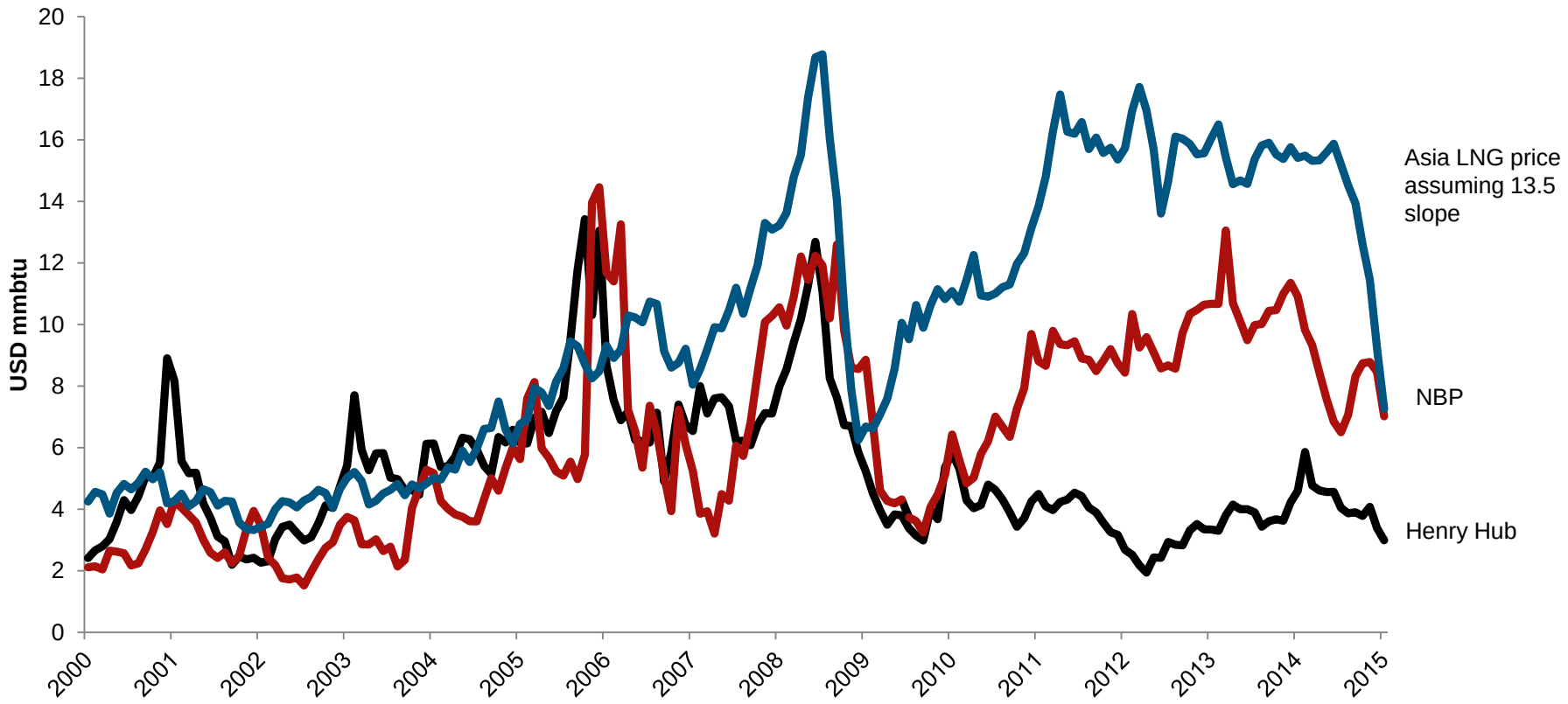
Is the scene set for convergence in global LNG pricing?

Sarah Fairhurst – PowerGen Europe 2015

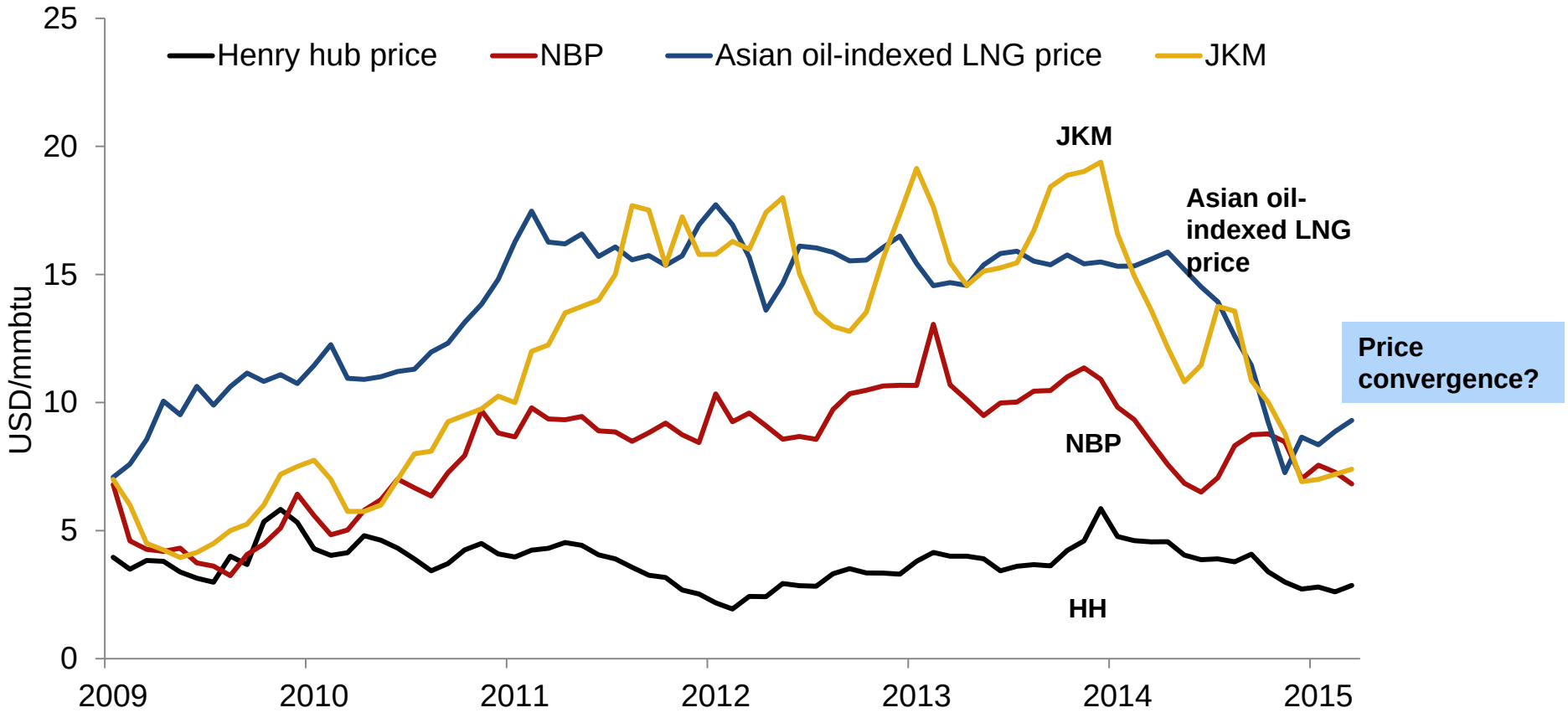
THE LANTAU GROUP
strategy & economic consulting

