10 September 2015

John Pierce
Australian Energy Markets Commission
PO Box A2449
Sydney South NSW 1235
Submitted via AEMC website - GPR0003

Dear John,

RE: Wholesale Gas Markets Discussion Paper

Thank you for the opportunity to provide comment on the Wholesale Gas Markets Discussion Paper (Discussion Paper). We note the Discussion Paper provides stakeholders with the opportunity to comment on three high level market design concepts that have been designed to focus the debate on key elements of gas market design.

Stanwell's interest in the gas market is as a trader of gas and industrial buyer for the gas-fired Swanbank E and Mica Creek power stations. Swanbank E power station has a capacity of 385MW and is located 10km from Ipswich, QLD. Mica Creek power station is 218MW and is located near Mount Isa, QLD. Stanwell is an active participant in the Brisbane STTM and Wallumbilla hub.

Stanwell supports the AEMC's high level consideration of the number and type of facilitated markets on the east coast. We have found that considering the three high level market design concepts has helped to evolve our thinking on the ideal future gas market. We expect that the AEMC's work will form part of the COAG Energy Council's vision for the long term development of the east coast gas market.

Stanwell supports physical gas hubs

After extensive research and analysis, and based on our experience at the Wallumbilla hub, Stanwell's preference is for the east coast gas market to evolve based on physical hubs rather than virtual hubs[1]. Stanwell's long term vision for the gas market is for one modelled on the US market with:

1. Logical commodity pricing points representing physical locations on the gas network (points at locations such as Wallumbilla, Moomba, Iona etc)
2. Long term contracts under which shippers pay cost based tariffs which underwrite the building and maintenance of pipeline capacity. These tariffs could be set by the Australian Energy Regulator based on recorded construction costs.
3. A transparent and competitive market in the resale of rights to use pipeline capacity. When setting tariffs, the Australian Energy Regulator could also authorise highly-specific, point-to-point capacity rights in order to create a secondary market in pipeline

[1] Virtual gas hubs were previously supported by Stanwell in our vision for the east coast gas markets in our submission to the AEMC's Public Forum Paper, March 2015, http://www.aemc.gov.au/getattachment/be67404a-42bc-4236-a845-f6406a377adb/Stanwell.aspx

capacity. These capacity rights could be segmented to cover the gas network between logical pipeline "break" points.

Importantly, this is a long term vision which can be achieved over time by making small incremental changes without compromising existing property rights. As discussed on page 6, the regulatory environment of the east coast gas market has proven successful by the fact that it has facilitated the establishment of a large LNG industry.

Virtual hubs lead to inefficient price signals for network investment

Unlike the electricity network, gas from producers to consumers follows a predictable and measurable path. Despite the co-mingling of gas from different sources, it is easy and transparent to measure the gas flows into and out of the pipeline at each location.

Traditionally gas transport has been procured based on the desired gas route from source to customer. In addition, gas pipelines have been constructed as a result of a collection of foundation long term contracts or built by a producer and sold to a pipeline company with a Gas Transport Agreement (GTA) in place. These investments are "efficient" as the customer has made the decision to invest[2].

Virtual hubs obscure the distance based price signals that would otherwise emerge. As a result, the pipeline owner must over-build the pipeline system to prevent congestion:

> *Prohibiting the use of point-to-point contracting… obscures the distance-based price signals that would otherwise emerge naturally on comparatively low-technology gas pipeline systems. In the absence of such signals, the system operator must either 1) over-build the pipeline system to prevent congestion or 2) live with occasional periods of congestion and the associated costs to gas consumers who cannot procure the most economical fuel or who have to generate electricity by more expensive methods. From the perspective of the social cost to the pipeline system, both options are wasteful - one devotes too much capital to pipeline capacity and the other provides too little service.* [3]

Virtual hubs require complex entry and exit tariffs

Virtual hubs require the pipeline transport system to act like a large vessel with one charge to "enter" the vessel and another separate charge to "exit". The sum of these two non-linked charges constitute the transport tariff. Because the tariff conceals the distance between the gas source and the customer, efficient distance-based price signals are obscured. The cost and complexity of this regime is revealed in the British Gas example:

> *Under the entry/exit regime, all gas on the British Gas system was assumed to travel to a central, hypothetical "national balancing point (NBP) from which it was*

[2] This is opposed to the electricity network where efficient point to point transport contracting is impossible. This is because it is impossible to predict where a particular power plant's output will go at a particular point in time. This means that the operation, pricing and expansion of the transmission grid must be regulated.

