



DOMGAS ALLIANCE



Western Australia's Domestic Gas Security

Report 2009

The DomGas Alliance

The DomGas Alliance represents natural gas users, infrastructure investors and prospective domestic gas producers in Western Australia. The Alliance aims to promote security, affordability and diversity of gas supply for industry and households.

The Alliance was formed in 2006 in response to a serious shortage of gas supply for new developments in WA. Alliance members represent around 80 percent of Western Australia's domestic gas consumption and gas transmission capacity, including smaller industrial and household users of gas.

The Alliance also includes companies working to develop domestic gas fields.

Members include: Alcoa of Australia, Alinta, Burrup Fertilisers, Dampier Bunbury Pipeline, ERM Power / NewGen Power, Fortescue Metals Group, Horizon Power, Newmont Australia, Synergy, Verve Energy and Murphy Oil.

The Alliance works closely with State and Federal Governments and other industry stakeholders to promote initiatives and debate on domestic gas supply issues.



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Abbreviations:

Tcf Trillion cubic feet

TJ Terrajoules

PJ Petajoules

Executive Summary

1. Importance of energy security

Energy security is an issue of vital importance. Energy underpins an economy's ability to develop and grow, attract investment, create employment and sustain living standards.

The concept "energy security" can be understood as encompassing a number of key elements:

- availability of supply;
- affordability of supply;
- reliability of supply;
- diversity of supply;
- competitiveness of supply; and
- longevity of supply.

The extent to which current and projected market structure and conditions satisfy these elements will determine the level of energy security.

2. Western Australia's dependence on gas security

Energy security is an issue of vital importance for Western Australia. Access to secure and affordable energy, particularly natural gas, underpins the State's mining and resource processing industries, fuels power generation, and supplies small businesses and households.

Western Australia is the most energy and gas-dependent economy in Australia. Natural gas supplies half of the State's primary energy requirements and fuels 60% of the State's electricity generation. In contrast, natural gas supplies 19% of the primary energy needs of Australia as a whole.

Given the dependence on gas-fired electricity, the availability and affordability of natural gas also has a major direct impact on households and small businesses through electricity prices, as well as gas prices.

The State's demand for gas will continue to grow. Western Australia will require around 1100 TJ/day of gas by 2014-15 to meet new and replacement demand. This demand is equivalent to the total size of the existing market for gas.

Importantly, around 274 TJ/day of replacement gas will be needed to replace existing gas contracts as they expire. These include large contracts for gas used to underpin existing electricity generation, industrial processing and manufacturing.

3. Natural gas' vital role in meeting the greenhouse challenge

Natural gas is the only conventional energy source that can underpin Western Australia's transition to a low carbon economy during the next 20 years.

Natural gas produces less than half the greenhouse emissions compared to coal and uses proven, readily available technology. Combined cycle gas-fired plants and gas-fired cogeneration plants constitute by far the most greenhouse efficient forms of non-renewable power generation.

Natural gas supply is also critical to underpin future expansion of renewable energy. Only natural gas plants can provide the peaking power capacity necessary to support renewable power such as wind and solar, and which makes renewable energy a feasible source of energy for the local market.

From a global greenhouse perspective, using natural gas to fuel local industry, power generation, small businesses and households represents the most greenhouse and energy efficient use of the State's natural gas resources.

Unlike LNG exports, domestic gas does not need to be liquefied, shipped long distances in tankers and then regasified before it can be used as a fuel – an energy-intensive process.

Domestic gas supply is over 92% energy efficient, with less than 8% of energy lost in the supply chain. In contrast, LNG is only 74% energy efficient, with 26% of the energy consumed by the LNG supply chain.

4. Challenges to Western Australia's gas security

Western Australia faces serious challenges to the availability, affordability, reliability, diversity, competitiveness and longevity of gas supply.

The State has been experiencing a serious shortage of natural gas. Current and prospective gas users have been unable to secure long term gas supplies in substantial quantities. The price of such short term gas that is available has risen dramatically.

Major producers appear to be focusing on LNG exports while withholding gas from the domestic market. Producers appear to be parking gas resources in Retention Leases for sequential development in increasingly ambitious LNG projects rather than supplying the domestic market.

Wholesale gas prices in Western Australia have risen four to five-fold over the past 18-24 months. Prices are now four to five times Eastern States prices on a delivered basis.

The State is dependent on just two supplier groups and two supply points for almost 100% of its domestic gas. This challenge to diversity of supply was underlined by two serious incidents in 2008 - an outage at the North West Shelf Joint Venture processing plant which temporarily affected 70% of the State's gas supply, and the Varanus Island incident which shut off 30% of the State's gas supply for many months.

Major producers exercise significant market power with the North West Shelf Joint Venture producers controlling 70% of the market and over 92% of gas resources in developed

fields. Joint selling arrangements, whereby six of the world's largest oil and gas companies combine to sell as a cartel to local consumers, substantially lessens competition.

The State has only limited reserves of natural gas. The bulk of gas resources are located offshore and in deepwater with no certainty of commercial development. Australia is aspiring to be the world's second largest LNG exporter despite holding just over 2% of the world's natural gas resources.

With the unrestricted growth of LNG exports, gas resources in the Carnarvon Basin, which supplies the bulk of the domestic market, could be depleted within 30 years.

Furthermore, if producer LNG export targets are achieved by producers, the total existing resources of the Carnarvon Basin will be fully committed by 2015-2020. Where gas is locked up in long term LNG export contracts, it is no longer available to meet the needs of local industry and households.

These challenges to gas security represent significant risks to future development, investment and employment in Western Australia.

5. Challenges to the State's greenhouse response

Escalating prices and domestic gas shortages also threaten the State's response on climate change. A number of resource and energy development projects have had to resort to coal-fired energy.

The recent State Government's electricity tender did not attract a base-load gas option, resulting in the State's next base-load power station being coal-fired as opposed to gas-fired.

At current prices in Western Australia, gas is no longer competitive with coal for baseload power generation and most resource processing.

This is unlikely to change under an emissions trading scheme.

At a wholesale gas price of \$7 per gigajoule (before transport costs), natural gas would only be competitive with coal for new baseload power plant construction at a \$90 per tonne carbon cost.

Recent wholesale domestic gas prices have been up to \$14-16 per gigajoule before transport costs.

Western Australia is facing a future where coal is the only viable energy source for baseload power generation. The current domestic gas shortage could be the single greatest factor contributing to greenhouse emission growth in the State over the next 20 years.

6. Domestic gas security is the most critical challenge facing Western Australia

Domestic gas security is the most critical challenge facing Western Australia. Failure to ensure gas security will have the most profound impact on jobs, investment and living standards in the State.

The current global financial crisis has however diverted public attention from this vital issue. What public attention there has been on gas supply has largely focused on LNG developments and the aspiration of a “Gorgon-led economic recovery”.

It is vital that governments look beyond the current financial crisis to put in place a long term gas security strategy. This will ensure that industry and the economy has the necessary energy supply to invest and grow post-2010.

7. 2050 Gas Security Strategy

Given the challenges to energy supply, a 2050 Gas Security Strategy is needed. This should look to the long term - the next 30-50 years – to ensure the energy needs of current and future generations are met, and to provide businesses with the certainty needed to support new investment.

To be effective, a 2050 Gas Security Strategy should include practical initiatives addressing all key energy security elements: availability, affordability, reliability, diversity, competitiveness and longevity of supply.

There is no “magic bullet” and no one initiative that could alone ensure the State’s future gas security. Instead, a package of initiatives should be implemented that address all key gas security elements.

Key Initiatives

- Stringent review of Retention Leases
- Remove anti-competitive joint selling arrangements
- Tax, royalty and investor incentives
- Third party ownership and common-use midstream infrastructure
- Domestic gas reservation
- North West Shelf State Agreement domestic supply obligations
- Tight gas development
- Gas quality specification
- Expedite approvals process for gas exploration and development
- Ensure climate change policies promote and not discourage domestic supply
- Ensure Australia’s international trade negotiations do not undermine energy security

8. Leadership is needed by government

A gas security strategy necessarily involves balancing the commercial interests of major producers with the long term needs of the State. This requires leadership on the part of government.

Major producers have, in the past, been strongly vocal in opposing measures that in any way intrude upon their freedom of commercial activity. Claims have been made about potential threats to Australia's sovereign risk from proposed measures, and that such measures would drive away international investment.

These concerns do not appear to have been realised in practice. Western Australia remains a highly attractive investment destination for international oil and gas producers, both from a resource and a regulatory perspective.

A report by Curtin University also found that over 90% of world gas reserves are directly or indirectly controlled by national oil companies. Only 8% of world reserves are subject to full access by international oil companies.

Given Western Australia holds almost 2% of the world's natural gas resources, the State represents a quarter of the total global opportunity available to international oil and gas companies on an open access basis.

Western Australia's natural gas reserves will continue to be highly sought after, and tightly held, by international oil and gas companies. It is the role of government to ensure the State's gas resources are developed in a manner that meets the current and future energy needs of the community.

CHALLENGES TO GAS SECURITY

Availability - Key Challenges

- Western Australia is experiencing a serious shortage of domestic gas.
- Current and prospective gas users are unable to secure gas supplies in substantial quantity.
- Major producers are limiting domestic gas contracts to a maximum of 6 years, while continuing to sign 20-25 year contracts with overseas LNG customers.
- Major producers are focusing on LNG exports and appear to be withholding gas from the domestic market.
- Producers appear to be utilising Retention Leases to park gas resources for increasingly ambitious LNG developments.
- In the absence of strong Retention Lease enforcement in Australia, major producers are incentivised to warehouse resources in Australia while accelerating development in other countries where more stringent "use it or lose it" rules apply.
- Current Retention Lease process lacks transparency and presents significant barriers to the entry of prospective new gas producers.
- Potential new gas field developments are unlikely to meet the State's requirement for over 1100 TJ/day in new and replacement gas by 2014-2015.
- The proposed Carbon Pollution Reduction Scheme discourages domestic gas supply by providing a financial incentive in the form of carbon credits to producers to develop and export the State's gas reserves as LNG.

Affordability - Key Challenges

- WA wholesale gas prices have risen four to five-fold over the past 18-24 months, and are around four to five times Eastern States prices on a delivered basis.
- Power generation, alumina refining and other processing in the South West represent over 80% of the WA market. Price affordability is critical for sustainability.
- Major producers seeking to justify price increases on notional “international” or LNG prices despite there being no world price for gas.
- Recent WA wholesale gas prices are significantly higher than prices in major gas producing/exporting countries. Prices are in fact closer to those in energy poor countries such as China, Japan and South Korea.
- Major producers are seeking more than “LNG-netback” prices – a premium return from local customers well in excess of that from LNG exports.
- Major producers are also seeking to price gas against high priced liquid fuels. While gas is price substitutable with liquids for some users, the bulk of the WA market cannot sustain liquids-equivalent pricing.
- At current prices in Western Australia, gas is no longer competitive with coal for baseload power generation and most resource processing.
- This is unlikely to change under an emissions trading scheme. At wholesale gas prices of \$7 per gigajoule, any ETS would need to impose a \$90 per tonne carbon cost to merely make natural gas competitive with coal for building new baseload power stations.
- While supply and demand factors impact affordability, they do not alone explain the significant price increases.
- Two producer groups control almost 100% of the WA market, with one being the effective monopoly seller to small gas users. This has a significant impact on competition and prices.

Reliability - Key Challenges

- Major upstream supply incidents in 2008 – the Varanus Island incident which shut off 30% of the State’s gas supply for several months, and the North West Shelf gas processing plant outage which curtailed 70% of the State’s gas supply for more than two days.
- Reliability and security of the Dampier to Bunbury Natural Gas Pipeline is not a major challenge.
- Local gas users highly dependent on natural gas as an energy source, and on existing gas producers for current and future supply.
- There are significant practical and economic constraints on the ability of existing users to switch from gas to alternative fuels.

Diversity - Key Challenges

- Western Australia is dependent on just two supplier groups and two supply points for almost 100% of its domestic gas.
- The bulk of the State's gas is sourced offshore from the Carnarvon Basin.
- Disruption in any one supply source will have profound impacts on the State, as demonstrated by the Varanus Island gas outage.
- The lack of supply diversity and the number of independent sellers impedes development of an efficient and competitive market.
- Current Retention Lease process lacks transparency and presents significant barriers to the entry of prospective new gas producers.

Competitiveness - Key Challenges

- The domestic gas market is highly concentrated. Two producer groups control close to 100% of the domestic gas market and resources.
- The North West Shelf Joint Venture controls around 70% of the market, and over 92% of the gas resources in developed fields.
- Apache-led Joint Ventures control most of the remaining market and gas resources in developed fields.
- It is understood that the North West Shelf Joint Venture does not typically supply smaller customers using less than 15 TJ/ demand. Smaller customers are effectively forced to purchase from Apache or Apache-led joint ventures – the effective monopoly seller for that section of the market.
- The upstream concentration extends to prospective new developments owned or controlled by the same North West Shelf Joint Venture participants or Apache.
- The North West Shelf joint selling arrangement substantially lessens competition by reducing the number of independent sellers from six to one.
- Participants in the North West Shelf Joint Venture and Apache-led Joint Ventures have access to sensitive information on pricing and timing of domestic gas sales.
- There are significant barriers to the entry of competitive new suppliers.
- In the absence of a competitive market, producers have significant ability to influence prices and withhold supply.

Longevity - Key Challenges

- Western Australia has only limited reserves of natural gas – a finite and diminishing resource.
- Australia is aspiring to be the world's second largest LNG exporter despite holding just over 2% of the world's natural gas resources. The bulk of these exports will be sourced from Western Australia.
- Estimates of gas reserves may considerably overstate the actual availability of gas.
- Only 17% of Western Australia's natural gas resources relate to developed fields. The bulk of resources are located offshore and in deepwater, with no certainty of commercial development.
- Gas resources in the Carnarvon Basin could be depleted within 30 years with unrestricted growth of LNG exports coupled with domestic demand.
- If LNG export targets are reached, the total existing resources of the Carnarvon Basin will be fully committed by 2015-2020.
- Where gas is locked up in long term LNG export contracts, it is no longer available to meet the needs of local industry and households.

KEY RESPONSES

Retention Leases

- Government should strictly apply a stringent approach to Retention Leases as required under the Act.
- Retention Leases should, in the first instance, be assessed to determine whether fields can supply the domestic market on a commercial basis.
- This expectation should be expressly stated in the relevant administrative guidelines or legislation.
- The Retention Lease process should be reformed to promote transparency and third party participation.

Remove anti-competitive joint selling

- Removing the North West Shelf joint selling arrangement will significantly increase competition by increasing the number of independent sellers from one to six.
- Joint selling should not be permitted in prospective new gas developments where they impact competition.

Tax, royalty and investor incentives

- Commonwealth and State tax, royalty and investment incentives should be provided to promote domestic gas exploration and development.
- Key incentives include: State royalty concessions; increased deductibility for pre-wellhead expenses from Commonwealth taxation; a Flow Through Share scheme; and Commonwealth and State grants.

Midstream infrastructure

- Third party investment in and common-use midstream gas gathering and processing infrastructure should be encouraged and facilitated.

Domestic gas reservation

- A national gas reservation policy should be implemented to support the existing State reservation policy and ensure producers do not avoid domestic supply obligations.
- The Gorgon gas project should include a 15% domestic supply commitment, with first delivery of domestic gas no later than start-up of the first LNG train.
- Opportunities to further strengthen the State gas reservation policy should be explored.
- National and State gas reservation policies should consider depletion of gas resources from unrestricted LNG development, in addition to ensuring current production is set aside for domestic use.

North West Shelf State Agreement

- The original intent of the North West Shelf State Agreement – placing priority on the availability of gas to the WA domestic market – should be maintained in the ongoing administration of the Agreement.
- The State Agreement provides a mechanism for the State to secure additional domestic supply commitments with respect to: the renewal or rolling-over of existing long term LNG export contracts; new LNG contracts entered into by the North West Shelf Joint Venture; and new LNG developments such as the mooted LNG Train 6.

Tight gas

- Promote tight gas development through appropriate tax and royalty incentives.
- State royalty concessions should be provided such as royalty holidays and reducing the royalty rate for tight gas developments.
- Increased deductibility from Federal taxation for pre-wellhead expenses should be provided to recognise the significant pre-wellhead costs involved with tight gas projects.
- A Commonwealth Flow Through Share Scheme would support emerging tight gas companies and promote new frontier developments.

Gas quality specification

- The State Government's proposed framework will facilitate the entry of out-of-specification gas into the pipeline by promoting commercial resolution between parties.
- This could promote the development of additional new sources of domestic gas, such as the Macedon field.

Climate change policies

- Australia’s climate policy framework should recognise the vital role of natural gas as the only conventional energy source that could underpin Australia’s transition to a low carbon economy within the next 20 years.
- Any assistance provided to natural gas producers be on a level playing field that does not discriminate against domestic gas exploration, development and supply.
- The 60% assistance provided to LNG exporters under the CPRS should be extended to domestic gas production.
- Natural gas used as a fuel source should be subject to the same assistance as natural gas used as a feedstock.
- The climate policy framework should support initiatives to promote the earlier uptake of natural gas as a transitory fuel in the initial years of the CPRS.

Free Trade Agreements

- The Federal Government’s trade negotiations should support, or at the very least not undermine, Western Australia’s long term energy security.
- The Federal Government should not undertake to any treaty commitments that would any way constrain the ability of Federal and State governments to secure energy resources.
- Energy security commitments should be excluded from Australia’s Free Trade Agreement negotiations.

Other measures to encourage domestic gas exploration and development

- The Federal and State governments should streamline approvals processes, reduce unnecessary delays, and eliminate regulatory duplication and overlap.
- Domestic gas projects should be subject to a “fast-track” approvals process to promote development and minimise lead-times to domestic gas delivery.
- The State Government’s Exploration Incentive Scheme will encourage energy exploration, particularly in greenfield areas.
- The Scheme should provide explicit focus on domestic gas exploration by quarantining a reasonable proportion of the exploration drilling grants solely for domestic gas exploration.
- It should also identify domestic gas exploration and development in the Canning and Perth Basin as a key priority for the geoscience information components of the Scheme.

Purpose

Energy security is an issue of vital importance for Western Australia. Access to secure and affordable energy, particularly natural gas, underpins the State's mining and resource processing industries, fuels power generation, and supplies small businesses and households.

In recent years, Western Australia has been experiencing a serious shortage of natural gas. Current and prospective gas users have been unable to secure long term gas supplies in substantial quantity. The price of such short term gas that is available has risen dramatically.

The State's dependence on natural gas was underlined by two serious incidents in 2008 - an outage at the North West Shelf Joint Venture processing plant which temporarily affected 70% of the State's gas supply, and the Varanus Island incident which shut off 30% of the State's gas supply for many months.

These incidents reinforced the importance of secure, affordable and reliable gas supply, and the need for long term policy measures to ensure energy security.

The purpose of this report is to:

- provide an assessment of Western Australia's energy security, specifically domestic gas; and
- propose a detailed policy framework to ensure the State's gas supply security for the next 20-50 years.

¹ International Energy Agency, http://www.iea.org/Textbase/subjectqueries/keyresult.asp?KEYWORD_ID=4103

² World Economic Forum, *The New Energy Security Paradigm*, September 2006, Geneva.

Energy Security

1. Energy security

Energy security is an issue of vital importance for Western Australia. Access to secure and affordable energy underpins the State's ability to develop and grow, attract investment, create employment and sustain living standards.

The term "energy security" encompasses a number of important concepts. The International Energy Agency (IEA) describes energy security as "the uninterrupted physical availability at a price which is affordable, while respecting environment concerns".¹

The IEA considers energy security as including short-term considerations - the ability of the energy system to react promptly to sudden changes in supply and demand. It also includes long term considerations – such as timely investments to supply energy in line with economic developments and environmental needs.

Similarly, the World Economic Forum considers energy security as including among other things: the physical security of a country's energy infrastructure, such as from terrorist attacks or natural disasters; the ability of a country to withstand unexpected price hikes or interruptions in energy supply, such as the oil-price shocks; and long term access to reliable and competitively priced energy.²

2. Key principles

Energy security can therefore be understood as incorporating a number of key elements:

- **availability** of supply;
- **affordability** of supply;
- **reliability** of supply;
- **diversity** of supply;
- **competitiveness** of supply; and
- **longevity** of supply.

In relation to Western Australia's domestic gas security, these key elements can be further defined.

