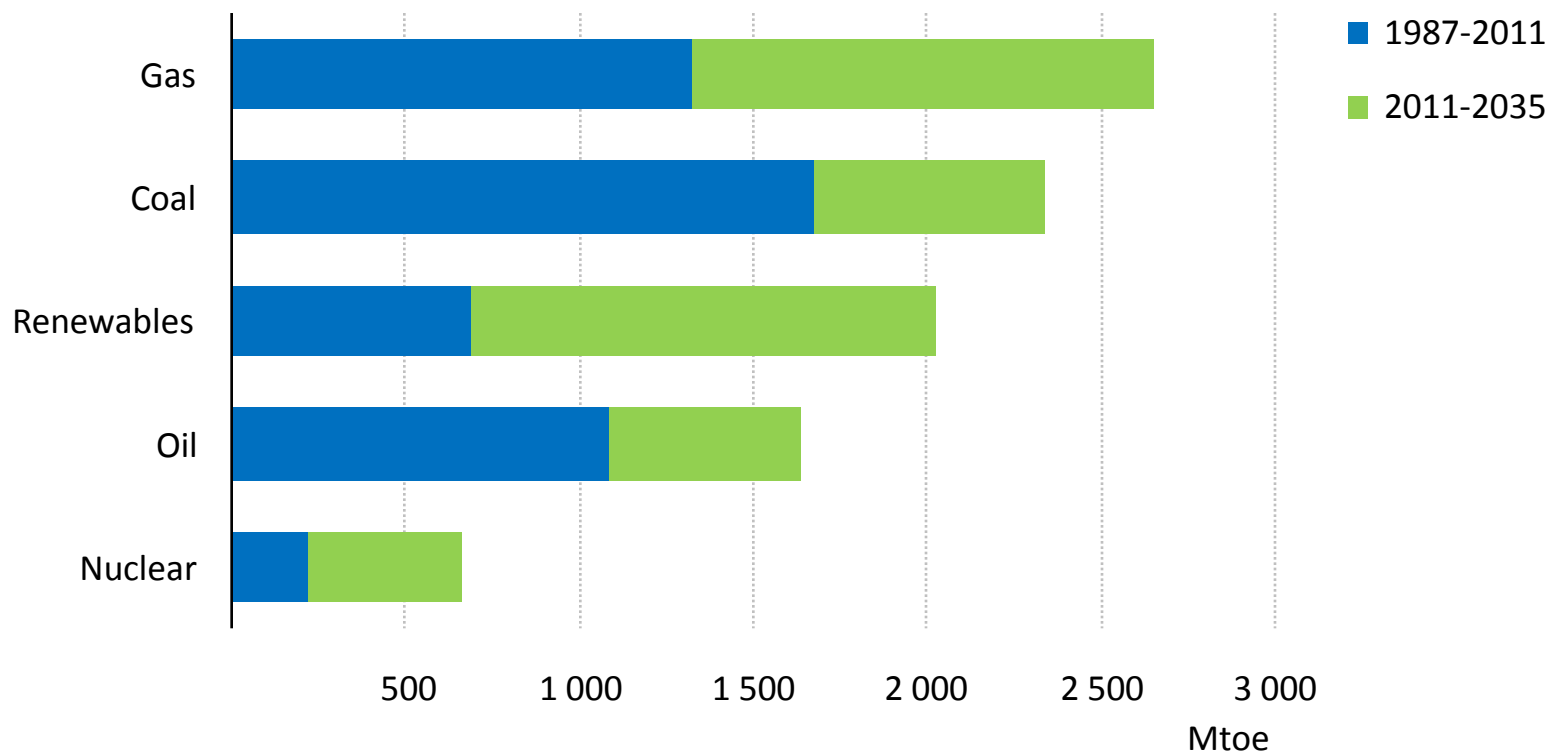
Share of global growth 2012-2035



China is the main driver of increasing energy demand in the current decade, but India takes over in the 2020s as the principal source of growth

