

World Energy Outlook 2014

London
12 November 2014

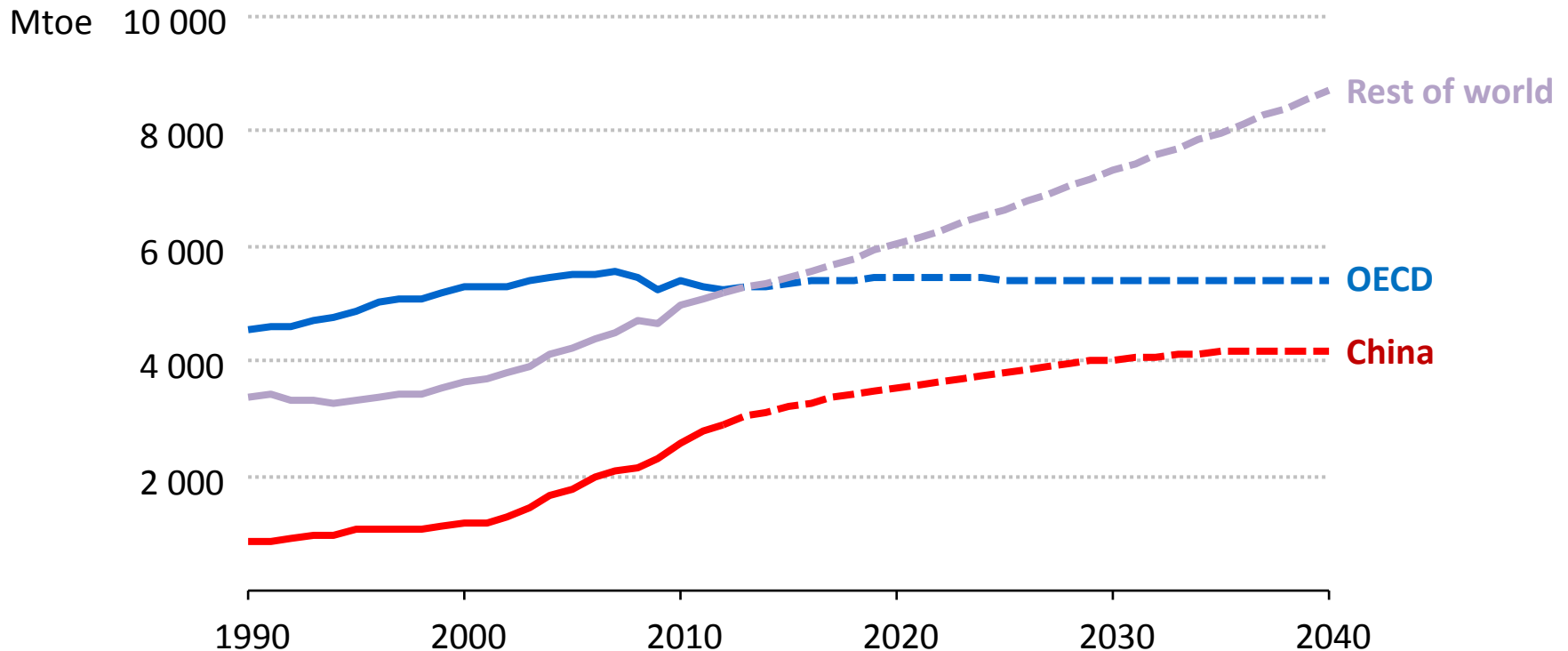
Signs of stress in the global energy system

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- **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

