



LNG Infrastructure in Philippines

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What drives LNG Infrastructure?

- Economic Drivers
 - The use of LNG is cheaper than some alternative fuel
- Environmental Drivers
 - The use of LNG reduces emissions or other harmful outcomes
- Government Policy
 - Government gives incentives or defines policy that makes LNG more attractive than other options

So what has changed on these in the past year?

- Economic Drivers

- Changes in the oil price are significant since the conference last year. Will this drive more LNG in Philippines?
- Advancement of new gas-fired projects (San Gabriel phase 2 & Avion) and coal fired projects have progressed

- Environmental Drivers

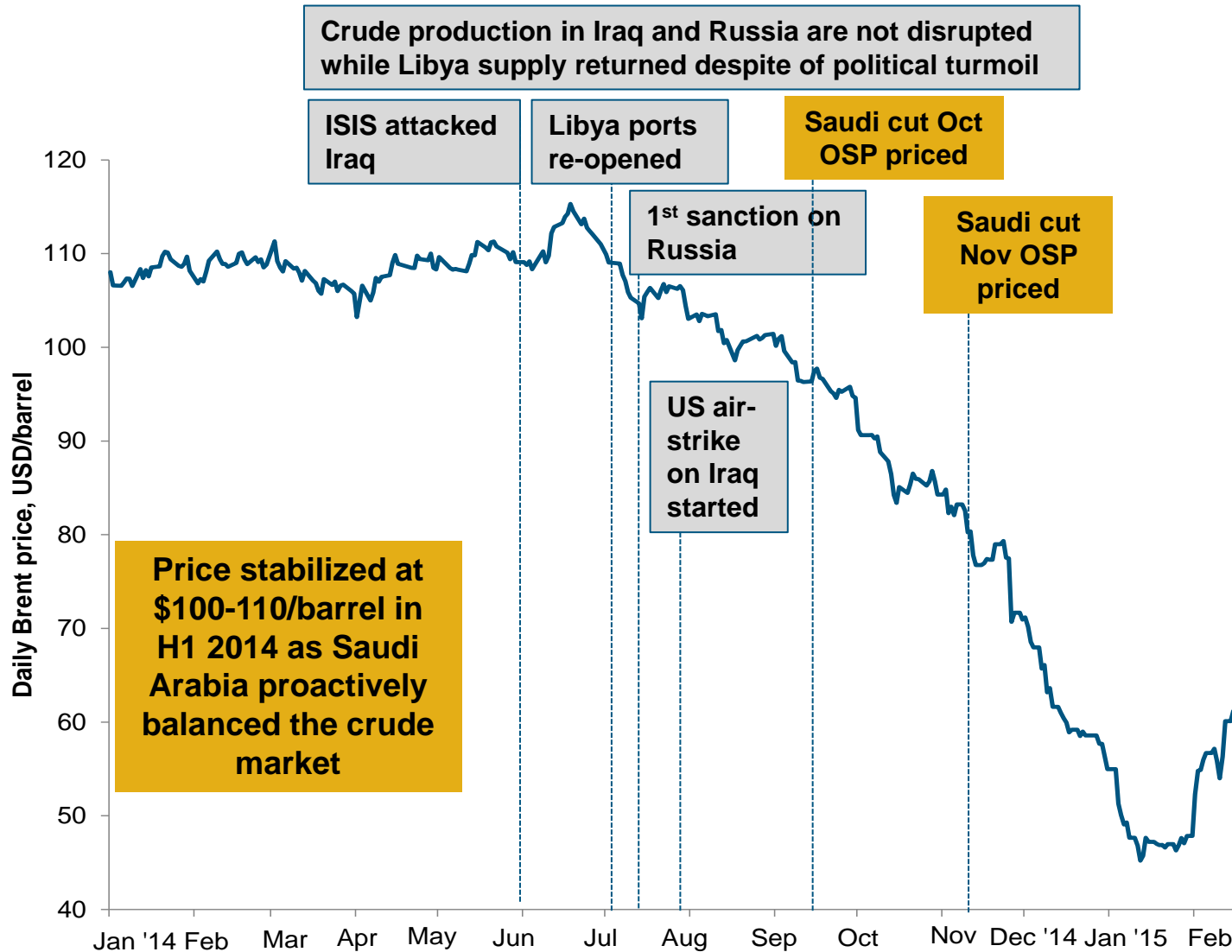
- Expansion of quotas for Renewable Energy
- No change in coal taxation; no overt moves to a “carbon tax”