[3] Makholm, J. D. 2015. Regulation of Natural Gas in the United States, Canada and Europe: Prospects for a low carbon fuel. *Review of Environmental Economics and Policy:* 13

subsequently shipped back to its respective users. Creating a transactions and balancing regime for this entry/exit model proved difficult and costly. As of 1996, four years after its start, the commercial and logistic side of the regime, called the "Network Code" had cost British Gas alone in excess of £180 million and viewed as difficult, obstructive, and unfair by gas users and shippers.[4]

The entry/exit regime is also hindering efficient market outcomes in the European market:

Another potent barrier to competitive inland gas transport across the European Union lies in the apparent wholesale adoption of the UK-style entry/exit pricing in the 2009 legislative actions, to the specific exclusion of pricing based on the use of particular point-to-point pipeline facilities - the basis for such competition in the United States… As in the United Kingdom, such an oddball pricing scheme for inland transport, comprising otherwise easily identified capital-intensive pipeline facilities, is more a barrier to pipeline entry than anything else - particularly in its manifest inability to reflect any sort of efficient pricing and utter hostility to forming reasonable long-term capacity contracts.[5]

Further benefits of physical hubs

Markets need both standard and bespoke products. This can be achieved by voluntary markets for liquid standardised (ie. exchange traded) products in conjunction with bilaterally negotiated agreements for non-standard products. Physical hubs allow for both product types whereas virtual hubs do not allow for the latter.

The market is constantly evolving and a market design which includes physical hubs is readily scalable. For example, if the proposed Northern Territory gas pipeline eventuates, a physical hub could be set up at the interconnection between this pipeline and the existing pipeline network. However, under a virtual hub arrangement, the hub would need to be reconfigured to incorporate the new pipeline with probable changes to entry and exit tariffs around the node.

It is sometimes argued that virtual hubs promote liquidity as it pools more buyers and sellers together. This is not necessarily true. If the virtual hub adds to participant costs, liquidity may be drawn away from the virtual node into off-market trades (see Wallumbilla analysis below). In addition, although the European and US markets are roughly the same size, liquidity is many times greater in the US (physical hub) market compared to the European (virtual hub) market..

Comparison of US and European markets

The European and North American gas pipeline system is of roughly equivalent size but has very different institutional and market arrangements. In simplistic terms, it could be viewed as a comparison of a transparent physical hub based market with point to point transport contracting (US) to a primarily virtual hub market modelled on the electricity market (Europe).

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[4] Makholm, J. D. 2012. The Political Economy of Pipelines. *University of Chicago Press:* Page 59

[5] Makholm, J. D. 2012. The Political Economy of Pipelines. *University of Chicago Press:* Page 171

The Political Economy of Pipelines provides a comparison of the two markets[6]:

> *In the United States, gas trades under contracts indexed to gas spot prices at the various physical points (called "hubs") where independent pipelines come together. The country has a competitive gas market in which prices are formed in large and highly liquid spot markets, independent from the similarly liquid spot markets in oil. Europe has no such freely competitive gas market. In the United States, gas and gas futures contracts are traded at the New York Mercantile Exchange (NYMEX), a testament to the fact that gas has become as fungible and readily transported as grain, beef, or any other commodity. The EU pipeline system also has a few gas-trading hubs and the new European Energy Exchange (EEX), but both the hubs and the EEX handle tiny volumes in forward trades in comparison to their US counterparts.*
>
> *The contrast between the gas market in the United States and Europe extends to their pipelines… Europe regulates pipelines via a complex patchwork of EU and national regulations. Europe has no system of tradable legal entitlements in gas transport capacity. Some minor short-term swapping of pipeline capacity does occur, but it is as the discretion of the pipeline companies and is not analogous to the trade in capacity rights that characterises the modern market for gas transport capacity in the United States. In Europe, pipelines sometimes publish measures of available capacity, but they are not uniquely defined and pipeline companies retain control over the figures. Names of shippers are kept secret by the pipeline companies, and information about shipping gas across the continent is unavailable to open scrutiny, imposing a heavy logistical and information burden on European shippers that would independently attempt to ship gas supplies across Europe.*

