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Challenges to JCC Pricing in Asian LNG Markets

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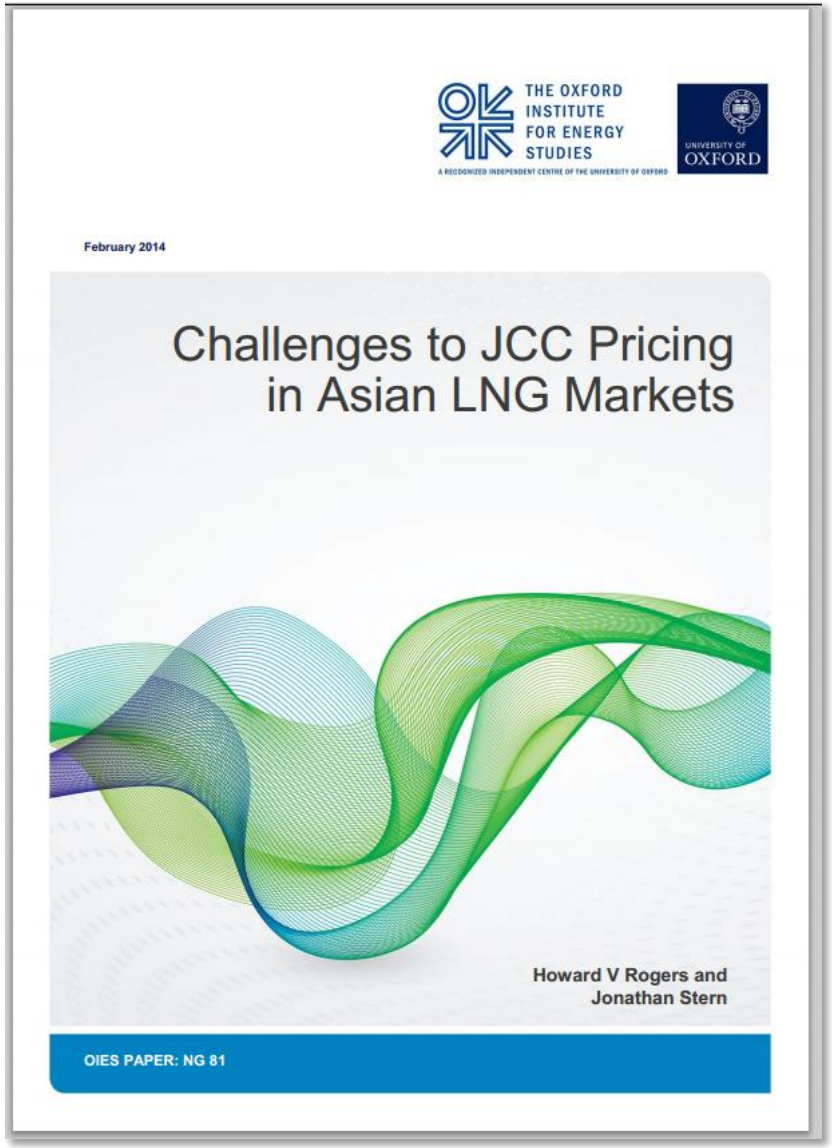
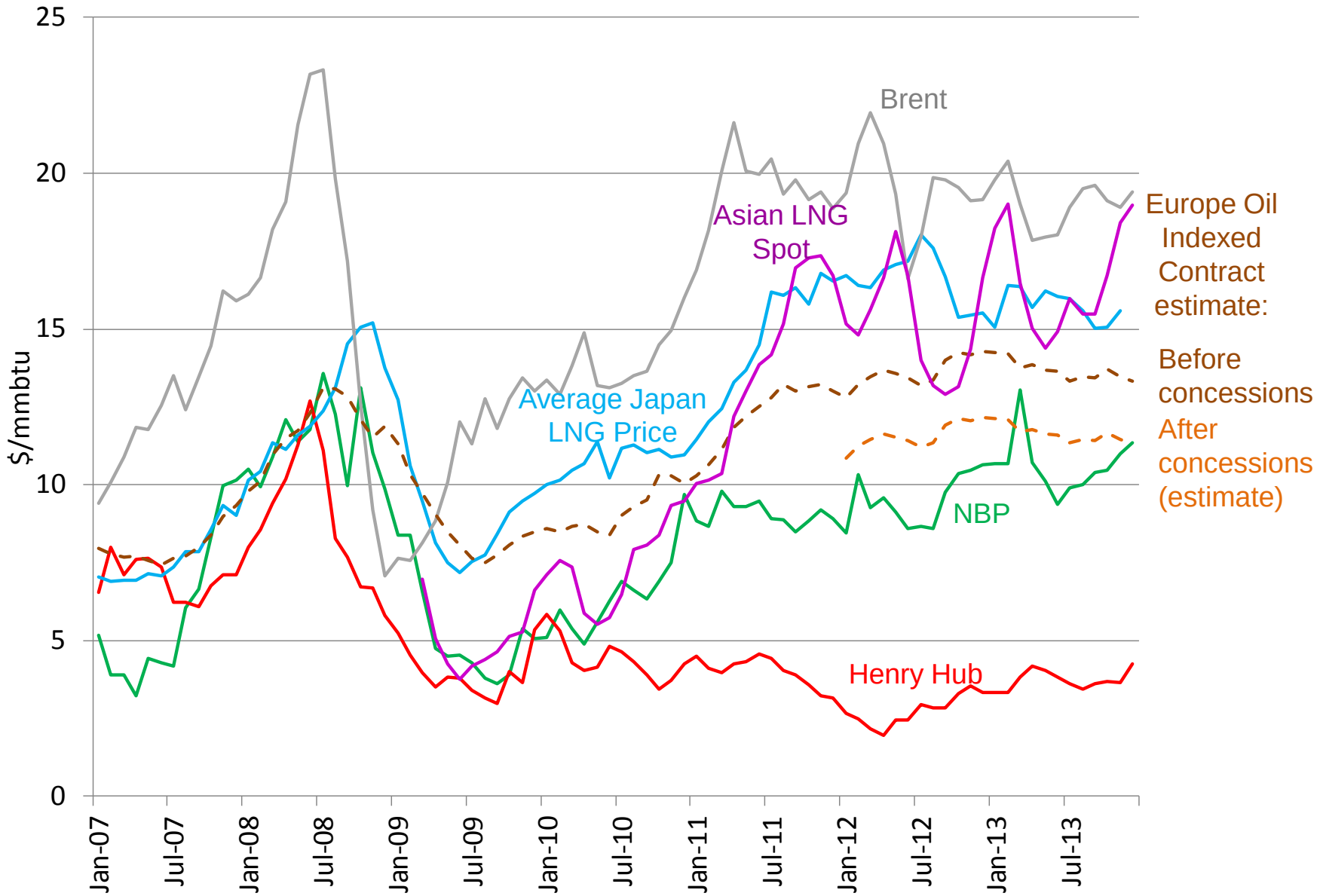


http://www.oxfordenergy.org/2014/02/challenges-to-jcc-pricing-in-asian-lng-markets-2/

Asia pays very high prices for LNG imports



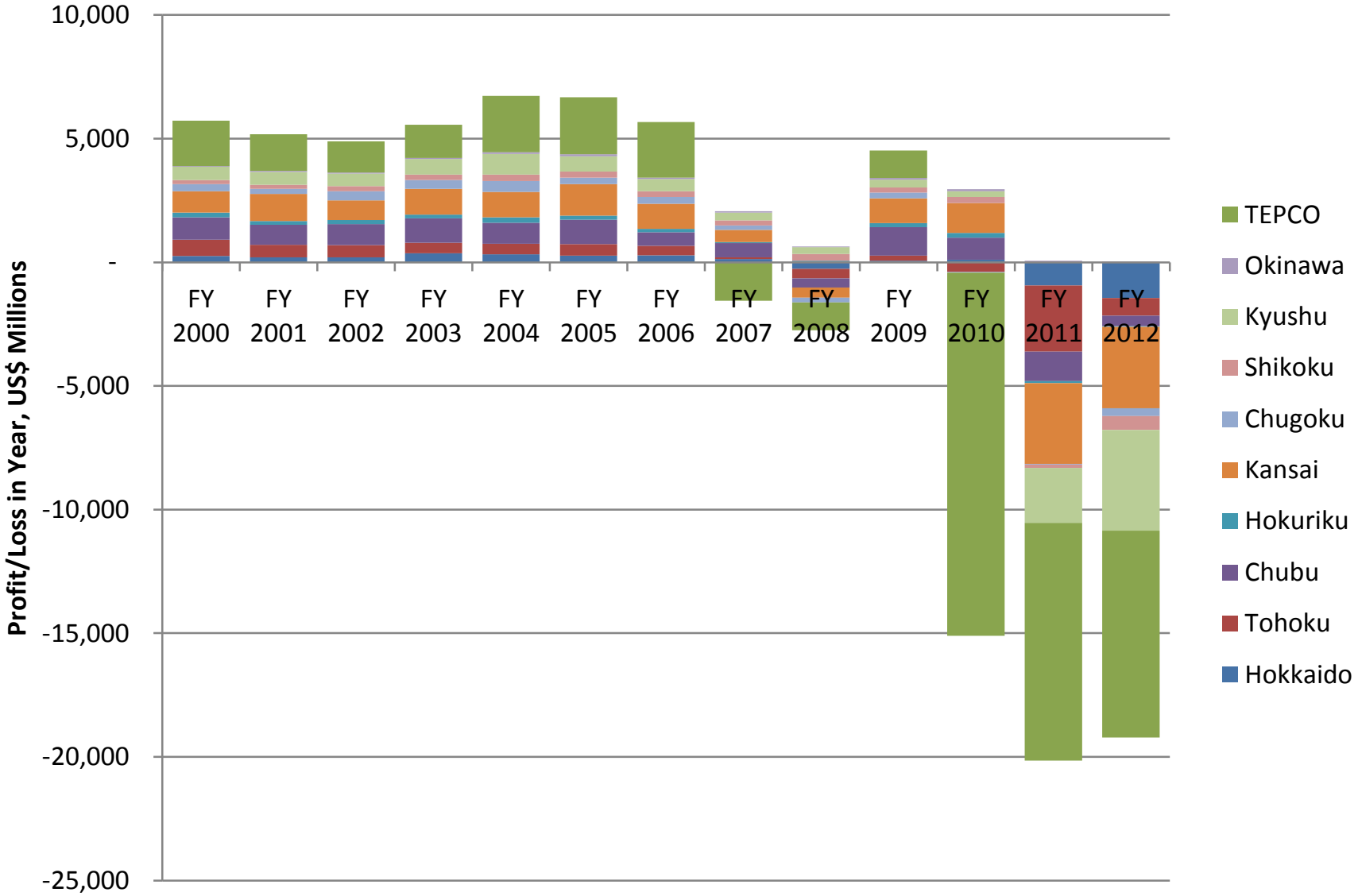
SOURCE: *Platts, EIA, Argus, Own Analysis*

What's the Problem?

