CME

29 June 2010

Mr Timothy Hughes
Principle Research Officer
Economics and Infrastructure Committee

Dear Mr Hughes

PARLIAMENTARY INQUIRY INTO DOMESTIC GAS PRICES

The Chamber of Minerals and Energy of Western Australia (CME) is the peak resources sector representative body in Western Australia. The role of CME is to champion the Western Australian resources sector and assist it in achieving its vision to lead the world in sustainable practice through innovation and to underpin Australia's position in the global economy.

CME represents companies directly involved in the resources sector (including mining, oil and gas) or those providing services to it. CME's member companies generate 90 per cent of all mineral and energy production and employ 80 per cent of the resources sector workforce in the State.

We welcome the opportunity to provide general comment to this parliamentary inquiry, noting CME is not in a position to address the specific terms of reference as we do not maintain, or have access to, the information required. However, general feedback from our members is that the prices for natural gas on offer to Western Australian mineral processors have risen significantly in recent years following many years of "relatively" low prices.

The mining, mineral processing and oil and gas sectors are now major drivers of Western Australia's and Australia's economic growth. In Western Australia alone, the resources sector contributes nearly $4 billion in royalty payments (including petroleum royalties rebated to the state under the Petroleum Resource Rent Tax) as well as substantial contributions to other taxation revenues, government charges and community contributions.

Energy underpins our resource development and primary processing industries; therefore, as a consequence of general economic expansion and the growth in mineral processing and extraction, the State is a large energy consumer. In addition, Western Australia has also become a substantial energy exporter.

Accordingly, Western Australia needs to find a balance between ensuring the security of energy supply to meet the ongoing needs of the expanding domestic economy, while facilitating the growth in energy exports.

CME sees a number of issues arise from the ever increasing demand for energy in the State. These include, but are not limited to:

- As Western Australia is a major exporter of energy, world energy prices will have an impact on the domestic energy market.
- The necessary involvement of the public and private sector in delivering new tranches of energy infrastructure, particularly in the North and Mid-West regions. Facilitating competition and diversity in energy supply in the regions is a key challenge for the future.
- While necessarily involving uncertainty, expectations for new major minerals projects, and domestic gas developments, suggest that the future domestic gas supply/demand equation will continue to be finely balanced for the period through to 2020. A number of factors will influence this balance, including
  - the realisation of new domestic gas supplies;
  - feasibility of major LNG projects;
  - expectations for the future price of gas – both LNG and domestic gas; and
  - the extent of new domestic gas demands from mining, other industry and downstream processing developments.

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CME believes that, in developing its Strategic Energy Initiative for Western Australia, the government should be mindful of some key, and possibly unique, features of the WA economy. In particular, the critical role energy plays in underpinning our economic development.

CME has advocated the need for the State to articulate a clear framework for the development and ongoing operation of a competitive and efficient, secure and reliable, diverse and sustainable system of energy services to WA. This framework would also require a clear statement in relation to the respective roles of public and private sector investment in order to encourage more competition in the sector.

Competitive markets will promote efficiency which will help to ensure that energy supplies are delivered cost effectively, both in terms of the mix of energy services and how the energy system evolves over time.

A secure and reliable supply of energy services is fundamental to economic and social outcomes. It requires ongoing investment in a diverse range of energy supplies that delivers competitive pricing and certainty for investment.

A diverse energy system will reduce reliance on any one particular element in the system, increase reliability and maximise flexibility in response to future change.

Sustainability means delivering energy services in a manner that meets the needs of the present generation without compromising the ability of future generations to meet their needs.

CME considers the need for central coordination to be paramount to achieve the abovementioned. As a key policy making body, the WA Office of Energy is best placed to undertake this role.

For further information on CME's position please refer to our submission to the *State Energy Initiative Issues Paper (see attached).* Please note CME members cover all sectors in the energy supply chain – from producers and energy transporters through to consumers. Accordingly, the comments put forward in our submission do not necessarily represent a consensus but reflect the divergent views of our members.

Also attached is a copy of the CME State Growth Outlook. This version was published in 2009; however CME is currently updating the data for publication later this year. The State Growth Outlook provides data on the expected future demand for energy in Western Australia.

CME would welcome an opportunity to discuss with you the matters raised in this letter.

Yours sincerely

Reg Howard-Smith
Chief Executive

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STRATEGIC ENERGY INITIATIVE ISSUES PAPER: COMMENTS FROM CHAMBER OF MINERALS AND ENERGY

INTRODUCTION

The Chamber of Minerals and Energy (CME) welcomes the opportunity to comment on the WA Government's Strategic Energy Initiative (SEI) Issues Paper. The comments outlined in this response from CME directly reflect the views of CME members, gathered through written feed-back and in workshop and meetings specifically organised to consider the Issues Paper.