- Government Policy

- No change
- Gas Master Plan, while completed, has not been published

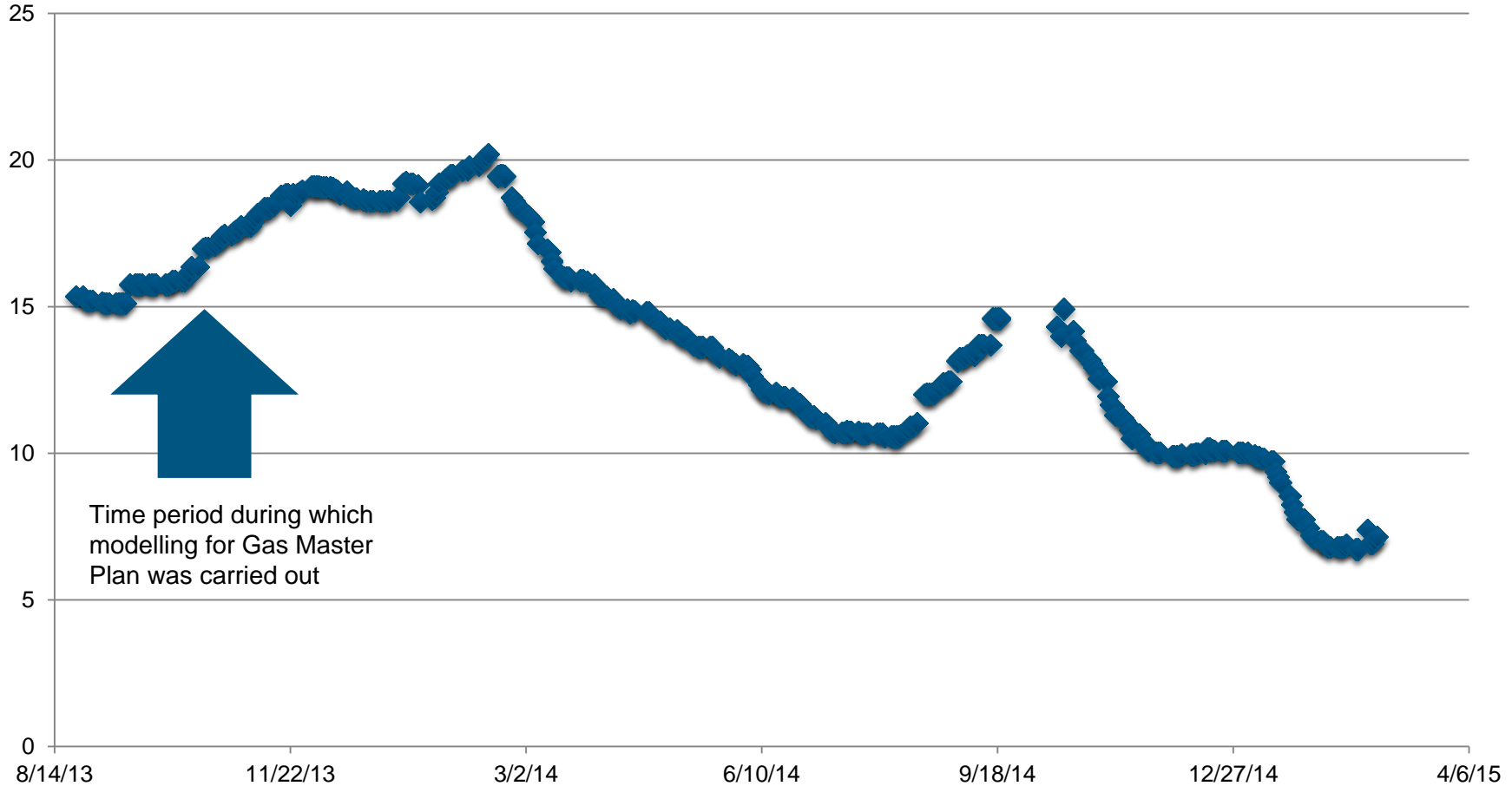
The rest of the presentation will focus mainly on economic drivers

Asian LNG prices are linked to oil prices. Brent has dropped by half from the high level in H1 2014