- Oil price linkage was introduced in the 1970s when oil was the main competing fuel to natural gas in Japanese power generation
- The cost pass-through mechanism allows Japanese utilities to adjust their gas and power tariffs to end users by the same percentage as the country's average LNG procurement cost movements, regardless of an individual buyer's actual purchase costs
- Projects "need oil linked prices" to support new LNG supply

But, post-Fukushima, a new mood/new fundamentals; Japanese utilities begin to make substantial losses

Japan: 10 Largest Power Company Financials – very big losses!



Source: http://www5.fepc.or.jp/tok-bin-eng/kensaku.cgi

What is the main problem related to pricing: is it price level or price formation?

- Is the problem that prices are too high? If so the problem is <u>price level</u>
- Or is the problem that prices no longer have any market logic? If so the problem is <u>price formation</u>

Reducing the <u>price level</u> is a short term solution, but in the longer term only a change in <u>price formation</u> will solve the current problem

If the problem is the price level – what could be done?

- Reduce the base price
- Reduce the slope
- Adjust the “kink points” of the S-curve
- *Repeat the above as often as required…*

What does this achieve: it reduces the level of the price, but maintains the JCC mechanism. But if oil prices continue to rise then constant adjustment is required

If the problem is price formation – what is the way to approach the problem?

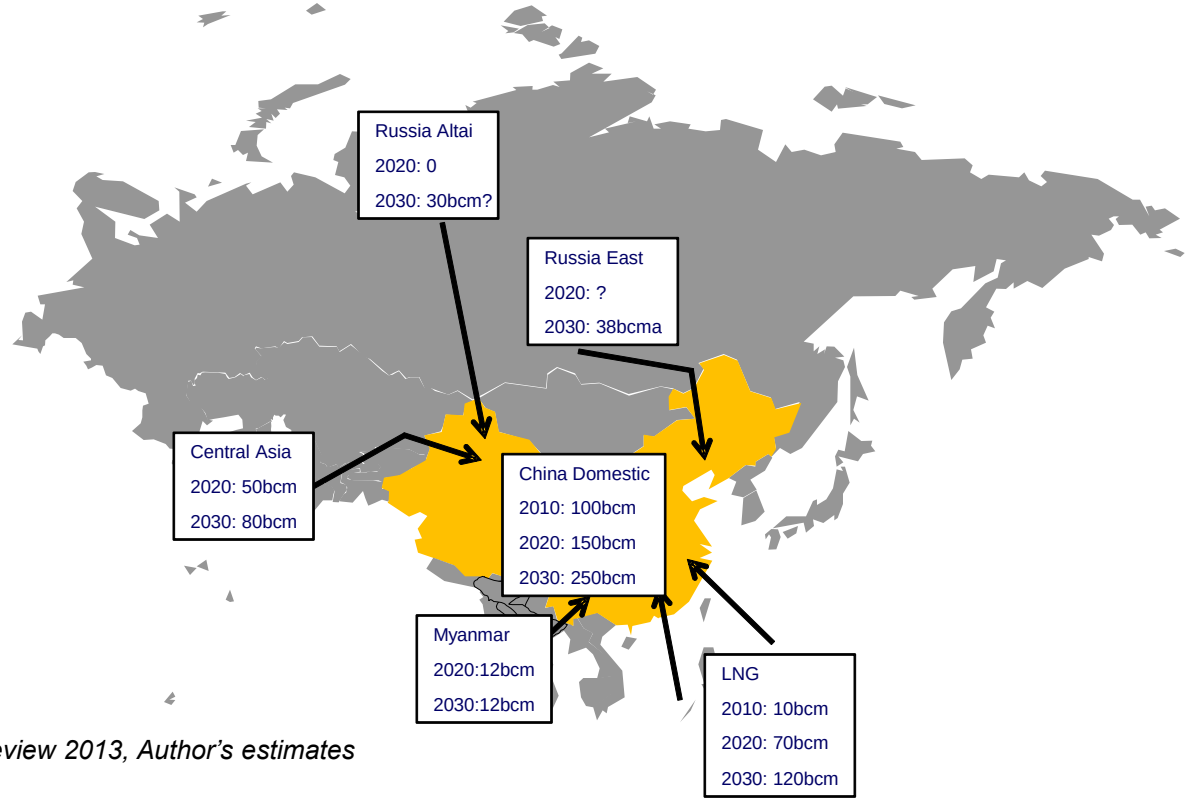
Reassess the market for gas, what fuels (energies) compete with natural gas

Assess whether interfuel competition is still operating and in which part of the market?

- **If yes, a mix of oil products/coal/ power base price and index may work**
- **If no, then the market will need to move to a spot/hub gas index eg:**
  - **JKM or similar and related to this**
  - **Henry NBP (plus liquefaction and transport costs)**
  - **A hub price: physical, virtual, located in Asia**

The aim of the process is a price which keeps LNG/gas competitive nationally and globally

China illustrates the differences between JCC, oil-indexation, alternative fuel and hub pricing



Source: BP Statistical Review 2013, Author's estimates

- **Pipeline imports from Central Asia and Myanmar (and negotiations with Gazprom) are oil-indexed**
- **LNG prices are JCC-based**
- **Post-2011 price reform aims at hub pricing at Shanghai citygate, based on an average of gas import and alternative fuel pricing**

Price Formation Option 1: alternative fuel pricing

ADVANTAGES:

- Reflect current energy market conditions which can be monitored over time
- Should never get substantially out of line with competing fuels

DISADVANTAGES:

- Competitive fuels difficult to agree with sellers
- Needs frequent re-calibration as market and fuel mix evolves.
- May be only a transitional stage to spot/hub prices

Does interfuel competition have a market logic; in which countries and which sectors?
If not, the only alternative is supply/demand pricing of some sort

Price Formation Option 2: Spot and Futures Pricing

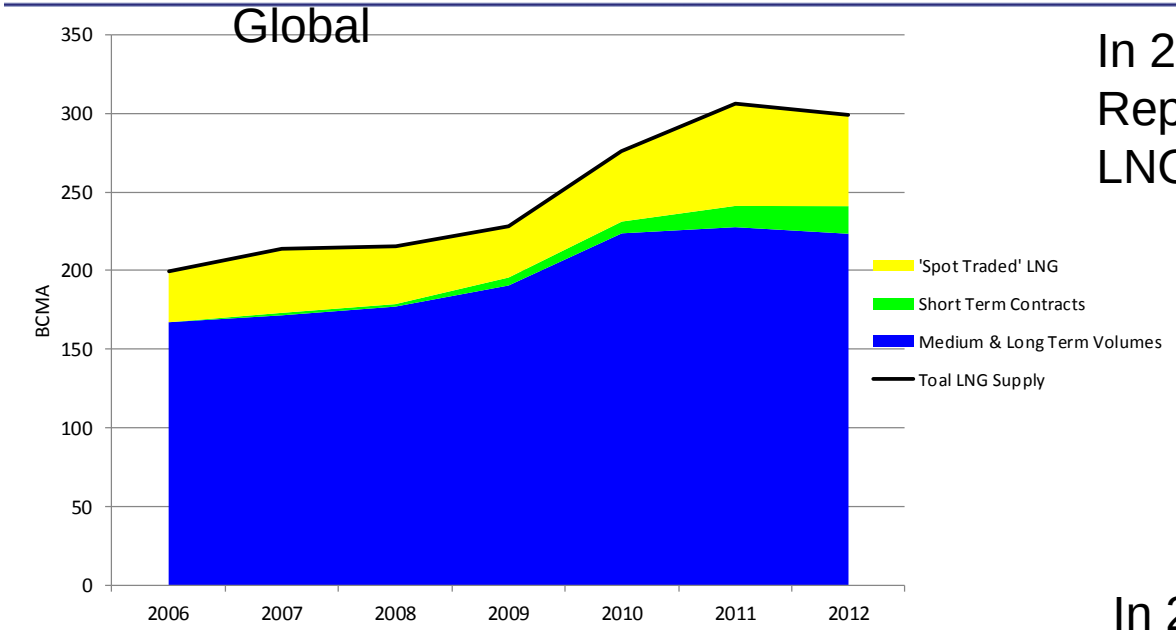
Spot LNG Price Index (eg JKM):

- **Advantage: reflects current Asian LNG supply/ demand balance**
- **Disadvantages:**
  - **too few cargoes (at least currently) on which to base long term contracts**
  - **May reflect global, rather than Asian, market dynamics**