The three global LNG markets are driven by fundamentally different forces



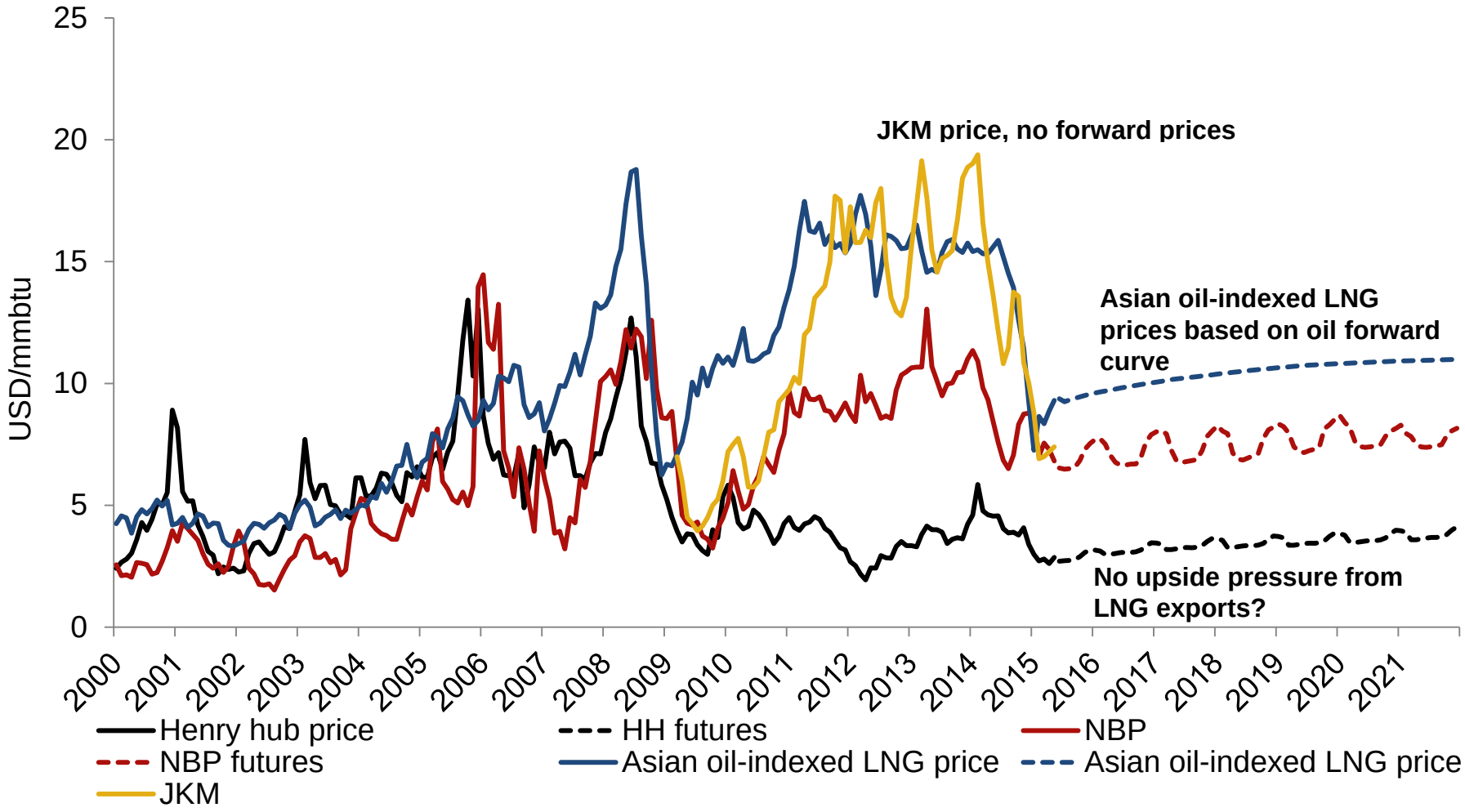
We assume that the LNG price will adjust immediately in this graphic.
But in reality there will be a lag of 3 months before contracted LNG price adjusted downwards as that is lead time for Japan Customs to release statistics on crude oil imports.

The different market prices are moving closer, but is this convergence?



.. Or just because they all have similar drivers?

The convergence may be a transient effect of supply overhang and falling oil prices



