Qenos

12 April 2021

LNG Netback Price Series Review
Australian Competition and Consumer Commission
LNGnetbackreview@accc.gov.au | www.accc.gov.au/gasinquiry

To whom it may concern,

Qenos Submission: Response to the ACCC review of the LNG netback price series

Qenos welcomes the review of the LNG netback price series by the Australian Competition and Consumer Commission (ACCC). Qenos acknowledges the work undertaken by the ACCC to rapidly develop an LNG netback price series as part of its Gas Inquiry to improve market transparency.

As outlined in the ACCC Issues Paper (18 March 2021), the prices published by the ACCC in the LNG netback price series are short-run LNG netback prices, based on the Japan Korea Marker (JKM) published by S&P Global Platts as a representation of Asian LNG spot prices. In a well-functioning gas market, adequate supply is developed for export and domestic demand at prices that allow the manufacturing sector to compete on the global stage. Despite Australia's apparent advantage of an abundance of gas, domestic gas is not readily available at internationally competitive pricing. Structural changes to the current ACCC LNG netback price series methodology are essential to deliver this. A revised netback series must incorporate a long run netback pricing basis, it must also be compatible with the future global LNG industry market structure, and allow for appropriate returns along the entire gas value chain, thereby benefitting the entire Australian gas industry.

Qenos has undertaken an extensive review of Australia's current domestic gas prices and alternative pricing mechanisms. These changes, if adopted, will further enhance the relevance of the LNG netback price series into a true and transparent 'domestic reference price.' All major globally traded commodities have a transparent price index, e.g. iron ore and jet fuel, and gas sold into the Australian east coast domestic market should be no different.

The detailed submission input is included in a table format below. A summary of the key changes required are:

1. Reference LNG price marker

An appropriate reference is a gas-on-gas price marker that is deep and liquid. Henry Hub, the leading global gas marker, should be used as the basis for the Australian domestic LNG netback price appropriately adjusted for US export and transport costs into the North Asian market. The US is increasingly the global LNG price setter given the US industry's scale, low cost and increasing LNG capacity. At least one major Australian domestic gas producer has recently announced that US LNG delivered to Asia is expected to set the price for new supply[1].

[1] Santos 2020 Investor Day Presentation, 1 December 2020, p. 21.

Compared with JKM, the Henry Hub price is a gas on gas marker, has deep liquidity, is set by actual trades monitored by an independent competition regulator and provides a deep futures market that provides a platform for a long term LNG netback basis which allows all market participants to manage their price risk and exposure.

2. LNG plant capital costs

The LNG netback pricing methodology should be based on long-run costs that reflect a competitive market and deduct the capital and fixed costs associated with operating, developing and constructing the LNG infrastructure. The fundamental premise is that domestic gas should not be more profitable than export gas. Domestic gas is not processed by LNG export facilities so it should not incur these costs. Australian domestic consumers should not be contributing to the capital cost recovery for an asset that is not part of the domestic supply chain and that was sanctioned based on long term export contracts generating this capital recovery. Producers don't incur these costs in supply the domestic market, therefore domestic consumers should not be funding export capital. LNG export capital should be recovered through long term export contracts, not through domestic customers.

In other markets such as the US, the LNG sector is not integrated with upstream producers. Producers receive long-run prices and only pay for export capital through tolling arrangements for LNG export facilities. Domestic gas prices for consumers, producers and exporters alike reflects long-run gas-on-gas pricing that operates in a deep liquid properly functioning market.

Ultimately, a long run netback pricing basis is required in order for the Australian gas industry to be globally competitive and underpin new LNG export investment in the future.

3. LNG plant costs

Liquefaction and pipeline cost assumptions used by the ACCC should be updated to incorporate the actual costs of these services.

Qenos provides feedback on the specific issues as follows:-

The length of the forward LNG netback price series

QUESTION	RESPONSE
1. Whether there would be merit in the ACCC publishing a longer-term LNG netback price series.	Qenos' preference is generally to enter into longer term gas contracts, particularly for feedstock supply in order to underpin major plant maintenance re-investment. Qenos notes that producers in recent years are generally reluctant to offer longer term contracts (3+ years) and will incorporate additional price risk premiums into longer term offers (if offered). A longer-term forward LNG netback series therefore has genuine merit as long as the