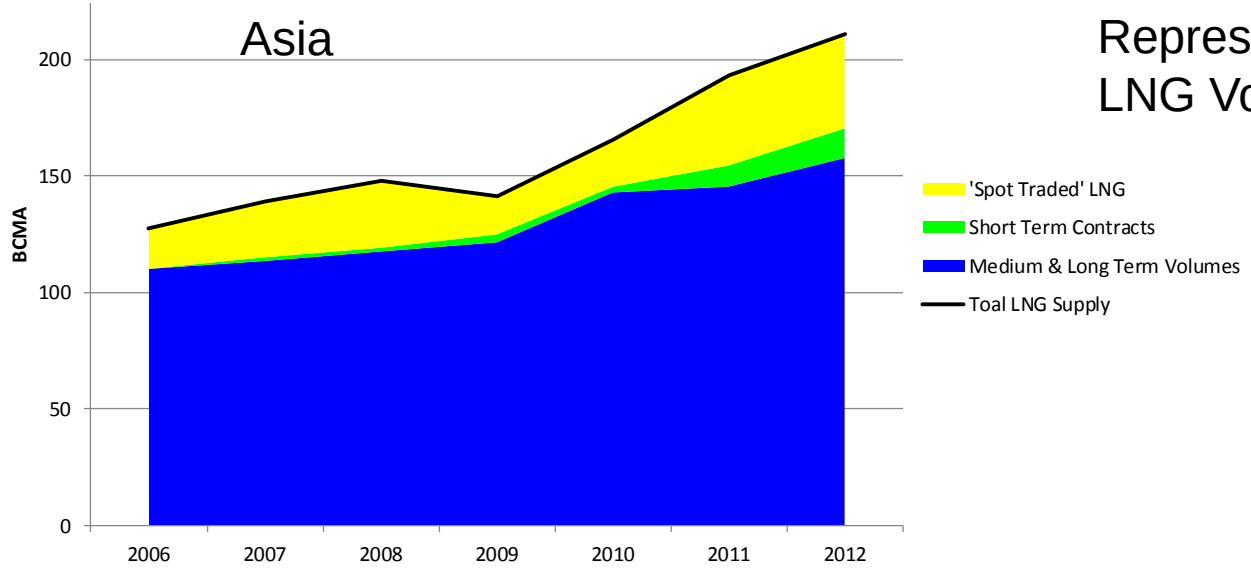
Futures Market Pricing (announced by Japanese government in April 2013) – but this needs a physical basis

This would become much more credible if spot and short term trade increases; liquidity is insufficient on which to base a futures price

Spot LNG Volumes



In 2012, Spot LNG Cargoes Represented 19.5% of Global LNG Volumes



In 2012, Spot LNG Cargoes Represented 19.1% of Asian LNG Volumes

Source: GIIGNL, Author's Analysis

Option 3: Henry Hub/NBP-based pricing

ADVANTAGES:

- **Established hub price mechanism, no suspicion of manipulation by Asian stakeholders**
- **Currently lower price than JCC**

DISADVANTAGES:

- **risky if HH prices rise significantly above $6/Mmbtu (and oil price falls)**
- **No Asian market fundamentals**

Henry Hub/NBP pricing risks being a short term device to reduce price level, not a long term solution to the price formation problem; cold weather in US in Feburary 2014 illustrates how HH prices can increase

Price Formation Option 4: Pricing at an Asian Hub

ADVANTAGES:

- **Provides on-going price reference which can evolve from physical trade into a hedging/risk management reference with a range of durations**
- **Can be a physical or virtual location**

PROBLEMS: needs many (all?) market players to agree on:

- **location – each country wants its own hub**
- **liquidity acceptable as price reference**
- **rules – trading/financial regulation**

This will take national/regional agreement and time to establish

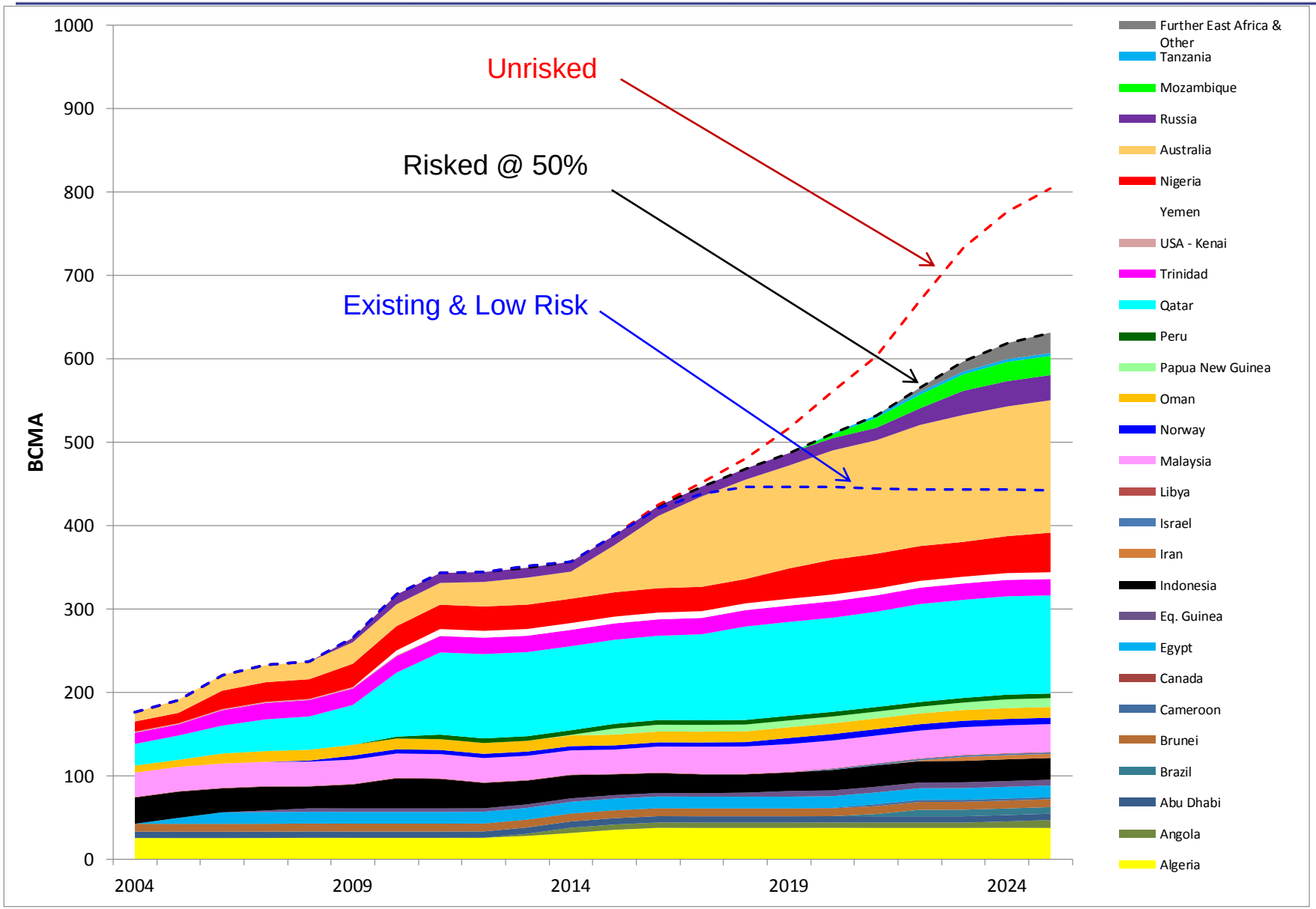
Uncertainties in Global Dynamics Post 2015

- Asian and particularly Chinese Natural Gas and LNG demand.
- Continued robustness of US shale gas production and scale of US LNG exports.
- Scale and pace of non-US LNG export supply (especially Australia, East Africa, Russia, Canada).
- Shale gas outside North America (post 2020/2030?)
- Russian strategy for price versus volume for pipeline supply in Europe (and Asia)

Drivers for change

Drivers for Change: LNG Supply 2005 – 2025

(Excluding Possible US & Canadian Projects)