CME members cover all sectors in the energy supply chain – from producers and energy transporters through to consumers. Accordingly, the comments put forward do not necessarily represent a consensus but nevertheless are well considered comments from energy participants designed to assist the government in developing a policy framework to underpin the SEI.

By and large these comments below follow the headings and sections of the Issues Paper and respond to the questions asked in that paper. The comments are also based on CME's paper: "Towards a State Energy Initiative" previously submitted to the WA Government, which is attached separately in full.

THEMES AND DRIVERS OF THE STATE ENERGY INITIATIVE

In broad terms, CME believes that in developing its Strategic Energy Initiative for Western Australia the Government should be mindful of some key, and possibly unique, features of the WA economy. Energy policy should be developed with a clear understanding of the nature of WA's economic drivers and in particular the critical role energy plays in underpinning our economic development. For example, some key themes emerge:

- WA is an energy rich state (gas, coal, uranium);
- WA has a rich renewable energy potential;
- Energy underpins our resource development and primary processing industries;
- Cost reflective pricing should be a driver that underpins energy tariffs in regulated downstream energy markets;
- WA's domestic gas and electricity markets are isolated physically from the eastern states, so that energy security is a high priority for energy policy;
- WA electricity market (and to some extent the gas market) has some unique features, differentiating it from the eastern states :
  - Geographic dispersion of the market
  - High percentage of self supply by private companies off grid and growing
  - Low overnight load for the South West Interconnected System (SWIS)
  - High reliance on gas for power generation.

The SEI Issues Paper tends to focus on existing energy forms, but the aim of the SEI, which is supported by CME, is to develop a framework for the next 20 years. Accordingly, there are some gaps in the Issues Paper for example:

- Transport energy – this is not dealt with in the Paper at all.
- There is limited mention of coal.

- Nuclear energy – this should at least be considered as a future option; nuclear power is evolving rapidly and it is difficult to see how this issue would not arise in the timeframe of the SEI. It may not be a current power source, but is worthy of investigation, monitoring and evaluation.
- Supply contracts – how they work in this market and how they may shape future policy considerations. WA's energy markets are characterised by bi-lateral commercial contracts, unlike the markets in the eastern states.

Energy is a vital contributor to the West Australian economy, as the use and application of energy underpins economic growth. The Western Australian economy is dominated by resource extraction and primary processing, which means that energy demand often grows in large increments requiring alignment of significant expansion of supplies to meet the increased demand. *"Towards A Strategic Energy Initiative"*

Investments in energy infrastructure, for both suppliers and consumers, are usually long term and involve significant capital outlays. Government intervention can significantly change the rationale and likely returns for these investments. Hence the role that the Western Australian Government intends to take in Western Australian energy markets should be well considered, coordinated and clearly articulated in order to provide the certainty for suppliers and end users alike to make their investments and plans.

CME notes that the four strategic goals outlined in the Issues Paper (secure energy; reliable energy; competitive energy; and cleaner energy) closely match the four 'objectives' outlined in CME's "Towards a Strategic Energy Initiative".

Objectives of a State Energy Policy
A Western Australian State Energy Policy would articulate a clear framework for the development and ongoing operation of a competitive and efficient, secure and reliable, diverse and sustainable system of energy services to Western Australia. This would include a clear statement in relation to the respective roles of public and private sector investment in order to encourage more competition in the sector. *"Towards A Strategic Energy Initiative"*

The comments in the following pages on the SEI Issues Paper point to some key considerations for policy development:

- Markets are the best drivers of the State's energy resources.
- Government's role is to set energy policy framework to ensure that market solutions can work.
- All sectors of the energy supply chain need to be taken into consideration when developing energy policy and the linkages – including feedback effects – between them needs to be understood.
- Government ownership of energy assets may put it in conflict with trying to set the rules for market players. Government should consider its future role in energy markets – its focus should be in setting policy and ensuring independent regulation, rather than as an owner of assets.

THE STATE'S ENERGY DEMAND AND SUPPLY SCENARIOS

The provision of accurate and widely available information on energy supply and demand is critical to the proper functioning of energy markets. Previously the State Government saw this as one of its key responsibilities, but in more recent years that role has been neglected. While private companies and organisations like CME can do their own scenario planning, Governments are more able to gather and disseminate information to a wider audience.

Issue

Are the broad trends and drivers outlined in the Issues Paper (economic development; changing human settlement patterns; technological change; a climate change mitigation measures and impacts) credible and are there others that may impact on the future demand and supply for energy? Have all the issues been covered?

Note: Comments outlined below to the above issues are grouped into broad trends and drivers listed for developing energy demand and supply scenarios.