2.1 Availability of supply

- the availability of gas supply to meet current and future needs of industry, electricity-generation, small businesses and households;
- the availability of gas supply to roll-over existing long term gas supply contracts for power generation and resource-processing as they expire over the next 5 years;
- the availability of new long term gas supply contracts to underpin new and existing investment in power-generation, gas transmission infrastructure and resource-processing development;
- the ability of new domestic gas exploration and production companies to access and develop fields for domestic supply.

2.2 Affordability of supply

- the affordability of domestic gas prices to sustain downstream processing, power generation and gas supply infrastructure investment in Western Australia;
- the affordability of gas and electricity for small businesses and households;
- the extent to which natural gas provides effective fuel-on-fuel competition with coal.

2.3 Reliability of supply

- the protection of each section of the gas supply chain from supply interruptions;
- the ability of emergency response arrangements to quickly restore production in the event of supply outages or to provide alternative fuel supplies;
- the extent of redundancy built into the gas supply and delivery systems;
- the effectiveness of the technical regulation which oversees the design and ongoing operation of domestic gas processing and supply facilities.

2.4 Diversity of supply

- the number of different gas supply sources (offshore, onshore, inshore, domestic gas processing facilities) into the domestic market;
- the number of independent suppliers into the domestic market;
- whether there is a diversity of contract terms offered to gas users as to price, quantity, and short and long term contracts;

- whether there is sufficient diversity of supply sources to minimise any downstream impact to the State should any one supply source be disrupted.
- the ability of new domestic gas exploration and production companies to access and develop fields for domestic supply.

2.5 Competitiveness of supply

- whether there is effective competition between upstream suppliers on pricing, quantity and contract terms;
- whether there is a large number of independent gas suppliers into the domestic market;
- the extent to which future gas field developments will enhance upstream competition.

2.6 Longevity of supply

- whether sufficient reserves of gas are being set aside to meet the current and future needs of the State;
- whether industry has confidence that long term gas supply contracts approaching renewal can be rolled-over at affordable prices for sufficient terms (more than 10 years);
- whether industry has confidence in future gas availability to make investment decisions in new power generation, resource processing or infrastructure developments;
- whether an appropriate balance is being maintained between LNG exports and the energy needs of local industry and households.

3. Current State and Federal energy security reviews

Both the Federal and the State Government are conducting strategic reviews into energy security. These comprise the Federal Government's Energy White Paper process, and the State Government's Gas Supply and Emergency Management Committee review.

3.1 *The Federal Government's Energy White Paper process is seriously flawed*

The issue of energy security is currently being considered as part of the Federal Government's Energy White Paper. While the original intent of the White Paper was Australia's future energy security, there has been a significant shift in focus towards maximising Australia's energy exports.

In January 2008, the Federal Government expressed serious concerns over Australia's long term energy security and the need for a national response. The Federal Government committed to developing a national Energy Security White Paper that would provide a strategic vision and policy framework for the next 20-30 years.

A key driver for the Energy Security White Paper was concerns over Western Australia's serious domestic gas shortage. In an interview with *The West Australian* newspaper, the Federal Minister for Resources, Energy and Tourism warned it would take a tougher line on renewing leases for undeveloped gas fields and also the need for initiatives to insulate Australia from "the world's new Cold War" – the battle for energy between countries such as China and the United States.³

The Federal Department of Resources, Energy and Tourism's website commits the Government to "the provision of adequate, reliable and affordable energy to meet future energy consumption needs and to underpin strong economic growth, consistent with the principles of environmental responsibility and sustainable development". On energy security, the Department states:

Ensuring the security of energy supplies is key to supporting economic and social activity in Australia. Energy security is about our ability to meet the energy needs of the Australian community and industry – both in the short and in the long term. In an Australian context, energy security is defined as the adequate, reliable and affordable supply of energy where: adequacy is the provision of sufficient energy to support economic and social activity; reliability is the provision of energy with minimal disruptions; affordability is the provision of energy at a price which does not adversely impact on the competitiveness of the economy and which supports continued investment in the energy sector.

The Department states that to help ensure energy security, the Government has released a National Energy Security Assessment, which will provide input into the development of future energy policy including the Energy White Paper.

While the initial driver for the White Paper was domestic energy security, this focus has fundamentally shifted to maximising the potential of Australia's energy exports. This is a matter for serious concern.

³ *The West Australian*, 'Energy needs, supply-route security in focus', 15 January 2008.

The Terms of Reference for the Energy White Paper declares as its objective: “fostering growth opportunities and innovation that will ensure Australia maximizes its competitive advantages as a leading supplier of energy, energy technology and energy services”.

This shift in focus from energy security to energy exports is underlined by the Minister’s media statement on the Energy White Paper on 28 November 2008. The focus of the statement is on Australia becoming the premier energy exporter in the Asia Pacific.

Table: Minister for Resources, Energy and Tourism, media statement, 28 November 2008”

“Minister Puts Focus on Long-Term Energy Needs” (extracts)

The Minister for Resources and Energy, Martin Ferguson AM MP, today has told the first meeting of the Energy White Paper High Level Consultative Committee that there success could be the first step in Australia becoming the premier energy exporter in the Asia Pacific.

“The White Paper will allow us to look at how we create and capture regional and global opportunities to become a leading producer, and exporter of energy technologies and services. However, to achieve this we must have an economically sound framework on which to base investment decisions.”

This bias towards energy exports and exporters is evident in the membership of the 15-member Energy White Paper High Level Consultative Committee established by the Federal Government.

Current and prospective energy or LNG exporters make up **eight out of the ten** non-government representatives on the Committee.

Domestic energy users, for whom energy security is a matter of vital importance, are only represented by only **two positions** on the Committee.

Developing a long term national energy security strategy will involve difficult policy choices. These include the need to balance the narrow commercial interests of energy exporters with the broader energy needs of the Australian community.

The fundamental shift in the Energy White Paper’s focus from domestic energy security to energy exports, and the dominance of energy exporters on the White Paper Committee, represent serious flaws in the current process. The ability of this process to deliver meaningful outcomes on energy security is now open to question.

*Table: Energy White Paper
Consultative Committee*

.....
Industry Representatives
.....

<i>Graeme Hunt</i>	<i>BHP Billiton *</i>
<i>Russell Caplain</i>	<i>Shell Australia *</i>
<i>David Knox</i>	<i>Santos *</i>
<i>Agu Kantsler</i>	<i>Woodside *</i>
<i>Stephen Creese</i>	<i>Rio Tinto *</i>
<i>Karen Moss</i>	<i>Origin Energy *</i>
<i>Peter Freyburg</i>	<i>Xstrata Coal *</i>
<i>Belinda Robinson</i>	<i>APPEA *</i>
<i>Michael Fraser</i>	<i>AGL Energy</i>
<i>Brad Page</i> <i>Association</i>	<i>Energy Supply</i>

** Current or prospective energy exporters or
industry association*

3.2 *WA Gas Supply and Emergency Management Review*

In January 2009, the State Government established the Gas Supply and Emergency Management Committee. The Committee's purpose is to review and advise the government on the security of Western Australia's gas supplies and the management of future supply disruptions. The Committee's terms of reference include:

- gas disruption emergency response;
- gas supply security, both present and long term;
- the entire gas supply chain and the risk, duration and effect of potential supply disruptions;
- alternative approaches to avoid or minimise gas supply disruption or mitigate its effect; and
- lessons learnt from past gas supply disruptions.

The Committee is scheduled to provide a final report to the State Government in September 2009.

The Committee's comprises a balanced mix of government and industry participants, as well as upstream suppliers and downstream gas consumers. This provides confidence that the Committee's inquiry will reflect a diversity of economic interests, as opposed to being dominated by the views of upstream gas exporters.

Western Australia's Domestic Gas Security

1. The importance of domestic gas security

Western Australia is the most energy and gas-dependent economy in Australia. Natural gas supplies half of the State's primary energy requirements and fuels 60% of the State's electricity generation. In contrast, natural gas supplies 19% of the primary energy needs of Australia as a whole.⁴

The State's natural gas consumption averaged an estimated 1,194 TJ/day in 2006-07 – seven times the volume used in 1983 prior to deliveries from the North West Shelf.⁵ Since 1984, domestic demand for gas has been growing at around 8.5% per year.

Natural gas supplies industry, households and small businesses; and fuels electricity generation in Western Australia. Access to secure and affordable natural gas underpins the State's manufacturing, processing and mining industries, and the significant employment and export benefits they provide.

Manufacturing, electricity generation and mining account for up to 90% of annual domestic gas consumption in Western Australia.

Critically, 60% of the State's electricity generation is gas-fired. The availability and affordability of natural gas therefore has a major direct impact on households and small businesses through electricity prices, as well as gas prices.

Table: Domestic gas consumption in Western Australia ⁶

Domestic gas consumption	
Manufacturing	up to 40%
Including alumina, other non-ferrous metals, iron and steel, chemicals, glass, ceramics, cement and concrete	
Electricity generation	around 30%
Mining	20-25%
Other uses	10%
Including commercial services, transport and storage, residential gas for cooking and heating	

The State's dependence on domestic gas supply and the critical importance of energy security was underlined by the January 2008 North West Shelf Joint Venture and the June 2008 Varanus Island incidents.

In January 2008, an electrical fault at the North West Shelf gas processing plant at Karratha resulted in domestic gas supply being suspended for more than two days. The North West Shelf Joint Venture supplies around 70% of the State's domestic gas requirements.

The June 2008 Varanus Island incident shut off 30% of the State's total gas supply and resulted in significant economic damage gas users. The loss of supply resulted in severe disruption to operations as well as higher costs as companies were forced – to the extent they were able – to switch to alternative gas supplies or energy fuels.

While some gas users were able to switch to diesel, this was at a significant economic cost and unsustainable for the longer term. Other gas users were forced to curtail or shut down operations through inability to secure

⁴ ABARE Energy Update 08.

⁵ ABARE: Natural gas consumption by State, 2008

⁶ Chamber of Commerce and Industry of Western Australia, *Meeting the Future Gas Needs of Western Australia*, May 2007, pp.38 onwards.

alternative non-gas supply, or alternative supply at a commercially sustainable cost.

The Varanus Island outage had a compounding impact on industry by disrupting the local production and supply of other essential inputs, such as fertilizers for local agriculture, reagents for the mineral processing industry and industrial gases such as carbon dioxide. The incident had far-reaching economic, employment and investment impacts and also resulted in significant inconvenience to households.

2. Demand for gas will continue to grow

The State's demand for gas will continue to grow. A 2008 report by Economics Consulting Services concluded that Western Australia will require around 1100 TJ/day of gas by 2014-15 to meet new and replacement demand.⁷ This is equivalent to the total size of the existing market for gas.

The expected demand comprises: 274 TJ/day of replacement gas, 68 TJ/day of resource project grid connected electricity and 783 TJ/day of new mineral and petroleum processing projects. While the current global financial crisis may affect the timing of some minerals processing projects requiring gas, potential demand remains significant.

Importantly, around 274 TJ/day of replacement gas will be needed to replace existing gas contracts as they expire. These include large contracts for gas used in electricity generation, industrial processing and manufacturing.

There is no certainty that gas will be available to meet these replacement contracts and that contracts can be automatically rolled-over. Contracts may be tied to fields that are declining and with producers that have no replacement fields in the required timetable.

This raises serious issues for Western Australia's electricity, manufacturing and minerals processing sectors in meeting existing energy needs.

3. Natural gas' vital role in meeting the greenhouse challenge

Energy security and climate change are inseparably linked with efforts to reduce greenhouse emissions dependent on access to clean energy. To that end, natural gas has a vital role in meeting Western Australia's greenhouse challenge. It is the only conventional energy source that can underpin the State's transition to a low carbon economy during the next 20 years.

Natural gas produces less than half the greenhouse emissions compared to coal and uses proven, readily available technology. Combined cycle gas-fired plants and gas-fired cogeneration plants constitute by far the most greenhouse efficient forms of non-renewable power generation.

Over its life, a new 350 megawatt per hour natural gas combined cycle plant will produce 30 million tonnes of carbon dioxide emissions, compared to 70 million tonnes for an equivalent coal power plant.⁸ In terms of annual greenhouse gas emissions avoided, the difference is equivalent to removing 325,000 cars off the road.

Natural gas underpins the development of greenhouse-friendly gas fired cogeneration plants. Cogeneration plants at alumina refineries in Western Australia for example generate steam which is used in the alumina refining process, as well as electricity for supply into the grid. Cogeneration plants can achieve at least 75% energy efficiency, compared with 30-50% for comparable coal fired generation.

⁷ Economics Consulting Services, *Natural Gas Outlook for Western Australia and Economic Impact*, October 2008.

⁸ Simshauser, P. and Wild, P. (2007) 'The WA Power Dilemma', p.23; available at www.bbpower.com/media/299790/25907%20wa%20energy%20summit.pdf.

Natural gas supply is also critical to underpin future expansion of renewable energy. Only natural gas plants can provide the peaking power capacity necessary to support renewable power such as wind and solar, and which makes renewable energy a feasible source of energy for the local market.

4. Domestic gas supply is the most greenhouse- and energy-efficient use of the State's natural gas reserves

From a global greenhouse perspective, using natural gas to fuel local industry, power generation, small businesses and households is the most greenhouse and energy efficient use of the State's natural gas resources.

Unlike LNG, domestic gas does not need to be liquefied, shipped long distances in tankers

and then regasified before it can be used as a fuel – an energy-intensive process.

Domestic gas supply is over 92% energy efficient, with less than 8% of energy lost in the supply chain. Transport through the Dampier to Bunbury Natural Gas Pipeline, the longest gas transmission system in Australia, only uses less than 3% of the energy transported.⁹

In contrast, LNG is only 74% energy efficient, with 26% of the energy consumed by the LNG supply chain.

In terms of lifecycle emissions, LNG produces 20% more greenhouse emissions on a per gigajoule basis compared to domestic pipeline gas.¹⁰

Table: DomGas Alliance lifecycle study (2009)

For every 100 GJ of energy in the supply chain:

	Energy Delivered	Energy Consumed	Total	Energy efficiency
DomGas	92.3 GJ	7.4 GJ	100 GJ	92.3 %
LNG	73.7 GJ	26.3 GJ	100 GJ	73.7 %

Lifecycle greenhouse emissions for:

1 GJ LNG 67 kg CO₂-eq

1 GJ domestic gas 56 kg CO₂-eq

1 GJ of LNG generates almost 20% more greenhouse emissions over its lifecycle than domestic pipeline gas.

⁹ 2009 DomGas Alliance study.

¹⁰ 2009 DomGas Alliance study.

The Alliance’s analysis is consistent with other international studies. A Carnegie Mellon University study found LNG generated almost 25% more greenhouse emissions over its lifecycle compared to domestic natural gas. The study also found that the upper band of emissions associated with LNG approached that of coal.¹¹

Table: Carnegie Mellon lifecycle study (2007)

Lifecycle emissions			
(lb CO2-e per megawatt hour)			
	DomGas	LNG	Coal
Midpoint	1250	1600	2100
Upper Band	1600	2400	2550

A study by Climate Mitigation Services also found that liquefying and transporting natural gas in LNG tankers accounted for around 21% of the total lifecycle emissions of LNG.¹²

Furthermore, Western Australian industry and electricity generators are in the main extremely energy efficient compared to their international counterparts. This reinforces the global greenhouse benefits of using the State’s gas resources to fuel industry and power generation in the State.

Claims by major LNG exporters that Australia is helping solve the world’s greenhouse problems by exporting its clean reserves of natural gas are therefore open to challenge. Such claims ignore the lifecycle footprint of LNG production and only seek to compare end-use emissions of gas versus coal. They also appear at odds with LNG exporters seeking recognition of the LNG industry as a carbon and emissions-intensive industry under the Federal Government’s emissions trading scheme.

¹¹ Jaramillo, Griffin and Matthews, ‘Comparative Life-Cycle Air Emissions of Coal, Domestic Natural Gas, LNG and SNG for Electricity Generation’, *Environ. Sci. Technol.* 2007, 41, 6290-6296.
¹² Heede, R., ‘LNG Supply Chain Greenhouse Gas Emissions for the Cabrillo Deepwater Port: Natural Gas from Australia to California’, Climate Mitigation Services Study, May 2006.

5. Increasing global importance of energy security

The importance of energy security will continue to grow in an energy- and carbon-constrained world. A report by the Australian Strategic Policy Institute warned against taking for granted Australia's long term energy security.¹³ Key findings of the report include:

- The world is entering an era of steadily tightening energy markets.
- Energy security will become increasingly important to national security. This is due to the growth of demand from the United States, China and India, and increasing dependence of world energy supplies from unstable regions.
- Australia is no less dependent on a small range of fossil fuels than most other developed countries.
- There will be a dramatic rise in Australia's dependence on imports for oil and petroleum, particularly from the Middle East.
- There is a need for Australia to factor broader aspects of energy security into its foreign and defence policies.

The report found that Australia's historical position of being dependent on imports for only a quarter of energy has led to a tendency for Australian governments and society to be more sanguine about energy security than many other countries.

The report warned there was little reason for complacency given Australia's high dependence on energy, and the fact that Australia's self sufficiency in petroleum products is declining markedly. The report's findings have particular relevance for Western Australia as the most energy-and gas-dependent economy in Australia.

6. Conclusion

Western Australia's economic growth and prosperity depends on domestic gas security.

Demand for gas will continue to grow. The State will require around 1100 TJ/day of gas by 2014-15 to meet new and replacement demand.

Natural gas supply has a critical role in the State's response on climate change. It is the only conventional energy source that can underpin the State's transition to a low carbon economy during the next 20 years.

It is also vital for underpinning future expansion of renewable energy. Only natural gas plants can provide the peaking power capacity necessary to support renewable power such as wind and solar.

From a global environmental perspective, using natural gas to fuel local industry, power generation, small businesses and households is the most greenhouse and energy efficient use of the State's natural gas resources.

¹³ Michael Wesley, 'Power Plays: Energy and Australia's Security', Australian Strategic Policy Institute, October 2007.

Challenges to Domestic Gas Security

1. Overview

Having examined the importance of domestic gas security, the report will examine the current West Australian gas market against the key energy security principles. It will be shown that the current gas market structure and conditions present serious challenges to the State's energy security.

Energy Security - Key Principles

- Availability of supply
- Affordability of supply
- Reliability of supply
- Diversity of supply
- Competitiveness of supply
- Longevity of supply

2. Availability of supply

Key Challenges

- Western Australia is experiencing a serious shortage of domestic gas.
- Current and prospective gas users are unable to secure gas supplies in substantial quantity.
- Major producers are limiting domestic gas contracts to a maximum 6 years, while continuing to sign 20-25 year contracts with overseas LNG customers.
- Major producers are focusing on LNG exports and appear to be withholding gas from the domestic market.
- Producers appear to be utilising Retention Leases to park gas resources for increasingly ambitious LNG developments.
- In the absence of strong Retention Lease enforcement in Australia, major producers are incentivised to warehouse resources in Australia while accelerating development in other countries where more stringent "use it or lose it" rules.
- Current Retention Lease process lacks transparency presents significant barriers to the entry of prospective new gas producers.
- Potential new gas field developments are unlikely to meet the State's requirement for over 1100 TJ/day in new and replacement gas by 2014-2015.
- The proposed Carbon Pollution Reduction Scheme discourages domestic gas supply by providing a financial incentive in the form of carbon credits to producers to develop and export the State's gas reserves as LNG.

2.1 WA's serious gas supply shortage

Western Australia accounts for around 80% of Australia's natural gas resources and the bulk of its LNG exports. The State however continues to experience a serious domestic gas shortage and a very tight market. Current and prospective gas users have been unable to secure long term gas supplies in substantial quantity.

Evidence of this serious gas shortage includes:¹⁴

- gas suppliers were unable to meet existing contracted supply obligations, with Tap Oil for instance issuing a notice of force majeure in relation to its contract with Burrup Fertilisers;
- the Gindalbie Karara iron ore project has had to rely solely on coal fired generation;
- Newmont has chosen coal fired power for its Boddington gold project despite the fact that gas would, assuming reasonable prices, be a more attractive option;
- DBP was required to significantly downsize an expansion of the Dampier to Bunbury Natural Gas Pipeline in 2006 as a number of prospective projects were unable to secure gas supplies; and
- DBP tenders for additional gas failed when the prospective supplier withdrew its offer.

The recent State Government's electricity tender did not attract a baseload gas option, resulting in a baseload coal proposal being the only viable option.

The DomGas Alliance continues to be approached by resource processors and power generators concerned about the availability of domestic gas.

The gas shortage presents serious challenges to the State's energy security, as well as its ability to support new investment, employment and economic growth. New project investments dependent on gas supply for energy are at risk of going offshore or interstate because of the shortage of gas.

