

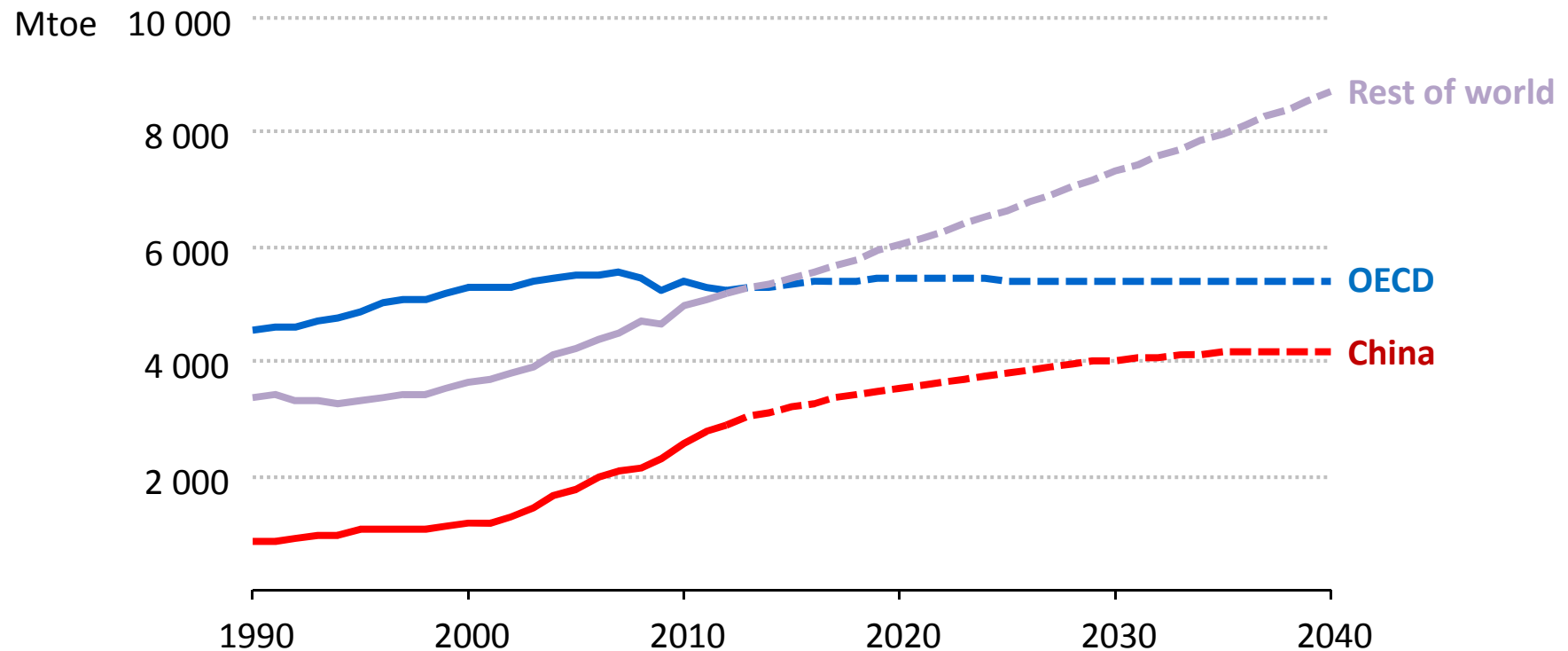
World Energy Outlook 2014

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Directorate of Global Energy Economics
Paris, 18 March 2015