A mix that is slow to change

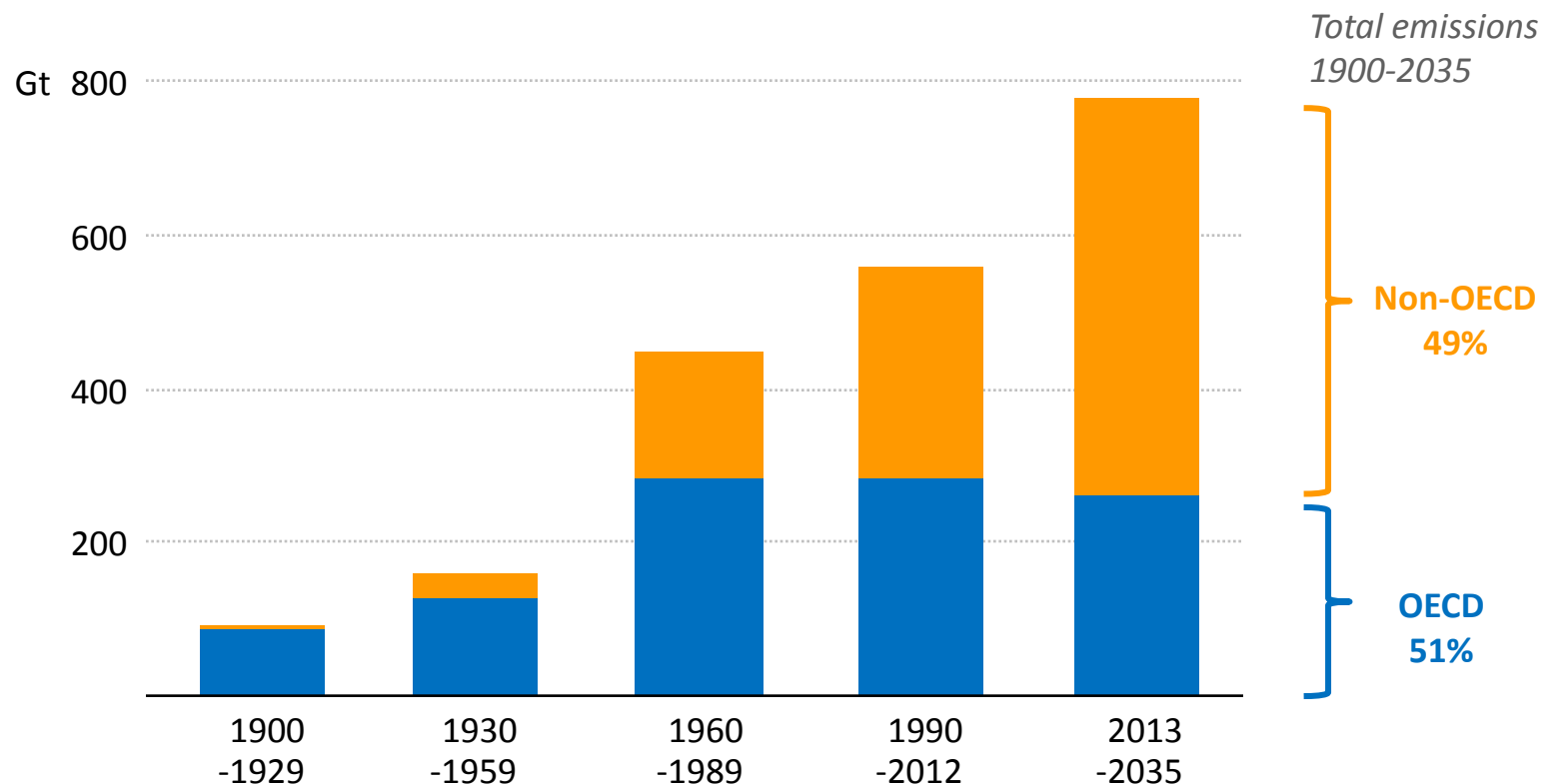
Growth in total primary energy demand



Today's share of fossil fuels in the global mix, at 82%, is the same as it was 25 years ago; the strong rise of renewables only reduces this to around 75% in 2035