2.2 Difficulty in securing long term contracts

Historically, Western Australia's gas supply market has been characterised by long term contracts. Long term take-or-pay domestic gas contracts underpinned the original development and subsequent expansion of the North West Shelf project.

Long term contracts are necessary to enable capital intensive developments such as resource and minerals processing developments and new power stations. Such investments involve significant capital investment with rates of return assessed on a 20-25 year timeframe. Businesses require confidence as to the future availability and affordability of energy to be able to invest.

Long term contracts also underpin ongoing investment and operation of the State's vital gas supply infrastructure. Regulated infrastructure such as the Dampier to Bunbury Natural Gas Pipeline functions in a regulatory environment involving write-off periods of 60 years or more without regard to resource availability.

Recently however, major gas producers have been shortening contract terms on a "take it or leave it" basis. The Economic Regulation Authority of Western Australia reported in 2007 that producers were only offering contracts with a maximum term of 5 years with volumes restricted to about 10 terajoules a day.¹⁵ This is having an

¹⁴ Synergies Economic Consulting, *WA Gas Supply & Demand: The Need for Policy Intervention*, July 2007, p.15.

impact on customers seeking long term certainty over energy supply.

At the same time, major producers continue to enter into long term contracts with LNG customers.

- In 2003, the North West Shelf Joint Venture entered into a 25 year agreement to supply 3.3 million tonnes of LNG a year to a Chinese customer.
- In 2004, the North West Shelf Joint Venture entered into a 25 year contract to supply 1.6 million tonnes a year of LNG to Tokyo Gas in Japan.
- In 2007, Woodside entered into agreements, including price, with PetroChina and the CPC Corporation (Taiwan), each for the supply of 2-3 million tonnes of LNG over 15 to 20 years from Browse.
- In March 2008, the North West Shelf Joint Venture entered into a further 8 year contract with Tokyo Gas to supply 530,000 tonnes per year of LNG.
- In December 2008, Shell announced it had signed a 20 year contract to supply up to 40 million tonnes of LNG to PetroChina.

There is no evidence to support claims that long term domestic gas contracts have operated to discourage domestic gas development. Prior to 2007, there has in fact been a stable and continuous contracting of supply to the domestic market on competitive prices and long term contracts.

Long term contracts have also not prevented gas producers from supplying international customers and in expanding the LNG export market. In fact, the North

West Shelf Joint Venture has significantly expanded production from the original three LNG processing trains to five LNG trains, with a sixth train foreshadowed by Woodside.

A number of existing domestic contracts are expected to expire within the next 5 years. The 2008 Economics Consulting Services report concluded that around 274 TJ/day of replacement gas will be needed to replace existing gas contracts as they expire. These include large contracts for gas used in electricity generation, industrial processing and manufacturing.

The difficulties being experienced by local industry and power generators to secure long term contracts for existing operations, or to underpin investment in new developments, presents significant challenges to the State's energy security.

2.3 Focus on LNG exports at the expense of domestic supply

Development of the original North West Shelf project was underpinned by the domestic market. But for SECWA and Alcoa's initial commitment to purchase domestic gas – in the form of a take-or-pay contract – and commitment to the construction of the Dampier to Bunbury Natural Gas Pipeline, there would have been no North West Shelf development.

By providing low-risk returns for over 20 years, the domestic market enabled the North West Shelf participants to develop gas production and the subsequent LNG export industry.

The intent of the North West Shelf State Agreement Act was to ensure sufficient priority was placed on meeting the requirements of the WA domestic gas

¹⁵ ERA, Gas Issues in Western Australia, Discussion Paper, 2007.

market. The Agreement committed the North West Shelf Joint Venture parties to the supply of domestic gas to SECWA of up to 10.5 million cubic metres per day (or 414 TJ/d) over 20 years. It also envisaged LNG exports of up to 6.5 million tonnes per year over a term not less than 20 years.¹⁶

Since the original arrangements were struck, LNG exports from the North West Shelf Joint Venture have increased by over 250% from the originally envisaged volume, with additional expansions envisaged.

LNG Train 4 was completed in 2005 and LNG Train 5 completed in 2008. LNG Train 5 is producing 4.4 million tonnes of LNG annually, bringing total LNG export production to 16.3 million tonnes per year.¹⁷

Woodside has flagged construction of a further six LNG Trains, with the ambition of an additional 77 million tonnes of LNG capacity within the next 15 years.¹⁸

The North West Shelf Joint Venture has in recent times been committing to the extension of supply contracts from Trains 1 and 2. It is understood that the original 20 year terms of these contracts will start to expire from 2009.

In contrast, supply to the domestic market by the North West Shelf Joint Venture has increased only marginally. The Joint Venture has not offered any significant new volumes of gas into the domestic market for several years, notwithstanding the severe gas market shortfall.

In 1998, the North West Shelf Joint Venture advised – as part of its justification for seeking authorisation to extend joint selling – that it intended to increase the capacity of the domestic gas processing plant to 1,100 TJ/d through the construction of an additional domestic gas processing train. This commitment was never met despite the Joint Venture participants continuing to sell as a single entity to local consumers.

It is also understood that the North West Shelf Joint Venture does not typically supply smaller customers using less than 15 TJ/d demand. Smaller customers are forced to purchase from Apache or Apache-led joint ventures – the effective monopoly seller for that section of the market.

2.4 *Withholding of supply through Retention Leases*

The bulk of WA's gas reserves are currently held under Retention Leases on the basis that they are uneconomic to develop. Further reserves are held in Exploration Licences which are close to expiry and are due to be converted to either Production Licences or Retention Leases.

Section 38B of the *Petroleum (Submerged Lands) Act 1967 (Cth)* provides for the grant of a Retention Lease over petroleum discoveries. A Retention Lease may be granted where a petroleum discovery proves to be currently non-commercial but has the potential to become commercial within 15 years.

¹⁶ *North West Gas Development (Woodside) Agreement Act 1979*, Schedule 1, recitals (c) and (d)

¹⁷ Woodside Petroleum, 'North West Shelf Venture Produces First LNG From Train 5 Production Facility', ASX Announcement, 1 September 2008.

¹⁸ ABC News online, 'Outlook remains strong: Woodside', 1 May 2009, <http://www.abc.net.au/news/stories/2009/05/01/2558367.htm>

While the initial term of a Retention Lease is five years, this may be renewed provided it still meets the required uncommerciality criteria. Under the Act, a Retention Lease must be converted to a Production Licence when a reserve is commercial.

The aim of the Act is to encourage and facilitate exploration, investment and development of Australia's petroleum resources, while at the same time ensuring resources are developed in an appropriate timeframe, and in a manner that meets the needs of the local community.

The Act seeks to achieve this balance through the commerciality requirement. The grant of a Retention Lease protects the interests of upstream companies that discover gas resources that are not commercially viable in the short to medium term. Where however resources become commercially viable, they must be developed.

The Act does not permit the "parking" of commercially viable gas resources for development at a time most convenient to the lease holder. Nor does it distinguish between whether a resource can be commercially developed for domestic gas or for LNG export. Producers are not, therefore, entitled to withhold otherwise commercial resources from supplying the domestic market or to develop in sequence reserves most profitable for LNG export.

Recent experience however suggests major producers are using Retention Leases to withhold supply from the domestic market, and to park gas

resources as part of a strategy to aggregate fields for increasingly ambitious LNG projects. The Joint Working Group on Natural Gas Supply noted that:

"[T]he market environment has changed significantly in recent years. As a result, there is an expectation that the prospects for commercialising many known gas resources have improved substantially."¹⁹

The Federal Minister for Resources, Energy and Tourism also appeared to recognise producers' use of Retention Leases to set aside "sequential fields that may be required for a large LNG project".²⁰

It should be noted that the major gas producers have global operations with investment decisions assessed on a global basis. In the absence of strong Retention Lease enforcement in Australia, major producers are incentivised to warehouse resources in Australia while accelerating development in other countries where more stringent "use it or lose it" rules.

The practice of major producers in Western Australia withholding domestic supply now appears to be translating to the Eastern States.

In March 2008, the Sydney Morning Herald reported on Queensland Gas' proposed LNG project at Gladstone. The article reported the company appeared to be withholding supply from the domestic market to obtain higher LNG prices in the future.²¹

In January 2009, the Australian Financial Review reported on a decision by BG to shelve plans to build a 400-600 megawatt gas-fired power plant in the Hunter Valley

¹⁹ Ministerial Council on Mineral and Petroleum Resources / Ministerial Council on Energy Joint Working Group Report on Natural Gas Supply, Final Report, September 2007, p.32.

²⁰ Hon. Martin Ferguson AM MP, Minister for Resources, Energy and Tourism, Address to the Melbourne Mining Club, 9 April 2009.

²¹ 'Queensland Gas looks to high-value LNG', Sydney Morning Herald, 6 March 2008, available at: <http://business.smh.com.au/queensland-gas-looks-to-highvalue-lng/20080305-1x7t.html?skin=text-only>

region to instead export the gas as LNG. The decision was reported to be a major setback to New South Wales' efforts to reduce its dependence on coal-fired energy and reduce greenhouse emissions.

Table: Australian Financial Review report ²²

**BG switches to LNG export plan',
Australian Financial Review, 16
January 2009 (abstracts)**

Efforts by NSW to reduce its dependence on coal-fired power generation have suffered another major setback following the decision by British energy giant BG to pull the pin on a \$750 million power development in the state.

BG has shelved plans to build a 400-600 megawatt gas-fired power plant in the Hunter Valley region just months after inheriting the project through its \$5 billion takeover of Queensland Gas Co.

The plant was expected to generate up to 600 jobs and electricity for between 320,000 and 500,000 homes, with gas for the project to come from a pipeline linking the Hunter Valley with QGC's coal-seam gas fields in Queensland.

At the time plans for the power station were unveiled last May, QGC's then chairman, Bob Bryan, said the plant would operate with half the greenhouse gas emissions of a coal-fired power station and would provide a long term solution to NSW's electricity needs.

Given the bulk of WA's gas reserves are currently held under Retention Leases, delays to the timely development of resources – where they could commercially supply the domestic market – constitute a serious challenge to the availability of gas.

The current Retention Lease process presents significant challenges to improving availability of supply. The process lacks transparency with no formal opportunity for gas users or prospective gas developers to participate. Prospective gas producers have reported significant barriers in being able to access information and to engage in the process which favours existing lease holders.

2.5 Pipeline capacity is not a significant constraint

Concerns have been raised, particularly in the wake of the Varanus Island outage, that existing capacity of the Dampier to Bunbury Natural Gas Pipeline is a constraint on domestic gas supply. There is no evidence to support this. Western Australia's ongoing gas shortage is due to the shortage of gas entering the pipeline, not the capacity of the pipeline itself.

Since 2005, the pipeline owner and operator, DBP, has committed \$1.8 billion to expanding the pipeline. It has already been duplicated for about 50% of its length, which will increase to close to 80% by mid-2010 with completion of the State 5B Expansion Project.

DBP has demonstrated that the capacity of the pipeline can be increased – the engineering, financing and building of new capacity - in less time than it takes to build a major gas using facility, such as a power station or major resource processing development.

²² 'BG switches to LNG export plan', *Australian Financial Review*, 16 January

The pipeline operator maintains close contact with existing and prospective shippers regarding future requirements for pipeline capacity. Further expansion of the pipeline beyond Stage 5B will depend on growth in demand for gas in the South West – and more particularly on the availability and competitiveness of new gas supplies.

Neither of the gas supply emergencies in January 2008 or June 2008 related to operation of the Dampier to Bunbury Natural Gas Pipeline. They were instead caused by major gas producer failures at the North West Shelf gas processing plant and the Varanus Island gas processing plant.

2.6 *New gas field developments unlikely to meet expected demand*

Announcements have been made of studies for new gas field developments that could potentially supply the domestic market. However as noted by the Economic Regulation Authority, there is no definitive domestic gas production development timetable for most of these fields.²³

Table: Prospective gas field developments

Project	DomGas Delivery	DomGas Volume
Reindeer	possibly 2010-2011	up to 120 TJ/d
Macedon	possibly 2012	up to 200 TJ/d
Gorgon	?	up to 300 TJ/d
Pluto	unlikely before 2016	?
Julimar	?	?

Even if all of these developments came on-stream, new production would not meet Western Australia’s requirement for over 1100 TJ/day in new and replacement gas by 2014-2015.

2.7 *Proposed ETS treatment of LNG exports*

Under the design of the Federal Government’s Carbon Pollution Reduction Scheme, the LNG industry is treated as an Emission Intense Trade Exposed (EITE) industry and will qualify for 60% assistance towards any emissions it produces from the production of LNG.

The production of domestic gas on the other hand qualifies for no assistance meaning that the full cost of a carbon tax will be borne by domestic gas, further impacting its price.

To the extent that the gas supplier is not able to pass onto its customers the carbon costs incurred at every step in the gas supply chain, this could distort investment decisions in favour of LNG over domestic gas. Where gas producers are able to pass on carbon costs to the domestic market, this could further increase the cost of natural gas for downstream industry.

The CPRS discourages domestic gas supply by providing a financial incentive – in the form of carbon credits – to major gas producers to develop and export the State’s energy reserves as LNG, rather than supply local industry and households.

²² Economic Regulation Authority of Western Australia, *Discussion Paper: Gas Issues in Western Australia*, June 2007.

²³ Economic Regulation Authority of Western Australia, *Discussion Paper: Gas Issues in Western Australia*, June 2007.

²⁴ Chevron has publicly indicated that domestic gas supply would only be made around the start-up of Gorgon’s third LNG train – “The solution proposed by the Gorgon Joint Venture participants will provide the progressive supply of up to 300 terajoules per day of domestic gas with delivery starting at or around ready-for-start up of the Project’s third LNG train”: Gorgon Project Update, October 2008.

3. Affordability of supply

Key Challenges

- WA wholesale gas prices have risen four to five-fold over the past 18-24 months, and are around four to five times Eastern States prices on a delivered basis.
- Power generation, alumina refining and other processing in the South West represent over 80% of the WA market. Price affordability is critical for sustainability.
- Major producers seeking to justify price increases on notional “international” or LNG prices despite there being no world price for gas.
- Recent WA wholesale gas prices are significantly higher than prices in major gas producing/exporting countries. Prices are in fact closer to those in energy poor countries such as China, Japan and South Korea.
- Major producers are seeking more than “LNG-netback” prices – a premium return from local customers well in excess of that from LNG exports.
- Major producers are also seeking to price gas against high priced liquid fuels. While gas is price substitutable with liquids for some users, the bulk of the WA market cannot sustain liquids-equivalent pricing.
- At current prices in Western Australia, gas is no longer competitive with coal for baseload power generation and most resource processing.
- This is unlikely to change under an emissions trading scheme. At wholesale gas prices of \$7 per gigajoule, any ETS would need to impose a \$90 per tonne carbon cost to make natural gas competitive with coal for building new baseload power stations.
- While supply and demand factors impact affordability, they do not alone explain the significant price increases.
- Two producer groups control almost 100% of the WA market, with one being the effective monopoly seller to small gas users. This has a significant impact on competition and prices.

3.1 *Two distinct and separate segments.*

The West Australian gas market can be characterised as consisting of two separate and quite distinct markets.

A small market segment comprises resource extraction and support activities in the north of the State and the Goldfields regions. For many gas users in these locations, energy costs represent only a small proportion of operating costs, with

natural gas a substitute for high priced liquid fuels (diesel).

The bulk of the WA gas market however comprises power generation, alumina refining, and resource processing and manufacturing in the South West. This segment accounts for over 80% of existing gas demand and remains highly sensitive to gas prices.

Gas fuel costs for a typical 300 MW combined cycle gas plant previously accounted for around 52% of annual costs.²⁵ At delivered ²⁶ gas prices of around \$7 per GJ, fuel costs would comprise 65% of the annual costs of a baseload gas plant. At recent gas prices in WA, this proportion would be considerably higher. For gas to be a competitive fuel source for baseload power generation, gas prices need to be competitive with coal prices.

The sustainability of major gas users also underpins operation of the Dampier to Bunbury Natural Gas Pipeline. Without major gas users - and the baseload demand and economies of scale they provide - gas delivery costs for gas users in the South West could rise dramatically. This would have a significant impact on industries, small businesses and households.

3.2 Domestic gas prices have risen dramatically

Wholesale gas prices have risen dramatically in Western Australia. Historically, prices for gas delivered to South West markets (including transmission costs) have been around \$3.50-\$4.50 per gigajoule.

According to press reports of recent contracts, WA wholesale gas prices have risen four to five-fold over the past 18-24 months. This has seen wholesale gas priced at up to \$14-16 per gigajoule before transport costs.

In 2007, Apache and Santos offered gas for sale from the Reindeer field in a joint tender. The tender included a pricing formula which provided for a price expectation of \$14 per gigajoule for gas

wholesale. The final price attained by producers is not known but the sellers have advised that it represented a significant increase to historical WA prices and a premium to Eastern States prices.

In October 2008, Santos announced a contract to supply gas to Moly Mines. The contract was stated to be for 33 petajoules of gas over six years with projected revenue of \$US 380 million (\$A 527 million). The gas price was linked to international oil prices. At the contract's then assumed oil price of \$US 90 a barrel, this would have equated to \$16 per gigajoule for gas before transmission costs.

At recently reported price levels, WA gas prices are around four to five times Eastern States prices on a delivered basis. Domestic gas prices in the Eastern States are around \$3-4 per gigajoule on a delivered basis.²⁷

Rising energy prices present a significant challenge to industry in the current global economic crisis. Downstream industry and households in Western Australia are already facing considerable distress from falling commodity prices, export demand and employment, without the added challenge of rising energy costs.

3.3 Notional international pricing and liquids pricing

Major producers have sought to justify significantly higher gas prices on the basis of notional "international" or LNG prices. This is despite there being no world price for gas. Natural gas prices vary significantly between countries and regions, and are tightly controlled in many countries such as China.

²⁵ At previous wholesale gas prices, excluding delivery costs, of around \$3 per GJ.

²⁶ Wholesale gas price plus transport costs

²⁷ October 2008 price data published by Vencorp for the Victorian spot market indicates prices at around \$3-4 per gigajoule.

*Table: Comparison of International Gas Prices Paid by Industry 2006*²⁸

Natural gas prices for industry (2006)	
(\$US per GJ)	
Argentina	1.78
Barbados	22.45
Bolivia	1.96
Brazil	13.21
Canada	7.27
Chile	11.35
Taiwan	11.05
Colombia	8.33
Cuba	3.34
Finland	6.63
France	11.01
Japan	11.63
Kazakhstan	1.67
S Korea	13.23
New Zealand	4.99
Russia	1.66
Trinidad and Tob.	2.71
United Kingdom	10.25
United States *	8.07
Venezuela	0.47

* Current US domestic gas prices are around US \$4 per GJ

Gas prices in gas producing or exporting countries are substantially lower than prices in non-gas producing or exporting countries. 2006 delivered gas prices for industry in gas producing countries range from \$US 0.47 (Venezuela), \$1.66 (Russia), \$1.78 (Argentina), \$1.96 (Bolivia), \$2.71 (Trinidad and Tobago), \$4.99 (New Zealand) to \$8.07 (United States).

Current US domestic gas prices are around \$US 4 per gigajoule.

Recent WA domestic gas prices are however significantly higher than prices in other gas producing or exporting countries. They would in fact align with prices in energy poor countries such as China, Japan and South Korea.

There are also indications that major gas producers are seeking more than “LNG-netback” prices. This would represent a premium return from domestic customers well in excess of that which could be derived from LNG exports. The up to \$14-16 prices envisaged by recent domestic gas contracts are well in excess of delivered LNG prices, let alone LNG-netback prices.

Major producers are also seeking to price domestic gas against high priced liquid fuels. The recent domestic gas contracts contained a pricing formula that linked natural gas prices to liquids (TAPIS crude or international oil prices). This presents significant challenges for Western Australia’s energy security.

²⁸ US Energy Information Administration, *International natural gas prices for industry*, available at <http://www.eia.doe.gov/emeu/international/ngaspr.html>. Energy end-use prices including taxes, converted using exchange rates.

As discussed above, only a very small segment of the WA market comprises users for whom natural gas is price substitutable with liquid fuels (diesel). The bulk of the WA market – power generation, alumina refining and other resources processing – is highly price sensitive. For such users, liquids-equivalent gas pricing would render operations non-sustainable.