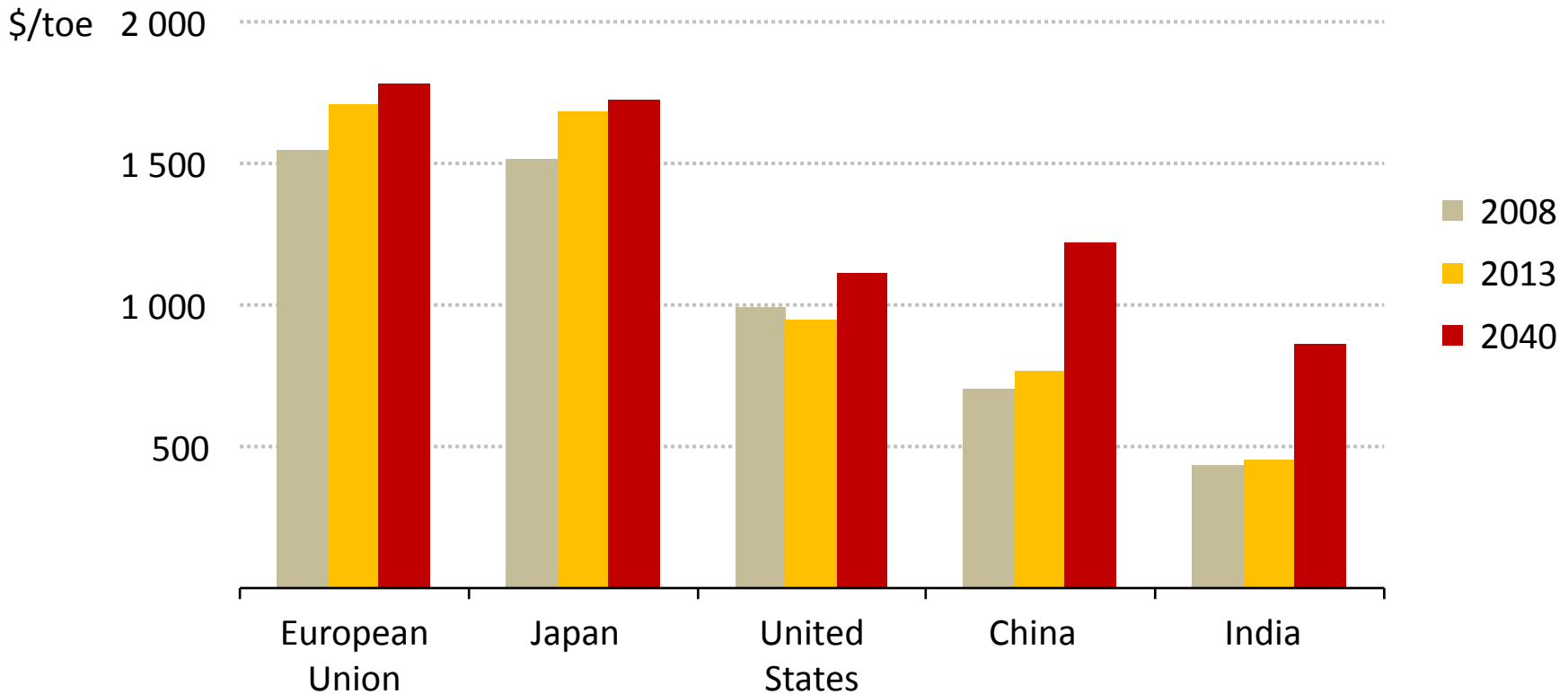
Energy demand by region



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

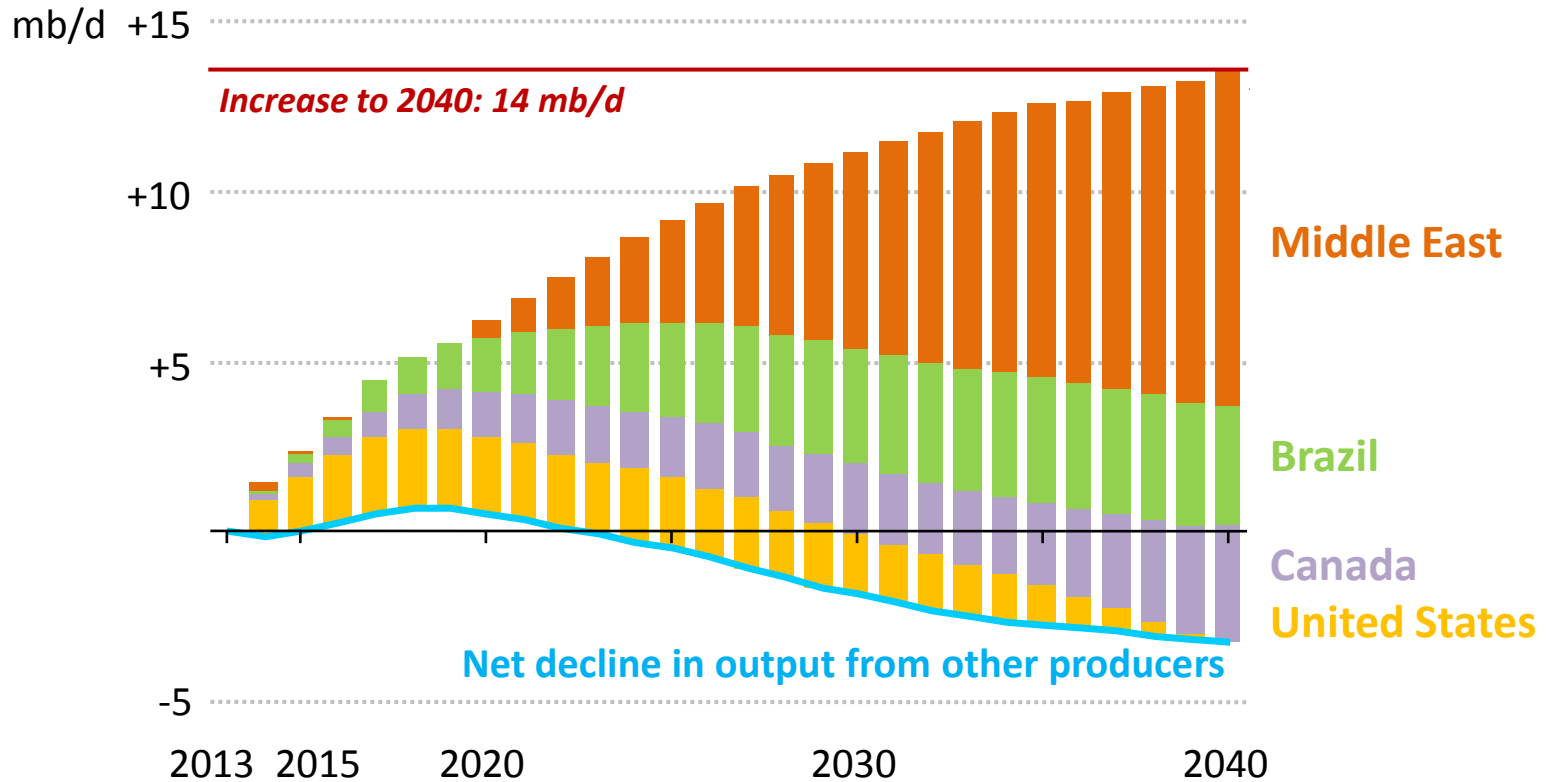
Weighted average cost of energy paid by consumers