	structural issues to the current LNG netback price methodology are addressed. Alignment to a global gas on gas marker with sufficient long-term liquidity such as US Henry Hub is critical to developing a longer term price series. JKM has inadequate liquidity, is a market survey, with its limitations exposed over a longer forward period.
2. The most appropriate period, or periods, over which to publish forward LNG netback prices, based on market trends in LNG markets and the east coast gas market.	The price series could readily be improved to include a 2,3,4,5 and 10 year forward curve by aligning to a liquid global marker such as the Nymex / CME Group's Henry Hub price. Note there is likely limited value in monthly data beyond a 2 year forward view. An annual forward price reference for any LNG netback series beyond a 2 year forward outlook should be sufficient for most stakeholders.
3. Whether the ACCC should publish multiple forward LNG netback prices, based on different periods (to inform pricing for different GSA terms).	As above.
4. How important it is that the length of the forward LNG netback price series is consistent with the duration of domestic GSAs.	The ACCC LNG netback series in its current format only plays a minor role in domestic GSA negotiations to assist pricing transparency. Publishing a price series over various periods may have a moderate increase in importance. Crucially, a more liquid longer term marker reference (e.g. Henry Hub) enabling longer term forward curves to be developed would materially increase the LNG netback series utilisation through providing a platform which allows all market participants to manage their price risk and exposure.
5. Whether there are relevant market benchmarks for a longer forward LNG netback price series, or methods/approaches to deriving such market benchmarks.	The ACCC states in its review (section 2.4, p. 18) that a lack of available data has limited the ACCC's ability to publish a longer forward period due in part to the illiquidity of the JKM futures market compared to the more mature derivatives markets. The most relevant market benchmark for a longer forward LNG netback price series is the US Henry Hub given its deep liquidity of trading by financial institutions and the US's increasing relevance as the global LNG price setter.
6. Issues that should be considered in calculating a	In publishing a longer term price series, the ACCC will need to consider alternative sources of data on longer

longer-term LNG netback price series.	term LNG freight costs or alternatives to deriving such benchmark.

LNG price

7. The influence of international gas markets on pricing in the east coast gas market.	Refer 8.
8. The relevance of different international LNG and gas price markers for LNG pricing in key LNG export markets and the east coast gas market.	In developing a robust Australian East Coast gas pricing mechanism, the leading global gas marker, Henry Hub, should be used as the best reference as it will set the benchmark for future competitive gas supply globally. US gas is expected to be the price-setter for competitive gas globally, by being: • The largest source of global gas supply growth over the next decade.[2] • The large source of LNG supply growth globally and in the Asia Pacific over the next 20 years Henry Hub-priced gas is becoming the benchmark for competitive gas production and supply globally, given the position of US gas exports on the global gas supply curve. Evidence of this is cited in numerous industry sources, including:- "*LNG pricing is increasingly driven by US and European gas hub prices plus transport*"[1] "*US LNG delivered to Asia…expected to set price for new supply* "[1] "*The large block of US projects is expected to be the marginal supply…the long-term market clearing price for LNG reflects full cost of supply from US projects*"[2] *The US Henry Hub price…serves as a global reference price [for natural gas] due to a large LNG export industry actively seeking arbitrage opportunities*"[3] "*The abundance of shale volumes being produced and exported from the US has made Henry Hub a global price reference.*"[4]

	The Henry Hub marker has key advantages over the existing JKM marker being:- • Strong liquidity • Price transparency of traded volumes set by gas supply and demand vs JKM's market survey approach involving at times few participants • Market monitored through an independent competition regulator [1] Santos 2020 Investor Day Presentation, 1 December 2020, p. 21. [2] Energy Insights 'Global gas and LNG outlook to 2035' (H1 2019) [3] IEA World Energy Outlook 2019 [4] IGU 2020 World LNG Report
9. Whether the relevance of different LNG and gas price markers is different for short term versus long-term LNG netback prices.	The global LNG pricing trend for long term contracts is shifting from oil to gas-linked. Gas-linked pricing arrangements as a proportion of total global gas imports increased from 33% to 54% for the decade to 2019, with oil-linked decreasing from 62% to 42%.[5] US exports linked to Henry Hub are expected to provide the marginal supply for the LNG industry over the time periods commonly negotiated for domestic GSA's (1 to 5 years). [5] IGU Wholesale Price Survey 2020 Edition
10. Whether the relevance of different LNG and gas price markers, for the LNG netback price series, is likely to change over time.	Refer 8 and 9.
11. Whether the ACCC should consider additional methodological approaches, such as averaging, to account for the impact of price volatility of price markers on calculated LNG netback prices.	An advantage of a Henry Hub marker is that it is less volatile than marker references such as JKM, potentially due to its deeper liquidity. As such a Henry Hub reference may negate the need to consider such additional methodological approaches, thereby improving the value of the series by ensuring that short term volatility does not disguise longer term trends.
12. Any other issues that should be considered when determining which LNG and gas reference price should be used for the ACCC LNG netback price series.	-

LNG freight costs

13. Available data sources for longer-term LNG freight	Qenos understands that Argus is not the most widely used reference in the market. Other sources such as the

