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Re: AEMC 2015 East Coast Wholesale Gas Market and Pipeline Frameworks Review, Pipeline and Capacity Trading Discussion Paper Dated 18 September 2015

INTRODUCTION

Encana International (Australia) Pty Ltd (“**Encana Australia**”) a wholly owned subsidiary of Canadian based Encana Corporation (“**Encana**”), welcomes the opportunity to respond to the above referenced issues paper (the “**Paper**”). Encana was created in 2002 through the merger of PanCanadian Energy Corporation and Alberta Energy Company. The history of Encana and its predecessors spans over 125 years of Canadian based oil and gas operations. A pioneer in the development and production of unconventional resources, Encana has been a leading developer of unconventional oil and gas in North America for several decades. As a leading North American gas producer, Encana has been a major shipper or facility user on gas pipelines across Canada and the U.S., has owned and operated one of the largest gas trading hubs in North America (the AECO hub in Alberta) and has owned and operated the largest independent gas storage business in North America. Encana is Canada’s largest gas producer and among the top 5 gas producers in the U.S.; all from unconventional gas

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resources. In 2002 Encana divested much of its midstream assets, including 150 PJ's of underground gas storage working gas capacity with 3.0 PJ/d and 3.8 PJ/d of maximum injection and deliverability capacity respectively. Encana Australia is constantly evaluating acquisition opportunities in Australia's petroleum industry generally and in its gas industry in particular. Encana Australia and its predecessor AEC International have owned ATP's in Australia since the 1990's.

SUMMARY

Access to low cost pipeline infrastructure on a non-discriminatory basis and fees for service that reflect the value of that service is the hallmark of a functioning gas market. Encana Australia has experienced this for decades in North America and as a leading gas producer has been influential in the many gas pipeline debates and public hearings held across North America. Gas is held hostage to gas pipelines and the vast majority of gas pipelines globally remain natural monopolies. All gas pipelines in Australia are natural monopolies and their economic regulation, service charges and access to capacity do not in any way resemble the contract carriage model that was pioneered in North America many decades ago and remains in effect today.

The gas pipeline sector in the east coast of Australia has not served the gas industry very well to date in terms of providing good services at reasonable tariffs on a non-discriminatory basis to all market participants and prospective users. This has resulted in inflated delivered gas costs, a lessening of competition, inefficiencies throughout the value chain, and an extremely slow development of underground gas storage facilities and a short term trading market. This model is out dated and needs to be drastically altered in order to accommodate the future ongoing needs of the much larger east coast gas industry that involves large gas exports at Gladstone and the production of higher cost unconventional gas resources. The challenges facing eastern Australia's gas industry at the moment are unprecedented and successfully meeting those challenges will require the adoption of much more efficient models and practices from overseas, including those pertaining to the gas pipeline sector.

Pipeline Tariff Levels in the East Coast are extremely high

The NGTL high pressure pipeline system located in Alberta, Canada is operated by TransCanada Pipelines Limited and handles 10 PJ/d of gas and is 24,373 km in total length. It gathers gas from 1,000 different receipt points (interconnections with gas plants, gas storage facilities and other gas pipeline systems) and delivers gas to over 200 delivery points (downstream export pipelines, gas storage facilities, reticulation systems and large end users facilities). The NGTL system interfaces with 100's of different operators and handles gas for 100s of shippers. The cost to use the entire NGTL system is \$0.20/GJ to get on the system at one of the 1,000 receipt points and there is no cost to go to a UGS facility located in Alberta and to get back onto the NGTL system from storage and there is no additional cost to ultimately deliver the gas to any deliver point in Alberta. Should one wish to export gas out of the province instead of selling into the provincial market, then there is an additional charge incurred when leaving the province at the borders of \$0.15/GJ to 0.18/GJ depending on the border point. There is no infrastructure in Australia that remotely resembles the value for money that one gets in, not only Alberta, but in any province or state in Canada and the U.S. This is not because of volume, as many Australian operators argue, but because of the cost of service model that Australia rejected for pricing its gas infrastructure services.

Re-definition of the Term “Contract Carriage Model”

It is important to first understand that the definition of 'Contract carriage model' in Australia is markedly different than the generally accepted definition of that term as it is defined in Europe and North America. As is the case so often found in Australia's gas industry, Australia elected to redefine a term commonly used overseas which leads to much confusion and misunderstanding. I am very familiar with the meaning of contract carriage model and I can assure you that this model has been materially modified in Australia and as a result it is not very effective. The model adopted for Australia is plagued with market power abuse and has discouraged gas on gas competition,

commercial innovation and new gas supplies from new entrants. It has also discouraged the creation of a secondary market for pipeline and storage services and the formulation of meaningful workable gas hubs and the STTM. Large users of gas have generally not bought gas delivered to upstream delivery points and gas traders in the wholesale market are virtually non-existent.

The fact that the east coast has two distinctly different models for gas pipelines and gas scheduling on those pipeline systems and the fact that it now has two distinctly different gas specifications on large gas pipelines that inter-connect in SE Qld says much about the lack of policy and indifference to efficiency and ease of operations in the east coast gas industry. Europe and North America have made great strides in standardising the gas industry so that trade and operations between countries can be more efficient and yet the small east coast region of Australia has the exact opposite approach.

First Principles

The key performance indicators of a functioning eastern gas market should include the following:

1. Multiple sellers of gas competing for markets on a daily and monthly basis;
2. The cost of gas supply should generally decrease as competition increases due to an emphasis on cost cutting and greater efficiency of operations and capital employed;
3. Gas prices would be volatile and thereby send price signals regarding the value of such services as gas storage;
4. A gas futures market is a hallmark feature of a working commodity market and it replaces gas price forecasting or guessing what the future value of gas is;
5. Gas pipeline tariffs should be the same for everyone utilising the same type of service on any given day. Pipeline tariffs should represent the age and the history of depreciation of the pipeline. Economies of scale associated with low cost expansions would be enjoyed by all users of a

pipeline on a non-discriminatory basis. The owners of firm service contracts have no say in the use of interruptible service or the pricing of that service by third parties willing to utilise that same capacity on a second priority basis.;

6. A range of gas prices would exist depending on the term of a sale, the flexibility of the transaction and many other features. The commodity price would be distinct and separate from all other aspects such as transportation and storage costs;
7. A vibrant and large open access gas storage sector would exist and all market participants would be encouraged to utilise the services which would be offered on a non-discriminatory basis;
8. A price differential would exist between the domestic gas market in eastern Australia and the netback price received from the LNG export. The LNG export market must clear the market (landed LNG price) in the destination market while the domestic market price of gas would be determined by the supply and demand dynamics associated with all of the gas that remains trapped in eastern Australia;
9. The utilisation rates of flowing gas wells and gas plants should be very high as the marginal cost to produce gas is very small relative to the prevailing gas price in a liquid gas market. The cash cost to produce is equal to the royalty payment and the operating cost;
10. The gas production and gas reserve replacement rates would be 'just in time' to offset well declines and R/P declines. Excess inventory of either 2P reserves (i.e. beyond 8 years of annual production) or producing wells is an inefficient use of capital and increases gas costs unnecessarily. Australia typically has a large inventory of excess gas reserves and gas well production capacity which is unnecessary and tends to manipulate the market prices;
11. The gas supply chain would be very resilient to change, that is, it would have the capacity to cope with large changes without compromising reliability and security of supply and do so in a very cost effective manner.