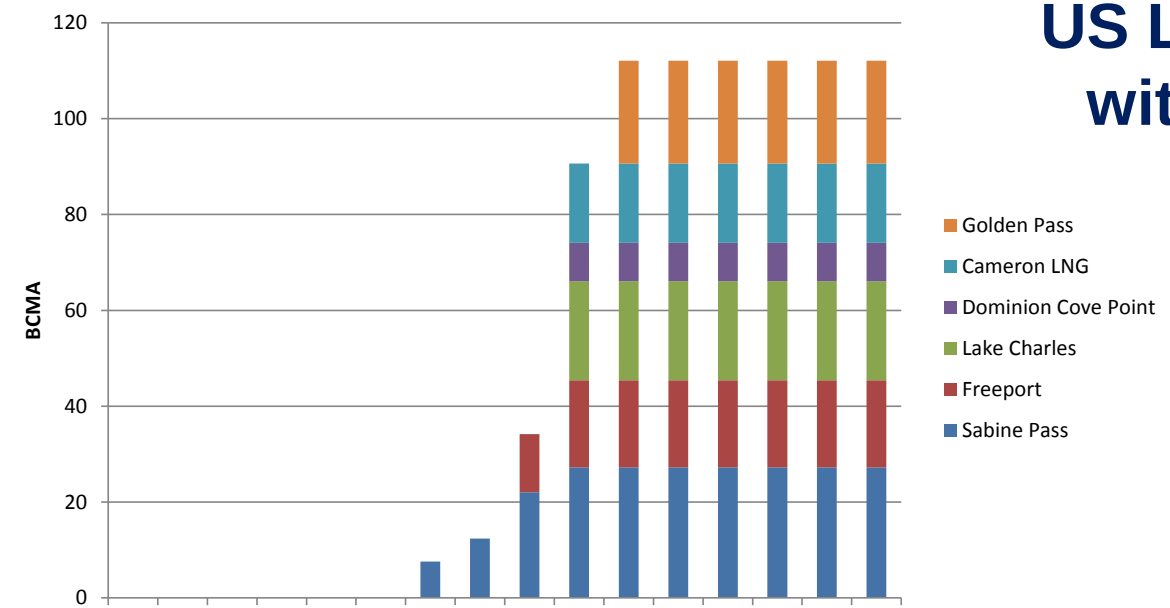


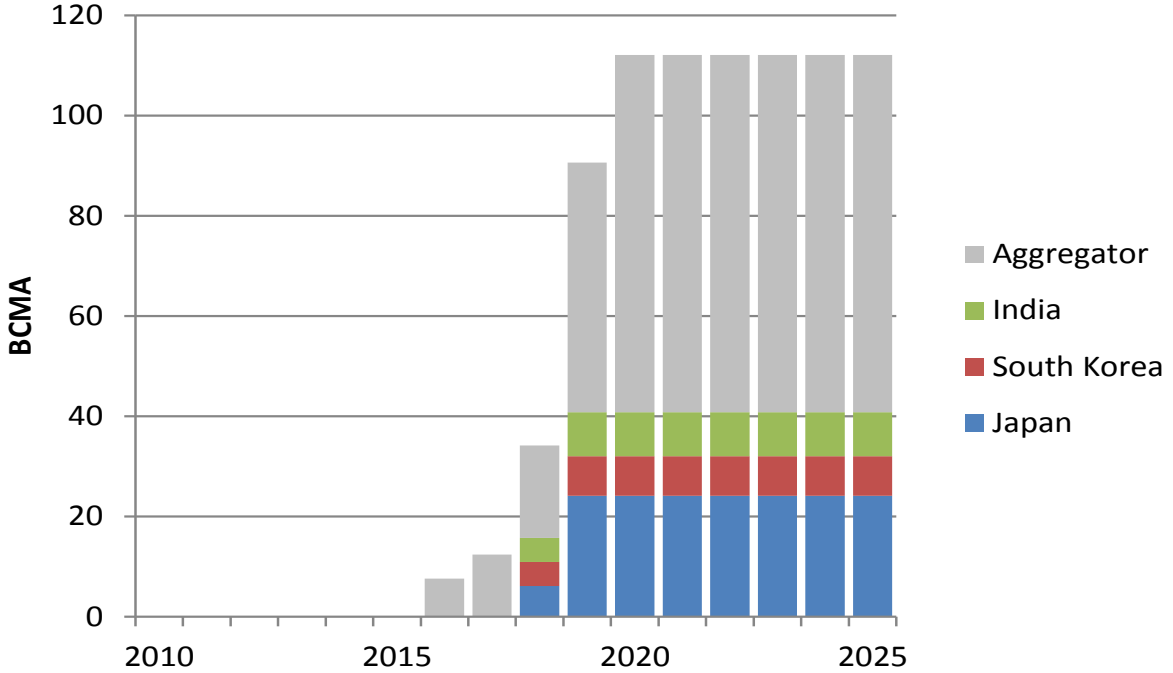
Source: Waterborne LNG, D. Ledesma, Own Analysis

Global LNG Fundamentals: major uncertainties for Asia

- Co-incidence of North American Exports with next increase of global LNG supply (Australia, East Africa, etc) may lead to a new ‘glut’ or at least a ‘softer’ LNG market.
- In part this will be fostered by LNG aggregators / portfolio players all targeting (finite) Asian LNG demand.
- It will also depend on how much Russian pipeline gas and LNG export capacity is developed and by when
- In addition to the assumed continued robustness of US production this also depends on growth of Chinese demand for LNG

US LNG Export Projects with secured off-take

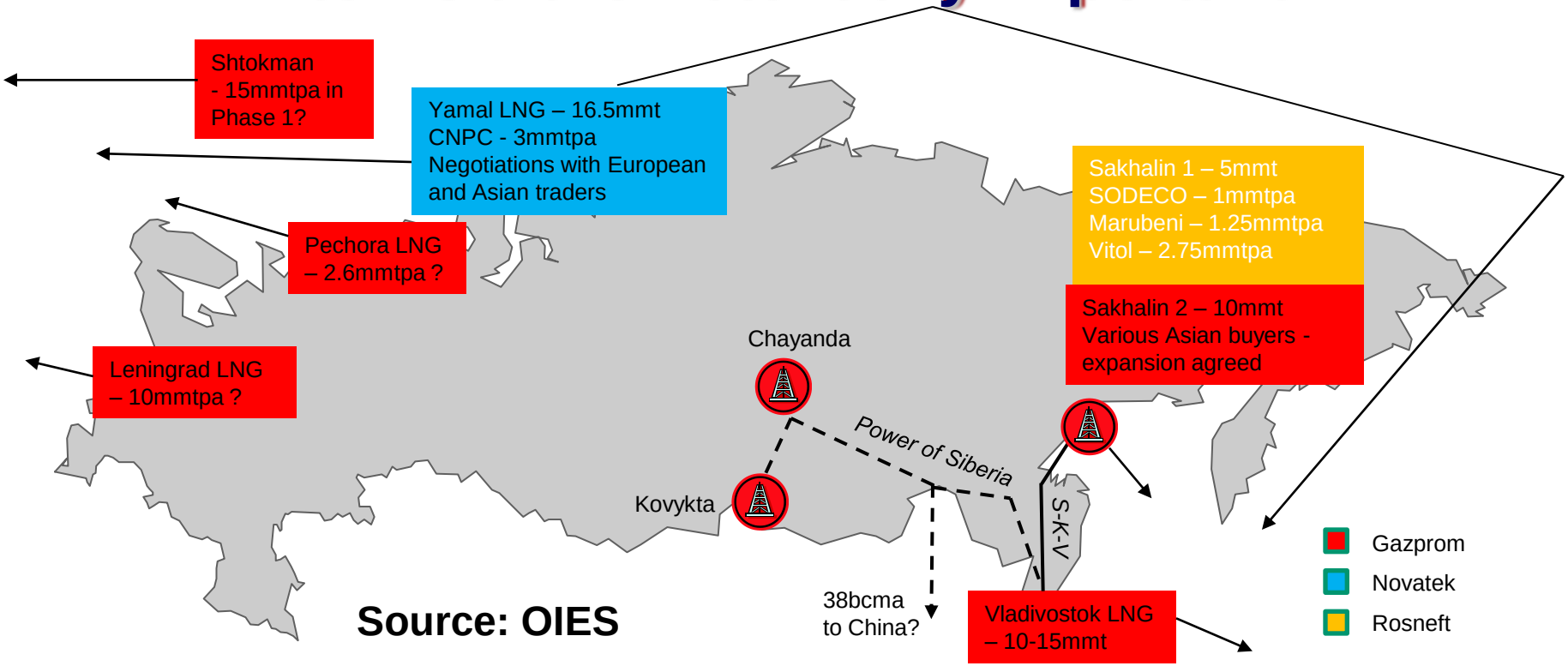




Note that US LNG exports are relatively limited prior to 2019-20. This is <u>a big uncertainty</u> for LNG supply

