

Global LNG: will new demand and new supply mean new pricing?

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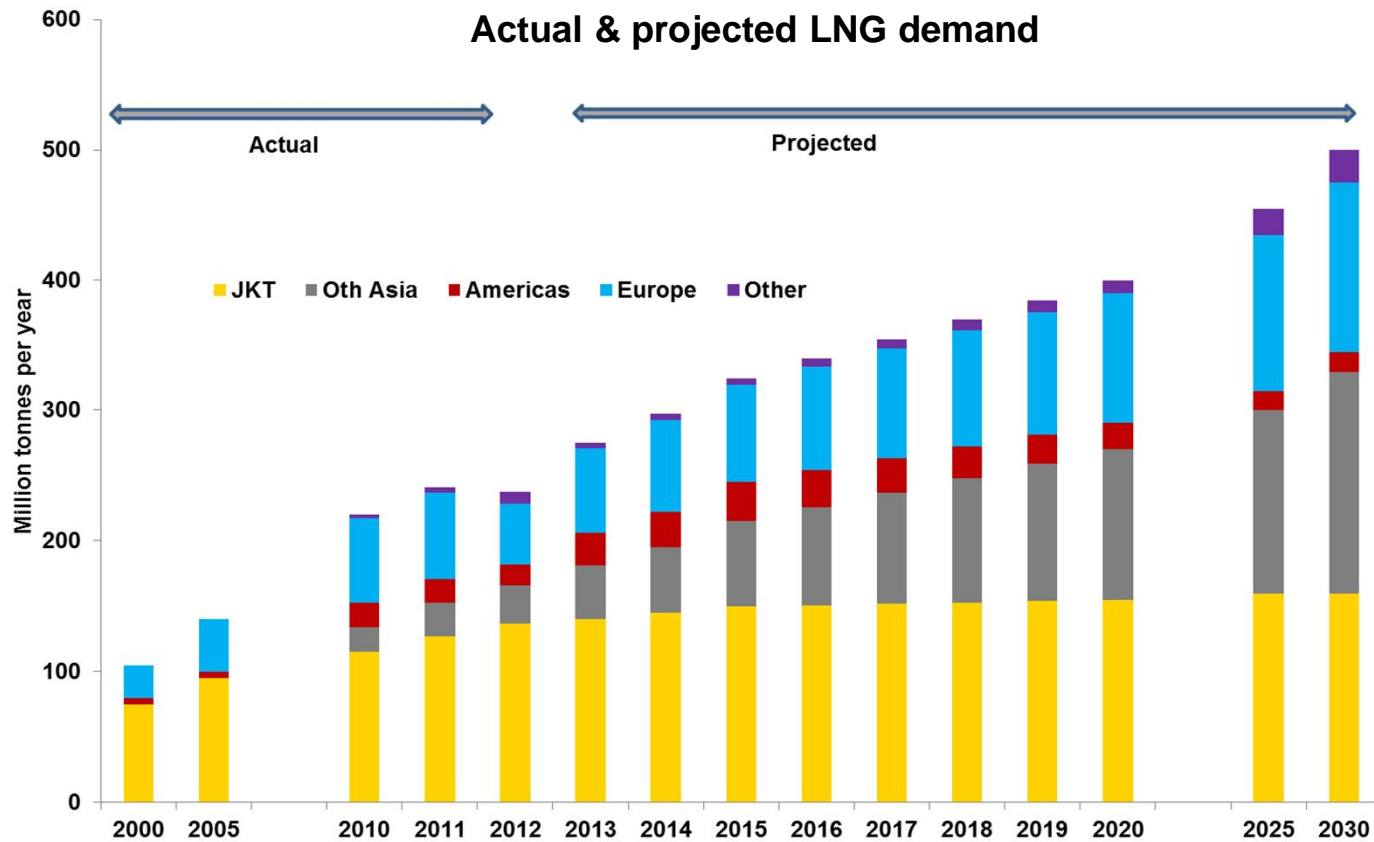
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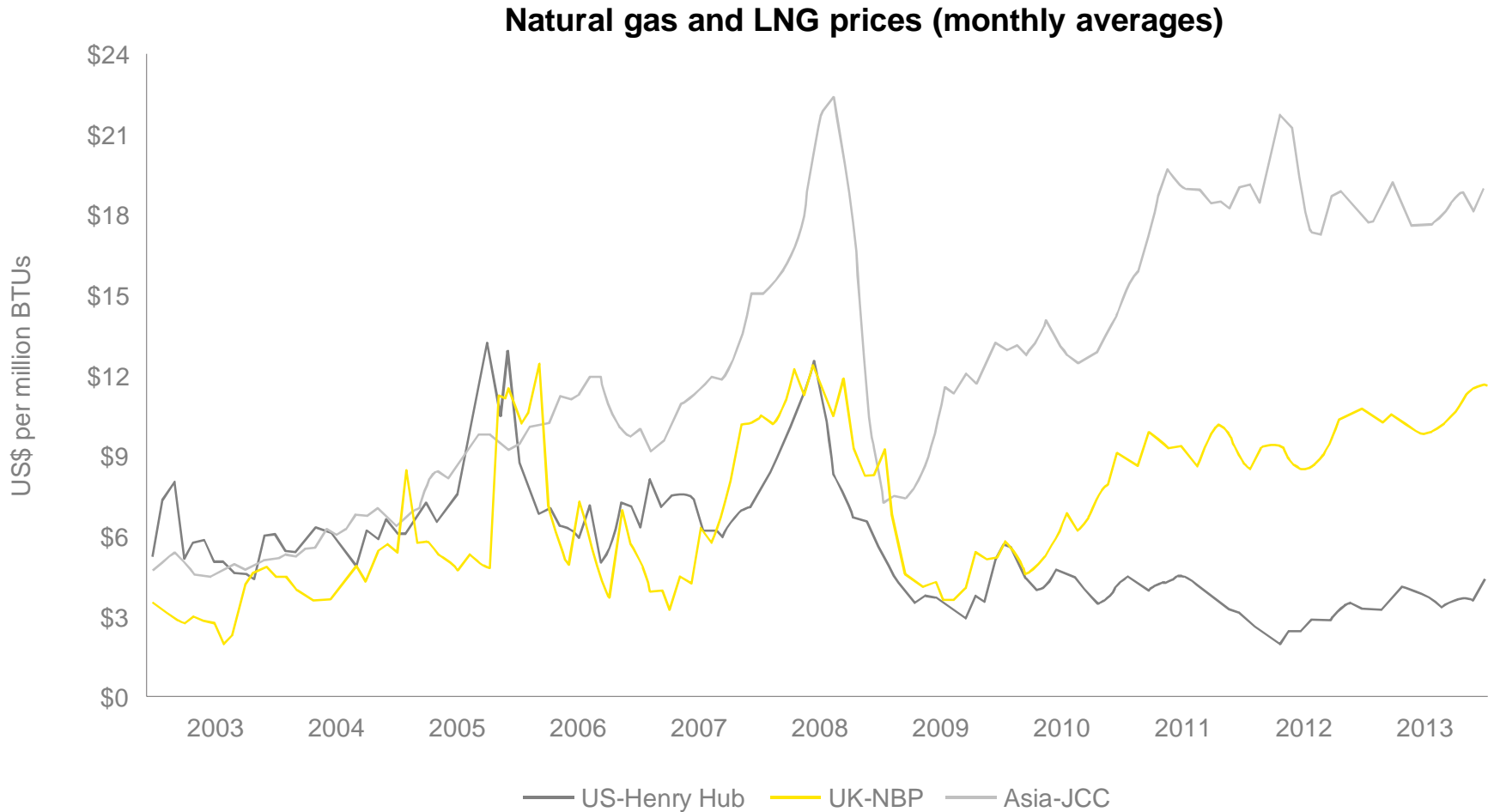
LNG and the “Golden Age of Gas”