The evidence in a gas market of the elimination of market power is when the following criteria have been met:

1. A Fungible Commodity downstream of the gas processing plants – gas molecules should be a homogenous, fungible commodity to enable the free trade and movement of gas throughout the connected gas grid and into and out of any gas storage facilities. A common gas specification must exist across all gas pipelines for gas to be a fungible commodity. Long term contracts that tend to de-commoditise gas should be discouraged.
2. Access to Low Cost Infrastructure – transportation and reticulation services should be provided at the lowest cost consistent with the adequacy of service, safety, and a return to the investor commensurate with risk. The recovery of capital costs should be on a depreciating asset with no recapitalisation of the asset regardless of who owns the assets. Furthermore, tariffs should be non-discriminatory and cost based with no cross subsidisation among the various users or across various services. For example, a back haul transportation charge should be minimal since this service actually creates more forward haul capacity in a gas pipeline as the gas will move by displacement as opposed to actual physical movement. This transaction also reduces compressor fuel and other variable costs to the pipeline.
3. Multiple Sellers – this means that gas faces competition in the domestic market from not only other sources of energy or feedstock, but also from gas from many other sources. One would expect that intense gas to gas competition would be the primary source of market forces in Australia's domestic gas market as opposed to alternative fuels and/or gas export prices.
4. Multiple Buyers – this means that transactions or gas trading takes place at each level of transaction from producer to consumer. While this may appear to be counterintuitive, gas should be traded many times prior to consumption in order for inefficiencies to be worked out of the value chain. Marketing and trading companies greatly assist in the driving out of inefficiencies along the value chain and also increase the churn levels at gas trading hubs.

These conditions will generate an environment that attracts investment to all sectors of the gas industry and results in potential short term gas price volatility but long term health and stability in the industry.

An efficient gas industry is the product of market forces working diligently in the gas commodity market (i.e. gas trading and services) and strict economic regulation of any and all market participants who hold excess market power such as the owners/operators of midstream and downstream gas pipeline infrastructure and any other segment of the value chain that is not subject to market forces. This does not occur unless good policy and practices exist at the Government level and proper market power tests and solutions to mitigate such market power exist and are applied in a non-discriminatory manner. The proverbial 'level playing field' must be diligently and ruthlessly sought after.

Another indicator of market maturity involves the role of underground gas storage (UGS) facilities in a gas market. Gas storage is one of several instruments providing flexibility but is, in most OECD countries, by far the largest instrument due to its efficiency and cost competitiveness. In liberalised gas markets, it competes with other flexibility services and instruments, such as supply flexibility or swing capacity, interruptible contracts, fuel switching by some consumption facilities, line-pack and LNG peak-shaving units. Liberalised gas commodity markets can accurately value the services provided by storage. Storage is acquiring a new role as additional storage services and higher performance facilities have been introduced by the growing number of independent gas storage owners/operators in liberalised gas markets. The traditional functions of meeting demand fluctuations, using the grid more efficiently and providing security of supply are still valid. In liberalised markets, storage will also play roles in price hedging and as a trading tool, allowing players to exploit price differentials.

The largest gas production regions of the world, namely Western Canada, the Gulf of Mexico region of the U.S. and Russia, all have large UGS capacity in order to optimise gas production operations and related upstream infrastructure. The growth in

unconventional gas production has resulted in an even higher demand for UGS capacity in predominantly gas producing regions since it is important to isolate gas production operations from any and all gas demand swings. Most of these gas storage customers rely on interruptible pipeline capacity to and from the gas storage facilities. The development and use of gas storage in eastern Australia has been severely hindered by both high transportation tariffs generally and from the lack of low cost interruptible transportation services on pipelines that have surplus capacity that is left largely unused.

An efficient gas market has many characteristics that are not as yet present in Australia's gas industry. Some of the features of an efficient gas market are as follows:

1. Multiple gas transactions (buyers and sellers) at every stage in the value chain;
2. Proliferation of services such as underground gas storage, hub services, and financial services;
3. A vibrant primary market and a vibrant secondary market. The short term trading of gas as a commodity and access to unused or surplus pipeline capacity is a pre-requisite for the secondary market as is sufficient depth in the market;
4. Inefficiencies are minimised and/or eliminated very quickly by market forces and the innovation and creativity of market participants. Market participants include a variety of service providers and are not limited to pipeline operators, retailers, gas producers and gas consumers as is the case in Australia at present;
5. Gas flows hourly and daily to those willing to pay the prevailing market price somewhat like what occurs in the electricity market in Australia. Gas trade is not hoarded or encumbered by long term contracts with very restrictive terms and conditions but is swapped and exchanged freely throughout the gas value chain in order to meet all gas demand at the lowest possible price. Gas deliveries and withdrawals from underground gas storage facilities occurs continuously as the role of balancing the

physical volatility of demand and supply is absorbed easily by gas storage facilities. Salt cavern gas storage is the most efficient type of gas storage for short term balancing and depleted reservoir gas storage is the most efficient type of gas storage for longer term and seasonal balancing;

6. Real time gas price signals indicate the physical balancing of the system and gas price volatility and the level of gas prices sends signals to various market participants that more or less facilities are required at various points along the value chain. For example, large gas price volatility will encourage gas storage developers and owners to expand existing facilities and or develop new ones. This is how market forces look after the needs of a gas industry in a competitive environment.

Since gas pipelines and reticulation facilities are seldom, if ever, subject to competitive forces their tariffs, services and policies must be scrutinised and regulated by a regulatory body in order to ensure that barriers to competition are minimised and ideally eliminated. The regulation of gas pipelines across Australia has been at best dismally managed to date. The 'light handed' regulation policies adopted in Australia for gas pipelines has not resulted in a level playing field nor open access to low cost infrastructure. Benchmarking to world's best practice regarding this sector of the gas industry confirms these allegations but this is not the principle topic of this report and therefore will not be addressed in detail.

There are many examples overseas of functioning gas markets. The North American gas market has long been considered to be the most sophisticated and mature gas market and it does not resemble what exists today in eastern Australia. The reasons given for why Australia is different are, in my view, nothing but excuses.