Emissions off track in the run-up to the 2015 climate summit in France

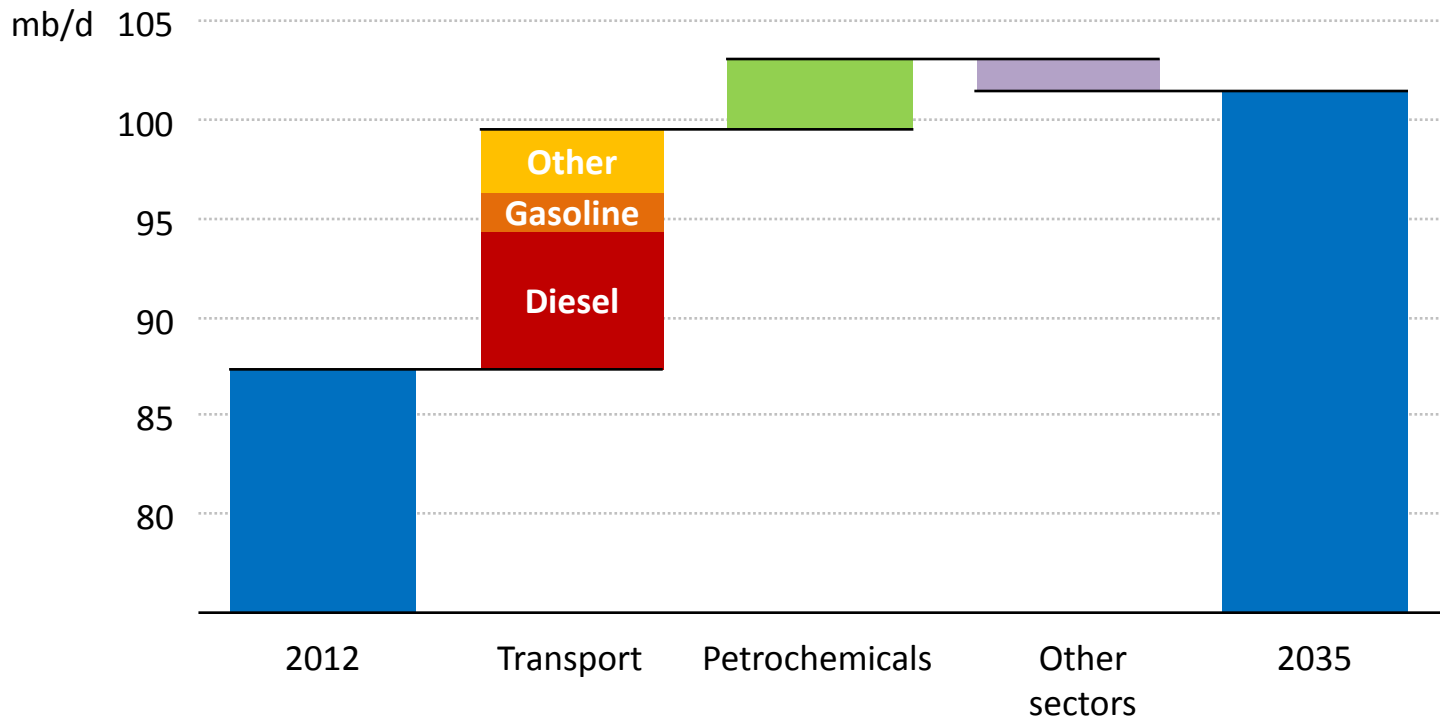
Cumulative energy-related CO₂ emissions



Non-OECD countries account for a rising share of emissions, although 2035 per capita levels are only half of OECD

Oil use grows, but in a narrowing set of markets

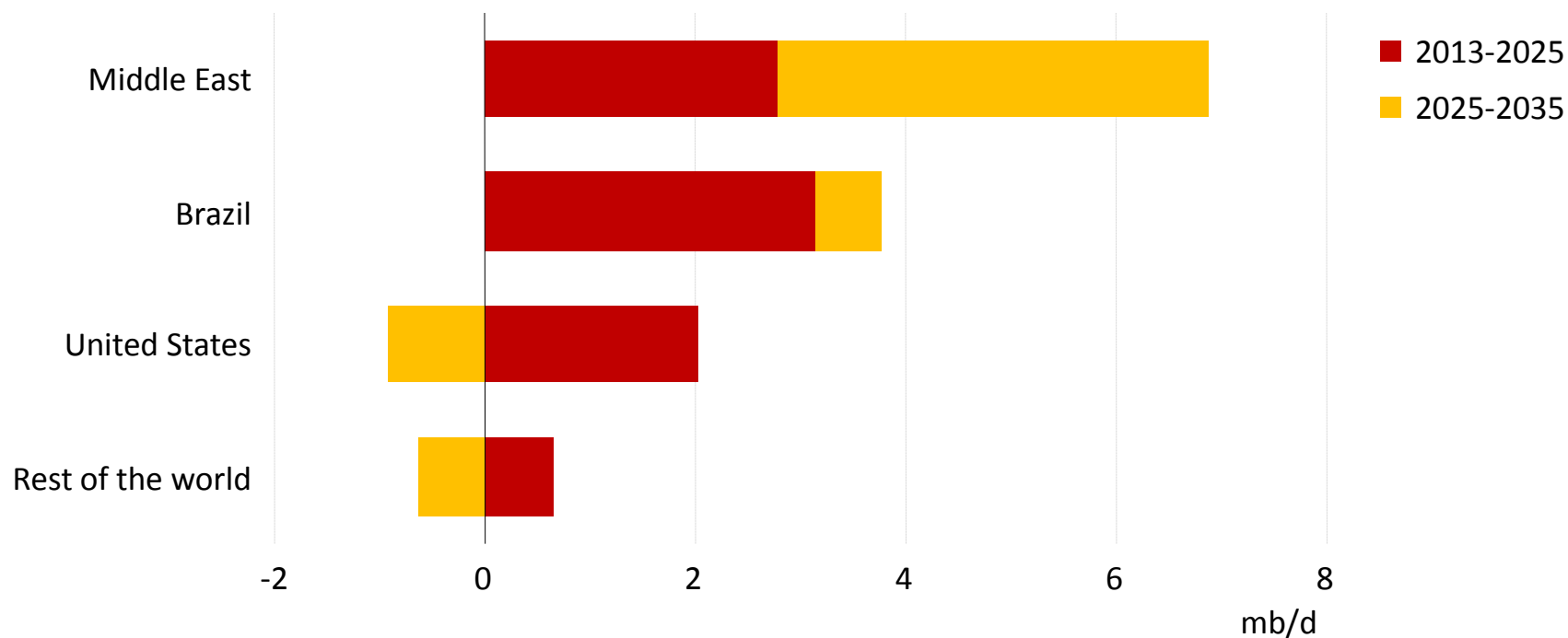
Oil demand by sector



China becomes the largest consumer of oil by 2030, as OECD oil use drops; demand is concentrated in transport, where diesel use surges by 5.5 mb/d, & petrochemicals