- ▶ Global natural gas demand is expected to grow by almost 2% per year, but demand for LNG is expected to grow by almost 4% per year



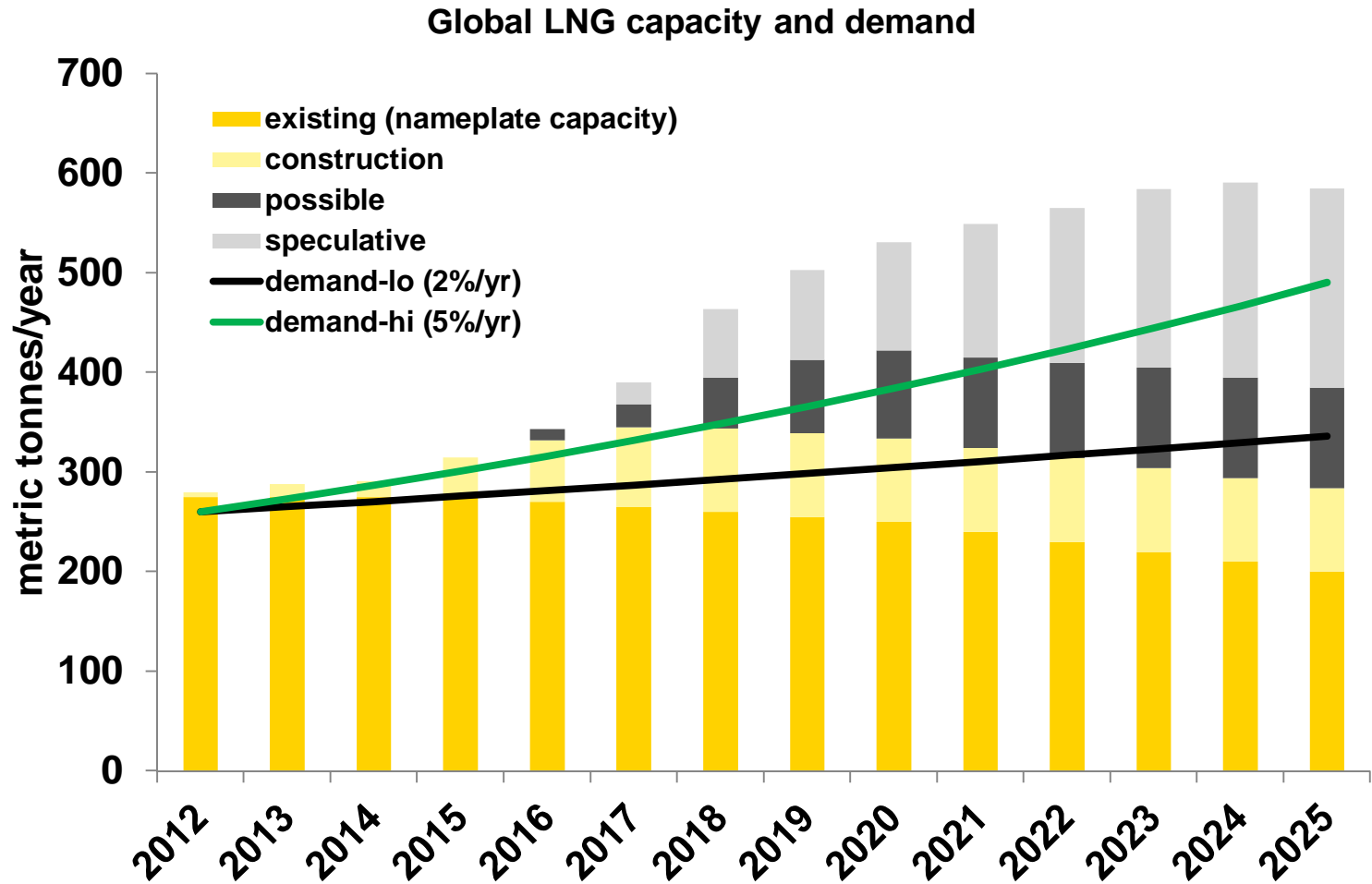