Open Access in Australia is at Best a Theoretical Concept

We have a grave concern that many of the essential elements pertaining to an open access pipeline system in eastern Australia are missing. These include but are not limited to the following:

1. Until multiple pipeline paths exist to any market or from any supply basin, tariffs on any given pipeline have to be substantially equal for any given service for any and all facility users;
2. Capacity release program – for the secondary market to function, where pipeline owners have the right and the impetus to sell any and all otherwise unused daily capacity to third parties on an interruptible, short haul or backhaul basis at very reasonable tariffs that are a fraction of the firm forward haul rate;
3. Well defined queuing procedures and advertisements (referred to as “open season” procedures in North America) for expansions and new projects;
4. Contract flexibility, including flexibility of receipt and delivery points; term; interruptible and firm services offered: back haul, partial haul, and forward haul;
5. Well defined pipeline to pipeline arrangements for both upstream and downstream facilities (both existing and future additions);
6. Real time access to information (contract flows, capacity constraints, curtailment procedures, availability of capacity and released capacity, etc. ;
7. Rules encouraging the development of trading hubs and market centres (pooling points for transactions).

In our view, while there is a lot of talk about open access, capacity trading, etc. the basic principles or underlying market structure is missing the first principles or basic ingredients necessary for an effective open access inter-state pipeline transmission grid. Negotiating with another shipper for capacity is inefficient and unworkable. This is not the practice in either Europe or North America. The ‘Foundation Shipper’ concept with all of the related long term privileges and market access power is unique to

Australia. While firm pipeline users typically have take-or-pay payment obligations they usually have no say in who uses the associated capacity to the extent that they refuse to use it all and they most certainly would have no say in the tariff for that capacity when used by third parties on an interruptible basis. In both Europe and North America long term firm transportation customers welcome the maximum daily utilisation of pipelines for most of the additional revenue associated with the selling of interruptible service is reimbursed to the firm customers on a pro-rata basis and thereby effectively reduces their take-or-pay payment. Many of these concepts are simply missing in Australia as the modus operandi seems to be one that focusses on market power abuse.

Structural Issues

The gas industry can be broken into several generic vertical components, although the actual nature of these components may vary greatly from one geographic area to another. The physical or operational components are production, gathering, transmission and distribution. Overlaying the operational aspects of the gas industry is marketing or trading – the buying and selling of the commodity, which can occur at any or all points in the physical chain. In a given region, a monopoly may exist at any of these physical stages. Principles such as privatisation and open access can be used to eliminate the monopoly through appropriate legislation and regulation that creatively compels “closed” or essential facilities to provide services to all on a non-discriminatory basis.

This enables trading to occur at any point during the movement of gas from wellhead to burner tip. Trading hubs or market centres can develop; producers receive the benefits of serving multiple, diverse markets and buyers benefit by having a broader choice of supplies and suppliers making way for competitive forces and the development of a commodity market.

In a developed commodity market, willing buyers can find willing sellers to trade on a spot or longer term basis: ie. daily, weekly, monthly, yearly basis or longer. Buyers,

who may or may not be the actual consumers, can negotiate for any number of pricing options, allowing the buyer to lock in prices or retain pricing flexibility for the term of the deal. Pricing can be stripped from physical delivery completely, with the gas buyer arranging for deliveries of gas at market prices month after month, and “swapping” his market price for a fixed price or other type of pricing through a financial contract. An options market allows the gas buyer to purchase the right to take gas at his option at a particular time. This affords the buyer an opportunity to contract for one method of peaking service.

Through a combination of physical purchase agreements and commodity derivatives, the buyer will be able to purchase the type of deliverability he needs – base load gas, full requirements, peaking, seasonal load or fuel switching with pricing that can be fixed, indexed, or variable, also according to the buyer’s need. On the other side of the trade, the gas seller (be it a producer, aggregator, or institutional trader), can find markets that fit its economic and operation situation.

Producers can opt to sell all their gas to one user or marketer or can strip out and sell base load production to one or more buyers and then sell excess gas to different buyers for peaking needs at premium prices. Producers can lock in pricing for terms which match their lender’s requirements, thus helping them secure needed financing on favourable terms. The buyers and sellers can meet anywhere in the marketplace – the wellhead, plant outlets, gathering systems pipeline receipt or delivery points, at the inlet of the reticulation system or at the city gate or consuming facility.

There are no legal or structural impediments to trading nor does any one market participant enjoy any unfair marketing or purchasing advantage because of its control over any physical asset required to gather, transport or distribute the gas.

Competition: The best way to ensure that an adequate supply of any commodity is available at reasonable prices is to rely on a workably competitive market. Local distribution companies and public utility commissions must create workable competition

in the natural gas marketplace in order to bring the benefits of competition to gas customers.

In developing a commodity market for gas, competition is the key element, yet the hardest to achieve. Ideally, competition must occur between producers (gas on gas) between marketers, and between transportation providers. Gas on gas competition can be achieved in several ways. In a producing basin or area, multiple producers or interest owners can compete for markets, even though capacity out of that basin is on a single pipeline.

Different production areas will compete for the same markets, whether or not they are served by a single or multiple pipelines, as long as adequate interconnections exist to move gas across pipelines. Movement can be contractually effectuated through forward hauls or backhauls (displacement). The use of the capacity release program introduces competition for capacity on a single pipeline system. Under this system, shippers which hold firm transportation rights on the pipeline can resell their capacity to other shippers, on a firm or interruptible basis, thus having their capacity compete with capacity held by other firm shippers as well as the capacity sold by the pipeline itself.

Marketers can compete at all locations, provided they have unfettered access to production, gathering, transmission and distribution access. The more places competition can occur along the chain of production-transportation-distribution, the easier it will be for market signals to work and for prices and services to reflect those most valued in the marketplace.

The sale of non-firm, backhaul and short haul capacity at very low tariffs does not undermine the incentives to invest in new capacity as demonstrated overseas for decades but it does undermine the market power of the few foundation shippers in the east coast of Australia. This market power should not exist and regulators and Government agencies should not protect this hang-over from the past. Long term firm shippers in Australia definitely hoard pipeline capacity and they most certainly use that

power to preclude their competitors from these markets and also to preclude large gas buyers from buying gas from their competitors under more flexible gas supply arrangements than the traditional long term GSA. These entrenched practices that are very unique to Australia have outlived their usefulness for they add unnecessary costs to the gas supply chain and they frustrate new gas supply entrants, gas retailers and large gas end users and they kill creativity, flexibility, the short term trading market and the development of gas storage facilities.

Comparable Access: For a market to be competitive, numerous entities must be capable of packaging and marketing a competitive product. In the gas industry, the benefits of competition will only be available at the burner tip if local distribution companies make their own capacity – and capacity they control on delivering pipelines – available to others on an equal basis.

