

World Energy Outlook 2014

London
12 November 2014

Signs of stress in the global energy system

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Outlook
2014

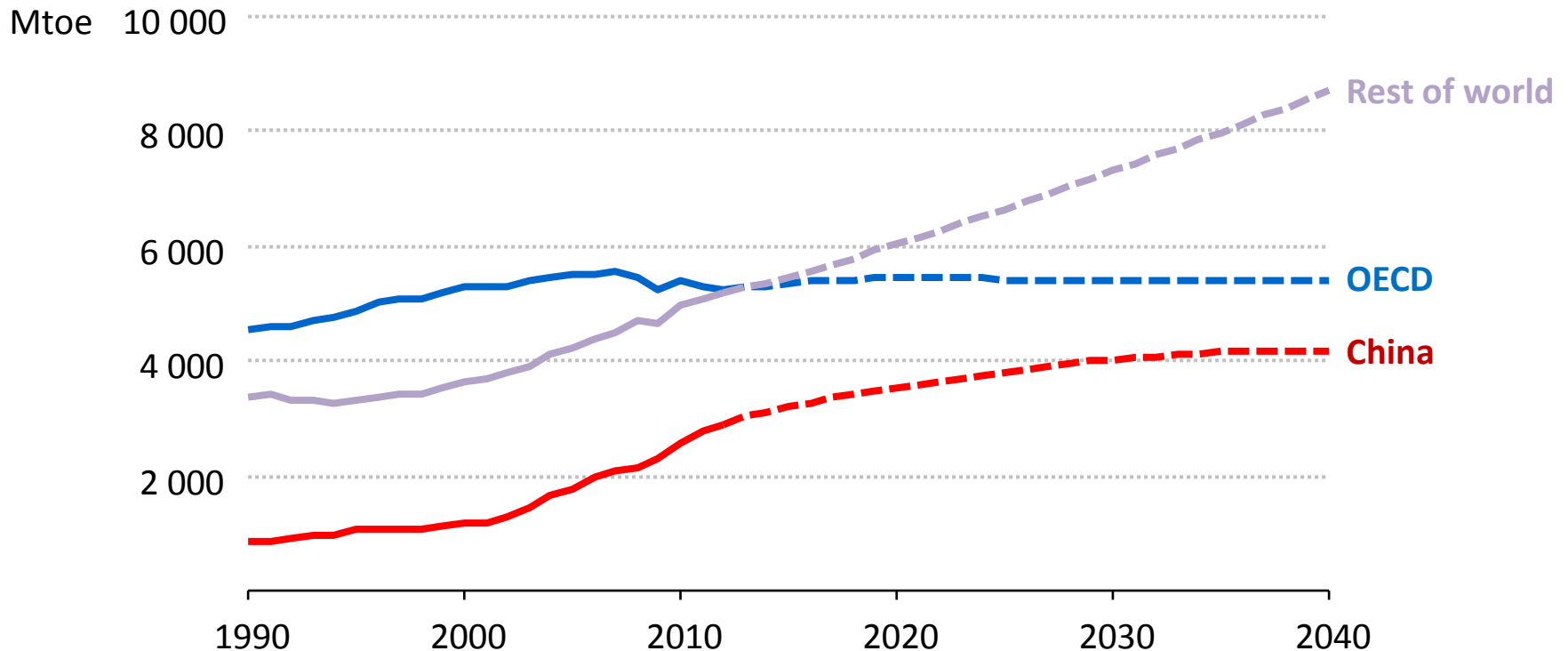
- **Current calm in markets should not disguise difficult road ahead**
 - *Turmoil in the Middle East raises doubts over future oil balance*
 - *Resurgent debate over the security of gas supply to Europe*

- **Mixed signals in run-up to crucial climate summit in Paris in 2015**
 - *Global CO₂ emissions still rising, with most emitters on an upward path*
 - *At \$550 billion, fossil fuel subsidies over four-times those to renewables*
 - *Increasing emphasis on energy efficiency starting to bring results*