The different institutional and market arrangements between Europe and the United States have led to the following outcomes:

1. From 2009 though to 2013, European gas consumers paid about $425 billion more for their gas than their United States counterparts[7]. This has had significant implications for the European economy and manufacturing sector. The price disparity between the United States and Europe has also meant that gas is the fuel of choice for power generation in the United States while coal is the fuel of choice in Europe: with resulting carbon emissions implications.
2. Gas futures trading (a sign of a functioning market) is almost non existent in Europe compared to the United States.[8]
3. Since 2009, United States gas prices have permanently separated from oil prices compared with European prices with continue to track the oil price.[9]

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[6] Makholm, J. D. 2012. The Political Economy of Pipelines. *University of Chicago Press:* Pages 55-56

[7] Makholm, J. D. 2015. Regulation of Natural Gas in the United States, Canada and Europe: Prospects for a low carbon fuel. *Review of Environmental Economics and Policy:* 2

[8] For example, the average 2013 daily forward volume at the New York Mercantile Exchange was 333,000 times the level of such trades on the InterContinental Exchange. Source: Makholm, J. D. 2015. Regulation of Natural Gas in the United States, Canada and Europe: Prospects for a low carbon fuel. *Review of Environmental Economics and Policy:* 5

As a result of these outcomes in the European market compared to the United States market, the AEMC should be wary of adopting major elements of the European regulatory arrangements including virtual hubs.

Proposed changes to the Wallumbilla hub demonstrates some problems with virtual hubs

AEMO are currently investigating changes to the design of the Wallumbilla gas supply hub in a parallel process to the AEMC's East Coast review. The aim is to consolidate the current three trading points into a single trading zone, or virtual node.

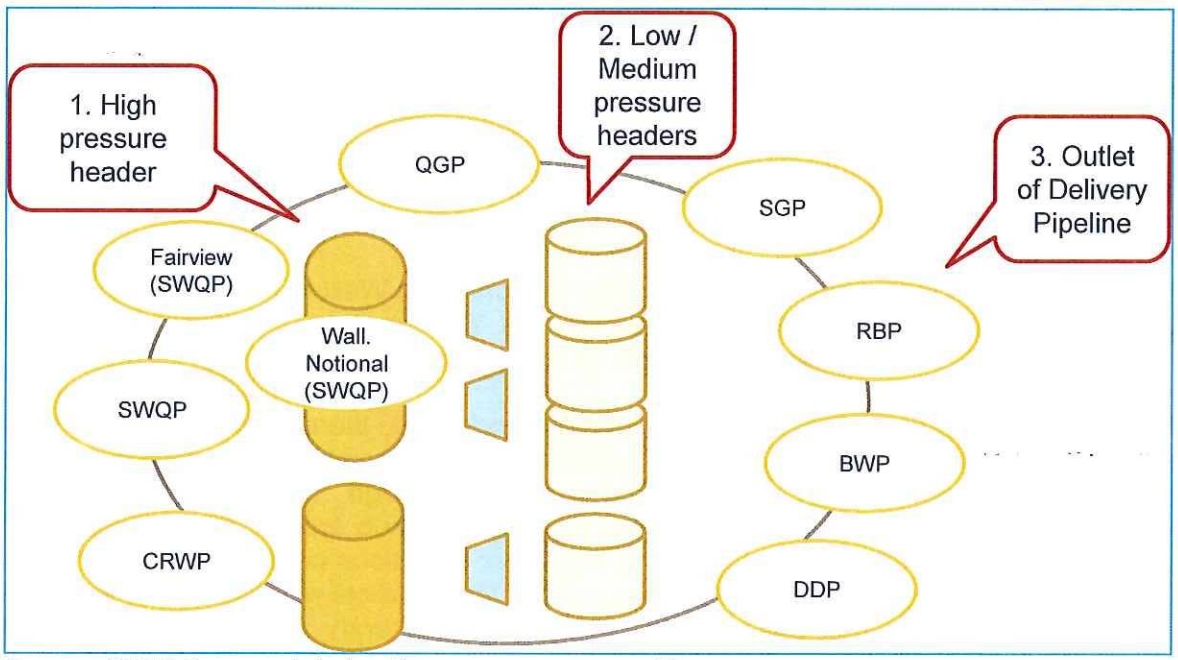
While critical elements of the hub design remain undefined, there have been significant problems encountered even in defining the notional delivery point for this relatively simple location. As examined in AEMO's original hub design investigations, physical interconnection of the pipeline facilities which comprise the hub are limited to those which have warranted historic investment, creating significant limitations on the volume of service that can be assumed to be available between points. This conflicts with the critical feature of any virtual hub design: that gas can be moved from any entry point to any exit point associated with the hub.

