

LNG and Energy Security in Northeastern Asia

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About International Energy Agency

Founded in 1974

- Formed in wake of 1973 oil embargo with mission to promote member country energy security -- autonomous agency of the Organisation for Economic Cooperation and Development (OECD)

29 member countries and 2 countries in accession

- **Asia Pacific**: Australia, Japan, Republic of Korea and New Zealand
- **North America**: United States, Canada
- **Europe**: Austria, Belgium, Czech Rep, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey and United Kingdom

3 Association countries and 4 key Partner countries

- **Association countries**: China, Indonesia and Thailand
- **Key Partner Countries**: Brazil, India, South Africa and Russia

Secretariat: Paris

Energy security

Economic growth

Environmental sustainability

Engagement worldwide

Importance of the region

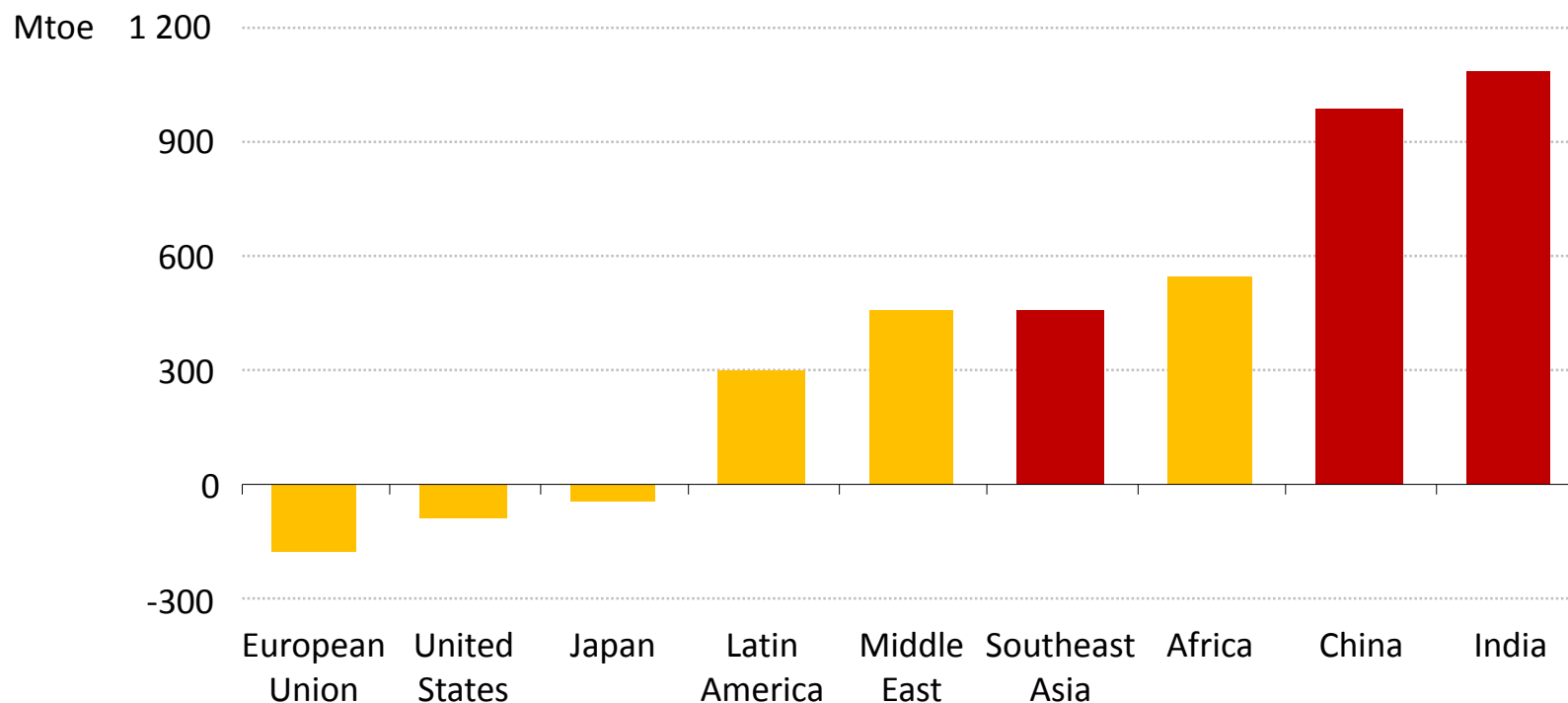
Ranking of key economies in the world

	GDP	Population	Energy demand	Gas demand	LNG Imports	Oil	CO ₂ emissions
China	2	1	1	3	3	2	1
Japan	3	11	5	5	1	4	5
South Korea	11	27	9	19	2	8	7
% of global total	22.3%	21.1%	28.4%	10.2%	55.6%	19.9%	33.6%

Northeastern Asia has an important role to play in areas of global economic growth, energy market development and environmental protection.

Demand growth in Asia

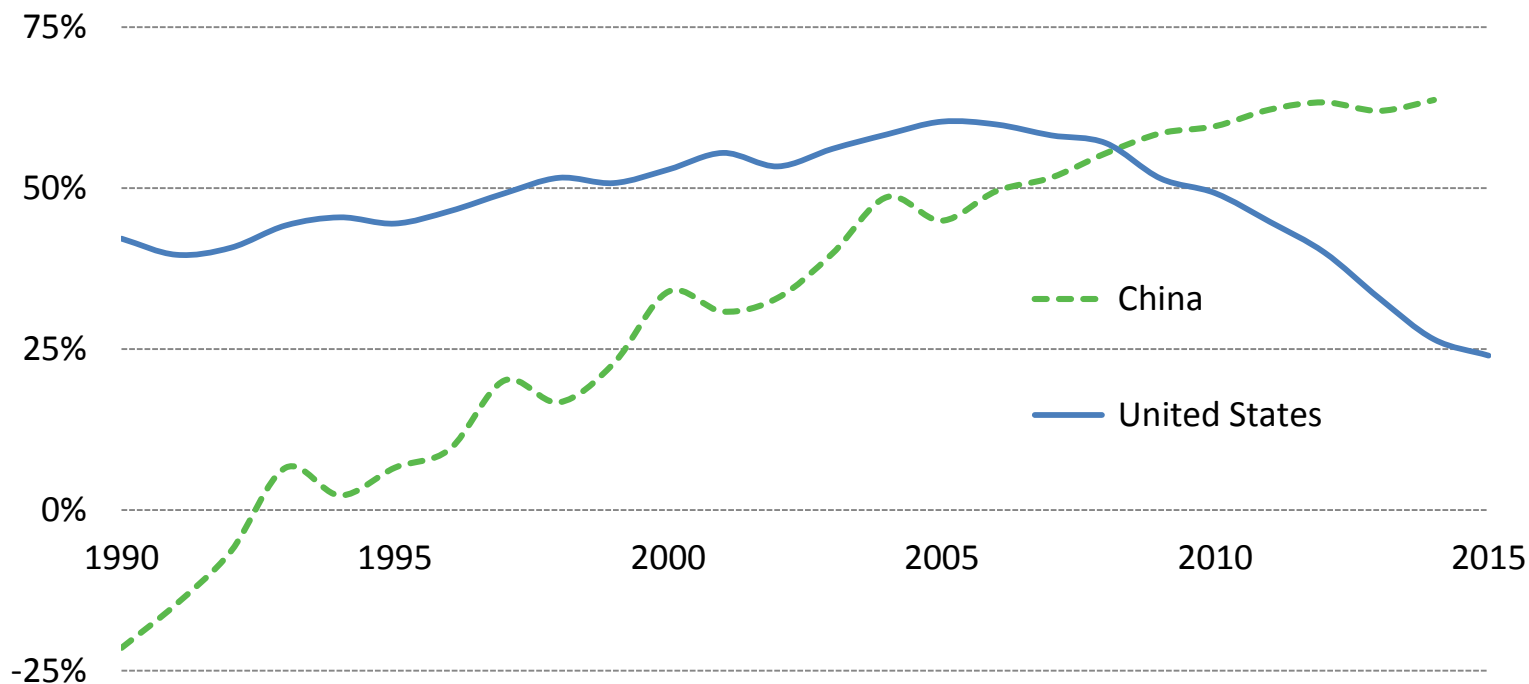
Change in energy demand in selected regions, 2014-2040