Sources: Company & Media Reports, Author's Assumptions

Russian LNG and Pipeline Gas Export Projects to Asia are Potentially Important



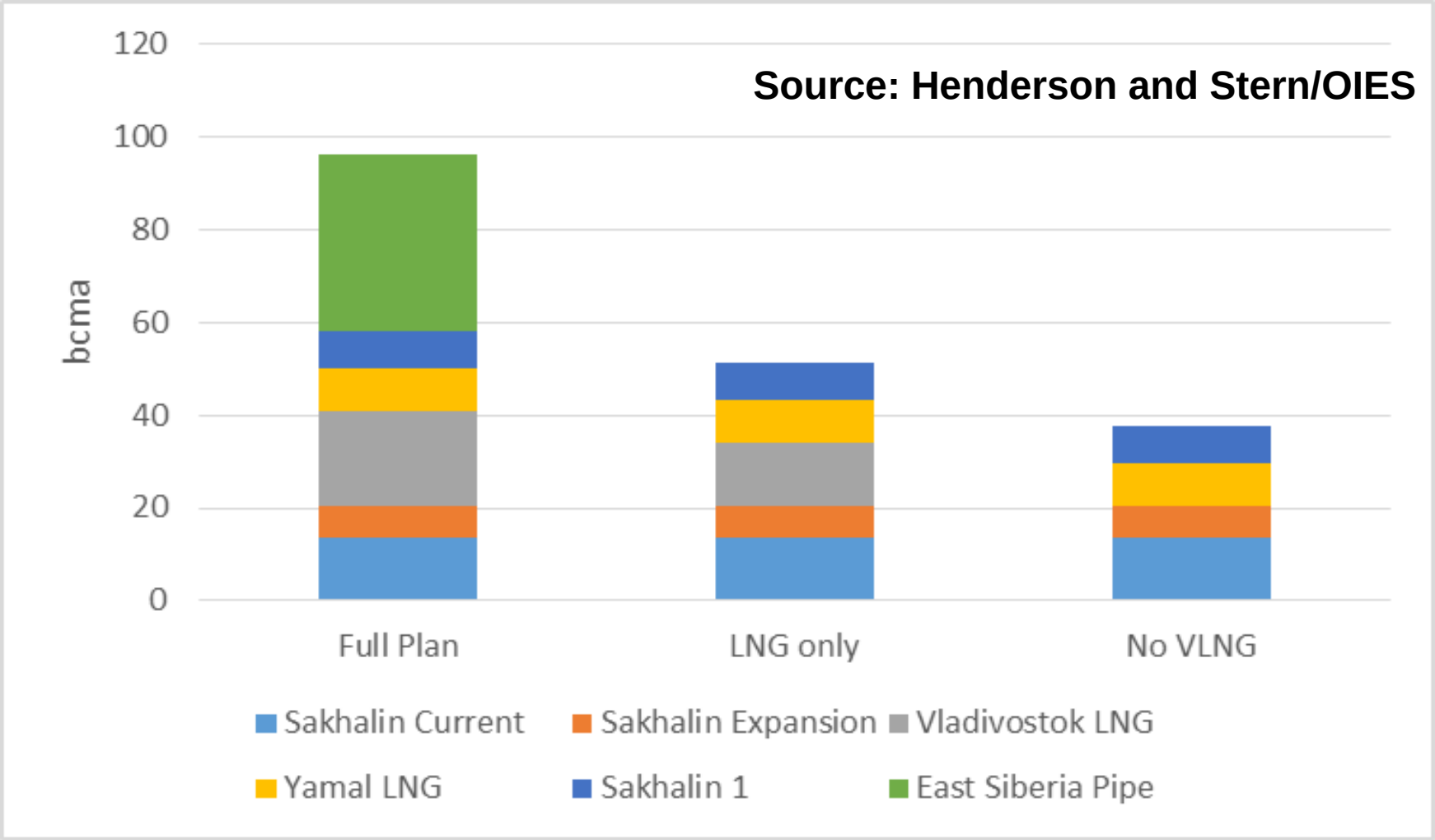
Source: OIES

The ending of Gazprom's monopoly on LNG exports at the end of 2013 indicated government support for 3rd party exporters – Rosneft and Novatek are actively competing with Gazprom for customers

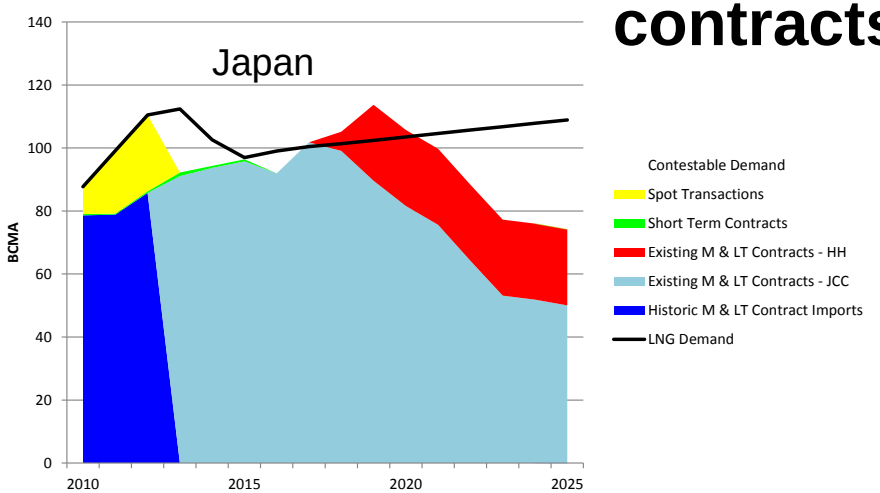
The Power of Siberia Pipeline and VLNG Terminal ~ $80-90bn

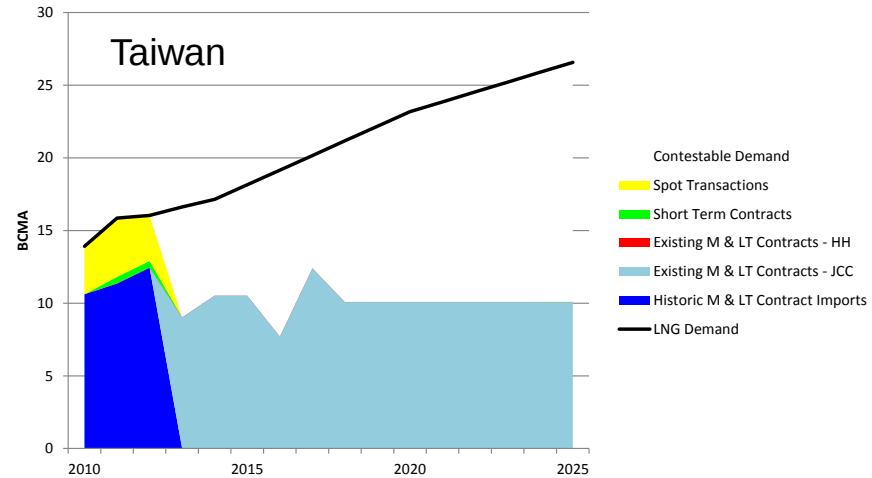
Economics of Vladivostok LNG depend on "Power of Siberia" Pipeline Gas Exports to China

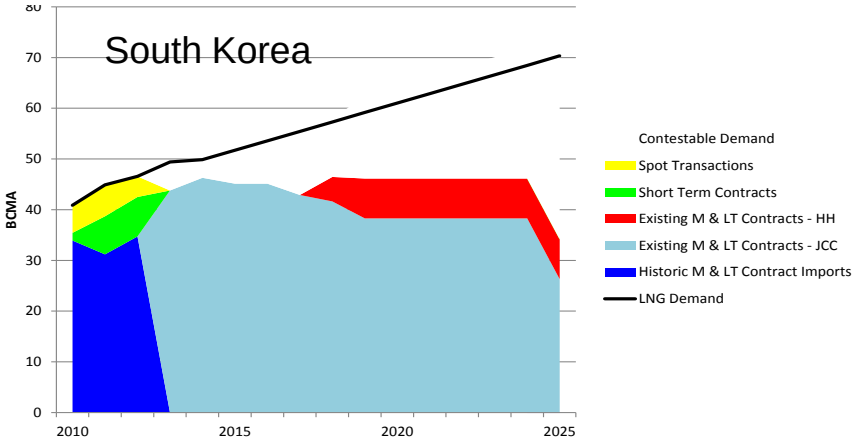
Russian pipeline gas exports could cut Chinese LNG import requirements by 40 Bcm/year in the 2020s

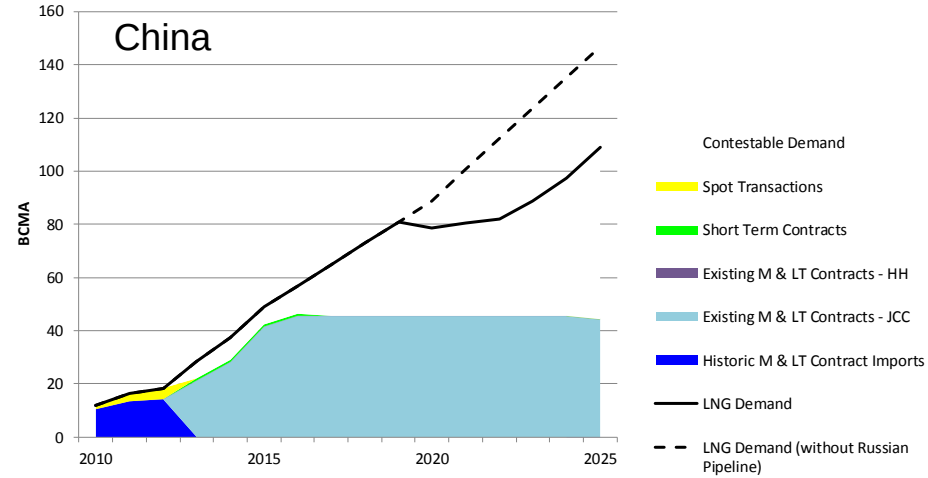


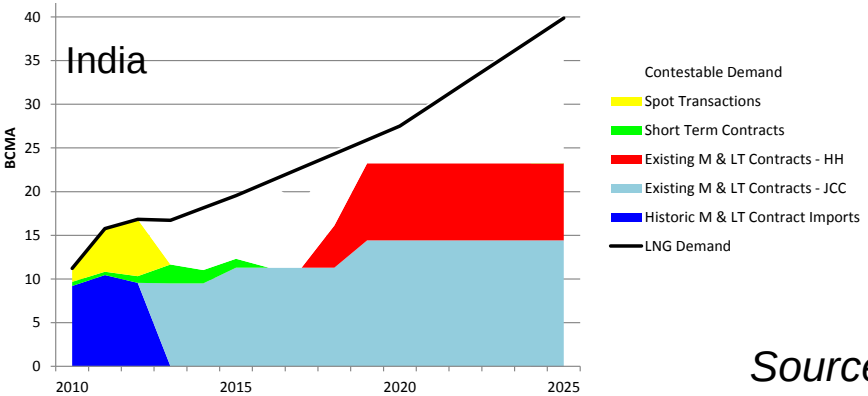
Asian LNG Importers: spot, short term and long term contracts 2010 - 2025