Source: Ernst & Young assessments of data from multiple sources

Global gas prices: volatile arbitrage



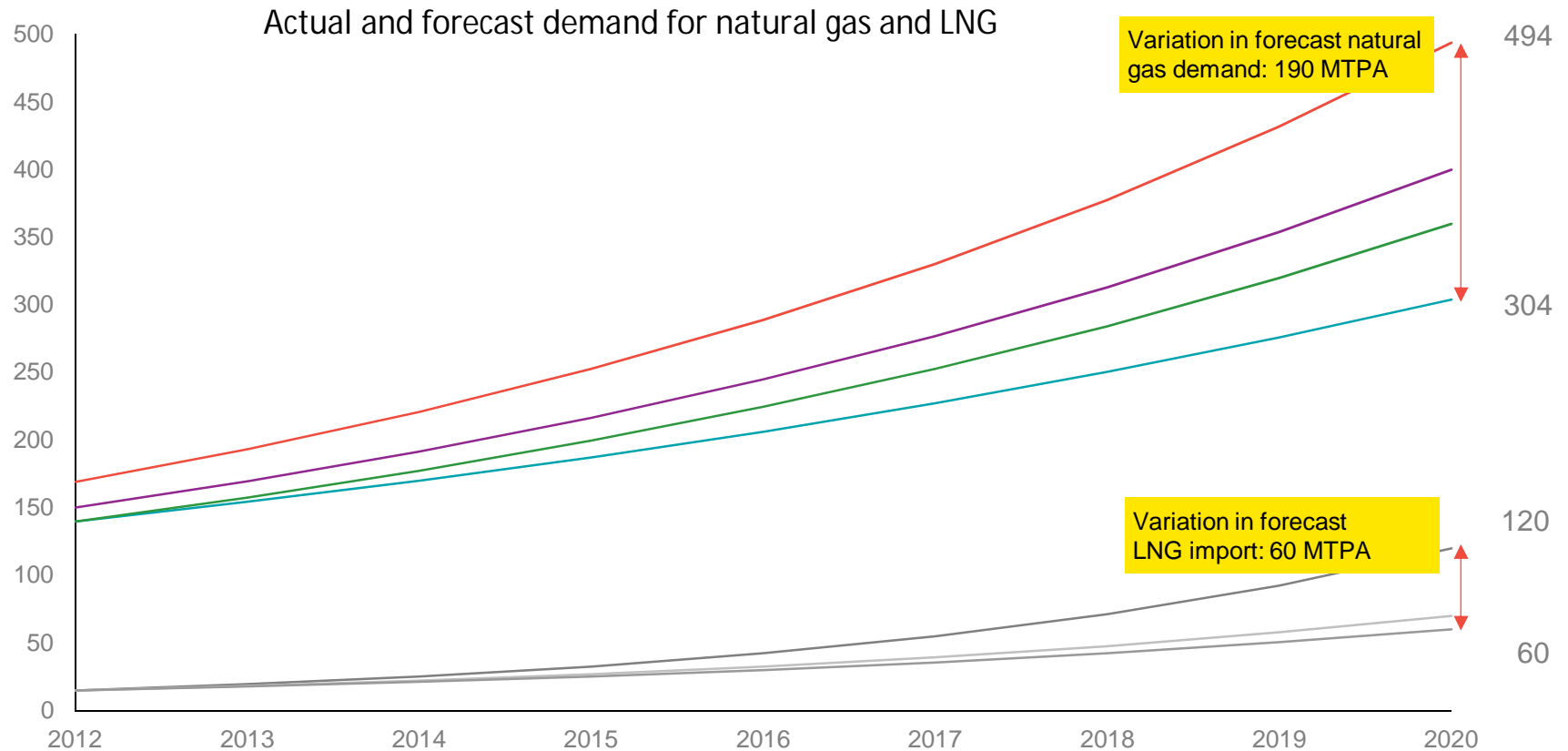
Source: *Natural Gas Week* and Thomson/Reuters