Energy use worldwide grows by one third to 2040, largely driven by Asia

Evolution of energy security concern

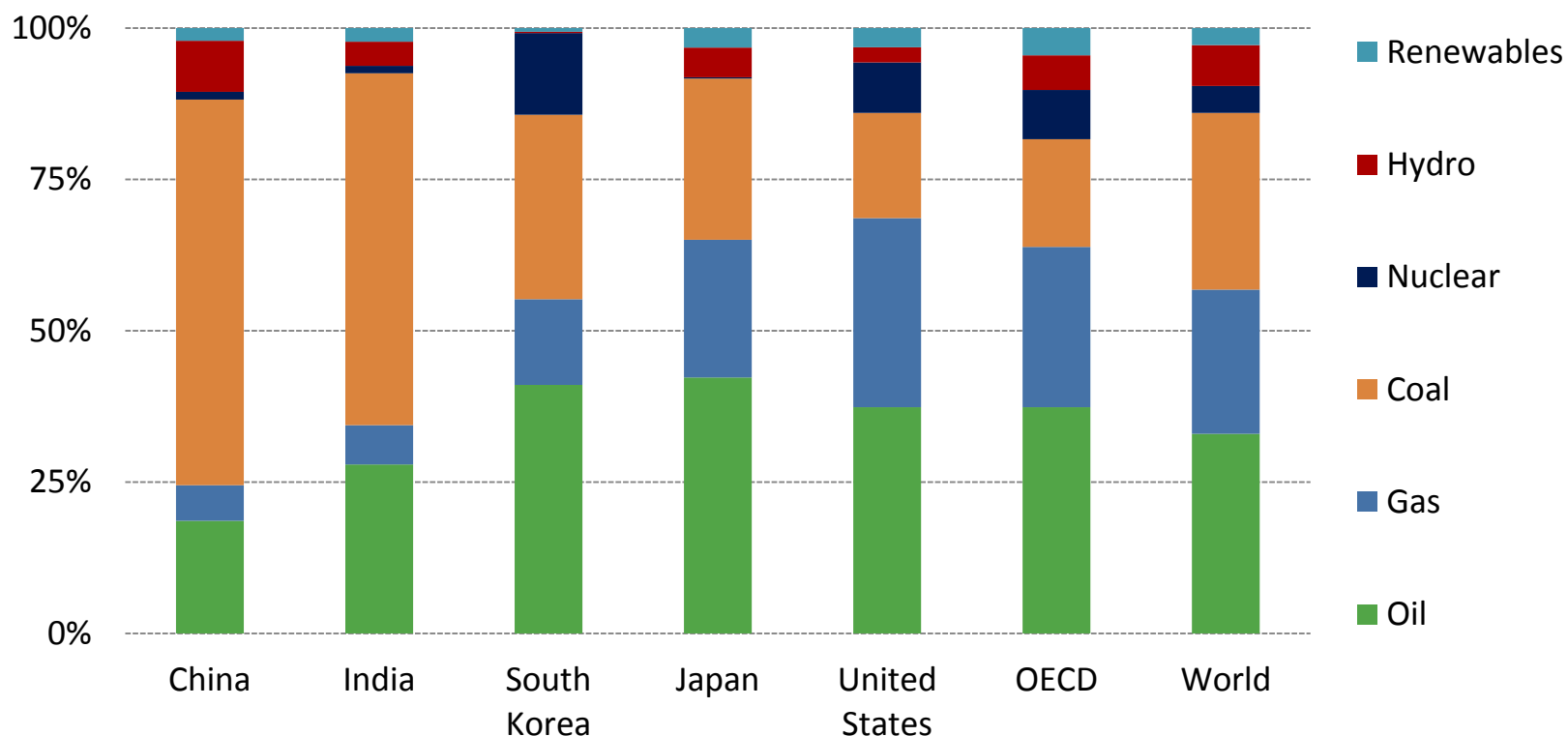
Change of oil dependence rate: China vs. United States



Shale gas revolution in the United States has profound implications for US-China relations and beyond.

Comparison of energy mix

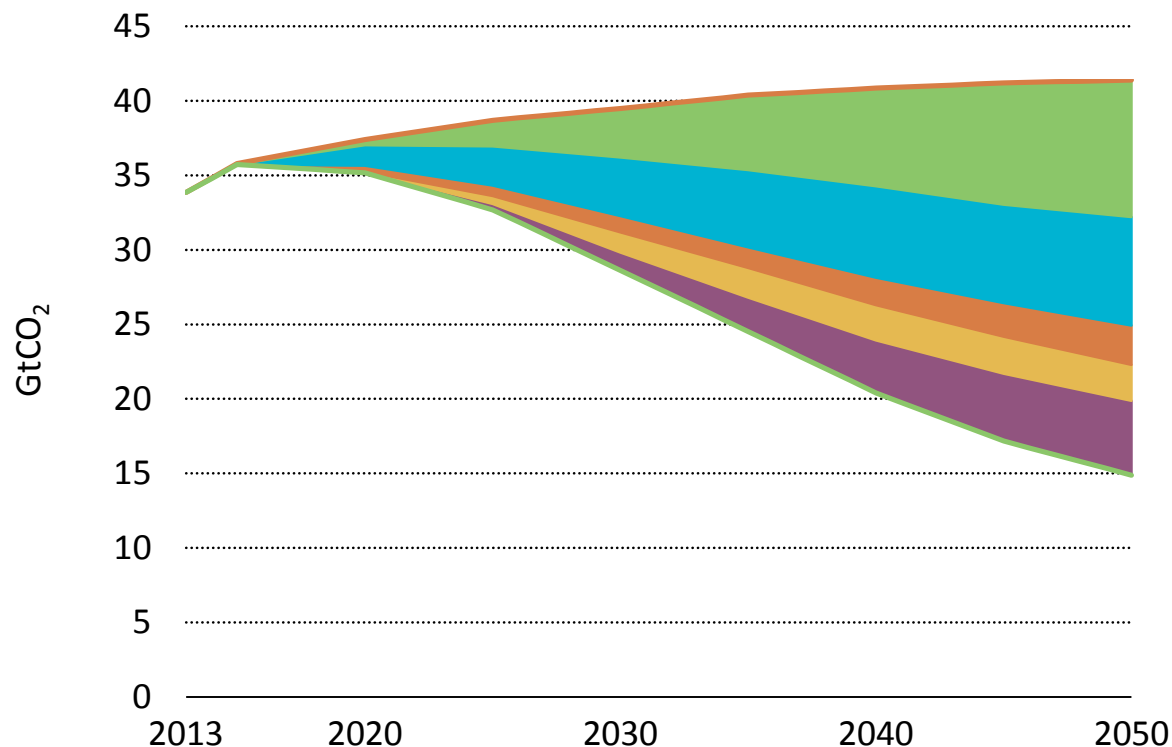
Energy mix of different economies



Convergence of energy mix between key emerging economies and OECD countries have significant impacts on energy trade and environmental agenda.