- **Will change in global energy be led by policies, or driven by events?**

Changing dynamics of global demand

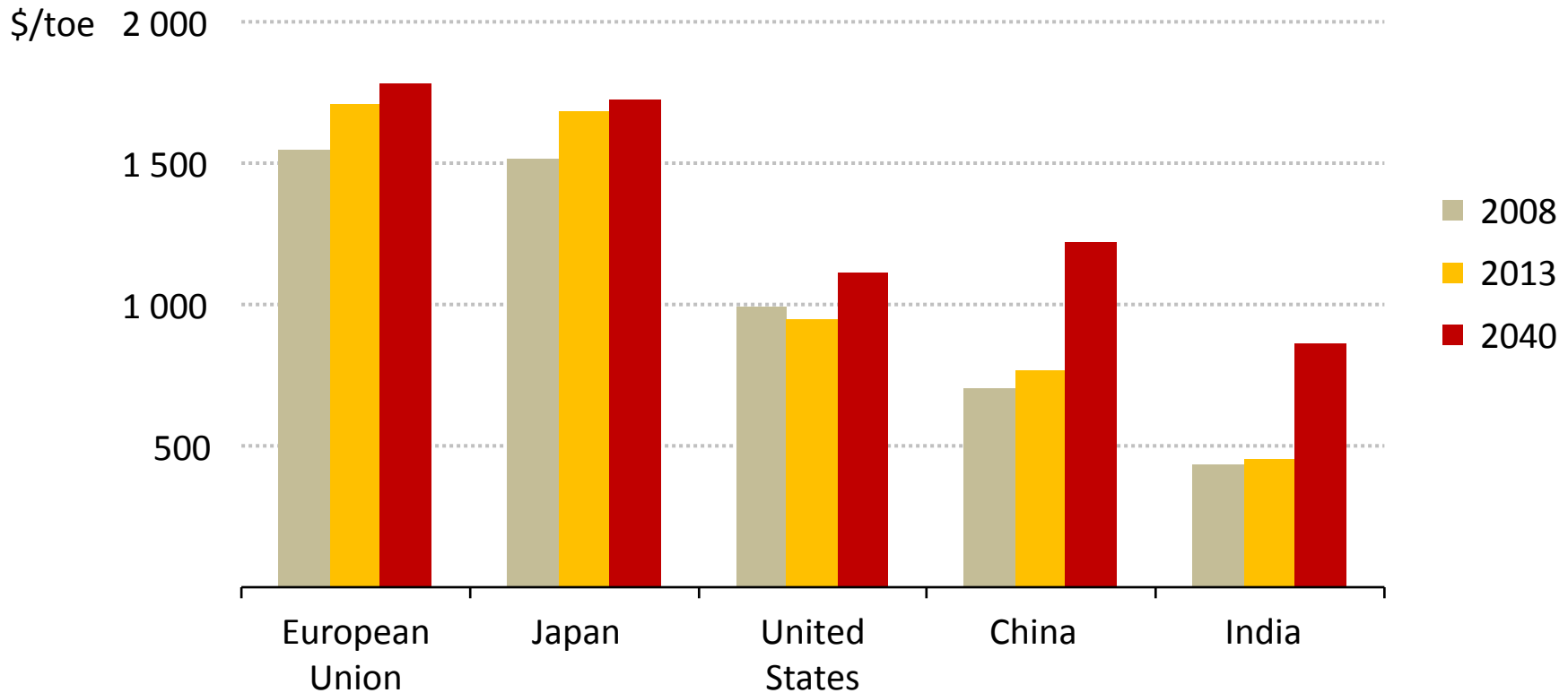
Energy demand by region



As China slows, then India, Southeast Asia, the Middle East and parts of Africa & Latin America take over as the engines of global energy demand growth.

United States holds a strong position on energy costs

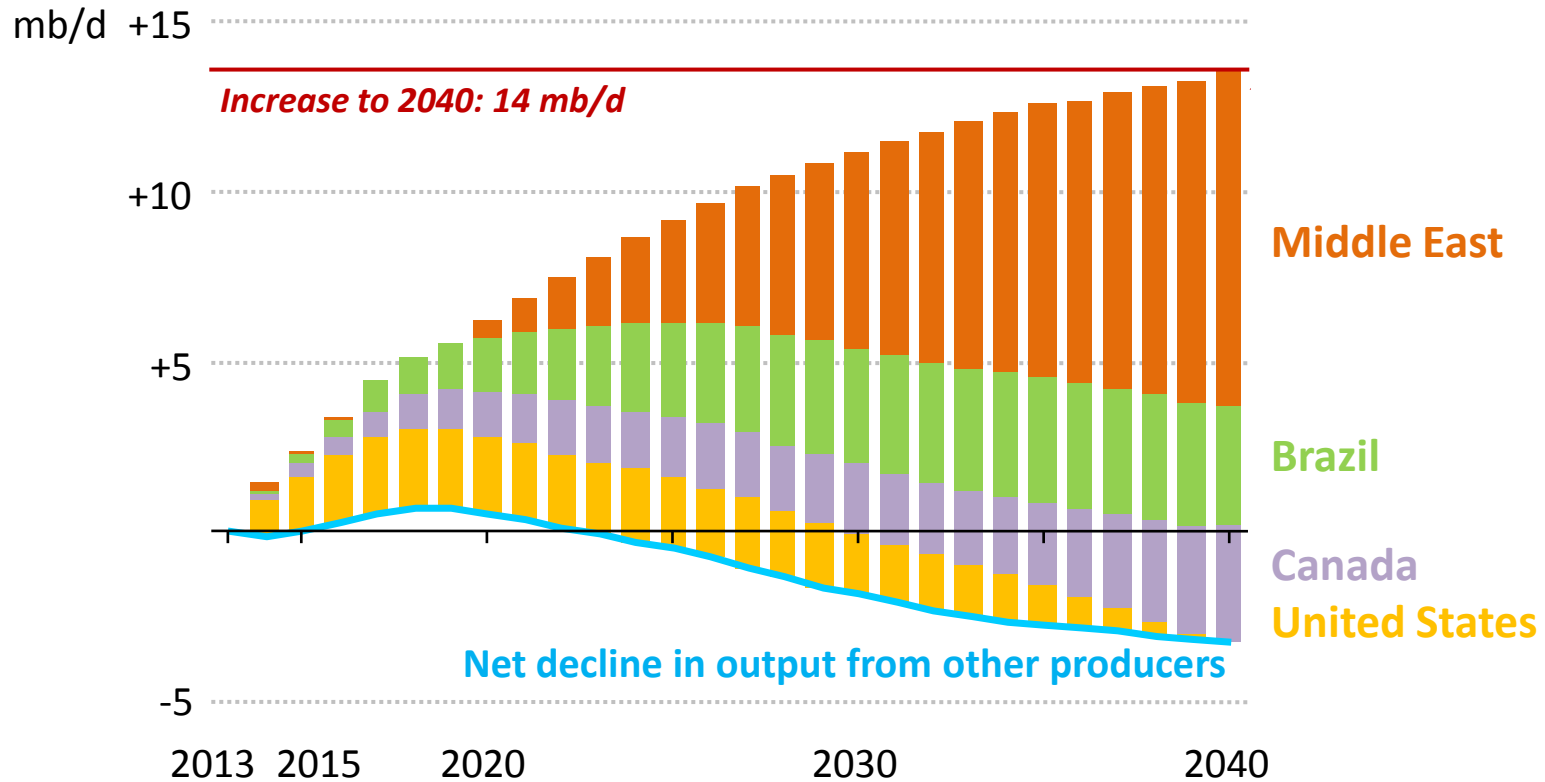
Weighted average cost of energy paid by consumers



