



The New LNG Abundance and Repricing Challenges



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Repricing Challenges

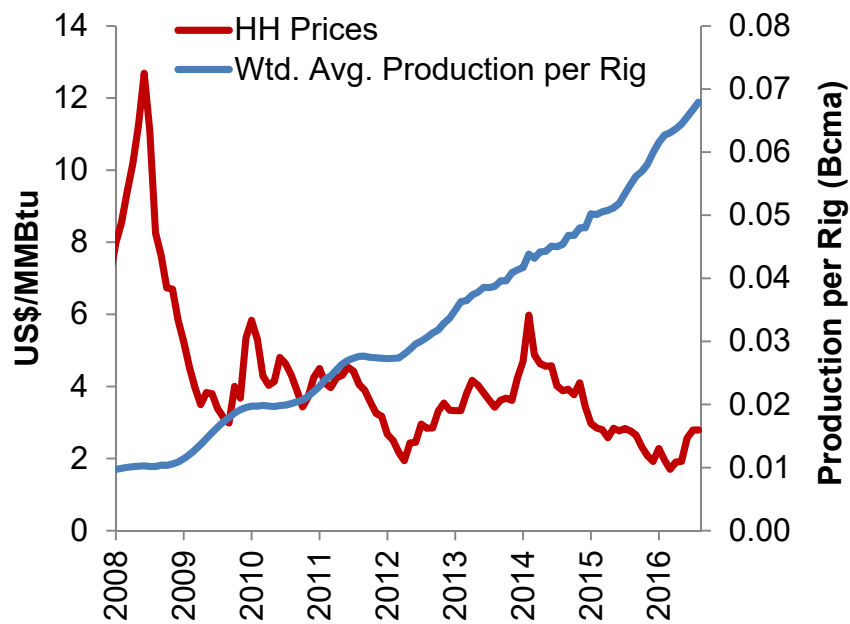
THE NEW LNG ABUNDANCE

Resilient U.S. Shale Output



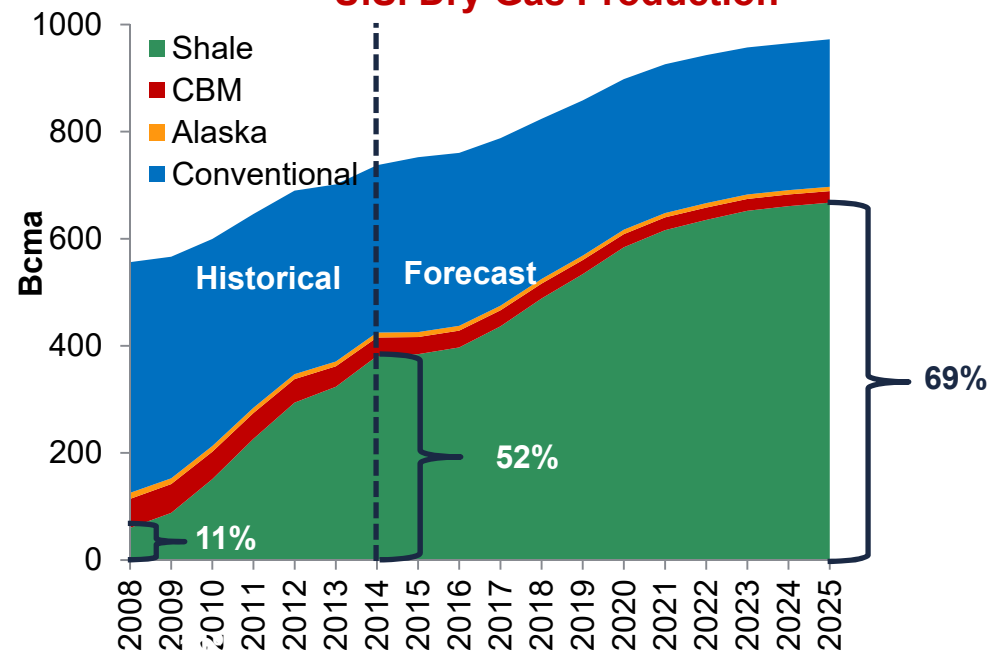
U.S. well productivity increased 6x between 2008 to 2016, sustaining resilient shale production despite declining HH prices. Looking ahead, will the wave of shale producer bankruptcies and restructurings lead to orderly consolidation or market disruption?

U.S. HH and Well Productivity



Sources: U.S. EIA, BRG Analysis.

U.S. Dry Gas Production



The recent purchase of significant shale gas resources by Shell, Tokyo Gas, and Total probably signal market capitulation and sector consolidation

Arrival of American LNG

Cheniere has commissioned the first U.S. world-scale LNG export terminal, launching a wave of new production capacity that will make North America a major LNG supplier by 2020. How will global markets respond, and what will be the Asian market implications?

Sabine Pass Terminal



- Cheniere Energy announced substantial completion of Train 1 at Sabine Pass on May 31, 2016.
- Train 2 at Sabine Pass is expected to reach substantial completion in September, 2016.

Region	Sabine Export Volumes* (Bcm)	Share (%)
Asia	0.3	13%
Europe	0.2	8%
Middle East	0.3	14%
Latin America	1.4	65%
Total	2.2	100%

Sources: Cheniere Investor Presentation, July 2015. Cheniere News Release, May 31, 2016. LNG World News, July 19, 2016

* LNG volumes sourced from IHS Waterborne from January 2016 to August 2016.

Expectations for U.S. Exports

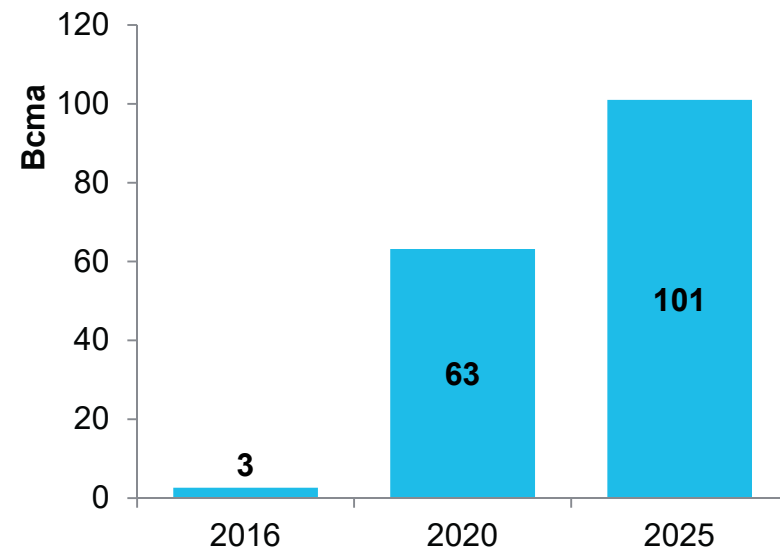


Low LNG prices and DOE review procedures have delayed FID for some U.S. LNG terminals. Offtaker contracts are critical for FERC approval and financing, but the commercial bloom is now off the U.S. LNG rose.