Two chapters to the oil production story

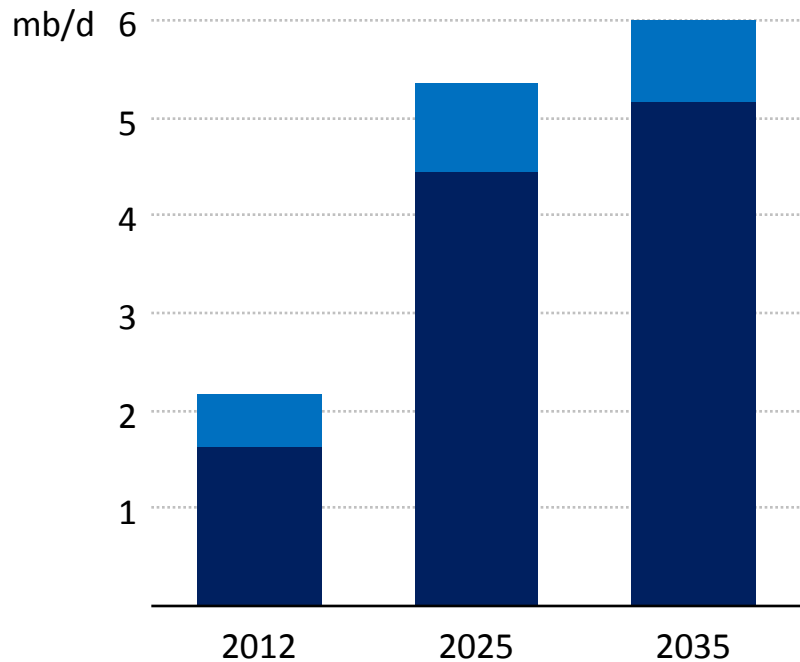
Contributions to global oil production growth



The United States (light tight oil) & Brazil (deepwater) step up until the mid-2020s, but the Middle East is critical to the longer-term oil outlook

Brazil cuts a distinctive profile

Brazil oil production



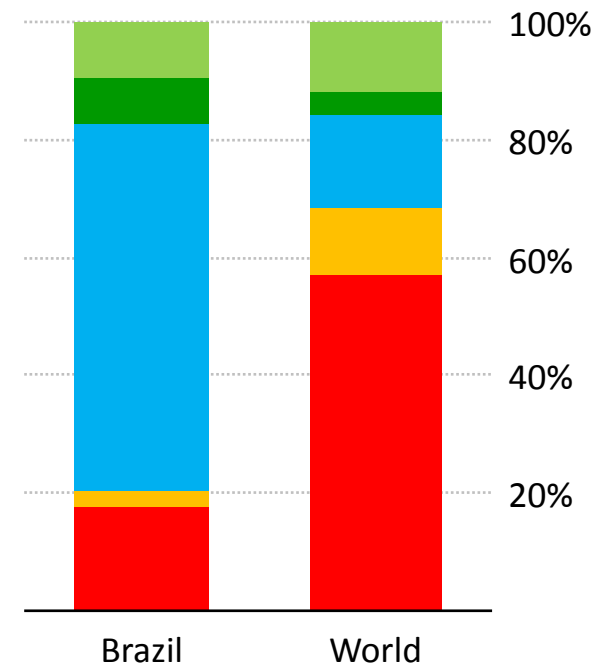
Oil production:

- Other
- Deepwater

Electricity generation:

- Other renewables
- Bioenergy
- Hydropower
- Nuclear
- Fossil fuels

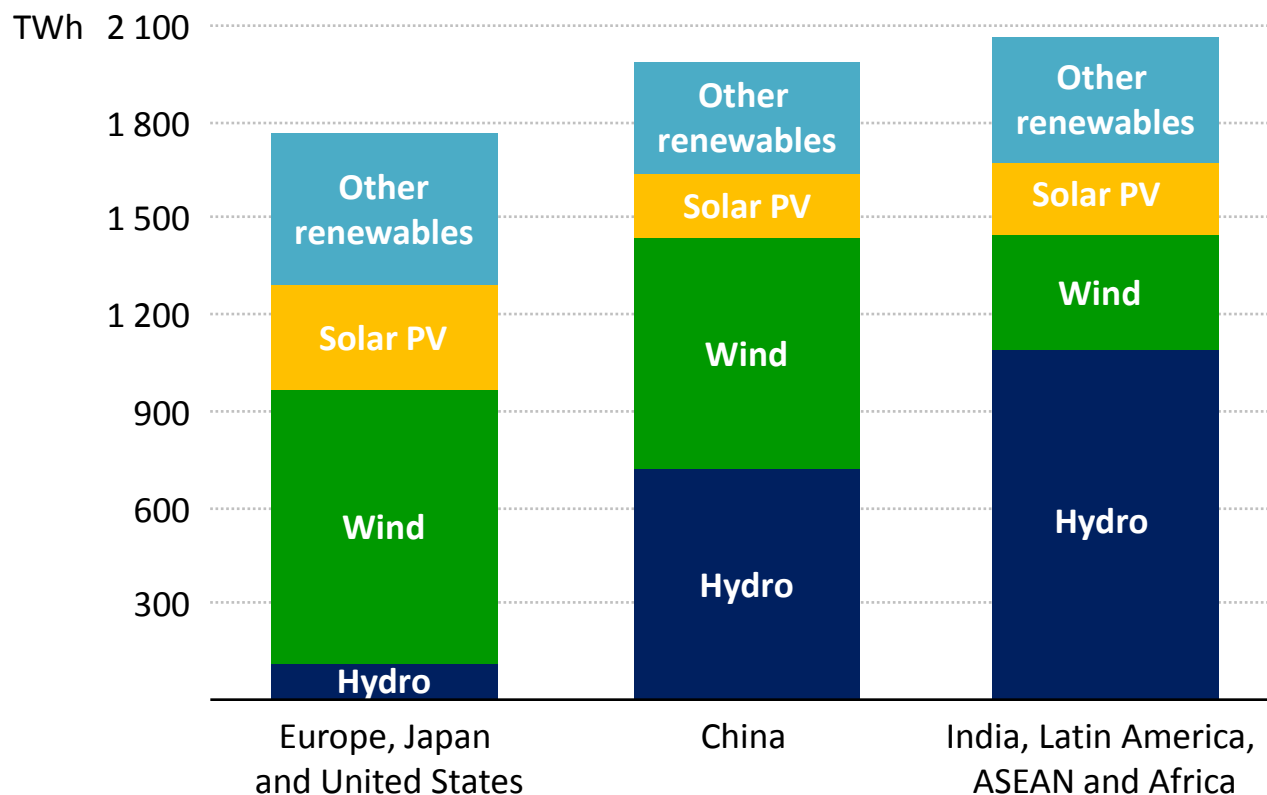
Electricity mix by fuel, 2035



Complex deepwater projects see Brazil joining the top ranks of global oil producers, while the domestic power mix remains one of the least carbon-intensive in the world

Renewables power up around the world

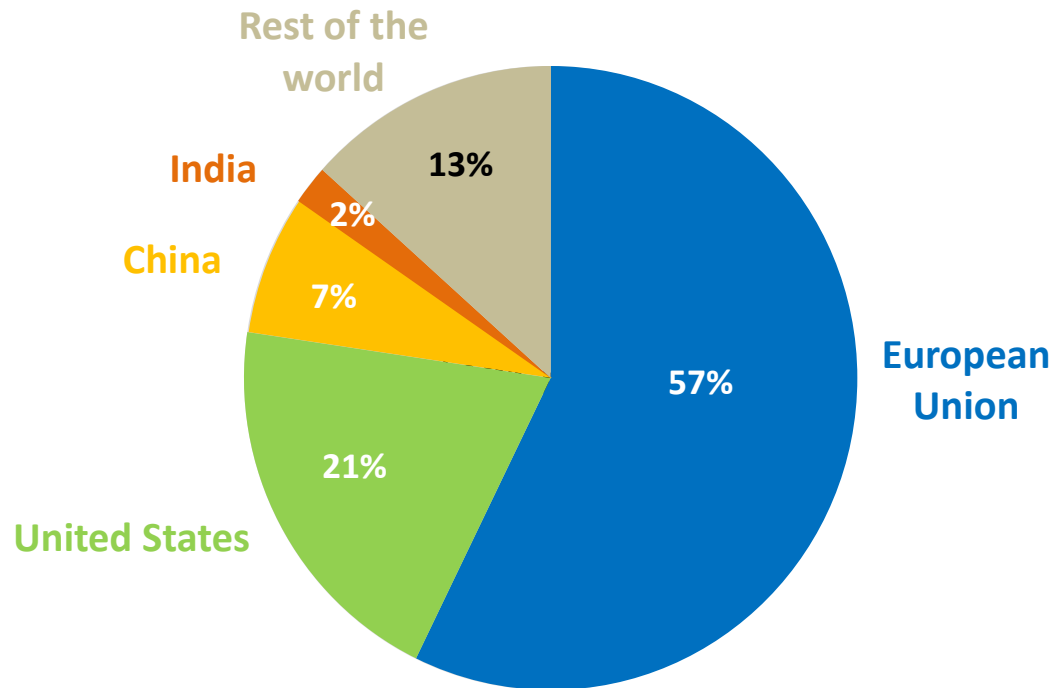
Growth in electricity generation from renewable sources, 2011-2035



The expansion of non-hydro renewables depends on subsidies; additions of wind & solar have implications for power market design & costs