Economies face higher costs, but the pace of change varies: China overtakes the US, costs double in India & remain high in the European Union & Japan

Instability in the Middle East a major risk to oil markets

Oil production growth in United States, Canada, Brazil & the Middle East



The short-term picture of a well-supplied market should not obscure future risks as demand rises to 104 mb/d & reliance grows on Iraq & the rest of the Middle East

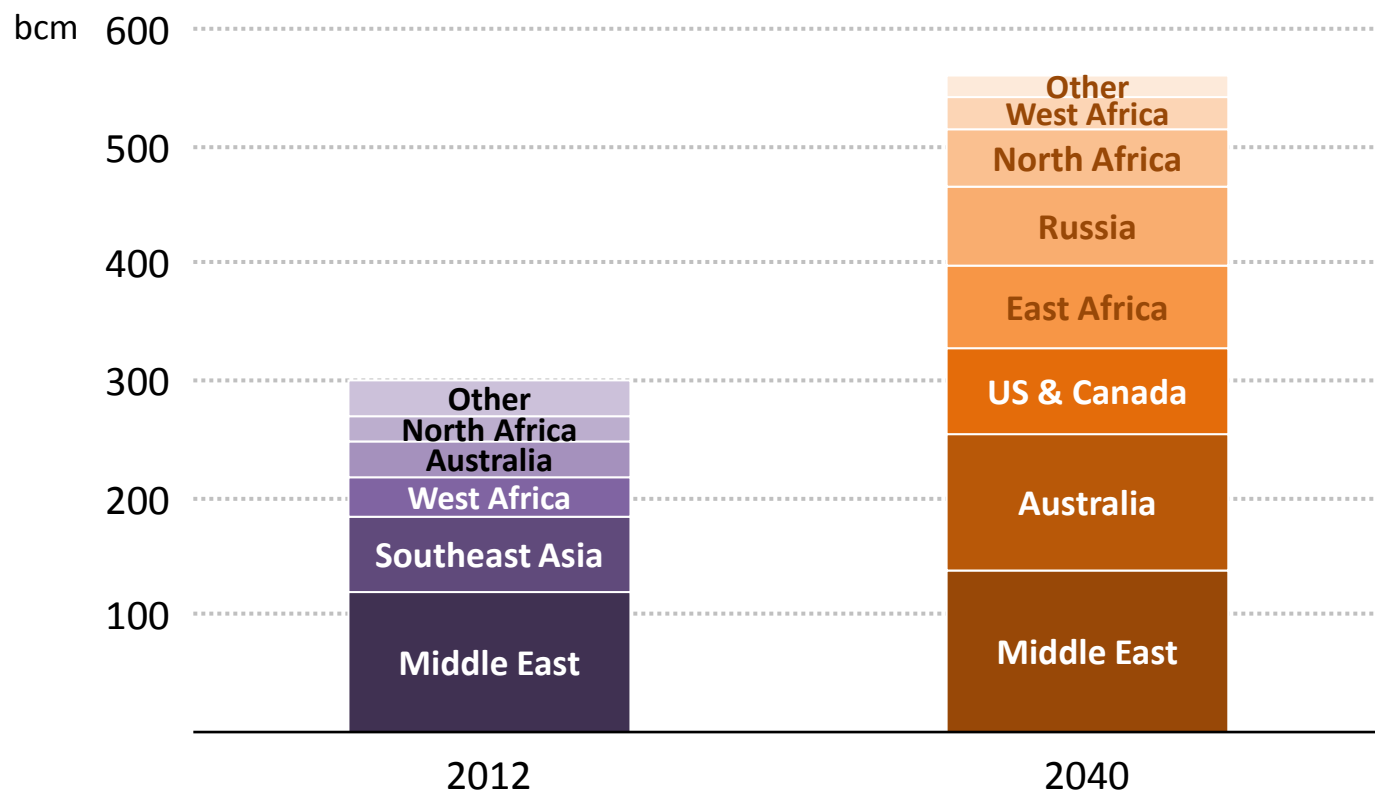
Looking ahead on the oil price

- **Against a backdrop of weaker demand, buoyant supply in North America has brought prices down – but can it keep them down?**
- **Lower prices are starting to curtail upstream spending plans, with implications for future supply**
- **Over time, squeezed cash flow would constrain the capacity of North America & Brazil to act as engines of global supply growth**
- **Sustained \$80/barrel oil could provide some breathing space to major oil importers, boosting demand & GDP**
- **It would also accelerate reliance on low-cost producers in the Middle East, some of which face major investment challenges**

Gas on the way to become first fuel, with role of LNG on the rise

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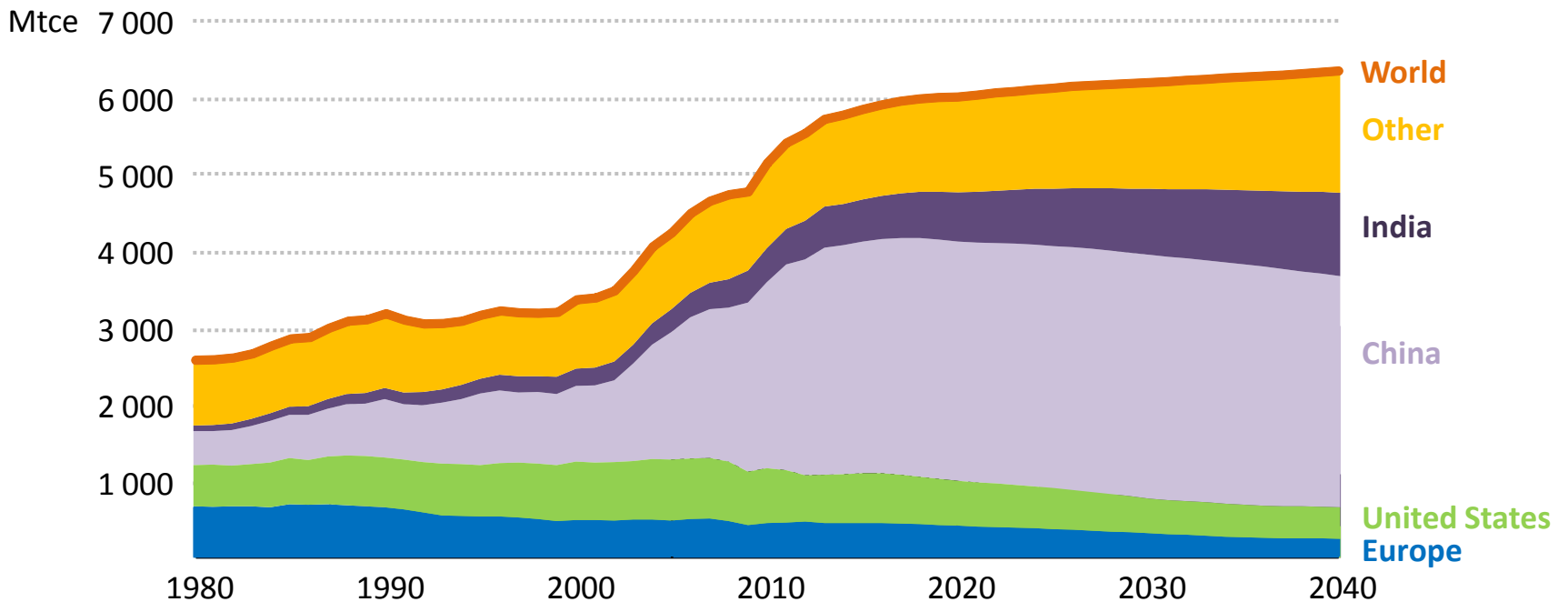
Main sources of regional LNG supply



**Share of LNG rises in global gas trade, pushed by a near-tripling in liquefaction sites:
LNG brings more integrated & secure gas markets, but only limited relief on prices**

