DGP Sub. 27

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From: Peter Hartley [hartley@rice.edu]
Sent: Tuesday, 21 December 2010 12:26 AM
To: Committee, Economics & Industry Standing; Nahan, Mike; cannington@mp.wa.gov.au
Cc: Ken Medlock
Subject: Re: Submission to the Inquiry into Domestic Gas Prices

Attachments: WADomGasInquiryHartleyMedlockRevised.docx; ATT00001.txt


WADomGasInquiry HartleyMedlockR...


ATT00001.txt (3 KB)

Tim, Mike, Bill,

Ken made a few more clarifying edits to the submission that I sent last night Houston time. I have attached the revised (and improved) copy. Could you please use this as our "official" submission to the Standing Committee Inquiry?

Regards,
Peter Hartley

Inquiry into Domestic Gas Prices,
Economics and Industry Committee,
Legislative Assembly of the Parliament of Western Australia

This submission has been written by:

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The submission is respectfully submitted in response to a request from the committee Chair, Dr Mike Nahan MLA, and Deputy Chair, Mr Bill Johnston MLA following a meeting held at Rice University on Monday, November 1. The submission details in writing suggestions that we made to the Chair and Deputy Chair of the committee during that meeting.

Terms of reference of the Inquiry

On 20 April 2010 the Legislative Assembly asked Economics and Industry Committee to investigate:
(a) the price of gas for customers throughout Western Australia;
(b) the comparison of the price of gas with other states, especially Victoria, and whether there is a significant price differential and, if so, why; and
(c) the contrast between domestic gas prices in Western Australia and international LNG prices and the LNG contracts that govern these international prices.

The Committee was also asked to make recommendations on any measures that could be implemented to reduce the price of gas in Western Australia.

The tabling date for the Committee Report is 28 February 2011.

Introduction

The Government of Western Australia should not aim to set a particulardifferentialbetween natural gas prices in Western Australia and prices in other markets, such as international LNG and/or other states of Australia. Rather, it should establish institutions todetermine the price of natural gasso as to maximize the net benefits from exploiting the potentially vast natural gas resources within state borders and off the Western Australian coasts.

Resources are only likely to be developed to maximum benefit if the market rules are clear and predictable. Uncertainty about future policies is extremely harmful to incentives to invest in long-term risky projects, as much if not more so than the technical and geologic uncertainties that face upstream developments.

As has been demonstrated in the United States, introducing maximum competition where feasible while regulating the natural monopoly elements of the transportation network is the keyto achieving an efficient natural gas market. Australia has already moved in this direction with its recently implemented National Gas Rules, which govern access to natural gas pipelines. Our proposed modification of the Domgas policy in Western Australia would complement the National Gas Rules by ensuring transparency in pricing of natural gas in Western Australia and nurturing a market that can be a model for Australia and the wider Asia-Pacific region.

Governing principles ofa domestic gas pricing policy

Western Australia is currently one of the most attractivelocations in the world for developing natural gas resources. Large capital commitments have been made by foreign and domestic interests to developthelarge conventional natural gas resource potential identified in the Carnarvonbasin in the northwest shelf and the Browse basin off Kimberley. Resources also exist in the Perth basin in the state's southwest.Moreover, geologic conditions are favourable for extending the known reserve base substantially, particularly offshore in northwest Australia. In addition to the areas with ongoing high levels of active development, there is potential for conventional oil and gas discoveries off the southern coast at the western end of the Great Australia Bight, and unconventional resource development from tight gas, coal seam gas and shale gas formations.

Costs are important for turningidentified geologic potential into economically recoverable resources.Although labour costs are relatively high in Australia, offsetting factors include the high productivity of Australian workers and a very strong scientific, technical and industrial support base for the mining industries. In addition, some required inputs,including steel products, can be imported at relatively low costs from countries such as Malaysia, Thailand, China, Taiwan, and South Korea.

First and foremost, having good production prospects is necessary for attracting investment in the oil and gas industry, but it is not sufficient. Western Australia is also very well situated, due to its location, to serve rapidly growing demands in Asia, especially in China. Firms producing inWest Australia already have well-developed trading relationships with major customers in the relatively mature Japanese and Korean markets.

The combination of a large resource endowment and proximity to existing and emerging markets also does not guarantee that developments will occur. The other major element of comparative advantage for Western Australia is that it has a stable and predictable legal and political regime with freedom of access for foreign and domestic oil and gas firms. Many international oil and gas companies are denied access to major resourcesin various locations around the world, especially in countries with a national oil company. Moreover, even where access is not explicitly prohibited, relatively high risks of political and social disruption in these locations mean that firms require a much higher rate of return on their investments to justify investing in those locations. As a result, Western Australian resourcesare very attractive prospects and will, other things equal, tend to be developed first. An important objective of Western Australian government policy therefore ought to be to maintain this comparative advantage in terms of a stable and predictable legal and political environment.