Increasing subsidies for increasing renewables

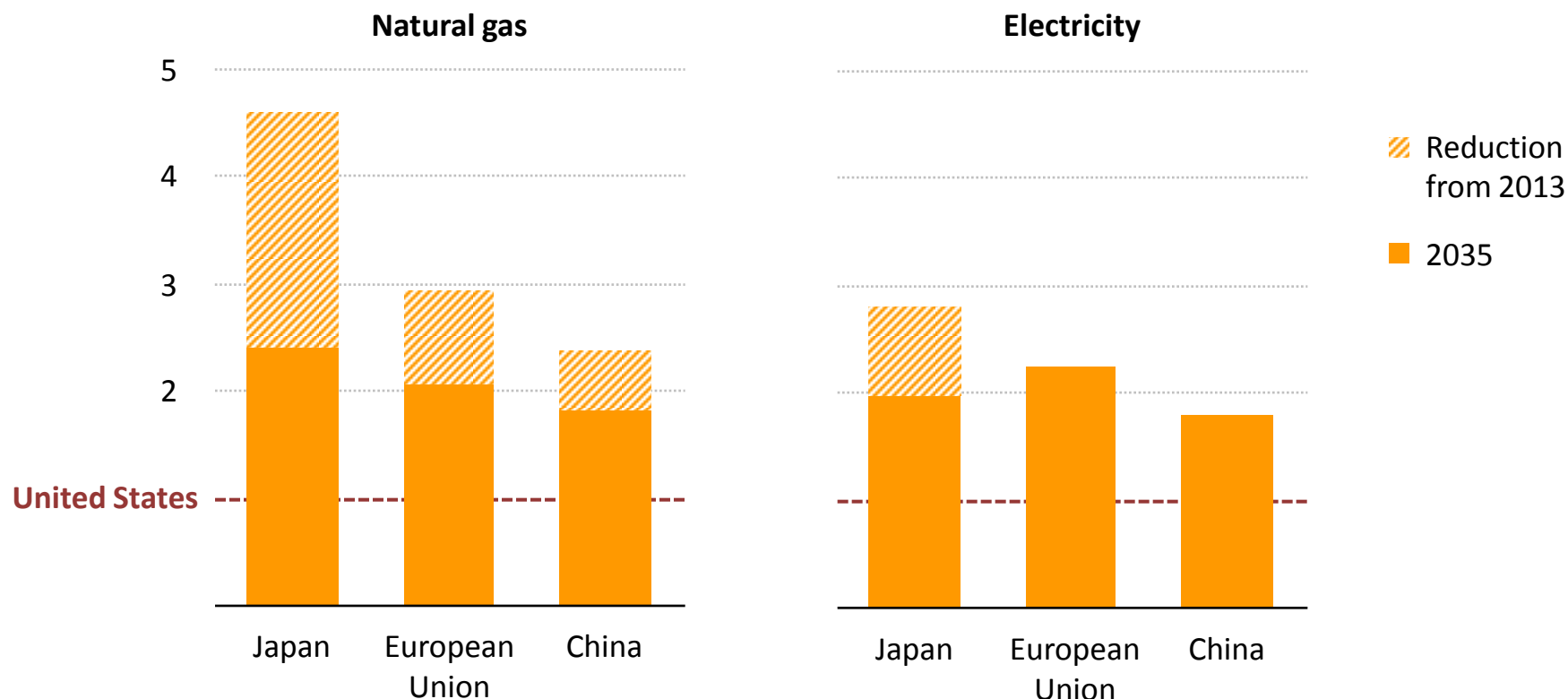
Renewable-energy subsidies by region in 2012



Renewables subsidies increased to \$101 billion in 2012, more than half of which are in the European Union; renewables subsidies are set to more than double by 2035

Who has the energy to compete?