Changing dynamics of global demand

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Energy demand by region

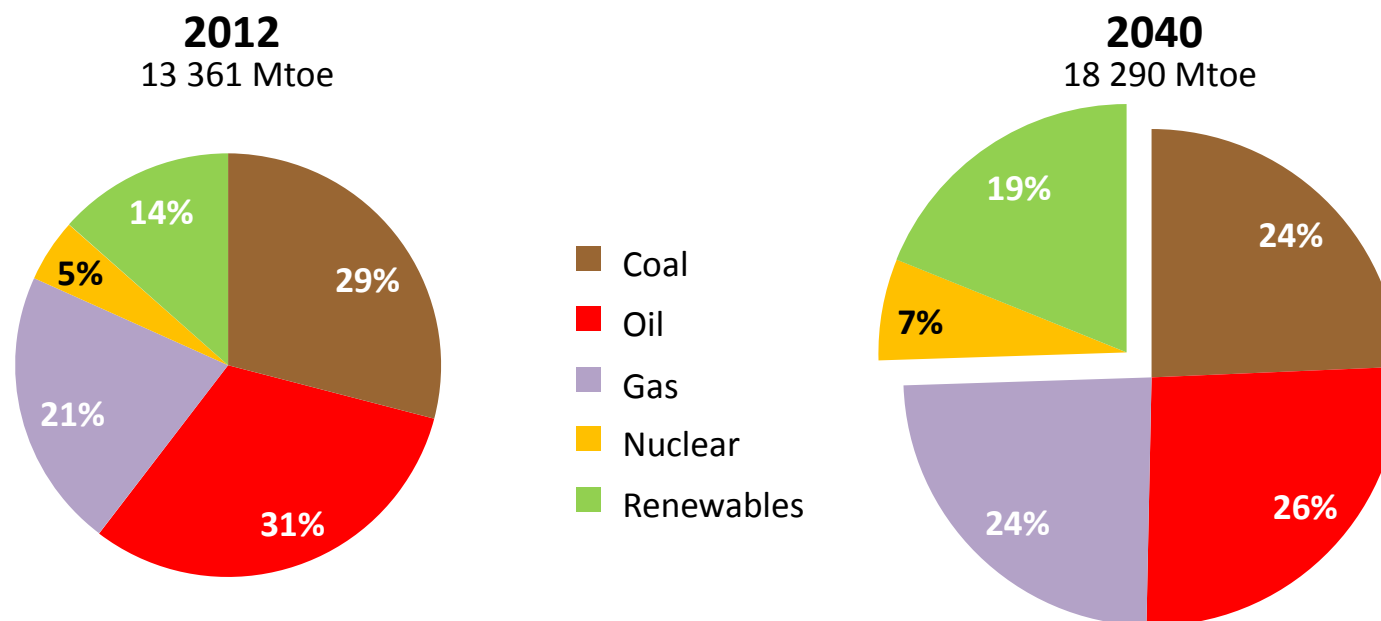


As China slows, then India, Southeast Asia, the Middle East and parts of Africa & Latin America take over as the engines of global energy demand growth.

A mix moving towards natural gas & low-carbon energy

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Fuel shares in world primary energy demand