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



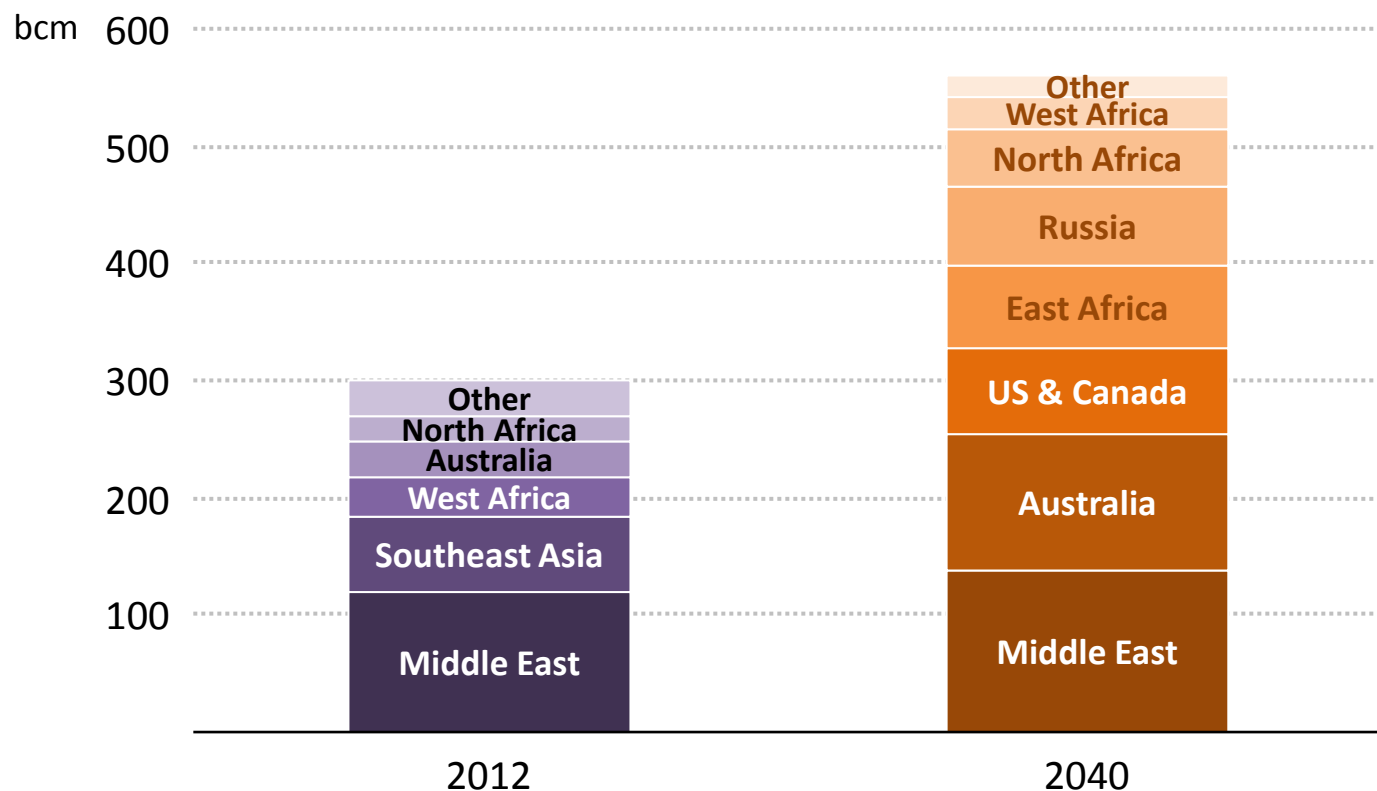
The short-term picture of a well-supplied market should not obscure future risks as demand rises to 104 mb/d & reliance grows on Iraq & the rest of the Middle East