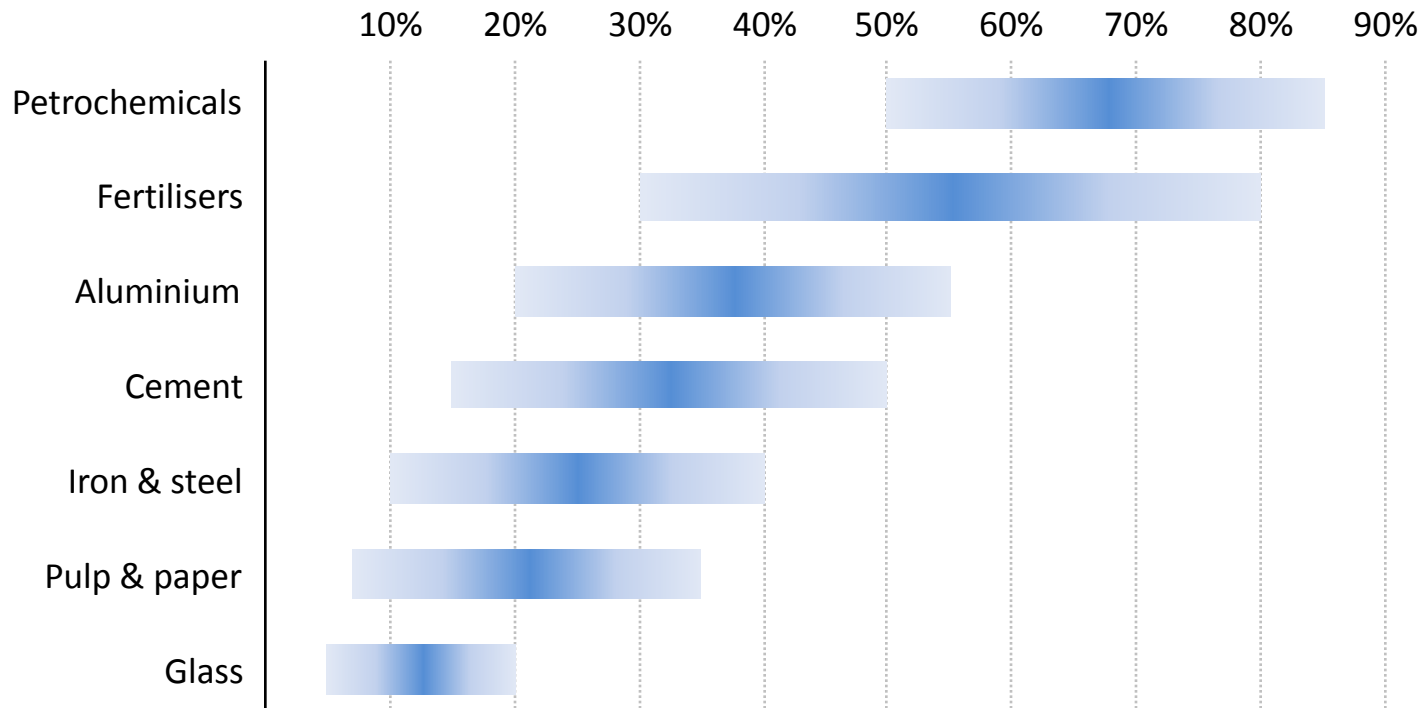
Ratio of industrial energy prices relative to the United States



Regional differences in natural gas prices narrow from today's very high levels but remain large through to 2035; electricity price differentials also persist

Energy-intensive industries need to count their costs

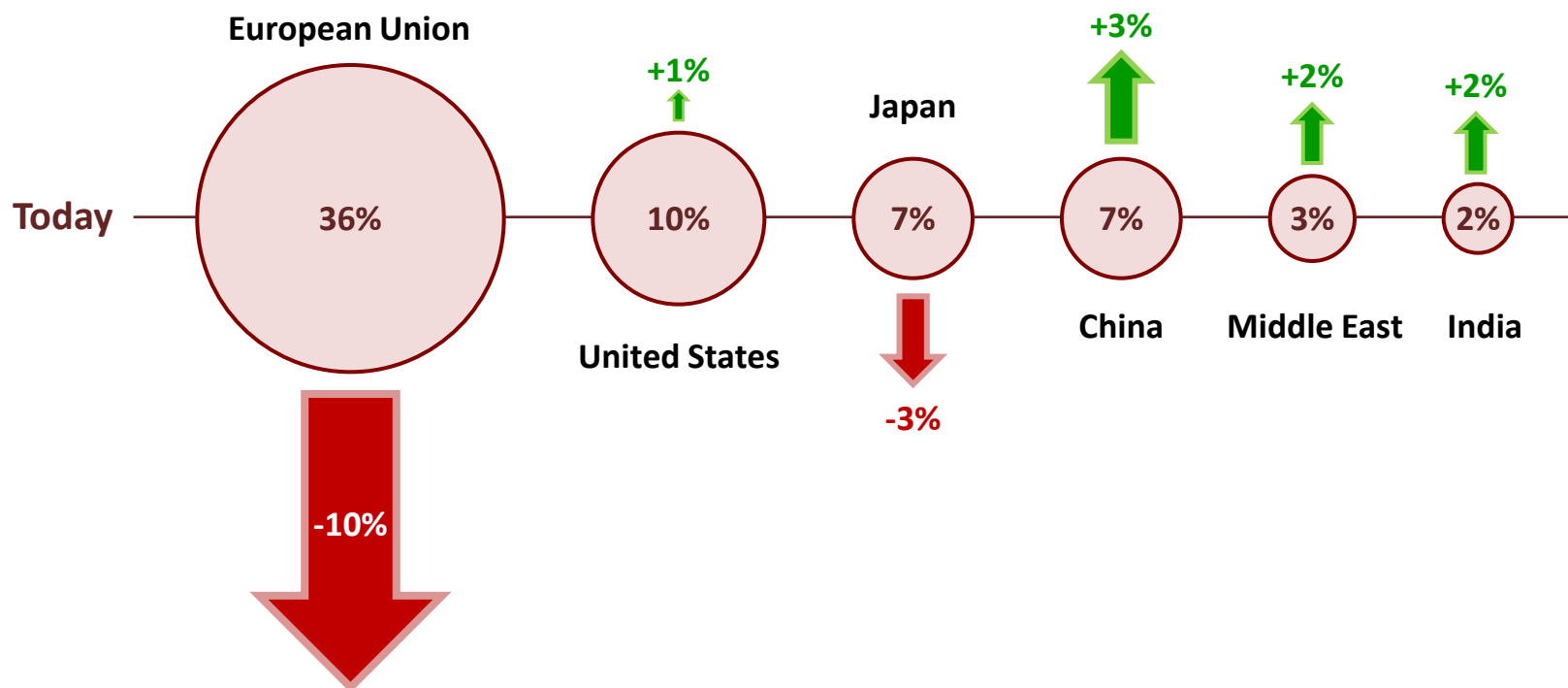
Share of energy in total production costs for selected industries