This is reflected in the spot price of LNG over the last 18 months

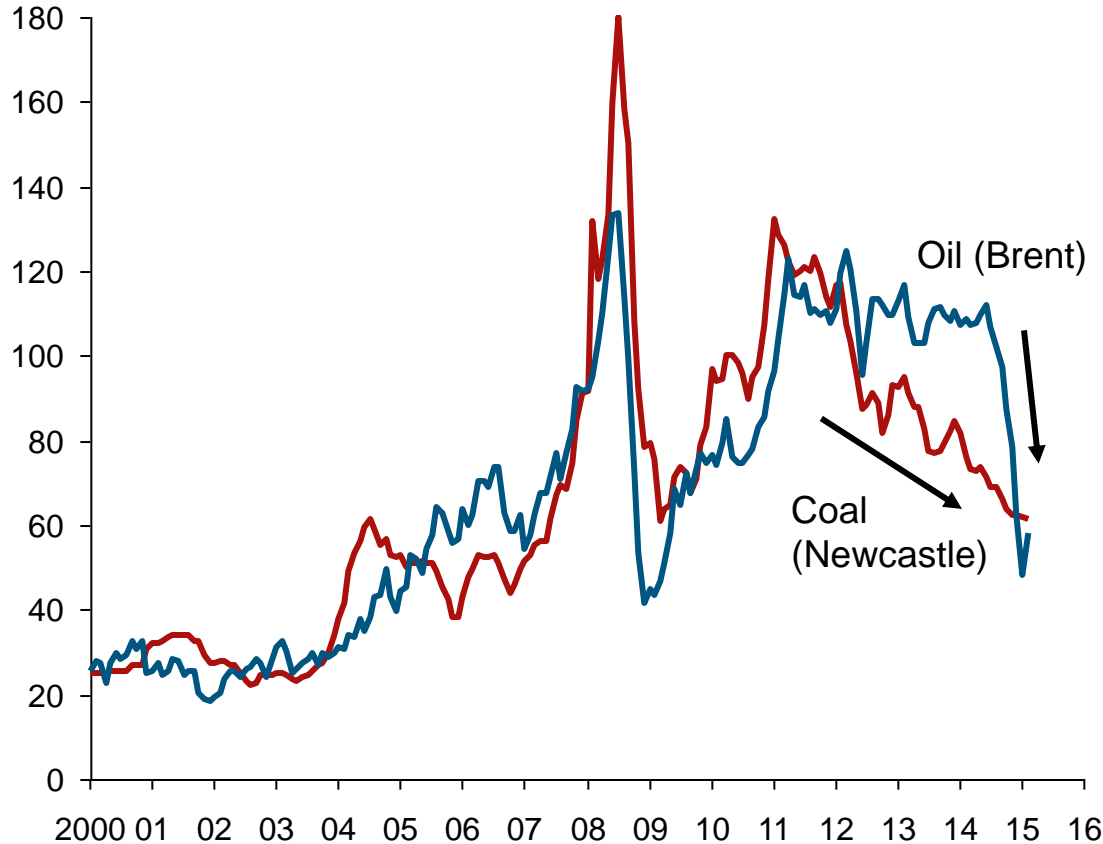
Daily JKM Spot Prices, \$/MMBtu



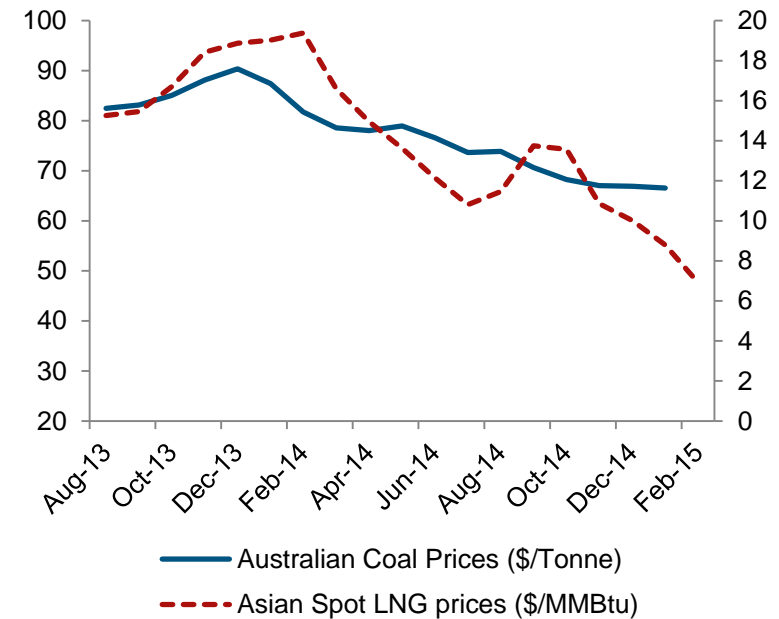
But LNG is not the only fuel to have changed price. Coal prices have also softened gradually since early 2011