U.S. LNG Advanced Project Capacity

Advanced Projects Status*	No.	Contracted (Bcma)	Capacity (Bcma)
Operational**	1	6	6
Post-FID (Under Construction)	5	76	82
Advanced Pre-FID***	5	22	39
Total Advanced	11	104	127

U.S. LNG Export Volumes



Sources: BRG Analysis

*Includes expansions

**Sabine Pass Train 1 is operational.

***Awaiting FERC Approval / Commercially Contracted

Game Changer! Expanded Panama Canal



The inauguration of a long-awaited Panama Canal expansion was completed on June 26, 2016 and first-ever LNG vessel transited the expanded canal on July 25, 2016 from US Gulf Coast.

Panama Canal



Sources: Paris, Costas & Whelan, Robbie (2016, June 20). The Panama Canal Expands. *The Wall Street Journal*. First-ever LNG Vessel transits the Expanded Panama Canal, Pancanal Press Release.

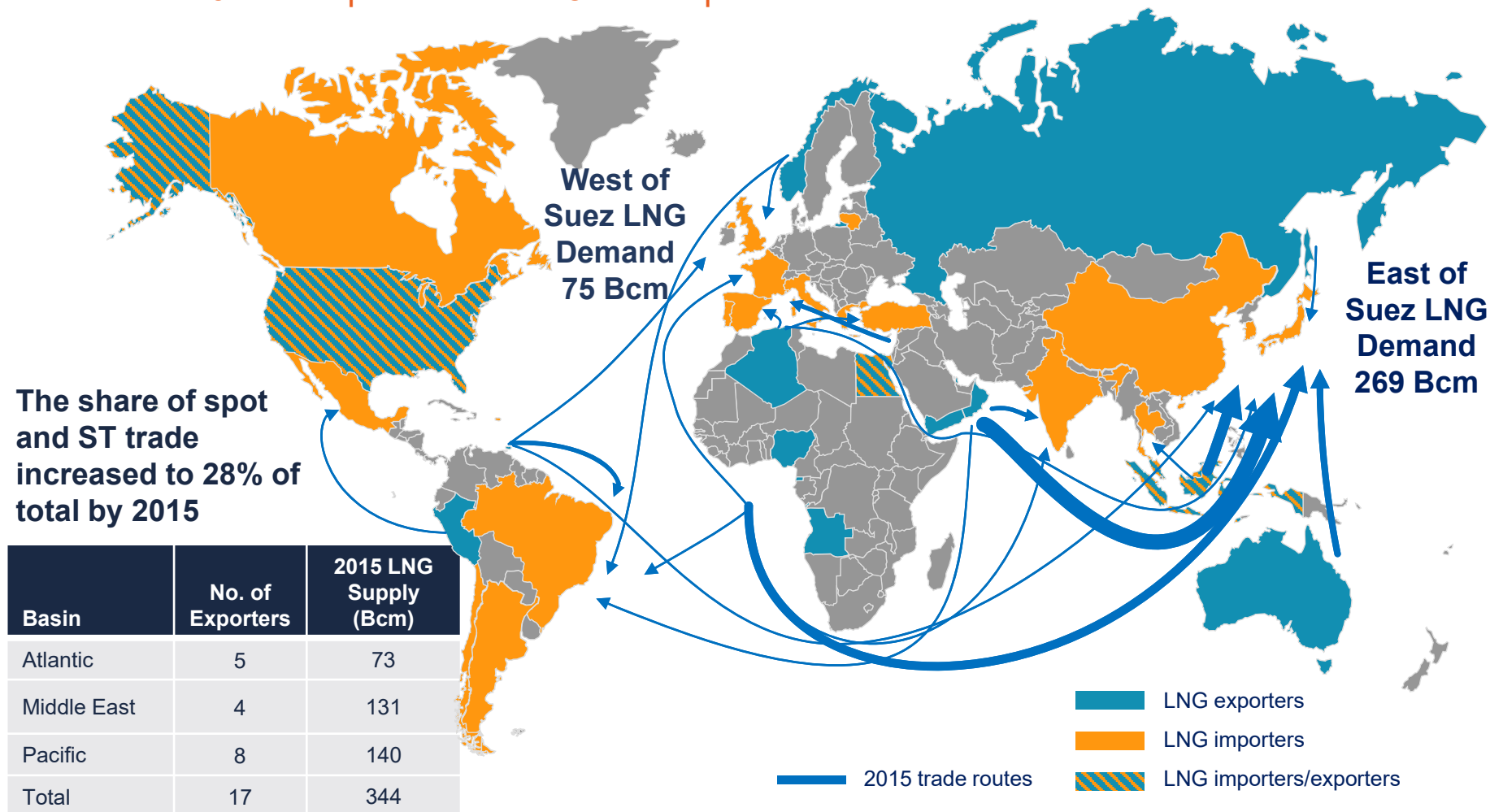
After a two-year delay, cost overruns, leaky locks, and labor disputes; the \$5.4 billion, nine-year expansion of the Panama Canal is complete:

- It comes at a time when US starts to export LNG while demand and prices are falling throughout Pacific Basin.
- This route shortens the voyage for U.S. LNG to Asia by **22 days** and saves approximately **30%** (~\$0.8/MMBtu) in cost per roundtrip.
- Approximately **27-50 Bcma** of LNG is estimated to transit the canal at full operation.
- This will increase spot/short-term LNG trading and foster greater price convergence between Asian, European and North American markets.

Abundance Fosters LNG Trade (2015)



Booming shale output took the US off the global LNG market and enhanced LNG trade in Asia, with West of Suez demand falling below one quarter of the global market as trade grew to 344 Bcm with 6 new exporters* and 18 new importers