Global coal demand leveling off

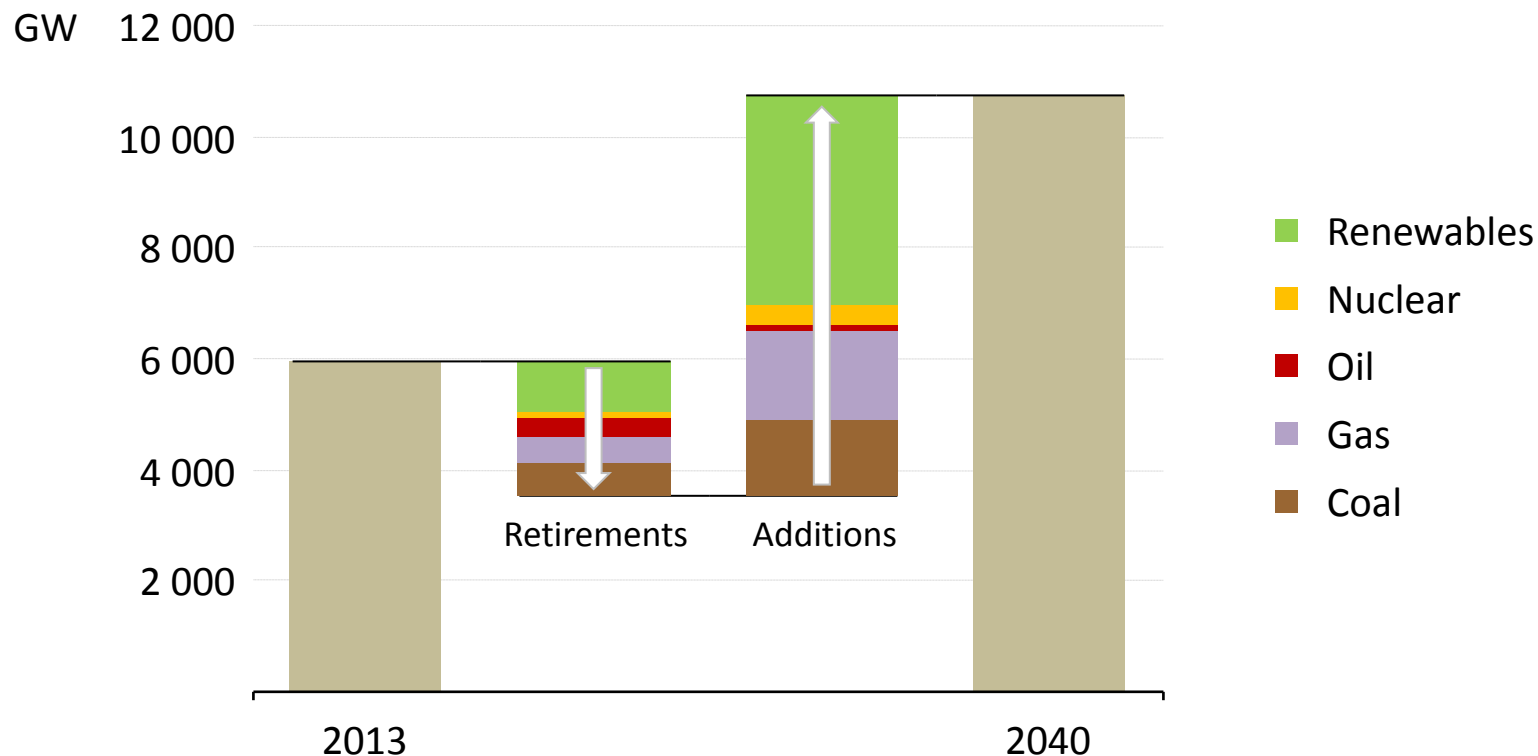
Global coal demand by key region



Global coal demand growth slows rapidly due to more stringent environmental policies, underlining the importance of high-efficiency plant & CCS to coal's future