A shipper in a virtual node would indicate that they wish to inject gas at point X, remove it at point Y and leave the details to the hub operator. However if the physical path from X to Y is congested, there will likely be no indication to the shipper at the time of its nomination or trade. This creates inefficiencies in the way the hub is managed and the way investment in the hub is prioritised.

By contrast a physical hub with trading locations at X and Y, and a visible market for hub services between the points would provide an indication of the congestion by the price offered for the transfer. This may prompt the shipper to reconsider their plan to ship gas through the hub thereby easing extra congestion. It might also provide the opportunity for participants with flexibility not readily observable to the hub operator to offer this to the market. Additionally it may provide a signal that further investment in transfer capability is required. .

Further, a single pricing zone (virtual node) may create complexity or additional cost through the selection of an inopportune location for standard delivery. In the Wallumbilla example, three locations are being considered for the default delivery location as seen below.

[9] Makholm, J. D March 2015, If Europe wants to embrace natural gas as a bridge to a low carbon future, it should draw from America's stunning success. Available: http://blogs.lse.ac.uk/usappblog/2015/03/18/if-europe-wants-to-embrace-natural-gas-as-a-bridge-to-a-low-carbon-future-it-should-draw-from-americas-stunning-success/



Source: AEMO Gas supply hub reference group, paper 26

Creating a reference point at either the low/medium or high pressure headers would create difficulties for shippers (including Stanwell) who currently sell into the Roma Brisbane Pipeline (RBP). This occurs because sellers on the RBP can no longer be confident of being matched with a buyer on the RBP (as they can when offering at the RBP under the current design). This creates the need for the RBP seller to secure transport and Maximum Daily Quantity (MDQ) to the new reference point (and potentially compression services if the high pressure header is used).

Buyers on the RBP would then need to secure transport and MDQ from the reference point back into the RBP. Even if the RBP seller is eventually matched with a buyer at the RBP, the seller will not know this until matching has occurred and will have to add into its offer price the cost to transport the gas to the reference point. This may mean that a buyer on the RBP pays more under the virtual node than they would under the current arrangements.

Alternatively, a RBP seller may opt to trade outside the on-screen market through a pre-match trade where the RBP delivery point can be specified. This will reduce the offer price of the gas as transport to the reference point will not need to be included in the offer. However trading through the pre-match market would take liquidity away from the on-screen market when compared to the current physical hub arrangement.

The case for fundamental change is not compelling

Given the success of the east coast gas market in facilitating LNG development, and the fact that the LNG projects can internally manage their gas operations, the case for fundamental change to the design of the east coast gas market is not compelling.

The United States regulatory environment has facilitated a boom in shale gas which has reversed the decline of manufacturing, lowered gas imports and created an environment for tougher emissions standards. By these standards alone, the United States gas regulatory settings appear to be driving efficient market outcomes.