Coal and oil monthly prices (2000-Feb 2015)

US\$/MT or bbl

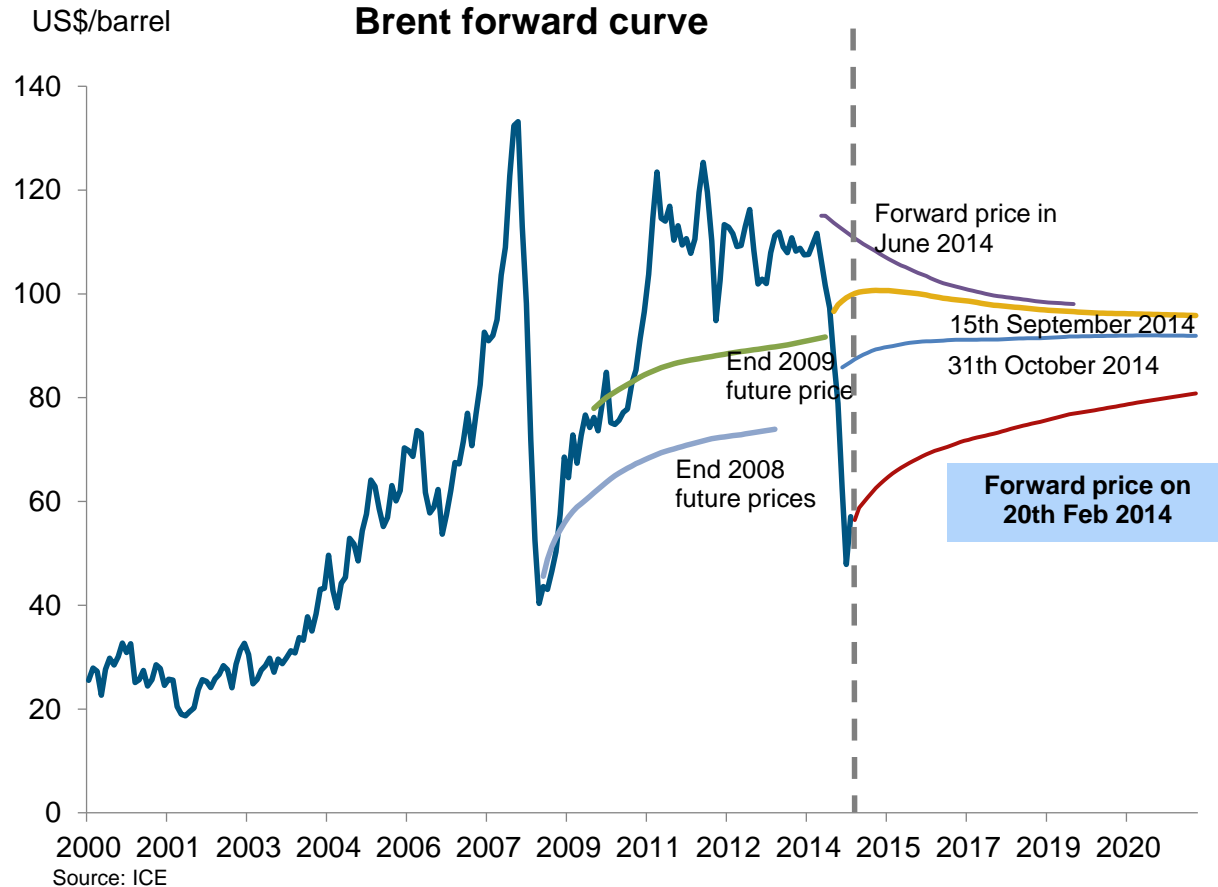


Since the start of the Master Plan process



In addition, we should not forget that the longer term has not changed as much as the short term

- Forward price curves in recent years have been quite consistent



	Dated Brent (\$/barrel)
2013 (historical)	109
2014 (historical)	99
2015 (forecast)	55
2016 (forecast)	65
2017 (forecast)	70
2018 (forecast)	75
2019 (forecast)	80
2020 (forecast)	80