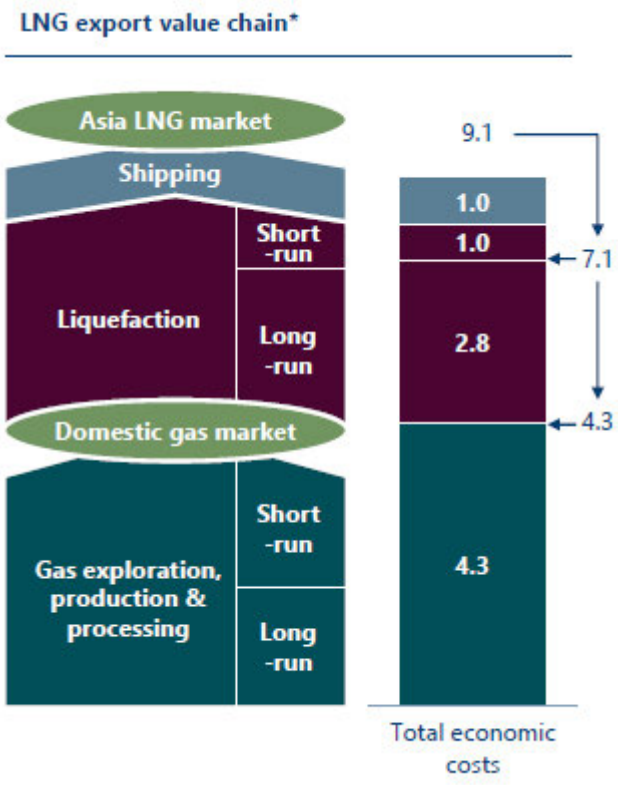
rates (beyond a period of two years), and whether the appropriate data source would be different if different international LNG and gas price markers were used to calculate LNG netback prices.	Baltic exchange marker publish Gladstone to Japan forward curves up to three years and is more aligned with the actual market. Extrapolation may be required for longer term netback calculations. A US Gulf Coast to Japan reference on the same reference source is also be required for a Henry Hub based LNG netback.
14. Whether northeast Asia should be considered the appropriate delivery location for the purposes of estimating LNG freight costs for LNG exported from Gladstone.	North East Asia is the appropriate delivery location. An LNG netback price mechanism with a Henry Hub starting price would add US Gulf Coast to Asia LNG freight costs (as well as US liquefaction costs) to determine a Delivered Asian reference price. Then subtract Gladstone to Asia LNG freight costs (as well as other LNG cost components).
15. Any other issues that should be considered when sourcing longer-term LNG freight rates.	-

Conversion to $AUD/GJ

16. Whether the ACCC's current approach to converting FOB LNG prices to $AUD/GJ is appropriate.	A five-day average of exchange rates published by the Reserve Bank of Australia is acceptable for the purpose of converting $USD to $AUD, however referencing currency futures aligned with the relevant period should be considered particularly given the potential of a longer term price series.
17. Alternative approaches that should be considered by the ACCC.	-
18. Any other issues that should be considered when converting FOB LNG prices to $AUD/GJ.	-

LNG plant costs

19. Whether the ACCC's current approach to deducting LNG plant and liquefaction costs is appropriate.	The ACCC's current approach to deducting LNG plant and liquefaction costs is not appropriate. The current approach using short-run marginal cost assumptions is reflective of an industry structure that does not deliver competitive market behaviour. This is as a result of the LNG industry being vertically integrated into gas production and highly concentrated with limited independent domestic supply. Over 75% of East Coast 2P reserves are owned by LNG exporters. Effectively a short-run netback basis locks in

	pricing into domestic markets by LNG and domestic producers that captures returns on export capital. Domestic gas is not processed by LNG export facilities so it should not incur these costs. Australian domestic consumers should not be contributing to the capital cost recovery for an asset that is not part of the domestic supply chain and that was sanctioned based on long term export contracts generating this capital recovery. Producers don't incur these costs in supply the domestic market, therefore domestic consumers should not be funding export capital. LNG export capital should be recovered through long term export contracts, not through domestic customers. The fundamental premise is that domestic gas should not be more profitable than export gas. The schematic below illustrates this issue. 
20. How LNG plant and liquefaction costs should be accounted for when calculating the LNG netback price series.	In a well-structured competitive market, domestic gas prices should reflect long-run (not short-run) netback prices. The LNG netback pricing methodology should be based on long-run costs and deduct the capital and fixed costs associated with operating, developing and constructing the LNG infrastructure. A domestic mechanism based on long-run netback prices ensures export capital is recovered in