Western Australia’s experience appears to be translating to the Eastern States with the development of LNG projects based on coal seam methane. A presentation by Origin Energy predicted that access to international LNG markets will likely result in significant increases in gas prices.²⁹

The National Generators Forum also warned that LNG export developments in Gladstone, Queensland, could potentially double the price of gas in the eastern states from the current \$3.50 per gigajoule: “We are worried that prices on the eastern seaboard will mirror the far higher export price, as is the case with domestic gas prices in WA, where an LNG export industry already exists.”³⁰

3.4 Greenhouse implications

Escalating prices and domestic gas shortages present significant risks to the State’s response on climate change. At current prices in Western Australia, gas is no longer competitive with coal for baseload power generation and most resource processing.

This is unlikely to change under an emissions trading scheme.

At a wholesale gas price as low as \$7 per gigajoule (before transport costs), natural gas would only be competitive with \$2 per gigajoule coal at the following carbon costs:

- \$90 per tonne carbon cost - on a long run marginal cost (LRMC) basis, that is, for new baseload power plant construction;
- \$110 per tonne – on a short run marginal cost (SRMC) basis, that is, for plant already built.

Recent wholesale domestic gas prices have been as high as \$14-16 per gigajoule before transport costs.

Figure: Competitiveness of \$7/GJ gas US. \$2/GJ coal: key assumptions

	Plant Size MW	Capital Cost \$/kW	Useful Life Years	WACC %	Capacity Factor %	Heat Rate GJ/MWh	Fixed O&M \$/MWh	Variable O&M \$/MWh	Carbon Intensity t/MWh
Coal (Sub Critical)	300	2,500	35	12.0%	90.0%	11.0	18.0	3.0	0.9
Gas (CCGT)	300	1,750	25	12.0%	80.0%	8.5	8.5	2.5	0.5

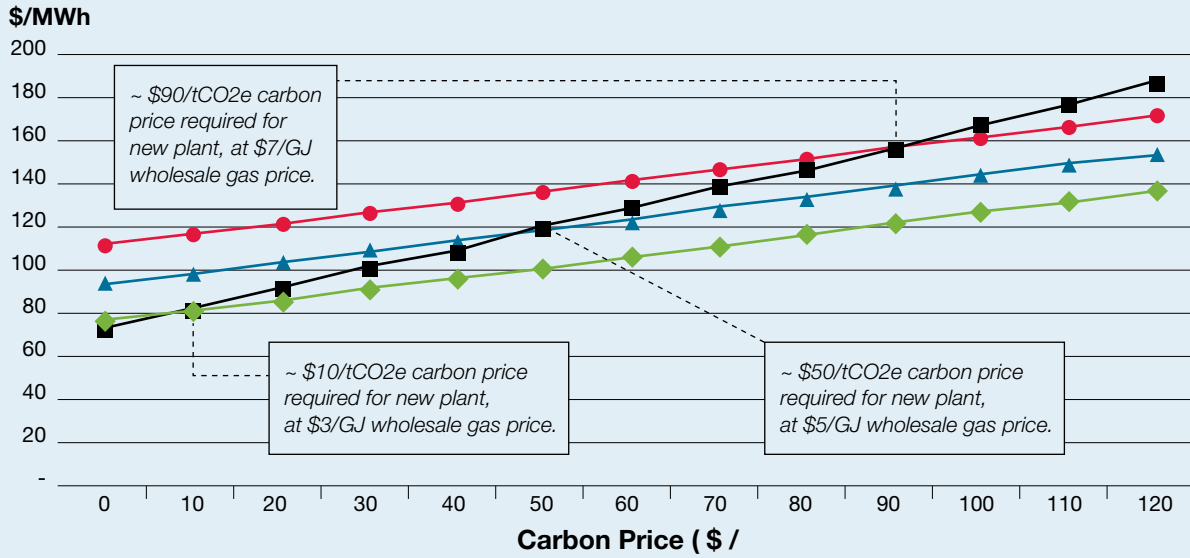
Additional Comments: Gas transport cost is assumed to be \$1.50/GJ.

“Grandfathering” and similar concepts are not considered. Numbers are indicative only.

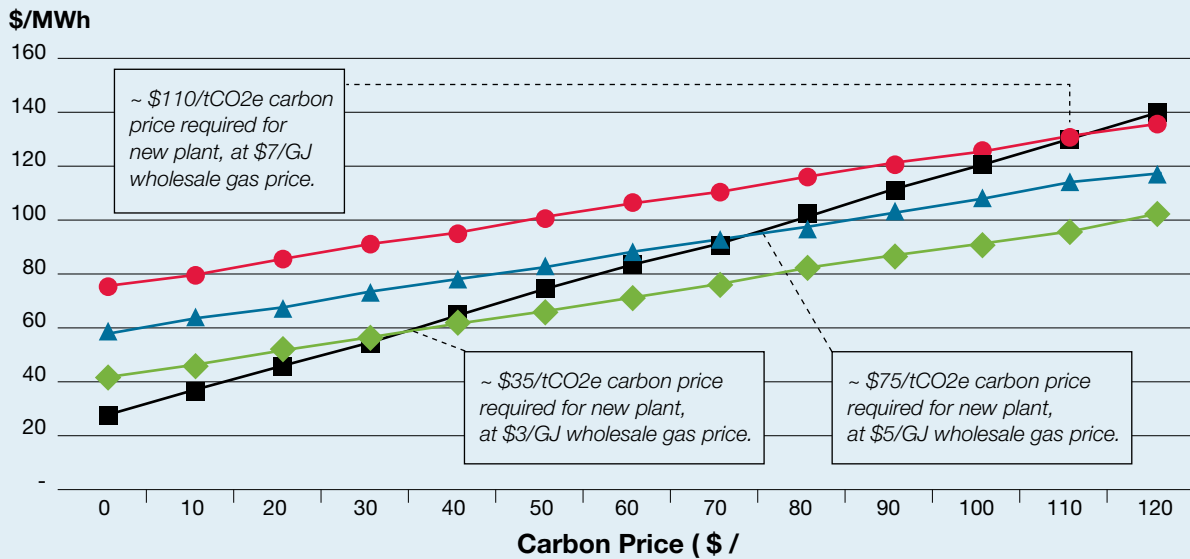
²⁹ Origin Energy, presentation at Macquarie Conference, May 2008.

³⁰ ‘Gas price under pressure’, *The Australian*, 1 July 2008

Long Run Marginal Comparison



Short Run Marginal Comparison



- Coal Subcritical (\$2/GJ)
- ◆ Gas CCGT (\$3/GJ commodity)
- ▲ Gas CCGT (\$5/GJ commodity)
- Gas CCGT (\$7/GJ commodity)

Abbreviations: • CCGT: combined cycle gas turbine • tCO₂e: tonne of CO₂ equivalent • MWh – megawatt hours
 • kW: kilowatt • WACC: weighted average cost of capital

As a result of the escalating prices and supply shortages, a number of resource and energy development projects have had to resort to coal-fired energy. The State Government has announced for instance that the next base-load power station in the State will be coal-fired as opposed to gas-fired plant.

Gas availability and pricing therefore represent long term risks to the State's carbon footprint. The domestic gas shortage could be the single greatest factor contributing to emissions growth in Western Australia over the next decade.

3.5 Implications for competitive fuel mix

By increasing the cost of clean energy, rising gas prices undermine industry's ability to meet national greenhouse targets and dramatically increase the cost of any emissions trading scheme.

Rising natural gas prices also impact on the competitive fuel mix in Western Australia. Removing gas from a competitive fuel mix will lead to higher overall energy costs as coal prices traditionally shadow gas prices. This will result in higher fuel costs for power generation, and electricity costs for businesses and households.

3.6 Factors behind the significant price increases

The lack of domestic supply, coupled with demand, has affected affordability of supply. However, supply and demand factors do not alone explain the significant price increases in Western Australia. Prices in the Eastern States remain many magnitudes below recent WA domestic gas prices, despite Western Australia accounting for the bulk of Australia's natural gas resources and production.

One argument advanced by major producers is that long term domestic gas contracts in Western Australia have operated to suppress gas prices and discourage new domestic gas development. There is no evidence to support this claim. There has in fact been a stable and continuous history of contracting of supply to the domestic market prior to 2007, on competitive prices and long term contracts.

Long term contracts have also not prevented producers from supplying international customers and in expanding the LNG export market. In fact, gas producers continue to pursue long term contracts with overseas LNG customers, such as the 20 year contract concluded in December 2008 between Shell and PetroChina.

Attention must therefore be focused on the structure of the WA gas market. Two producer groups control almost 100% of the market, with one producer (the Apache-led joint ventures) being the effective monopoly seller for small gas users. In the absence of a competitive upstream market – as exists in the Eastern States – gas producers have significant ability to increase prices.

4. Reliability of supply

Key Challenges

- Major upstream supply incidents in 2008 – the Varanus Island incident which shut off 30% of the State’s gas supply for several months, and the North West Shelf gas processing plant outage which curtailed 70% of the State’s gas supply for more than two days.
- Reliability and security of the Dampier to Bunbury Natural Gas Pipeline is not a major challenge.
- Local gas users highly dependent on natural gas as an energy source, and on existing gas producers for current and future supply.
- There are significant practical and economic constraints on the ability of existing users to switch from gas to alternative fuels.

4.1 Upstream gas processing plants

Factors relevant to reliability of supply include: the ability of emergency response arrangements to quickly restore production in the event of supply outages or to provide alternative fuel supplies; the extent of redundancy built into the gas supply and delivery systems; and the effectiveness of the technical regulation which oversees the design and ongoing operation of domestic gas processing and supply facilities.

These matters are the subject of detailed inquiry by the State Government in relation to the Varanus Island incident which shut off up to 30% of the State’s gas supply for many months. They are also relevant to the other major upstream incident in 2008 – the North West Shelf Joint Venture outage which affected 70% of the State’s gas supply. They will not be examined in this report.

4.2 Reliability of the Dampier to Bunbury Natural Gas Pipeline does not represent a major challenge

Both major gas supply outages in Western Australia in 2008 related to upstream components of the gas supply chain. The operation of midstream and downstream gas transport infrastructure such as the Dampier to Bunbury Natural Gas Pipeline is also relevant to reliability of supply.

The Dampier to Bunbury Natural Gas Pipeline is located underground and therefore well protected. Any breach of the pipeline can be repaired within around three days. If the breach happened on a section which has been duplicated, the impact on pipeline capacity would only be about 20%.

Single compressor failures would only have minimal impact on pipeline capacity. The failure of a whole compressor would only reduce pipeline capacity by 5-10% depending on location.

Pipeline storage (linepack) which can be made available in emergencies is limited to about half a day's throughput, and is therefore of limited benefit in a long term disruption such as the Apache incident

Since the third party access regime on the pipeline was introduced in 1995, the pipeline has met all of its contractual obligations in respect to the delivery of firm services.

4.3 *Local consumers have no reasonable alternatives to domestic gas supply*

Local gas users are highly dependent both on natural gas as an energy source, and on existing gas suppliers for current and future gas supply.

In the absence of gas pipelines linking Western Australia with South Australia or the Northern Territory, there is no competition from interstate sources.

In the absence of an LNG receiving terminal in Western Australia, there is no competition from imports. From a practical and economic perspective, no receiving terminal is likely to be constructed.

As demonstrated in the Varanus Island outage, there are significant practical and economic constraints on the ability of existing users to switch from gas to alternative fuels such as coal. This underlines the importance of reliability of supply.

5. Diversity of supply

Key Challenges

- Western Australia is dependent on just two supplier groups and two supply points for almost 100% of its domestic gas.
- The bulk of the State's gas is sourced offshore from the Carnarvon Basin.
- Disruption in any one supply source will have profound impacts on the State, as demonstrated by the Varanus Island gas outage.
- The lack of supply diversity and the number of independent sellers impedes development of an efficient and competitive market.
- Current Retention Lease process lacks transparency and presents significant barriers to the entry of prospective new gas producers.

Western Australia's domestic gas market is characterised by a lack of supply diversity. The State is dependent on just two supplier groups (the North West Shelf Joint Venture and Apache-led joint ventures), and two supply points (the North West Shelf gas processing plant and the Varanus Island gas processing plant) for almost 100% of its domestic gas.

The bulk of the State's domestic gas is sourced offshore from the Carnarvon Basin with limited supply from other offshore fields, or from inshore/onshore. Two producer groups control almost 100% of the domestic market, with the six participants of the North West Shelf Joint Venture selling jointly instead of independently.

This lack of supply diversity presents significant challenges to the State's energy security. The disruption of any one supply source will have profound consequences for downstream industry, power generation and households, as demonstrated by the 2008 Varanus Island gas outage.

Lack of diversity impedes the development of an efficient and competitive market. Such a market can only operate where there is a diversity of independent sellers providing consumers with a diversity of contract terms over price, volume, length of contract, take-or-pay provisions, reliability of supply, peaking provisions, options for renewal and reserve back-up.

The current Retention Lease process presents significant challenges to improving diversity of supply. Currently, the bulk of WA's gas reserves are held under Retention Leases on the basis that they are uneconomic to develop. The process however lacks transparency with no formal opportunity for gas users or prospective gas developers to participate. Prospective gas producers have reported significant barriers in their ability to access information and to engage in the process which favours existing lease holders.

Domestic gas users are currently supporting efforts to improve diversity of supply. In 2008, Alcoa and Latent Petroleum have formed a joint venture to appraise and develop the Warro Gas Field north of Perth. The "tight gas" field is located onshore and close to existing gas pipeline infrastructure.

In 2007, Alcoa also entered into an agreement with ARC Energy (now Buru) in which Alcoa pre-paid \$40 million to support ARC Energy's gas exploration program in the Canning Basin.

ERM Power is expanding its presence to upstream gas exploration and production. The company has secured an exploration footprint in Western Australia and has acquired prospective greenfield and farm-in acreage (an arrangement where the company buys-in an interest in a lease owned by another operator). It has also successfully bid for exploration acreage in its own right.

If successful, these activities could deliver potential new sources of domestic gas and improve diversity of supply.

6. Competitiveness of supply

Key Challenges

- The domestic gas market is highly concentrated. Two producer groups control close to 100% of the domestic gas market and resources.
- The North West Shelf Joint Venture controls around 70% of the market, and over 92% of the gas resources in developed fields.
- Apache-led Joint Ventures control most of the remaining market and gas resources in developed fields.
- It is understood that the North West Shelf Joint Venture does not typically supply smaller customers using less than 15 TJ/ demand. Smaller customers are forced to purchase from Apache or Apache-led joint ventures – the effective monopoly seller for that section of the market.
- The upstream concentration extends to prospective new developments owned or controlled by the same North West Shelf Joint Venture participants, Apache or in conjunction.
- The North West Shelf joint selling arrangement substantially lessens competition by reducing the number of independent sellers from six to one.
- Participants in the North West Shelf Joint Venture and Apache-led Joint Ventures have access to sensitive information on pricing and timing of domestic gas sales.
- There are significant barriers to the entry of competitive new suppliers.
- In the absence of a competitive market, producers have significant ability to influence prices and withhold supply.

6.1 *The downstream market has undergone significant liberalisation*

At the time the North West Shelf Joint Venture was established in the 1970s, domestic gas supply in WA was characterised by a single supplier from the Dongara field (WAPET). The North West Shelf Joint Venture negotiated a single contract with the State Energy Commission of WA (SECWA) – a vertically integrated State electricity and gas monopoly buyer.

Since then, there has been a fundamental transformation in the downstream market.

This has seen a significant expansion in: the size of the domestic market and domestic demand; the number of direct buyers; and the number of parties currently buying through an aggregator many of whom could elect to purchase directly.

In 1995, the original SECWA contract was disaggregated leading to the emergence of six independent buyers: the Electricity Corporation (South West); the Electricity Corporation (Pilbara); the Gas Corporation; Alcoa of Australia Limited; Hamersley Iron Pty Limited; and Robe River Mining Co. Pty Ltd.

Other key reforms implemented in the 1990s and 2000s to increase downstream competition in the market include:

- the separation of the supply and transmission components of the SECWA domestic gas supply contract as part of the disaggregation;
- the introduction of an open access regime for the Dampier to Bunbury Natural Gas Pipeline;
- the establishment of AlintaGas and Western Power as separate corporatised businesses;
- the privatisation of the Dampier to Bunbury Natural Gas Pipeline in 1998;
- the staged removal of barriers to competition in the downstream domestic gas market;
- the privatisation and sale of AlintaGas in 2000; and
- the disaggregation of Western Power to establish four entities (Verve, Synergy, Horizon Power and Western Power) with existing gas supply contracts or the ability to contract with gas suppliers.³¹

As a result of these reforms, the downstream market today is highly competitive with around 25-30 customers buying gas directly from producers.

The Apache-led joint ventures supply the majority of these parties, including most of the North West Shelf Joint Venture's customers. These contract sizes range from >80 TJ/d down to approximately 1 TJ/d.

In addition, aggregators such as Alinta and Synergy supply a large number of customers ranging from large industrial customers, to light industrial and commercial customers as well as households.

Many of these aggregator customers can purchase directly from a producer and arrange their own transmission but for reasons of convenience prefer to purchase a delivered service through an aggregator. Perth Energy is also building a presence in the domestic market as an aggregator.

6.2 Upstream market remains tightly concentrated

While the downstream market has undergone significant transformation to increase competition, the supply side of the market retains the same high level of concentration which existed in 1995. This has created a significant disparity in the market power of sellers vis-à-vis consumers and limits market competition.

The North West Shelf Joint Venture, through its joint selling arrangement, controls close to 70% of the domestic gas market. As a consequence, it has significant ability to influence prices or withhold supplies.

Apache-led Joint Ventures supply around 30% of the market. This means that just two producer groups control almost 100% of the domestic gas market.³²

This concentration in supply is reinforced by the fact that the two producer groups together control close to 100% of gas reserves in developed fields that supply the domestic market.

³¹ Western Power (Networks) was created without the ability to purchase power or gas.

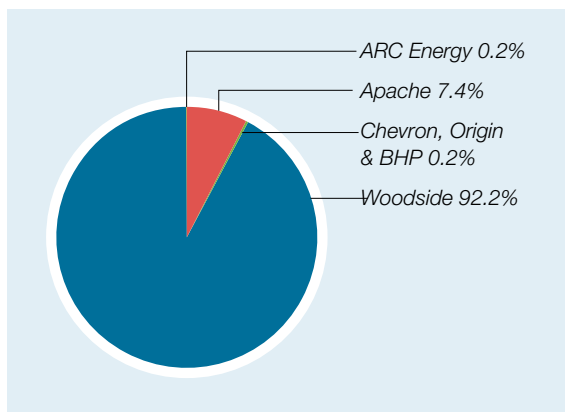
³² Synergies Economic Consulting, WA Gas Supply & Demand, July 2007, p.88.

From the current fields providing gas that is marketed as part of domestic gas projects, over 92% of the remaining gas resource is contained in fields held by the NWSJV.³³ Another 7.4% is located in the John Brookes field operated by Apache.³⁴

The fact that two producer groups control 100% of developed reserves has a significant impact on competition and supply. Supply cannot be increased at short notice to meet market demand unless one or both of the groups decide to act. Producers can essentially withhold supply and drive up prices.

It is understood that the Joint Venture does not typically supply smaller customers using less than 15 TJ/d demand. Smaller customers are therefore forced to purchase from Apache or Apache-led joint ventures – the effective monopoly seller for that section of the market.

Figure: WA Developed Gas Reserves by Operator³⁵



6.3 Upstream concentration extends to prospective new developments

The majority of prospective new field developments that could increase gas supplies to the domestic market are owned or controlled by one or more of the North West Shelf Joint Venture participants, Apache, or in conjunction.

Table: Prospective new developments and participants

Development	Participants
Pluto	Woodside*
Macedon	BHP Billiton* and Apache
Wheatstone	Chevron*
Gorgon	Chevron*, Shell* and Exxon Mobil
Reindeer	Apache, Santos
Julimar	Apache, Kufpec

* Denotes a North West Shelf Joint Venture participant

This provides for a very tight grouping of producers with significant market power from existing operations, and control over future developments that could supply the domestic market.

³³ Synergies Economic Consulting, *WA Gas Supply & Demand*, July 2007, p.35.

³⁴ Synergies Economic Consulting, *WA Gas Supply & Demand*, July 2007, p.88.

³⁵ Synergies Economic Consulting, *WA Gas Supply & Demand*, July 2007, p.88.

6.4 *The North West Shelf joint selling arrangement substantially lessens competition*

The North West Shelf Joint Venture comprises six participants: Woodside, Shell, BP, Chevron, BHP Petroleum and MIMI (Mitsui and Mitsubishi).

Each participant has the right and obligation to own, take and separately dispose of its production entitlement.³⁶ With six participants, this would equate to six individual sellers each owning a share of production that could be sold to local consumers.