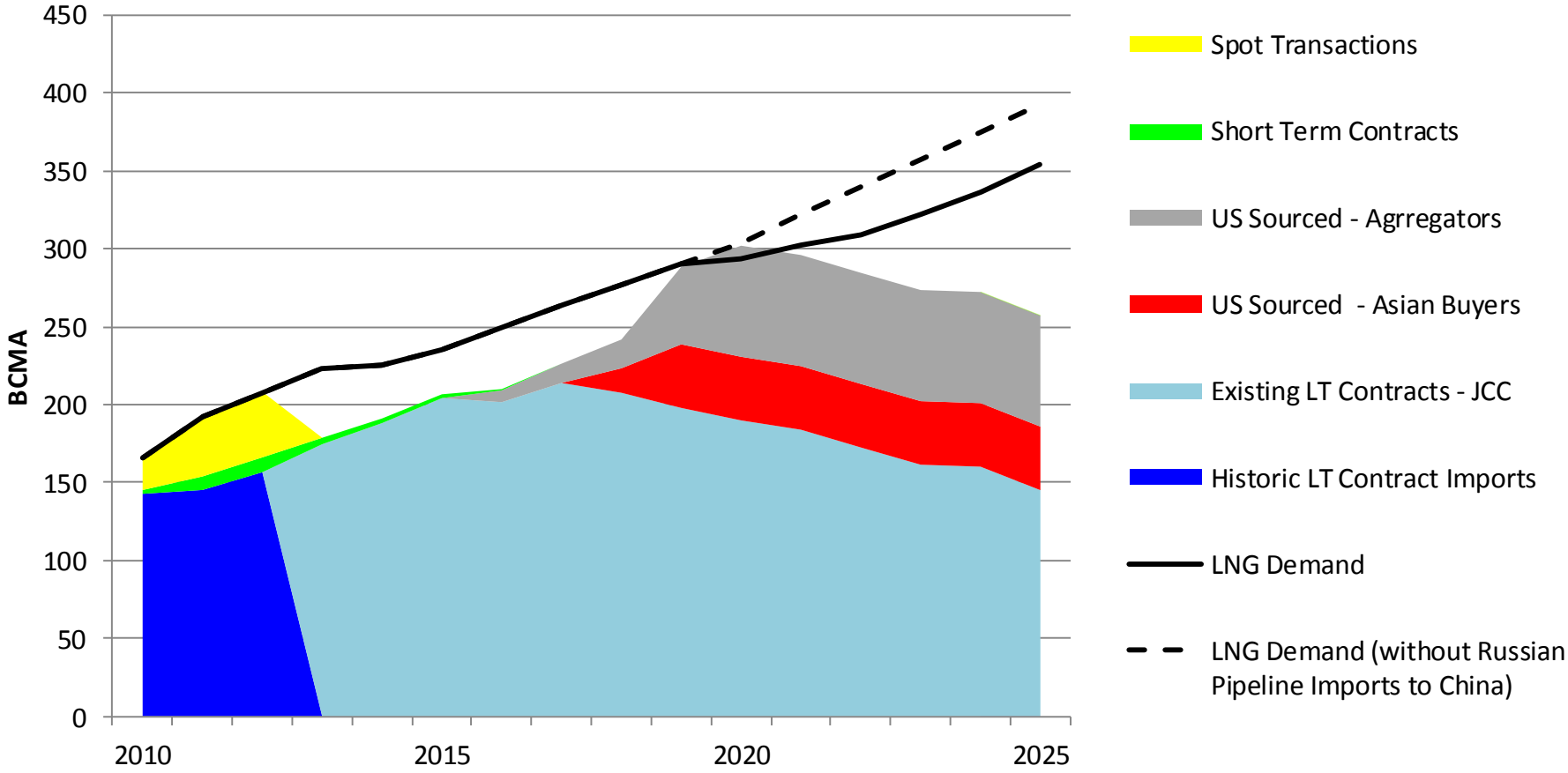




Source: GIIGNL, D. Ledesma, Rogers and Stern 2014

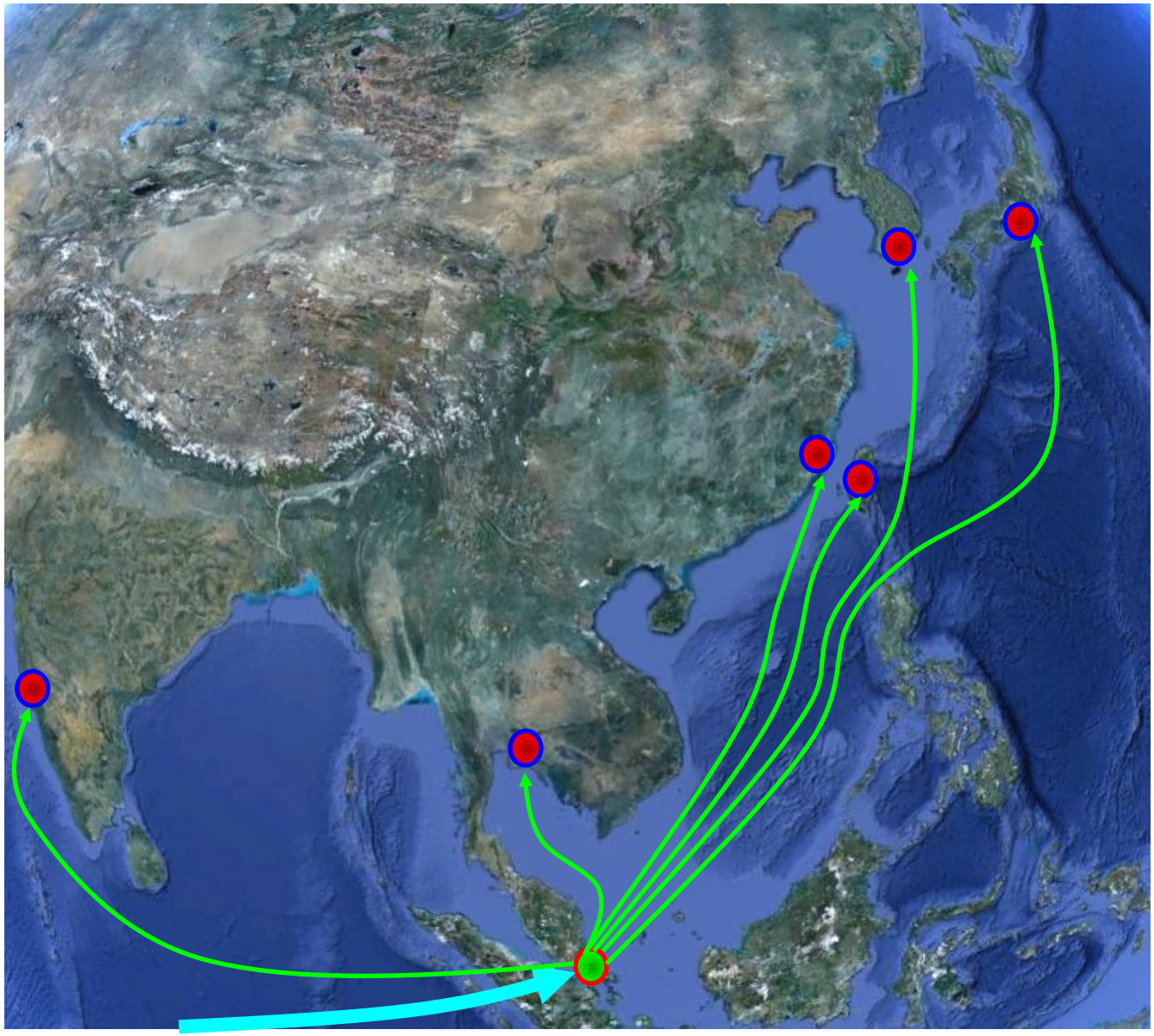
Future Asian LNG Demand and Contracts: spot, short term and long term

Sources: GIIGNL, Rogers and Stern 2014

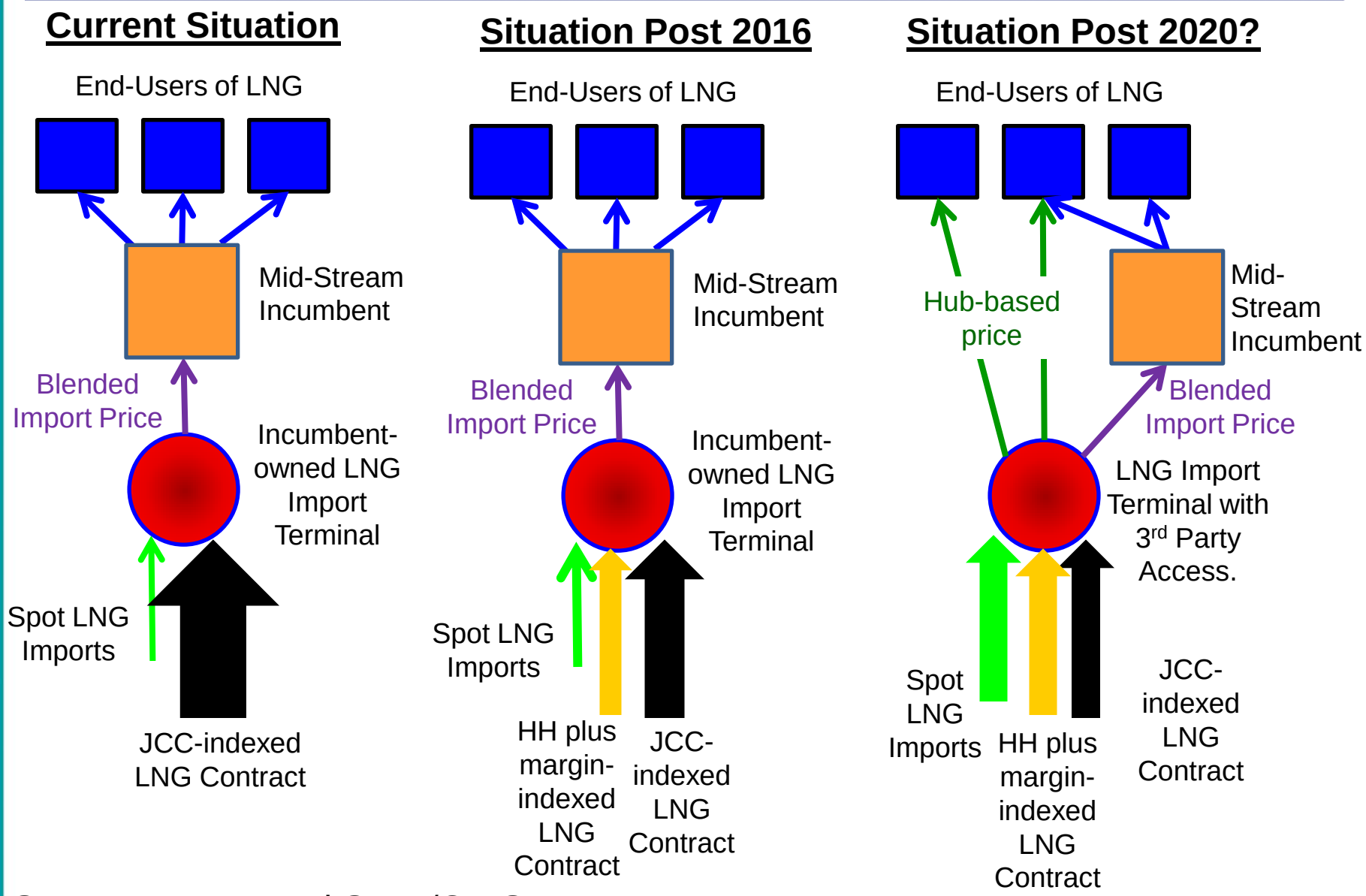


The Asian LNG market could become very competitive in the late 2010s and early 2020s; China is <u>a big uncertainty</u> for LNG demand

A Future Asian LNG Hub: Singapore, Shanghai or Tokyo?