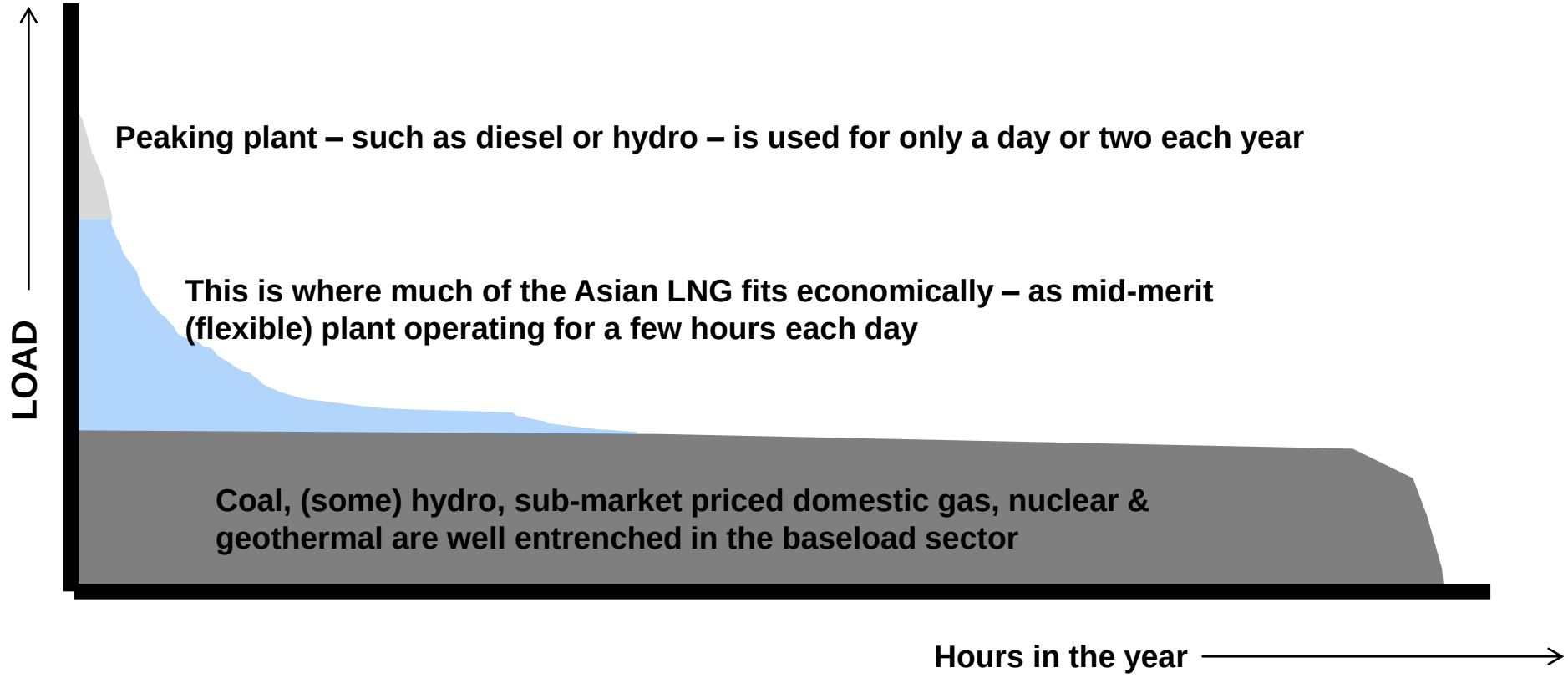
Source: BP Statistical Review, ICE, CME Group

There are a number of fundamental questions to consider

- Will Asian LNG buyers increase their exposure to short-term and spot LNG market in their procurement strategy?
- Will Asian long-term LNG contract prices gradually shift away from oil indexation so its long-term LNG price could be determined by the fundamental supply and demand situation in the gas market but not the oil prices?

New Asian buyers are looking at LNG differently and may need different commercial terms

Many Asian LNG buyers are looking at pure economics of LNG vs coal… and LNG cannot compete in the baseload

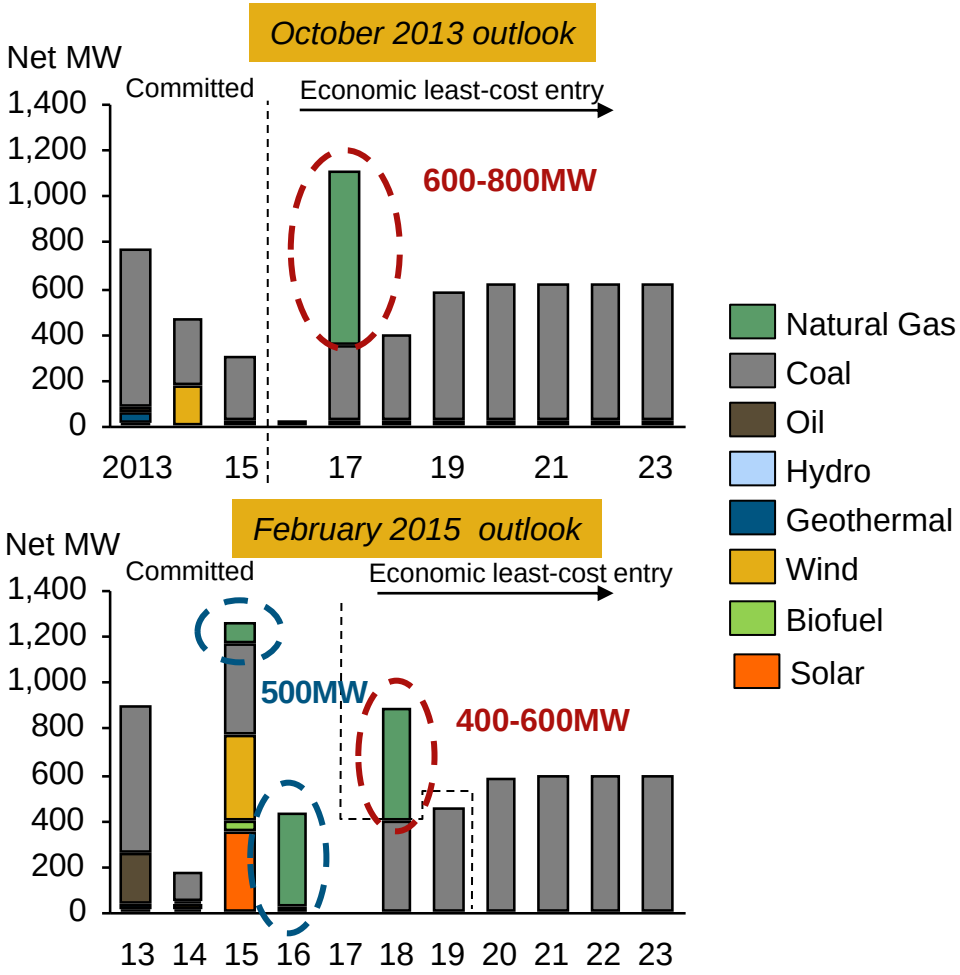


Asian utilities are under pressure on price – with the more competitive electricity markets most focussed on least cost generation expansions

As an example – this is the least cost expansion for the Philippines

- Philippines already has 3000MW of gas fired generation capacity that runs baseload for commercial reasons (take or pay)
- Much of the new capacity currently under construction is coal
- Our analysis of the system done for the Gas Master Plan in 2013 highlighted that about 600-800MW of new mid-merit LNG fired capacity was economic (even taking into account terminal costs)
- A refresh of that analysis in February 2015 after the oil price fall highlighted no significant change in the story
- Some of it is under construction now… but the big question is whether LNG will be available on commercial terms that match the flexibility requirements