In a system where the pipeline or an affiliated marketing entity purchases gas for resale, comparable access levelises the playing field between the owner of the pipeline facility (including its affiliates) and other participants. The facility owner will not enjoy a competitive advantage over would-be competitors for sales or supplies, where those advantages would have derived from the facility owner's inherent ability to control and operate the system or have access to information about markets, supplies or transportation capacity not generally available to others. Achieving this condition requires several things. First, a system must be made available which will allow market-significant facility information to be transmitted to all interested parties on a real-time basis. If, for example, a situation has developed on a pipeline system that will require gas to be shut in immediately, or will require additional supplies be delivered into a market in an emergency condition, all potential shippers should be able to receive that information as soon as the pipeline knows about it, particularly where it will impact their current arrangements.

This information can be transmitted by phone, facsimile or electronic bulletin board. Other real-time information must also be accessible to shippers. They must have

access to flow information to determine whether their receipts and deliveries are in balance and match their nominations. Information about constrained points, available capacity, market and supply conditions that are in the hands of the pipeline or distribution company have to be shared with all the market players.

Pipeline owners have spare capacity to market whenever their pipeline is not flowing at 100% of capacity regardless of how much firm service is contracted for and to whom. This is a fundamental principle of the contract carriage model that is sorely missing in Australia. Hence the illiquid pipeline capacity trading market outside of Victoria. This has little to do with the contract carriage model generally but has everything to do with the definition of that so called model in Australia!

Cost of Service: An efficient, competitive market cannot exist unless all services used to bring the product to the point of consumption are priced with due regard to the actual cost of providing the service.

Gas pipelines will, in most cases, represent natural monopolies and as such tariff regulation designed to mimic competitive outcomes will be of critical importance. We would submit that cost-of-service regulation or at least a rate cap based on a reasonable return is the appropriate starting point for such facilities. Where a facility is the only one to service a supply area or market, it should be permitted to charge rates which it can justify on the basis of its reasonable costs incurred to provide service to those areas, with a reasonable rate or return allowed. To the extent these facilities do in fact face physical competition from other facilities, those segments of the facilities or points on these facilities can be deregulated, and market rates, that is tariffs negotiated between the parties at arms-length, can be charged. None of the gas pipelines in Australia would pass the market power test that justifies market based tariffs.

New gas pipelines in North America generally charge initial tariffs of less than A\$0.08/GJ/100km for full haul forward service and this tariff would quickly decline over the life of the pipeline and in 10 years stabilise at less than A\$0.03/GJ/100km. The

pipeline tariffs in the east coast of Australia are generally orders of magnitude higher than this and their tariffs have no relationship to their age, historical revenue, their initial construction cost or their ongoing operating cost.

Curtailement: In order to avoid distortions in competition, extra-market influences should be circumscribed as possible. Historic gas supply curtailment rules should be revisited to reflect the newly competitive market environment. To cover extreme situations, curtailment rules should be developed beforehand to ensure that human needs and property are protected in the instances where either supply or capacity is inadequate to meet market demand. These rules must provide for notice to all parties of emergency conditions as far in advance as possible, procedures for revising nominations, confiscating gas, make-up provisions, and penalties in cases where a party fails to act in a responsible way after receiving timely notice of a critical situation.

Competition in gas should evolve around the commodity and associated services (the contestable portion of the industry) and not infrastructure, such as pipelines, which are inherently monopolistic. To do otherwise, distorts the playing field. To differentiate pipeline tariffs between facility users on any other basis than terms of service is undue discrimination. For these reasons concepts such as incremental pipeline tolling have lost in the great debates among regulators and industry participants held over the years in North America. Since the gas industry is held hostage to the physical world of pipelines and gas plants, they should not be allowed to distort in any way the marketing, trading and ultimately the retailing of gas.

Economic Regulatory Vacuum

Gas infrastructure, namely pipelines and reticulation systems, are natural monopolies and therefore must be controlled by competent regulation and regulators. Australia has very little experience in this regard due to the fact that this infrastructure was largely government owned across eastern Australia until the mid to late 1990's. The

privatisation and subsequent regulation of this infrastructure was done in such a manner as to ignore all of the lessons and policies in this regard overseas.

The economic regulation of gas pipelines is a surrogate to competition and therefore is a prerequisite to the development of a functioning gas market. This has yet to be achieved in eastern Australia. While North American has evolved to the extent that offshore gas pipelines, offshore production platforms and most gas processing plants are no longer owned by gas producers but by specialised low cost of capital, value creating midstream companies, Australia has reversed that trend and gas producers prefer to build, operate and own their own onshore gas transmission pipelines as is the case with all three LNG export projects at Gladstone. Furthermore, gas is often converted to electricity near the supply and the electricity transmitted long distances as opposed to the normally accepted, preferred solution of pipelining the gas to electricity demand sinks and then converting it to electricity. This behaviour is indicative of market failure in terms of eastern Australia's gas pipeline sector.

The situation must be improved for the benefit of those who wish to move gas as opposed to the benefit of the pipeline owners. Any benchmarking to world best in class practices would indicate that there is a huge problem in eastern Australia in the gas pipeline sector.

Most OECD countries, including Canada and the U.S. and most, if not all, countries in the EU, have very strict guidelines and rules regarding competition policy and introduce onerous market power tests regarding market behaviour with respect to price setting. The enforcement of these guidelines is an ongoing process and outcomes have serious implications to the extent that companies or individuals are deemed to have sufficient market power to materially influence the price of indigenous gas supplies into the domestic market of that country. The Canadian competition analysis methodology is similar to that used by U.S. antitrust authorities and by U.S. regulators in evaluating the state of competition in natural gas storage markets in that country. The market structure in a gas market region, i.e. Western Australia or the east coast Australia gas

market would be examined and scrutinized in order to determine whether the geographic gas market region raises competition policy concerns or not. Specifically, moderate levels of seller concentration and potential market entry suggest a competitive structure and the absence of market power. The prevailing market price for gas and related gas contracts and selling mechanisms would also be examined to determine whether or not competition policy concerns exist in that regard. It is difficult to imagine how either of the Australian gas markets would pass any kind of market power test or any type of test to determine the essence of an open and competitive gas market.

Canadian competition policy authorities routinely evaluate the state of competition in specific markets, including its gas industry. In effect, the existence of market power reflects the absence of competition in that the firm or firms exerting the market power can profitably influence prices (i.e. raise and maintain prices above competitive levels), quality, variety, service, advertising, innovation or any other dimension of competition. A review of the structural characteristics of the market with particular emphasis on seller concentration and barriers to market entry and exit generally occurs. In addition, other factors such as the rate of innovation, market transparency, and the value and frequency of transactions are considered when relevant.