The State's energy demand and supply scenarios - Economic Development

Comment

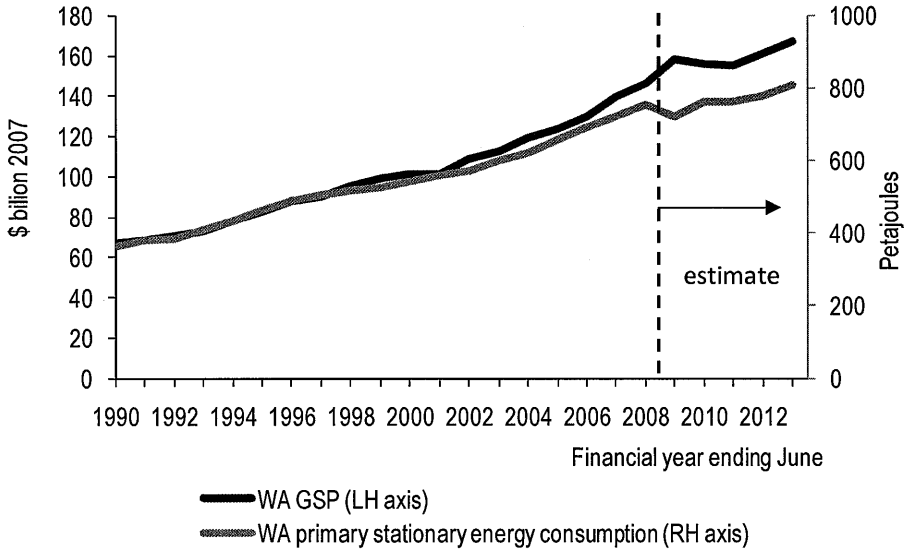
- There is a need in considering energy demand and supply scenarios to take into account a number of national and state issues that may impede economic development, including for example the provision of infrastructure, skilled workforce, taxation settings, regulatory regimes and project approvals.
- Consideration is also required on the importance of world-competitive energy costs being vital to attracting investment in WA.
- Market deregulation is a worldwide trend which will shape future economic scenarios. Governments have moved away from owning energy assets to encouraging and relying more on private investment.

The State's Energy Demand and Supply Scenarios - Changing Human Settlement Patterns

Comment

- CME's "State Growth Outlook" document provides a good basis for developing energy and demand supply scenarios and should be referenced in developing the SEI. The main issue is that demand will be uneven and focused on certain growth centres.
- For example, increasing domestic electricity demand driven by WA's growing population – and concentrated predominantly in the Perth to Bunbury corridor -needs to be taken into account.
- Outside of the Perth – Bunbury corridor, WA's settlement pattern is highly dispersed, with few major electricity demand centres.
- Primary energy consumption will continue to grow in line with Gross State Product (see graph below). This may seem self evident, but it points to the need to understand how that primary energy demand can be met – and fuel supply is the basis for primary energy.

WA Gross State Product and primary energy consumption



- Note: Energy consumption excludes energy used for transport purposes. The dip in 2008-09 reflects the impact of the Varanus Island gas explosion.
- Data source: Analysis and estimates based on ABS 2009, Australian National Accounts: State Accounts, Catalogue 5220.0, www.abs.gov.au; WA Government 2009, 2009-10 Budget: Economic and Fiscal Outlook: Budget Paper Number 3, www.dtf.wa.gov.au,; ABARE 2009, Energy Update, www.abare.gov.au; ABARE 2007, Energy Projections to 2029-30, www.abare.gov.au; and Senate Economics Committee 2008, Matters relating to the gas explosion at Varanus Island, Western Australia, www.aph.gov.au, pp 38. *"Towards a State Energy Initiative"*

The State's energy demand and supply scenarios - Technological Change

Comment

In addition to those listed in the Issues Paper, areas of technological change that may impact on future scenarios should also include:

- Carbon capture and storage – where WA has some natural advantages and has taken a lead in research and development; and
- Developments in small scale nuclear power stations – which may better suit WA's smaller grids.
- Future improvements in the efficiency and capacity (or size) of renewable energy projects.
- Energy storage systems may emerge based on new technologies

The State's Energy Demand and Supply Scenarios - Climate Change Mitigation Measures and Impacts

Comment

- Statements in the Issues Paper in relation to the future impacts of climate change could be more cautious – potential impacts, at this juncture, are not certain.

SCOPE OF THE STRATEGIC ENERGY INITIATIVE

1. SECURE ENERGY

CME believes that a secure and reliable supply of energy services is fundamental to the welfare of Western Australians. This requires ongoing investment in a diverse range of energy supplies and minimal barriers to entry for new suppliers.

Secure Energy - Definition and Scope

Issue

Is the definition and scope of issues relating to secure energy adequate, and are there any additional factors that need to be considered?