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

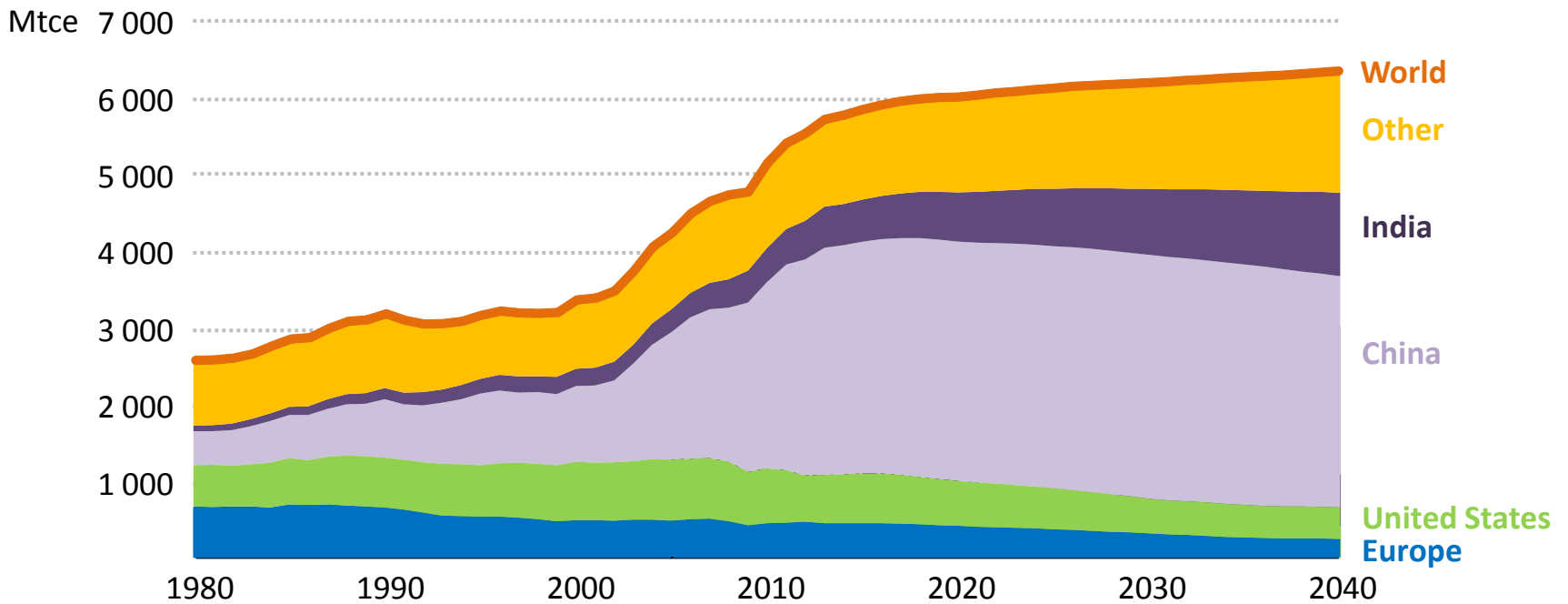
Main sources of regional LNG supply



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

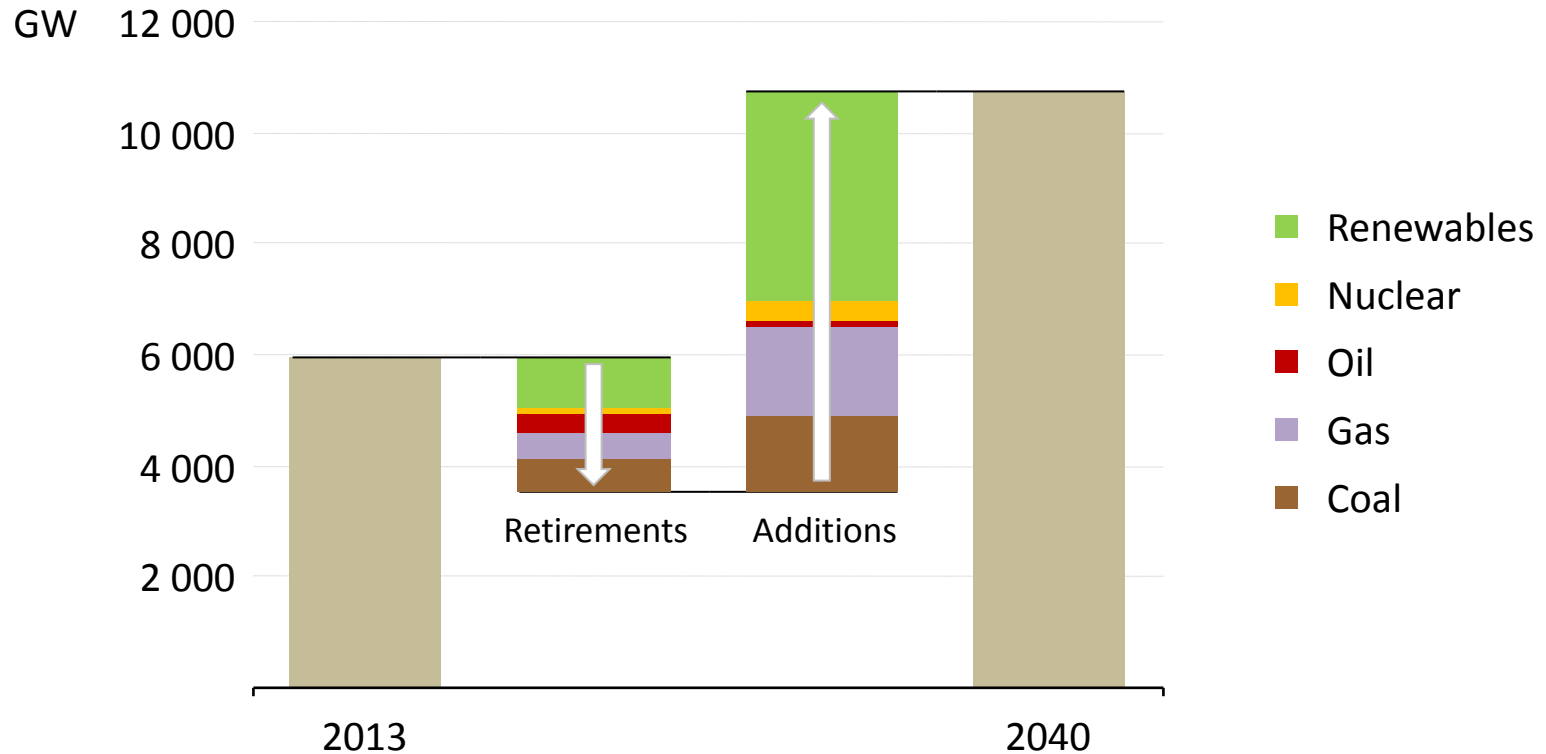