Ambiguity in medium term demand and prospects of new supplies leading to delays in FID of projects



Source: Ernst & Young assessments of data from multiple sources

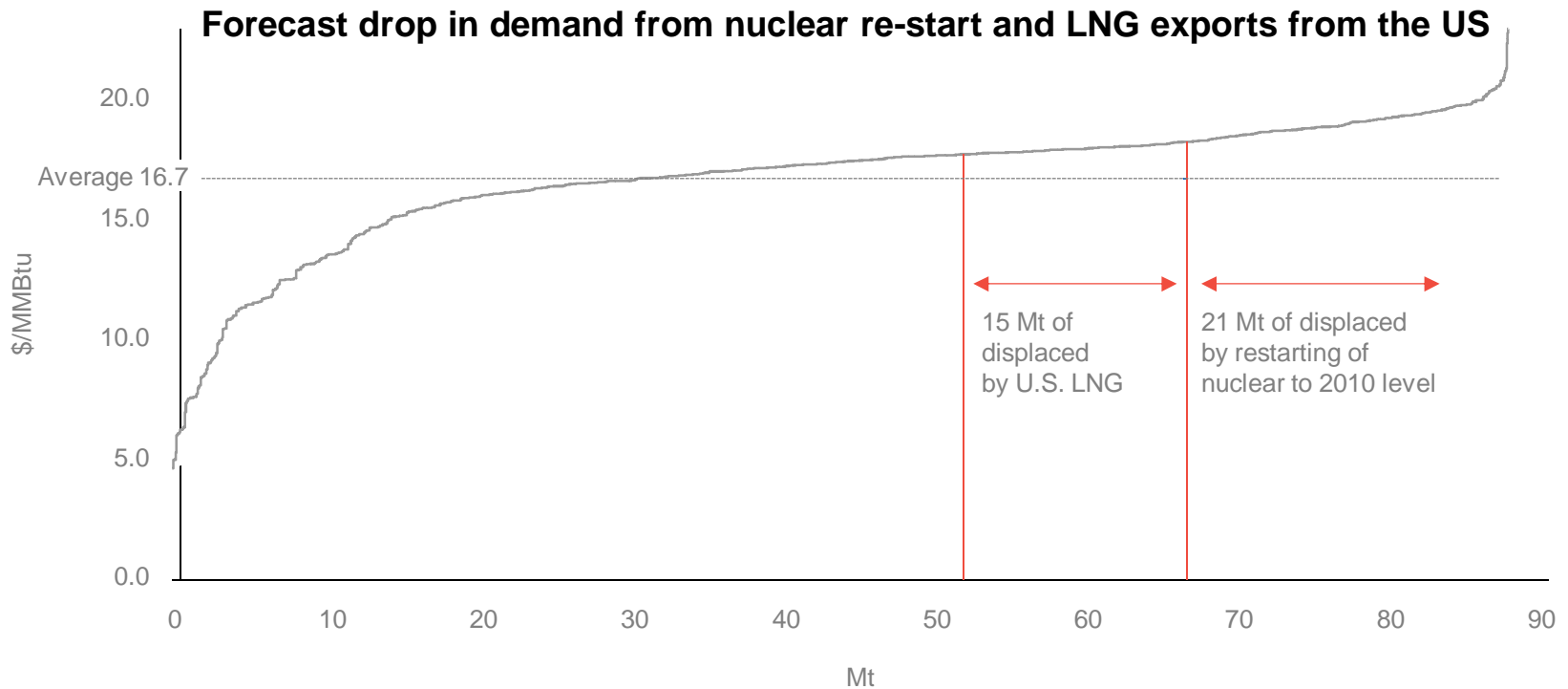
Large variation in forecast demand for natural gas and LNG from China