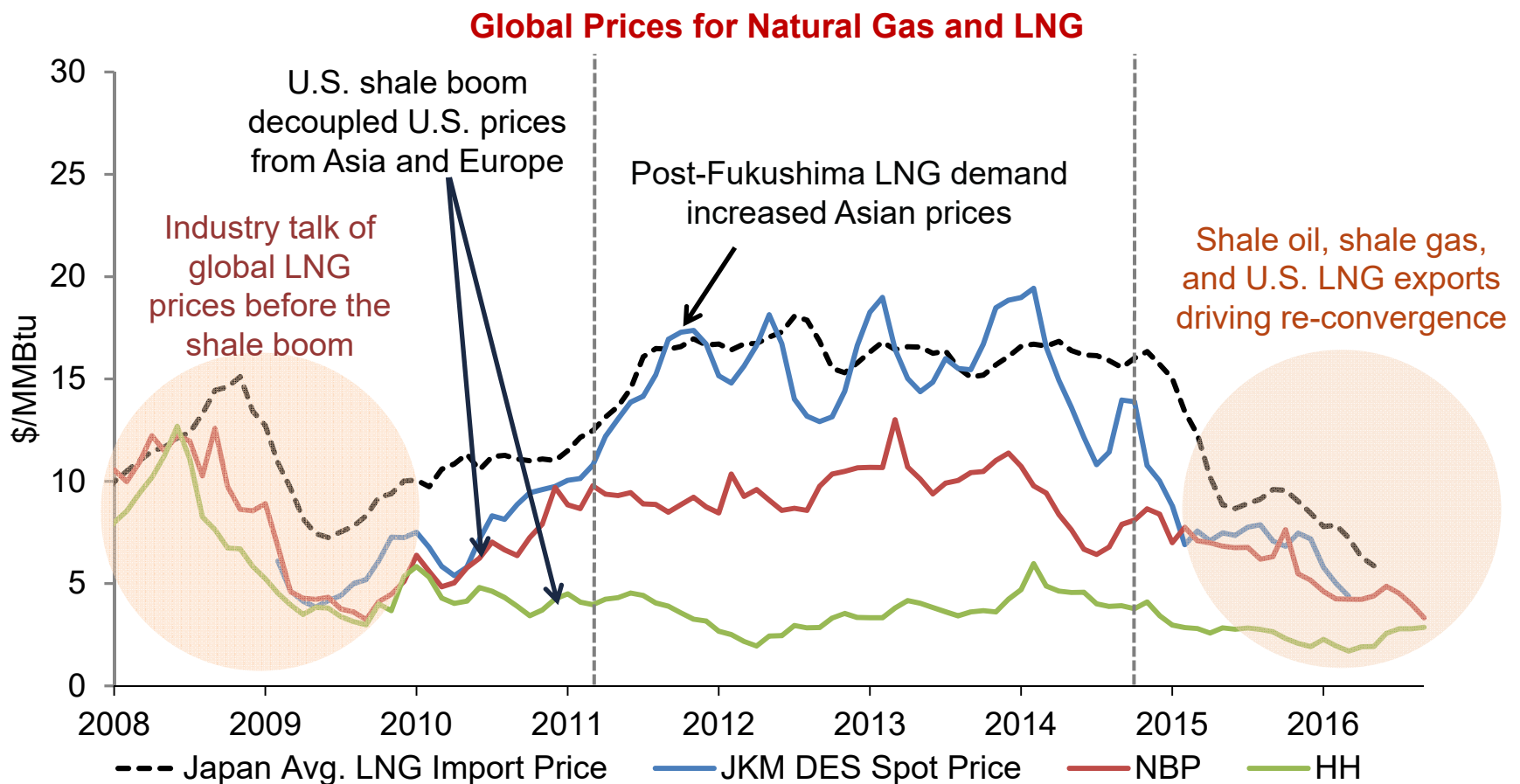
Sources: BRG Analysis, IHS Waterborne, GIIGNL

*There were six new exporters in 2015. Because two of the 2006 exporters were out of services in 2015, the total number of exporters increased by four.

Abundance Drives Price Convergence...



The expansion of US LNG exports into a surplus market, combined with sluggish demand and oil price collapse, will continue to drive convergence of long-term contract and hub prices

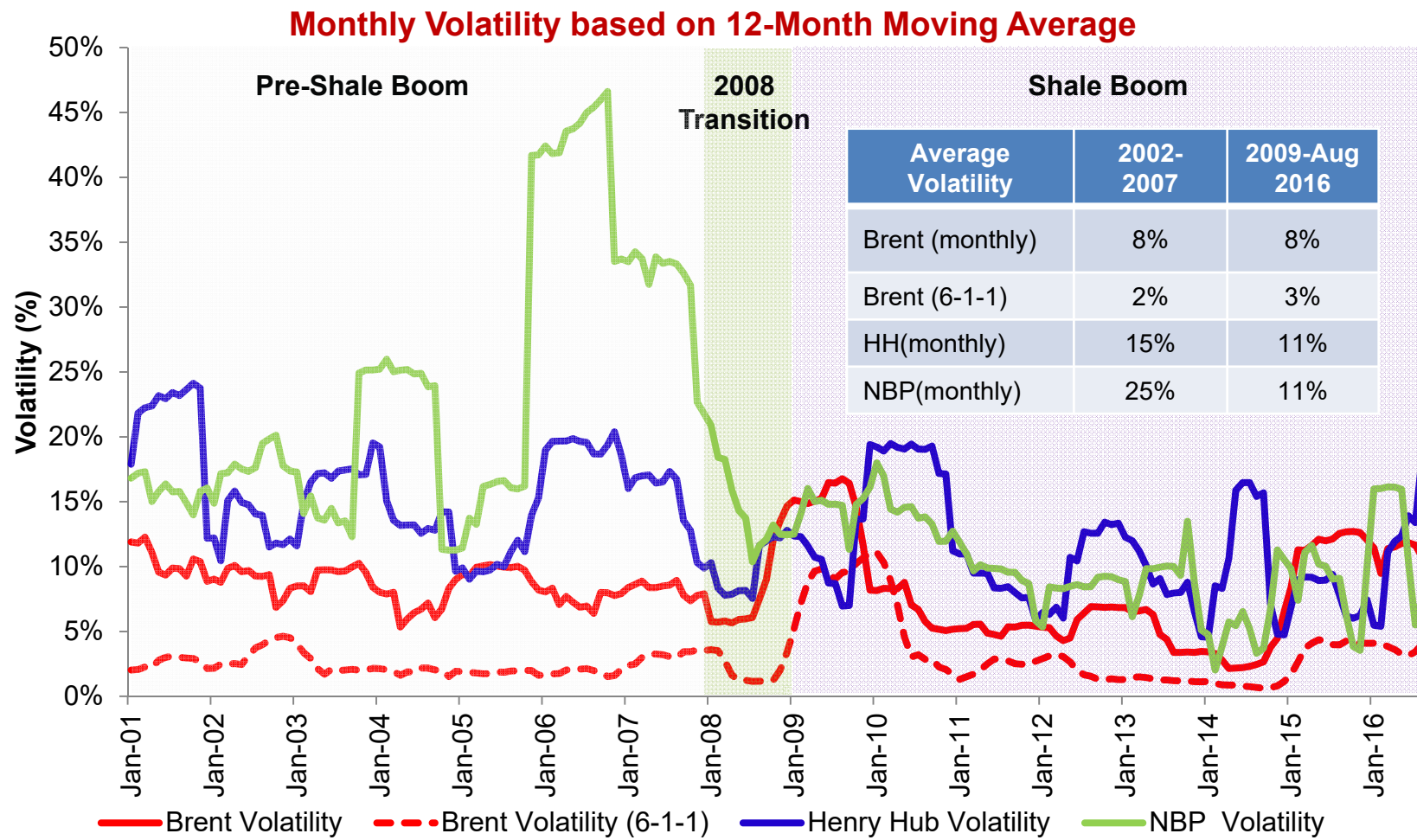


Sources: BRG's Analysis, Platts, Bloomberg

...And Lower Volatility at the Hubs



Shale production has and will likely continue to reduce price volatility in the traded markets of North America and Northwestern Europe.