In the U.S. the FERC defines market power as the ability to profitably maintain prices above competitive levels for a significant period of time. This principle has been interpreted by the FERC in more detail as follows:

1. If a company can sustain an increase in its rates in the order of 10% or more without losing significant market share, the company is in a position to exercise market power to the detriment of the public interest; and
2. A significant period of time is typically considered to be one year or more.

A seller could exercise market power by acting alone (unilateral market power) or acting together with other sellers (interdependent market power). If the market was characterized by a Herfindahl-Hirshman Index (HHI) value (a measure of concentration)

below 0.18 the applicant for market-based rates would be subject to less scrutiny than if the index was above this level.

These conditions will generate an environment that attracts investment to all sectors of the gas industry and results in potential short term gas price volatility but long term health and stability in the industry. What is perhaps surprising and counter intuitive is that while deregulating or liberalising a regional or national gas market, federal and state regulatory agencies typically become more intrusive in the individual transactions among producer, pipeline, distributor, retailer and consumer. The alternative is to nationalise resources and infrastructure and that is the course taken by some countries. The HHI serves as a first screen to measure market power. If the HHI indicates market power, then a second screen is applied to see if the market participant is in a position to exercise market power. The market power framework employed by the FERC and often adopted by the NEB in Canada consists of the following five steps:

- 1) product market definition;
- 2) geographic market definition;
 - a. identify facilities and services;
 - b. identify the geographic market;
 - c. identify good alternatives;
- 3) market concentration analysis;
- 4) identify potential competition ; and
- 5) Identify other factors.

The first and second steps lay the foundation for the market concentration analysis by defining what the product is and who is in the market. The third step examines measures of the market participant's market power. The fourth and fifth steps examine factors that might alter interpretation of the concentration measures.

Gas pipeline services, or the lack thereof, and a basic unwillingness to be open for business beyond the foundation customers is a real problem in the east coast. Market participants cannot access idle pipeline capacity without making a deal with the holders

of firm transportation capacity. This is a ludicrous business model for the concept of common facilities is lost and replaced by the concept of market power skewed to the foundation customers as they essentially control who uses the pipeline capacity that they don't wish to use on any given day.

Economic Regulation of Common Carriage Infrastructure Policy

Since all gas is held hostage to infrastructure unless and until it is converted into LNG, most national gas policies focus on the intrinsic market power of all midstream and downstream asset owners. These assets include underground gas storage, gas transmission pipelines, gas reticulation pipelines, gas hubs, and some gas processing plants.

Australia lags every OECD country in this regard. 'Gas de-regulation' or 'gas liberalisation', whichever term you prefer, is something of a misnomer given that in a deregulated market, items such as transmission tariffs, reticulation tariffs, storage fees and access terms to both firm and interruptible capacity remain regulated or controlled by state, provincial and national regulators, as the case may be. What has really been de-regulated or liberalised is the market price of gas molecules along the value chain, often referred to as the wholesale gas market.

An efficient gas industry is the product of market forces working diligently in the gas commodity market (i.e. gas trading and services) and strict economic regulation of any and all market participants who hold excess market power such as the owners/operators of midstream and downstream gas pipeline infrastructure and any other segment of the value chain that is not subject to market forces. This does not occur unless good policy and practices exist at the Government level and proper market power tests and solutions to mitigate such market power exist and are applied in a non-discriminatory manner.

The FERC applies a market power test to assets such as gas pipelines and gas storage facilities to determine if they can be permitted to charge market based rates for services as opposed to being subject to regulated prices under the cost of service regulation mechanism. Most facilities, even in the very facility intense North American gas market, are deemed to have market power. It is most certain that no gas pipeline, gas reticulation nor gas storage facility in Australia would qualify for exemption under these market power tests and yet most of them have been excused from economic regulatory scrutiny.

The complete absence of any meaningful pipeline tariff regulation or price regulation in Australia is extremely problematic. Gas pipeline owners have been charging tariffs that are not comparable to either Europe or North America and it is not due to any of the voluminous excuses generated by the gas pipeline sector of how Australia is different from overseas markets but it is because of a complete misunderstanding of how gas transmission infrastructure can work very efficiency for the national interest. The pipeline sector interest has been served very well across Australia for decades and its genesis stemmed from when most pipelines were government owned and operated.

Increased concentration of pipeline ownership is not necessarily a problem in itself, but coupled with a lack of strict economic regulation to minimise or eliminate market power, becomes very problematic. Gas pipelines are natural monopolies and must be treated as such by regulators or else the domestic market will suffer as it has in the east coast. Gas penetrations are embarrassing low for an OECD country with abundant gas resources. Market power remains relatively unchecked in this sector of the gas industry and among other things, there is no level playing field as services and tariffs are discriminatory. This fundamental structural defect prohibits the development of a vibrant underground gas storage sector and prohibits the creation of a hub around which a vibrant STTM can grow.

The fact that gas pipelines in the east coast can and do respond to the opportunity to make windfall profits should not be confused with a timely response to meet shipper

needs for all market participants whether a producer, trader, storage customer, retailer, or end user. Most gas pipelines in the east coast are essentially controlled by the foundation shippers who are almost exclusively made up of a few among the gas producing community. Unlike in Europe or in North America, these holders of long term firm service contracts on various pipelines control the capacity whether or not they intend to use it during any given pipeline nomination period. This is about as anti-competitive as one can get given the fact that access to gas pipelines is essential for the movement of gas in the domestic market.

For example backhaul rates often equal or exceed forward haul tariffs in Australia – another of many business practices that do not reflect the cost of providing the service as backhauls actually create more capacity for forward haul service. This essentially makes the pipeline capacity on a commercial basis exceed that of its physical capacity. The list of bewildering practices in the east coast pipeline sector is very long and cannot be dealt with in this submission.

Conundrum Decades in the Making

The liberalisation and de-regulation of gas markets and gas industries has occurred in North America and Europe to various degrees commencing in the 1980's. Reports written ten years after the de-regulation of Canada's gas industry showed tremendous benefits to all of the stakeholders (upstream, midstream and downstream participants alike) as inefficiencies were driven out of the gas industry and exports grew at unprecedented rates.

The same cannot be said of the Australian experiment that commenced in the early 1990's as part of the micro-economic reform process. Australia stubbornly ignored all of the lessons from Europe and North America and insisted on a new and untested model. This model involved recapitalising the nation's entire gas pipeline infrastructure at or above replacement cost as Governments grabbed essentially another industry tax as they exited the ownership of infrastructure.

Australia then decided to not economically regulate infrastructure and the services that they offered but relied on “light handed regulation”, whatever that is. It is the task of regulators to generate a surrogate for competition in the event that market power exists and it most certainly exists for all gas transmission pipeline owners. It is ludicrous to suggest that any gas pipeline in Australia has competition and therefore should not economically regulated in a manner that one would regulate a natural monopoly.