Least-cost capacity expansion plan for Luzon under expected assumptions

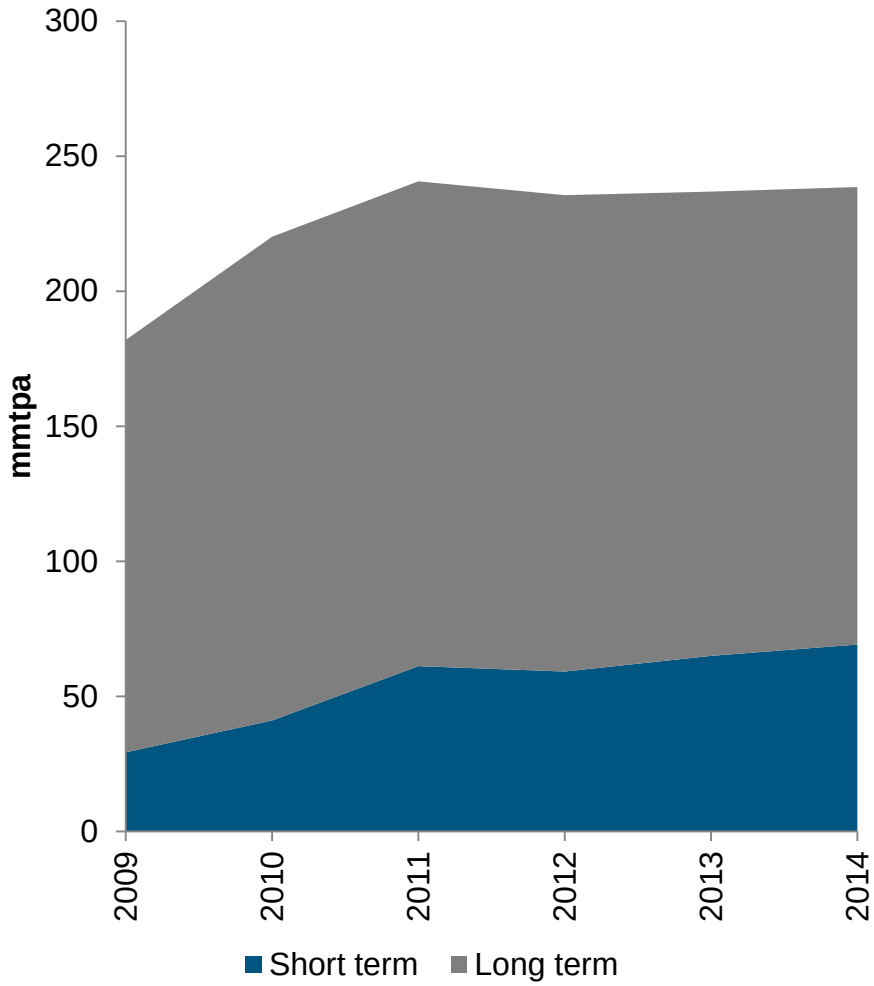


Source: TLG analysis

As a result we are seeing a number of changes in Asian purchasing

- Increasing spot/short-term LNG trade with entry of more LNG players in an expected supply surplus market environment;
- Start-up of US LNG exports acting as a catalyst for change;
- Long-term potential of Russia acting as a swing gas supplier for Europe and Asia (given that Russia itself has borders in both continents);
- Successful reform in the key Asian markets this time round, making moving away from oil-indexation a real possibility?
  - Noting that this has been tried before!;
- The use of LNG in the Asian power sector being driven more strongly by economics, acting as another catalyst for change in Asian LNG procurement practice?
  - Asia in general is still grappling with some of the economic fundamentals of electricity production that the USA and Europe learned decades ago!)

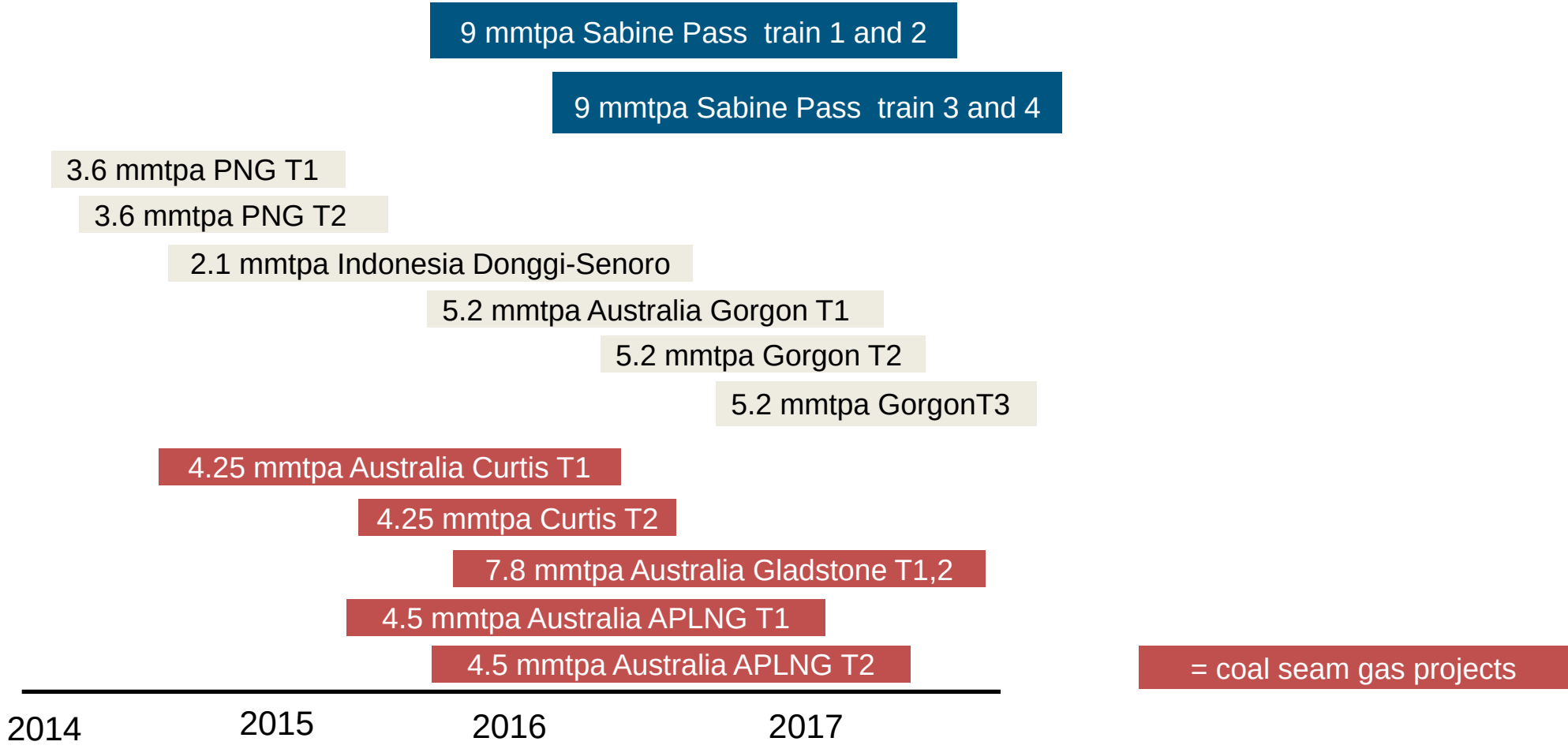
The trend in short term LNG cargoes is rising…