With regard to natural gas prices, a key requirement for maximizing the value that Western Australia obtains from its resource endowment is known in the economics literature as the Little-Mirrlees rule. The rule is a quite general result that can be shown to hold under weak assumptions, and even in the presence of other distortions in the economy that adversely impact the efficiency of resource use. Applied to natural gas, it states that domestic uses of natural gas (or any other exportable or importable commodity to a market where the trading nation is essentially a "price taker") ought to be priced at their opportunity cost – that is, the amount that the natural gas could instead be sold for on the export market, less transportation costs. Prices above the opportunity cost would preclude domestic uses of the resource that yield greater value than exporting it. Conversely, prices set below the opportunity cost would encourage domestic uses of the resource that have lower value than could be obtained through exports.

A policy that aims to maintain natural gas prices that differ from opportunity costs imposes more than static efficiency losses. It also encourages investments in very long-lived capital equipment, such as power plantsor mineral processing facilities. This resultsin a growing constituency that is likely to make substantial capital losses on previous investments if the policy is changed, and therefore strongly opposed to reform. Once instituted, the policy turns into a situation analogous to holding a "tiger by the tail." Retaining the policy leads to increasing costs, but dropping it becomes very costly for the incumbent government.

Another major problem with attempts to set prices that differ from opportunity costs is that prices could be perceived as unstable and unpredictable. It is well known that substantial uncertainty about future costs or revenues provides a strong incentive to postpone the final investment decision in order to learn more information about the investment environment.This point only serves to emphasize the importance of developing a credible and predictable policy framework.

We realise that in all jurisdictions blessed with substantial mineral resources the public may expect the prices of those abundant indigenous resources to be substantially lower than anywhere else in the world. Certainly, many countries with substantial oil reserves, for example Iran and Venezuela, or substantial natural gas reserves, such as Russia, have a long history of selling petroleum productsand/or natural gas at highly subsidised prices.

Subsidised prices often are portrayed as a way of remitting to the population some of the rent associated with exploiting the resources. A more efficient way of achieving this aim, however, is to auction mining exploration leases. So long as the auction mechanism is welldesigned, with competitive bidding and an expectation that taxes or regulatory policies will not be changed at a later date, one would expect the winning bid to represent the risk-adjusted discounted present value of the rents associated with the resource. The taxpayer thus gets the benefits of those rents with neither the risks associated with developmentnor the distortions associated with taxes or subsidies.

The costs of energy price subsidies can be extreme. For example, shortages of gasoline in Iran – despite it being a major crude oil producer – result largely from extremely low domestic prices for petroleum products, which encourage consumption at an inefficiently high level. In fact, a similar policy in Indonesia ended with rioting in the streets as the government was forced to eliminate gasoline subsidies. Yet another example involves heavy subsidies of natural gas prices in the Ukraine, which have stymied the development of considerable domestic natural gas resources and left the country more dependent on natural gas imports than it would likely otherwise be.

In an internationally competitive market, efficient prices in jurisdictions with substantial resource production will be lower than prices in major consuming regions. In fact, absent capacity constraints the prices in producing areas will equal the selling prices minus the costs of delivering the product to the major consuming markets. In the case of natural gas produced in Western Australia,delivery costs are quite high since they involve liquefaction and transportation costs for LNG. For example, in the model of the world natural gas market that we have developed (the Rice World Gas Trade Model, hereafter referred to as theRWGTM)[1]prices for natural gas in Western Australia remain among the lowest in the world at least through the middle of this century.

Establishing transparent pricing arrangements through a modified Domgaspolicy

A working assumption in the RWGTM is that prices are determined in competitive markets, which is what drives the aforementioned result regarding price in Western Australia. A concern, however, in the case of Western Australia is that natural gas sales within the state are currently made under bilateral long-term contracts, and there is no guarantee that these bilateral contract prices reflect the prevailing opportunity cost of the resource. We suggest that transforming current institutions to produce more transparent pricing arrangements and more competitive domestic markets for natural gas is a legitimate goal of Western Australian government policy. We shall further outline how the current domestic gas policy could be modified to make it more compatible with the objective of ensuring domestic prices reflect true opportunity costs while at the same time promoting the development of a transparent and competitive domestic gas industry.

As we understand it, the current domestic gas (Domgas) reservation policy requires the equivalent of 15% of natural gas production from LNG export projects be reserved for domestic use. Project developers can, however, fulfil this requirement by contracting with

[1] Details of the model can be found in *Natural Gas and Geopolitics: From 1970 to 2040*, edited by David Victor, Amy Jaffe and Mark Hayes, Cambridge UK: Cambridge University Press, 2006 or in various publications on the James A. Baker III Institute for Public Policy web site, www.rice.edu/energy

other parties to deliver the equivalent amount of natural gas to the domestic market from other sources. When the policy was introduced, the government stated that the 15% target reflected "current estimates of future domestic gas needs, estimated gas reserves and forecast LNG production."