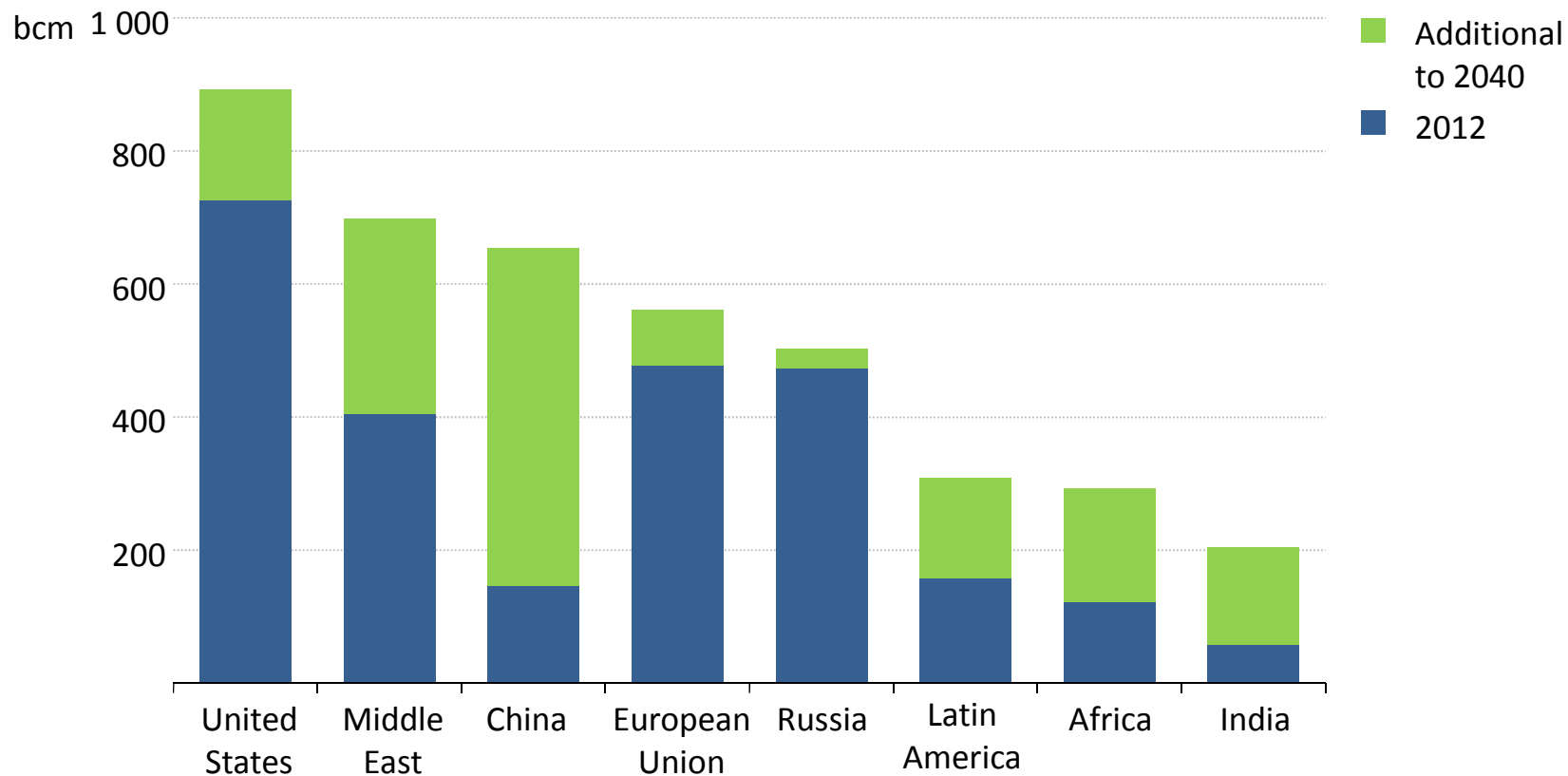


Declining shares of oil & coal in the mix bring the overall share of fossil fuels down to just under three-quarters by 2040, with gas on the way to becoming first fuel

China and the Middle East: key sources of demand growth

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Natural gas demand by region

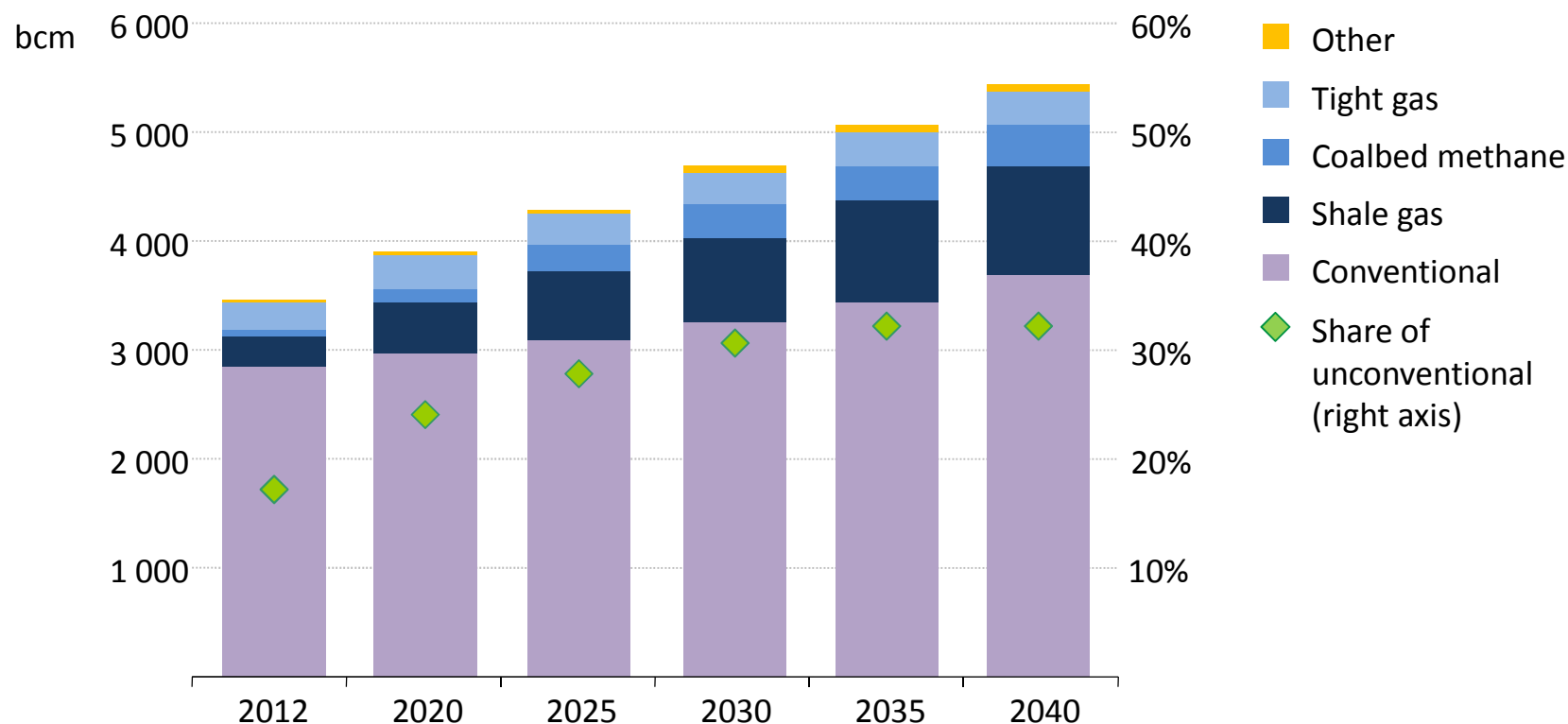


Gas demand growth in China & the Middle East alone, driven largely by the priority to diversify the fuel mix for power, is more than double the rise in total OECD gas use

