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February 7, 2014

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Innovative Energy Consulting Pty Ltd (IEC) Submission in Response to the Eastern Australian Domestic Gas Market Study (Study) Released January 3, 2014

IEC welcomes the opportunity to provide comments on the Eastern Australian Domestic Gas Market Study. IEC has provided commercial, strategic and regulatory consulting services to gas industry clients operating in North America and Australia's since the mid 1990's. IEC's clients include various government agencies and departments, industry associations and large companies operating across the value chain. IEC's Managing Director, Glen W. Gill, has participated extensively in Canada's gas de-regulation process that commenced in the mid 1980's and in gas matters pertaining to Australia's economic reform process that commenced in the early 1990's. He has been an executive of numerous large corporations including EnCana's predecessor, Enron, BHP Billiton, Allgas/Energex and Emera Energy. Among other things, IEC completed a comprehensive and publicly available report for the DomGas Alliance dated November 2012, the Australia Domestic Gas Policy Report, that benchmarks Australia's gas industry to other major OECD regions and countries that have surplus gas resources and are net exporters of gas to other countries and regions, as the case may be. The issues and challenges facing eastern Australia are many given how little has been accomplished since gas reform commenced in the early 1990's especially compared to the implementation of gas liberalisation (reform or de-regulation) initiatives in other OECD countries, particularly North America. Our comments in this submission will focus on a selection of key areas which we consider to be the underlying root cause of most issues and problems. In particular we will offer a reality check regarding some of the underlying

assumptions implicit in the referenced paper. Most of the government led gas reform initiatives to date in eastern Australia have been mere 'window dressing' for they have not as yet resulted in the creation of a fair, competitive and open gas market as defined by any generally acceptable commodity definition of such. It is our view that the eastern Australian gas industry has major structural and regulatory issues that are becoming very problematic and will increasingly do so as export options materialise in a high oil price environment.

Summary

- Eastern Australia's gas industry is 40+ years old and yet it does not display many of the features that one would expect to find in an OECD country that has a world class endowment of gas resources, a vibrant gas consuming sector, an interconnected pipeline grid and 4 decades of development;
- Two decades after the initiation of gas reforms across Australia, there appears to be very little actual progress made in terms of creating meaningful gas to gas competition, greater efficiency and productivity in the gas value chain, a more resilient gas supply chain, gas penetration in the total primary energy supply (TPES) and low delivered prices to major end users of gas.
- The absence of abundant low cost gas supplies to the domestic gas market generally, i.e. engineered gas shortages and high gas pricing to the domestic users of gas, reflects a lack of resiliency to change, a poor industry structure in terms of gas trade, poor policies regarding the stewardship of government owned gas resources and very poor economic regulation of gas pipelines and other vital infrastructure. The result has been and continues to be many unintended consequences and these consequences will only escalate with the introduction of LNG exports from Gladstone.
- The re-emergence of state parochialism is a major concern as Qld's primary objective appears to be export most, if not all, of their gas resources into the now lucrative LNG export market with little to no concern over the impact of unconstrained exports on the remaining states and territories connected to the eastern Australia gas grid. This is clearly a return to pre-microeconomic reform behaviour where inter-state gas trade was prohibited. The risk of stranded gas related investment and other costs to Australia's economy generally due to such a parochial strategy have been ignored to date.
- The export of onshore gas supplies from eastern Australia is much different than the export of otherwise stranded giant offshore gas fields as is the case in WA and the Timor Sea. The Commonwealth Government and the general public would be well served if these differences were addressed for they are many and they have profound implications on other issues including, but not limited to, the social license to operate, the economy and political goodwill and popularity.

- LNG exports offer gas explorers and producers several benefits including, but not limited to: access to a somewhat liquid world LNG market, gas market diversification and the ability to accelerate gas production and sales. The conversion of gas into LNG and the subsequent sale of this product should not dictate the domestic gas price any more than the conversion of gas into any of many other by-products for export. The vertical integration of the LNG export projects has resulted in a large shift in market power to the upstream sector which would not have occurred had a tolling model been applied or a prohibition of vertical integration. It is rather unusual for gas exports to a higher priced gas market to set the domestic gas price in the region of abundant and surplus gas resources. Such a scenario is not governed by market forces but by market power as evidenced by other large gas exporting regions such as Alaska and western Canada.
- Security, reliability and efficiency in the gas industry has been proven elsewhere to be obtained by economic regulation of those with excess market power (i.e. infrastructure owners/operators) and a transparent, fully competitive commodity market (gas) with multiple buyers and multiple sellers trading frequently in time and at frequent intervals along the value chain.
- Any benchmarking to other OECD countries in general and to those with abundant gas resources in particular, indicates that eastern Australia has historically been a very dysfunctional gas industry and it continues to fall far below world's best practice in terms of security, efficiency, reliability and pricing of pipeline gas supplies. This is not a very good report card and radical changes are required to correct the situation.
- Benchmarking also illustrates that Australia clearly lags other OECD countries that have abundant gas resources in terms of creating value from that resource and this gap is expected to increase under the scenario of increased LNG exports at the expense of the health of the domestic gas market. Gas share of TPES is low, gas consumption per capita is low and delivered gas prices to large gas users are relatively high.
- Gas is the only primary energy source that is not a globally traded commodity. The unique properties of gas that have resulted in many regional, national and continental gas markets invoke a requirement for unique policies and regulation of the gas industry, similar to what is required for the electricity industry. Australia has failed to properly address the gas industry in this regard.
- Access to readily available, low cost gas supplies has, and will increasingly constitute a large competitive advantage for developed and developing nations worldwide. As an energy form, gas is by far the cleanest burning fossil fuel and its value is increasing along with global carbon consciousness. The many non-energy uses for gas are also important components of most developed economies.

- History has proven that countries with large resource endowment do not automatically gain an economic competitive advantage over countries that do not have such surplus endowment of resources. Exporting countries have to take the necessary precautions to avoid what are known to economists as the Natural Resource Curse and Dutch Disease. Australia's large LNG export boom, that is well underway, has the capacity to trigger both of these symptoms and the subsequent regrets. Mere "hewers of wood and drawers of water" would remain forever poor if they failed to industrialise. Furthermore sudden shocks to an economic system from export booms are not in a country's best interest.

- Gas resource rich countries rely on a comprehensive menu of interventions and gas regulations and policies in order to protect the national interest and the best interest of the general public regarding the use of indigenous gas production. Benchmarking illustrates that Australia does not manage its gas resources adequately to ensure that gas explorers and production companies operate in a manner that is consistent with a vibrant domestic gas market.

- Australia needs to have sufficiently comprehensive policies and regulations in place in order to control and manage the export of raw commodities. Simply relying on market forces without comprehensive guidelines and controls to mitigate inequitable market power is one extreme while nationalising all resources is the other extreme. Neither of these scenarios has proven to serve the public interest very well.

- Gas resource rich countries, regions and continents generally export gas only after they first develop their own domestic gas market into a vibrant one that has very high gas consumption rates per capita and a high gas penetration in the TPES. To do otherwise destroys value and effectively de-industrialises the exporting region. If and when indigenous gas production declines, exports are reduced to allow the domestic market to continue to access abundant low cost gas supplies.

- Gas exports and a vibrant domestic gas market are not mutually exclusive but it is common to have a rather large price differential between gas production serving the domestic gas market and gas production serving the export market in a net exporting region or country. This is consistent with the regions or nations best interest until free trade agreements are entered into between countries. The convergence of domestic gas prices to LNG export netbacks first in WA and now in Qld are clearly not in any party's best interest except the Australian gas producers.
- Russia, Norway, the Netherlands and Canada are major gas exporting nations that are comparable to Australia in terms of economic and socio political factors and, with the exception of Norway, they all have

comprehensive export and, domestic gas policies that ensure that a large price differential exists between gas export netback prices and domestic gas netback prices in order to stimulate and protect the extensive use of indigenous gas in each country. Norway's situation is justified due to the surplus hydro power generation capacity in Norway and the low cost green nature of this abundant energy source.

- Alaska, Texas and Alberta are examples of large gas supply regions within OECD countries that have gas policies and regulations that ensure low delivered gas prices regionally while embracing reliable gas exports from the producing region for surplus gas supplies.

- To the extent that Australian LNG exports result in domestic gas demand destruction and/or upward domestic gas price pressures then unlimited LNG exports and the associated sterilisation of gas reserves dedicated thereto have serious macroeconomic consequences. The recent demands by Qld CSG producers for export parity pricing will have significant economic and environmental consequences.

- The development of gas import dependence – whether the gas sector was developed on domestic gas or based on imported gas – typically plays the decisive role for differences in gas pricing mechanisms which have developed in different regions of the world. Countries whose gas consumption can predominantly be supplied by domestic gas production have regulatory control, should they wish to use it, of supply (upstream) and demand (downstream) and thus a major influence on the gas pricing mechanism that is employed in that country. Therefore in reference to Australia's situation, Japan's gas supply costs to consumers (i.e. gas export prices received by Australian LNG sales) should have no bearing on Australia's gas supply costs to domestic consumers.

- North America, and increasingly Europe, relies on intense gas to gas competition whereby multiple sellers and multiple buyers trade for gas on a short term basis, a concept yet to be employed effectively in Australia. Gas pricing and other sale terms found in long term gas supply contracts to Australian large gas consumers reflect engineered gas supply shortages, market bearable pricing and other market control tools utilised by gas producers. This anti-competitive behaviour has escalated now that the world LNG market for Australian gas exports has improved in terms of pricing and demand. This is not in the national interest.

- Security of gas demand is as important as security of supply as the gas industry is capital intensive and the infrastructure that it is held hostage to is specialised and exclusively used for gas. Domestic gas demand is a much more secure market than the export market and domestic gas demand with its vast network of infrastructure takes much longer to build

than does an export industry, including long lead time LNG export facilities. Consequently, demand destruction in the domestic market due to high domestic gas prices, uncertainty over the availability of affordable gas supplies and declining trust in the gas industry and in government regulation and policies pertaining to the gas industry is to be avoided. While it may take a decade to build gas export facilities it takes multiple decades to build a vibrant domestic gas market.