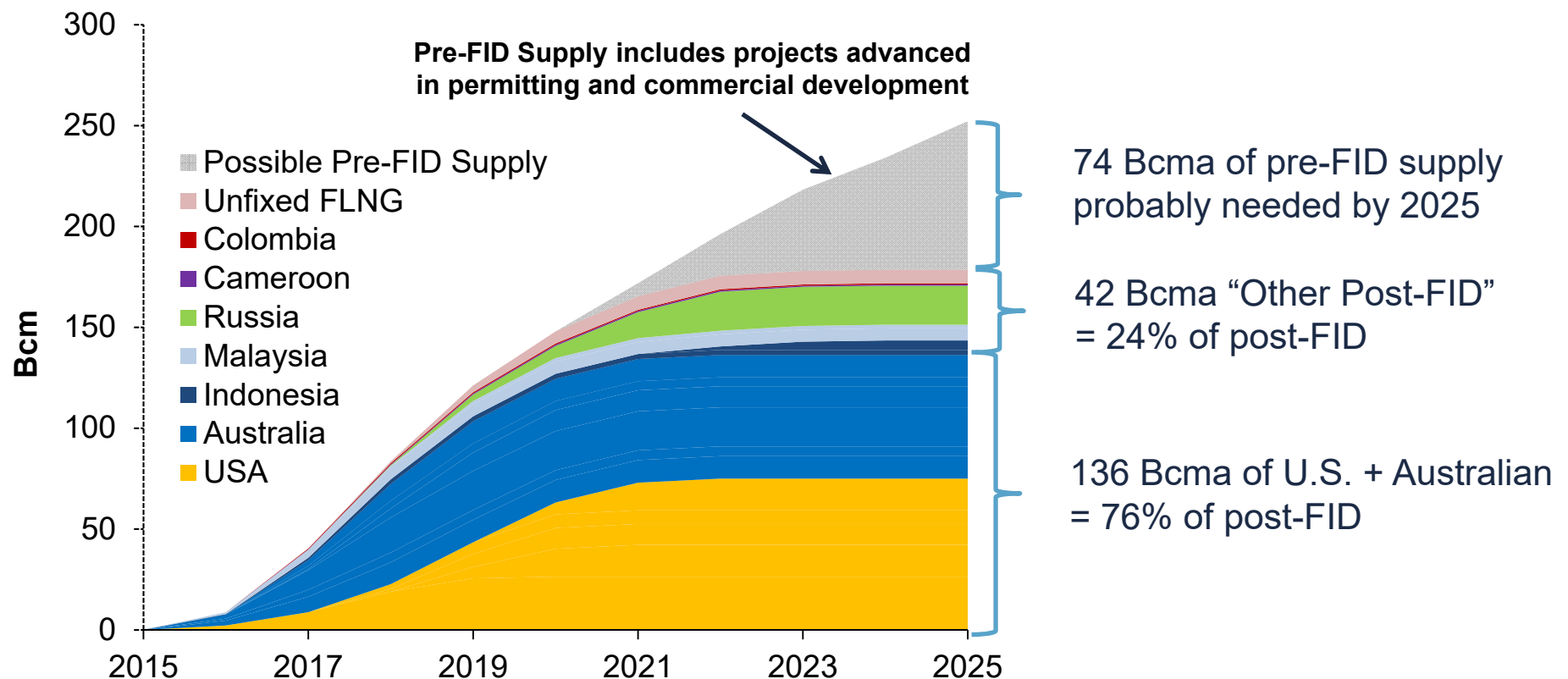
Sources: BRG Analysis. Gas and Oil prices are sourced from Bloomberg. Volatility is calculated based on moving 12-month of monthly price returns; Brent 6-1-1 refers to rolling average Brent prices over 6-month with one month time lag prior to application

Global Supply Boom



From 2015 to 2025, the 178 Bcma of post-FID liquefaction projects will be completed -- covering approximately 60% of incremental demand. After market surpluses are absorbed, an additional 74 Bcma advanced pre-FID supply will probably be needed as well