The scale of the climate challenge

Contribution of technology area to global cumulative CO₂ reductions

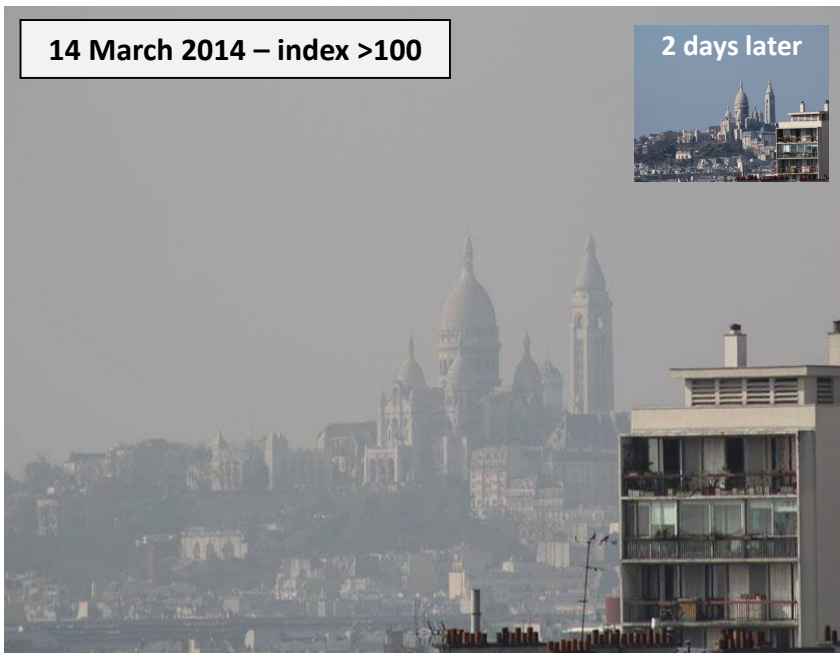


The carbon intensity of the global economy can be cut by two-thirds through a diversified energy technology mix