- The unanticipated shale gas production boom in the U.S. has resulted in stranded LNG import terminals and re-gasification assets in the U.S. and on the east coast of Canada that were largely built less than 7 years ago to offset declining indigenous North American gas supplies. This is a clear example of how unreliable LNG trade can be in the long term and how security of gas demand is much higher in the domestic gas market than exists for LNG exports regardless of contracts. The domestic gas market in an OECD country will always be there to the extent that indigenous gas production is priced reasonably. Australia's domestic gas market should be valued by gas producers operating in Australia and the ultimate resource owner, the crown, for in the longer term indigenous gas always has a large transportation cost advantage over future gas imports to that market (i.e. PNG pipeline gas or LNG imports).
- Benchmarking to other OECD countries in general, and to those with abundant gas resources in particular, reveals that significant efficiency gains and other advantages to both gas consumers and gas producers could be achieved if policy and structural changes were introduced in Australia. Australia has recently attracted and continues to attract significant capital investment in its upstream sector of the gas industry and it needs to adopt policies that continue to support both this upstream investment and ensure that its domestic market has access to readily available low cost gas supplies. These activities are not mutually exclusive as demonstrated by many large gas producing regions overseas.
- The influence of increasing gas exports (pipeline gas or LNG) from most large gas exporting regions on domestic gas prices is usually the opposite to what has happened in WA and is currently occurring in Qld and the east coast of Australia. Larger exports usually mean larger surpluses of indigenous gas resources and that normally translates into downward pressure on domestic gas prices. This is how market forces work in a well functioning market. Export projects, whether they be via LNG or long distance gas pipelines, are very capital intensive and therefore export capacity typically lags the amount of surplus gas supply deliverability, reserves and production over the requirements of the local and domestic gas market.
- The many unchallenged claims by gas producers across Australia that the domestic market now must compete with exports vis-a-vis gas price reflect

a new pinnacle of what has for some time been an escalation of market power and market manipulation. Most third party consultants in Australia echo the producer rhetoric which is another major concern. Quite the opposite to Australia, is the U.S. where proposed gas export projects are required to demonstrate how they will reduce prices and price volatility in the domestic U.S. gas market to the satisfaction of the U.S. Department of Energy (DOE). Furthermore, the DOE constantly monitors the situation and if necessary will revoke the export licence to the extent that it fails to demonstrate that it remains in the national interest. The DOE has stated in its conditional approval of the recent Sabine LNG export licence: "We intend to monitor those conditions in the future to ensure that the exports of LNG authorized herein and in any future authorizations of natural gas exports do not subsequently lead to a reduction in the supply of natural gas needed to meet essential domestic needs. The cumulative impact of these export authorizations could pose a threat to the public interest. DOE is authorized, after opportunity for a hearing and for good cause shown, to take action as is necessary or appropriate should circumstances warrant it. Furthermore, DOE/FE will evaluate the cumulative impact of the instant authorization and any future authorizations for export authority when considering any subsequent application for such authority." Even remote Alaska has to comply with these rules. The level of petroleum related activity (450,000 producing gas wells in the U.S.) indicates that investment is not discouraged by such policies. Canada has a very similar policy and monitoring procedure and Canada has in excess of 150,000 producing gas wells.

- Exports to a gas market where higher gas prices prevail may yield a price advantage to the exporter and to the Government in terms of its royalty revenue from gas production allocated to that export sale but there should be no linkage between higher international gas prices under export activity and the domestic gas market prices of the exporting country or region. To the extent that export prices are low, there is often an export floor price equal to the domestic gas market wellhead price prevailing in the exporting country to alleviate the ‘dumping of resources’ to competing economies. Domestic gas production for domestic gas consumption in a net gas exporting nation or region should be priced on the basis of the availability of supply to that market and, in turn, the marginal costs of indigenous gas production. Contrary to the allegations by Australian gas producers, the price received from exports is irrelevant. Any convergence of these two prices, unless under a floor pricing policy for exports to prevent resource dumping, is due to a free trade agreement or a symptom of market power abuse and market failure.

About IEC

IEC provides commercial, regulatory and strategic advice to large companies in the gas industries of North America and Australia. IEC's Managing Director, Glen W. Gill, has held executive positions over 2 decades with many of the largest gas companies operating in both Australia and North America and across the entire value chain. Most of his experience is with upstream petroleum exploration and production companies but his experience includes large vertically integrated gas and electricity companies that are involved in gas production, power generation, reticulation, trading, gas pipelines, and gas storage.

Mr. Gill was involved in the de-regulation of Canada's gas industry that commenced in 1985 and represented the interests of AEC Oil & Gas (predecessor to North America's largest unconventional gas producer and second largest gas producer, EnCana), in that process. Mr. Gill was also involved in the micro-economic reforms that commenced in Australia in the early 1990's as they related to the gas industry and in that process he represented the interests of BHP Petroleum and its related companies, BHP Steel and BHP Minerals.

It is important to note that IEC is neither a gas producer nor a gas consumer and is not representing any client interest in this submission. IEC is therefore objective and unlike many of those submitting submissions, has no self serving agenda. Glen has extensive experience in the regulatory and policy arena and has written comprehensive submissions to regulators and policy makers in both Canada and Australia over the past 3 decades.

The gas industry tends to be very fragmented and each sector tends to make self-serving arguments to the extent that it is sometimes difficult for policy makers and regulators to find a balanced solution to issues or to generate workable criteria for goals and objectives. This submission may be particularly helpful in that IEC is only attempting to make observation and comments based on extensive experience working across the gas value chain in Australia and overseas.

Eastern Australia Gas Policy – Reality Check

Industry Rhetoric Abounds

The amount of self serving, unchallenged rhetoric found in Australia's gas industry is second to none and in my view this rhetoric has, and continues to cause delays in the natural evolution of the gas industry into one that is much more efficient, dynamic and reliable. APPEA and APIA are, in my view, the most active generators and spreaders of such rhetoric. Unfortunately many of the large consulting companies work for their members and in order to maintain their client base they resort to regurgitating this rhetoric. The absence of an equivalent to Canada's National Energy Board or the USA's FERC, where an independent government body staffed by industry experts challenges many of this self serving rhetoric and keeps the countries energy policies on a balanced national interest perspective has, in my view, resulted in the protraction of a very dysfunctional gas industry in eastern Australia. Facts are generally friendly and I would encourage policy makers to be thorough and utilise bench marking data and not simply generate excuses for Australia as has been witnessed in the past.

One of the implicit assumptions in the Study is that the cost of finding and producing gas increases with time. There is no surprise where this assumption originated but there is little evidence to support it. Naturally the cost of LNG export facilities increased to unprecedented levels when a record high activity level was reached recently. The cost of unconventional gas supplies decreases due to many factors including volume of wells drilled and superior completion techniques as reported by most large unconventional gas operators in North America. The average gas well rate in North America is but 0.1 TJ/d and yet producers in North America have lowered production costs sufficient to compete at prices much lower than in eastern Australia. Competition is the key. When the low cost producer wins, gas producers focus on driving down costs which is good for all stakeholders in the gas industry. Gas production in eastern Australia has and continues to be very inefficient compared to operations and practices in North America. One very revealing feature is the utilisation rates associated with wells and gas plants. Gas wells in North America have an average utilisation rate exceeding 90% while those in eastern Australia are typically around 50%. The offshore wells in the Bass Strait have the lowest utilisation rates in eastern Australia despite the multi-billions of capital invested in those gas production facilities. Benchmarking Bass Strait to the offshore Gulf of Mexico gas production utilisation rates and ownership of offshore infrastructure is rather revealing.

Polarisation Abounds

Self serving rhetoric generally goes unchallenged in Australia because of many factors but perhaps chief among them is the polarisation of the various stakeholders and sectors that comprise the gas industry. There is little to no attempt by APPEA, APIA, ESAA and various end user associations to understand the other's perspective and to collaborate to build a better industry for all involved. Gas industry conferences

and debates when they do occur resemble the Springer Show on TV as opposed to any intentions to solve issues, compromise and create a win/win. While the gas industry tends to be much more polarised than the electricity industry in most OECD countries, the extent of this polarisation in Australia is extreme. For example APPEA constantly claims that Australia has benefited from 'cheap' gas to date and that the era of cheap gas is now over. The large end users of gas in eastern Australia have in reality experienced higher delivered gas prices generally over the past 4 decades than their counterparties located in other gas rich regions such as the Gulf Coast of the U.S. or in Alberta, Canada. Statements about the end of the 4 decades of available cheap gas in eastern Australia are simply nonsense as the only truly cheap gas was the $0.27/GJ fixed price contract between the Bass Strait producers and Gas and Fuel. The pipeline charges in Australia have been and continue to be orders of magnitude higher than that for an equivalent sized, length and age gas pipeline in either Europe or North America.

Market Participants Indifference

Market participants in Australia's gas industry in general have tended to demonstrate a general lack of bona fide interest or an apparent indifference to issues and solutions. The degree of participation and the quality of submissions to government sponsored forums such as this one is but one indication of this problem. This is another structural problem that involves the belief of not being empowered to be able to make a difference. This is not the case in either Europe or North America. The extended and very engaging recent process involving whether to allow, and if so how much LNG exports from either Canada or the US lower 48 states, is but one example of how the gas industry cultures differ in how they engage over issues.