Incremental LNG Supply

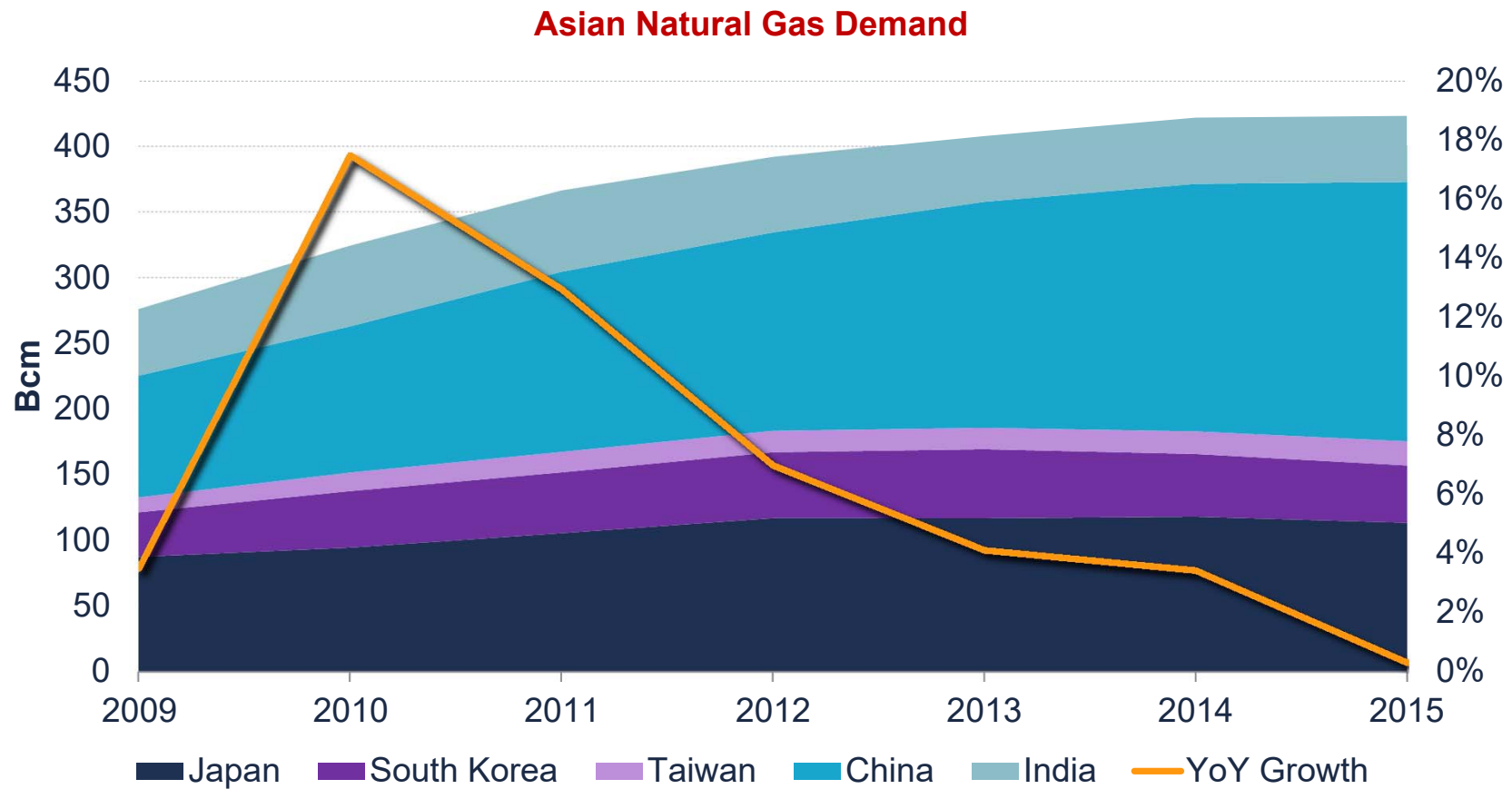


Sources: BRG Analysis, Global LNG Info

Note: Unfixed FLNG includes Exmar FLNG, Golar's Gimi and Gandria LNG projects.

Asian Demand Deceleration

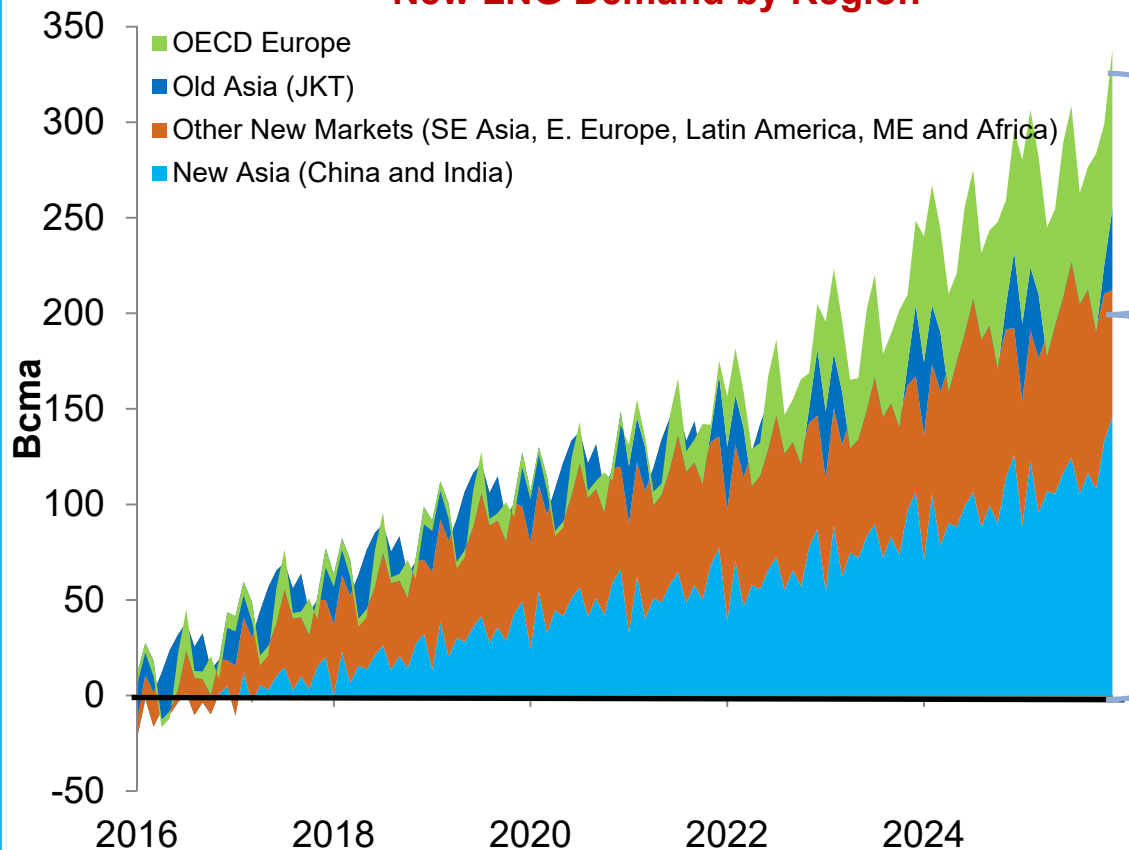
Slowing demand growth will put pressure on pricing under new LNG long term contracts.



Demand Rebound

Traditional markets remain the backbone of LNG trade, but demand growth will be dominated by New Asia markets (China and India).

New LNG Demand by Region



Incremental Demand

28% of growth from traditional markets, dominated by OECD Europe growth as Old Asia remains flat.

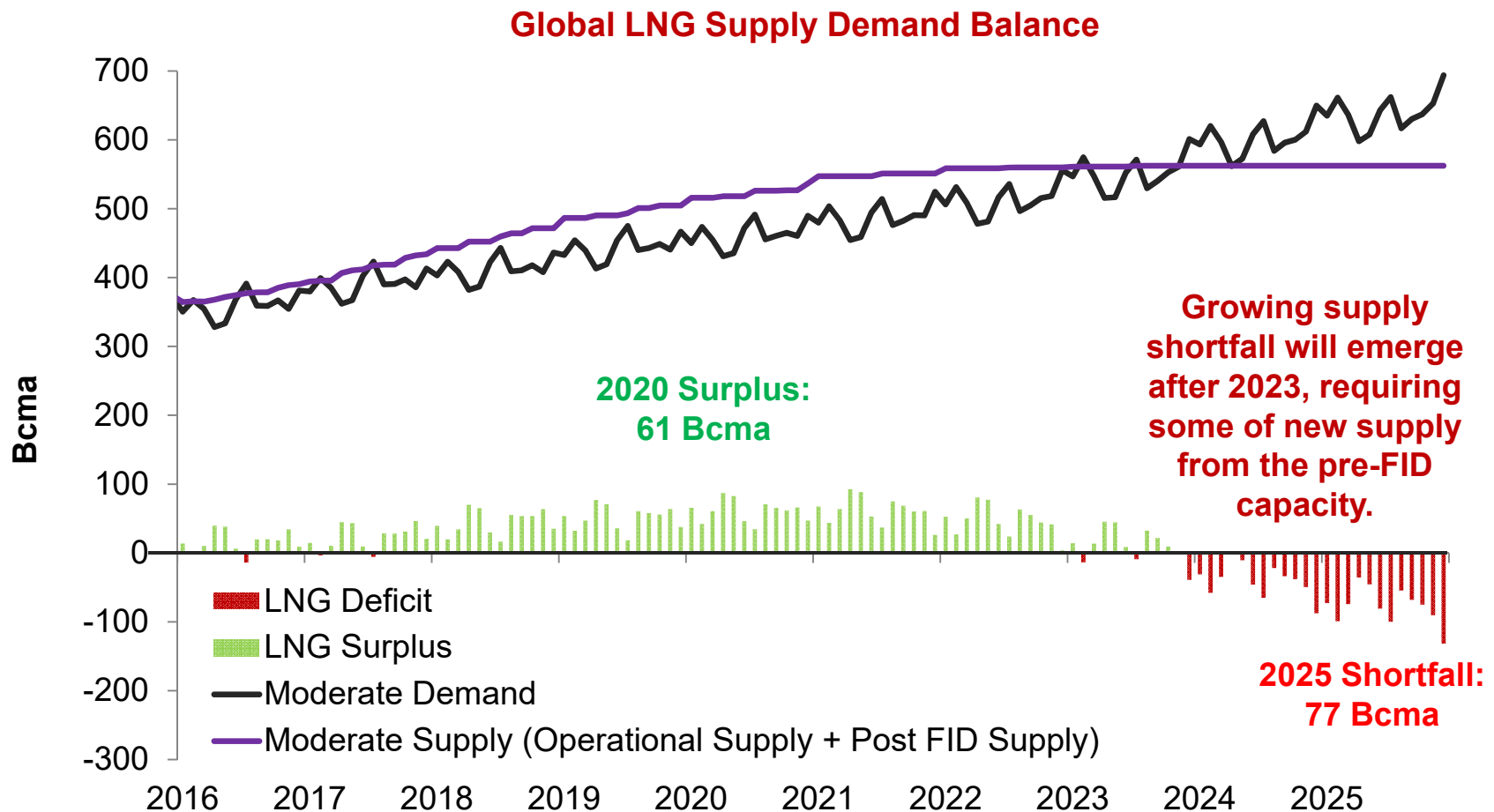
72% of growth from new markets, dominated by New Asia growth, with moderate growth from Other New Markets.