Unconventional gas production a rising share of the mix

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World natural gas production by type

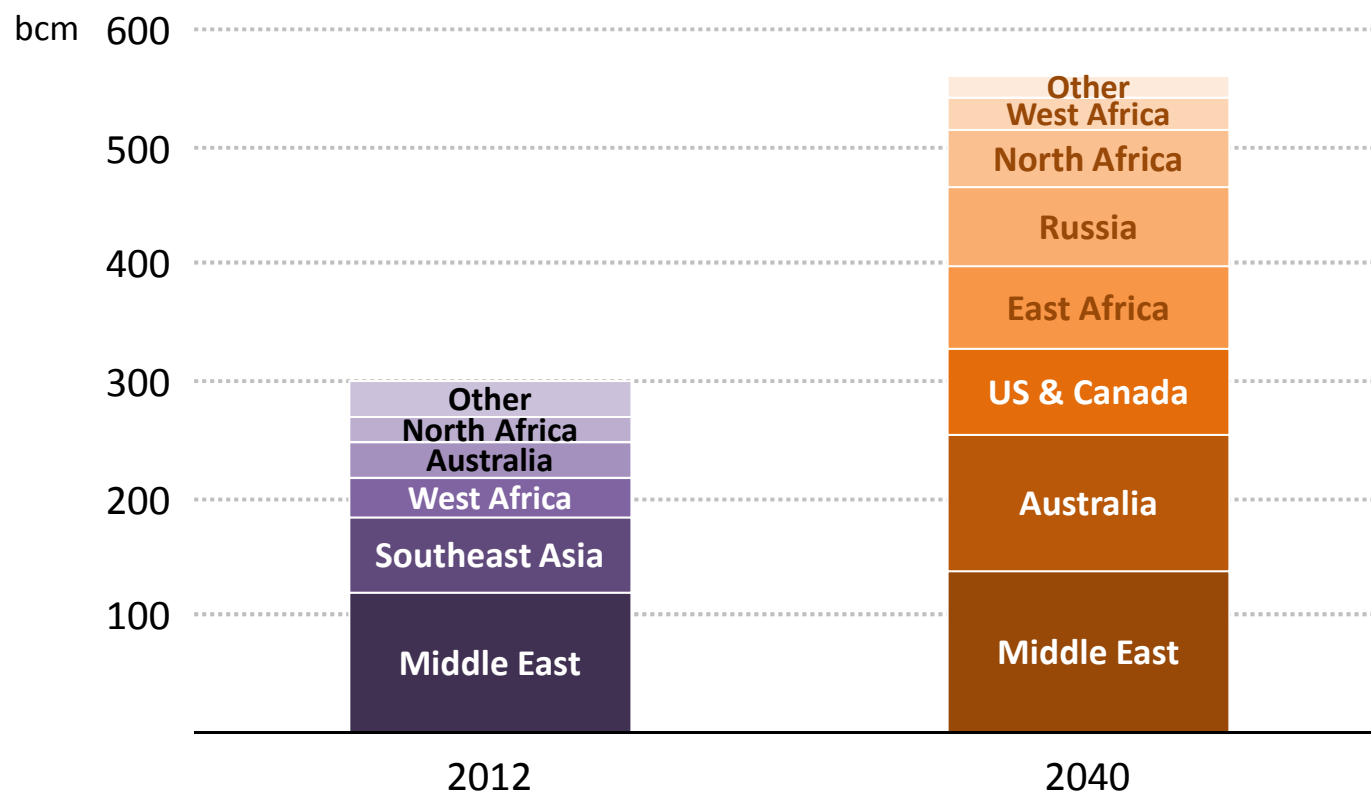


Most of the growth in gas supply comes from unconventional sources; by 2040, more than half of total unconventional output is produced outside the US and Canada

Share of LNG grows in global gas trade

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Main sources of regional LNG supply