Global coal demand by key region



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

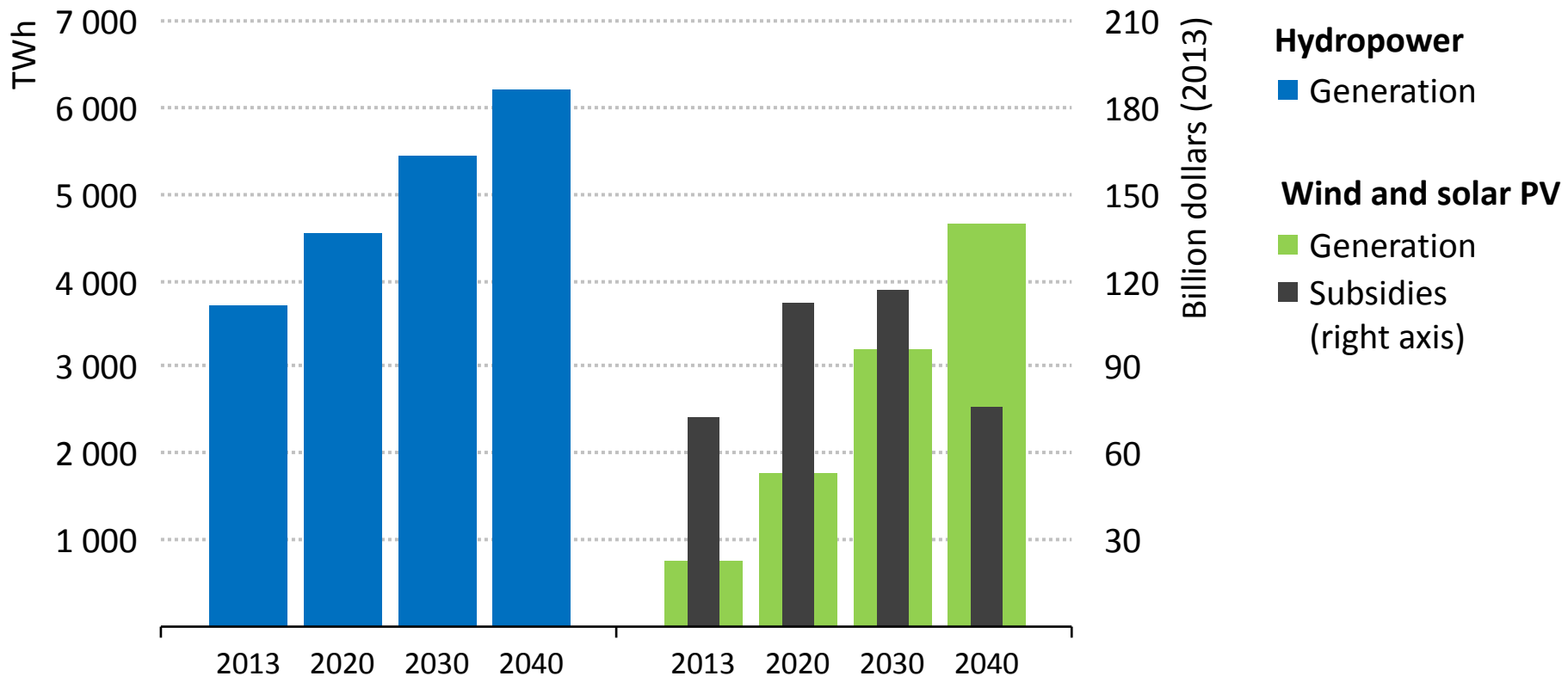
Power capacity by source, 2013-2040