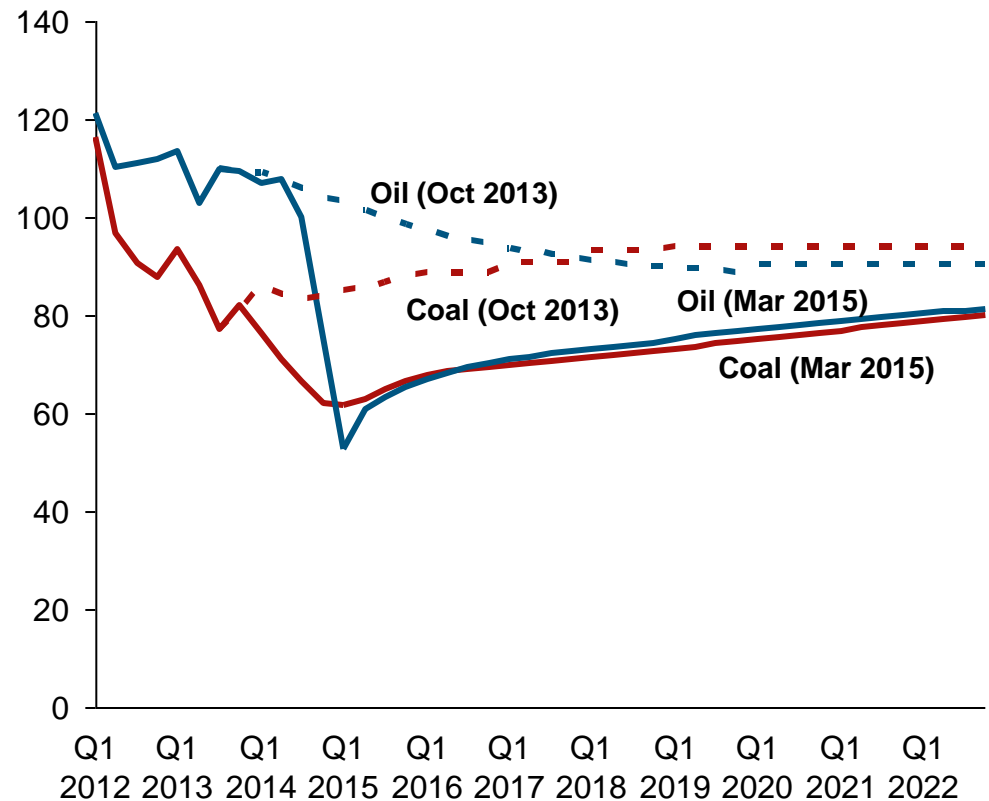
The market thinks that oil (and thus LNG) prices will rise again in the medium term

How does the changing fuel price affect the economic use of LNG in Philippines?

- As part of our Gas Master Plan Phase 1 analysis in October 2013, we modelled the economic use of LNG in the WESM and identified how much new plant burning LNG was economic
- At that time, expectations of future fuel prices were quite different to those now, particularly in the near-term
- To see the impact of lower LNG prices, we have re-run that analysis to see if the outcome has changed

Comparison of oil and coal price projections

US\$/bbl or US\$/mt (2013 prices)