The six participants however market gas to individual WA domestic customers through joint selling arrangements implemented through North West Shelf Gas Pty Ltd, a vehicle staffed mainly by secondees from the joint venture participants.

North West Shelf Gas acts in accordance with instructions given by the North West Shelf Joint Venture participants and markets on common terms and conditions, including price, to domestic customers.

The joint selling arrangement substantially lessens competition by:

- dramatically reducing the number of independent sellers to the domestic market from six to one;
- forcing individual consumers to negotiate with North West Shelf Gas which sets a common price and conditions for six producers, and
- preventing consumers from dealing with individual NWSJV participants.

Absent the arrangement, there would be six individual sellers each competing and negotiating in the market. The joint selling arrangement substantially interferes with competitive trading in the market.

In contrast, overseas gas customers continue to benefit from greater competition and long term contracts for LNG sales. Overseas customers can negotiate with a diversity of potential suppliers, which forces WA gas producers to compete with other international suppliers on price and contract terms.

The arrangement has or is likely to have the effect of lessening competition by suppressing “rivalrous market behaviour” and the “independent rivalry in all dimensions of the price-product-service packages offered to consumers and customers.”³⁷

The 2002 COAG Energy Market Review Report (“the Parer Report”) identified joint selling as a key barrier to a more competitive gas market:

“In the Australian economy there is a general presumption that competition between firms achieves the most sustainably efficient market place.”

“Overall, the Panel finds that separate marketing, where it can be practically implemented, will encourage a more competitive natural gas market. Given the significant evolution in the Australian gas market in the last decade, the first steps should now be taken toward encouraging greater competition through separate marketing where this can be achieved.”

In its 1998 Determination on North West Shelf Joint Venture’s application for joint selling authorisation, the ACCC stated:

³⁶ ACCC 1998 Authorisation Determination, *supra.*, p.8.

³⁷ Re QCMA (1976) 25 FLR 169, at 188-189.

“It is the Commission’s view that, where possible, separate marketing is to be preferred to joint marketing. By creating price competition between as many suppliers of gas as possible, separate marketing should generate a number of benefits for consumers and users of gas.”

“The Commission believes that separate marketing of gas by joint venture producers, wherever feasible, will be more competitive than coordinated marketing and likely to provide a wider variety of supplier options that would better meet market demands.”³⁹

6.5 Producers have significant bargaining and market power from access to information

The joint selling arrangement provides suppliers significant bargaining and market power vis-à-vis consumers through access to sensitive commercial information.

Major producers through the North West Shelf Joint Venture and Apache-led Joint Ventures have access to detailed knowledge of the commercial terms and timing of all domestic gas sales arrangements including on:

- price;
- supply volumes;
- contract term and expiry; and
- the identity and supply demand of potential customers seeking gas.

The sharing of what would otherwise be confidential commercial and market information confers producers with a significant advantage in negotiations with potential consumers. This can only serve to limit competition in the market place between producers.

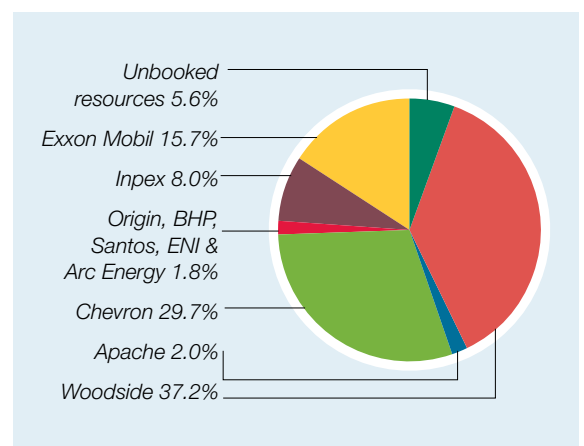
In contrast, potential consumers have no access to commercial information on other gas contract negotiations, including what other consumers have paid in recent contracts. This severely limits their ability to bargain on a level playing field with producers.

6.6 Significant barriers to the entry of competitive new suppliers

There are significant barriers to the entry of competitive new suppliers. The North West Shelf Joint Venture and the Apache-led joint ventures together control close to 100% of WA’s developed reserves of natural gas, with the North West Shelf Joint Venture alone controlling 92% of developed reserves.

The bulk of identified gas reserves in Western Australia are also held by existing gas suppliers through Retention Leases. Of these suppliers, a substantial majority are participants in either the North West Shelf Joint Venture or Apache-led Joint Ventures.

Figure: WA Total Gas Reserves by Operator⁴⁰



³⁸ 2002 COAG Energy Market Review Report (“the Parer Report”), pp.203-204.

³⁹ ACCC, Determination on the Application for Authorisation – North West Shelf Project, 29 July 1998, pp.32 and 47.

⁴⁰ Synergies Economic Consulting, *WA Gas Supply & Demand*, July 2007, p.91.

This concentration in supply is demonstrated by producer market shares in gas reserves in the Carnarvon Basin, which supplies the bulk of Western Australia's domestic gas. Almost 90% of proved and probable (2P) reserves of gas are held by the same North West Shelf Joint Venture participants.

Table: Producer shares in Carnarvon Basin gas reserves ⁴¹

Producer shares	
Woodside	26.1%
BHP Billiton	12.6%
BP	12.8%
Chevron	12.8%
Mitsubishi-Mitsui MIMI	12.4%
Shell	12.6%
Total NWSJV Participants	89.3%
Santos	2.4%
CNOOC	3.4%
Kansai Electric	0.7%
Tokyo Gas	0.7%
Apache Energy	3.3%
Total Other	10.5%

New supply is dependent on a developer identifying and securing potential gas resources. These involve significant exploration costs and time delays. Gas developments also involve large infrastructure investments requiring significant capital expenditures. These include the cost of field development, as well as associated pipelines to link fields to existing gas transport and delivery infrastructure. These challenges represent significant barriers to the entry of new suppliers.

The majority of prospective new gas developments in Western Australia are also controlled by the same North West Shelf Joint Venture participants or Apache and its partners. This provides for a very narrow grouping of existing and prospective suppliers, all of whom have access to detailed knowledge of the commercial terms and timing of all domestic gas sales arrangements. These suppliers also participate in common marketing decisions in existing and new Joint Ventures including on price, supply and contract terms.

In the absence of effective ring-fencing commitments enforced by the ACCC, the risk of collusion and market exploitation is high. Producers that are participants in the North West Shelf Joint Venture are unlikely to undercut pricing arrangements negotiated by the Joint Venture. Nor are they likely to support North West Shelf Joint Venture pricing decisions that would in any way undercut prices in their non-NWSJV projects. The effect on competition is substantial.

⁴¹ AER / ACCC, *State of the Energy Market* (2008) ch 8.

7. Longevity of supply

Key Challenges

- Western Australia has only limited reserves of natural gas – a finite and diminishing resource.
- Australia is aspiring to be the world’s second largest LNG exporter despite holding just 2% of the world’s natural gas resources. The bulk of these exports will be sourced from Western Australia.
- Estimates of gas reserves may considerably overstate the actual availability of gas.
- Only 17% of Western Australia’s natural gas resources relate to developed fields. The bulk of resources are located offshore and in deepwater, with no certainty of commercial development.
- Gas resources in the Carnarvon Basin could be depleted within 30 years with unrestricted growth of LNG exports coupled with domestic demand.
- If LNG export targets are reached, the total existing resources of the Carnarvon Basin will be fully committed by 2015-2020.
- Where gas is locked up in long term LNG export contracts, it is no longer available to meet the needs of local industry and households.

7.1 Limited reserves of a non-renewable resource

Western Australia does not have “vast” or “over a hundred years” of gas. In fact, the State has only limited reserves of natural gas – a finite and diminishing resource.

Western Australia holds under 2% of the world’s natural gas resources, which represents little more than one year of world gas consumption. This compares to the significant reserves held by other major gas exporters.

Table: Natural gas resources by country ⁴²

Country	% World Resources
Russia	27%
Qatar	15%
Saudi Arabia	4%
United Arab Emirates	4%
United States	3%
<i>Australia</i>	2%

While Australia as a country has just over 2% of the world’s natural gas resources, it is aspiring to be the world’s second largest natural gas exporter. This compares to Russia, the world’s largest exporter of natural gas with 27% of the world’s natural gas resources.⁴³

⁴² US Energy Information Administration, International Energy Outlook 2008, p.44.

⁴³ US Energy Information Administration, Background on Russia, available at <http://www.eia.doe.gov/cabs/Russia/Background.html>.

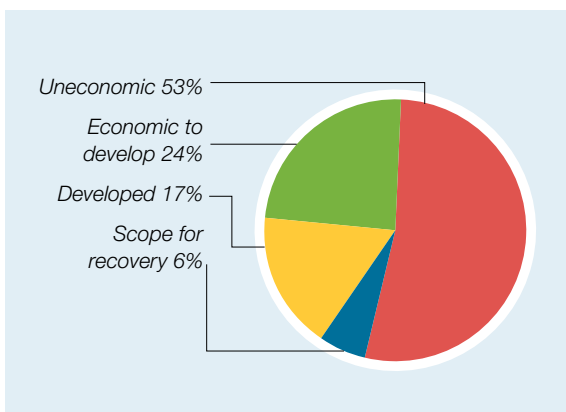
The bulk of Australia’s LNG exports are expected to come from Western Australia which has around 80% of Australia’s natural gas resources.

7.2 Accessibility of new resources

Western Australia is estimated to have 120-140 trillion cubic feet (Tcf) of gas resources. However, this estimate refers to “P50” resources with only a minimum 50% or higher probability of economic recovery.

Only 17% of Western Australia’s estimated natural gas resources relate to developed fields.

Figure: WA Gas Reserves ⁴⁴



The bulk of resources are located offshore and in deep water. There is no certainty that these reserves could be commercially developed. Many of the fields have gas quality issues which impact on development economics and environmental acceptability.

As recognised by the Commonwealth – States Joint Working Group Report on Natural Gas Supply, there are significant barriers to easily accessing and commercialising a significant proportion of natural gas reserves. ⁴⁵

7.3 Depletion and contracting out of resources

The unrestricted expansion of LNG exports presents significant challenges to longevity of supply through: (1) the depletion of available gas resources; and (2) the locking up of gas production through 20-30 year LNG contracts.

First, with the unrestricted growth of LNG exports coupled with domestic gas demand, gas resources in the Carnarvon Basin could be fully depleted within 30 years. This raises challenges for the State’s energy security given the Carnarvon Basin currently supplies the bulk of Western Australia’s gas needs.

Similarly, Synergies estimates that WA total domestic gas reserves – which includes the Carnarvon, Browse, Bonaparte and Perth Basin - could be exhausted as early as 2027 under worst case scenario analysis, or more feasibility by 2050. This estimate however disregards infrastructure constraints that may limit the availability of gas from remote reserves. ⁴⁶

The above assessments do not take into account recent comments by Woodside flagging an extra six LNG processing trains and a potential 77 million tonnes of additional LNG capacity within the next 15 years.

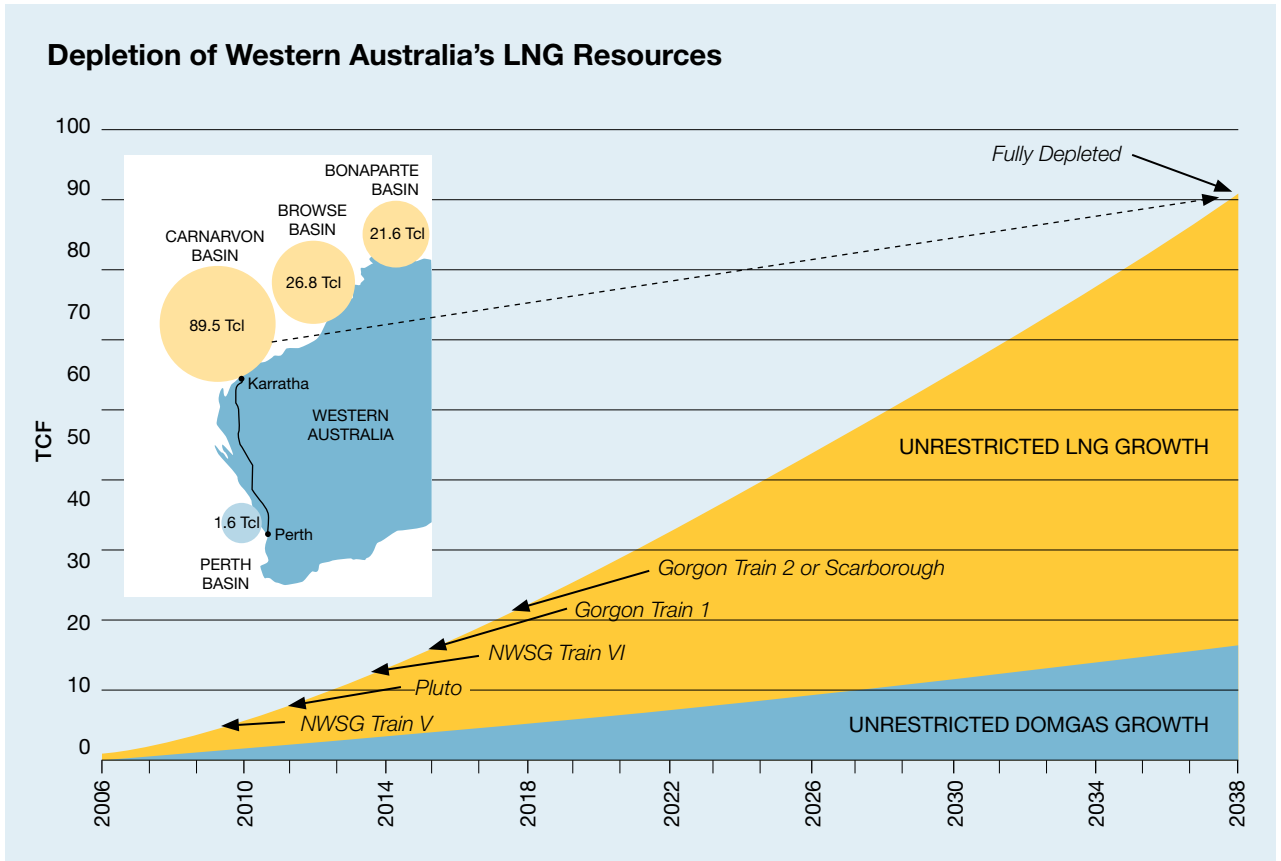
It cannot be assumed that new natural gas resources could be discovered, brought to production, and supplied at affordable prices to local industry and households. Producers and government refer to new gas discoveries as “deeper, further and dryer”.

⁴⁴ Synergies Economic Consulting, *WA Gas Supply & Demand: The Need for Policy Intervention*, July 2007, p.8.

⁴⁵ Ministerial Council on Mineral and Petroleum Resources / Ministerial Council on Energy Joint Working Group Report on Natural Gas Supply, Final Report, September 2007, p.7.

⁴⁶ Synergies Economic Consulting, *WA Gas Supply & Demand: The Need for Policy Intervention*, July 2007, p.34-35.

Figure: Depletion of Western Australia's LNG resources



Second, the locking up of gas production in the form of long term LNG contracts presents significant challenges to availability of gas.

The 2004 LNG contract negotiated by Woodside with China is understood to peg prices at the equivalent of \$US 25 a barrel for oil. The contract is to supply the state-owned China National Offshore Oil Corp with 3.5 million tonnes of LNG a year for 25 years.

Where gas is locked up in long term LNG contracts, they are no longer available to meet the current or emerging needs of local industry and households notwithstanding that gas is being physically produced and brought onshore, and notwithstanding the willingness of industry to pay.

Should government and producer export targets of 50-60 million tonnes per annum of LNG be realised, the total existing resources of the Carnarvon Basin will be fully committed by 2015-2020.

Domestic Gas Security Strategy

1. The need for a long term gas security strategy

The report has identified significant challenges to Western Australia's gas security in terms of availability, affordability, reliability, diversity, competitiveness and longevity of supply. These present real risks to future development, investment and employment in the State.

The Western Australian government has sought to respond to the gas security challenge through a range of initiatives. These include the domestic gas reservation requirement, by facilitating tight gas development, and more recently through an Exploration Incentive Program.

Efforts at the Federal Government level have focused on Retention Lease administration although a review on strengthening the process has been underway since 2007 with no outcome.

While these initiatives are welcome, responses to date only address some but not all key energy security elements. While efforts have been made for instance to improve availability of supply, there has been limited attention given to ensuring competitiveness of supply – in particular, to address the fundamental market structure characterised by joint selling and where just two producer groups control almost 100% of the market.

As a starting point, a gas security strategy should recognise the economic, social and environmental importance of domestic gas security:

- Economic – the importance of gas supply for the State's mining, manufacturing and process industries
- Social – the benefits to households and local communities from energy supply and on the prosperity created by downstream industries

- Environmental – the importance of natural gas supply in meeting the challenge on climate change.

It should look to the long-term – for the next 30-50 years. This would recognise the vital importance of energy supply to current and future generations, and to provide industries today with certainty over energy security that would facilitate new investments.

To be effective, it should include practical initiatives that address all key energy security elements: availability, affordability, reliability, diversity, competitiveness and longevity of supply.

2. Elements of a 2050 Gas Security Strategy

In identifying the initiatives that could comprise a 2050 Gas Security Strategy, there is no "magic bullet" and no one initiative that could alone ensure the State's future gas security. Instead, a package of initiatives should be implemented that address all key gas security elements.

Some initiatives address more than one energy security element. The use of tax and royalty incentives would, for example, help to encourage domestic gas exploration and development and new entrants to the market. This will promote availability, affordability, reliability, diversity, competitiveness and longevity of supply. However, fiscal incentives alone would not ensure a competitive gas market in the required timeframes. It is therefore important that each energy security key element is addressed by a range of measures.

The following initiatives are recommended as part of a 2050 Gas Security Strategy. These initiatives, if implemented as a package, will help ensure the State's future gas security.

	Availability	Affordability	Reliability	Diversity	Competitiveness	Longevity
Stringent review of retention leases	✓	✓	✓	✓	✓	✓
Remove joint selling	✓	✓		✓	✓	
Tax, royalty & investment incentives	✓	✓	✓	✓	✓	✓
Midstream infrastructure	✓	✓	✓	✓	✓	✓
Domestic gas reservation	✓			✓	✓	✓
NWS State Agreement domestic supply obligations	✓			✓	✓	✓
Tight Gas development	✓	✓	✓	✓	✓	✓
Expedited approvals and exploration incentives	✓	✓	✓	✓	✓	✓
Gas quality specification	✓	✓	✓	✓	✓	✓
Climate change policies	✓	✓				✓
Free Trade Agreement negotiations	✓					✓

3. Some considerations

Before proceeding to a detailed examination of gas security initiatives, it is necessary to discuss: the importance of looking beyond the current global financial crisis; and perceived sovereign risk concerns that might be raised in response to regulatory measures to ensure gas security.

3.1 *Looking beyond the current financial crisis*

Despite the considerable impacts experienced only recently during the Varanus Island gas outage, the current global financial crisis has diverted public attention from energy security issues. What public attention there has been on

natural gas supply has largely focused on LNG developments in the hope of a “Gorgon-led economic recovery”.

Notwithstanding the global financial crisis, domestic gas supply remains the most critical economic challenge facing Western Australia. Today this challenge will continue after the global economy returns to normal growth patterns.

It is vital that governments look beyond the current financial crisis to put in place a long term gas security strategy. This will ensure that industry and the economy has the necessary energy supply to invest and grow post-2010.

It is also vital that governments continue to scrutinise prospective gas developments to ensure they support domestic gas security. It is the role of government to ensure the long term needs of the community are met, and that the rush to a “Gorgon-led recovery” does not in any way dilute this commitment.

3.2 Perceived sovereign risk claims by producers

A long term gas security strategy necessarily involves balance, in particular the need to balance the commercial interests of gas exporters, with the long term needs of industry and households in the State. This requires leadership on the part of government.

Major gas exporters have in the past been vocal in opposing initiatives they perceive as intruding in any way their complete freedom to operate. In recent times, exporters have claimed that removal of the condensate excise exemption will threaten future gas investment. Exporters also claimed that Western Australia’s gas reservation policy would drive away

investment, gas reservation being a feature of the State’s gas market since the late 1970s.

Claims by major gas exporters over sovereign or investment risk have not, in the past, translated into practice. As demonstrated by recent announcements, major oil and gas companies continue to invest both in gas exploration and in new project developments in Western Australia.

Western Australia also remains a highly attractive investment destination for international oil and gas producers, both from a resource and a regulatory perspective.