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

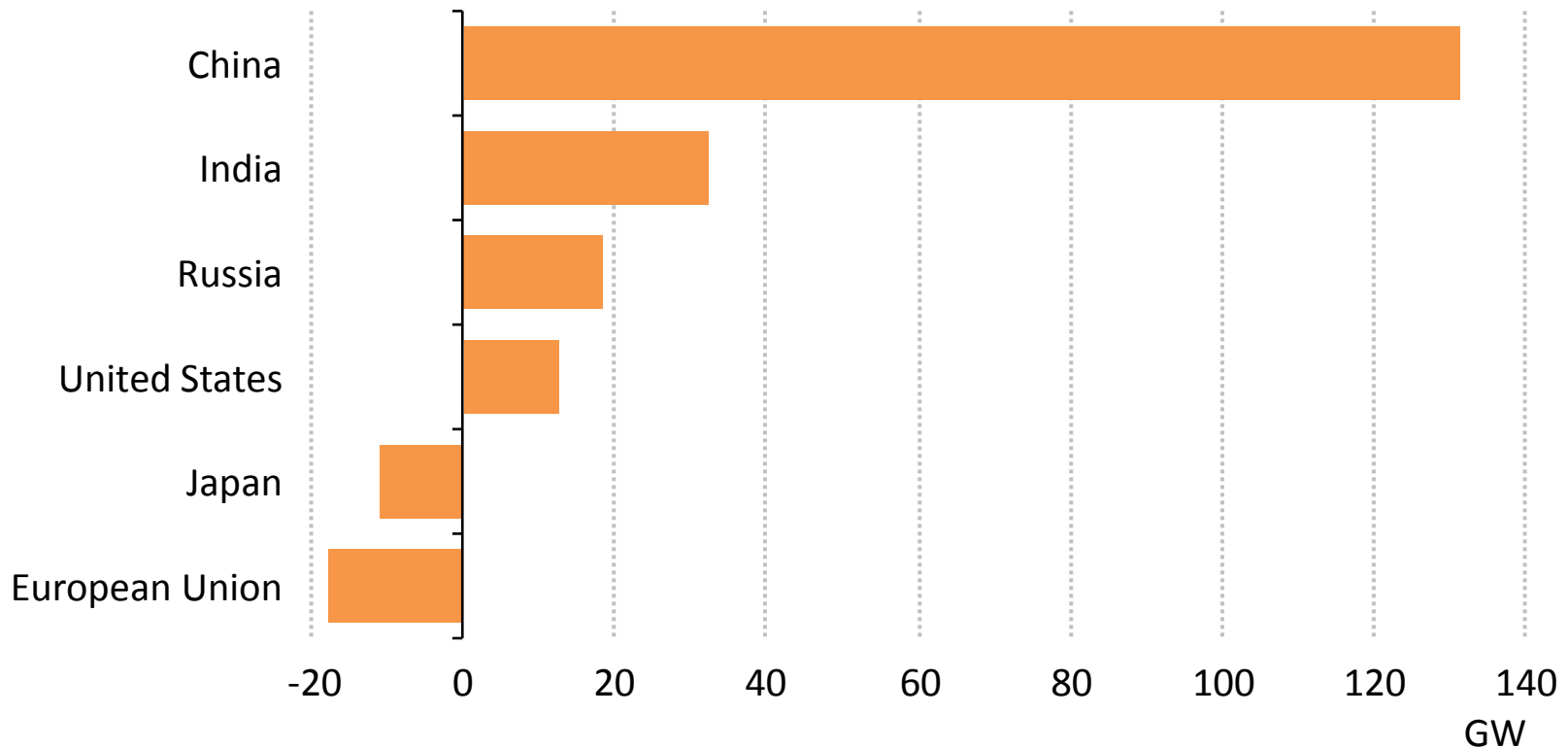


Renewables supply half of the growth in global power demand; wind & solar PV subsidies decline from 2030 as costs fall & recent higher-cost commitments expire