Source: GIIGNL

- The recent rise in short term cargoes has been driven by the need by Japan for LNG and the decline in demand for LNG in Europe.
- This was to a large extent forced on the industry but does highlight what we believe will be a growing trend.
- This is driven on the supply side by US LNG which is call on the very large pool of US gas.
- And on the demand side by uncertainty on the level of demand by buyers.
- In time reform of gas markets in Asia could lift the amount LNG traded on a short term basis.

The over supply situation may continue if more LNG liquefaction projects come online….



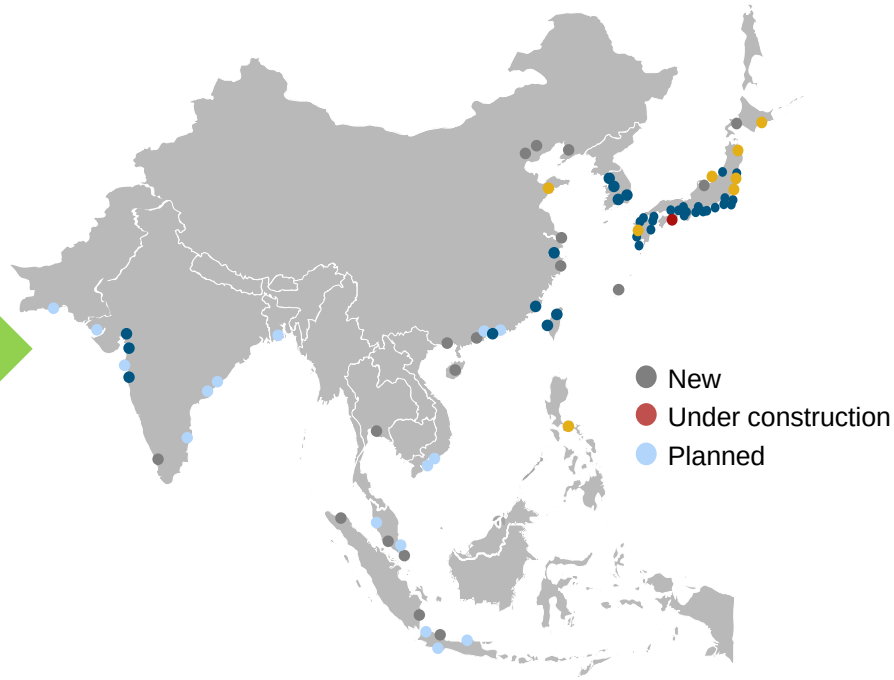
….. Noting that a number have already been cancelled or delayed this year

The boom in LNG import infrastructure across the Asia region provides greater choice in destinations for cargoes and less need for the 'virtual pipeline'

2010

Many countries did not have any LNG import infrastructure

2015

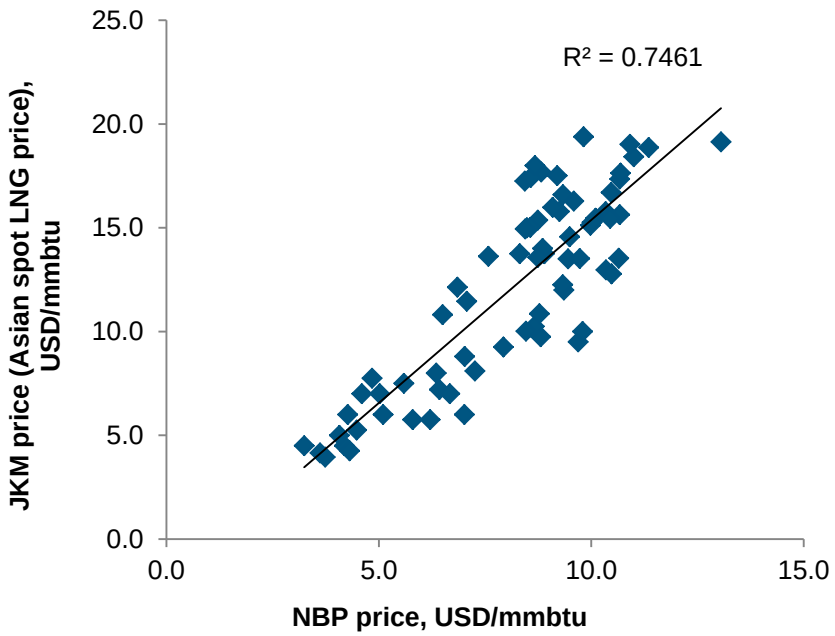


Planned LNG terminals have either materialized, are under construction, or plans are underway across Asia