Air quality – a global local problem



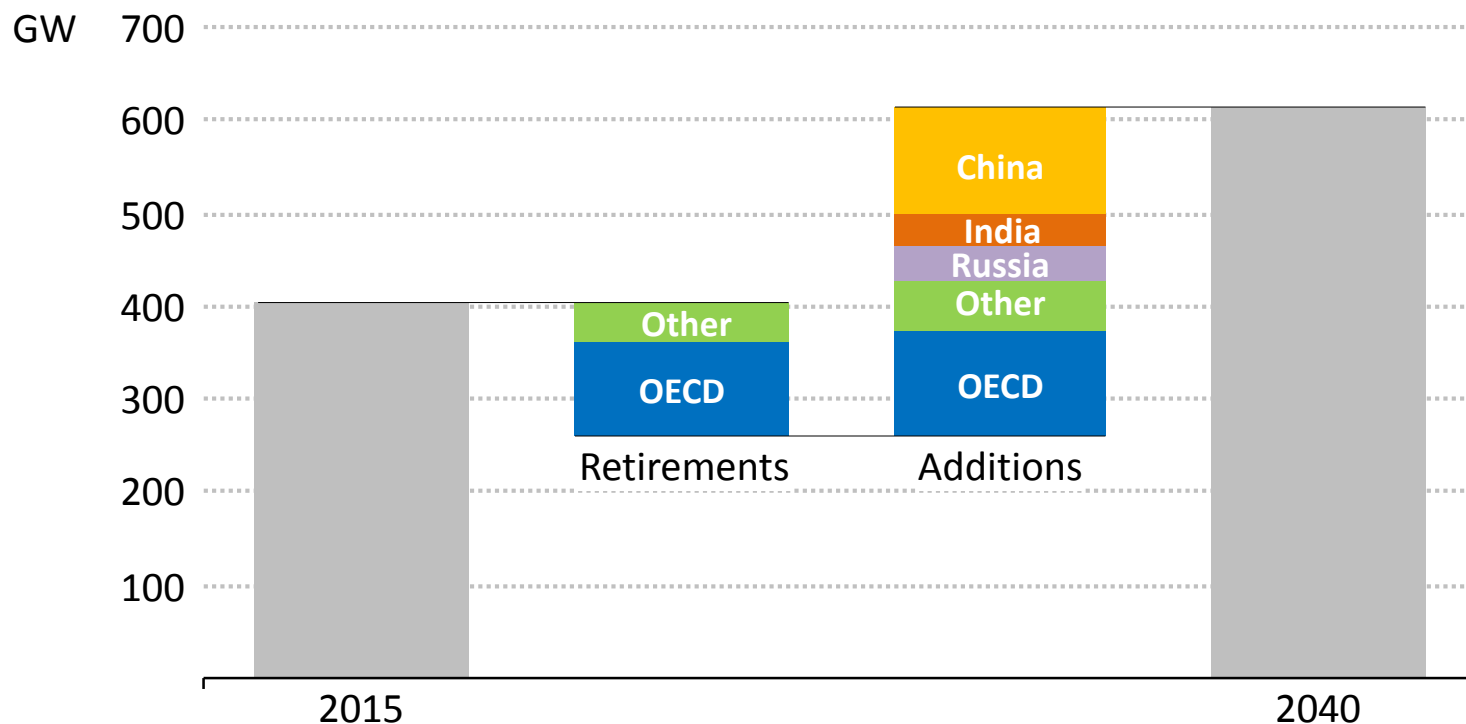
Los Angeles Photochemical Smog, 1940s



Great London Fog, 1952

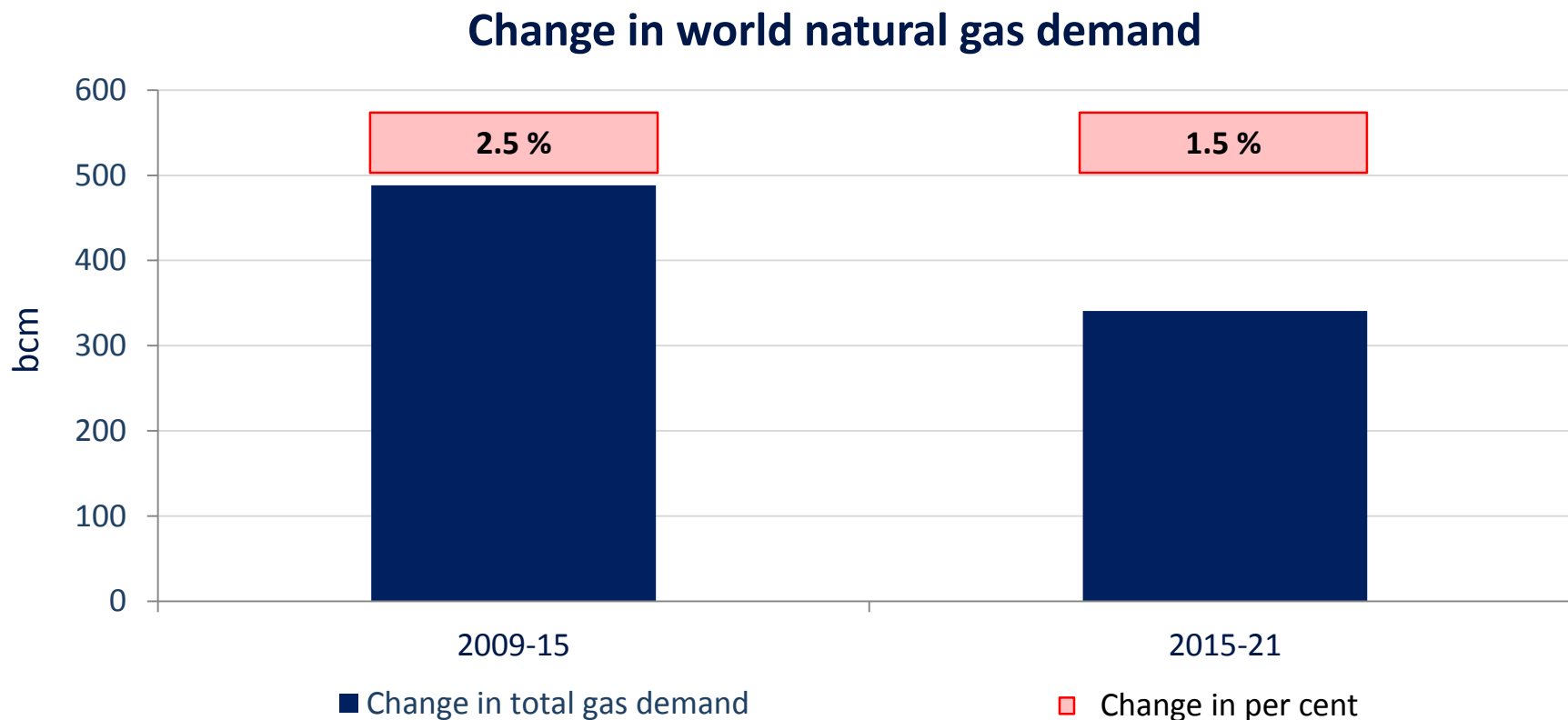
Nuclear capacity increases, but no nuclear renaissance in sight

Nuclear capacity by selected region



Capacity grows 50% to over 610 GW in 2040, led by non-OECD, notably China & India; yet the share of nuclear in the global power mix remains well-below its historic peak

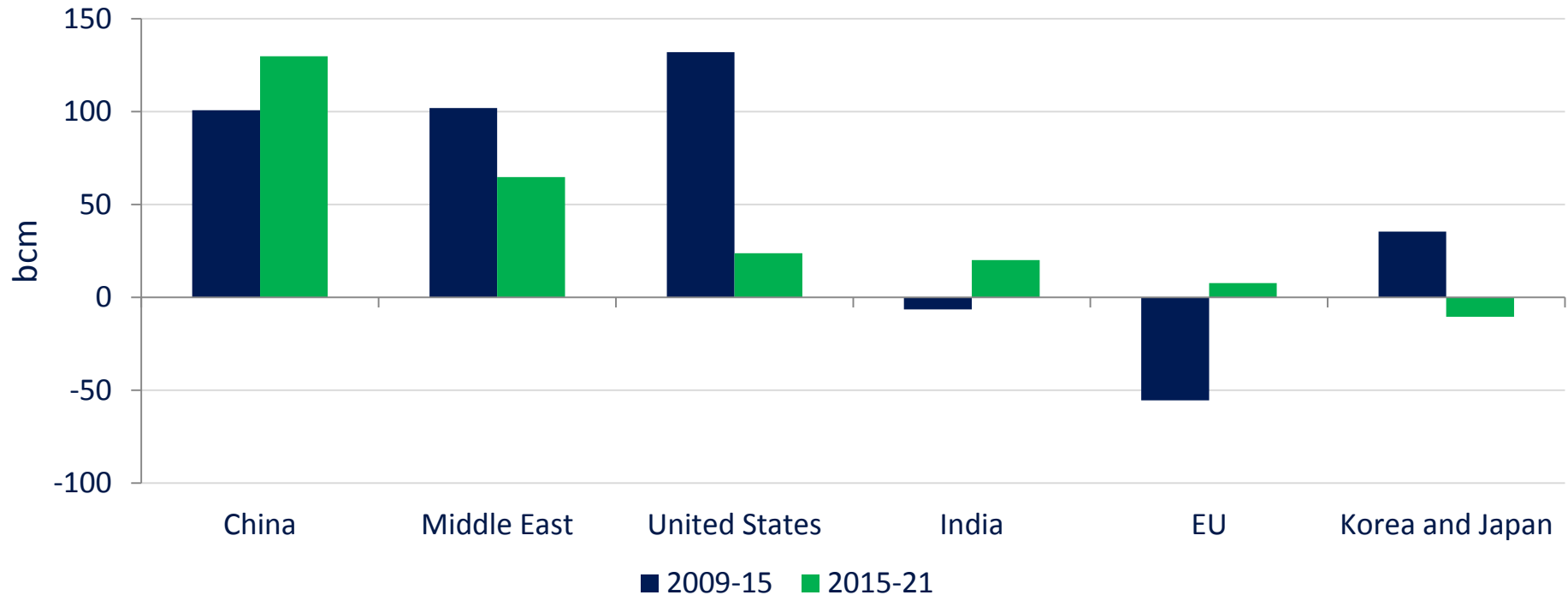
Growth in global gas demand slows



Growth in gas demand slows as it faces greater competition in the power sector; yet it is the only fossil fuel that does not suffer a decline in its share of the energy mix