Comment

- Households in WA should have adequate energy to maintain health and safety.
- Energy storage is of critical importance for future energy security – this is one of the lessons of the Varanus Island incident.
- Energy diversity needs to recognise coal and liquids as a traditional and ongoing energy sources.
- Comments in relation to energy price movements in the Issues Paper need to reflect markets and market mechanisms at the disposal of participants to manage fluctuations.
- Transport energy should be considered; transport uses energy but also can provide supplies of liquid and alternate fuels – in an emergency for example.

Well functioning energy markets are a key contributor to our economic welfare. Energy markets depend upon the fundamentals of demand and supply to ensure efficient outcomes and setting of prices that encourages new supply to meet increasing demand. Governments have a role in establishing arrangements and policies which allow them to function efficiently and effectively. *"Towards a State Energy Initiative"*

Secure Energy - Current Context

Issue

Are the issues raised in this section – relating mainly to the supply and price of natural gas in the domestic market – adequately covered and does it present an accurate picture?

Note: Comments in this section of the Issues Paper relating to the domestic supply of natural gas reflect differing positions of CME members in the energy supply chain.

Comment - The view that Market Mechanisms Resolve Supply Constraint

- There is nothing inherently wrong with higher gas prices – they reflect the workings of the current market structure, primarily a rapid growth in potential off-take by minerals projects.

- Mismatches in supply and demand will inevitably emerge (and drive price instability) when the timeframes for new supply of gas (long) are not matched with the time frames for new demand (short to medium).
- Government intervention to mandate volume or price outcomes is inconsistent with a timeframe based on market mechanisms and is unnecessary.
- Market development initiatives are underway (Gas Bulletin Board & Gas Statement of Opportunities) and will provide greater information transparency to assist market outcomes.

Comment – The view that Market Mechanisms are Not Functioning Efficiently

- The issues raised need to reflect the potential impact of a deficiency of supply on the competitiveness of local business.
- Potential price increases are a result of supply deficiencies.
- High energy prices do stifle other investment; WA is a mining state as well as an energy exporter and higher energy prices impact on WA's competitiveness as an exporter of minerals.
- The market only works in reality when there is high information symmetry, flexible entry and exits and a large number of buyers and sellers. None of these are true for energy in WA – especially upstream gas.

Secure Energy - The Issues

Energy security is a particularly critical issue for WA which is isolated from the rest of Australia – it has no physical connections in either electricity or gas infrastructure. This is an important consideration in driving energy policy, especially in regard to energy security.

Issue

Are the key objectives of energy security outlined in the Issues Paper appropriate? What other issues may be relevant?

The following comments from CME members highlight that the focus on energy security should be about providing a diversity of supplies and encouraging new entrants.

Comment

- Energy storage issues and opportunities may be relevant to energy security.
- The market should ensure that optimisation of energy resources:
  - Ensure relevant energy resources are utilised for appropriate purposes e.g coal/gas for stationary power;
  - Gas for peaking/base load;
  - Liquids only for transport sector (diesel);
  - LNG/LPG for domestic use and remote power opportunities.
- Recent studies such as the final report of the GSEMC post-Varanus incident should be noted.
- Ensuring competition at every stage of the energy supply chain is important for security of supply.
- Cogeneration (either coal or gas) is a highly efficient form of energy production that adds to diversity and security.

- Any consideration of future energy policy in regard to improving energy security should also look at incentives to promote further exploration and economic development of new projects onshore/offshore.
- Examine Increased interconnectivity between pipeline assets such as extension of the Mid West pipeline to connect to DBP and GGP further south.
- Consideration of time/upfront costs required for LNG projects.
- While it is reasonable to dismiss the inclusion of traditional 1000 MW nuclear power plants in energy planning to 2030 (size mis-matched to SWIS), the latest small to medium scale modular nuclear power plants (e.g. 125 MW modules) should be included as a possible supply option. Modular nuclear power plants should be evaluated on their merits.
- Understanding the increasing importance of self-supply in energy for remote locations as part of the total WA power mix.
- Some additional comments on the timely development of new supply:
  - Much of the change in energy sources (renewable energy and CCS) is very dependent on the price signal. This may take some time to be achieved (given the failure to date of international forums).
  - Our market mechanisms – and specifically the creation of a competitive market, will be important to drive innovation and investment. The WEM in the SWIS has been under review under the current State Government – and coupled with a general weakness in those who have invested in generation (Verve, Alinta, and Griffin) – continued new investment cannot be assured.
  - The emerging NWIS requires considerable policy direction to create a market able to meet projected load growth in an efficient manner.
- The impact of the 20% Renewable Energy Target and how that will be met. This is important because the right choices could assist energy security (e.g. solar thermal) whereas poor choices could put supply at increased risk.