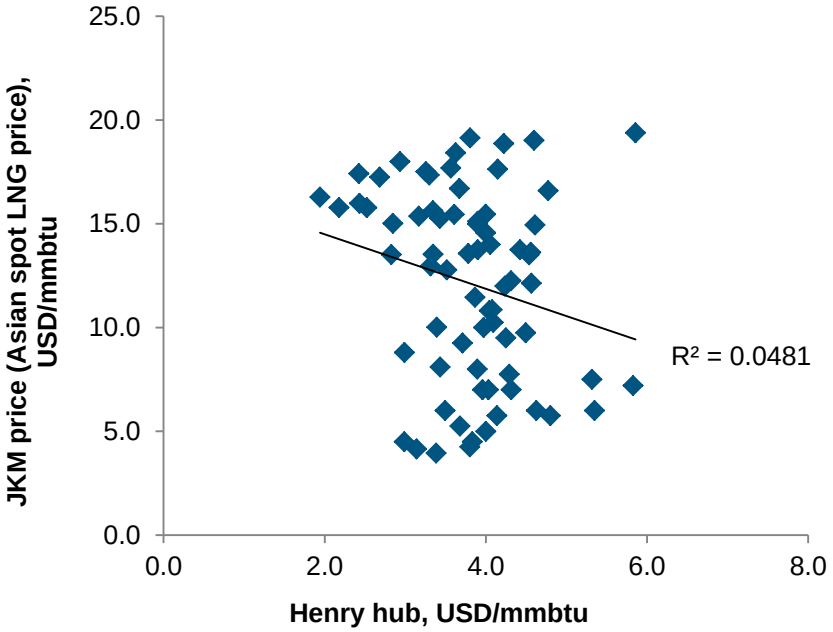
Source: TLG analysis

The arbitrage plays have increased correlation between Asian and European but not US prices

Asian spot LNG price is correlated with UK gas price,



but not the US gas price



- An increase in trade between these regions would increase this correlation
- The lack of correlation with the USA reflects a lack of export infrastructure in the USA - will this change after the start-up of LNG exports from USA?

The start-up of US LNG exports could act as a catalyst in the market

- US pricing and business models are completely different from the traditional LNG business:
  - If buyers contract for liquefaction capacity rather than a combined service, when they want LNG, they can buy it at Henry Hub prices and pay the variable costs of liquefaction plus transportation.
  - This LNG is then available to go anywhere: – resell or for own use. Effectively, the tap can be turned on and off at will.
  - Such high flexibility could increase spot trading and pricing arbitrage opportunities.
- Asian buyers have been adjusting to this business models by setting up trading offices and acquiring upstream gas assets in the US.
- Over time, the traditional LNG model with long-term contracts with high take-or-pay clauses could be under challenge, and may be forced to offer more flexible terms.
- Pricing of US LNG is all linked to Henry Hub prices, irrespective of whether the LNG is sending to the European market or the Asia Pacific market. Such pricing structure will physically connect the US gas market with the Asian and European gas markets, likely making the prices of the three regional markets become more correlated.

Could Russia also act as a catalyst for more convergence?

- Could Russia act as a swing supplier for Europe and Asia using its long distance pipeline network?
- Russia's Energy Strategy to 2030 indicates a focus on gas exports on the Asia Pacific market, with exports expected to increase to around 75 billion cubic meters by 2030, accounting for about one quarter of the country's total exports

Source: "The Russian Gas Matrix: How Markets are Driving Change", Henderson & Pirani eds

- In 2014, Russia concluded a decade-long gas negotiation with China for a 30-year gas contract totalled 38 billion cubic meter per year (equivalent to about 28 mtpa LNG) via China's preferred eastern route in mid-2014

… but this could take some time!

- Realistically the materialization of these projects will likely be a decade-long process.
- Even though the first Russia China gas deal mentions that gas will start to flow from Russia to China by 2018, the project will be likely delayed given the current financial difficulty that Russia is experiencing.
- And the current push by Europe to reduce reliance on Russian gas is also a factor to consider which may change this potential linkage

The pace of reform in Asian gas markets is another key factor in regional pricing

- Is Asia LNG pricing high due to oil linkage or lack of a free market?

Linkage to Japan Crude Cocktail/Brent

- In the 1970s oil comprised 60 percent of Japan's fuel mix for power.
- Therefore it made some sense to link the LNG price to the price of what was being substituted, namely crude oil.
- But Japan's fuel mix in 2010 comprised nearly 30 percent each for nuclear, coal and LNG and 5 percent each for oil and hydro. Most nuclear plants look set to restart through to 2020.
- With oil such a small part of the fuel mix why continue the LNG price link to oil?

Lack of third party access

- The lack of a free or liberalised gas market in most Asia countries can also be viewed as an impediment to a new way for LNG/gas price formation.
- In Japan, Korea and Taiwan the fuel costs are for the most part a pass through to end-users by integrated companies offering a bundled service.
- Where is the incentive to change or reform?