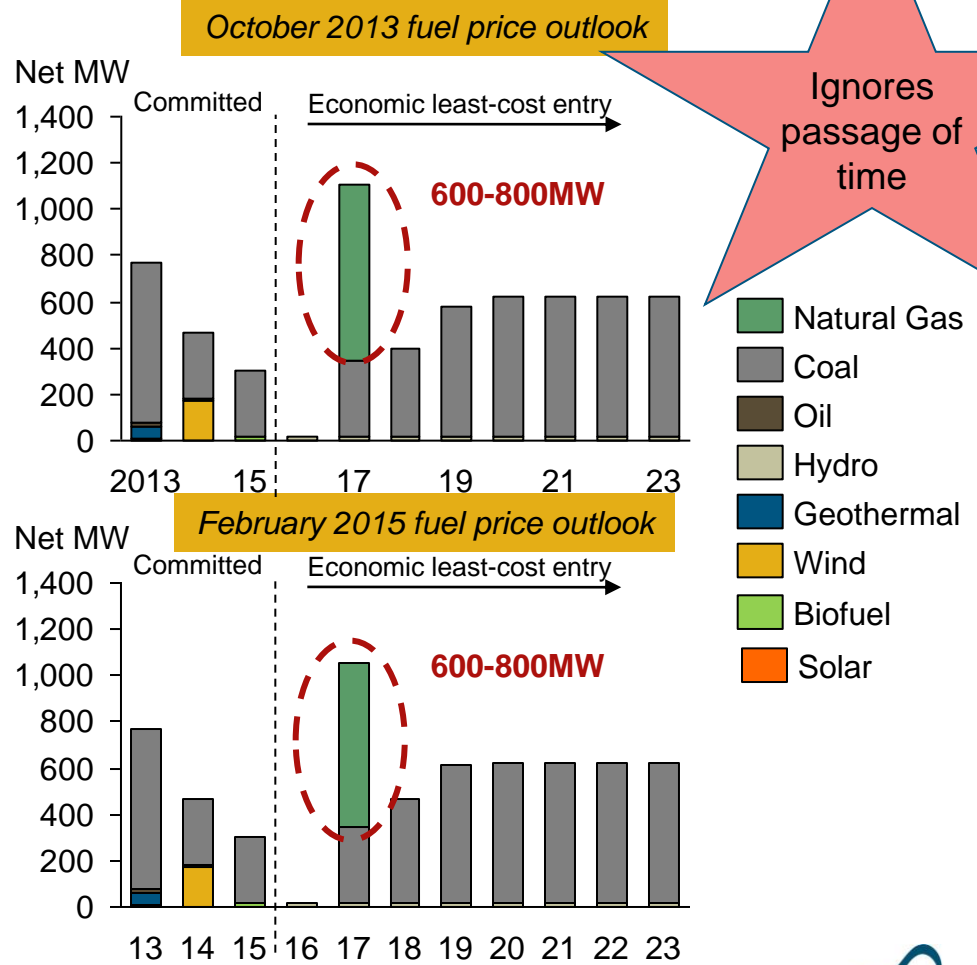


The results are remarkably consistent with the previous analysis – there is still a clear economic role for LNG in the power sector

- The economic new build of CCGT using these updated fuel price assumptions is still about 600-800MW
- If the economic new build were built, these plants would run mid-merit/peaking (varying between 15%-35%) and consume c. 0.1-0.3 mmtpa of LNG
- Existing gas-fired plant would also eventually switch to LNG
- Total demand for LNG in Luzon’s power sector would exceed 0.6 mmtpa

LNG remains a good fuel for mid-merit and peaking operation but it is unlikely to be an economic baseload fuel

Least-cost capacity expansion plan for Luzon under expected assumptions



Taking into account the passage of time, other developments also affect the need for more gas-fired capacity and ultimately more LNG demand



- Option to use Malampaya gas supports more gas-fired capacity

- As anticipated but not then certain, FirstGen’s San Gabriel phase 2 and Avion have since achieved financing and are under construction
- They plan to eventually use Malampaya gas and ultimately LNG
- Changing the way Malampaya gas is used supports the entry of more gas-fired capacity and ultimately more LNG



- Additional renewable impacts on system

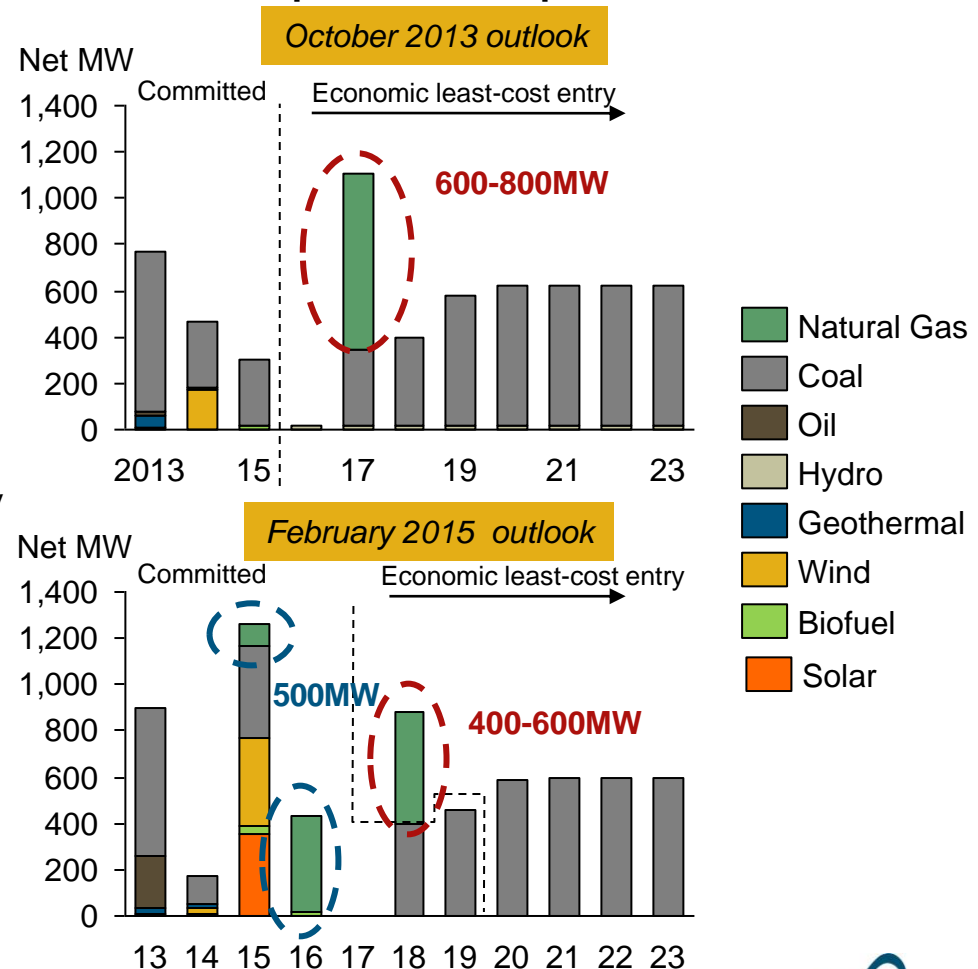
- Significantly more solar and wind capacity appears likely in response to Government policies increasing total available capacity
- More intermittent generation may require more flexible plant in the system to respond to times when solar and wind are unavailable