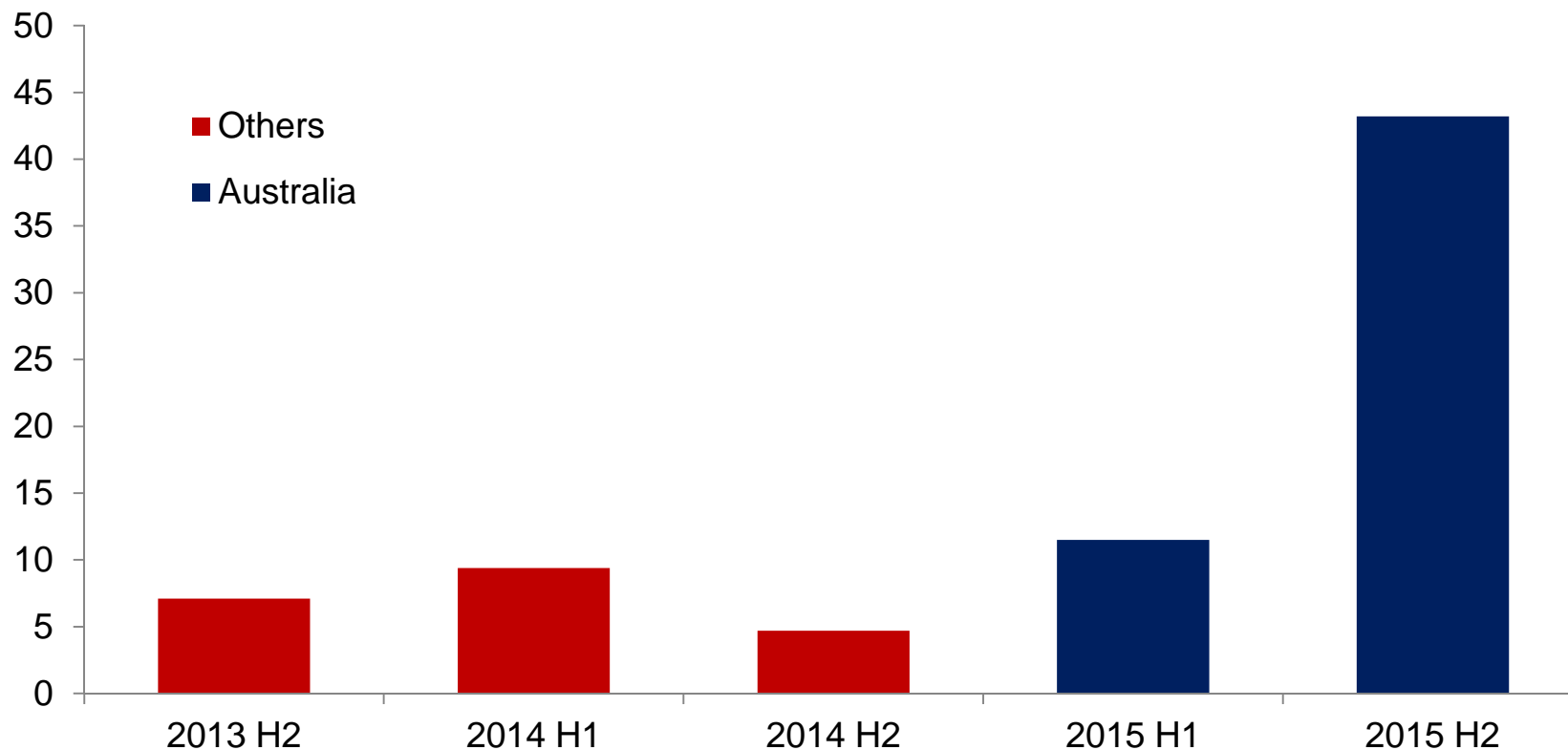


A near-tripling in liquefaction sites boosts the role of LNG, bringing more integrated & secure gas markets, but only limited relief on prices

Short term LNG growth

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Additional LNG capacity (growth relative to the previous period, bcm)