A report by Curtin University found that over 90% of world gas reserves are directly or indirectly controlled by national oil companies. Only 8% of world reserves are subject to full access by international oil companies.

Given Western Australia accounts for just under 2% of the world’s natural gas resources, it represents a quarter of the total global opportunity available to international oil companies on an open access basis.

There is therefore a need to test sovereign risk claims that major gas exporters might raise in response to individual gas security initiatives. Previous experience has not matched the rhetoric.

Western Australia’s natural gas reserves will continue to be highly sought after, and tightly held, by international oil and gas companies.

Retention Leases

Key Responses

- Government should strictly apply a stringent approach to Retention Leases as required under the Act.
- Retention Leases should, in the first instance, be assessed to determine whether fields can supply the domestic market on a commercial basis.
- This expectation should be expressly stated in the relevant administrative guidelines or legislation.
- The Retention Lease process should be reformed to promote transparency and third party participation.
- Targeted benefits: **availability, affordability, reliability, diversity and competitiveness and longevity.**

1. Stringent approach needed

Given the bulk of WA's gas reserves are currently held under Retention Leases, ensuring resources that can supply the domestic market are developed is vital to availability of supply. Under the Act, producers should not use Retention Leases to withhold supply from the domestic market, or to park resources for increasingly ambitious LNG projects.

While the Federal Government has previously indicated a commitment to a stringent approach to Retention Leases, consistent with the object and provisions of the Act, this commitment appears in question with the recent focus on LNG projects. In a recent speech, the Federal Minister for Resources, Energy and Tourism even acknowledged as "having merit" the use of Retention Leases to set aside "sequential fields that may be required for a large LNG project".⁴⁷

Such an approach, if applied, would be contrary to the object and provisions of the Act. The Act is explicit that a Retention Lease must be converted to a Production Licence when a reserve is commercial. The Act does not provide an exception for leases – that

might otherwise supply the domestic market – to be set aside for the purpose that they might at some time in the future contribute to an LNG development.

It is vital that the Federal Government reaffirm a stringent approach to Retention Leases. The expectation should be reinforced with major producers that gas resources cannot be withheld where they could commercially supply the domestic market.

2. The need for greater transparency and third party participation

There is a need to improve transparency and third party participation in the review process. There is currently no gazetting system which would make public the substance of a Retention Lease application, nor is there a formal procedure for third parties to participate.

The current process provides for an asymmetry of information that exclusively benefits existing lease holders. Prospective gas producers have expressed frustration at the current arrangements and their difficulties in being able to access information and engage in the process.

⁴⁷ Hon. Martin Ferguson AM MP, Minister for Resources, Energy and Tourism, Address to the Melbourne Mining Club, 9 April 2009.

This contrasts with existing State and Commonwealth environmental approval processes for development projects. These processes provide for transparency and significant opportunity for stakeholder input.

Greater transparency and third party participation will:

- improve the underlying basis of Retention Lease decisions;
- encourage third party participation;
- subject applicant claims and assumptions to greater scrutiny and contestability;
- strengthen the application of the commerciality test; and
- promote new field development.

Measures to improve transparency and third party participation include:

- A public, on-line registry of State and Commonwealth Retention Leases should be established.
- The registry should provide clear indication on the current status of individual Lease applications or review process, and identify Leases coming up for review.
- The Designated Authority should make a public announcement when it begins the process of reviewing an individual Retention Lease.
- The factors and assumptions used by the Designated Authority to test “commerciality” should be publicly disclosed.
- Publishing an assumptions or data book identifying key factors such as prices, local demand, rate of return, expectations on CAPEX / OPEX.
- Expert reports commissioned by the Designated Authority into matters such as market conditions, construction costs, etc, should be published.

- The Government’s Joint Technical Report should be published.
- There should be a review period allowing third parties to submit information in relation to the assessment parameters used by the Designated Authority, the assumptions and development concepts being advanced by the proponent, or to reinforce or challenge the Designated Authority’s draft decision.
- Opportunity should be provided to third parties to have input into the establishment of conditions for the grant or renewal of Retention Leases.
- The reasons and substance of the Designated Authority’s decision should be published.
- There should be an independent peer review or third party assessment to review and validate the Joint Technical Report, and to test the assumptions and conclusions made.

3. Reviews of the Retention Lease process have been ongoing since 2006 with no action

It is concerning that government processes to review the Retention Lease process has been ongoing since 2006 with no action. In September 2006, a Commonwealth, States and Territories Joint Working Group on Natural Gas Supply was established in response to concerns over domestic gas supply.

In July 2007, a consultants’ report recommended Retention Leases be stringently reviewed to ensure the commerciality test was being met and that producers were not using leases to withhold gas from the domestic market.

⁴⁸ Ministerial Council on Mineral and Petroleum Resources / Ministerial Council on Energy Joint Working Group Report on Natural Gas Supply, Final Report, September 2007, p.32.

In September 2007, the Joint Working Group released its Final Report recommending that existing Retention Leases be stringently reviewed and that “tests of commerciality test are rigorously applied and enforced.”⁴⁸

The Joint Working Group also recommended further investigation to improve the Retention Lease process to ensure transparency. The Joint Working Group tasked the Upstream Petroleum and Geothermal Subcommittee to conduct this investigation and to report by March 2008.

In April 2008, the Federal Department of Resources, Energy and Tourism wrote to stakeholders announcing a policy review of the Retention Lease process. Domestic gas users provided a detailed submission to the process in the same month.

In May 2008, the Department of Resources, Energy and Tourism advised it was preparing an options paper on the Retention Lease process “to encourage discussion and opinion so as to identify and refine possible changes to the Retention Lease system”. The Department indicated the options paper will be provided to stakeholders for comment.

No discussion paper has since been publicly released.

In December 2008, the Productivity Commission released a Draft Report on the *Review of Regulatory Burden on the Upstream Petroleum (Oil and Gas) Sector*. Alarming, the Draft Report recommended that Retention Leases be subject to even “lighter handed regulation” and that lease periods be extended from the current 5 years to 15 years. These recommendations, if adopted, would have further weakened the Retention Lease system and discourage timely development of gas resources.

In April 2009, the Productivity Commission issued its Final Report calling for greater transparency and certainty in the Retention Lease process.

Figure: Timeline of reviews to improve the Retention Lease process

Sept 2006	Federal / State Joint Working Group on Natural Gas Supply established in response to domestic supply shortage
July 2007	Consultants’ report recommends major reforms
Aug 2007	<i>Stakeholders provide detailed submission</i>
Sept 2007	Joint Working Group releases Final Report recommending major reforms.
Nov 2007	<i>Stakeholders provide detailed submission</i>
April 2008	Federal Government announces policy review of Retention Lease process
April 2008	<i>Stakeholders provide detailed submission</i>
April 2008	Federal Government requests Productivity Commission to undertake review into regulatory Burden on upstream oil and gas sector
May 2008	Federal Government advises it was preparing an options paper
July 2008	<i>Stakeholders provide detailed submission to Productivity Commission</i>
Dec 2008	Productivity Commission releases Draft Report which includes recommendations on Retention Lease process
Jan 2009	<i>Stakeholders provide detailed submission to Productivity Commission Draft Report</i>
April 2009	Productivity Commission issues Final Report recommending major changes to Retention Lease process

4. Stringent approach has increased exploration and development in the United Kingdom

Concerns have been raised by major producers that any tightening of the Retention Lease process would discourage exploration and development in Australia.

Experience in the United Kingdom in fact demonstrates the opposite.

Previously, the UK did not have a process to force activity when oil and gas licences were granted. Licences granted between 1964 and 1972 were “multi-block” - if the initial term obligation was fulfilled with a Development somewhere on the licence, companies could retain acreage into the second term for up to 46 years without any further activity.

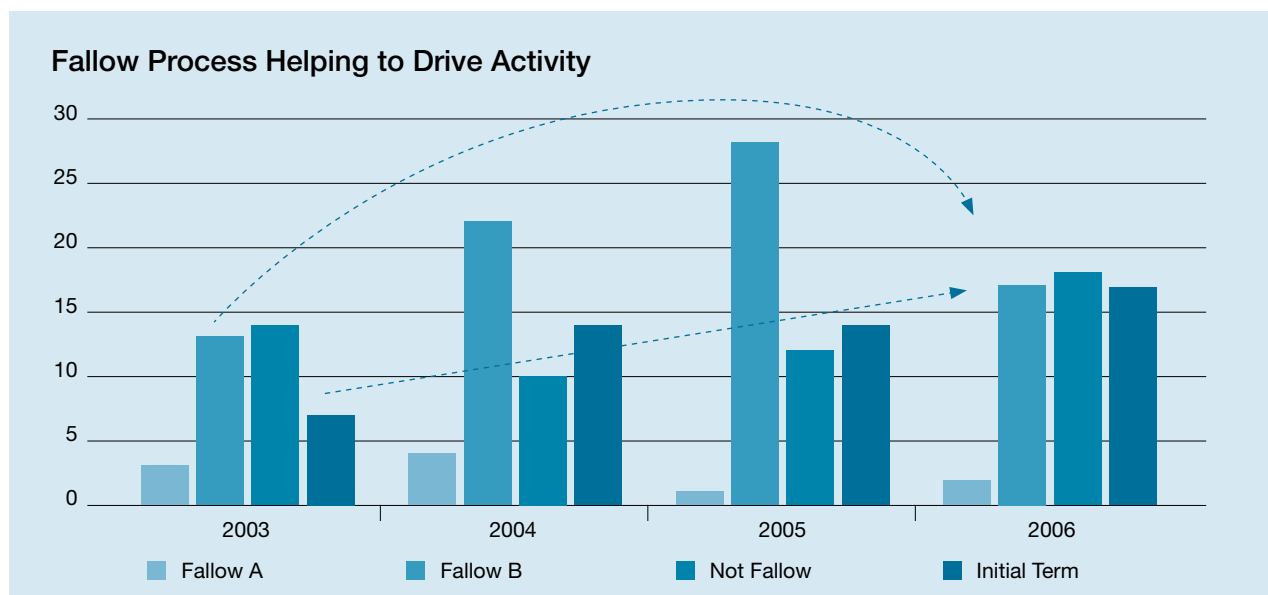
The UK Government implemented an initiative to facilitate development of fields that were Fallow Discoveries or on Fallow Blocks. Under the current system, both blocks and discoveries are considered Fallow after three years and are classed “Fallow B”.

These “Fallow B” Discoveries and Blocks are released on the UK government website if the current licensees were unable to progress activity due to misalignment within the partnership, a failure to meet economic criteria, or other commercial barriers. Fallow B Discoveries that have been listed on the website for two years or Fallow B Blocks that have been listed on the website for one year will be relinquished if there are no agreed plans for significant activity.

Far from discouraging investment, the UK’s efforts to tighten the country’s Fallow Field process have in fact significantly increased exploration and production activity by oil and gas companies.

A similar outcome could be expected in Western Australia. A number of prospective oil and gas producers are already expressing an interest in developing fields that have been held by major producers for many years. The current Retention Lease process and the lack of transparency and opportunities for third party participation however present significant barriers to prospective producers.

Figure: UK Department of Trade and Industry presentation ⁴⁹



UK fields which are now under Development or in Production that were Fallow Discoveries or on Fallow Blocks

- Duart
- Maria
- Gadwell
- Pict
- Chiswick
- Grove
- Wenlock
- Thurne
- Arthur
- Horne
- Davy East
- Seymour
- Saturn Area
- Wren
- Brechin
- Cutter
- Farragon
- Munro
- Broom
- Nuggets N4
- Goldeneye
- Braemar
- Sycamore
- Caledonia
- Madoes
- Mirren
- Scoter
- Carrack
- Playfair

⁴⁹ UK Department of Trade and Industry, 'Initiatives to Encourage Exploration', 20 March 2007.

Joint Selling Arrangements

Key Responses

- Removing the North West Shelf joint selling arrangement will significantly increase competition by increasing the number of independent sellers from one to six.
- Joint selling should not be permitted in prospective new gas developments where they impact competition.
- Targeted benefits: **availability, affordability, diversity and competitiveness**

1. Overview

The North West Shelf Joint Venture (NWSJV) producers – which supplies almost 70% of the domestic market - currently sell gas to domestic customers through a joint selling entity North West Shelf Gas. The arrangement forces gas consumers to deal with a single entity rather than with individual participants of the Joint Venture.

The arrangement significantly reduces the number of sellers and, as a result, competition in the domestic market. The impact of joint selling is further exacerbated by the concentration in gas supply. Two operating entities (North West Shelf and Apache) supply close to 100% of the domestic market and control the developed fields that currently service the WA domestic market.

In the absence of any authorisation, joint selling appears to be in breach of section 45 and 45A of the Trade Practices Act 1974 which prohibits price fixing and arrangements which substantially lessen competition.

Concerns over joint selling and the impact on WA consumers were first raised with the Australian Competition and Consumer Commission as early as 2007. The matter has now been under investigation by the ACCC for well over 2 years with no announcement as to enforcement action.

Unless action is taken to remove the NWSJV joint selling arrangement, there is a real risk that joint selling could become standing practice in other gas developments. This would significantly limit any competitive benefit that future gas developments might have in relation competition to existing suppliers.

The 2002 COAG Energy Market Review Report (“the Parer Report”) identified joint selling as a key barrier to a more competitive gas market.”

*Table: The Parer Report*⁵⁰

The Parer Report (2002)

“In the Australian economy there is a general presumption that competition between firms achieves the most sustainably efficient market place.”

“Overall, the Panel finds that separate marketing, where it can be practically implemented, will encourage a more competitive natural gas market. Given the significant evolution in the Australian gas market in the last decade, the first steps should now be taken toward encouraging greater competition through separate marketing where this can be achieved.

⁵⁰ 2002 COAG Energy Market Review Report (“the Parer Report”), pp. 203-204.

2. The NWSJV Participants include some of the world's largest oil and gas companies and enjoy substantial market power

The NWSJV Participants include some of the world's largest oil and gas companies, including Shell, BP, Chevron, Woodside and BHP Billiton. Individually, these companies possess significant commercial and market power compared to local gas customers. They have highly sophisticated businesses, with the operational and resource backing of multi-billion dollar global operations.

By comparison, many of the 25-30 companies that purchase gas direct from producers are smaller to medium sized companies, including emerging resource processing and energy generation companies. These companies are at a commercial disadvantage in negotiating gas supply contracts, even without the six NWSJV Participants combining to set prices and contract terms jointly.

The disparity in market power between suppliers and customers is accentuated by the fact that local customers have no reasonable alternatives to domestic gas supply. Local gas users are highly dependent on existing suppliers for current and future gas supply. By comparison, sellers have an alternative market in the form of overseas exports.

The NWSJV participants also have significant bargaining and market power through access to sensitive commercial information. Through the joint selling arrangement, the participants have access to detailed knowledge of the commercial terms and the timing of all domestic gas sales arrangements, including on: price, supply volumes, contract term and expiry, and the identity and supply demand of potential customers seeking gas.

The sharing of what would otherwise be confidential commercial and market information gives the NWSJV participants a significant advantage in negotiations with potential customers. In contrast, potential customers have no access to commercial information on other gas contract negotiations, including what other customers have paid in recent contracts. This severely limits their ability to bargain on a level playing field in the market.

The market power of the NWSJV participants will be further entrenched by the fact that the majority of prospective new gas developments in Western Australia are controlled by the same NWSJV participants, Apache, or in conjunction.

3. The existing arrangement encourages abuse of market power

The joint selling arrangement enables the NWSJV participants to act in a coordinated way that encourages abuse of market power. This was evident in threats by producers to raise gas prices to consumers because of the removal of a Federal Government subsidy to producers.

In August 2008, the NWSJV operator, Woodside (Managing Director and CEO, Don Voelte), threatened to pass on the removal of the Federal Government condensate excise exemption in the form of higher gas prices to domestic consumers.⁵¹

Table: *The West Australian*

'Woodside warns on forcing Shelf split', 17 September 2008

"Woodside chief executive Don Voelte said there could be a big backlash from some of the multinationals if the Australian Competition and Consumer Commission forced the partners to compete against each other for customers."

"He also said his company would not feel guilty about passing on to its gas customers a proposed increase in oil excise, saying he had to look after Woodside shareholders."

The removal of the subsidy on condensate production does not justify any increase in prices for natural gas. The condensate excise exemption was an historical concession that was provided to the North West Shelf Project to help support its initial development.

Since then, the North West Shelf Project has grown to become a highly profitable and world-class producer comprising some of the world's largest oil and gas companies.

Further, the excise is applied on the production of condensate, not natural gas. It is telling that the NWSJV has not threatened to pass on the cost of the removal of the condensate excise exemption to overseas LNG customers, or to local or overseas condensate customers. The NWSJV participants are forced to compete in competitive markets for these products, unlike the position in the WA domestic gas market where they enjoy substantial market power.

4. The joint selling arrangement constrains development of a more mature and competitive market

In its 1998 Determination on the NWJSV joint selling authorisation, the ACCC identified certain features as indicating a more mature market. These included the development of a short term trading or spot market, the entry of brokers and the development of financial markets.

Those elements can, however, only arise in a competitive and dynamic market characterised by a multiplicity of sellers and the opportunity for a multiplicity of individual contracting arrangements. The joint selling arrangement constrains this by preventing competition between supplies who account for around 70% of the market.

The notion that separate marketing could arise only after a mature market characterised by the elements identified in the 1998 Determination was explicitly rejected by the Parer Report.⁵²

⁵¹ Gas market faces ACCC shake-up', *The West Australian*, 29 August 2008; 'Households winners in NW Shelf gas shake-up', *The West Australian*, 30 August 2008; 'Gas price "inflated", watchdog called in', *The Weekend Australian*, 30-31 August 2008.

⁵² For an overview of recent developments in Australia see AER, *State of the Energy Market* (2008) ch 8.

Table: The Parer Report ⁵³

The Parer Report (2002)

“The Panel has concluded that not all the features of a mature market need to be present for separate marketing from joint facilities to be feasible. If they were, separate marketing itself would probably only be of academic interest, as a high degree of competition would already be achieved. The existence of secondary markets with associated financial products are outcomes of a mature market, rather than prerequisites for separate marketing. For each gas producing joint venture, some market features will be more important than others in considering the feasibility of separate marketing.”

“Moving toward separate marketing would be considered as part of the overall package to improve the competitive nature of the natural gas market. Separate marketing itself should be regarded as one of the ingredients that in the appropriate circumstances helps create competition and thereby a more mature market.”

The ACCC cited and adopted the position expressed in the Parer Report in the PNG Gas Project determination in 2006,

The New Zealand Commerce Commission adopted a similar view in its authorisation determination on joint selling for the Pohokura gas field. The Commission considered that joint selling could have a material adverse impact on development of a competitive market in the future. This was because a future competitive environment was dependent on a number of sellers in the market, including a number selling from each field. ⁵⁴

5. Benefits of removing joint selling

Removing the joint selling arrangement would increase the number of independent sellers from one to six. This would substantially increase competition in the domestic gas market.

Natural competition between six independent suppliers would be allowed to occur. NWSJV participants would actively compete against each other and third parties. Customers would have the opportunity to deal with a wider range of suppliers, which would allow competition on price, supply and contract terms.

Each of the six NWSJV participants would have a significant quantity of gas to supply to the domestic market. Individual NWSJV participants would also be able to access supply from outside the North West Shelf Project to back contracts.

Individual NWSJV participants would be encouraged to monetise their proportion of reserves and supply the domestic market.

Allowing competition between the NWSJV participants would encourage a significant increase in the number of gas customers and opportunities to supply smaller consumers – in the same way that the entry of a new supplier Apache has promoted competition and supply in recent years.

Decisions by the NWSJV on the marketing or supply of domestic gas are now made on the basis of the “lowest common denominator” whereby any one of the six NWSJV Participants can act to block supply.

Substitution between individual suppliers would become easier. Customers would also have a greater opportunity to deal with different sellers (maintain a portfolio

⁵³ 2002 COAG Energy Market Review Report (“the Parer Report”), pp.199-200.

⁵⁴ New Zealand Commerce Commission Determination, Decision 505, September 2003, para.392.

of suppliers) to meet a required quantity as opposed to being forced to source their requirements from a single supplier.

Greater diversity of supplier risk–preferences would ensue. Each of the NWSJV participants would have their own supplier risk–return preferences which could then be translated to individual negotiations with potential customers.

“Deals” could be done between individual NWSJV participants to trade reserves, production capacity and processing capacity. This might allow one or more NWSJV Participants to take a more aggressive position in supplying the domestic gas market.

All six NWSJV participants would have to collude on price and contract terms to arrive at the current situation that consumers currently face as a result of the joint selling arrangement.