- Reduced incentives to build peaking capacity

- Lower offer price cap and new secondary price cap decrease the incentives to build new gas-fired capacity

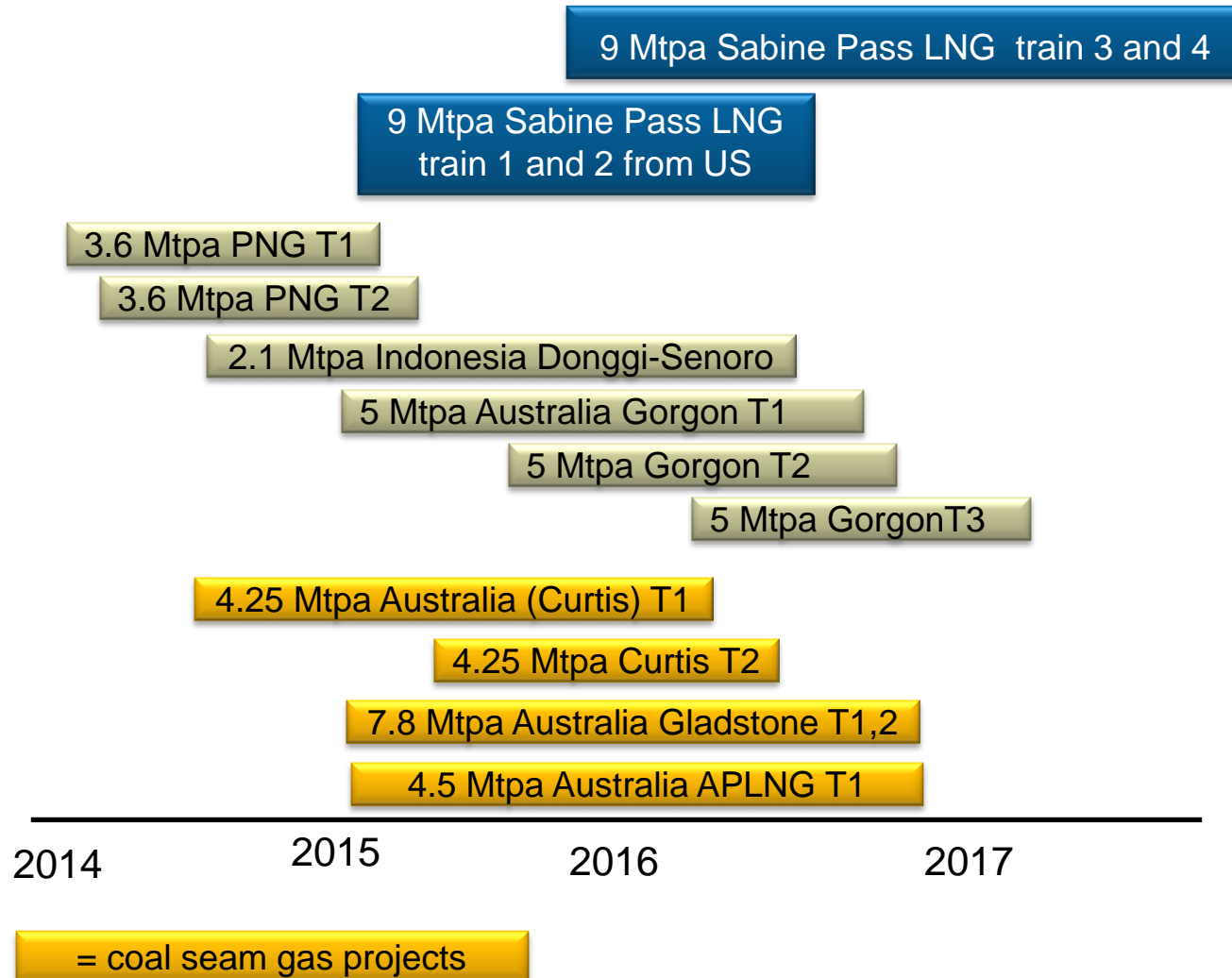
Least-cost capacity expansion plan for Luzon under expected assumptions