The gas pipeline sector in the east coast has historically charged very high tariffs and offered very poor service levels as benchmarked to gas pipelines economically regulated in either Europe or North America. The tariffs and rates are so poor from a capacity user’s perspective that they do not even resemble the pipeline sector overseas. I have done extensive benchmarking in this regard and the findings, again reflect an apparent indifference in Australia regarding pipeline cost on a per GJ/100km haul basis, on the level of services offered and on the access terms for contracted but otherwise unused capacity on a daily basis.

For some unknown reason, the east coast has privatised pipelines at above their replacement cost and/or allowed new pipelines to be constructed with widespread exemptions from any meaningful economic regulation nor third party access terms. This is unexpected and counter to any growth and value generation from this industry given the relatively large distances separating gas supplies and gas markets compared to Europe. Compared to North America generally and Canada specifically, the distances between gas supply and gas demand in the east coast is relatively short. For example, the average GJ of gas produced in Canada in 2000 travelled on average over 3,000 km on a gas pipeline (excluding reticulation) prior to its consumption. The average tariff paid for the pipeline transmission component in Canada would be similar or less than that paid in Australia on average for gas that travels but a fraction of the distance travelled by an average GJ of gas production. Once normalised for the age of gas pipelines, their size and historical throughput, properly regulated gas pipelines tend to have a fairly common firm forward haul tariff on a \$/GJ/100 km basis.

Australia's pipelines vary widely in this regard and are orders of magnitude higher than those found in North America.

The so-called Greenfields Incentive is not necessary for pipeline investment and is a by-product of acquiescing to the self-serving rhetoric of APGA and its members. Much larger and much more capital intensive gas pipelines have been and continue to be built overseas without such an incentive. It is not consistent with the best interests of the gas industry in general as it results in windfall profits to gas pipeline owners and in very poor services and high tariffs to all of the customers who follow the foundation customers. Again this is unique to Australia and it has resulted in many negative unintended consequences and the benefits are very questionable.

Canada is a global leader in the pipeline sector for oil, gas and NGL's related infrastructure and it has never required such an incentive program in order to attract the necessary capital required for green field pipelines. In 2002, Canada's pipelines moved 6,300 PJ's of gas and 860 million bbls of oil, of which 60% was exported to the USA via long distance pipelines. As of 2008 there was in excess of 100,000 km of large diameter high pressure transmission pipelines in Canada serving the petroleum industry. The province of Alberta has over 400,000 km of energy related pipeline (i.e. pipelines used to gather, transmit and distribute oil, gas and NGL's) and the cost to use this system is but a fraction of the cost to use a short inter-state gas pipeline in Australia.

The secondary market for gas pipeline capacity is essentially non-existent in the east coast due to the onerous manner in which one has to access unused contracted capacity. Unlike North America and Europe the gas pipeline owner/operator in Australia does not have the right to sell contracted but otherwise unused pipeline capacity during a nominating period. The pipeline company in Australia has essentially sold that capacity to one party and cannot sell it to another, even on an interruptible basis that would be subject to the right of first refusal from the party that has contracted the capacity. The right of first refusal is typically exercised by a firm capacity customer

during the nomination process of scheduling throughput for the next period (as short as 4 hours in North America and typically a day ahead in Australia). Should that party elect to not utilise all of its contracted capacity, the pipeline operator in Europe and North America has the right to sell that capacity on an interruptible basis to all interested parties and the funds from that sale would be used to reduce the tariffs to all firm customers. In Australia, any interested parties must negotiate with the firm foundation customer – good luck with that one!

In Europe and North America all gas pipeline customers utilising the same type of service over the same distance on the pipeline would all pay exactly the same tariff –a principle referred to as non-discriminatory access and services. Non-discriminatory tariffs and services is a key to the creation of gas trading hubs and a vibrant STTM. Competition should revolve around the GJ of gas and not the pipeline tariffs along a similar pipeline route.

Delivery and receipt point restrictions are common due to the fact that gas pipelines do not have unrestricted flexibility in their operations. However, requests for changes in either a delivery or receipt point over a stipulated period of time should be respected and accommodated by the gas pipeline operator on a reasonable efforts basis and subject to the operational integrity of the pipeline. To simply refuse to entertain and accommodate such requests reflects a very poor attitude and a very poor customer service culture.

Pipeline Services

An effectively regulated pipeline or that operating in a competitive environment would exhibit the following:

- Aggressive marketing of otherwise unutilized capacity (reserved by firm service contracts but not utilized from time to time). In 1992 interruptible service on US pipelines rose to as high as 55% of the total annual throughput. In a competitive environment where multiple facility users freely

exchange gas on any given pipeline with counter parties, the cost of back hauls and interruptible forward haul service is but a token of the corresponding forward haul rate. This reflects the desire to contribute to fixed costs in any manner possible when operating in a competitive environment;

- Embrace user pay principles for firm forward haul customers. In order to avoid bypass and discriminatory rates, pipeline companies charge rates based on distance, length of contract term, and perhaps volume in order to create good will, reflect the value created to the pipeline company by the business transaction, and minimize bypass risk;
- Offer a full menu of services – gas parking, gas banking, interruptible, various levels of firm service, back haul, one stop shopping on multiple pipelines, seasonal rates, demand/commodity price structure, option to provide fuel in kind, variable terms, etc. A pipeline company operating in a competitive environment seeks to create new demand and a broader customer base by adding services in a pro-active manner. Such services are as fair and equitable among its customers as possible and either match or are superior to any of its competitors;
- Offer as much flexibility as possible to its customers. In a competitive environment, a pipeline company has the necessary systems in place and staff with a can do attitude in order to share information frequently with the market place and react to the demands of its customers. A customer focused pipeline will survive and prosper in such an environment;
- Aggressively stimulate gas demand since the gas infrastructure business is one with large economies of scale. In a competitive environment, pipeline companies seek to maximize throughput volume as opposed to unit tariffs. The average utilisation rates on all gas transmission pipelines in eastern Australia are very poor compared to those in North America or Europe.
- Comfortable with a reasonable rate of return; i.e. one that is commensurate with its risk / reward profile. Achieved rates of return on equity in North America fell as low as 2% in 1988 according to a survey of the Interstate

Natural Gas Association and averaged less than 10% from 1985 to 1992. The best way for a pipeline company to minimize risk is to be located in a region or country with a growing and vibrant gas industry;

- Seeks to efficiently handle a large data base of information and customers. TransCanada's NGTS pipeline system in Alberta increased its customer base from less than ten prior to gas de-regulation in Canada to several hundred soon after de-regulation and reduced its nomination period or gas day from 1 day with 48 hours notice to 4 hours with ½ hour notice period;
- Work with all industry participants in order to meet the ever changing needs of the market place. Producers, end users, marketing companies, gas utilities, etc. all have somewhat different needs. A pipeline operating in a competitive environment seeks to understand and to meet these needs.