Secure Energy - The Issues - Upstream Production and the Bulk Transportation of Energy

Upstream Production

WA is relatively rich in gas resources, though they are mainly located off-shore in the State's north-west. While development of those resources began primarily to supply the local market, the opportunity to sell LNG on the world market has increased substantially in recent years.

Issue

What changes (if any) are required to current policies to facilitate the development of energy resources and facilities?

Note: Again, commentary in this section largely reflects the positions of energy players in different sectors of the energy supply chain.

Comment - The View that Market Mechanisms are Not Functioning Efficiently

- WA has substantial affordable gas reserves including some that, to date, have not been developed.
- These need to be developed to match State needs while cognisant of company investment risk.
- Review the Domestic Gas Reservation Policy and clarify the intent – supply and/or price objectives – in other words is the driver of policy to increase supply or is it to reduce price, or both?
- Offshore Western Australia is no longer a frontier exploration region and the case for joint marketing may have changed. Further evaluation of such marketing arrangements is needed.
- Onshore oil and gas exploration already enjoys royalty concessions but a royalty holiday for 10 years should be considered for areas that can readily access existing pipeline infrastructure.
- Ensure domestic gas reservation commitments are unconditional.
- Ensure Retention Lease reviews and determinations are transparent and publicly available.
- More transparency.

Comment - The view that the Market is Efficient

- The most efficient outcome is achieved by letting the market allocate resources. There is no role for government in setting up regulatory structures that distort this economic reality.
- The market is working to attract new supply with multiple new gas projects under construction, in development or under consideration.
- Joint marketing is a rational and necessary arrangement for future upstream investment and functions effectively without negative market outcomes. This proposition was validated by the ACCC in the recent review of the application for joint marketing of pipeline gas by the Gorgon Project.
- Unconditional domestic gas reservation policies are a blatant attempt to shift economic rent downstream.
- There is no such thing as "domestic gas exploration" only gas exploration.
- Many of the issues mentioned are already dealt with via other processes or from ongoing reviews. The SEI should take feedback from those processes and not attempt to reinvent the wheel.

Secure Energy - Downstream Infrastructure: Transport and Access

Investment in downstream energy transport infrastructure (gas and electricity) markets is vital to enable downstream energy markets to function properly. Such assets are more often than not regulated in order to provide fair access to third party users. Regulatory settings though need to balance investment with fair treatment of users.

Issue

What are the current Commonwealth and State policy impediments to investment in downstream energy infrastructure? How can regulatory systems affecting investment in and protection of energy infrastructure be improved to ensure availability of energy for downstream markets?

Comment

- Regulated pricing is a major disincentive to invest and a further disincentive to invest in providing cheap up-front options for later expansion of initial facilities. Pricing should reflect the risk in new investment in infrastructure.
- Ensure the approvals process is robust, however provision of appropriate timelines, processes and outcomes need to be transparent.
- Consideration of future energy technologies should be linked to studies of future infrastructure requirements.
- There may be a need to move energy specifications to a national standard – including gas quality in gas transmission pipelines.
- Studies have been undertaken as to the need for further gas pipelines to provide capacity and competition and indeed the transport of "industrial grade" gas. These should be assessed in the 2010 – 2030 time line.
- The Government should examine whether the existing electricity infrastructure can cope with an influx of 20% renewable energy being exported to the grid.
- Amend tax schedules to allow higher rates of depreciation for upstream capital (gas production and processing facilities), pipelines, HV transmission lines, remote generation etc.
- The current Western Power policy of unconstrained transmission access in the SWIS needs review,
- Capital constraints on Western Power transmission expansion are a current impediment to the connection of new generation assets.
- Western Power's ability to make investment decisions is also hampered by the New Facilities Investment Test under the Access Code.

Secure Energy - Renewable and Alternative Energy Production

Renewable and alternative energy technologies, while more expensive than conventional technologies, can allow added security to markets should traditional energy supplies be curtailed on constrained.

Issue

What are the current impediments to the development of alternative energy and low emission technologies? What opportunities exist, and what policy options could be used?

Comment

- In regard to technologies for new primary energy conversion the main barrier to development is fundamental energy losses (40 – 50%) and CO2 generation involved in Gas to Liquid (GtL) or Coal to Liquid (CtL) conversion. Consider only for boutique (high value) liquids generation or in the scenario of major regional liquid fuel supply disruptions. However it should remain on the table to succeed or fail on its own merits.