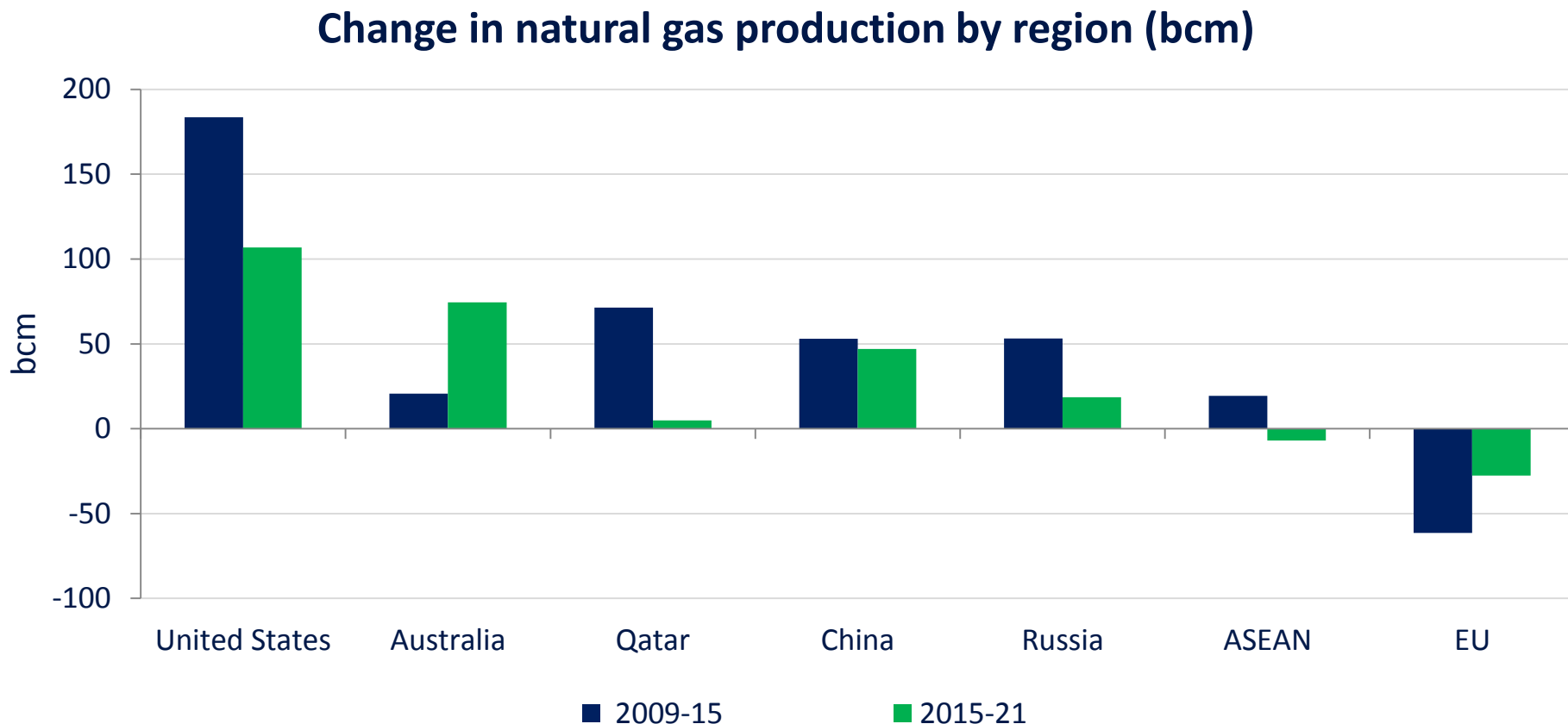
China drives increase in global gas demand, as the United States takes a back seat

Change in natural gas demand by region (bcm)



***US gas demand growth slows sharply, driven by stagnation in the power sector;
EU gas demand gradually recovers on coal & nuclear power plant retirements***

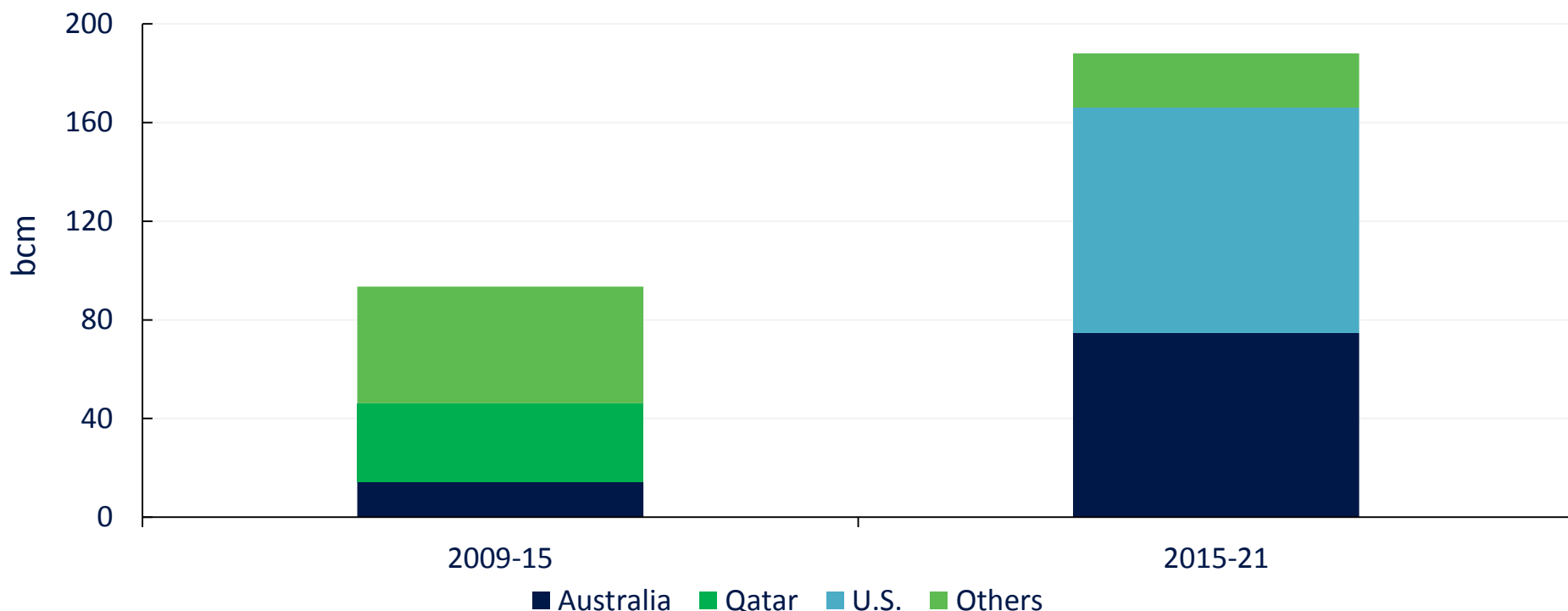
Growth in gas production is led by the United States and Australia



The United States & Australia rather than the more established exporters – Russia, Qatar & ASEAN – are the main source of production growth