Energy-intensive sectors worldwide account for around one-fifth of industrial value added, one-quarter of industrial employment and 70% of industrial energy use.

An energy boost to the economy?

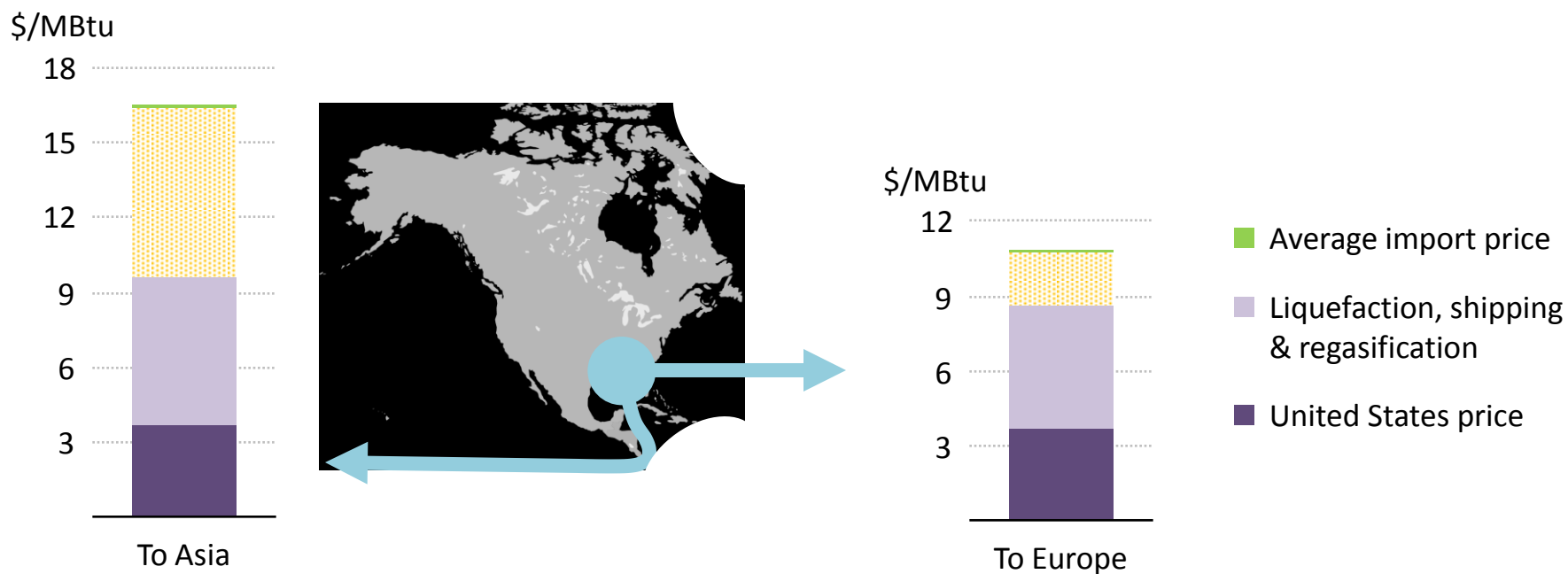
Share of global export market for energy-intensive goods



The US, together with key emerging economies, increases its export market share for energy-intensive goods, while the EU and Japan see a sharp decline

LNG from the United States can shake up gas markets

Indicative economics of LNG export from the US Gulf Coast (at current prices)



New LNG supplies accelerate movement towards a more interconnected global market, but high costs of transport between regions mean no single global gas price

Orientation for a fast-changing energy world

WORLD
ENERGY
OUTLOOK
2013

- **China, then India, drive the growing dominance of Asia in global energy demand & trade**
- **Technology is opening up new oil resources, but the Middle East remains central to the longer-term outlook**
- **Regional price gaps & concerns over competitiveness are here to stay, but there are ways to react – with efficiency first in line**
- **The transition to a more efficient, low-carbon energy sector is more difficult in tough economic times, but no less urgent**