Sources: BRG Analysis

Global LNG Markets Rebalance in 2020s



With supply increasing faster than demand, global LNG trade surpluses will increase through 2022, but then will be absorbed

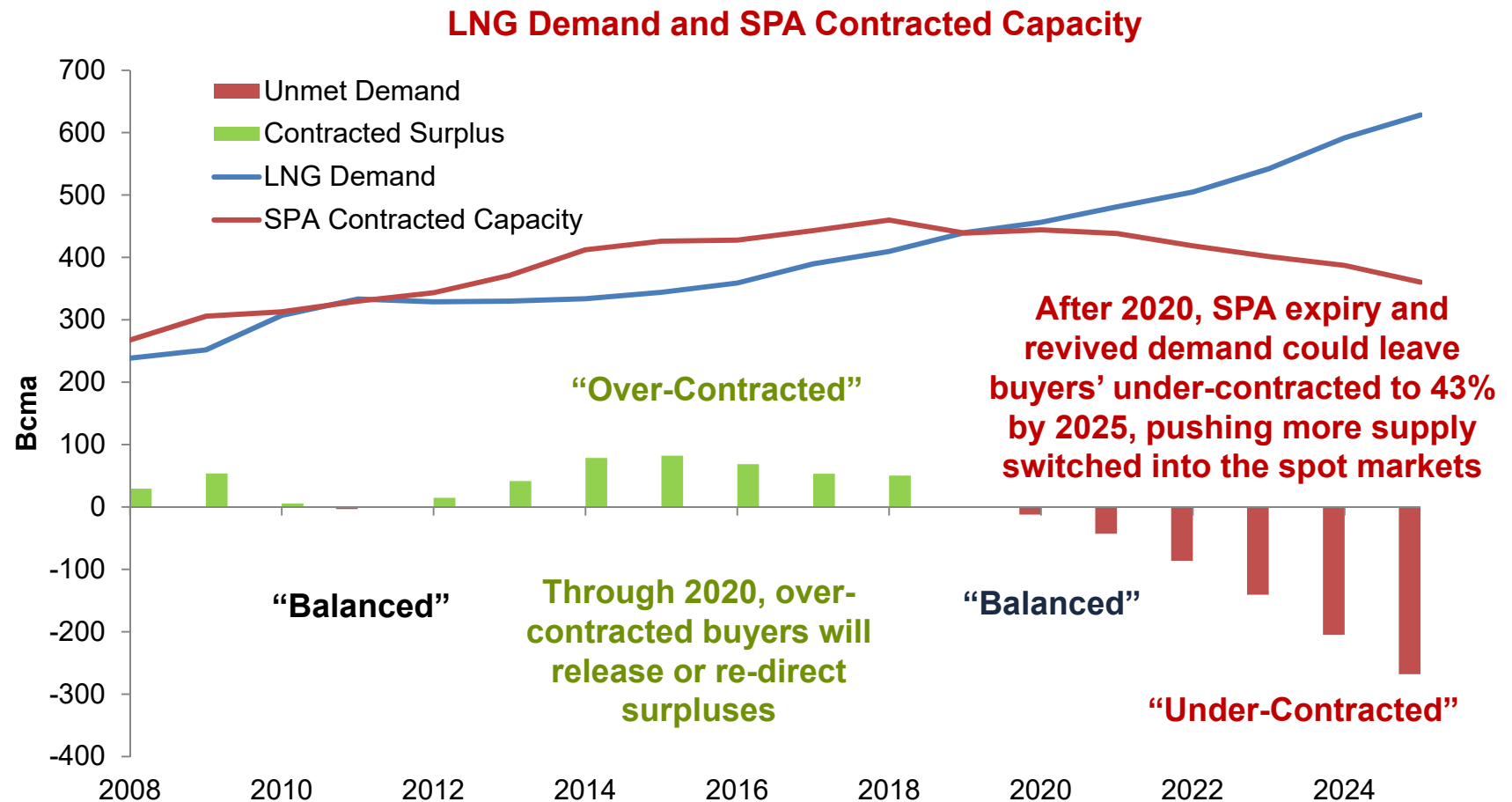


Sources: BRG Analysis

Commercial Markets Rebalance Sooner



For post 2020 LNG, pre-FID projects will compete with legacy supply from expiring contracts. If the pre-FID wins out, the contract expiry supply would be driven into the spot markets