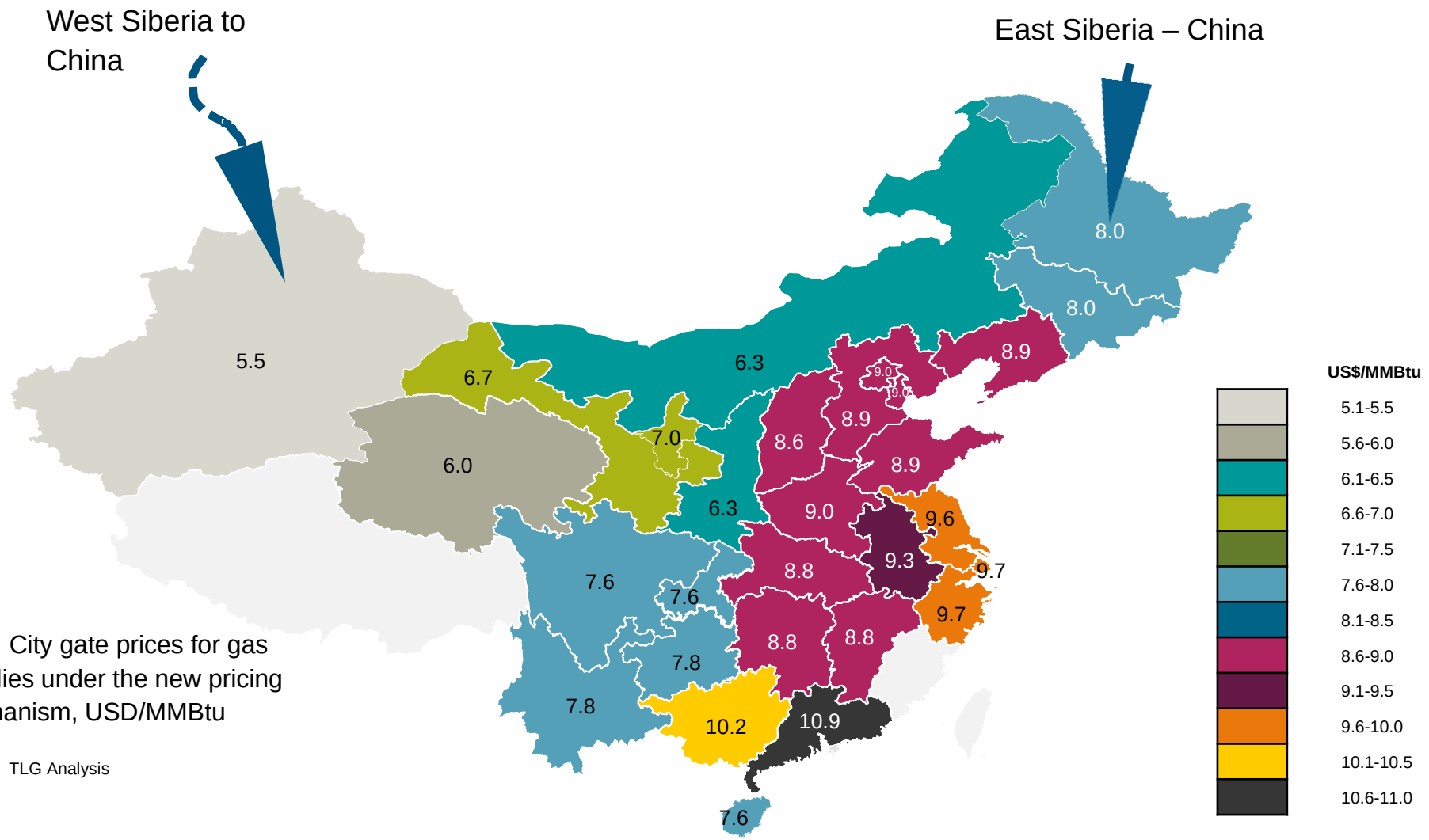
Pricing distortions

- In China the higher price of long term contracted LNG compared to domestic gas has been to an extent absorbed as a loss by the national oil and gas companies.
- Pooling of inexpensive domestic gas with expensive imported LNG has also been used in Southeast Asia by some countries to derive an average price and mask the marginal price.

Asia is still very different to the USA as a gas market

- Very wide range of development – from highly developed countries with developed LNG infrastructure such as Japan, Korea and Singapore….
- … to countries such as Myanmar with an electrification rate of only 30%
- Power is the main driver of gas demand in most Asian economies
- Still a lack of gas-on-gas competition

China is learning quickly about the price of gas – but it has a long way to go to develop the full required infrastructure and arrangements needed



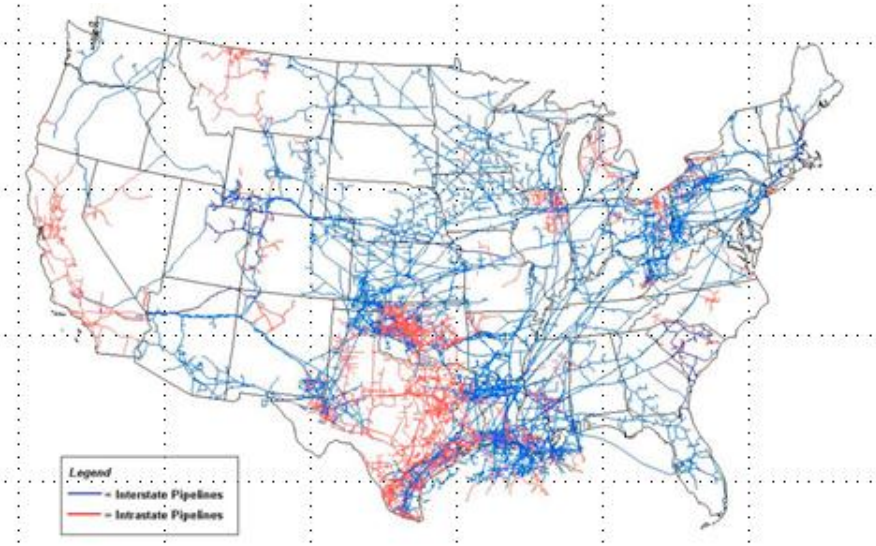
Note: City gate prices for gas supplies under the new pricing mechanism, USD/MMBtu

Source: TLG Analysis

A hint of the scale of build out in China is given by size of US gas transmission

US gas pipeline infrastructure
Inter-state pipeline length – 360,000 km

~4,000 km



Source: EIA

China gas infrastructure, 2015
45,000 km

~4,500 km

Central Asia

Source: PetroChina, news reports and TLG analysis

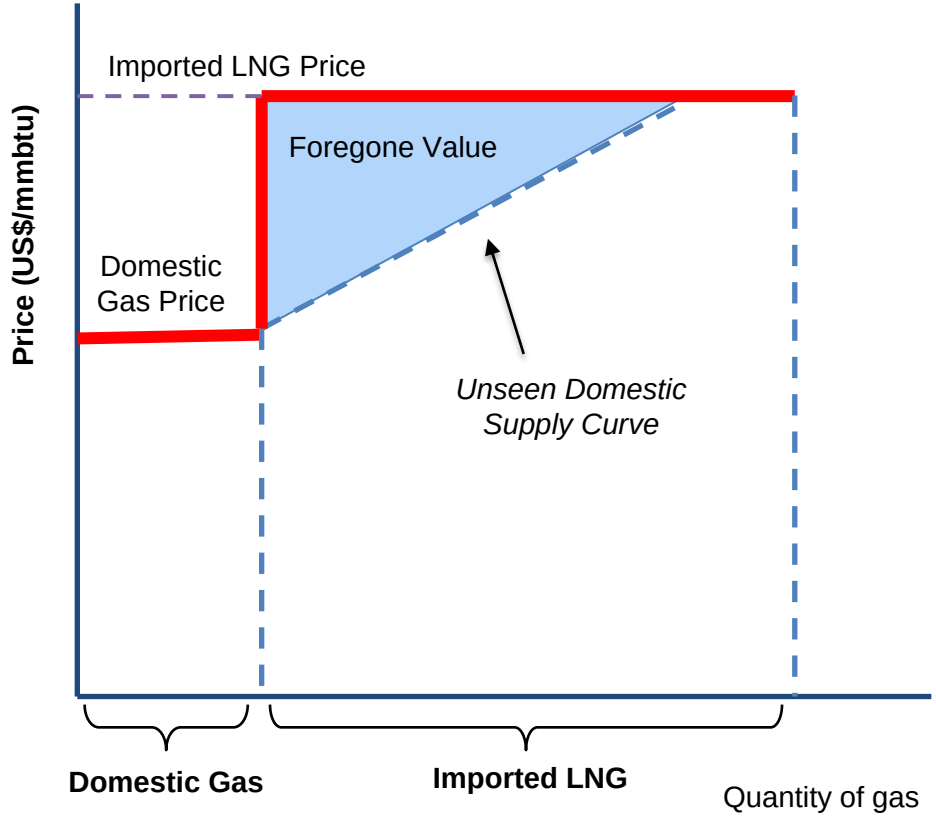
Can the incumbents handle all the new build out?
Probably not so another point in favour of liberalisation to allow in new entrants.