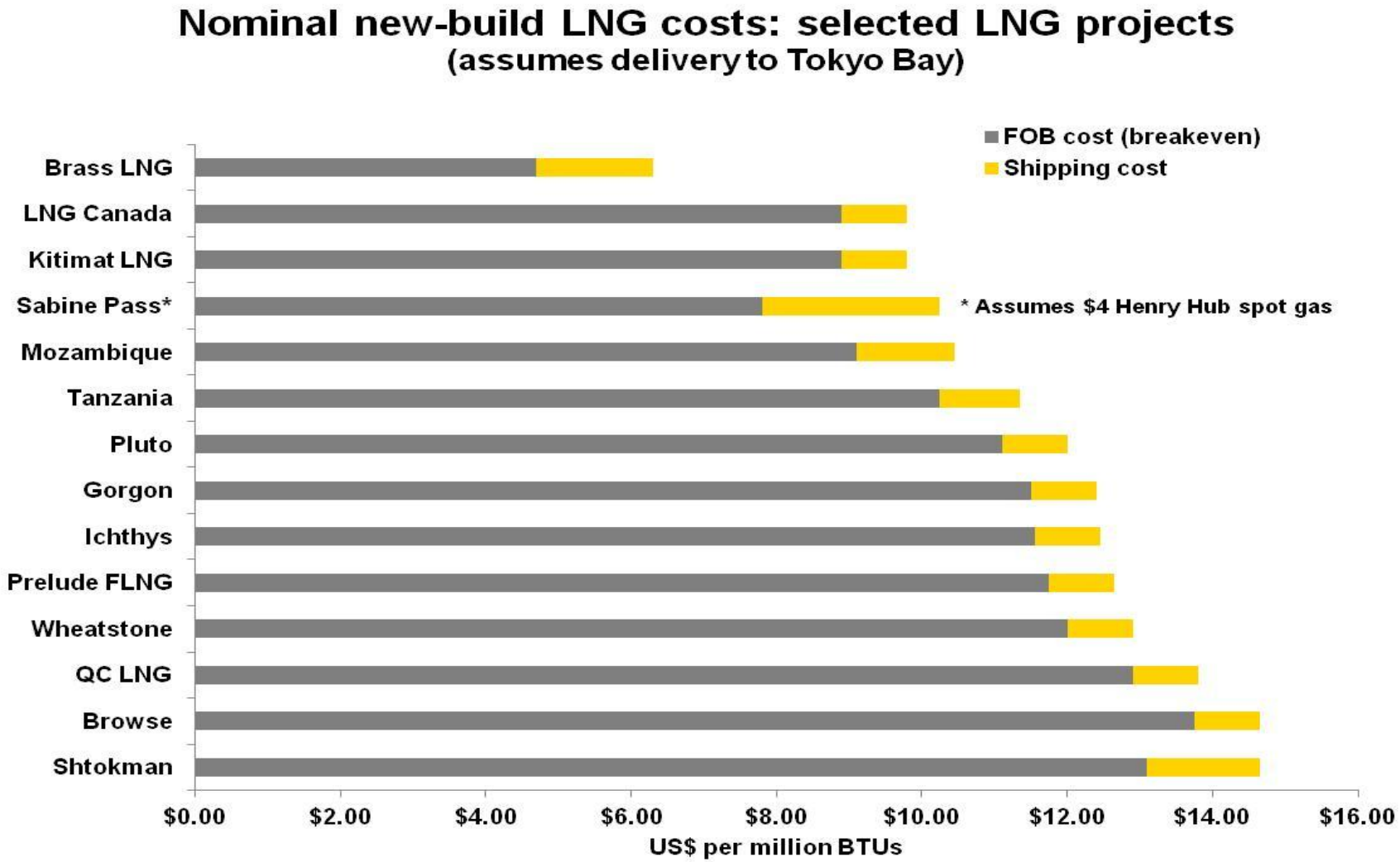


Asian LNG Hub – Three Stages of Development ?



Source: Rogers and Stern/OIES

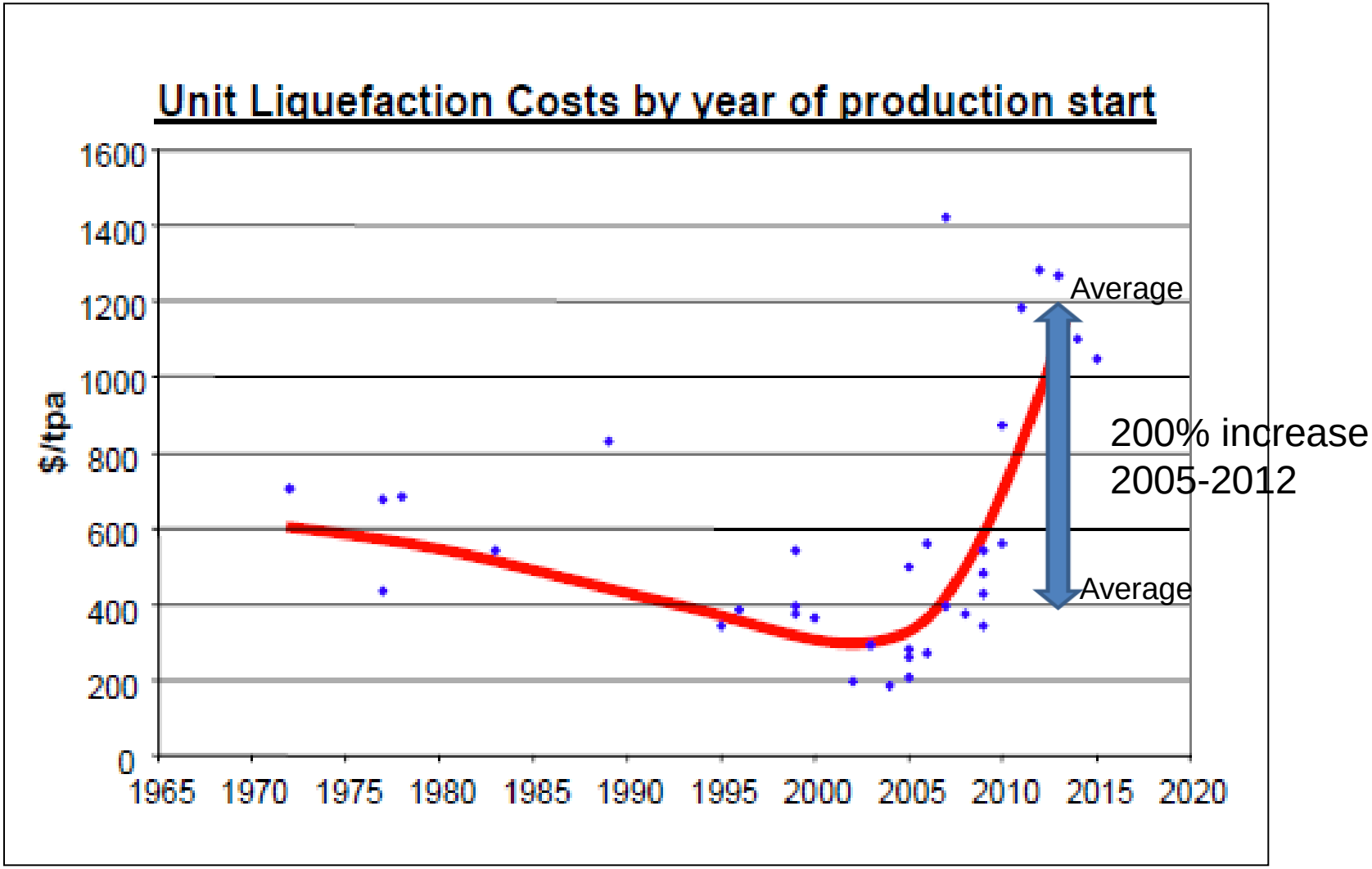
Costs are a major problem for new LNG projects



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

Commercial "train wreck" approaching for some Australian projects?