- Some renewable energy needs short term storage options to make a full contribution to the SWIS. For example, hydro can serve as a renewable energy source in its own right but also provide a valuable service in buffering supply from e.g. wind and PV solar. Also, Wellington Dam could be used as a hydro-tank storage buffer.
- Commercial scale renewable energy will remain small players in the market for the time being. The SWIS will find it hard to use more wind. Solar PV may be viable in 10 years or so, but it will only really replace liquids and some gas peaking due to its limited daytime operation.
- Underground coal (UCG) gasification presents an opportunity in WA. There are a number of isolated coal deposits in WA that may prove unsuitable for mining coal, but may be suitable to extract gas through UCG processes. These technologies have developed rapidly on the east coast and in the right circumstances, may compete with tight gas or LNG constrained domestic gas. The Government could ask Geological Survey to evaluate.
- In conjunction with gas field operators, the Government should develop long term plans to use large depleting offshore gas fields and associated infrastructure for CO2 sequestration. Ensure tax and regulatory regimes do not penalise this option.
- Prevent the automatic pass through of carbon costs to the consumer – the supplier has to be part accountable to reduce CO2 footprint.
- The cross-subsidisation of wind power in the SWIS is a concern of many industry players:
  - the IMO Working Group on Renewable Energy is producing detailed data on this;
  - wind power does not help peak demand.
  - wind power requires excessive load following plant that must run at all times.
  - in the SWIS, the available wind and load following exceeds demands – affecting the security of the SWIS network; and
  - wind power presents challenges to the grid but not as large or insurmountable as Western Power habitually states.
- Improving the efficiency factor for all forms of energy production should be an object of market design and energy policy.
- Bio fuel production is expensive but may be assisted through targeted measures, such as tax relief.
- Modular small-medium nuclear power plants should also be included in the mix of possibilities, especially given their low emission features.
- Given the long lead times to develop a nuclear industry, the market and regulatory impediments should be reviewed now, based on the assumption that within a decade, a nuclear power station will be approved for construction. Government should identify policy/regulatory constraints and provide information to underpin community discussion.

According to the Australian Uranium Association, *"Australia's uranium exports annually offset around 400 million tonnes of carbon dioxide that would otherwise be produced around the world in the use of fossil fuels to generate electricity. This is arguably Australia's single biggest contribution to the global fight against climate change and should be recognised and incorporated both in Australian energy policy and climate change policy.*

As well, the fact that nuclear energy is the only currently available, low carbon, low pollution, base load electricity generation technology means it would be wise to retain the option of reviewing the merits of nuclear power for use in Australia." Australian Uranium Association.

Energy Supply Systems in the North West, Midwest and Remote Communities

WA has a greatly dispersed population base, though many of the State's resources are in remote areas. Energy supply to those industries and communities is a key policy issue. Energy infrastructure in those regions has often been developed by the resource companies themselves, but Governments may have a role in improving coordination and sharing of infrastructure.

Issue

What are the current problems with the energy supply systems serving industry and communities in the north-west, mid-west and remote communities?

Comment

- Examine feasibility of a HVDC transmission line from the South West to Pilbara as a way of transferring power to SWIS from northern tidal / solar power plants or remote mid-size gas fields or for interconnecting the NWIS/SWIS.
- The NWIS needs policy direction from the point of view of integration and access.

Downstream Infrastructure: Power Generation and Market Design

Issue

What are the current Commonwealth and State regulatory impediments to investment in downstream energy infrastructure – including market mechanisms for power generation, approvals for land access and environmental approvals?

Comment

- Market mechanisms that promote investment in power generation (e.g. Reserve Capacity Mechanism) need reform. It is very difficult to earn long term returns in the market in its present form – and that is using conventional generation, not higher risk renewable generation.
- Locational price signals for generators are currently not recognised. This would give an incentive for new generation projects to locate in the best places to improve the grid.
- There is no merchant investment opportunity in the WEM, unlike in the NEM. Generators and retailers require long term Power Purchase Agreements in the WEM in order to finance new projects and this constrains development opportunities.
- There is no underground gas storage of significance in this State. This should be proposed without delay.
- The age of generation and network assets must be consideration within this SEI vision.

Well designed energy markets are a key contributor to our economic welfare. The success of these markets depends on the institutions and frameworks that facilitate their development and operation. Governments have a role in establishing the institutional arrangements and pre-conditions which allow them to function efficiently and effectively.
"Towards a State Energy Initiative"

2. RELIABLE ENERGY

Reliable energy is focussed on ensuring that WA's energy supply is of a consistently high quality and is delivered with minimal disruption. It is a real time operation focus for energy markets.

Reliable Energy - The current context

Issue

Is the description of the current context for energy reliability adequate?