Retirements add to the investment challenge in the power sector

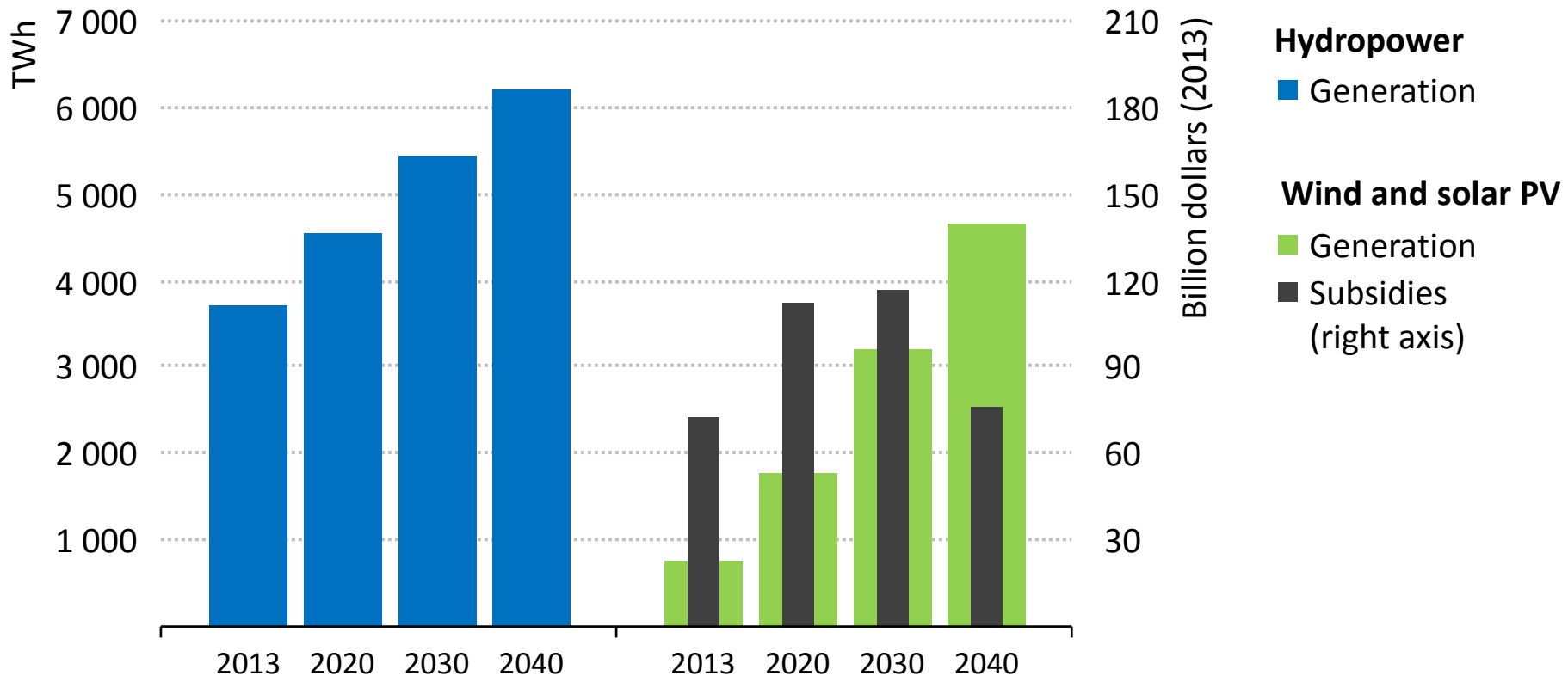
Power capacity by source, 2013-2040



Despite limited demand growth, OECD countries account for one-third of capacity additions – to compensate for retirements & to decarbonise