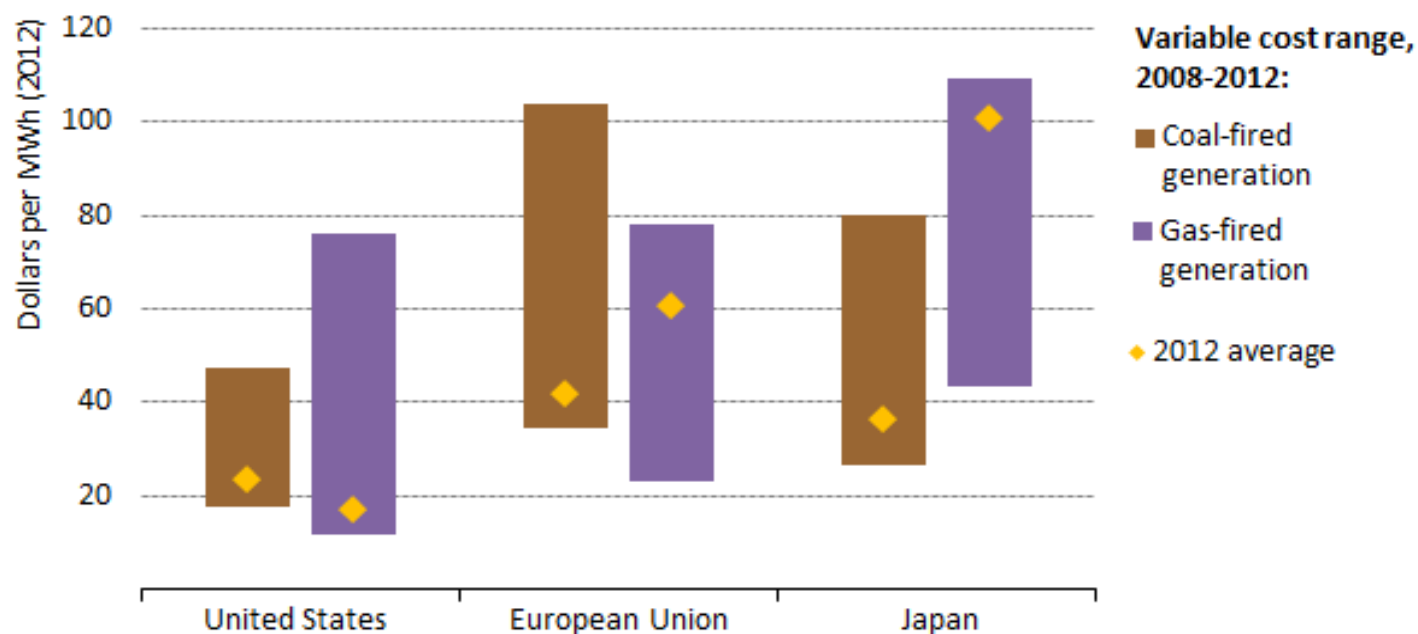


Australia and the US will add significant LNG to the market in the short-term, but could face immediate challenges finding markets

Coal vs. Gas competitiveness?

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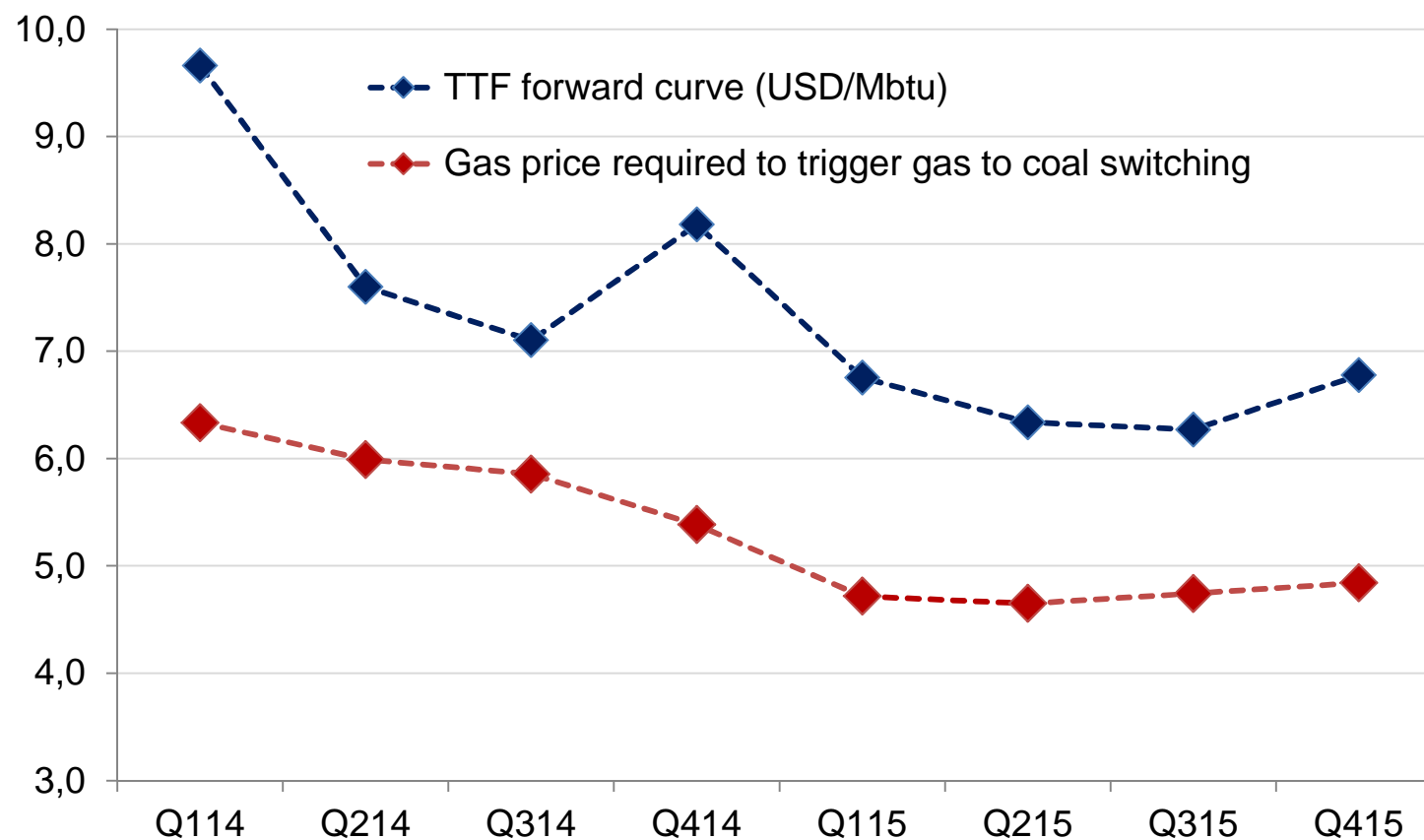
Electricity generating costs for coal and gas by selected region and for 2008-2012 fuel prices (WEO 2013)