Comment

- This section of the Issues Paper does not appropriately recognise the important role coal, as well as other fuels, played during the Varanus Island incident. For example, the reopening of Muja AB played an important role in ensuring reliability of power supplies was maintained.
- Pipeline linepack capacity provides a significant buffer to upstream outages.
- Consideration must be given to the strategic storage of LPG and domestic LNG.
- Government needs to have a good understanding of where strategic energy reserves are located around the State – in regional areas, held by industry or defence facilities – particularly in the event of an emergency.

[The SEI should] encourage and coordinate the development of contingency plans for low risk but high consequence events such as major interruptions to supply. *"Towards a State Energy Initiative"*

Reliable Energy - The Issues

Issue

What options are available to the State, to customers and energy players to improve energy reliability? What reliability standards are appropriate?

Comment - Reliability Standards

- There needs to be some analysis of the incremental cost of providing additional reliability in the SWIS. Also include the estimated cost of power failure (e.g. widespread load shedding over a 24 hour period, mid-week) to put things in perspective.
- We have a reliability standard set too high for the physical nature of our grid and fuel sources. We have an electricity market that talks about maintaining reliability with generation reserves and transmission constraints in the order of 8% reserve margin, but fuel supply issues that can disrupt 30% or more of the available supply. These are inconsistent.
- Reliable energy supply ensures WA at least has a platform to attract investments in energy intensive industries/or the need for reliable energy industries e.g aluminium refineries

- We need to ask small use customers these questions in a sophisticated survey - offer reliability/price options and evaluate uptake. The Government needs to evaluate community/industry willingness to pay. It is not the role of government to subsidise energy reliability. It is the role of government to evaluate this and check for market failure.
- At wholesale level this issue is already addressed by the terms and conditions of supply that are agreed between the supplier and buyer of a product or service. Investors and customers should be able to analyse the acceptable level of reliability not have it dictated by policy.
- Government may need to recognise a "market failure" and enforce higher levels of system reliability than customers are prepared to pay for. Government may need to subsidise reliability out of general tax revenues or impose higher tariffs with rebates for vulnerable customers.
- An audit of existing infrastructures should be undertaken as part of normal operational programming deficiencies and an upgrade programme put in place.

Comment - Network Reliability

- Electricity infrastructure costs have more than doubled over the last 5-10 years
  - the delivery model appears to be flawed e.g "alliance partnering" is a very expensive delivery model;
  - competitive tendering should be considered by Western Power to deliver better outcomes.
- Reliability issues are more often infrastructure failures, rather than generation. Fix the infrastructure i.e. network.
- Reliability of transmission capacity needs a rethink. It would be erroneous to make the SWIS as reliable as Governments would like – it should be approached on a cost/benefit basis.
- Widespread adoption of back-up generation by commercial users in the SWIS is a sign of inadequate energy planning and is bound to be a globally sub-optimal outcome compared to sufficient investment in SWIS infrastructure. However, some low cost embedded options may be more efficient depending on location, but this requires rules to recognise locational pricing signals.

Comment - Market Structure & Generation

- As our Capacity Market has shown us, we can place too high a premium in having spare capacity available, but the cost of (liquid) fuel to run this spare capacity is very high – hence we can have a reliable system, but it means we have expensive power.
- The Capacity Market is a blunt instrument and not good at incentivising a balanced range of generation investment.
- As an islanded electricity market the SWIS cannot afford to have reduced reserve capacity.
- Back-up generation should be tendered as a service supplied to the SWIS.
- Investment in smaller fast-response generation to provide "load/wind" following services is not necessarily the cheapest solution, but subsidies must be recognised and met by the community.
- Local and distributed power generation in regional locations (e.g. Kalgoorlie), should be encouraged to reduce over-investment in the network and enhance security.

Comment - Gas Transport

- Pipeline linepack capacity provides a significant buffer to upstream supply outages.
- Ensuring the energy corridors (e.g. DBP easement) are secure and isolated from potential threats (non terrorist related) would help safeguard reliable supply.
- Increased interconnection between pipelines and possibly producers should be considered to improve reliability/provide back-up.

Comment - Customer Options

- Opt in electricity tariffs should be considered – consumers able to send excess generation back in the grid.
- Smart metering is considered to be a significant "behavioural change" incentive to reduce peak demand and put less stress on energy supply.
- Ensure end user capacity to trade energy to other customers called Demand Side Response. This should be encouraged.

Comment - Fuel Supply

- More liquid fuel storage is needed – both for metro and key regional towns. This may warrant a separate study.
- Access to Defence liquid fuel supplies could be considered.
- Local bio fuel production should be encouraged to provide diversity of fuels.
- Oil / gas swaps with other liquid storage owners could be looked at.

Comment - Alternate Solutions

- We should look to make more use of our coal assets (e.g. coal gasification) and incentivise supply from more diverse small gas reserves closer to market.
- Gas storage is a key investment in securing reliability across a number of industries.
- Energy storage (pumped hydro systems or thermal energy storage systems) should be investigated – especially where peak energy prices are high – such as the Goldfields or Geraldton/edge of grid.