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

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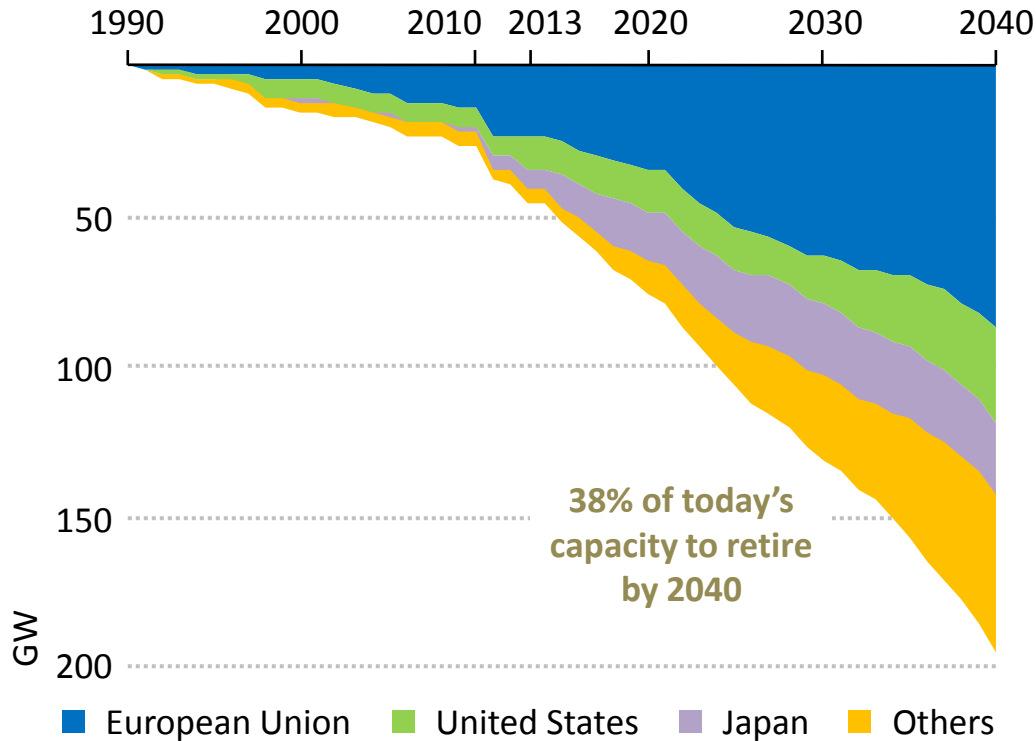
Net capacity change in key regions, 2013-2040