Competitiveness of coal vs. gas depends on fuel cost, assumption on carbon price and environmental regulation; low gas prices can shift the balance

Gas to coal switching in Europe

European gas prices might need to drop towards \$5/mmbtu if gas-to-coal switching is the way to rebalance the market

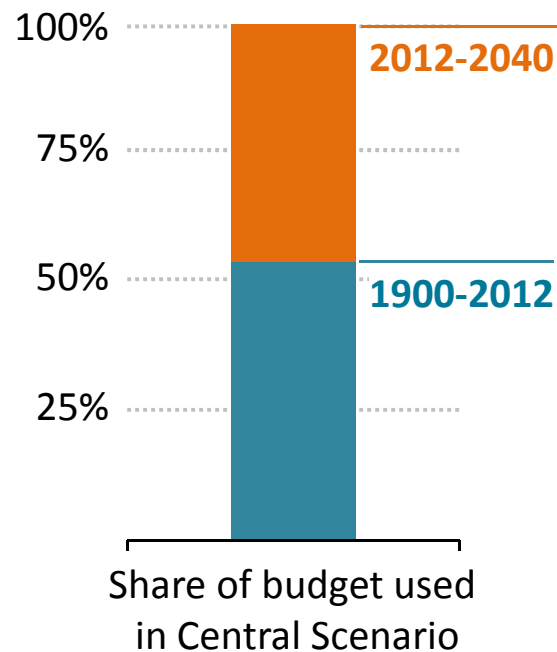


Note: Based on gas, coal, and carbon forward curves as of May 20 2015 – approximate switching price

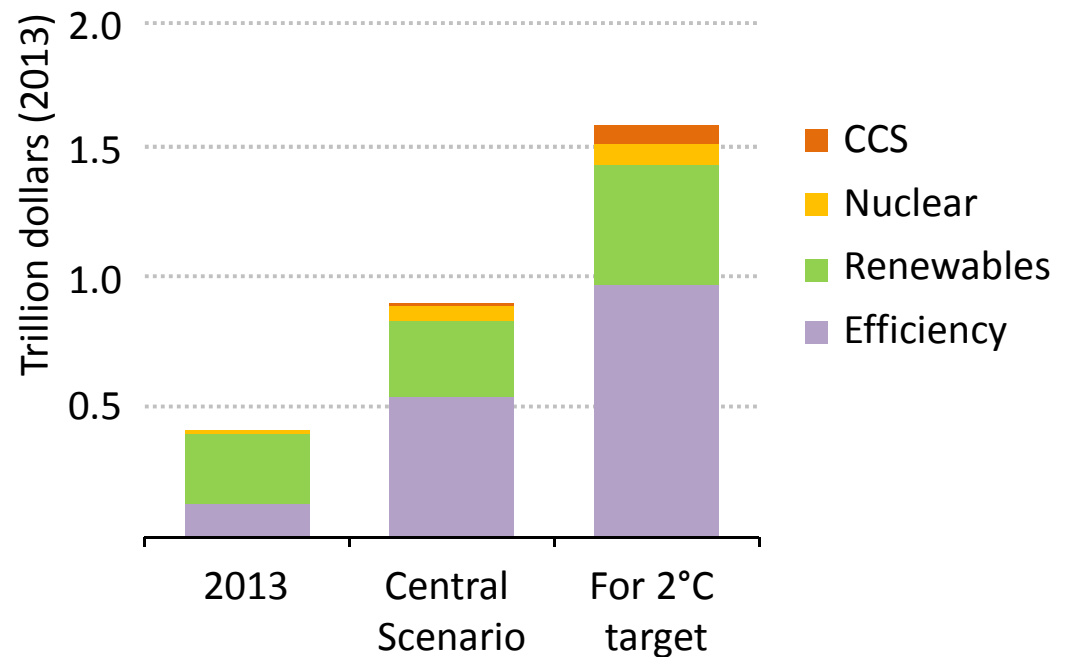
The 2 °C goal – last chance in Paris?