Gas Demand vs a Gas Market

Gas demand supplied by a few long term supply contracts should not be confused with a vibrant functioning gas market. Many, including the Minister, often allude to a gas market in eastern Australia and that market forces will prevail and cope with change in an acceptable manner. My experience in the gas industry spans both models and while I agree that open and fair markets can be very resilient to large changes and cope very well with them, as has been well demonstrated in North America for a couple of decades, I have yet to witness any evidence of such a 'gas market' operating anywhere in Australia. The recently released Study queries how fast the market's ability to respond to the challenge of future market dynamics that include a large LNG export component at Gladstone. Such queries imply that a gas market exists in eastern Australia at this time. There is, in my view, no transition as contemplated in the Study but actually a large build up of additional market power by the upstream sector in general and those with LNG export capacity in particular. In a functioning gas market, the introduction of LNG exports would have but a short term material impact on domestic gas prices. This is far from the situation in eastern Australia for gas producers can and are effectively holding the domestic gas market under siege as they have strengthened their gas supply cartel and have created a better option for themselves. It is interesting to note that export parity gas pricing was

not demanded by the owners of the North West Shelf project when oil prices were $10 to $20/bbl and LNG netbacks were but a fraction of the domestic gas prices received from the WA domestic gas market! The end users of gas in WA were, for a couple of decades, paying premium prices for gas relative to that received by the gas producers from their LNG buyers. Gas producers operating in most OECD countries do not expect export parity prices for their gas supplies sold into the local domestic gas market but most OECD countries prohibit the 'dumping' of gas resources – that is the selling of gas to customers overseas or at a national border that is priced less than gas sold to the domestic market.

Any belief that we are simply in a transition period and that the gas market forces will sort everything out is ill founded. The recent run up in gas prices in eastern Australia is evidence of the fact that there is no operational gas market. The simple facts are that the east coast has never before experienced such gas drilling activity and related gas production capacity increases and yet gas prices at the STTM have increased under this unprecedented over supplied gas situation. The laws of supply and demand simply don't work in Australia's gas industry as experienced repeatedly in both WA and now eastern Australia!

In a functioning gas market, participants forecast gas prices based on the futures market and other fundamentals such as the r/p ratio, gas drilling rates, production decline rates, gas storage capacity, full cycle cost, half cycle cost and marginal production costs. In eastern Australia there is no futures market for gas (no underlying reliable short term trading market) and the other factors are simply ignored because they have little to do with prevailing gas prices. Eastern Australia has an abundance of 2P gas reserves, an abundance of gas wells and gas deliverability related thereto, low utilistation rates on existing gas plants with adequate gas production connected to those plants and low utilistation rates on most gas transmission pipelines.

Meaningful gas to gas competition has yet to occur in eastern Australia and APPEA has done a great job to date convincing everyone that it is not a requirement. There is a lot of discussion around 'markets' and 'supply' and explanations regarding how gas costs will inevitably rise and how world LNG prices (conveniently picked from one desperate region in the world) are inevitable but none of the gas producers are willing to compete head to head for gas markets. I hail from Canada where gas resources are also largely crown owned and the owner of the resource, namely the government representing the people, take a pro-active role in ensuring that the gas is produced and sold not at the highest possible price but at a price that makes sense for all stakeholders. The hoarding of reserves and the withholding of gas supplies from markets due to producer price expectations is prohibited in Canada for that is not in the best interest of any stakeholder except possibly the gas producer. It is only in the gas producer's best interest if all gas producers behave accordingly and are allowed to do so. That is precisely the situation that we find ourselves in across eastern Australia. The anti-competitive behaviour that I have witnessed in eastern Australia by gas producers would not be permitted in Canada.

Gas Industry Resiliency

Eastern Australia's gas industry has very little resiliency or capacity to cope with change. The establishment of an inter-connected multiple state gas grid was a good start to creating resiliency but access to low cost transportation service remains problematic. This and long term contracts with onerous delivery point specifications continues to frustrate the movement of gas from over supplied regions to undersupplied regions on a real time basis.

The lack of abundant open access gas storage facilities is another major flaw in the gas industry of eastern Australia. Europe, Russia and North America have and continue to rely on gas storage for greater efficiency, reliability and flexibility. The uninformed believe that gas storage is not required in Australia due to the climate. Over 1/3 of the U.S. gas storage capacity is located in the Gulf of Mexico region and is utilised for the power generation market and to manage gas supply interruptions. The introduction of a large concentrated gas demand at Gladstone (LNG feedstock demand) will change the flow patterns for pipeline gas across eastern Australia but this transition will be protracted due to the lack of flexibility in the gas supply system. For example, otherwise shut-in Bass Strait production cannot economically access Gladstone due to the absence of a direct gas pipeline path up the east coast. The existing gas transmission system was built to provide control and barriers to entry, protecting the two original gas plants, namely Moomba and Longford, and they do not provide the flexibility, value and services that a bona fide gas transmission network normally delivers. The lack of a flexible low cost gas transmission network is one of a few major structural problems that exist in eastern Australia's gas industry.

Government Policy

Sound government gas industry policy has been missing in eastern Australia. While there are many different components to energy policy in general and gas policy in particular, I will comment on a few examples.

The privatisation and re-capitalisation of gas pipelines originally owned by various governments was a symptom of this issue. In a large country, access to low cost gas pipeline service is of paramount importance and yet eastern Australia has forfeited this key ingredient that is necessary to create an open and vibrant gas market. This situation was exacerbated by the lack of strict economic regulation of tariffs on most gas pipelines and by the essentially meaningless access principles and policies adopted. As a former executive of the largest gas pipeline company in North America, it is my view that the contract carriage model does not exist in eastern Australia for very few of the basic characteristics of that model are displayed in the domestic gas pipeline sector. For example, the level playing field (i.e. the same tariff for all shippers utilising the same service on any given day) does not exist. This is a fundamental pre-requisite for gas trading hubs to operate and for competition to occur. While the existing gas pipeline model used outside Victoria is referred to as the common carriage model the definition of those terms is different than that used in either Europe or North America for it lacks the basic ingredients that define that

model. Access to low cost infrastructure is a key success factor that is missing and should be addressed. A basic market power test would illustrate that all gas transmission pipelines in eastern Australia have substantial market power. Since economic regulation is a surrogate for competition, these pipelines should not be exempt from strict economic regulation.

The allowing of joint venture gas marketing by gas producers or perhaps more accurately the discouragement of each gas producers to take and market in kind, long term gas sale contracts, confidential gas pricing, and many other generally accepted characteristics of the current eastern Australia gas industry by various government agencies and departments reflects either a complete lack of understanding of how to create a freely traded open gas market or favouring one sector of the gas industry over the other sectors. Market power issues are alive and well in eastern Australia's gas industry and they appear to be largely untouchable. Whether this is by choice or an inadvertent decision by uninformed policy makers is a key question that remains unanswered.

In most OECD countries, particular attention and detail is given to policy pertaining to food, water and energy supplies. Gas and electricity demand a much higher scrutiny than other forms of energy due to the fact that both are difficult to transport and store and neither is a world commodity that is readily traded and available to import as needed. Consequently, the export of electricity and gas generally require a demonstration by the proposed exporter that it is in surplus to the foreseen requirements of the exporting country and that the export will not have a material impact on the domestic price for the commodity in question, electricity or gas, as the case may be. Eastern Australia appears to be rather indifferent about gas exports since no public interest test or discussion in that regard has been applied to any of the current LNG export projects at Gladstone. Apparently Australia has no policy regarding the value of indigenous gas which is very curious, particularly given gas is generally accepted as the bridging fossil fuel of choice to a lower carbon emissions future. Even remote Alaska has an onerous process with export applications and permits for the export of its gas in the form of LNG. Alaska has very little domestic gas demand and has been exporting LNG far longer than Australia and yet elects to enforce a level of control over the export of its vast gas resources. Most gas producers accept and acknowledge that such a process can be managed and is indeed simply a deterrent against market power and abuse vis-a-vis serving the domestic gas market in the exporting country or region.

A lack of policy promoting the development and commercial use of underground gas storage (UGS) is another major impediment to a low cost reliable gas supply to the domestic gas market. UGS has been utilised since the 1960's in North America and quickly spread to nine European countries and Russia. Gas storage development and use was embraced by Alberta, Canada in the 1980's in order to lower its gas supply cost and therefore compete with U.S. supplies to U.S. gas markets. The amount of gas storage in Alberta now exceeds 350 PJ's of working gas and the maximum deliverability from gas storage facilities is 7 PJ/d. This storage is open

access storage and was built to provide greater resiliency to its gas supply portfolio of 140,000 producing gas wells and 100+ gas processing plants. This gas storage deliverability is equal to 40% of the total production capability from all of the producing gas wells and associated gas plants. This storage has enabled Alberta to retain its position as a low cost gas supply basin and all of this storage was built on a commercial basis by the private sector. It is widely recognised that gas hubs, trading and low cost gas supply requires a portfolio of gas storage facilities embedded in the gas transmission system. Eastern Australia has one open access gas storage facility at Iona and its capacity is essentially negligible in comparison to the gas production rates in eastern Australia over the next few years.

The gap between gas industry regulation and electricity industry regulation in eastern Australia is huge. While electricity is considered an essential service and therefore fundamental to the national interest it is difficult to exclude gas in that argument given the fact that the cost of gas fired electricity often sets the price in the electricity market and the fact that gas is used widely in Victoria's residential heating market. While voters will not freeze in the dark if gas is not available, the cost to the economy is significant as was demonstrated after the Longford gas plant explosion. Extremely high gas prices have the same effect as gas shortages in that demand destruction will exist and the general public should demand explanations and possibly claim for damages related to stranded investments.

Eastern Australia Gas Policy – Submission Guideline Questions

Gas Market Reform Agenda

It is, I suggest, time to admit that the experiment to reform eastern Australia's gas industry utilising an unproven Australian made model that commenced in the mid 1990's has not delivered adequate results. Any post mortem analysis would conclude that not much was accomplished toward the objective of creating an open and competitive market for gas. Two decades after the commencement of major gas reform initiatives the gas industry remains plagued by gross inefficiencies and unchecked market power.

By comparison, Canada created a competitive gas market commencing in October 1985 via a land mark de-regulation agreement of the gas commodity while maintaining the economic regulation of gas pipelines. The following is an excerpt from a report by the National Energy Board of Canada called Natural Gas Market Assessment – 10 years after Deregulation published in September, 1996:

> The main story in the natural gas producing sector in the last decade was the 40 percent fall in wellhead prices that occurred from 1985 to 1987 and the subsequent actions by the sector to survive in the lower price environment that has persisted since then. The gas producing sector has responded by aggressively cutting costs and rapidly expanding export sales. Cost reductions have come from corporate downsizing, applications of new technology such as "3-D" seismic, improved drilling practices, improved inventory management, and increased attention to costs in each step of the exploration and production process. As a result of all these actions, gas replacement costs in Alberta have been reduced in real terms by about 50 percent since 1985.