6. Separate selling is practical and feasible

Requiring the NWSJV participants to sell domestic gas independently of each other is practical and feasible. Marketing decisions are already made separately by the participants.

All of the JV participants retain substantial marketing capability within their respective organizations to support the marketing of the original DomGas Venture and the Incremental Venture production. All contracts for supply of gas to domestic customers involve all six (for the Incremental JV) counterparties contracting separately.

While North West Shelf Gas Pty Ltd negotiates with a purchaser on behalf of the JV participants, it has to communicate with and seek approval from all six JV participants on contract terms and price. North West Shelf Gas Pty Ltd therefore has no authority to agree terms – it operates as a clearing house or postbox by which all six parties come

together to set contract prices and terms. Removing NWSG would not prevent each of the NWSJV participants from using their existing marketing teams to negotiate with individual purchasers.

The NWSJV operator already has mechanisms to manage supply from two separate domestic gas JVs – the original DomGas Venture and the Incremental Venture. The two JVs have different ownership structures and different entitlements to reserves and production / processing facilities.

Gas for supply to the domestic market is processed through the Goodwyn and North Rankin production platforms on behalf of both joint ventures. Production from these platforms comes together in two production trunk lines which deliver the gas to processing facilities on the Burrup Peninsula. There is therefore a fully blended stream of product that is owned by *two separate JVs with different ownership structures.*

This product is already being sold to the domestic market on the basis of different shares reflecting the different ownership structure of the two JVs, with the participants internally managing production and sales nominations between the original DomGas and the Incremental JVs.

There is clearly a mechanism in place to allocate gas between the two JVs and the different JV participants in their respective proportions. There is no reason why this same mechanism could not be used to support separate selling by each of the JV participants into the domestic gas market.

That separate selling is practical is demonstrated by the fact it is already taking place in practice. Participants in other joint venture gas developments are selling separately into the WA domestic market, the Eastern States and in other countries.

Table: Separate selling for natural gas

.....
Examples of separate selling
.....

- NWSJV participant Woodside is independently marketing gas from the Browse and Pluto fields.
- Separate selling is taking place by Apache and Santos from the John Brookes field joint venture through the Apache operated Varanus Island domestic gas processing facility which supplies 30% of the WA domestic gas market.
- Shell and Chevron (NWSJV participants) have been prevented from selling jointly in Denmark, Norway and New Zealand.
- Separate selling of natural gas is happening in the Otway Basin in Eastern Australia. Santos has separately marketed gas from its interest in the Casino field. Woodside has separately marketed gas from its interest in the Geographe/Thylacine field.

7. Major producers are required to sell separately in other countries

NWSJV companies have been required in other countries to sell independently gas produced under a JV project.

In 2002, the European Commission required the GFU (Gas Negotiation Committee) to cease joint selling of domestic gas in Norway. The case concerned the joint sale of gas through a single seller GFU which negotiated sales contracts with buyers on behalf of all gas producers, including Shell, in Norway and thus fixed the selling price, volumes and all other trading conditions.

Table: EC Norway case ⁵⁵

EC, 'Commission objects to GFU joint gas sales in Norway', 13 June 2001

"The European Commission has warned Norwegian gas producers that the joint sale of Norwegian gas carried out through the Gas Negotiation Committee (GFU) is in breach of the European Union competition rules as it fixes, among other things, the price and the quantities sold."

"As the European gas market is progressively being liberalized, it is of paramount importance that producers sell their gas individually so that those customers that can already choose their supplier benefit from real choice and competitive prices."

In 2003, the Danish and European Commission competition authorities required producers to market gas individually. The case concerned the joint selling of gas by producers, including Shell and Chevron (both NWSJV participants).

As part of the settlement, producers also undertook to offer an additional 7 billion cubic metres of gas for sale to new customers over a period of 5 years when new gas volumes are available. This appeared to recognise that the effect of joint selling in Denmark had been to limit gas supply and competition.⁵⁶

⁵⁵ European Commission, 'Commission objects to GFU joint gas sales in Norway', IP/01/830, Brussels, 13 June 2001; available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/01/830&format=HTML&aged=0&language=EN&guiLanguage=en>

⁵⁶ European Commission, 'Commission and Danish competition authorities jointly open up Danish gas market', 24 April 2003, available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/03/566&format=HTML&aged=0&language=EN&guiLanguage=en>

In 2002, the New Zealand Commerce Commission revoked an authorisation previously granted to the three joint venture participants of the Pohokura gas field to sell jointly. Collectively, the three Pohokura joint venture partners accounted for 88% of New Zealand's natural gas production. The participants are now required to sell separately. This includes Shell, a NWSJV participant.⁵⁷

8. Producers no longer have commercial imperatives to sell jointly

The disaggregation of the SECWA contract transformed the domestic gas market from one characterised by a vertically-integrated monopoly buyer, to one where there are 25-30 individual customers. Joint selling by the NWSJV participants is no longer required to balance the market power of a single monopoly customer.

In the initial stages of the North West Shelf development, Woodside had no operating experience or revenues, but was required to underwrite 50% of the initial domestic gas investment. This led to close financial scrutiny and extremely stringent funding constraints on the part of Woodside's banking consortium. The joint selling arrangements were put in place in that context.

That commercial incentive no longer exists. The North West Shelf Project has grown to become a highly profitable, world-class producer comprising some of the world's largest oil and gas companies. Woodside, the operator of the North West Shelf Project, has grown into one of Australia's largest companies. Any claims that joint selling might be justified for the original greenfield project no longer arise today.

9. Producers will continue to have commercial incentive to supply domestic gas even with separate selling

Claims have been made that requiring producers to sell separately and compete with each other could discourage supply, reduce domestic gas exploration and development, and encourage some producers to exit the domestic gas market.

These claims appear mischievous. Each of the NWSJV participants would have strong commercial incentives to sell gas separately in the WA domestic gas market if the joint selling arrangement was removed.

As part of the North West Shelf Project, each of the NWSJV participants has the right and obligation to own, take and separately dispose of its production entitlement.⁵⁸ This includes domestic gas produced by the DomGas Venture and the Incremental Joint Venture. Given that gas produced by the NWSJV has commercial value, individual participants will continue to have a commercial incentive to supply their share of production to the domestic market.

Contrary to claims by Woodside, the WA domestic gas market has been, and continues to be a profitable market. The original North West Shelf domestic gas contract was not a "low priced" contract. Two-thirds of the gas was priced against high-priced Collie coal, with one-third priced against imported oil. This pricing structure continued until the contract was disaggregated in 1995, when new supply competition from Apache helped put downward pressure on prices.

⁵⁷ New Zealand Commerce Commission Determination, Decision 581, June 2006.

⁵⁸ ACCC 1998 Authorisation Determination, p.8.

The domestic market continues to provide significant opportunities for producers. There continues to be a serious shortage of gas which has led to a very tight market. Demand for gas will continue to grow as shown by the 2008 Economics Consulting Services Report on expected WA gas demand. The domestic market continues to offer the advantages of low sovereign risk, no currency risk, geographic proximity without the need for vast shipping distances to China or Japan, and access to long term contracts. The domestic market also provides stable returns to producers and does not suffer from the volatility of international oil prices (and increasingly LNG prices). This will ensure that producers remain in the market and provides an incentive for LNG projects to include a domestic gas leg.

Legal and political constraints make it unlikely that the NWSJV participants would exist from the domestic market if the joint selling arrangement was removed. Given the State's dependence on the NWSJV for almost 70% of its domestic gas, and the fact that the NWSJV participants continue to hold the bulk of the State's gas reserves, neither the State nor Federal Government would permit any reduction in domestic gas supply that would impact economic growth, development and energy security.

Furthermore, the intent of the North West Shelf State Agreement is that continued expansion of LNG exports from the NWSJV be matched by commitments to the domestic market. The State Agreement provides a mechanism for ensuring the provision of additional domestic gas supply capacity when consideration is being given to renewal or rolling-over of long term LNG export contracts coming to expiry, or to further LNG expansions.

It is unclear how separate selling will operate to discourage exploration or new gas development. The New Zealand Commerce Commission has rejected claims that preventing joint selling would have an impact on the level of new gas exploration in New Zealand. The Commission also considered that preventing joint selling was unlikely to make an otherwise viable field non-viable.⁵⁹

⁵⁹ New Zealand Commerce Commission Determination, Decision 505, September 2003, para.390-391.

Tax, Royalty and Investment Incentives

Key Responses

- Commonwealth and State tax, royalty and investment incentives should be provided to promote domestic gas exploration and development.
- Key incentives include:
 - State royalty concessions such as royalty holidays, reducing the royalty rate or rebasing the commodity value for royalty assessment;
 - increased deductibility for pre-wellhead expenses from Commonwealth taxation;
 - Flow Through Share scheme; and
 - Commonwealth and State grants to promote domestic gas exploration and development, and new “frontier” developments and technology such as tight gas.
- Targeted benefits: **availability, affordability, reliability, diversity, competitiveness** and **diversity of supply**.

1. Current tax and royalty arrangements

The Commonwealth, State and Territory Governments levy taxes and royalties on petroleum products which are extracted from Commonwealth and State or Territory lands. These taxes and royalties are levied to ensure that the people of Australia who own the land which the companies are exploiting for commercial gain, are adequately compensated.

Broadly, if a hydrocarbon field is located in a Commonwealth area (defined as outwards of three nautical miles from the territorial sea baseline) it will be subject to the Petroleum Resource Rent Tax (PRRT) regime, which is levied by the Commonwealth Government.

If a hydrocarbon field is located in State or Territory areas (on-shore or in coastal waters) it will be subject to petroleum royalties collected by the State or Territory, and a crude oil excise collected by the Commonwealth Government. The PRRT regime does not overlap with the royalty and excise regimes.

In Western Australia there are two exceptions to this arrangement. First, Barrow Island, an on-shore field which is subject to a resource

rent royalty (RRR) which is shared by the Commonwealth and Western Australian Governments. Second, North West Shelf exploration permits WA-1-P and WA-28-P, off-shore fields, which are subject to petroleum royalties and crude oil excises collected by the Commonwealth Government.

2. Current arrangements may act as a disincentive to domestic gas development

While the current Federal and State tax and royalty regime does not appear to provide any deliberate bias in favour of investors pursuing large scale LNG projects, certain features of the regime operate to encourage LNG export while discouraging domestic gas exploration and development.

Certain concessions provided under the PRRT system may act as an incentive for large companies to explore and develop large size petroleum fields in remote offshore locations. Because of the scale of the projects in terms of reserve development and production potential, gas export options have been pursued.

PRRT is levied on the super profits (as the regime permits for compounding to recognise the timing and risk of the exploration expenditure incurred) of a petroleum project, and as such expenditure spent on exploring and developing a petroleum field reduces a company's PRRT liability.

Furthermore, concessions afforded to larger companies, or groups of companies, allow them to transfer these undeducted expenditures between projects or between companies, to minimise overall PRRT liability. This concession attracts large companies and groups of related companies, who have the capital and infrastructure to support exploring and developing multiple fields.

The exploration expenditure 150% uplift concession also incentivises companies to explore and develop remote 'frontier' fields, located a substantial distance from existing infrastructure. This concession is in practice only able to be utilised by large companies, with substantial amounts of capital and infrastructure. These fields are too large and too remote from existing infrastructure to be developed for the domestic market alone and tend to be developed with a focus on the LNG export market.

In contrast, many of the smaller gas fields are located on-shore and in coastal waters. These fields are generally not large enough to support an LNG development and as such gas developed from these fields could be directed into the domestic market.

These inshore and onshore petroleum fields are subject to the royalty and excise regime, where royalties are calculated on the wellhead value of the petroleum produced, as opposed to profits. Because of this, producers may incur royalty liabilities for years before fields become profitable. This will impact upon the net present value of the investment and discourage domestic gas development.

3. The need for fiscal incentives

Given the strategic importance of natural gas, it is vital that Australia's taxation arrangements promote domestic gas supply. Initiatives could in particular encourage the exploration and development of gas reserves located close to existing infrastructure either onshore or in coastal waters.

Reasons why these reserves may not have already been developed may include:

- the size of the known reserves and potential size of unknown reserves;
- the inability of smaller companies to raise capital to explore and develop marginal fields;
- the difficulties associated with extracting the gas (i.e. tight gas reserves); and
- the economics of exploring and developing the smaller fields under the current royalty regime.

By targeting these factors, tax and royalty incentives can promote development, entice new entrants into the upstream gas market, and lead to a diversification of supply among different competitors and reserves. Such incentives could promote smaller domestic gas developments, or LNG projects with a domestic gas component. This will help balance the oil and gas industry's current focus on LNG exports, and the incentive under existing tax and royalty arrangements to develop Australia's natural gas resources as large scale LNG projects.

Incentives could also encourage new frontier technical challenges such as onshore "tight gas" fields. Tight gas developments involve additional technology and significant pre-wellhead expenses compared to conventional fields. Increased deductibility of pre-wellhead expenses could for example promote field development.

In the current economic downturn, inshore and onshore exploration activities – which are the most likely sources of competitive domestic gas supply - are impacted to a far greater extent than deepwater offshore exploration. This is because the companies involved are reliant on regular injections of risk capital from the local market.

The consequences for future domestic gas supply of inadequate support for domestic exploration are therefore potentially extensive and further underline the need for tax, royalty and investment incentives.

4. Appropriate incentives

Appropriate tax and royalty incentives include:

- State royalty incentives – such as royalty holidays, and rebasing the commodity value of royalty assessment;
- Commonwealth tax incentives – such as reducing the statutory cap on the effective life of upstream gas assets, and targeted incentives for “tight gas” development;
- Flow Through Share Scheme for domestic gas exploration and development; and

In addition, investment incentives such as Commonwealth and State grants can encourage and support companies to explore for and develop gas fields for domestic supply.

A quantitative assessment is provided in the Appendix. This demonstrates that tax and royalty incentives can have a significant impact on the net present value of after-tax cash flows of domestic gas field projects that promotes the commerciality of such projects. In some instances, it could facilitate the development of projects that might otherwise not be commercial under the existing tax and royalty regime.

Where fiscal incentives enable the development of gas fields, the impact on government budgetary arrangements could be neutral or even positive. This is where incentives deliver tax and royalty streams from gas fields that might otherwise not be developed.

4.1 State royalty concessions

State royalty concessions could provide important encouragement for domestic gas developments. These include royalty holidays, reducing the royalty rate or rebasing the commodity value for royalty assessment. Such concessions can promote the development of domestic gas fields by improving the upfront economics of a project, particularly for tight gas projects.

Any impact on State revenue could be limited, particularly where the concessions allow the development of a field that might otherwise be uneconomic to develop in its initial stages, which would subsequently generate significant royalties for the State over the long term life of the field.

It is recommended that the royalty rate for domestic gas developments be reduced to 5% to promote development. Alternatively, royalty holidays for the first 6 years of a domestic gas project should be provided.

Where gas fields involve LNG projects with a potential domestic gas leg, royalty concessions can be provided for the domestic gas component to promote domestic supply.

4.2 Increased Commonwealth deductibility for pre-wellhead expenses

Increased deductibility for pre-wellhead expenses could be provided for domestic gas developments under federal taxation arrangements.

A 175% uplift on expenditure incurred in exploring and developing domestic gas reserves should be provided, particularly for tight gas where development involves significant pre-wellhead expenses.

The uplifted tax deduction would be available to companies once the expenditure is incurred, and the companies would not have to develop gas before they received the tax incentive. The impact of this incentive would be to reduce companies' taxable income and may provide an incentive to companies with an existing tax liability.

4.3 Commonwealth Flow Through Share Scheme

A Flow Through Share scheme would provide significant assistance for smaller petroleum companies engaging in domestic gas exploration and development, and who are reliant on the market for risk capital.

Such a scheme would promote frontier and start-up developments where companies might not otherwise generate a taxable income in the initial project years that would make tax deductions an appropriate incentive.

By implementing an FTS scheme, these companies would be able to pass these losses through to investors who could use the tax deductions, which could in turn create interest and equity funding by investors.

4.4 Investment incentives

Commonwealth and State grants can encourage and support companies to explore for and develop gas fields for domestic supply.

Such grants are administratively straight forward to implement, and would support Australia's long term energy security by promoting competition and diversity of domestic gas supply.

Grants could also be used to promote new "frontier" developments and technology, such as greenfield tight gas developments. Grants have in the past been provided to support new technology development in the petroleum industry, such as coal seam methane and carbon sequestration.

Midstream Infrastructure

Key Responses

- Third party investment in and common-use midstream gas gathering and processing infrastructure should be encouraged and facilitated.
- Targeted benefits: **availability, affordability, reliability, diversity, competitiveness** and **longevity of supply**.

1. Overview

Currently, midstream gas gathering and processing facilities are scaled and built to support individual projects. This has the potential to lead to sub-optimal development with little integration. The likely end result is to increase project costs and make development of some gas fields uneconomic.

A significant component of the total costs of a new offshore development is the cost of midstream gas gathering pipelines – which rise the further gas fields are located from shore - and the associated gas processing facilities.

Multiple or common-use midstream gas supply and processing infrastructure has the potential to facilitate new domestic gas developments by lowering investment barriers and costs. Third part participation in midstream infrastructure investment could also promote development. For example, infrastructure operators may have lower hurdle rates of return than upstream producers which could facilitate investment.

2. Shared-use infrastructure could cut project costs by almost half

The DomGas Alliance engaged international energy consulting firm Wood MacKenzie to examine opportunities for common use mid-stream gas gathering and processing facilities.

The Wood MacKenzie report concluded that there were significant benefits including lower barriers to entry, a more economically efficient use of capital leading to lower gas supply chain costs and increased transparency in the costs of supply.

Two development scenarios were examined. The scenarios involved the development of gas fields in the Carnarvon Basin with a typical distance of 150 km to shore:

- Scenario One: three independent 100 terrajoules / day (TJ/d) developments, each with separate pipelines and processing facilities;

- Scenario Two: one integrated development utilising one common gathering trunkline and a processing plant of 300 TJ/d capacity

By consolidating developments into an integrated development with common-use facilities, capital costs could be reduced by almost half. This could deliver potential savings as high as \$1 billion.

By lowering investment barriers and costs, third party participation and common-use midstream infrastructure can help promote new domestic gas field developments.

Government can facilitate discussions between relevant stakeholders, and by improving transparency and disclosure in the retention lease system. An effective gas reservation policy would also ensure that any consolidation between domestic gas and LNG projects still delivers domestic gas supply.

Figure: Benefits of common-use infrastructure

	Scenario One Integrated System Capex (\$m) 300 TJ/d	Scenario Two Stand Alone Capex (\$m) 100 TJ/d x 3 fields	Timing
Pipeline to Shore Costs			
Field A – Initial 100 TJ/d	\$555 (150 km x 20")	\$445 (150 km x 16")	Year 1
Field B – Subsequent 100 TJ/d	\$111 (50 km x 12")	\$445 (150 km x 16")	Year 3
Field C – Subsequent 100 TJ/d	\$111 (50 km x 12")	\$445 (150 km x 16")	Year 5
Gas Processing Costs			
300 TJ/d Plant	\$400	\$250 x 3	Year 1
100 TJ/d Plant			Years 1, 3, 5
TOTAL CAPEX	\$1, 177	\$2,085	

Domestic Gas Reservation

Key Responses

- A national gas reservation policy should be implemented to support the existing State reservation policy and ensure producers do not avoid domestic supply obligations.
- The Gorgon gas project should include a 15% domestic supply commitment, with first delivery of domestic gas no later than start-up of the first LNG train.
- Opportunities to further strengthen the State gas reservation policy should be explored.
- National and State gas reservation policies should consider depletion of gas resources from unrestricted LNG development, in addition to ensuring current production is set aside for domestic use.
- Targeted benefits: **availability, diversity, competitiveness and longevity.**

1. Challenges to longevity of supply

The report identified significant challenges to the availability and longevity of Western Australia's gas resources. These relate to the potential depletion of the State's existing gas resources, and the contracting out of production in long term LNG contracts.

Contrary to claims by LNG producers, Western Australia has only limited reserves of natural gas – a finite and diminishing resource. Only 17% of Western Australia's natural gas resources relate to developed fields. The bulk of resources are located offshore and in deepwater, with no certainty of commercial development.

At the same time, producers continue to expand LNG exports with Australia aspiring to be the world's second largest LNG exporter despite holding just 2% of the world's natural gas resources. The bulk of these exports are expected to be sourced from Western Australia.