A pipeline company that is either sheltered from competition or is not effectively regulated exhibits the following characteristics:

- Seeks to protect its existing customers from other customers so that they will return the favor by not supporting any competing pipeline projects;
- Seeks to maximize tariffs and sacrifice throughput volume. A high margin on less volume is easier than lower margins spread over a larger volume. This path of least resistance is sought after by companies that are protected from competition;
- Seeks to limit services to basic ones and does not offer prompt service in order to reduce the need for systems and administration. In order to minimize operating and administration costs, a pipeline company operating as a monopoly will offer only basic services and inflexible terms and conditions;
- Views the regulator as its prime customer rather than its facility users in particular or the industry in general. Most of the energy is focused on making argument to the regulator to support its position in undertakings. This defensive strategy spends time and energy making arguments regarding why things cannot be done rather than creating innovative solutions that are customer focused;

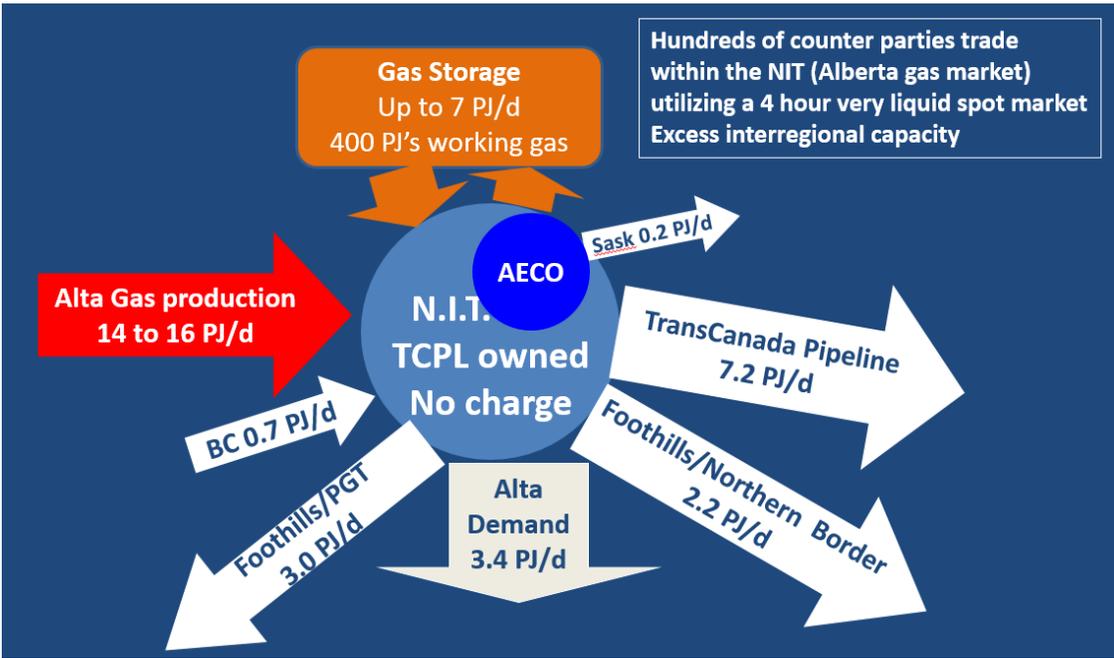
- Creates barriers to competition for it fears change in general. A pipeline company operating in this mode cannot survive in a competitive environment and so does everything in its power to thwart competition;
- Seeks to solve all issues and industry needs by building new facilities rather than by other more economically efficient means such as storage, fuel switching, interruptible service, and back hauls. The aggressive building of asset base in order to financially grow as a pipeline company is a common goal of monopoly pipeline companies;
- They embrace such things as sanctity of contract, property rights, and other historical features of contracts rather than seek to re-negotiate terms and conditions in a win / win fashion;
- Seek steady state conditions for a much longer time period than would be appropriate in a dynamic and competitive environment;
- Seek market bearable rates rather than cost reflective ones. The extraction of monopoly rent is difficult to relinquish.

Trading Hubs

Trading hubs may be either virtual or physical and both can work equally as well depending on many structural factors and characteristics of a region, country or continent, as the case may be. For example, one of the largest virtual hubs globally, is located in Alberta, Canada (The NIT). North America also has many physical trading hubs for gas that work well. Access to gas storage, multiple gas pipelines, a large number of customers, etc. are the critical factors and the correct model must be tailor made to those factors. Encana's predecessor, AEC, developed Canada's first gas trading hub (The AECO gas hub in southeastern Alberta) in the 1980's and that hub evolved into a much larger virtual gas hub that involves the entire NGTL gas transmission system that serves most of Alberta.

Gas trades within the NGTL system, which operates as a virtual gas hub for the STTM, exceed six times the physical flow (i.e. daily trades are in excess of 60 PJ/d while the

physical trade is 10 PJ/d). Ten very large gas storage facilities are embedded within the NGTL system and they can all turn from injection to withdrawal within a 4 hour period. These gas storage facilities have a combined capacity that exceeds 7 PJ/d of maximum deliverability and a working gas capacity available to third parties exceeding 400 PJ's (compared to Iona's 24 PJ's of working gas and 0.5 PJ/d of maximum deliverability). Gas is nominated and scheduled on a 4 hour basis on the entire NGTL system and there are very large penalties for any material deviation of actual scheduled gas from nominated volumes for any NGTL customer over each 4 hour nominating and dispatching period. The NIT or Nova Inventory Transfer virtual hub is illustrated in the figure below.



Gas trading hubs in eastern Australia remain dysfunctional and irrelevant despite the grandiose effort by several parties to pretend otherwise.

It is most interesting that the AEMC does not mention Canada anywhere in its discussion paper, even though Canada resembles Australia in many ways and in fact I would submit that Canada's gas industry had many more obstacles to overcome than does Australia in terms of the creation of an open and freely traded gas commodity

market. Despite those obstacles, the AECO or Alberta hub is actually much larger than the Henry Hub in terms of physical gas trades per day and there are a wide range of financial services related to gas available in Canada including a very liquid futures market.

None of the so called gas hubs in Australia would be recognised in either North America nor Europe as a bona fide gas hub due to the lack of open access gas storage directly connected to the hub, the lack of sufficient interconnecting gas pipelines with a common gas quality and the lack of acceptable access principles and a common non-discriminatory tariff on what little connecting pipelines exist at these hubs. Gas hubs don't suddenly appear because someone calls a geographic point on a map a gas hub. Gas hubs are functional and provide tremendous liquidity and eventually financial services associated with the underlying highly liquid physical market. Market makers and traders congregate at gas hubs as do gas storage operators. None of these players exist in the east coast.