Source: EY Analysis of data from various sources

Nuclear re-start can lower Japanese demand

- ▶ LNG import prices vary from less than \$5/MMBtu to around \$23/MMBtu
 - ▶ Expensive LNG can be displaced by restarting nuclear power generation and U.S. LNG, which will be produced with Japanese companies' participation

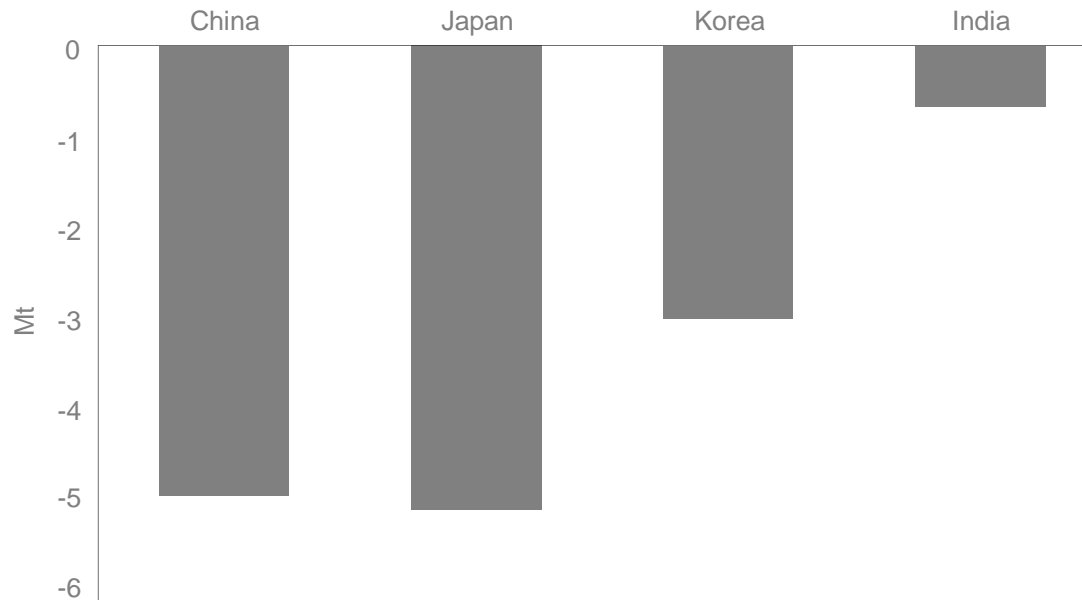


Source: IEEJ Presentation 10 September 2013

Demand for natural gas/LNG is not inelastic

- ▶ Rises in natural gas price result in decline of its demand
 - ▶ Combined demand from four major natural gas importers in Asia will reduce 9 Mt to 14 Mt if price rises by 10%
 - ▶ Full impact of increase in price of imported LNG in China & Japan not passed to customers resulting in losses to NOC/ utility companies