Global LNG export capacity increases sharply

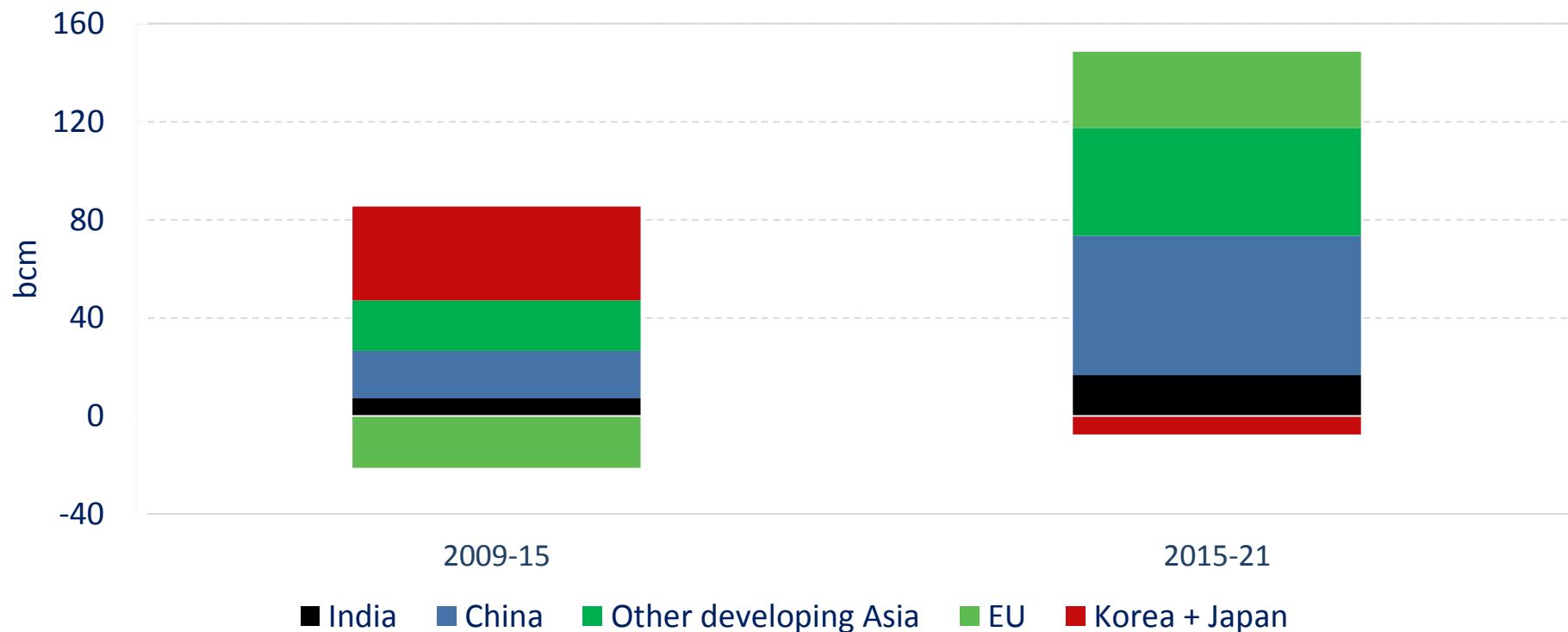
Liquefaction capacity additions



LNG capacity additions will be led by the US & Australia over the next five years; projects in Canada & East Africa could also move ahead if demand & prices recover

Developing Asia emerges as key engine of LNG import growth

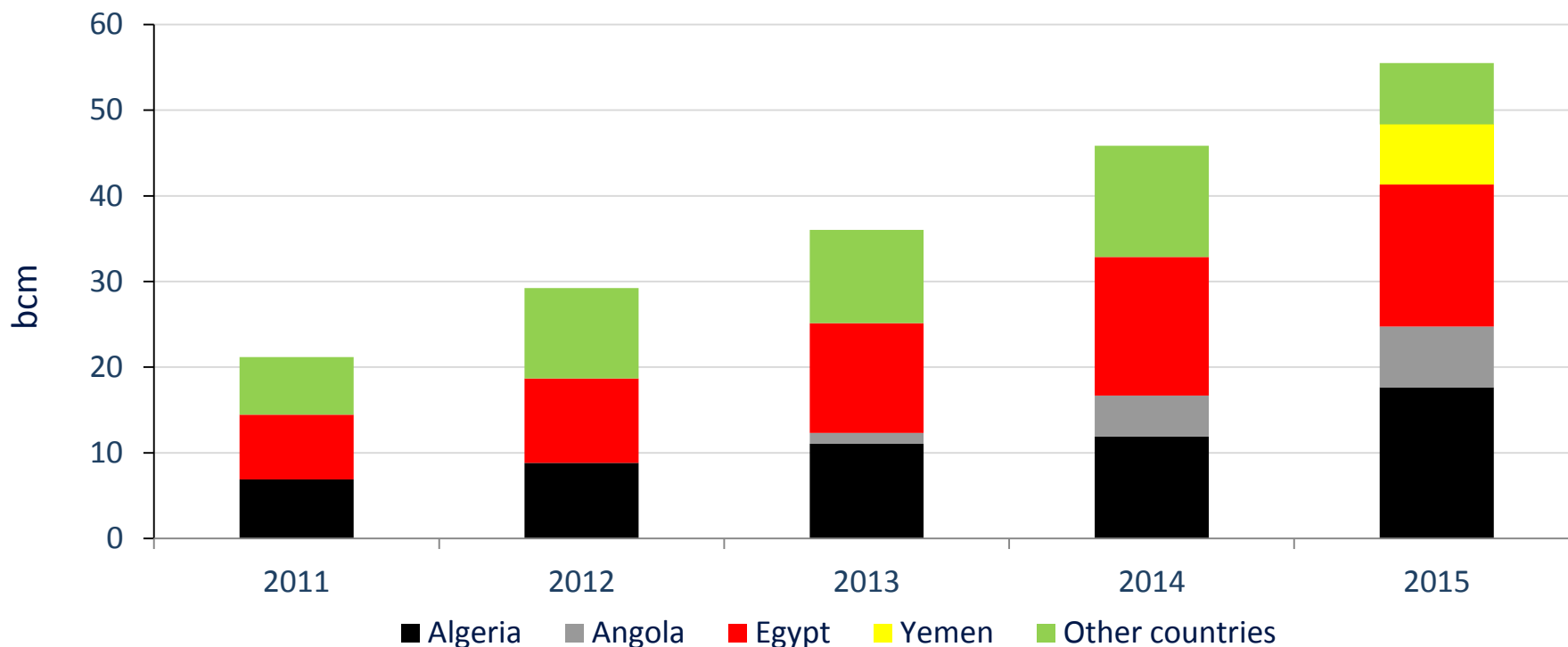
Change in LNG imports by region (bcm)



As imports from Japan & Korea are set to decline, the rebalancing of global markets will depend on the rate of expansion in China & other developing Asia