This presents risks to longevity of supply. First, existing gas resources in the Carnarvon Basin could be depleted within 30 years from unrestricted LNG exports. Second, as gas resources are locked up in 20-25 year LNG contracts, they are no longer available to meet the current and emerging needs of the local economy.

2. Governments are acting to secure vital gas reserves

A report by Curtin University found governments around the world are acting to secure energy reserves in an energy-constrained world. These range from gas reservation policies to fiscal measures to control the export of energy.

Malaysia and Egypt for example both maintain long term reservation policies to ensure the energy needs of future generations are met. These policies do not appear to have discouraged gas exploration and development.

Egypt’s national policy reserves one-third of natural gas for exports, one-third for domestic use and one-third “to save for our children”. The country accounts for international oil company Apache’s largest acreage position and around 22% of the company’s production revenue. Apache continues to have an active drilling program in Egypt, completing 215 of 238 wells and conducting 701 workovers and recompletions.⁶⁰

Similarly, Malaysia maintains a national depletion policy which imposes domestic production limits for oil and gas. International oil company Shell remains active in petroleum exploration and production, including natural gas in offshore Sabah and Sarawak. The company operates through production sharing contracts after a 1974 Act placed custody of Malaysia’s petroleum resources with the national petroleum corporation.

Table: National energy reservation policies ⁶²

Egypt	One-third of natural gas reserved for exports, one-third for domestic use, and one-third “to save for our children”
Malaysia	National depletion policy imposes production limits for oil and gas
Indonesia	25% domestic market obligation
Argentina	Export taxes on natural gas
China	Export taxes on natural gas and coal

3. A domestic reservation policy will promote long term security

Given the focus of major producers on developing fields for LNG exports, a domestic reservations policy will promote long term security of supply. This will be by reserving a proportion of gas produced for the domestic market.

The need for a reservation policy is further underlined by suggestions that major producers are using Retention Leases to withhold domestic supply and to set aside “sequential fields that may be required for a large LNG project”.⁶³

Domestic reservation has been a feature of the WA gas market since the late 1970s. The original North West Shelf project was underpinned by a domestic gas reservation obligation. The proposed Gorgon project also includes a domestic gas supply commitment.

The State Government’s 15% domestic gas reservation policy, announced in 2006, continues this long-standing practice.

There is a need to further strengthen the application of domestic reservation policies to ensure first-delivery of domestic gas from an LNG project is not unduly delayed.

While the efforts of successive WA governments on domestic gas reservation are welcome, there a need for a unified State-Commonwealth policy on reservations. A national reservation policy will ensure major producers do not avoid domestic supply obligations by constructing floating gas production platforms in Commonwealth waters or by transporting gas to the Northern Territory.

⁶⁰ Apache Energy website, <http://www.apachecorp.com/Operations/Egypt/index.aspx>.
⁶¹ Shell website, ‘Shell in Malaysia’, http://www.shell.com/home/Framework?siteld=my-en&FC2=/my-en/html/iwgen/about_shell/zzz_lhn.html&FC3=/my-en/html/iwgen/about_shell/what_we_do/factfile_ga_0109.html
⁶² Leonard, Manuhutu and West, ‘Domestic Energy Reservation Policies: An International Comparison’, Curtin University, 2008.

4. Gorgon gas project

While much of the economic benefit of the Gorgon project is in the construction phase, domestic supply will have long term economic and environmental benefits to the State. These potential long term benefits should be considered as a means of offsetting the environmental impacts associated with the expanded Gorgon project.

A 15% domestic supply commitment could deliver 6000 PJ of gas or 6 Tcf to the domestic market over the life of the project. Such a commitment is consistent with the State's 15% domestic reservation policy which underpins Western Australia's long term energy security and economic development.

It could also minimise greenhouse emissions and maximise energy efficiency. A 15% commitment could deliver emission reductions of around 66 million tonnes over the life of the project, equivalent to removing 1 million cars off the road for 15 years. This could substantially offset the increase in emissions associated with the proposed Gorgon project expansion.

While the Gorgon State Agreement obliges the joint venture to establish a DomGas Project by December 2012, Chevron has indicated that domestic gas supply would only be made around the start-up of Gorgon's third LNG train.⁶⁰

Any delay in domestic supply could diminish the downstream economic benefits and potential greenhouse mitigation benefits. In emission terms, an additional 1 million tonnes of greenhouse emissions could result for every year that domestic supply is delayed than would otherwise have been the case.

Given the economic and environmental benefits to the State, first delivery of domestic gas should be made no later than start-up of the first LNG train.

⁶⁰ Gorgon Project Update, October 2008.

North West Shelf State Agreement

Key Responses

- The original intent of the North West Shelf State Agreement – placing priority on the availability of gas to the WA domestic market – should be maintained in the ongoing administration of the Agreement.
- The State Agreement provides a mechanism for the State to secure additional domestic supply commitments with respect to:
 - the renewal or rolling-over of existing long term LNG export contracts;
 - new LNG contracts entered into by the North West Shelf Joint Venture; and
 - new LNG developments such as the mooted LNG Train 6
 - Commonwealth and State grants to promote domestic gas exploration and development, and new “frontier” developments and technology such as tight gas.
- Targeted benefits: **availability, diversity, competitiveness and longevity.**

1. Historical background

The North West Shelf Gas Project is governed by the North West Shelf State Agreement.

The Agreement establishes the framework of rights and obligations between the project participants and the State Government. The State Agreement was concluded and ratified by State Parliament in 1979. The Agreement is scheduled in the North West Shelf Gas Development (Woodside) Act 1979.

The intent of the North West Shelf State Agreement was to ensure sufficient priority was placed on meeting the requirements of the WA domestic gas market. The Agreement was originally due to expire in 2010, but was extended in 1984 to 2025.

When the State Agreement was concluded, the North West Shelf Gas project was envisaged to have three phases:

- **Phase I**
The domestic gas development, which involved construction of the DomGas processing plant and the Dampier to Bunbury Natural Gas Pipeline (DBNGP). This was underpinned by the 20 year take-or-pay contract entered into with the State Energy Commission of WA (SECWA), which was in turn backed up by a major commitment from Alcoa.
- **Phase II**
The initial LNG export phase, involving the construction of LNG Trains 1 and 2.
- **Phase III**
The expansion of capacity to process and export LNG, resulting in the construction of LNG Train 3.

The State Agreement committed the NWSGJV parties to the supply of domestic gas to SECWA of up to 10.5 million cubic metres per day (or 414 TJ/d) over 20 years. It also envisaged LNG exports of up to 6.5 million tonnes per year over a term not less than 20 years.⁶⁵

In 1994, the Agreement was amended to provide for the disaggregation of the original SECWA contract into the supply of “First Priority” gas – the balance of the 3023 PJ which was the subject of the SECWA contracts – to the SECWA Replacement Buyers.

These contracts were originally for 12 years and, the Alliance understands, have been subsequently renewed. The North West Shelf Joint Venture currently supplies daily maximum quantities exceeding 550 TJ/d to the domestic market – which is higher than the 414 TJ/d in the original Agreement.

2. LNG exports have expanded significantly

Since the original State Agreement and the 1994 amendments, the North West Shelf Joint Venture has committed to a significant expansion in LNG exports. LNG Train 4 was completed in 2005 and LNG Train 5 is commissioned in 2008. Completion of LNG Train 5 will bring LNG exports to a level of 16.3 million tonnes per year.

This represents a 250% increase compared to the originally envisaged 6.5 million tonnes per annum. The operator of the North West Shelf Joint Venture, Woodside, has foreshadowed further LNG expansion through a sixth LNG Train.

By comparison, supply to the domestic market by the Joint Venture has increased only marginally.

In 1998, the Shelf Joint Venture advised – as part of its justification for seeking ACCC authorisation for joint selling – that it intended to increase the capacity of the domestic gas processing plant to 1,100 TJ/d through the construction of an additional domestic gas processing train. This commitment was never met despite the Joint Venture participants continuing to sell as a single entity to local consumers.

⁶⁵ *North West Gas Development (Woodside) Agreement Act 1979*, Schedule 1, recitals (c) and (d)

3. The State Agreement provides a mechanism to ensure additional domestic supply

Given the State depends on the North West Shelf Joint Venture for around 70% of its domestic gas, increased commitment of gas reserves to LNG exports should be matched by additional commitments to the domestic market.

The Joint Venture has in recent times also been committing to the extension of supply contracts from Trains 1 and 2. It is understood that the original 20 year terms for these contracts begin to expire from 2009 with long-term extensions now being negotiated.

It is important that the original intent of the Agreement – that of placing priority on the availability of gas to the WA domestic market – be maintained in the ongoing administration of the Agreement.

The State Agreement provides a mechanism for the State to secure additional domestic supply commitments with respect to:

- the renewal or rolling-over of existing long term LNG export contracts as they expire;
- new LNG contracts entered into by the North West Shelf Joint Venture; and
- new LNG developments such as the mooted LNG Train 6.

Clause 46(1a) of the Agreement requires the Joint Venture participants and the State to “...consult and reach agreement on the requirements in the State and the manner on which they will be met...” before entering into arrangements for the sale, use, supply or export of gas during 2010 to 2025.

The North West Shelf Gas website also states that: “... production licences, retention leases and permits held by the NWSV for [the NWSV fields] expire between 2001 and 2018 ... The NWSV expects permits that expire to be renewed in the ordinary course of business”.

The importance of permit renewals to the North West Shelf Joint Venture provides the State Government with a mechanism to ensure additional supply to the domestic market.

The need for LNG contract extensions, new developments such as LNG Train 6 and permit renewals provides the State Government the opportunity to pursue further domestic gas supply commitments.

Tight Gas Development

Key Responses

- Promote tight gas development through appropriate tax and royalty incentives.
- State royalty concessions should be provided such as royalty holidays and reducing the royalty rate for tight gas developments.
- Increased deductibility from Federal taxation for pre-wellhead expenses should be provided to recognise the significant pre-wellhead costs involved with tight gas projects.
- A Commonwealth Flow Through Share Scheme would support emerging tight gas companies and promote new frontier developments.
- Targeted benefits: **availability, diversity, competitiveness** and **longevity**.

1. Challenges and opportunities of tight gas

“Tight gas” is gas held in tight or low permeability sandstone reservoirs where gas does not naturally flow to the surface. Fracture stimulation must be applied on the rocks to yield their gas. The process involves additional technical challenges compared to a conventional gas field

According to the Department of Mines and Petroleum, Western Australia potentially has around 9-12 Tcf of “tight gas” resources in the Perth Basin. These resources are located close to existing gas pipeline infrastructure and recognised markets.

Development of the State’s tight gas reserves would enable domestic gas to be supplied without a significant investment in infrastructure that might otherwise be required to transport the gas to market. It would improve diversity of supply by opening a source of onshore gas and reduce the State’s dependence on existing offshore supply.

The State Government is committing substantial effort to promoting and facilitating tight gas development, particularly in the Perth, Canning and Bonaparte Basins. This effort is welcome.

In 2008, Alcoa and Latent Petroleum formed a joint venture to appraise and develop the Warro Gas field. The field is located 200 km onshore north of Perth and holds up to 5 Tcf of natural gas. If proven to be commercially viable, the Warro Gas Project will be the first commercially viable tight gas field in Western Australia. The Project could supply over 100 TJ/day to the domestic gas market or around 10% of the State’s current gas consumption.

Tight gas fields are common in other parts of the world. Tight gas provides over 20% of the United States’ domestic gas supply and accounts for over 21% of the country’s total recoverable natural gas resources.

2. The need for incentives to promote tight gas development

Tight gas development presents additional economic and technical challenges compared to conventional gas fields. Appropriate tax incentives should therefore be provided to incentivise investment and to help improve project economics.

The development of the tight gas industry in the United States was underpinned by incentives to explore and produce unconventional natural gas. This promoted investment into deep exploration and development drilling making previously uneconomic reserves conventionally extractable.⁶⁶

Onshore tight gas developments currently fall within WA's State royalty regime which applies to petroleum and minerals development in State jurisdiction. Under the State royalty regime, royalties are levied on the value of production and not profits or income. This could operate as a disincentive to tight gas projects given the significant pre-wellhead costs associated with tight gas development.

In contrast, the Petroleum Resource Rent Tax (PRRT), which applies in offshore Commonwealth waters with certain exceptions, taxes the profits of petroleum production. Companies can also carry forward un-deducted expenses to offset against future PRRT assessable receipts.

In Western Australia, tight gas development could be encouraged by:

- State royalty concessions for tight gas developments;
- increased deductibility from Commonwealth tax for pre-wellhead expenses associated with domestic gas developments; and
- a Commonwealth Flow Through Share scheme for smaller petroleum companies engaging in domestic gas exploration and development; and

2.1 State royalty concessions

State royalty concessions could provide important encouragement for tight gas developments. These include royalty holidays, reducing the royalty rate or rebasing the commodity value for royalty assessment. Such concessions can promote the development of domestic gas fields by improving the upfront economics of a project, particularly for tight gas projects.

Any impact on State revenue would be limited, particularly where the concessions allow the development of a field that might otherwise be uneconomic to develop in its initial stages, which would subsequently generate significant royalties for the State over the long term life of the field.

To encourage tight gas development, the royalty rate for tight gas developments should be reduced to 5%. Alternatively, royalty holidays should be provided for the first 6 years of a tight gas project.

⁶⁶ See Natural Gas Supply Association, *NaturalGas.Org*, available at: http://www.naturalgas.org/overview/unconvent_ng_resource.asp

2.2 Increased Commonwealth deductibility for pre-wellhead expenses

Increased deductibility for pre-wellhead expenses could be provided for domestic gas developments under federal taxation arrangements.

A 175% uplift on expenditure incurred in exploring and developing domestic gas reserves should be provided. The uplifted tax deduction would be available to companies once the expenditure is incurred, and the companies would not have to develop gas before they received the tax incentive. The impact of this incentive would be to reduce companies' taxable income and may provide an incentive to companies with an existing tax liability.

2.3 Commonwealth Flow Through Share Scheme

A Flow Through Share scheme would provide significant assistance for smaller petroleum companies engaging in tight gas exploration and development, and who are reliant on the market for risk capital.

Such a scheme would promote frontier and start-up developments where companies might not otherwise generate a taxable income in the initial project years that would make tax deductions an appropriate incentive.

By implementing an FTS scheme, these companies would be able to pass these losses through to investors who could use the tax deductions, which could in turn create interest and equity funding by investors.

Other Measures to Promote Exploration and Development

Key Responses

- The Federal and State governments should streamline approvals processes, reduce unnecessary delays, and eliminate regulatory duplication and overlap.
- Domestic gas projects should be subject to a “fast-track” approvals process to promote development and minimise lead-times to domestic gas delivery.
- The State Government’s Exploration Incentive Scheme will encourage energy exploration, particularly in greenfield areas.
- The Scheme should provide explicit focus on domestic gas exploration by quarantining a reasonable proportion of the exploration drilling grants solely for domestic gas exploration.
- It should also identify domestic gas exploration and development in the Canning and Perth Basin as a key priority for the geoscience information components of the Scheme.
- Targeted benefits: **availability, affordability, reliability, diversity, competitiveness and longevity.**

1. Facilitate and expedite approvals and exploration

The current approvals process and stringent demands placed on developments create significant barriers to entry for new players. This could serve to discourage exploration and development, particularly by smaller domestic gas producers who do not have the same resources as major producers to devote to regulatory approvals processes.

While efforts have been made in this area, there are opportunities for further streamlining of State and Federal approvals processes for new projects. There is also a need for both Federal and State governments to examine the impact of policies and regulations on the gas supply chain, with a view to reducing unnecessary costs and inefficiencies.

The Productivity Commission has completed its *Review of Regulatory Burden on the Upstream Petroleum (Oil and Gas) Sector*. The report makes recommendations to reduce unnecessary delays (particularly for environmental and heritage processes), and to eliminate regulatory duplication and overlap. These recommendations should be examined by government.

Given the importance of domestic gas projects for Western Australia, such projects should be subject to a “fast-track” approvals process to promote domestic gas development and to minimise the lead-time to domestic gas delivery.

2. State Government Exploration Incentive Scheme

In 2009, State Government launched a new Exploration Incentive Scheme. The scheme commits \$80 million over five years and aims to encourage minerals and energy exploration. The scheme comprises six programs:

- Exploration and Environmental Coordination (\$1.5 million) – to improve online tenement application processes and increase transparency;
- Innovative Drilling including the Co-funded Drilling Program (\$26.9 million) – to support drilling in Greenfield areas and to provide pre-competitive geoscience information for petroleum and mineral explorers;
- Geophysical and Geochemical Surveys (\$32.5 million);
- 3D Geological Mapping (\$13.8 million);
- Promoting Strategic Research with Industry (\$2.3 million); and
- Sustainable Working Relations with Indigenous Communities (\$3 million) – to facilitate indigenous and environmental approvals.

A key focus of the Scheme is the provision of new geoscience information in greenfield areas, particularly at depth. Such information can have a significant impact on encouraging exploration, by helping reduce exploration risk for prospective companies.

While domestic gas is expected to be a beneficiary under the Scheme, the Scheme does not provide explicit recognition of the need to promote domestic gas exploration and development.

This could be achieved by quarantining a reasonable proportion of the \$15 million exploration drilling grants solely for domestic gas exploration; and by identifying domestic gas exploration and development in the Canning and Perth Basin as a key priority for the geoscience information component of the Scheme.

Appendix: Tax, Royalty and Investment Incentives

To quantify the impact that fiscal incentives can have on domestic gas field developments, two quantitative models were examined:

- a near-to-shore conventional gas field; and
- an on-shore tight gas field.

The impact of alternative incentives has been calculated in terms of the net present value (NPV) of after tax cash flows which the projects are expected to yield over a 10 and 20 year period.⁶⁷

The base case scenario represents the current fiscal and taxation regime, in which no incentives are offered. These projects forecast marginal returns over a 10 and 20 year period, to reflect the situations often facing potential investors in domestic gas fields.

The impact of the alternative tax, royalty and investor incentives on the NPV of the projects over a 10 and 20 year period are shown in the Table on the following page.

As demonstrated by the results, incentives such as reducing the royalty rate to 5% or providing a royalty holiday for the first 6 years of the projects have the greatest impact on the NPV of these projects over a 10 and 20 year period.

In these models, introducing a resource rent royalty has the effect of reducing the NPV of the projects, due to the significant revenue which the fields generate at the height of their production, relative to their costs.

Other fiscal incentives (such as rebasing commodity value for royalty assessment, providing increased deductions for eligible expenditure, allowing for quicker depreciation of capital assets or providing cash grants) all help to improve the NPV of the expected returns from the project.

⁶⁷ A discount rate of 15% was used to calculate the net present value of future after tax cash flows

Figure: Benefits of common-use infrastructure

Near-shore DomGas Project

Scenario	NPV of 10 years of after tax cash flows (\$M)	% impact of incentive on NPV	NPV of 20 years of offer tax cash flows (\$M)	% impact of incentive on NPV
1 Base case (no incentives)	55.96	na	\$18.52	na
2 Reduce royalty rate to 5%	89.79	60.46%	\$57.14	208.56%
3 Royalty holiday until 2015	101.08	80.64%	\$63.64	243.68%
4 Rebase commodity value for OPEX and depreciation	59.70	6.69%	\$22.26	20.21%
5 Resource Rent Royalty (40%)	-70.84	-226.60%	-\$101.75	-649.45%
6 Uplift in pre-well head expenses 175% allowable tax deduction	79.03	41.23%	\$41.59	124.60%
7 Reduce statutory cap on effective life of pipeline to 10 years	60.48	8.07%	\$22.63	22.21%
8 Provide 3 year cash grant to offset CAPEX	79.18	41.9%	\$41.73	125.37%

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Onshore Tight Gas Project

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Scenario	NPV of 10 years of after tax cash flows	% impact of incentive on NPV	NPV of 20 years of offer tax cash flows	% impact of incentive on NPV
1 Base case (no incentives)	\$70.31	na	\$119.76	na
2 Reduce royalty rate to 5%	\$91.48	30.12%	\$144.13	20.35%
3 Royalty holiday until 2015	\$97.11	38.13%	\$146.57	22.38%
4 Rebase commodity value for OPEX and depreciation	\$84.50	20.19%	\$135.69	13.30%
5 Resource Rent Royalty (40%)	-\$0.33	-100.47%	\$35.41	-70.43%
6 Uplift in pre-well head expenses 175% allowable tax deduction	\$73.60	4.68%	\$123.06	2.75%
7 Reduce statutory cap on effective life of pipeline to 10 years	\$71.24	1.32%	\$120.83	0.97%
8 Provide 3 year cash grant to offset CAPEX	\$73.96	5.19%	\$123.41	3.05%



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