If, and when, the east coast gas industry ever develops a bona fide STTM in terms of liquidity, transparency and reliability for price discovery that reflects the supply and demand conditions for gas in the east coast, then the reference price from that STTM would be relevant as an index and reference point for all future GSAs as evidenced in other jurisdictions overseas. That reference prices is based on a geographic location but there are well documented and proven methods of adjusting that prevailing market price to other geographic locations. In North America this adjustment is referred to as geographic 'basis'. Linkages from one gas trading hub to another tends to be very strong with a sensible correlation over time. Then, and only then, does a geographic basis become reliable to market participants. Inter-hub linkages are very strong now in North America, improving across Europe and do not exist in the east coast.

A material barrier to underground gas storage facility development in the east coast is the lack of access to interruptible gas pipeline services and the fact that if access is granted than reasonable interruptible tariffs are not available. Gas storage facilities are

typically built in uncongested locations along gas pipelines since storage customers must be able to access on a reasonable basis interruptible pipeline capacity on both a forward haul and back haul basis for gas injection and withdrawals from storage. While most of the gas pipelines in the east coast qualify from an uncongested criteria, access to spare capacity on a timely basis at a reasonable tariff seldom exists. For some reason gas pipeline operators would rather have low throughputs than offer pipeline services to gas storage customers.

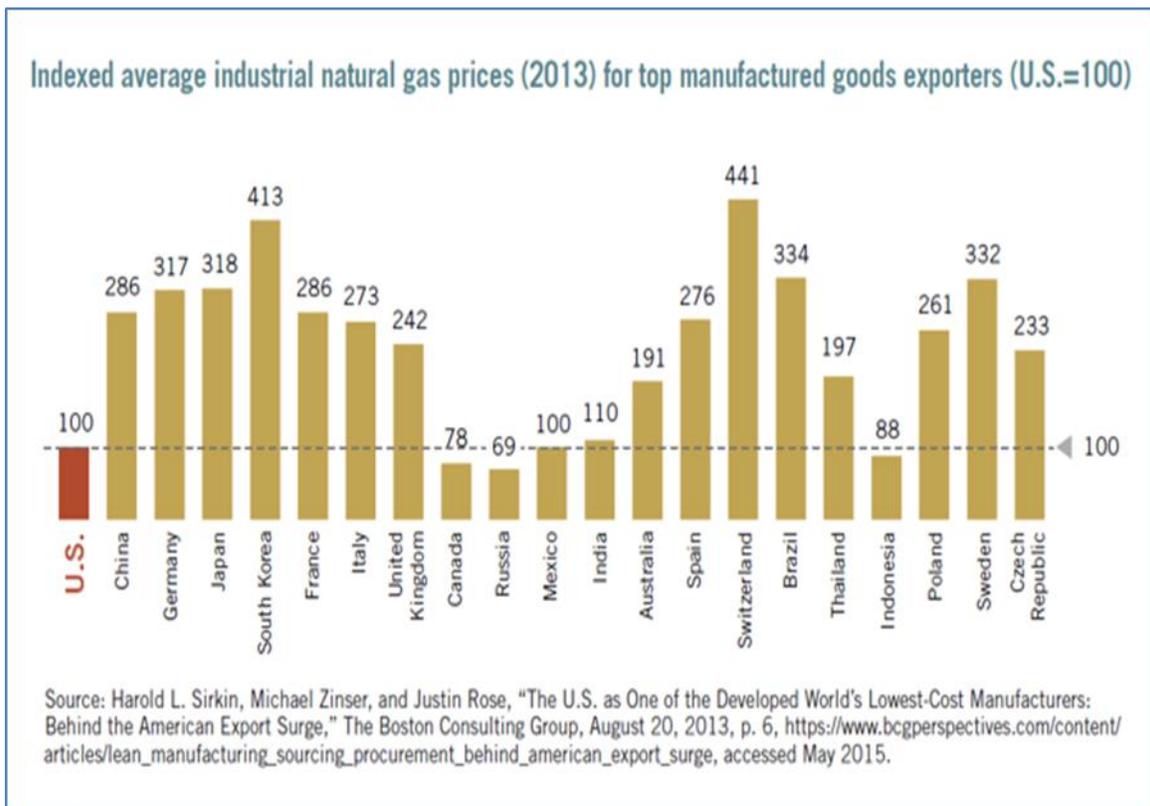
Discussion Paper

The Discussion Paper dated Sept 18, 2015 released by the Australian Energy Market Commission is, in our view, not very accurate in its understanding and description of the overseas experience related to this topic. Encana's perspective as a top North American gas producer with operations throughout that continent does not support much of the Overseas Experience description contained in the discussion paper. The description of the U.S. gas pipeline industry is misleading, inaccurate and very superficial. The paper omitted to discuss Canada, which in our view is very similar to Australia in many ways in terms of the challenges facing its gas industry and yet Canada is a world leader in moving gas and hydrocarbon liquids long distances on pipelines for very low transport fees. Eastern Australia today reminds us of where Canada was in the late 1950's when exports to the U.S. commenced from western Canada to a large degree. There are many lessons that Australia could learn from how Canada built a vibrant gas industry in a very low gas pricing environment utilising very long gas transmission pipelines (much longer distances between gas supply and gas demand than exists in Australia).

It is rather disappointing that overseas benchmarking in Australia's gas industry seems to continuously discover obstacles to change or excuses as opposed to motivation for change to a better world.

Complacency Cost is Very High

The cost of continued complacency will be very high for eastern Australia's gas industry – for both its domestic and export sectors. Delivered gas prices to end users in Australia has been historically high in spite of the relatively close proximity of gas supplies to markets compared to other gas rich countries such as Canada, the U.S. and Russia. Benchmarking of the average delivered gas price in 2013 to the industrial gas sector found in the following graph illustrates how Australia is economically disadvantaged and most of this disadvantage is due to high gas transmission and gas reticulation charges.



The new gas export market at Gladstone has only exacerbated this problem as the gas supply/demand balance is very tight in eastern Australia. The future challenges are many and will require a much more efficient and innovative gas industry structure. The cost of not quickly addressing the gas pipeline sector challenges will be substantially

higher than it has been in the past and Australia's gas industry is already the highest cost among the major OECD gas supply regions.

Conclusion

Encana Australia welcomes the AEMC's work and effort to date and looks forward to its consideration of the issues and comments contained in this submission. Should you have any queries in relation to this submission please contact me at either 07-5435-8288 or at glen@innovativeenergy.com.au

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