The concluding remarks of the report state:

> Overall, our report finds that the natural gas industry is efficient and responsive to the demands of the marketplace. The pipeline sector has developed a new range of services which, along with improved storage capability, has greatly enhanced the flexibility and reliability of the delivery system. The gas producing sector has cut costs sharply and has increased production dramatically, despite persistently low wellhead prices. While production has increased, the pace of technological change and improved knowledge of the producing basin in western Canada indicates that supply can be expected to meet Canadian and export demand for the foreseeable future. Current estimates of the ultimate potential of the Western Canada Sedimentary Basin are about 50 percent greater than those of ten years ago.

The key performance indicators of a well 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 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;
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 offered again on a non-discriminatory basis;
8. A large price differential would exist between the domestic gas market in eastern Australia and the netback price received from the LNG export market. 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. Withholding gas from the market would be prohibited by the resource owners (various governments) as it is not in the best interest of the nation for gas producers to manipulate the market for their commercial advantage;
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;
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.

There are many examples overseas of well 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.

Promote Gas Supply Competition

The initiation of gas supply competition would be a great start, followed by the promotion of gas supply competition over the long term. As I mentioned earlier, there has yet to be true gas to gas competition in eastern Australia and the gas producing sector has been, and continues to, adamantly resist this from occurring. The gas producers prefer to bring on gas reserves whenever they see fit and that translates into market manipulation and other anti-competitive behaviour. This attitude originated during the era when the eastern Australia gas demand was carved up by state and served by essentially one of two gas plants that did not compete for market share. While there no longer is a monopoly gas supplier to each state gas demand, this attitude of avoiding competition remains.

There are many different ways to force intense gas to gas competition and the following is a partial list of driving factors:

1. 'Use it or lose it' gas reserves associated with PL's. For example in Alberta a gas producer must quickly produce from all gas reservoirs under a PL, including up-hole gas or else the Alberta government will revoke the rights to any un-producing gas reserves and sell those rights to another interested party. The use it or lose it policies in Australia are very lenient compared to most jurisdictions overseas.

2. To the extent that gas prices are not cost based but rather market based (that is determined by true market forces) then the gas producer is wise to sell into today's gas market for tomorrow prices may collapse.

3. The low cost producer wins. To the extent that gas producers are truly price takers as are all primary producers in an open market, they take whatever revenue they can get and focus on driving down costs as they strive to be in the bottom quartile of the industry in terms of gas supply cost. Such a focus has been in existence for decades in North America and yet there is little, if any, evidence of its existence in eastern Australia to date.

4. The ultimate threat is the nationalisation of gas exploration and production activities to the extent that gas producers do not wish to offer fair and reasonable prices to consumers and to focus on costs and capital and operational efficiencies. National petroleum companies are popular and growing at alarming rates as nations seek to better control the cost of energy supplies and the exploitation of their natural resources.

Improve commercial and regulatory environment for infrastructure

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 what is referred to in the submission guide as a 'well 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 but 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.

Role for Non-market Interventions

Anyone promoting a gas reservation policy pertaining to insitu gas reserves either does not understand how elusive gas reserves are or else they do not understand how gas producers could and will 'game' such a rule to the extent that it is non-effective. The dedication of reserves to gas sale contracts is an old concept that disappeared long ago in North America. One of the reasons was that it introduced greater inefficiencies into the industry and another was the fact that it is almost impossible to administer. The only time recoverable gas reserves are truly known is when the last molecule of gas has been produced from any given reservoir.

Even gas producers avoid balancing uneven production interests or lifting by utilising gas reserves due to the risks and uncertainties involved.

Export controls are utilised by many OECD countries and Australia would be naive to think that such controls should be ruled out. Export licenses are used in both Canada and the U.S. as a large deterrent to prevent the neglect by the gas producing community to first and foremost ensure that abundant reliable low cost supplies are made available to consumers in the country of origin pertaining to that resource. The

onus is on the gas producer to demonstrate that the gas for export is surplus to the future requirements of the country given reasonable assumptions regarding reserve replacement rates, production replacement rates and domestic demand growth. Such a process creates a constant reminder of the objectives and goals of the country exporting the goods or in this case the gas – i.e. the national interest. It is rather preposterous to contemplate that gas producers in eastern Australia should and could export unlimited quantities of gas while neglecting, or worse yet, threatening the domestic gas demand in terms of abundant available reasonably priced gas and yet this seems to be the case in eastern Australia at the moment.

Governance and Implementation Issues

It is impossible not to become really cynical at this point. The history of Australia is that the ACCC has, and continues to, support such anti-competitive behaviour as joint venture marketing arrangements including the right of the upstream joint venture operator to have a right of first refusal on any and all gas sales agreements that a non-operator joint venture partner might wish to enter into with a third party. Do you truly believe that it is appropriate, for example, that Santos needs to approve a potential gas sale between Beach and Origin from Beach's gas production in the Cooper Basin gas unit operated by Santos?

Essentially all gas production has been 'taken in kind' and marketed in kind by gas producers in Alberta, Canada since the late 1980's. Gas producers operating in an open and liquid gas market actually prefer to take their gas in kind and diversify their gas sales portfolio as they see fit for each producer has different expectations vis-a-vis gas price, cash flow, margins and other business variables. Selling gas collectively has proven to be a very inefficient model, but it does allow gas producers to gain significant market power in a shallow gas market where the number of joint ventures operating in the upstream sector of the gas industry is relatively few.

There is little sense in developing more governance until we use the governance that exists today and sits idle with no apparent accountability.

Eastern Australia Gas Policy – General Policy Comments

The Domestic Gas Market Role

Once considered a waste by-product of petroleum activity and production, gas has evolved over the past 5 decades into the most desirable fossil fuel from an environmental and efficiency perspective. Additionally gas has very important non-energy uses for modern society. Globally, gas share of the total primary energy supply (TPES) is increasing and international gas trade is also increasing as many nations have inadequate indigenous gas resources or inadequate production rates from those resources to meet their growing domestic gas requirements. Australia is gas resource rich and yet lags the OECD average and significantly lags the average of OECD gas exporting nations in terms of gas penetration in its TPES. Australia's current gas and energy policy supports unlimited gas exports from Australia regardless of the impact on its already stunted domestic gas industry and the corresponding negative impact to its economy and environment.

Australia's domestic gas market has provided the necessary impetus for Australia's gas production and supply chain development from the discovery of gas in Roma in the early 1960's until oil linked LNG prices became profitable in 1999. It is entirely inaccurate and inappropriate for Australian gas producers to make claims today about how they have historically been disadvantaged by supplying Australia's domestic gas market and to make threats to not supply this market in the future unless and until it delivers the same netbacks to them as does LNG exports (i.e. parity pricing between LNG exports and the domestic gas market).

While Australia's domestic gas market has grown substantially since the late 1960's, it does not reflect the abundant low cost gas resources that exist across Australia. For example, Australia lags other major gas supply regions such as Western Canada, Russia and the south west U.S. in every benchmarking category that examines efficiency, gas penetration and low gas supply cost to consumers. There is little value adding to gas in Australia in terms of converting gas feedstock into various goods for both the domestic market and for export including: fertilizers, methanol and gas to liquid products. Australia also lags many OECD countries in terms of the use of gas for electric power generation.

The export of gas from Australia in the form of LNG commenced in 1989, lagging the introduction of pipeline gas supplies into Australia's domestic market by more than two decades and into Western Australia's domestic market by five years. There is little doubt that the sale of gas into the domestic market long before LNG was exported from Australia's first LNG export project, the Northwest Shelf project, was the catalyst for attracting petroleum exploration and gas production development across Australia. LNG sales from Australia were only contemplated when gas discoveries were sufficiently large that they could not in a reasonable time frame, be absorbed in Australia's relatively small domestic gas market. The lack of a continental Australia gas market has further exacerbated this issue.

Australia's R/P ratio can be compared to 12.4 years for Canada, 13 years for the U.S., and 4.5 years for the U.K. The global R/P ratio was approximately 64 years as of 2011 and the OECD average was 16 years. Australia's R/P ratio is comparable to the non OECD country average of 90 years. Australia's R/P ratio is indicative of an undeveloped economy in a resource rich country. Resource rich developed economies tend to generate large domestic gas demand (i.e. Alberta, Canada) and convert gas resources into value adding exportable goods thereby creating jobs and multiplying the benefits from its gas resources. There is always a limit to how large a domestic gas market can become given the population, etc of the resource rich country but Australia's domestic gas market is currently smaller than that of the province of Alberta, Canada. There has been very little effort in Australia to grow its domestic gas demand commensurate with its gas resource endowment.

Australia's use of gas as a feedstock is also extremely low compared to other gas resource rich countries. It is rather unusual for a large commodity producer (agriculture and mining) such as Australia to forfeit the many benefits to the economy and security of supply from manufacturing at least all of its own demand for such gas intensive input products as fertiliser and explosives. The replacement of imports is not only attractive economically but also from a supply risk mitigation perspective. Canada is a great example of intense gas usage based on a similar resource rich perspective as Australia. Canada consumes nearly 300% more gas on a per capita basis than does Australia and this gas consumption is driven not by the home heating demand related to the cold climate as many uninformed people believe, but by the industrial, mining and petrochemical sectors of the market. Canada utilises very little gas for power generation due to its abundance of hydro generated electricity (>50% of generation).