Renewables overtake coal to become the leading source of power

Renewables-based power generation and subsidies

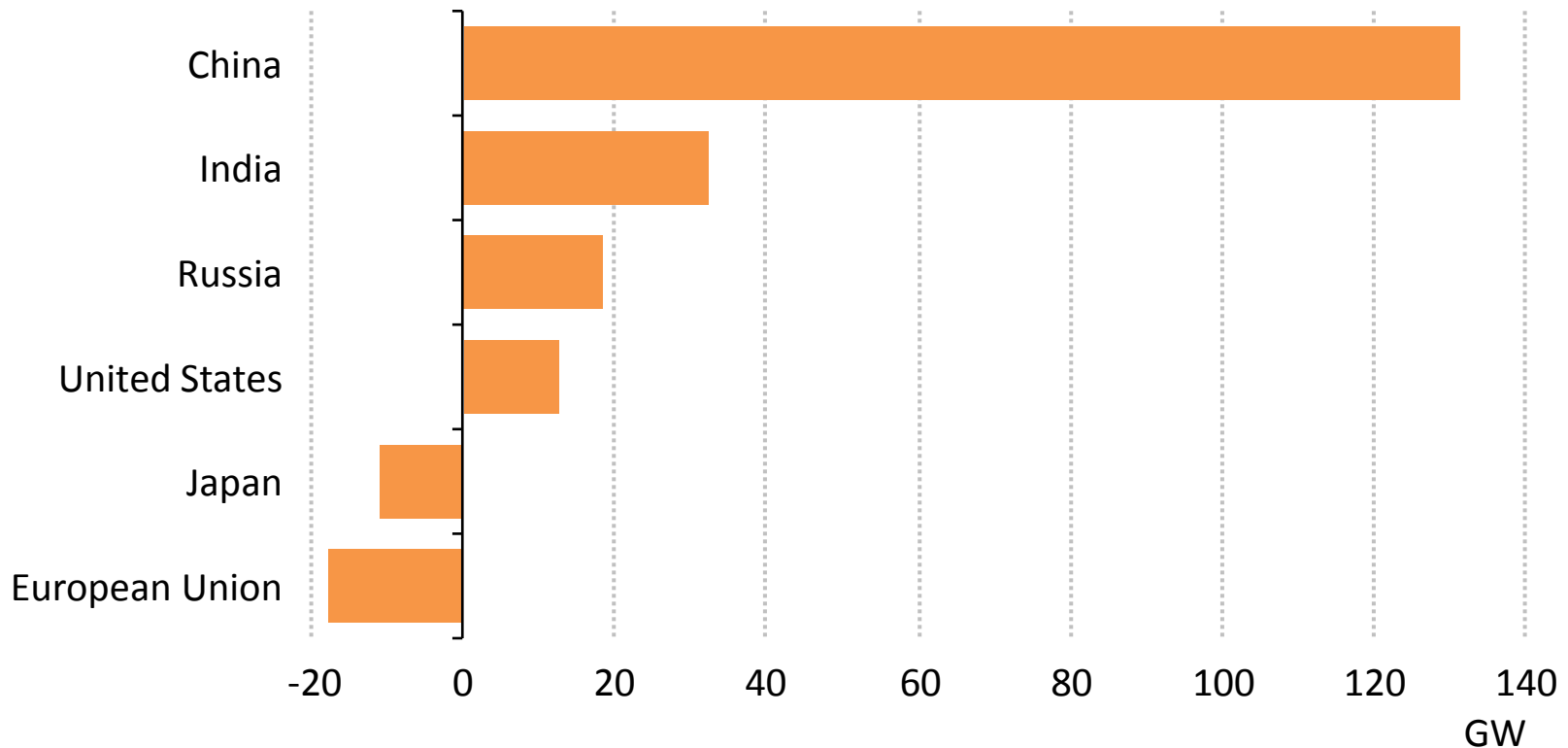


Renewables supply half of the growth in global power demand; wind & solar PV subsidies decline from 2030 as costs fall & recent higher-cost commitments expire

Nuclear capacity grows by 60%, but no nuclear renaissance in sight