China gas pricing on going reform

Shanghai reference price	• The gas reference price is a mix of the imported price of fuel oil and LPG. • On paper this is supposed to adjust automatically in practice it requires government approval.
Regional prices	• Deducting transmission costs enable netback city gas prices to be derived for all provinces. • This reform has also helped upstream gas pricing as well.
Third party access	• The NDRC has indicated a desire to introduce third party access. Experience from other countries suggests this will be a long process. • That said the incumbents could do with some help on the build out of new transmission.
Shale	• There were hopes by the authorities that the shale gale of the US might in time be repeated in China. • But differences in land and resource ownership, geology, population density, and access to pipelines work against a repeat performance in China.
Russia	• At current oil prices CNPC is probably going to absorb a loss on the first 30 bcma from east Siberia. If the price was set based on a free market hub such events might be avoided.

In many countries in Southeast Asia there is still domestic gas in the ground that would leap to market if it could access the Asian LNG contract price…..

'Kinky' Gas Supply Curve



- Across many parts of the developing world and in Asia there is often the cry "shortage of gas".
- But more often than not it is due to a breakdown in the pricing signals, or sometimes due to the incumbent monopoly blocking gas transportation.
- Or else a strong adverse reaction by the local government to lift local prices to encourage production.
- Often we see dis-continuous price / cost curves all across Southeast Asia, with the exception of Singapore.
- **How quickly will they disappear?**

Global LNG market is entering a phase of increased uncertainty

Old model

- Full investment and financial planning for the whole value chain
  - Careful planning/coordination along value chain before commitment
- Long term off-take agreements with stable pricing and high take-or-pay clauses
- Limited rights on diversions
- Limited recourse project financing

Emerging reality in more global trading-based environment

- Greater flexibility in pricing
- More spot LNG sales, option quantities
- Diversion and arbitrage as a value stream – “flexible network model”
- Sellers taking more of the market risk
- Equity stakes by buyers
- Project sponsors as off-takers, e.g., BG, BP in Atlantic LNG
- Corporate financing, bond markets
- Competition from brown-field developments – Indonesia, Malaysia, and possibly Australia – capital advantage

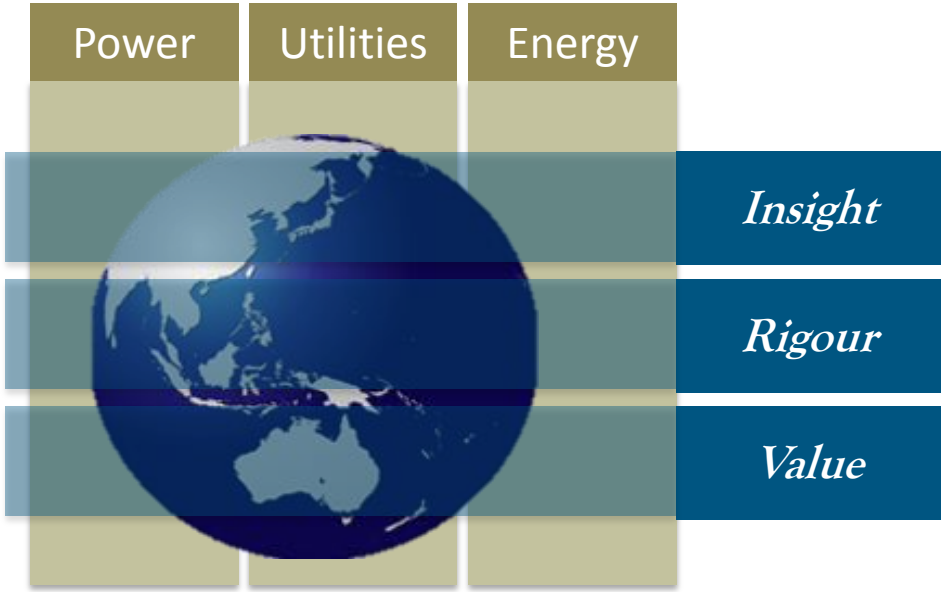
Liberalisation will take time

- The transition to liberalised gas markets in Asia can take time and is a complicated process with substantial historical baggage.
- However, to solve the Asia gas pricing “premium” paradox and move away from oil-indexing in the long term, the transition to a liberalised market may be a necessary process.
- Genuine reform with careful design pays well over time, based on the past experience in the US and Europe.
- In Asia it is economic to build LNG-fired power plants for mid-merit generation
- This will require flexible LNG contracts with a new business models is essential to making this work, especially in the developing countries in Asia.
- If more Asian countries move towards making such economical decision, a liquid LNG benchmark could be potentially formed in Asia Pacific, which would help solve the Asian pricing “premium” paradox and allow Asian buyers to have more pricing power.

And what could it mean for Europe?

- LNG in Europe promotes gas-gas competition with piped supplies and it allows diversity of supply sources in the event of disruptions.
- Low terminal capacity factors assist with the flexibility requirements of seasonal and other disruptions that require a flexible response.
- When Asian (and South American) prices are higher than European prices, cargoes divert away from Europe and European buyers must source their gas from more piped sources than LNG, reducing competition. With price convergence, the piped gas/LNG picture may be more balanced thus allowing more competition between LNG and piped gas.
- Similarly, flexibility only exists when supplies are available to flow in any direction – a more linked global market allows cargoes to divert as required for short term fluctuations allowing more flexible use of gas in both the Asian and European markets.
- There are also opportunities for Europe to gain prominence in the global LNG business. As with Brent oil, could Europe be the place to develop a global LNG pricing hub?
- More liquid European hub prices encourage importers in Europe to index their pipeline natural gas prices to hub prices. This may mean PNG imports from Russia will be more reflective of the fundamental gas supply and demand situation, and less on the oil price fluctuations, which could again provide benefits to European gas buyers.

Thank you



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