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World CO₂ budget for 2 °C ~2300 Gt

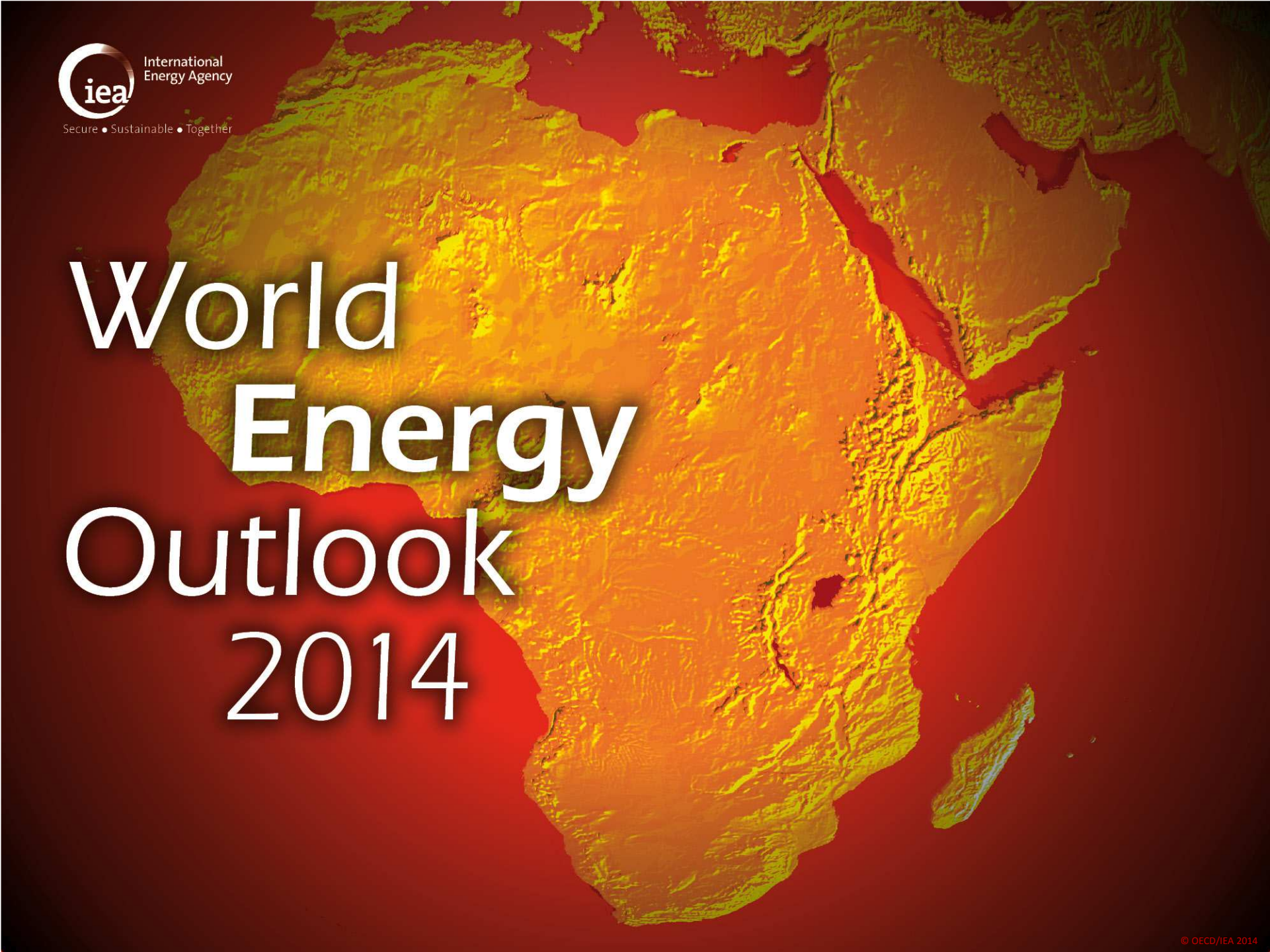


Average annual low-carbon investment, 2014-2040



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

- **Factors on both the supply & demand side are pushing gas towards a higher share in the global energy mix**
- **But the investment case cannot be taken for granted: gas faces stiff competition, large policy & pricing uncertainties**
- **The unconventional revolution will take time to spread: developments in China are critical to the global outlook**
- **The rise in LNG – notably from the US – is set to have a tangible impact on international market efficiency & security**
- **Natural gas has a role to play in moving us towards a low-carbon energy economy, but it is no panacea**



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