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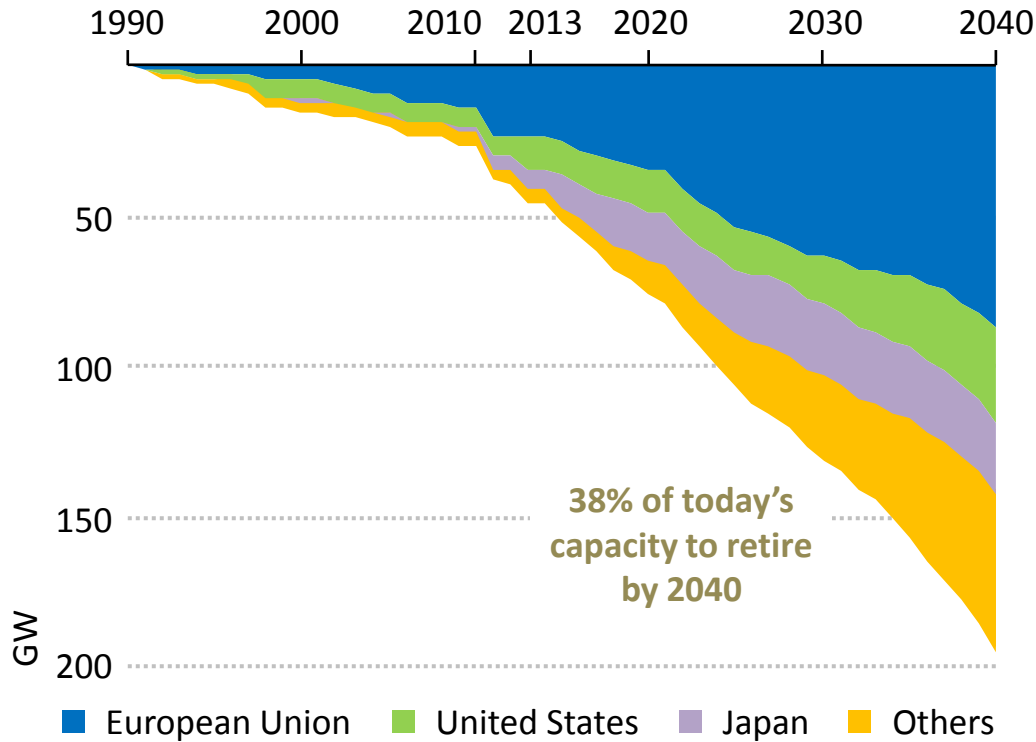
Net capacity change in key regions, 2013-2040



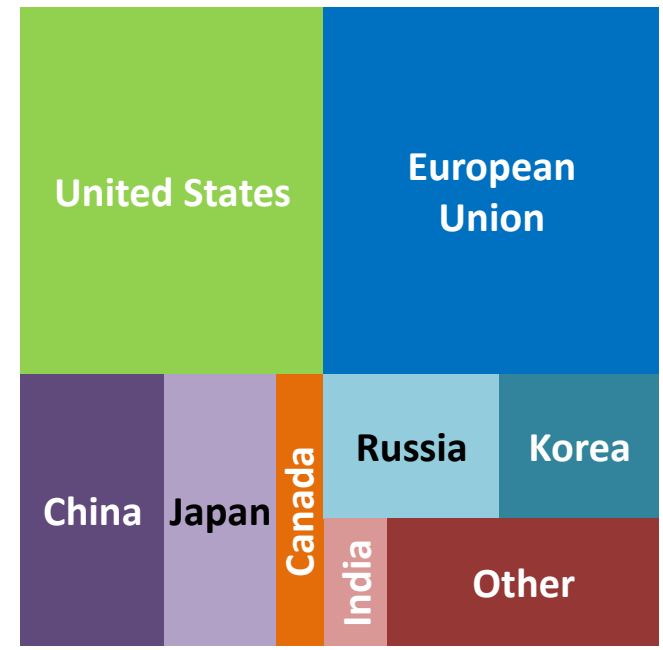
By 2040, an expanded nuclear fleet has saved almost 4 years of current CO₂ emissions & for some countries has improved energy security & balances of energy trade