There are a number of potential problems that can arise with such an approach. First, forecasts of domestic gas demand and LNG production are both very uncertain. Moreover, since both also may be influenced by the Domgas policy, forecast errors might actually influence realised market outcomes. In addition, there is generally large uncertainty about gas reserves and resourcesat any point in time. Reserves are not a function solely of geology but also depend on economic conditions. Thus, estimated reserves are likely to be a very unreliable indicator of the ultimate economically recoverable resources.

The potential costs of the current policy follow. For example, if 15% of gas production from LNG export projects is an over-estimate of domestic market demand, the result would be an indirect subsidy to domestic consumption and a tax on natural gas exploration and production. The artificially inflated supply on the domestic market would drive the domestic price of natural gas below the input price for liquefaction. As a result, the policy would discourage additional exploration and production for export LNG projects and, at the margin, international investors in such projects would seek other opportunities. In addition, lower domestic prices would discourage exploration and production by other producers in smaller conventionaland/or unconventional natural gas resources. Furthermore, the subsidy to domestic consumption would expand consumption beyond what it otherwisewould be, and may even become unsustainable if it results in inadequate domestic supply.

In the RWGTM,when there is noDomgasreservation policy in Western Australia, the proportion of Western Australian production allocated to the domestic market falls below the 15% target as LNG exports ramp up in the early 2020's. Hence, the RWGTM implies that the current policy would subsidise domestic consumption, and impose an implicit tax on Western Australian natural gas exports and production.

If the 15% Domgas quota remains below domestic consumption for the next decade, it does not mean that the policy would have no effect until the 2020's. Rather, forcing producers to effectively sell a portion of their production at below market rates would deter investment in Western Australia relative to other locations, thereby reducing the longer term stature of Western Australia as an LNG exporter. In fact, the mere *possibility* that Domgas sales could be at below market rates will have the stated effect.

We suggest that the appropriate policy for the Western Australian government should be to ensure competition in the domestic natural gas market with transparency in pricing and an adequate supply for domestic consumers at the efficient price (equal to opportunity cost, not a subsidised price). This could be achieved by requiring not that an amount of gas equal to 15% of LNG production be *reserved* for domestic consumption but rather that such an amount of natural gas be *made available throughauction*to the highest bidder. The auction would be open to exporters of LNG, domestic consumers, producers and marketers, which wouldenhance liquidity in the domestic market. Such a procedure would ensure that the price paid by domestic consumers matched the export price less the

costs of delivering the gas to the export market, and it would establish transparent pricing for domestic natural gas consumption. Moreover, the liquidity benefit would provide opportunities to smaller producers who might not otherwise enter the market due to high perceived risk of market access.

As under the current Domgas policy, developers of LNG export gas projects could contract with other parties to deliver the required amount of gas for auction on their behalf. Smaller fields that do not provide the economies of scale necessary to support an LNG export project could then be used to supply the domestic market. This also would allow the LNG export operations to benefit from economies of scale. Similarly, transportation costs could be reduced if the main domestic consumer market in Perth could be supplied from resources closer to the point of consumption. These could include unconventional resources such as tight sands and CSG that might otherwise be undeveloped for a much longer period of time.

The policy could further assist the development of a transparent and competitive domestic natural gas market if the natural gas to be auctioned could be delivered to a small number of locations, which could then develop as liquid pricing points. Having a large number of potential delivery sites would work against the goal of creating a liquid competitive market.Given the structure of the existing energy market in Western Australia, we suggest that Karratha and Mondarra could be designated as delivery points.

In the case of Karratha, the designation could be conditional on Woodside committing to its plans to build a second Pluto train as a tolling facility for third party exporters. This would provide the opportunity for smaller producers to participate in the export LNG trade and further stimulate the development of the natural gas industry in Western Australia, including possibly onshore shale gas resources in the Canning Basin.

The main reason for designating Mondarra as the second delivery point is that it satisfies the site requirements necessary for hub services. Namely, it is the site of the only commercial underground gas storage facility in Western Australia. It is also located adjacent to the two pipelines servicing Perth and the south west of Western Australia, making it a natural location for price arbitrage.

The current structure of the electricity market in Western Australia also argues in favour of having two designated delivery sites. Karratha is in the North West interconnected electricity supply system, while Mondarra is in the South West system. The lack of an interconnection between these systems prevents direct arbitrage of electricity prices, which in turn hinders the objective of delivering electricity to Western Australian consumers at lowest cost. Since gas-fired power plants are the marginal sources of supply in both systems, however, arbitraging natural gas prices can substitute for electricity price arbitrage. This would, however, require the development of liquid markets for natural gas with continuous trading in each of the two major electricity supply systems.

Facilitating the arbitrage of natural gas prices would serve little purpose, however, if gas cannot be freely traded across the state's pipeline network.Fortunately, the recently implemented National Gas Rules already allow for a competitive and transparent market in natural gas pipeline transport services. A key element of that system is that pipeline operators receive a regulated rate of return for building and operating open access pipelines, but the available capacity can be auctioned off to the highest value user.An