Key factors that could affect economics of LNG remain uncertain

- Malampaya supplies after expiry of current GSPAs and SC38
 - Quantities
 - Pricing
 - Degree of flexibility
- WESM offer price cap, secondary price cap and other market interventions
 - Provide lower incentives for investors by seemingly reducing ability to make required returns on investment
 - We are already seeing various potential investors pulling out of the market
- Regulatory framework for contracting with power offtakers
 - ERC rules still under development
 - Uncertainty over long-term direction of retail market (no gentailers?)
- Demand growth
 - Economic expectations falling below Government targets?

The good news is that new LNG supplies should push down spot LNG prices in Asia....



...the bad news is that lower oil and LNG prices mean that some projects have now been delayed or cancelled

For example:

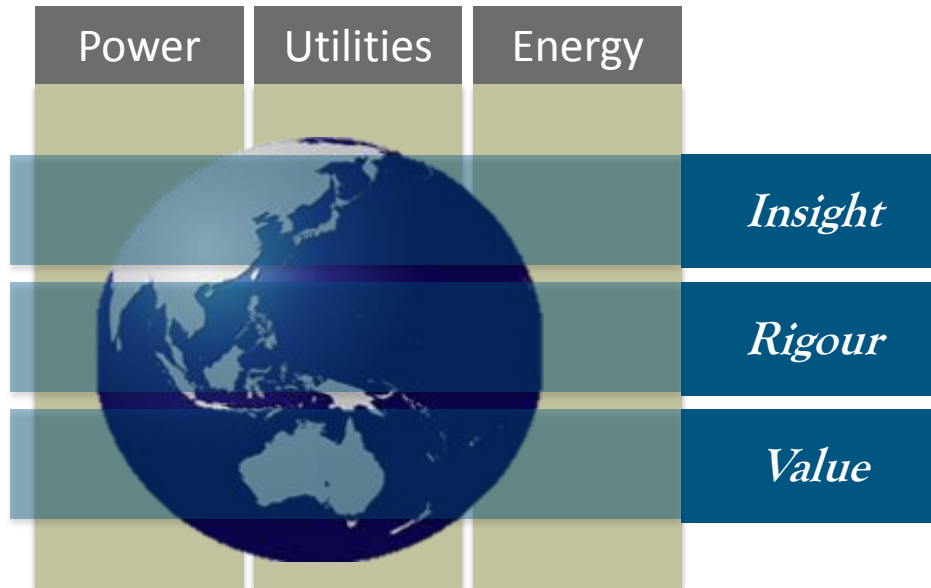
- Petronas has delayed making a final investment decision on plans to export liquefied natural gas from British Columbia
- BG Group said it was delaying a decision on the Louisiana LNG project
- Shell has cancelled plans for the Arrow LNG project in Queensland, Australia
- Woodside has delayed the investment decision on the Browse floating LNG project off Western Australia. The Chevron-operated Gorgon project in Western Australia is also running late.
 - Cost over runs are also plaguing Australian LNG projects, making new projects less certain

Most of these cite low LNG prices as the cause of the delay or cancellation

In summary, the message remains substantially the same as last year, despite the large global changes in prices

- LNG is economic in the Philippines for mid-merit operation
- The volume of LNG required is modest
- There remain challenges in bringing LNG into the Philippines and incentivising the market to build and burn the economic quantity of LNG

Thank You



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