Nuclear power: public concerns must be heard and addressed

Retirements of nuclear power capacity 1990-2040



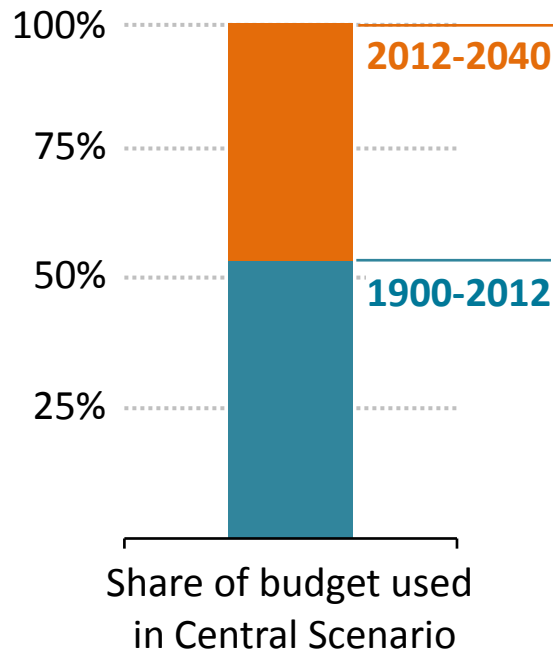
Spent nuclear fuel 1971-2040: 705 thousand tonnes



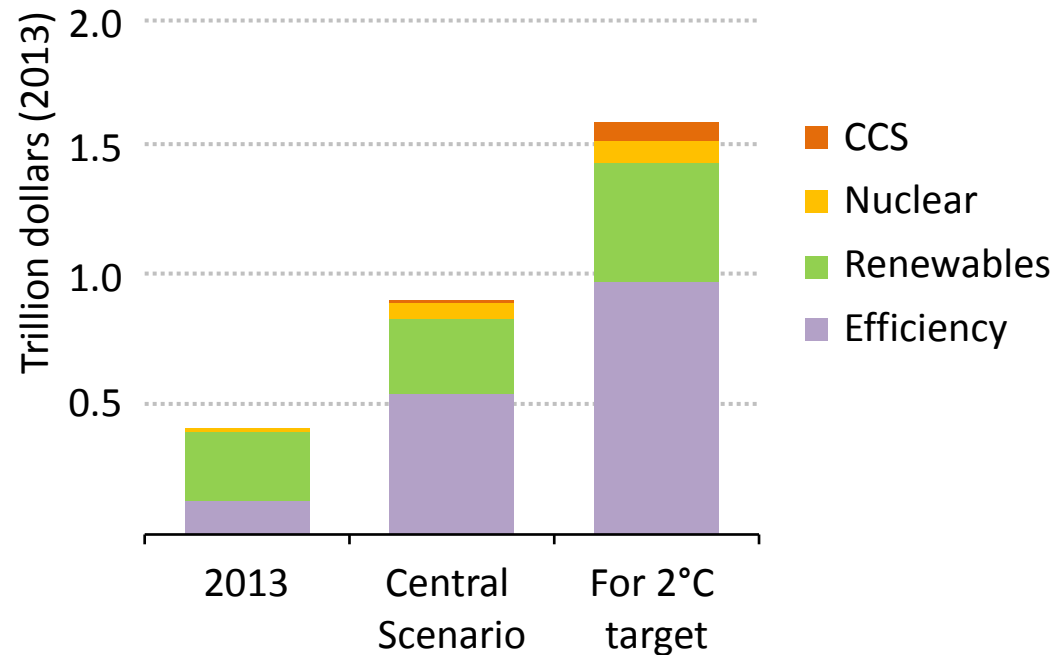
Key public concerns include plant operation, decommissioning & waste management; By 2040, almost 200 reactors are retired & the amount of spent fuel doubles

The 2 °C goal – last chance in Paris?

World CO₂ budget for 2 °C
~2300 Gt



Average annual low-carbon investment, 2014-2040



The entire global CO₂ budget to 2100 is used up by 2040 – Paris must send a strong signal for increasing low-carbon investment four times beyond current levels

Navigating a stormy energy future

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- **Geopolitical & market uncertainties are set to propel energy security high up the global energy agenda**
- **Volatility in the Middle East raises short-term doubts on investment & spells trouble for future oil supply**
- **Nuclear power can play a role in energy security & carbon abatement – but financing & public concerns are key issues**
- **Without clear direction from Paris in 2015, the world is set for warming well beyond the 2 °C goal**
- **Far-sighted government policies are essential to steer the global energy system on to a safer course**

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