Outages and feed gas issues: a growing energy security concern

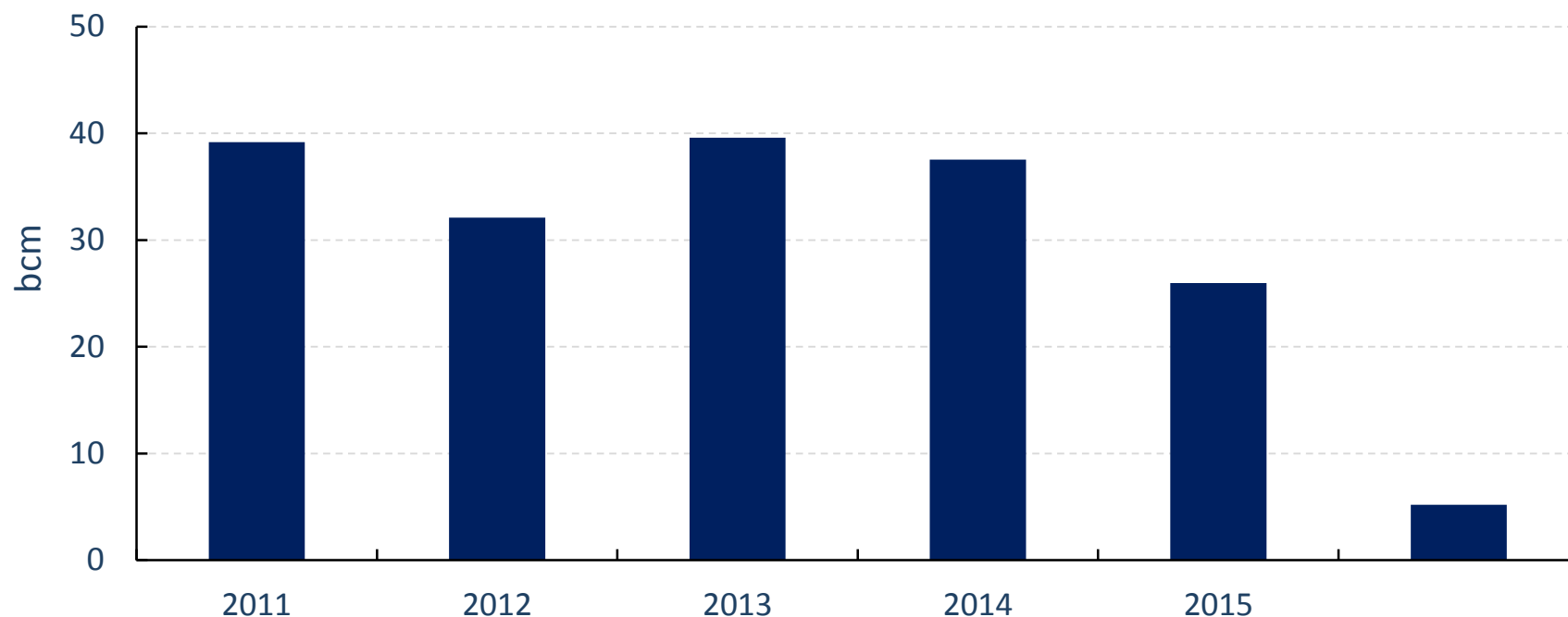
Liquefaction capacity offline



A growing level of LNG export capacity has gone offline over the past five years highlighting security and investment challenges across a host of producers

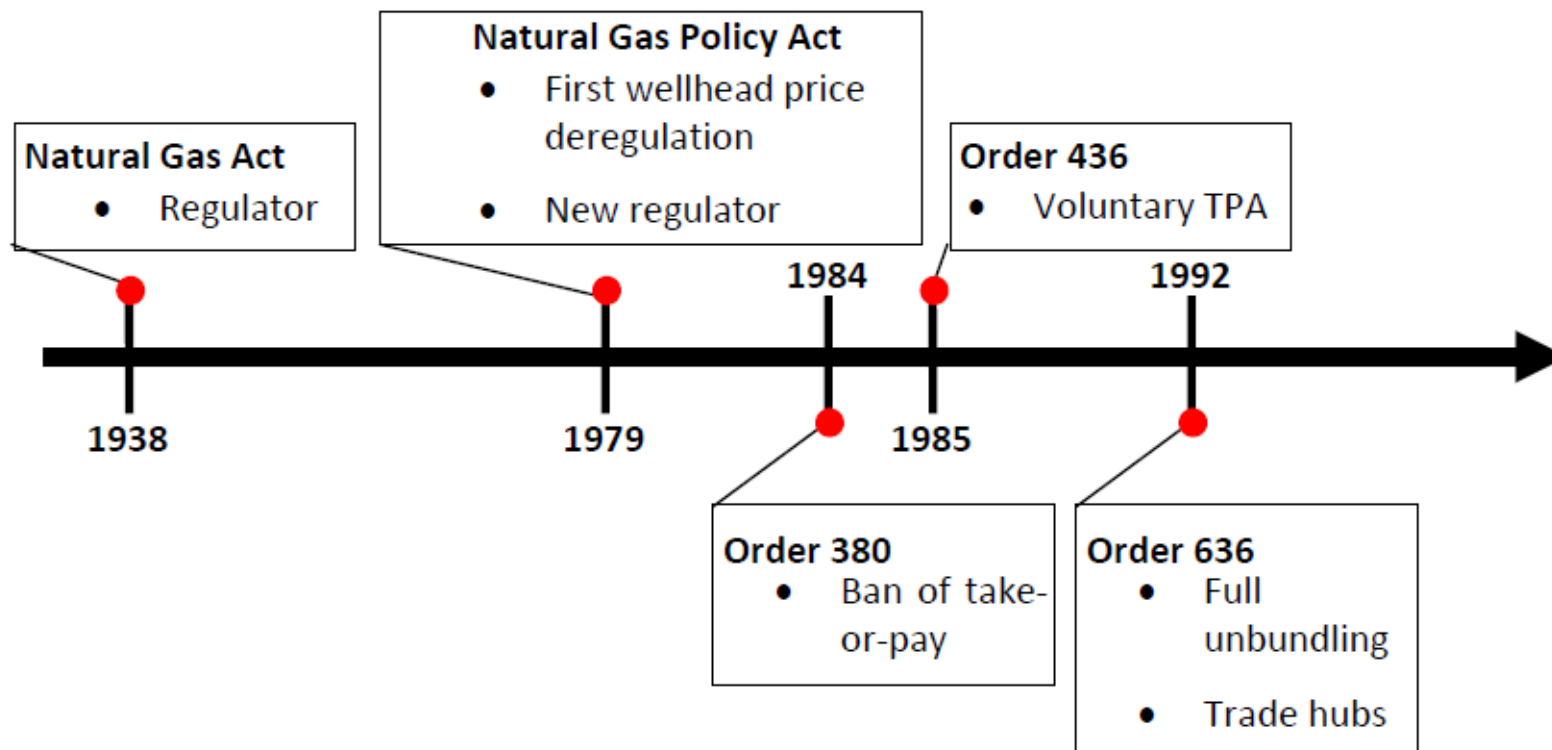
Investment in new LNG export capacity has ground to a halt

Final investment decisions in liquefaction capacity by year



The collapse in investment increases the risk of tighter markets in the next decade; concerns about gas supply security could quickly re-emerge