Absent a major policy shift, the path forward for Australia appears to be contrary to what most developed nations who have abundant gas resources would be. Australia's domestic gas market has been stunted for some time now and significant demand destruction is the outlook given the lack of a gas policy that protects the domestic gas market. It is obvious that Australia will soon be suffering from both the resource curse and the 'Dutch Disease' regarding its gas resources. Australia's use of gas in its primary energy consumption is at the world average; this is a very poor reflection of gas policy given Australia is about to become one of the world's top gas exporters, given that it has embraced a carbon constrained future and given it is an economically developed nation. Very few comparable nations have neglected their domestic gas market to the extent that Australia has. For example, gas consumption as a percentage of the total primary energy consumption for Russia, the Middle East and the Netherlands is twice that of Australia.

Reliance on Market Power Legacy in Australia

Australia's upstream sector of its gas industry has been plagued with anti-competitive behaviour since the genesis of the country's pipeline gas industry commencing in the 1960's. While it is not unusual for start-up regional pipeline gas markets to have

such growing pains, it is unusual for an economically developed country to continue to tolerate, and in some cases even embrace such behaviour for multiple decades.

Originally the buyers of gas were dominated by government owned companies and they demanded fairly harsh terms from petroleum producers that had no alternative gas market. The vintage GSA's between gas producers and the gas reticulation companies reflected this skewing of market power. Various governments also owned essentially all the gas pipeline infrastructure from the 1960's until the privatisation of these pipelines in the mid 1990's. The charges were high and the services poor associated with those pipelines compared to world's best practice, essentially reflecting another tax on the gas industry. The prohibition of interstate gas trade was another of many encumbrances to the struggling gas industry. Not surprisingly gas producers responded by developing anti-competitive patterns of behaviour in the manner in which they developed gas production leases and sold gas production across Australia. This behaviour was anti-competitive to such an extent that it would not have been tolerated in most OECD countries.

Post the mid 1990 gas reform initiatives, gas producers continued with their anti-competitive behaviour for it was entrenched in the system by now. They were joined by the new pipeline sector owners who took advantage of the recently formed and inexperienced pipeline regulatory bodies charged with ensuring that gas pipeline access and tariffs were in the public interest. The pipeline owner's accomplishments were many; to the extent that most gas pipelines in Australia are not economically regulated tariffs are generally discriminatory and the cost of services are not reflective of actual costs. The term 'service providers' for this sector has become rather ironic compared to the standards set in most other OECD countries.

The large end users of gas have essentially been victims of the many unintended consequences that resulted from the first 50 years of Australia's gas industry. Unlike other OECD countries that faced gas de-regulation and gas liberalisation, the large gas users across Australia did not, until recently, form a coalition to influence the evolution of Australia's gas industry. Gas users groups have been relatively fragmented compared to the gas producer association but this changing. The EUAA was mostly pre-occupied with matters and issues relating to the electricity industry but is now expanding its focus to domestic gas supply. The WA based DomGas Alliance has been engaged in public and industry debate for some time. Manufacturing Australia and the Australia Industry Group are also now engaging in the issue given the potential impact on Australia's manufacturing sector.

Domestic gas market policy must address, among other things, market power and anti-competitive behaviour. To not address this makes a farce out of the entire process. To date Australia has done very little in this regard on the basis that intervention done in most other gas resource rich countries is not appropriate or required in Australia. Nothing could be further from the truth as evidenced by the current state of Australia's gas industry.

To avoid abuse of market power (pushing gas prices up), competitiveness is assured is some gas markets overseas by ensuring access to many players on both the demand and supply sides. In such gas markets, security of supply is guaranteed by transparent, efficient and liquid markets and not by political protection. Infrastructure owners who have market power are economically regulated as a surrogate for competition but gas trade acts like a commodity. This is termed the commodity gas to gas competition market model throughout this submission. Australia has not embraced this model but has elected to hang on to the long term contract gas to gas competition model.

Alternatively, other nations nationalise their gas industries and/or control the pricing of gas in order to mitigate market power. This is a popular model in less democratic nations and less developed economies. The European and North American gas industries had major intervention by governments including price controls until the mid 1980's. Australia partially embraced this model through government ownership in gas pipelines and gas reticulation assets from the 1960's until the late 1990's.

A description of the many ways in which Australian gas producers have and continue to manipulate Australia's gas market and its regulators is beyond the scope of this submission. It is suffice to say that across Australia the pattern is similar and while that tactics often differ the result is the same. The result is high delivered gas prices to large gas consumers and onerous GSA's that contain anti-competitive restrictions and obligations that discourage the use of gas in Australia.

Oil is a transportable, global commodity. Gas is generally consumed on the continent where it's produced – and the relatively low price of gas in North America and most other gas producing regions compared to oil reflects that. The gas producers in Australia want to change this concept by their assertions that there is an emerging global gas market and that Australians have to pay global gas prices (i.e. match the netback price received from LNG exports to the highest priced gas markets in the world). Such a notion is contrary to what is the reality in the largest continental gas markets, namely North America and Europe where price differentials have and continue to exist between exports and indigenous gas production that serves the domestic market of exporting regions/countries.

There is absolutely no reason, in my view, for the governments of Australia to support the clear mission of the upstream sector of Australia's gas industry to distort and skew market power to the extent that they essentially control the domestic gas market. While gas producers undoubtedly would prefer to avoid gas on gas competition in the domestic market, it is not in the interest of the gas industry in general, the Government and the general public for this to continue.

The engineering of perceived gas supply shortages when the country is awash with gas resources is one of the main devices used by Australia gas producers to effectively prop up gas prices in the domestic gas market. The notion that a producer's ability to deliver gas under a long term sale contract must be underwritten

by demonstrated 2P gas reserves upfront serves the producers in this regard. This is a very ancient practice and an inefficient manner in which to conduct gas sale and purchase agreements and to underpin export projects. Similar reserve dedicated long term GSA's existed at one time in North America but were replaced in the 1980's with long term GSA's that were much more flexible and among other things did not contain dedicated gas reserves. The flexibility of these GSA's enabled the gas industry to become much more efficient. Long term contracting essentially disappeared in the 1990's as the market evolved to essentially all short term sales.

Finding and proving 2P gas reserves is a capital intensive business and producers should rely on their exploration track record and failing that, their ability to acquire gas supply either in-situ or gas production as required from third parties to supply any and all future gas supply commitments. The concept of dedicated gas reserves and stockpiling gas upfront prior to entering into long term sale contracts disappeared long ago in most overseas markets that lead the way in efficiency benchmarking studies.

For example, the U.S. has relied on an R/P ratio of less than 10 years for decades and Canada has followed in this regard. This transition occurred in both of those countries well before the conversion of the gas market to predominantly short term or spot transactions. The practice of reserve dedication has proven to be a very inefficient method in which to sell gas and was replaced by corporate performance guarantees with liquidated damage provisions for non-performance. The only reason that this gas contracting structure still exists in Australia is for the gas producers to effectively engineer a gas supply shortage. The sterilisation of sufficient proven producing gas reserves to underpin the first 15 or 20 years of sales from new LNG export projects only exacerbates this problem. It should be adequate for the proponents of these projects to have sufficient confidence in the ultimate gas resource base within economic reach of supplying those projects and their ability to continue to find and develop those resources at a profit. To rely on upfront dedication of proven gas reserves is a very conservative approach that does not exist in other industries, including the oil industry. There is much rhetoric in Australia regarding this subject as this concept is used to convince gas buyers to comply with the gas producer's agenda of controlling and manipulating the domestic gas market.

Claims by gas producers includes the rhetoric that the industry would not exist without long term sale contracts containing long term pricing formulas and infrequent and onerous price renewal provisions are not supported by fact. It has not been a barrier to investment in North America's gas industry and the worldwide oil industry as both are based on short term supply contracts and short term variable pricing formulas; usually based on a daily price index.

One of many examples that expose this rhetoric is the fact that, in Canada, large petroleum producers have spent $C 50 billion on oil sands mega mining projects in Canada. This expenditure is expected to grow by another $C 100 billion over the next few years if oil prices outlooks remain high. All of this expenditure is

underpinned by volatile, short term world oil prices and a 3 to 5 year oil futures market. To suggest that upstream gas production facilities would not exist in Australia without certainty of market and revenue to the producers is inconsistent with how the oil and gas industry operates in other OECD countries.

Free & Fair Gas Markets

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

I. 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. Long term contracts that tend to de-commoditise gas should be discouraged.

II. **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.

III. **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.

IV. **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. In Russia, Western Canada and the Gulf of Mexico region UGS facilities are used to promote gas exports to other regions and countries and to ensure that intense gas on gas competition occurs in setting domestic gas prices In excess of 50 UGS facilities exist in Canada and Russia and an UGS working gas capacity in each country in excess of 10% of the annual gas production is used effectively to lower delivered prices and to ensure reliability of gas supply on a daily basis. Gas storage has been a tool used for decades to enable gas exporting regions to achieve the necessary efficiencies and security of supply in order to accommodate the demands and expectations of both the domestic and export markets. These regions and countries over the past 40 years have developed their gas resources, export and domestic markets, and related infrastructure in such a way that the domestic market enjoy abundant, low cost, reliable gas. High valued export markets were served on a secondary priority but with a very high level of reliability. For example, Western Canada has exported over half of its gas production to the U.S. markets over the past 25 years while serving Canada's national domestic market on a first priority basis and yet has never defaulted on deliveries to its U.S. gas customers. An extensive network of underground gas storage and other facilities are used to ensure that gas supplies are abundant and to reduce price spikes in the prevailing gas market.

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:

I. Multiple gas transactions (buyers and sellers) at every stage in the value chain;

II. Proliferation of services such as underground gas storage, hub services, and financial services;

III. 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;

IV. 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;

V. 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;

VI. 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 generally 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.

A Vibrant & Competitive Gas Market

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 have 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. Permitting the charging of market based tariffs for gas transmission services is consistent with permitting the joint venture marketing of gas by upstream JV's but neither will result in the development of an efficient domestic gas market. As a result the gas industry (both producers and large consumers) proceeded to basically bypass the gas pipeline industry via gas field located power generation, or building their own gas transmission pipelines or relying on LNG exports for most of their markets. To make matters even worse, the ACCC renewed all joint venture marketing arrangements and/or granted new ones to new projects.