Changes in natural gas demand if price rises by 10%

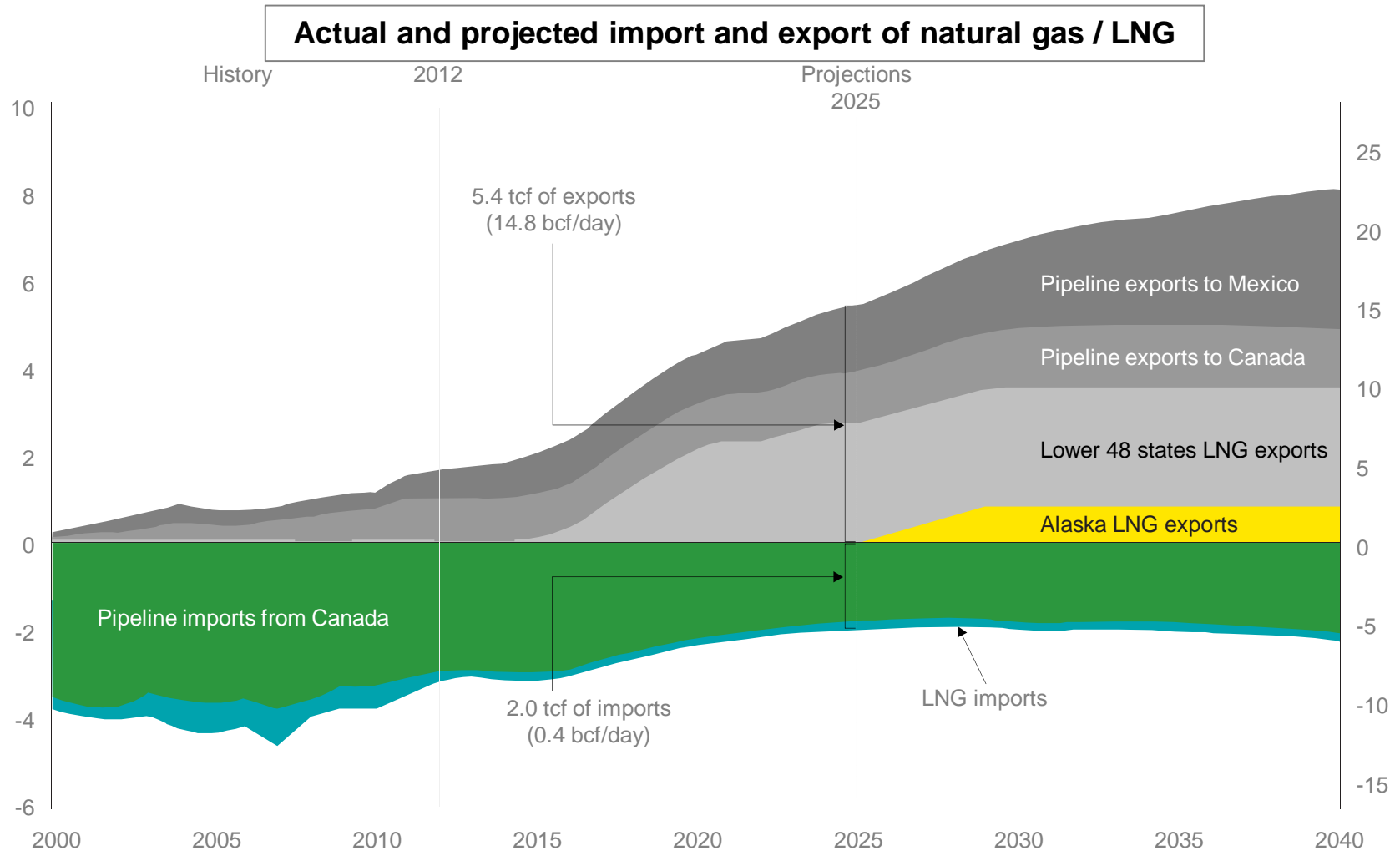


Source: IEEJ Presentation 10 September 2013

US LNG export application status

- ▶ Section 3(a) of the NGA permits exports of natural gas to non-free trade countries if DOE determines, that export is in the public interest
- ▶ Till May 2013 , DOE had approved one application to export LNG to non-free trade countries from the Sabine Pass liquefaction facility
- ▶ Approvals have accelerated since last May. DOE has now approved six proposals to export 9.3 billion cubic feet per day to non-FTA countries
 - ▶ Increasing trend for granting approval for lower quantity of exports to Non-FTA countries than exports to countries with FTA
- ▶ DOE currently has more than 20 applications pending which seek authority to export an additional 35.6 billion cubic feet per day of natural gas to non-free trade agreement countries
- ▶ Next three projects in DOE approval queue could take export capacity to ~ 14 bcf/d

Forecast large natural gas exports from the US adds uncertainty to new capacities planned in Australia



Source: EIA Presentation December, 2013

Canada: projects and themes

▶ Advantages

- ▶ Regulatory/market support for exports
- ▶ Projects led by global players
 - ▶ Operators and end-customers
- ▶ Cost advantages vs. US projects
 - ▶ All-in transportation
 - ▶ Operating costs
- ▶ Participants hold equity interests in gas

▶ Challenges

- ▶ Infrastructure required
 - ▶ Facilities, pipelines, production
- ▶ Cost pressures
 - ▶ Project construction, people shortages
- ▶ Lack of clarity on proposed LNG tax
- ▶ Global competition – oil price de-linking