In Australia, the gas regulatory environment has also facilitated the growth of the world's first LNG industry based on coal seam gas. The current east coast arrangements have facilitated $75 billion[10] of investment in 3 LNG projects. Australia remains on track to overtake Qatar as the world's largest LNG producer later this decade. With these results, the Australian gas regulatory settings also appear to be driving efficient market outcomes.

The argument that the east coast gas market may need more flexibility in the event of LNG trains tripping[11] also appears unfounded. The AEMC has estimated that a LNG train trip results in only a 6 to 8.5 percent increase in the domestic average daily gas demand and storage injection.[12] This analysis appears to neglect the fact that the pipelines of the LNG projects are linked together for the express purpose of managing their gas operations:

> *The interconnect points will enable gas to flow from one project to the other when necessary, for example to allow for LNG plant downtime and planned maintenance to occur without interrupting either project's gas field operations… Having two interconnects provides additional flexibility over the lifetime of both projects. It gives more options to the plant operators for moving gas. Ultimately it means the two companies will be able to buy, sell and swap gas at these points during scheduled and unscheduled events, therefore maximising plant productivity.*[13]

The greatest need for flexibility in the east coast gas market occurs in the present period up until the commissioning of the three projects. Once the three projects are online, they will be able to balance gas amongst themselves during unplanned outages. However, even with just one LNG project online, the market functioned effectively during a recent unscheduled event on the 14th August at QCLNG. The excess gas in the days following this event was managed through reductions in field output, bilateral arrangements (eg being burnt through QLD gas fired generators) and traded through the Brisbane STTM and the Wallumbilla hub. The prices in both the electricity and gas markets reflected the oversupply of gas, but both markets remained secure. As this unscheduled event was effectively managed by the current market frameworks, the AEMC can be confident of the future resilience of the market given similar events in the future will have additional sources of risk mitigation in the form of alternate LNG project trains.

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[10] Doubts rise about Australia's next LNG boom, Australian Financial Review, June 2015, http://www.afr.com/business/energy/gas/doubts-rise-about-australias-next-lng-boom-20150604-ghh8at#ixzz3lBvERSSZ

[11] AEMC. May 2015. East Coast Wholesale Gas Market and Pipeline Frameworks Review, Stage 1 Draft Report, page 19

[12] AEMC. May 2015. East Coast Wholesale Gas Market and Pipeline Frameworks Review, Stage 1 Draft Report, page 18

[13] Santos. July 2013. Santos GLNG and QGC sign industry collaboration deal, http://www.santos.com/Archive/NewsDetail.aspx?p=121&id=1387. Regarding the connection between the pipelines of GLNG and APLNG see http://www.platts.com/latest-news/natural-gas/sydney/santos-origin-to-cooperate-on-gas-swaps-pipelines-27558368

AEMC gas market concepts

The AEMC published three gas market design concepts in order to focus the debate on key elements of gas market design. To Stanwell this key debate is virtual hubs vs physical hubs which has been discussed in detail above. Accordingly we offer only brief comments on each of the market design concepts:

Concept 1: Not all of the hubs and demand centres would need to be implemented at once. The markets could be developed in a staged manner in consideration of the priority and need. In addition we assume that the design of the hubs and demand centres could be easily and cheaply replicated if future need for new locations arose. This relatively cheap market set up could also lend itself to removing markets in the future if they prove to be unutilised due to participant or market changes.

Concept 2: It is unclear how this market could operate without the inclusion of the Moomba supply centre. Concept 2 is a major change to the design of the Queensland market. It may be unwise to fundamentally redesign a market which has proven robust to the development and initial commissioning of a large LNG industry.

Concept 3: This is an exceptional change to the design of the market and would take years to fully implement given the existing property rights. It is unclear how it is superior to either of the other options.

Thank you for your consideration of Stanwell's response to the Discussion Paper. If you would like to discuss any aspect of this submission, please contact Jennifer Tarr on 07 3228 4546.

Regards

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