The principal characteristics of 'perfect competition' in the gas industry as defined by the Pipeline Review Panel established in Canada during gas de-regulation of that industry in June 1986 was as follows:

1) The existence of and application to a homogeneous product (natural gas satisfies this characteristic),

2) The existence of multiple buyers and sellers,

3) The absence of barriers – including government regulation – to sale, purchase, or delivery, and

4) Ready access to all relevant information.

Any resemblance of such perfect competition is sorely missing from eastern Australia's gas industry. All four of these pre-requisites for gas to gas competition need a substantial amount of improvement. Then, and only then, will the eastern Australia gas industry begin to work as an efficient market that offers reliable and secure gas supplies to consumers.

It takes considerable effort in the gas industry to accomplish a 'marketplace' where gas is freely traded as a commodity. Only Canada, the U.S. and the U.K. have successfully created such a marketplace. Gas producers supplying into those markets and increasingly so across Europe are price takers. Their gas supply costs and their price expectations are irrelevant except to the degree that they may wish to shut-in gas production when the prevailing price for gas is less than their cash costs (i.e. royalty payments and operating costs). In such a market gas producers focus on becoming a low cost producer Vis-a-Vis their competitors for they know that market

forces will reward low cost efficient gas producers and punish inefficient high cost gas producers. This is how capitalism works.

Since gas is held captive to the gas infrastructure network and is not a fungible commodity until it is pipeline gas or LNG, as the case may be, the creation of a level playing field across such a complex industry takes considerable effort and influence by Government and regulatory bodies. Failing the creation of such a marketplace where multiple buyers and multiple sellers frequently trade gas in meaningful quantities, gas prices tend to be monitored very closely for anti-competitive behaviour and often become economically regulated by Government.

To be successful, gas industry liberalisation entails four preconditions:

- There must be competitive gas available to the market;
- Customers must be free to choose among suppliers;
- The transmission system must be open to shipment by competitive suppliers ("open" or "third party access");
- Pipeline access must be non discriminatory.

All four steps have been successfully achieved in the U.S., Canada and the U.K.. Short term commodity trading has now largely replaced long term contracting in those markets, and those remaining long term contracts – mostly for cross border trade – are pegged to indictors reflecting gas to gas competition. This success is in contrast to import dependent regions for, despite efforts of the European Community to liberalise its gas industry, the progress there is far from complete. There has also been comparatively little effort to liberalise gas markets in Northeast Asia.

While Australia attempted to implement gas reform commencing in the 1990's, the characteristics of Australia's wholesale gas market do not resemble those found in a free and open gas market. Market power and market manipulation by the upstream and midstream sectors of Australia's gas industry has been, and continues to be problematic in Australia. For some unknown reason the government and regulatory agencies are either unwilling or unable to mitigate or eliminate these fatal flaws in the system.

There are two common early assumptions regarding the creation of gas to gas competition. Firstly, the pricing of other energy sources, such as oil, and LNG imports, if any, becomes largely irrelevant. Secondly, the traditional long-term contract, with its oil price linkage, could not survive since one could not sell oil linked gas in a commodity market priced below oil.

Gas molecules become a commodity while infrastructure related services such as transportation, storage and reticulation are cost based until such time as sufficient options are available to allow market forces to work in the provision of infrastructure related services. Gas storage is typically the first service to serve market based rates. Some gas pipelines might eventually be determined to have insufficient

market power and be able to charge market based rates but customers in that case must have many options available to transport gas from A to B and this is uncommon, except in North America. This gas market structure works in North America and the U.K. since many producers of domestic gas compete to create a very liquid commodity market. It can best be described as “commodity gas-to- gas” competition (Figure 1). Development of gas markets is usually presented as an evolution towards a more transparent, free and predictable environment.

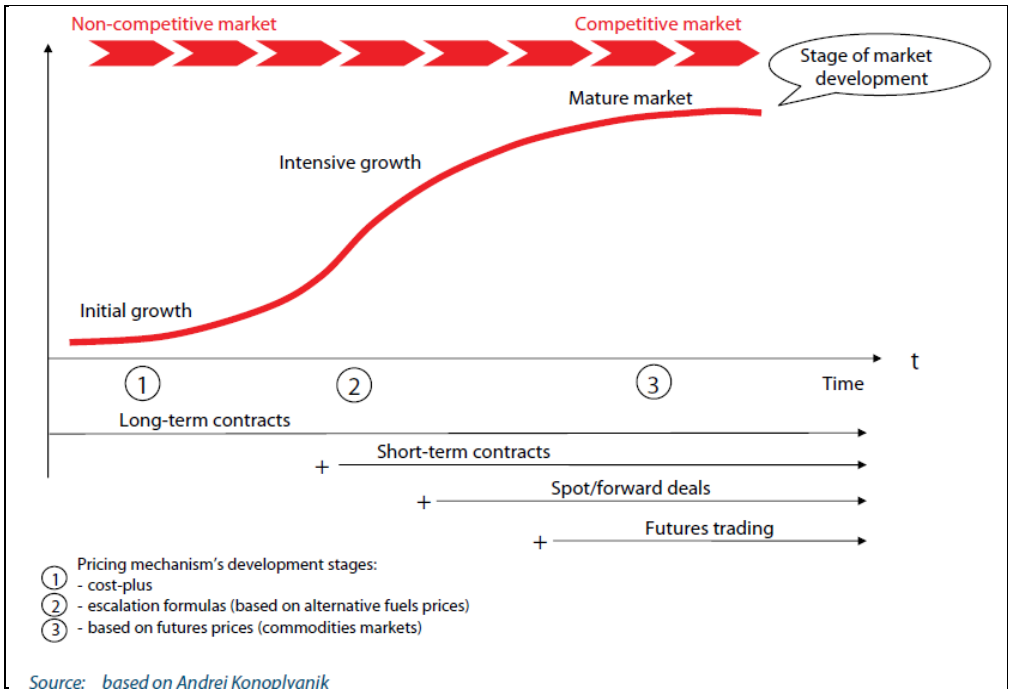
This evolution includes the following factors:

- infrastructure development, including the setup of increasingly more integrated transportation systems;
- an increase in the traded volumes in the physical market,
- evolution of the institutional gas market structure and primarily contract evolution (including pricing);
- development of regulations;
- growing competition between market players;
- increasing number of security threats (investment; physical; national energy security; bilateral international - security of supply and security of demand; security of transit);
- changes in the way the parties share the risks;
- and - most importantly – evolution of the mechanisms to reduce transaction costs (vertically integrated monopolies, long-term inter-governmental agreements, multilateral international agreements, asset swaps, and consortiums).

While gas to gas competition is the hallmark of efficient gas market structures, it is important to differentiate between contract gas to gas competition and commodity gas to gas competition. Commodity gas to gas competition involves real time price discovery in a liquid market and today this only occurs in Canada, the U.S., the U.K. and perhaps soon in the Netherlands and Germany. In commodity gas to gas competition markets the market place determines the clearing price for gas.

Contract gas to gas competition occurs in countries and regions such as Australia where long term GSA’s dominate the domestic gas market and the short term gas market is illiquid. The absence of a liquid transaction market discourages price discovery and transparency. Both sellers and buyers can be frustrated because of restrictive contractual terms and very little commercial flexibility. Gas prices reflect contract terms and market conditions at the time the contract was negotiated as opposed to current market conditions. This explains the large price differentials that exist across Australia and from one vintage GSA to another.

Figure 1. Gas Market Maturation Path



Australia's domestic gas market characteristics remain at the initial growth stage shown in Figure 1. While AEMO and the Victoria Government have tried to introduce and promote short term contracts and day trading in the wholesale east coast Australia gas market, these initiatives have not as yet resulted in any meaningful liquidity and/or market price derivation.

Australia's domestic gas market lags other OECD countries generally and in particular other OECD countries with abundant gas resource endowments. Australia has been espousing gas industry reform for some time now but the results of that initiative are very poor when benchmarked to other countries that have liberalised or de-regulated gas markets and industries. The supporting evidence includes the following:

- Low petrochemical use of gas (non-energy feedstock applications)
- Low gas share of TPES
- Low gas penetration rate in power generation
- Delivered gas prices to consumers
- Cost & access to infrastructure
- Lack of transparency
- Lack of liquidity
- Anti-competitive behaviour
- Hoarding of assets, capacity & resources

- Market manipulation

Gas Policy

While there is no universally accepted definition for security of gas supply, in developed countries like Australia the usual definition is simply the availability of sufficient gas supplies, on a daily basis operationally and on a long term sustainable basis for investments, at affordable prices. The way that this is interpreted varies by country. Security of gas demand is as important as security of supply because the gas industry is capital intensive and the infrastructure that it is held hostage to is specialised and can be used only for gas. Consequently, demand destruction in the domestic market due to high domestic gas prices, uncertainty over the availability of affordable gas supplies and declining trust in the gas industry and in government regulation and policies pertaining to the gas industry, is to be avoided. Gas supply without demand cannot be monetised and export projects, while they have their place, are not to be relied upon exclusively for gas sales. Gas export projects have a large list of associated risks that do not exist in the domestic gas market. Consequently when and if gas production declines in a net exporting country, like Canada, exports diminish with production decline until the country's gas supply and domestic demand are in balance again.

Likewise, currently there is no universally accepted definition of security of gas supply and demand, or how it should be measured. Security of supply and demand is driven by a number of factors - reliability of production, transportation, import, export, transit and storage capacity and the flexibility and responsiveness of the gas market to price signals. Security of gas supply and demand in Australia would be quite low, unacceptably so in my view, when benchmarked against other OECD countries with respect to these factors.