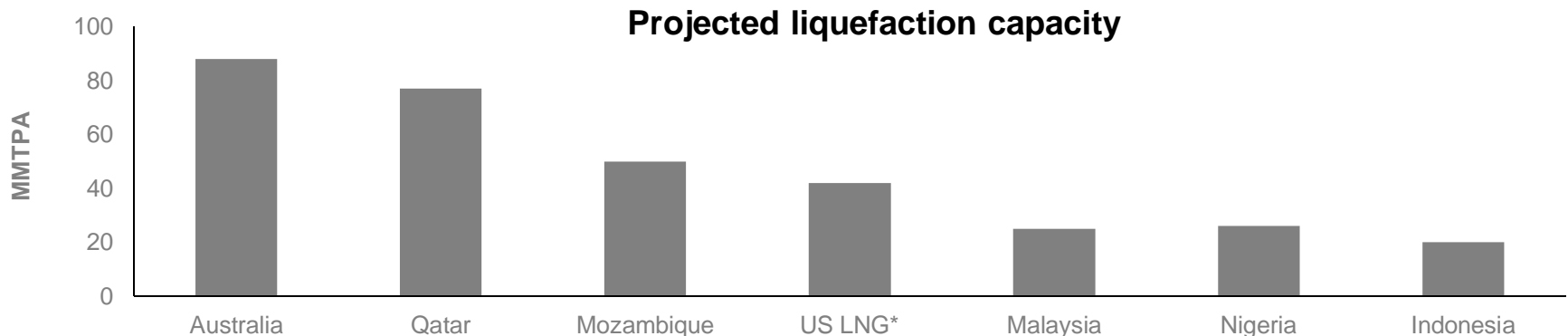
Major LNG projects

Project name	Size (bcma)
KM LNG	7.2
BC LNG Export	2.6
LNG Canada	33.4
Pacific Northwest	25.8
WCC LNG	39.3
Prince Rupert LNG	43.4
Woodfibre LNG	2.8
Total	154.5

Source: The Oxford Institute of Energy Studies

East Africa's potential

- ▶ Offshore Mozambique/Tanzania – tremendous recent discoveries of natural gas; estimates of recoverable volumes ratcheting upward
- ▶ “Big LNG” and Asian NOCs joining discoverers for development phase; “find and farm” model alive and well
- ▶ Economics into Asian markets very attractive
- ▶ Aggressive projection of future capacity by one of the operators (Anadarko)



Source: Anadarko Presentation at conference

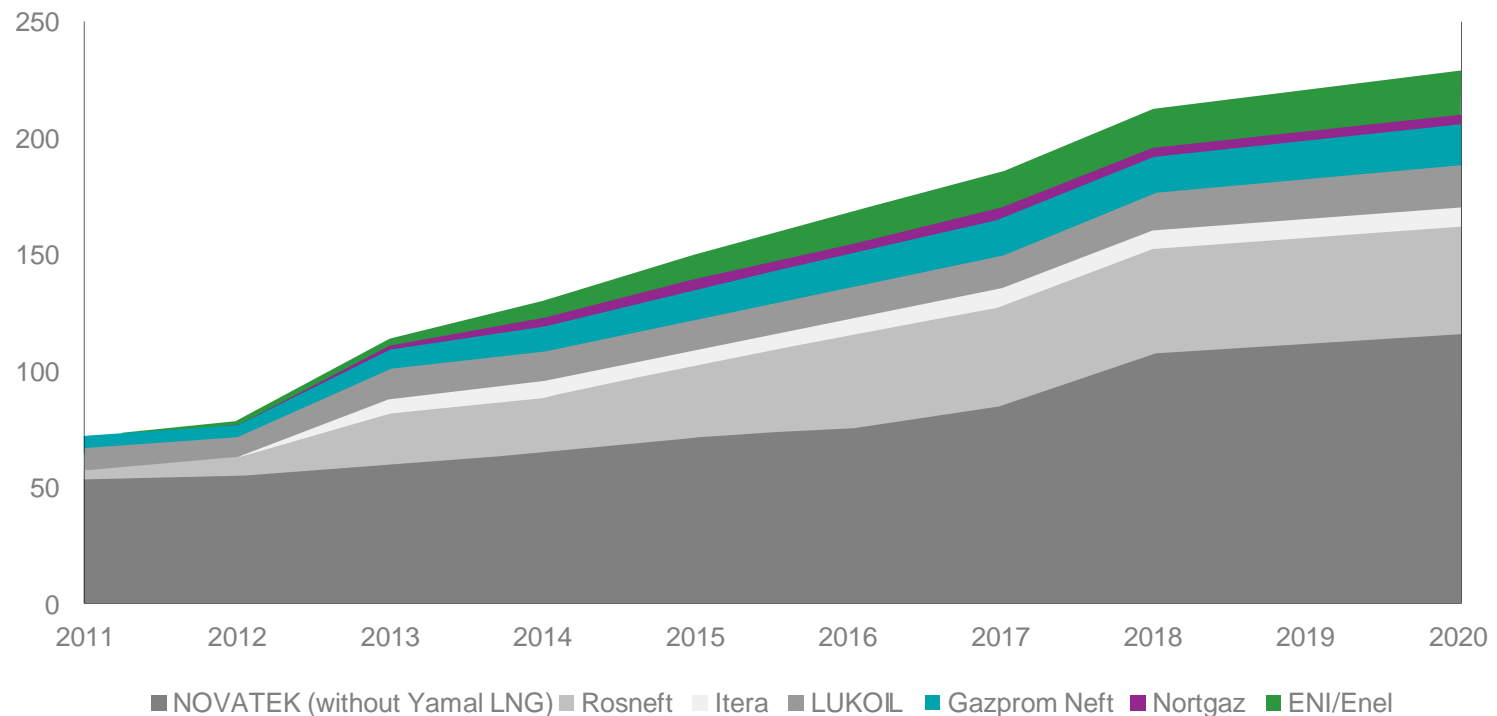
*US LNG Projects that have received non-FTA approval