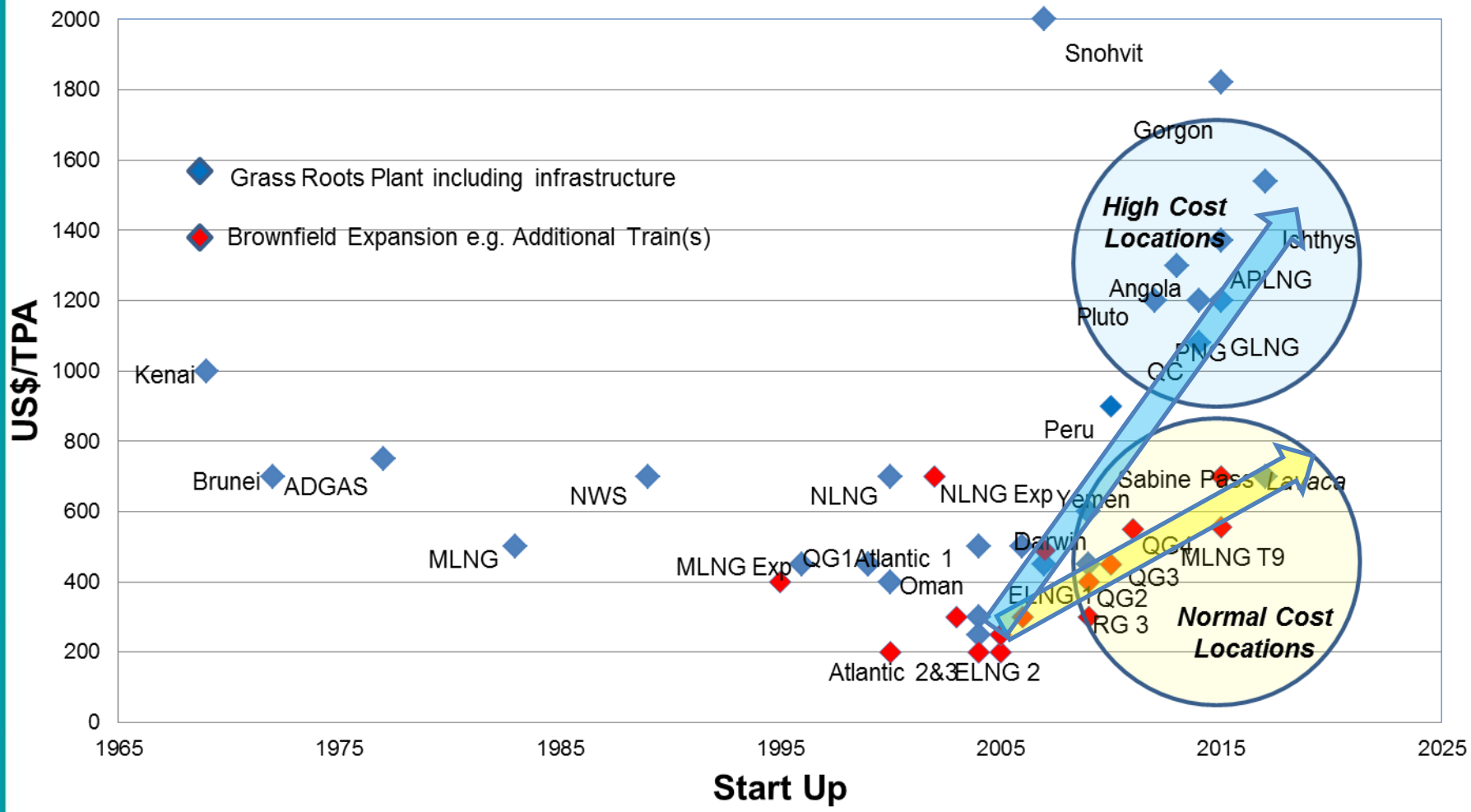
LNG Plant Cost ($/TPA) by Year of start-up



Data Courtesy GIIGNL/Wood MacKenzie

Songhurst/OIES: 2014

Recent LNG Costs – High and Low Cost Locations



Data Courtesy of GIGNL, Wood Mackenzie, Published Reports

Songhurst/OIES, 2014

Possible Areas for Future LNG Cost Reduction

- Utilisation of barge-mounted liquefaction plant built in China or Korea. This cost of this concept has been quoted at $600-700/TPA including storage
- For onshore constructed plants using a more competitive process and EPC contractors.
- Bringing in a competitor to GE/Nuovo Pignone (who currently have an exclusive supplier position) for refrigeration compressors and drivers. Other major vendors include Siemens, Dresser, Rolls Royce for different components
- Cooperation between the owners of different projects in the same area to get better value from the synergies. This is being applied in Mozambique where Anadarko and ENI are now planning a joint development.

SOURCE: MAJOR CONCLUSIONS FROM SONGHURST/OIES

Asian LNG: Scenario1. Contractual Impasse

- Buyers continue to complain about JCC pricing but there is little change in the status quo. No changes can be agreed in existing contracts.
- Buyers refuse to sign new long term contracts at prices linked to crude oil; producers refuse to go ahead with new projects on any other price basis, and no new LNG contracts are signed.
- Spot trade increases with US LNG export growth but the problems of price competitiveness (on average LNG import prices) mean that Asian LNG trade stagnates.

Asian LNG: Scenario 2. Smooth Contractual Transition

- New contracts start to be signed with a mix of oil, Henry Hub and NBP prices, with price review clauses which mandate renegotiation of prices after a number of years, anticipating the creation of an Asian hub.
- There are challenges to existing contract prices, but renegotiations result in adjustments which are tolerable for both buyers and sellers with no fundamental changes or litigation. Despite losses, Japanese buyers "hang on" until their existing long term contracts begin to expire/decline.
- Spot trading increases significantly and a hub price begins to emerge during the 2010s, initially in Singapore.
- By the 2020s, larger and more liquid hubs emerge in Tokyo and Shanghai and new contracts with buyers in those countries are priced on this basis.

Asian LNG: Scenario 3. Contractual Train Wreck

- For Japanese LNG buyers losses from existing contracts become financially untenable and they demand price renegotiations.
- These are resisted by suppliers with new, high cost new projects coming on stream which need to pay back substantial investments and feel unable to compromise on the JCC-related prices in their contracts.
- Litigation ensues with unpredictable results. The process highlights the need for a "reset" in the commercial framework.
- A several year period of commercial upheaval ensues during which no new contracts are signed other than with North American sellers…
- but spot and short term trading continues to increase and as in the Smooth Commercial Transition scenario, a hub price emerges in Singapore, followed by larger and more liquid hubs in Tokyo and Shanghai and new contracts with buyers in those countries are priced on this basis.

Asian LNG: Scenario Conclusions

- In all three scenarios, new contracts are signed with North American sellers on a Henry Hub price basis, but this introduces another risk for buyers that such prices do not reflect evolving market fundamentals in the Pacific region.
- We do not believe that `Contractual Impasse' is a sustainable scenario but it remains a possible outcome if parties are unable to reach agreement, at least for a few years.
- The `Smooth Contractual Transition' scenario is clearly the most desirable outcome to move from the JCC status quo to hub-based pricing. However, it depends on maintaining a controllable financial situation for buyers and sellers.
- The `Contractual Train Wreck' scenario results from the financial position of buyers (and/or sellers) becoming untenable. All Asian LNG stakeholders must clearly be hoping this does not occur but...
- markets where prices have liberalised and hubs have been created – North America, UK and Continental Europe – have had "contractual train wrecks" of varying magnitudes.

Most Difficult Problems to Resolve

- Threat to traditional "relationship culture" between buyers and sellers
- Lack of third party access to pipelines/ liquefaction terminals
- Dominant (monopoly?) players in all Asian countries
- Potentially greater price volatility
- Traditional "security culture" of Asian buyers:
  - Absolute assurance of demand coverage through long term contracts, replaced by greater short term/spot purchase
  - Not a problem as long as buyers offer the highest price, but no reason to offer several $/MMbtu more than necessary

Summary of the Problems Facing JCC

- **JCC is no longer a rational basis for pricing Asian LNG; threatens competitiveness of economics**
- **Key question is 'what is the most appropriate basis on which to price LNG, which reflects Asian market fundamentals and is most 'future-proof'?**
- **One or more Asian LNG trading hubs are the longer term solution to prices which reflect market fundamentals; establishing these hubs create difficult problems for both buyers and policymakers, especially..**
- **addressing the challenges of existing Long Term JCC contracts for high cost projects which have not yet commenced delivery**

FINAL THOUGHTS

- **This is likely to be a very difficult and painful transition which may take at least a decade to complete**
- **The solution may be different for different Asian LNG importing countries**
- **Oil prices will continue to play a role in determining LNG prices <u>but this will not be a contractual requirement</u>**
- **There is no <u>guarantee</u> that hub-based prices will always be lower than JCC prices (but with oil prices above $100/bbl this is likely)**

Thank you for your attention

This presentation is based on the following published research:

The Impact of a Globalising Market on Future European Gas Supply and Pricing: the Importance of Asian Demand and North American Supply' Howard Rogers, January 2012, *http://www.oxfordenergy.org/wpcms/wp-content/uploads/2012/01/NG_59.pdf*

A realistic perspective on Japan's LNG Demand after Fukushima. Akira Miyamoto, Chigako Ishiguro, Mitsuhiro Nakamura. June 2012 http://www.oxfordenergy.org/2012/06/a-realistic-perspective-on-japan%E2%80%99s-lng-demand-after-fukushima/

The Pricing of Internationally Traded Gas, Editor Jonathan Stern OUP/OIES 2012.

Challenges to JCC Pricing in Asian LNG Markets, Howard Rogers & Jonathan Stern, February 2014. http://www.oxfordenergy.org/2014/02/challenges-to-jcc-pricing-in-asian-lng-markets-2/

The potential impact on Asian gas markets of Russia's Eastern Gas Strategy, James Henderson and Jonathan Stern, February 2014. http://www.oxfordenergy.org/2014/02/the-potential-impact-on-asia-gas-markets-of-russias-eastern-gas-strategy/

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