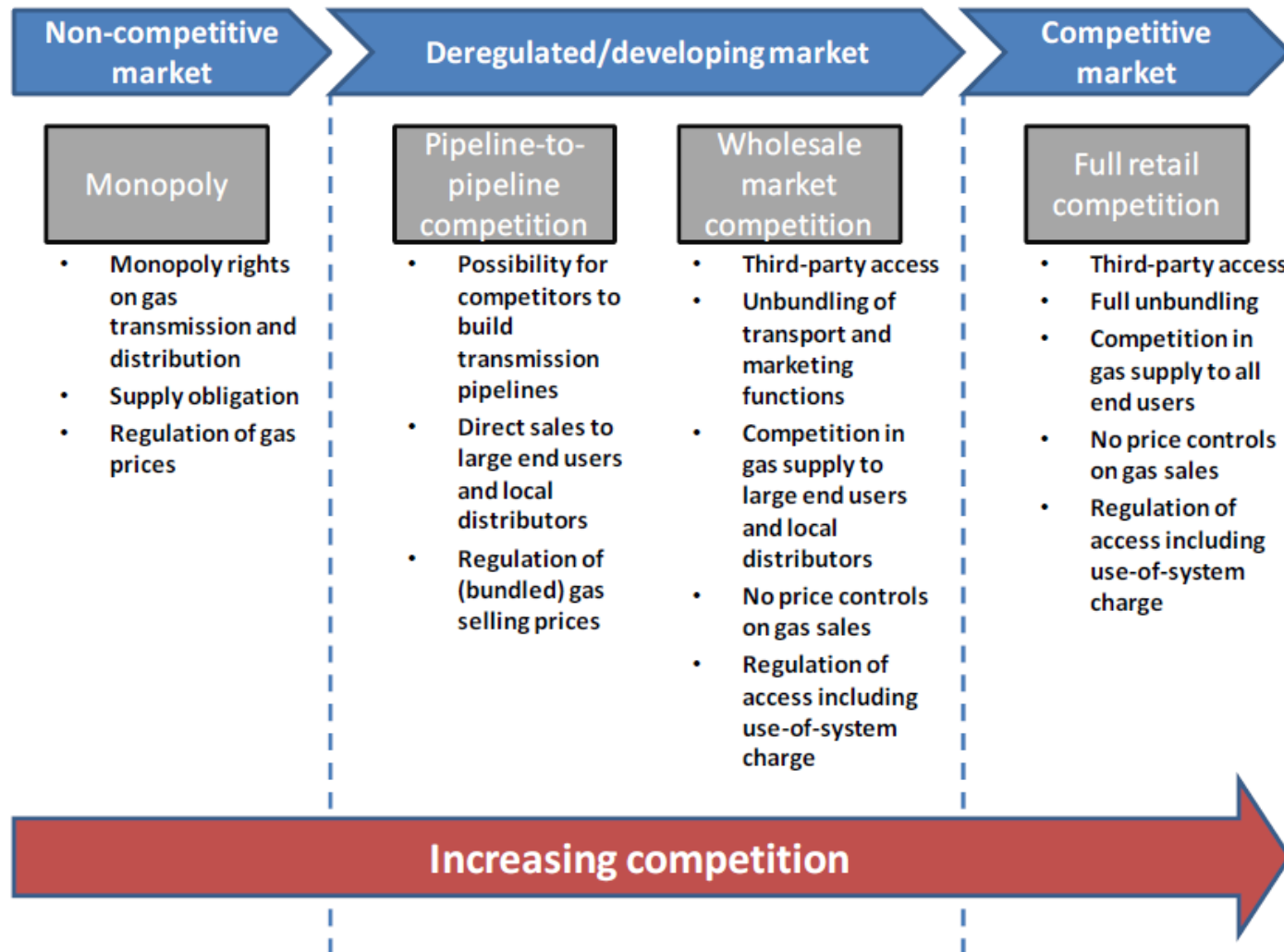
LNG pricing: where we start



- Oil indexation used to make perfect sense, but so did fax machines.
- Asia: is the problem price formation or price levels?
- Europe: virtual trading can work.
- US: any trade linkage brings Henry Hub to LNG pricing as well.

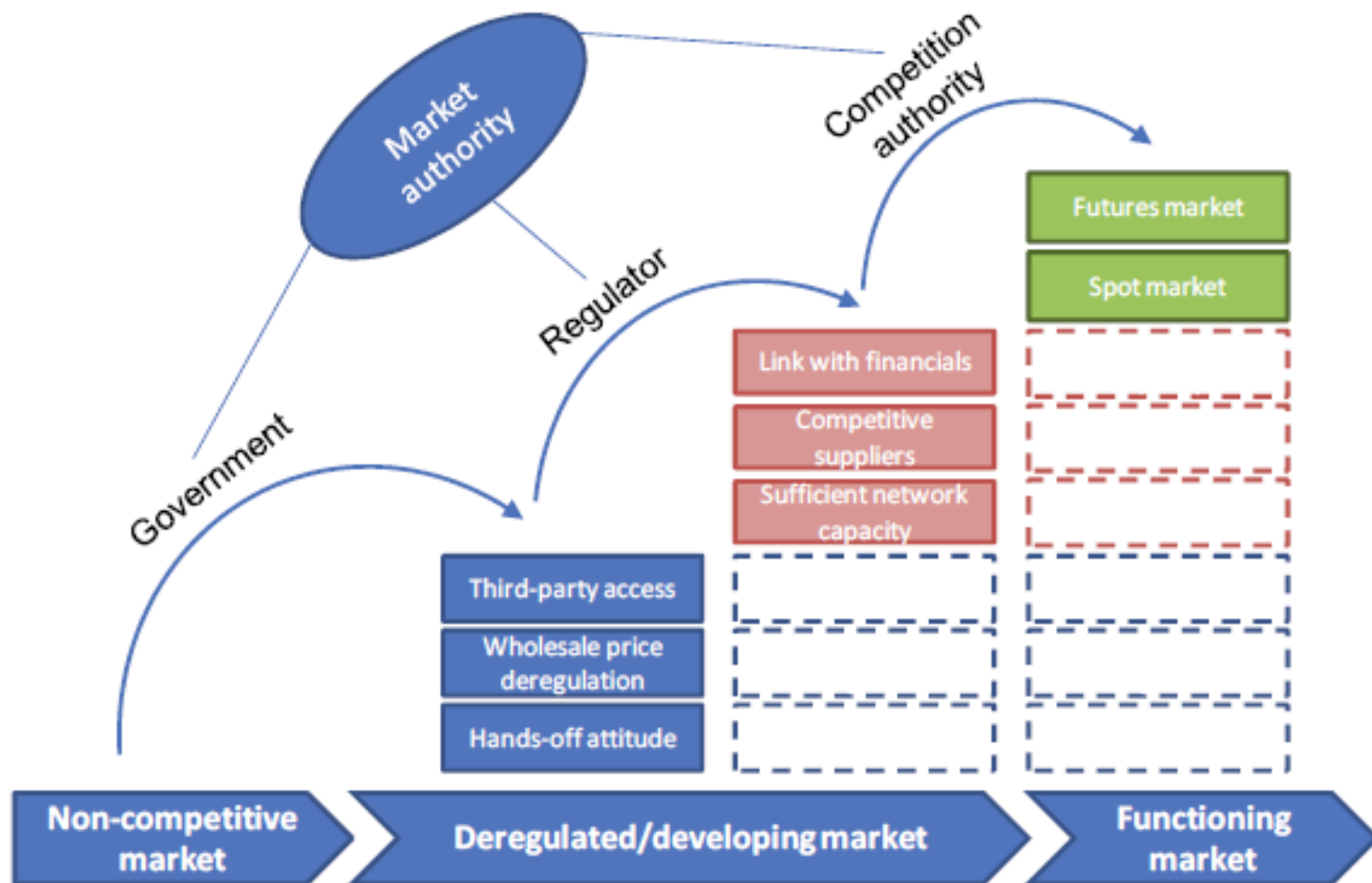
Next Step

How to increase competition in a Natural Gas Market



Next Step

How to Create a Competitive Wholesale Natural Gas Market



Take-home messages

- **The gas landscape is changing: production growth is increasingly driven by the US & Australia; demand growth by developing Asia.**
- **Global gas prices are set to stay under pressure, triggering a collapse in new investment. This could seed the sows for tighter markets into next decade.**
- **Competitive gas markets and a reliable gas price cannot develop overnight, and will not necessarily lead to lower price levels.**
- **Natural gas alone is not the entire answer for energy security challenge, but a market-oriented trading mechanism is beneficial.**
- **International collaboration is crucial to respond to energy security challenge; IEA is pursuing modernization efforts:**
 - *“Opening its doors” to the emerging economies*
 - *Taking on a new role to safeguard natural gas security*
 - *Becoming a global Clean Energy Hub*