- ▶ Above-ground/onshore challenges of infrastructure and immature fiscal/regulatory regimes

Russia: gas reforms underway to increase export of LNG

- ▶ Independents are ready to increase their production

Long term production plans

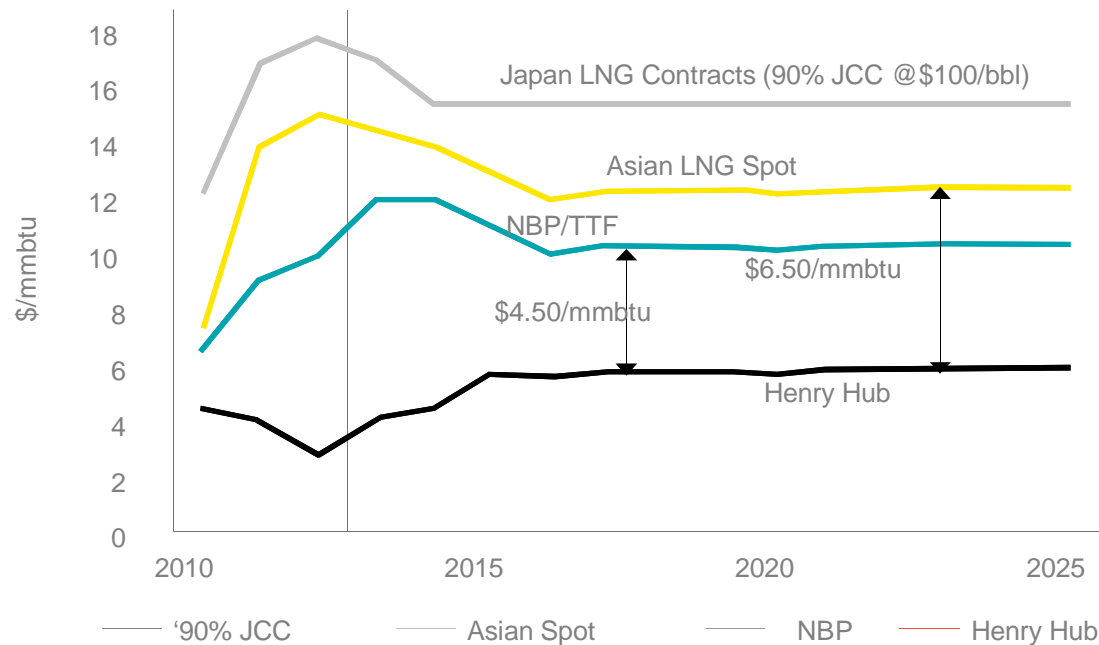


Source: Companies plans, Energy Research Institute of the Russian Academy of Sciences

Majority of forecasts show downward trend for prices in Asia

- ▶ “Henry Hub plus” is attractive if spot-gas prices stay under \$6/million BTUs — attractive to both buyers
 - ▶ Notably, most long-term US gas price assumptions are at around \$5-\$6/million BTUs.

Actual and forecast price of natural gas /LNG



Source: Oxford Institute of Energy Studies, Presentation 4 December, 2013

Can spot pricing transform the market?

- ▶ Availability of spot-linked gas from North America could upset traditional structure.
- ▶ “Henry Hub plus” pricing becomes attractive if spot-gas prices stay under \$6/million BTUs — attractive to both buyers (supply not tied to potentially rising oil prices) and sellers (margin opportunities).

US Gulf Coast LNG to Japan

(US\$ per million BTUs)						
Henry Hub spot	\$2.00	\$3.00	\$4.00	\$5.00	\$6.00	\$7.00
Energy cost (15%)	\$0.30	\$0.45	\$0.60	\$0.75	\$0.90	\$1.05
Capacity charge	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00
FOB cost	\$5.30	\$6.45	\$7.60	\$8.75	\$9.90	\$11.05
Shipping	\$2.50	\$2.50	\$2.50	\$2.50	\$2.50	\$2.50
CIF cost	\$7.80	\$8.95	\$10.10	\$11.25	\$12.40	\$13.55

Source: Deutsche Bank Markets Research, *Global LNG*, 17 September 2012

Steps taken by buyers to balance supply & price risk



Thank you – Any questions?



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