Sources: BRG Analysis, GIIGNL, Global LNG Info

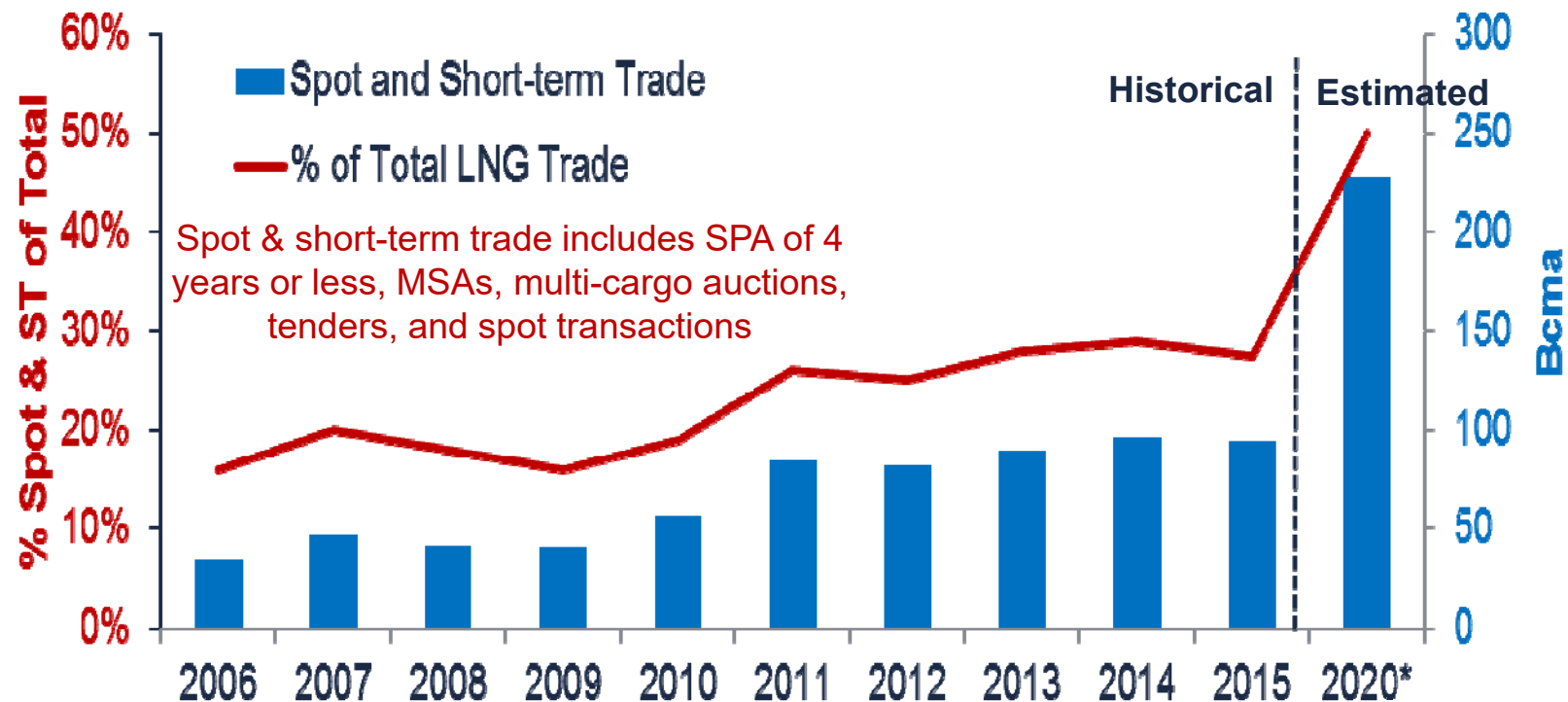
* SPA contracted capacity includes short-term, mid-term, and long term SPAs, including portfolio supply.

Abundance Yields Liquidity



Historically, the LNG markets have been opaque and illiquid. The increasing abundance of natural gas supply, LNG surpluses, and competition between pre-FID and legacy LNG supply are stimulating buyer confidence, and enhancing short-term trade and delivery flexibility

Increasing Role of Spot and Short-Term LNG Trade



Sources: BRG's Analysis, Bloomberg, GIIGNL.

* BRG analysis. Spot & Short-term trades are of a duration of 4 years or less

REPRICING LNG CONTRACTS

The Challenge of Repricing LNG



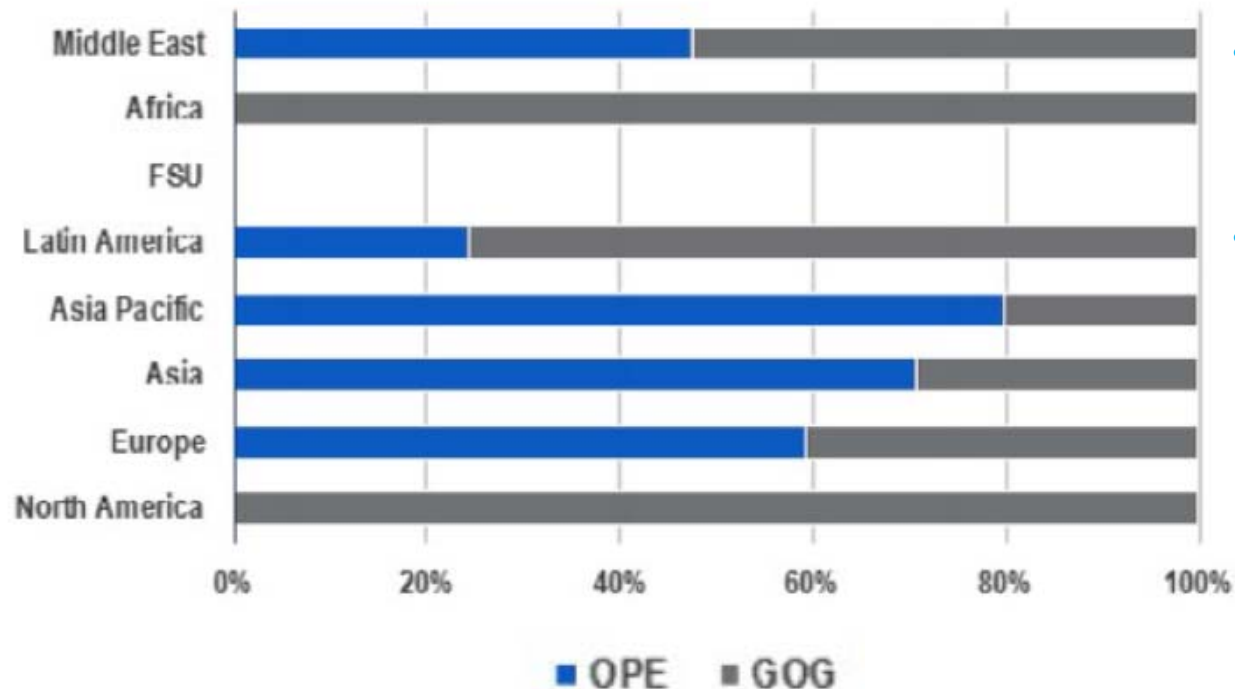
As the LNG industry grows, market change accelerates. After decades of reliance on oil-indexation for LNG pricing, this deeply rooted commercial tradition is being re-evaluated

- LNG supply growth, mounting oversupply, vintage contract expiry, and the arrival of flexible-volume U.S. LNG supplies tied to low U.S. hub prices have increased supply liquidity, driven Asian spot prices to record lows, and erased the “Asian premium.”
- With a wave of new U.S. LNG coming online by 2020, the current **oversupply**, supply **flexibility**, use of **hub pricing**, and use of **spot supply** will all increase.
- These changes will probably be sustained until the markets rebalance by the early in the 2020s.
- These ongoing structural market changes present buyers and sellers with new challenges and opportunities.
 - How can LNG be repriced in a **sustainable** fashion,
 - That is **equitable** to both buyers and sellers,
 - And continues to foster supply and demand **growth** over the long-term?