Some major energy security challenges in this sector include the following:

- inadequate development of gas production and gas supply infrastructure and insufficient investments along the entire gas chain (the underinvestment threat);
- high prices (price risk);
- Unmitigated market power that chronically exists in the gas and electricity industries due to the fact that these commodities cannot be easily transported or stored (market power risk);
- vulnerability of the critical energy infrastructure to natural disasters, terrorist attacks, military operations, industrial catastrophes and system accidents (physical and technological security);
- Political risks

It is common for OECD countries to develop a comprehensive gas policy that ensures the security of gas supply and demand country wide and thereby protects the public interest of the citizens of that country. It is beneficial for nations to use

private sector companies to invest in all aspects of the gas value chain but it is fundamental for that nation to regulate the industry in such a manner that results in security of gas supply and gas demand. The diversification of supply sources and markets is one of the best strategies to embrace in this regard. Multiplying one's supply sources reduces the impact of a disruption in supply from one source by providing alternatives. This serves the interests of both consumers and producers, for whom stable markets are a prime concern. East coast Australia has learned that inter-state gas pipelines built over the past 15 years have substantially reinforced security of gas supply. It is counter-productive to continue to embrace joint venture gas marketing and to prioritise LNG exports over the security of supply concerns of the domestic gas market.

Another important tool is a 'security margin' in the gas supply system that provides a buffer against shocks and facilitates fast recovery after supply disruptions. Because of the high day to day and seasonal variability of gas demand and the inevitable risk of physical outages in the delivery infrastructure, a buffer of spare capacity on the system is required for domestic gas supplies to be secure. This spare capacity can take a number of different forms: for example, sufficient spare production and reserve transportation capacity, oversized import infrastructure, curtailment of gas exports for diversion to the domestic market, underground gas storage capacity, LNG peak shaving facilities, backup supplies of equipment such as compressors on pipelines, demand side flexibility (e.g. fuel switching by power generators or large end users if possible) as well as carefully conceived plans for responding to disruptions that may affect large regions. While no gas supply system can provide 100% certainty that there will always be adequate supply to meet demand under any conceivable circumstance, most OECD countries have a very good track record in this regard because adequate energy security is in the best interest of the public. Australia's track record for gas supply security has not been stellar over the past two decades and yet very little has been done to remedy the situation.

A third goal of good gas policy is to ensure sufficient investments in the gas value chain. A balance must be struck so that sovereign risk is acceptable and asset risk is commensurate with possible ownership rewards. There is an abundance of rhetoric from industry associations and various market participants regarding this issue. Benchmarking to world's best practice is perhaps the best way to sound policy in this area. North America is constantly being criticised by Australian policy makers and gas industry participants as having too restrictive regulations and policies with respect to gas and yet the gas industry there is by far the most efficient globally, the largest gas market and has continuously attracted large investments throughout the gas value chain. For example, BHP Billiton has elected to grow its gas business preferentially in North America over Australia despite the fact that BHP Billiton's petroleum business had its genesis in the Bass Strait.

Finally, good policy must protect consumers and the public against opportunistic use of market power by market participants. Anti-trust regulation must be adopted and enforced in order to properly mitigate this issue. Strict economic regulation and

policies that are a surrogate for competition must be applied to assets that by their nature grant an unacceptable amount of market power to their owners/operators. In most OECD countries strict policies and regulations exist to ensure that gas infrastructure commonly used by market participants has non-discriminatory open access principles, low cost reflective tariffs, and provides services that benefit all market participants equally and the public interest generally. Australia has very little, if any, of these fundamental characteristics. Good policy also ensures that gas producers are subject to competition and are not permitted to withhold gas supplies, reserves or deliverability, from the domestic gas market.

In countries and regions like Australia where gas resources are owned by the governments of those countries, the main gas supply decisions are made by those resource owners. Hence the objective of gas exporting countries is typically to maximise their resource rent from gas exports while ensuring that affordable and reliable gas supplies are available for the domestic market within those exporting countries. The upper price limit for gas exports, whether pipeline gas or LNG, is determined by the competitive situation in the export market, usually by competition with substitute fuels within the importing country. This led to the linkage of LNG exports to crude oil prices on a delivered basis. The concept of netback prices to the exporting country based on the replacement value in the importing country underpins the world LNG market today and some gas pipeline exports such as gas supplies to Europe from Russia, Norway and the Netherlands.

The use of gas globally and its market share of primary energy source has increased over the past two decades as the 'dash to gas' continues to be of paramount importance to developed economies as they focus on cleaner burning, more efficient energy sources. Gas is widely recognised and embraced by such countries as the hydrocarbon fuel of choice. As mentioned previously, gas is not just the most desirable fossil fuel from an environmental perspective but gas also has very important non-energy uses. The petrochemical industry based on gas as a feedstock for the creation of fertiliser, plastics, and many other derivatives is an important sector in most OECD countries that have abundant indigenous gas resources.

Consequently, gas policies and regulation are an increasing focus for most nations. Europe has developed strategies for not only economic efficiency but also ensuring supply security with regard to medium to long-term gas procurement. Europe is attempting to cope with its increasing dependence on Russia for gas supplies. Japan is one of the largest consumers and its change in nuclear policy is having an impact on its LNG import strategy in terms of pricing methodology and security of adequate future supply. Canada and the U.S. have recently reversed gas production declines with the ongoing shale gas boom and are evaluating the impact of possible future LNG exports on their respective domestic markets.

To the extent that gas supply prices in Australia remain unlinked to LNG export netbacks, this enhances gas' competitive position relative to other energy supplies

depending on energy policy and energy market structure. For example, in the European power markets, gas input prices linked to oil have tended to make gas uncompetitive with coal and this remains a growing issue that could reduce gas demand in Europe and increase carbon and other emissions. Conversely, in North America, the recent drop in domestic gas prices has resulted in a large displacement of coal for power generation in the lower 48 U.S. The linking of gas to oil prices has been less of an issue in Asia where regulated power prices carry higher marginal fuel input costs. Competitive market structures rely on fierce competition in each form of primary energy in order to access the lowest cost energy supplies when adjusted to such externalities as carbon emissions, etc. The very competitive North American gas industry has consistently outperformed Australia in terms of delivering reliable low cost gas supplies to consumers, whether those consumers be large industrial consumers, power generators, petrochemical feed stocks or households utilising gas for heating and cooking.

Australia, as a gas exporting country like several other OECD countries and Russia, can learn a lot from these countries' security strategies and energy policies. As many other gas net exporting countries with developed economies have done, it is recommended that Australia accelerate efforts toward the creation of a vibrant and efficient national domestic gas market. The availability of abundant low cost gas (intense gas on gas competition by gas suppliers) and access to low cost gas infrastructure are two important conditions to the creation of such a domestic gas market in Australia. The impact of gas exports (LNG exports) must be carefully monitored and controlled so that exports do not in any way deteriorate the security and cost of gas supplies to the domestic gas market. Increasing gas exports have been successfully accomplished in many countries such as Canada, Russia and the Netherlands in a manner that actually improves the security of gas supply and lowers the cost of gas to major gas consumers in the domestic market.

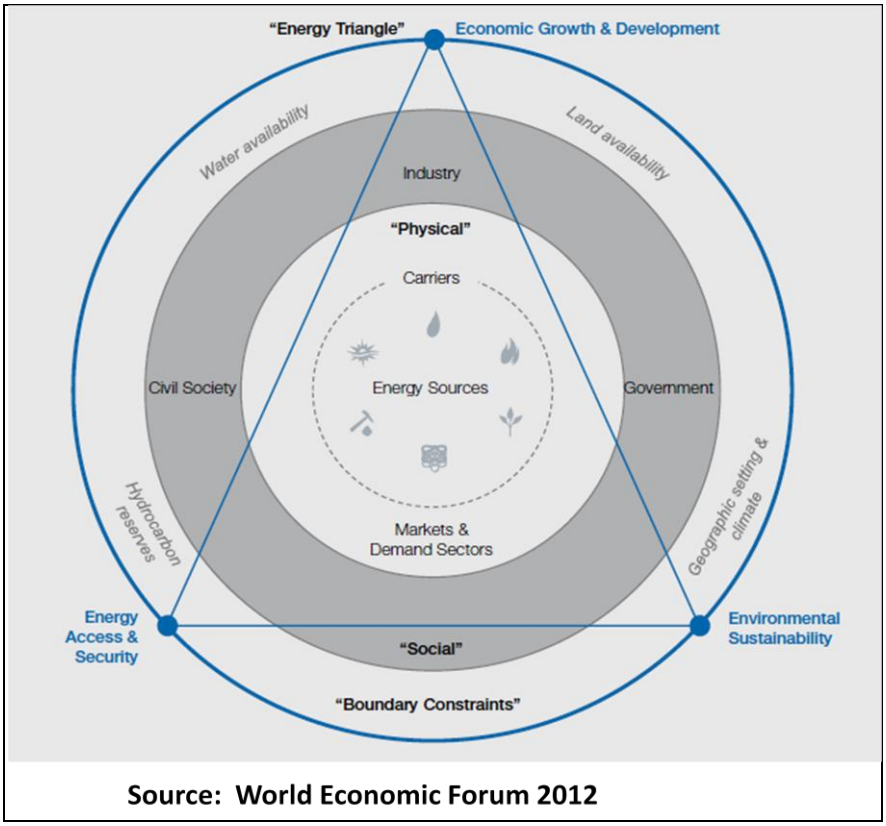
Gas policies and security of supply strategies vary from country to country but nonetheless they do exist and they deal with all matters of major concern with respect to a nation's domestic gas market. History demonstrates an escalation of resource nationalism in gas resource-rich countries. Gas resource-rich countries with developed economies tend to develop extensive gas related infrastructure (pipelines, hubs, storage, etc) to promote competition, diversity and security of supply. They also have comprehensive policies and procedures for first the creation of intense gas to gas competition in the upstream sector to foster abundant low cost gas and then in the mitigation of any and all temporary gas supply disruptions. The domestic gas market typically commands first priority on all issues and concerns at the expense of gas exports. This is considered to be good national policy in order to protect public interest.

Government policies in every country in the world influence both national and international energy architecture. Given the strategic significance of the industry, this is expected. It is also expected that national interests will continue to dominate energy policies. At present there is a patchwork of policies in Australia and this is

now impacting Australia's gas industry in such a manner that large, unintended consequences of the LNG export boom may materialise. These consequences have the potential to be extreme and any attempts to correct the situation may take a very long time to implement unless action is taken immediately to remedy the situation. Rational behaviour and sound business decisions are the hallmarks of the gas industry in many other regions and countries overseas that are also gas resource rich.