	export, not domestic markets, providing globally competitive gas for domestic users, particularly in trade-exposed industries. In other markets such as the US, the LNG sector is not integrated with upstream producers. Producers receive long-run prices and only pay for export capital through tolling arrangements for LNG export facilities. Domestic gas prices for consumers, producers and exporters alike reflects long-run gas-on-gas pricing that operates in a deep liquid properly functioning market. Ultimately, a long run netback pricing basis is required in order for the Australian gas industry to be globally competitive and underpin new LNG export investment in the future. Independent analysis commissioned by Qenos shows that long-run netback prices are sufficient to incentivise production and development of 2P reserves and do not have a large impact on excess LNG producer returns.[6] In addition to a shift to a long-run basis, LNG plant and liquefaction costs used by the ACCC should be updated to incorporate the best available assumptions. Refer specific comments addressed against Question 23 relating to LNG plant opex costs and plant efficiency. [6] Information available to ACCC on request
21. Whether different approaches to LNG plant costs should be used for different reference price markers.	-
22. Whether different approaches to LNG plant costs should be used for short-term and longer-term LNG netback prices.	No. A robust domestic gas pricing mechanism that incorporates the long-run capital costs should be used for both short-term and longer-term LNG netback prices – refer responses in Questions 19 and 20.
23. Any other issues that should be considered when accounting for LNG plant and liquefaction costs.	<u>LNG plant opex costs</u> The ACCC notes in Section 2 of the Issues Paper that it "uses information obtained periodically from the… LNG producers to estimate LNG plant costs." Qenos notes that the published data on the ACCC website does not appear to have changed since it was first published and still references CY 2017. Refer table below from the ACCC website (LNG netback price series – Public version – 1 April 2021.XLXS). Qenos requests the ACCC review and update this data.

	<table><tr><th>Marginal costs</th><th>CY 2017</th></tr><tr><td>LNG plant opex ($/GJ)</td><td>0.06</td></tr><tr><td>Transport cost to LNG facility ($/GJ)</td><td>0.04</td></tr></table> <u>LNG plant efficiency</u> For LNG plant efficiency, Section 2 states the ACCC uses "regression analysis to measure the marginal LNG plant efficiency for each LNG producer over a given quarter….by considering the amount of LNG that is produced for every additional unit of gas that is fed into the LNG plant." Qenos agrees with this methodology, however notes that the efficiency quoted does not appear to be following this methodology and does not appear to have changed since initially referenced based on a CY 2017 LNG plant efficiency of 94.5%. Refer table below from the ACCC website (LNG netback price series – Public version – 1 April 2021.XLXS). <table><tr><th>Marginal LNG plant efficiency</th><th>CY 2017</th></tr><tr><td>CY 2017</td><td>0.9450</td></tr></table> Data from APLNG and GLNG (Sep '19 to Jun '20 quarters) indicates an alternative of ~92% (range 88.9% - 93.2%). Qenos requests the ACCC review and update this data.

Pipeline transportation costs

24. Whether the ACCC's current approach to deducting pipeline transportation costs is appropriate.	As per Qenos' input to the "LNG plant costs" section addressed in Question 19 and 20 above, Qenos considers that LNG producers' long-run fixed and capital costs for pipeline transportation to the Gladstone LNG facilities should be referenced in the LNG netback calculation methodology. Qenos' observation is that the $0.04/GJ marginal cost is low when compared against transportation tariffs quoted for other east coast pipelines even when factoring in the relatively short distance, presumably as capital cost recovery is not being "charged." Other industry sources such as EnergyQuest that reference netback pricing use a higher basis of approximately $0.28/GJ for pipeline transportation to Gladstone within their calculation.
25. How pipeline transportation costs should be accounted for when calculating the LNG netback price series.	Refer Question 24.

26. Whether different approaches to pipeline costs should be used for short-term versus longer-term LNG netback prices.	Full capital cost deduction of transportation costs should be used for both short and longer-term LNG netback prices.
27. Any other issues that should be considered when accounting for pipeline transportation costs	-

Qenos is available to discuss its response and provide further detail regarding the proposed changes to the LNG netback series. Please direct any enquiries to myself or Campbell Thomas, Feedstock & Energy Manager at [redacted] or on [redacted]

Yours sincerely,

[redacted]

Stephen Bell

Chief Executive Officer

Qenos Pty Ltd

About Qenos

As Australia's only producer and leading supplier of polyethylene and ethylene, Qenos is a strategic manufacturing business of national interest. With manufacturing operations located in Altona, Victoria and Botany, NSW, Qenos is a large employer (650 direct employees and 350 contractors) with annual revenue of $800m, and payroll and other taxes of approximately $60m pa. Polyethylene is a critical raw material used as an essential input by hundreds of Australian polymer processors to manufacture products such as milk bottles, water tanks, pipes and packaging.

Qenos adds value to Australia's natural resources with over 24 PJ/a of ethane gas (a co-product of natural gas processing) supplied by Santos / Beach Energy and Esso / BHP as a feedstock to produce ethylene and polyethylene. Qenos sites also use 7 PJ/a of natural gas and 40 MW of electricity.