OPE Still Dominates LNG Imports

OPE still dominates LNG imports into Asia and Europe, but has been substantially reduced or eliminated in other regions

Reginal Price Formation 2015 – LNG Imports



- LNG imports are split 69% OPE and 31% GOG.
- At some 227 Bcm, OPE dominates most of Asia and some of Europe.

Structural Pressure on Term Contracts



The structural changes that are taking place in Asian gas markets put significant pressure on long-term contracts, but when negotiation and price review (if available) cannot bridge the growing divide between buyers and sellers, arbitration may be the only solution

Commercial Negotiation

- Provides a potentially swift and low cost solution.
- But requires a reasonable range of “middle ground” acceptable to the parties, even though the value in play is currently substantial.

Price Review

- Some contracts provide for this, some don't
- Practices vary across countries and contracts
- Interpretation of standards and metrics for measuring market change can be challenging.

Arbitration

- Process can be long and expensive.
- Hands authority and decision to third parties to settle intractable differences
- Parties may continue to negotiate and can settle at any point.

Price Renegotiations and Reviews

Asian long-term LNG contracts have begun a wave of price renegotiation and review

Solutions

Pricing

Renegotiations

Petronet vs Qatar: *“cut the price of gas [...] by almost half under an existing 25-year contract.”*

India vs Australia: *“[...] continues to negotiate for lower contract pricing”*

India vs Russia: *“[...] possibly focused on delaying delivery [...] keen to renegotiate long-term pricing.”*

Volume

China vs Australia: *“[...] renegotiated to take only half of its original contract volume from the first train of the Australia Pacific LNG (APLNG) project”*

Unknown

China vs Qatar: *“[...] renegotiating its 3-MMt/y contract with Shell from Qatargas”*

South Korea vs Qatar: *“[...] interest to engage RasGas in contract renegotiations”*

Sources: Bloomberg, Poten

Emerging Asian Trading Hubs

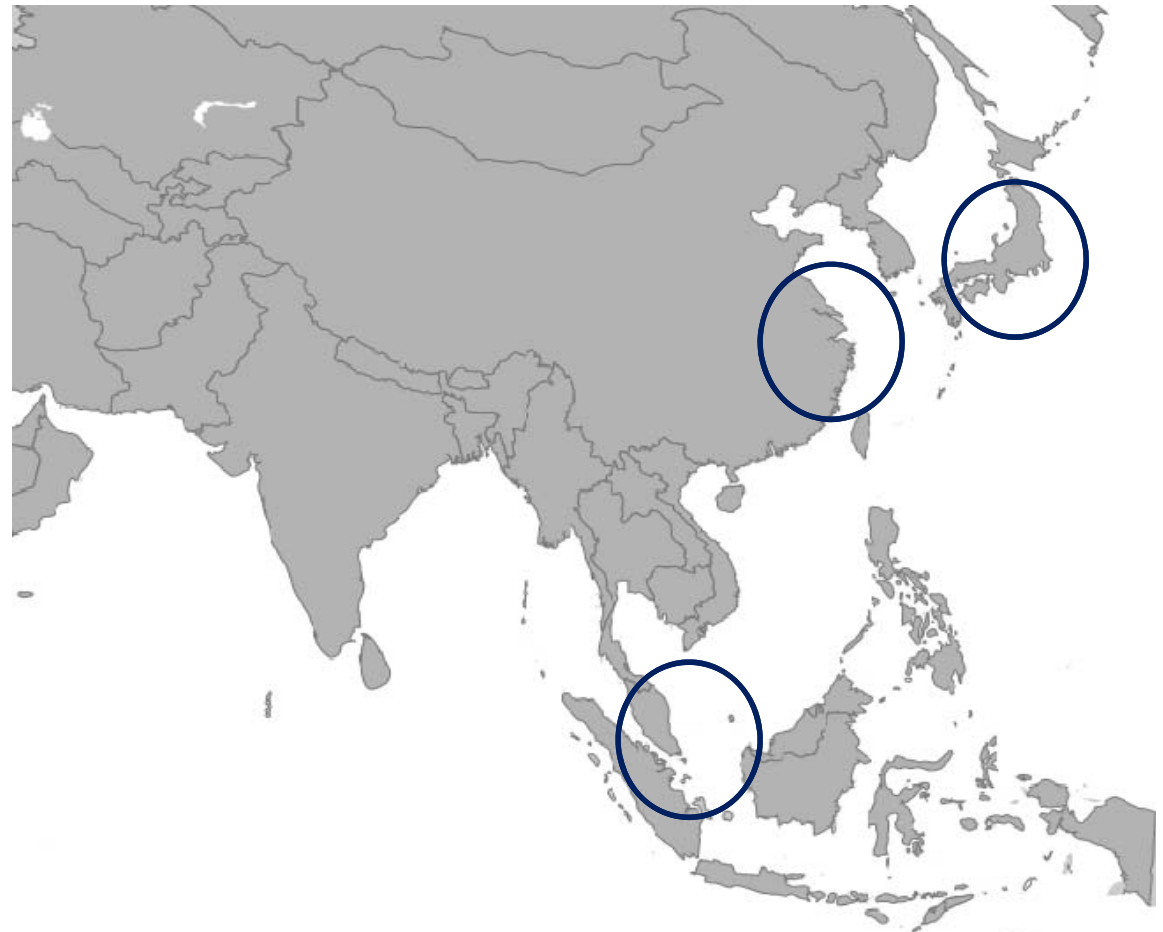
Asian LNG trading hubs and markets are emerging, but falling LNG demand and supply projects with inertia may impede development – and several new concepts compete for finite market transaction volume

Japan OTC Exchange: 5,000 tons traded between September 2014 to July 2016

Shanghai Petroleum Exchange: large potential, hub policy unclear

Singapore Exchange SLINGL: first financial swap on January 25th, 2016, liberalization further along than other markets

GLX: New entrant and first online platform for trading LNG



Agents of Change



In Asia, the ongoing market change may be delivered through a variety of vehicles, including development of liquidly traded price hubs, new contract price negotiation, existing term contract price reviews and re-negotiation, and commercial arbitration

Structural Market Transformation in Asia

similar to North America and Europe

Asia is in a Unique Position

greater LNG dependence, less interconnectivity

Existing Indexation Might Not Adapt

Contract Renegotiations Underway

Price Reviews and Arbitrations?

Asia's short-term markets are growing swiftly, but remain too thinly traded to reprice and revalue the structural market change now afoot



THANK YOU

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