Good policy always balances a number of interests and objectives. Gas policy typically seeks to address the economy, the environment and energy security (Figure 2). Meeting the imperatives of the energy triangle has become increasingly challenging as energy security and environmental imperatives are both strong and must be delivered against the background of difficult economic conditions following the global financial crisis. The financial crisis reminded the world of the intrinsic link between the price and availability of energy and the economy. It is fairly well accepted globally that access to low cost gas supplies will increasingly be a competitive and economic advantage. While not long ago each state and territory in Australia embraced that concept and hence prohibited the development of inter-state gas trade, apparently this has been replaced with a casual attitude regarding access to abundant low cost gas supplies and the use of gas in Australia's domestic energy market.

Figure 2. Energy Architecture Policy Framework



Source: World Economic Forum 2012

A few other OECD gas exporting regions and countries have vast experience in the creation of policies and practices that have invigorated both the export of gas to high value markets and the growth and wellbeing of the local domestic gas market. Australia has the opportunity to learn from such examples.

Benchmarking to other OECD countries in general, and to those with abundant gas resources in particular, would reveal that significant efficiency gains and other advantages to both gas consumers and gas producers could be achieved if policy and structural changes were introduced in Australia. Australia has recently attracted and continues to attract significant capital investment in its upstream sector of the gas industry and it needs to adopt policies that continue to support this upstream investment while ensuring that its domestic market has access to readily available low cost gas supplies. These activities are not mutually exclusive.

Benchmarking provides the ability to use the power of comparison to identify inefficient businesses and to force them to improve. A benchmarking of any sector of Australia's gas industry to other OECD countries would indicate that Australia's gas industry is very inefficient. Furthermore it would also indicate that regulatory failure runs rampant across Australia. Delivered prices of gas in Australia have not historically and do not now reflect the abundance of widely distributed gas resources across Australia. For example, most Australia states and territories are self sufficient in gas production while less than half of Canada's provinces and territories are self sufficient in gas production. Most of the states located in the L48 U.S. are also reliant on gas imports from other regions of the U.S. and Canada. Delivered prices to large end users of gas in Australia have historically been, and continue to be substantially higher than in the U.S. and Canada.

A healthy, growing and vibrant domestic gas market is considered to be a high priority in most large gas producing countries. All net gas exporting countries with developed economies, except Norway, ensure that their domestic gas markets have access to abundant reasonably priced gas supplies. It is generally considered to be in the public interest of gas resource rich nations to utilise this, now preferential hydrocarbon resource from an environmental perspective and efficiency perspective, as much as possible. Furthermore, industrialised nations link access to energy with prosperity and gas is no exception to this rule. Utilising gas as a valuable feedstock supply to the petrochemical and power generation sector is considered to be both good stewardship of resources and beneficial to the national economy. It does not, for example, make much sense for Australia to import explosives and fertiliser that use gas as one of the key inputs to the manufacturing process.

It is generally considered important for nations to prioritise the domestic market over exports regardless of how large a country becomes as a net exporter of gas. The domestic market is what drove the creation of a gas industry in most countries, particularly OECD countries and gas resource rich countries realise that they have little influence or control over the security of demand and pricing levels associated

with export markets, particularly LNG exports priced under long term LNG supply contracts that are subject to sudden and unpredictable changes such as contractual defaults, non-performance by the buyer and unilateral pricing adjustment demands that are not pursuant to the terms and conditions of the contract. For example, Japan has been paying premium prices for LNG imports for some time now and its recent nuclear energy policies are triggering a revisiting of LNG import pricing methodologies including questioning and challenging the terms and conditions under existing long term LNG supply contracts. Australia LNG is the major source of gas imports to Japan and therefore will be impacted by this energy policy change and subsequent impact on LNG import pricing to Japan.

The common practice for developed economies is to fully develop their domestic gas market prior to focussing on gas exports. It is obvious that Australia has badly neglected its domestic gas market over the past 40 years. Australia has been exporting gas since 1985 and gas producers have been complaining that additional gas exports are required in order to monetise the huge unconventional gas resources found in eastern Australia (i.e. gas supplies have outgrown Australia's domestic gas market argument). Australia's domestic gas market would be in the order of 63 Bcm per annum (approximately 2,300 PJ/a) to match the average use of gas per capita of Russia, Canada and the Netherlands. This represents a 245% increase from the current domestic gas market and is 140% of Australia's total 2011 gas production. Alberta, Canada is one of the largest gas exporting regions in the world and with a population of less than 4 million people its provincial gas consumption exceeds Australia's national gas demand. Alberta is by far Canada's wealthiest province and adopted very strict gas policies in the 1950's regarding balancing exports and adding value to gas within the province.

It is difficult to address an exporting nation's domestic gas policy without also addressing its export gas policy. The rules of engagement for petroleum companies operating in an OECD country usually clearly stipulate that serving the domestic gas market is top priority and only excess gas production and resources will be permitted to chase the export market. Free trade agreements (FTA's) clearly override such a policy. Such is the case, for example between Mexico, Canada and the U.S. One of the major problems of relying too much on export markets for any commodity and this is most certainly true for gas, is that countries and regions often switch from import dependent to self-sufficient due to game changers involving technology and energy policy. North America is a good example of this phenomenon in terms of both gas and oil. The unconventional resource boom sweeping across North America has the potential of converting a major oil importing continent into a self sufficient one again and the potential of converting a historically long term self sufficient gas continent into a major LNG exporter to the inter-continental gas market.

The export policy of any country reflects that country's energy policy regarding encouraging abundant and affordable pipeline gas supplies to its domestic gas market. Consequently, prior to FTA's, exports of gas from many countries, including most OECD countries, were closely monitored and controlled by various means in

order to ensure that the domestic gas market of the exporting country (i.e. Canada), and often an exporting region within a country (i.e. Alberta, Canada), was not in any way adversely affected by gas export activity. Prior to FTA's, gas exports were typically considered to be a gas producer privilege, as opposed to a right, that was earned and granted subject to many conditions, most of which ensured no adverse impact of such activity on the domestic gas market of the exporting region/country. Such energy policies were generated and endorsed in order to avoid or minimise symptoms and unintended consequences such as what are known to economists as the natural resource curse and Dutch disease. Such policies protect the public interest of the citizens of the gas exporting region. Now that FTA's exist among many nations, these export restrictions are only in effect between gas exporting regions and countries that are not parties to an FTA with that country. For example, LNG exports from the US have to be approved by FERC to the extent that the LNG is destined to a country that the US does not have an FTA with.

The other major reason to not rely too heavily on exports is the previously discussed resource curse or Dutch Disease. Merely exporting raw resources is not the long term answer to sustained growth and prosperity for a nation and therefore it is not in the public interest to over rely on gas exports to the extent that the domestic gas market is neglected. Benchmarking to other developed economies that are also gas resource rich has demonstrated that Australia's domestic gas market is currently much smaller than one would expect given the age of Australia's gas industry and the abundant widely dispersed gas resources found in Australia. There is little doubt that the wave of new LNG export projects in the absence of an export policy will result in demand destruction in Australia's domestic gas market resulting in a further disadvantage to its economy. Again it is very difficult to make the case that this is in the best interest of the citizens of Australia.

OECD countries that export energy in general and gas in particular, commonly have comprehensive export policies in order to ensure security of supply for the domestic market does not deteriorate as a result of exports and to ensure that gas exports are understood to be a privilege as opposed to a right. The requirements of the general public and the value adding potential must be met and exploited respectively and then, and only then, does deemed surplus gas resources be allowed to be exported to competing countries and economies.

The current issues and problems expressed by major gas end users across Australia as they seek either additional gas supplies for new demand growth opportunities or as they seek to replace expiring GSA's are particularly disturbing. It is obvious that there are a number of unintended consequences from the LNG export boom that could significantly hurt or at least disrupt the domestic gas market. Given that Australia's domestic gas market is already immature, inefficient and very small compared to other gas exporting nations such as Russia, Canada and the Netherlands, it would be difficult to recover from such a situation.

LNG exports from Australia offer gas explorers and producers several benefits including, but not limited to the following: access to a liquid world LNG market, gas market diversification and the ability to accelerate gas production and sales. The sale of gas exports to overseas markets should be construed as a right that is granted by Governments of exporting countries such as Australia and this right should not be confused with the obligation by gas producers to first look after the domestic market of the exporting country or state. For example, Canada has been a large exporter of gas to the U.S. since the late 1950's but the export of gas until NAFTA was always done as a surplus gas market opportunity and never at the expense of the domestic market. Canada's practice required export permits and export price tests to ensure that the domestic market was not disadvantaged in any way from the exporting of gas. Furthermore, the export market is served as a second priority to the domestic market in terms of reliability prior to NAFTA. Consequently, a large price differential existed between the price received by producers from the export market compared to that received from sales to the domestic market from the late 1950's until 2002, at which time surplus export pipeline capacity and NAFTA resulted in a converging of various regional markets into a continental market.

Conclusion

In conclusion, it is IEC's view that the Commonwealth has a large task ahead as it seeks to generate and implement the necessary policies in eastern Australia to create a vibrant gas market that is resilient to the upcoming changes in gas demand, including LNG export feedstock gas. Large and immediate changes to the structure and to the policies of eastern Australia's gas industry are necessary and perhaps long overdue in order to meet its stated objectives of "improving the gas market's ability to respond to price signals". The gas industry of eastern Australia exhibits many of the symptoms associated with market failure and regulatory failure and policies must be implemented to correct this situation. I suggest that the problem is much larger and more widespread than the stated objective. First one has to develop a true gas market which currently does not exist. Then, and only then, will market based or market derived price signals exist at which time the gas industry will respond and hopefully in an efficient and timely manner.

IEC appreciates the opportunity to offer these comments and offers them in the spirit of assisting the Australian Government Department of Industry in this vital task of balancing policy with stake-holders needs and interests. We hope that our views as expressed in this submission will be helpful toward that end.

Regards

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