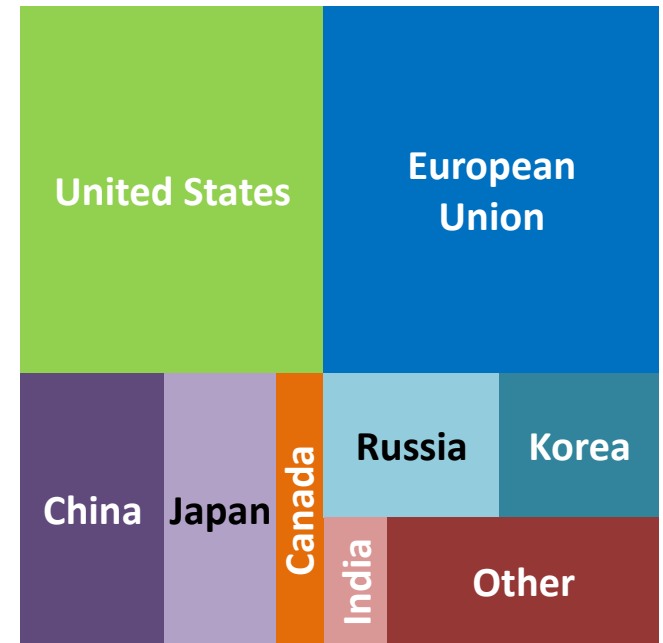
By 2040, an expanded nuclear fleet has saved almost 4 years of current CO₂ emissions & for some countries has improved energy security & balances of energy trade

Nuclear power: public concerns must be heard and addressed

Retirements of nuclear power capacity 1990-2040



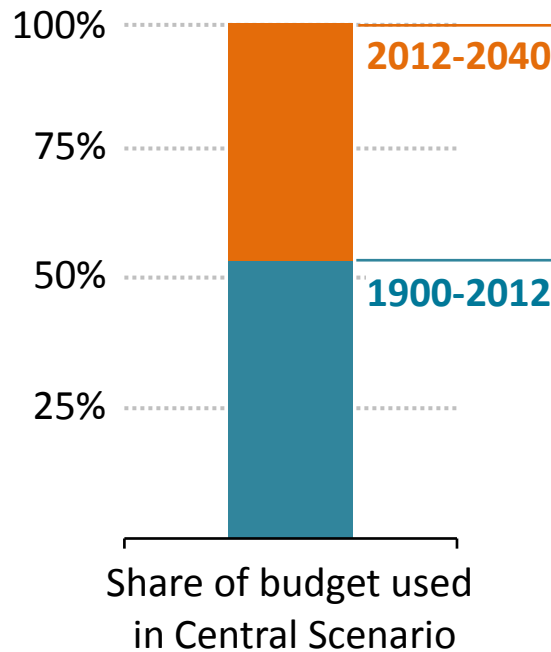
Spent nuclear fuel 1971-2040: 705 thousand tonnes



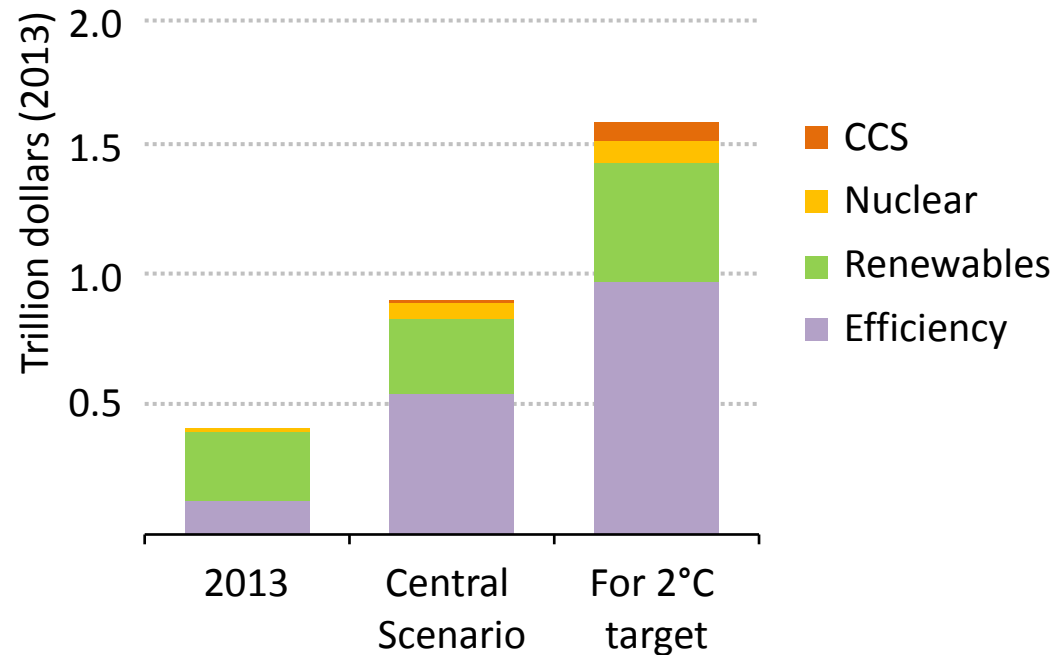
Key public concerns include plant operation, decommissioning & waste management; By 2040, almost 200 reactors are retired & the amount of spent fuel doubles

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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