3. COMPETITIVE ENERGY

Competitive energy markets produce the most efficient solutions, essentially driven by supply and demand. But getting the market structure right and eliminating barriers to entry should be a key aim of policy markers. In WA, this involves understanding the different "energy markets" – from upstream to downstream and their linkages. In other words, downstream energy markets are dependent on the availability of primary fuels – from upstream producers.

Competitive Energy - Definition and Scope

Issue

Are there any other areas that need to be addressed in the scope for competitive energy?

Comment

- Arguably the Commonwealth and State Governments have moved to create open and competitive markets – that certainly has been their aim, but there is still a long way to go.
- In relation to the comment on price transparency – not sure how this works with the predominance of bilateral commercially negotiated contracts in WA. Suggest the Government has a look at Victoria. Where prices are decoupled from market price setting very effectively.
- The creation of financial instruments needs further and careful consideration.
- WA needs an independent gas market operator.
- Lack of real time information on gas availability and infrastructure availability / capacity and constraints needs to be considered; again this will be assisted by an independent gas market operator.

[The SEI should] promote effective competition through the use of markets and structural separation where efficient, in both upstream supply and energy transformation, and in retail markets. *"Towards a State Energy Initiative"*

Competitive Energy - Current Context

Issue

Does the description of the current context for competitive energy adequately describe the policy settings and directions?

Comment

- Arguably there are "few" not "many" reasons for intervention by governments in competitive energy markets – if they are properly working as markets.
- There needs to be an overall policy objective of minimal government intervention.
- The comment/objective in relation to the State Energy Initiative taking into account potential consequences on our natural environment requires some clarification. It is not clear if this relates to emission reduction objectives.

Competitive Energy - The Issues (General)

Issue

What are impediments to increased competition in upstream and downstream markets and what policies are needed? Have there been unintended consequences from deregulation? What role should Government have? Can markets be better integrated?

Comment - Impediments to Competition

- Joint marketing generally reduces competition in a market.
- However, in WA, which has an immature gas market, joint marketing is more economically effective in encouraging investment thereby meeting the public benefit test (ACCC).
- The interpretation of the commerciality test in retention lease rollovers has inhibited competition.
- Allow joint marketing only on the basis of a net public benefit test.
- Allow rollover of Retention leases only when net public benefits.

Comment - Unintended Consequences of Deregulation

- There are always unintended impacts in markets. For instance, the east coast disaggregation and (semi) privatisation led to many unintended impacts. Firstly, most of the original private investors failed. Secondly, when they found their feet, they went about re-aggregating the businesses. This is because vertically integrated business is the most efficient response to that competitive market environment. Similarly, the original MRET policy did not foresee the adverse technical impacts of wind. Governments need to manage market regulation to allow it to evolve to keep pace with the change. If the change is socially unacceptable, then alter policy settings in a credible manner.
- Unintended consequences are presumably those that were not predicted – poor prediction mostly. The only option is flexible and responsible government policy. There will always be some unforseen outcomes.

Comment - Role of Government

- The Government should identify its energy supply objectives (to meet demand), and allow an independent body to set frameworks to achieve these and get out of the market allowing private money to make the necessary investment. If the costs are too high under this scenario, then any subsidisation by Government is at least transparent and efficient.
- Regulation in its current form does not allow for risk/price adjustment investment.
- It will never be set and forget. Accept that Government will always get involved and instead policy should set clear parameters within which Government must act.
- Verve and Synergy need to be horizontally separated into competing entities.
- Outcomes of the Verve Energy Review need to ensure an opening up of the market to fairer competition or it is likely to drive away serious investors (rather than niche players) who might ultimately bring some competition to the market.
- The State Government can get out of the business of competing in these markets (Verve and Synergy) and set up truly independent market bodies to manage them. They can also properly regulate the network business – at the moment it is merely Western Power liaising with the ERA as to how it should invest, rather than being a fundamental part of the electricity market (as it is treated in most other jurisdictions).

- Government should step away from the political football of low energy prices for consumers.
- Energy tariffs should reflect cost and reasonable returns – in other words, should be cost reflective
- Government credit ratings should not influence how Synergy contracts for its energy.

Comment - Integrated Markets

- First question should be whether or not different 'energy markets' should be integrated.
- Have more integrated 'gentailers'. The big market players in the east coast (Origin, AGL, TruEnergy) have vertically integrated into upstream fuel supply right through to downstream retail products. They have ensured they have a natural hedge by controlling the cost for energy, as well as the price at the retail level of the market.
- Big retailers should (and do) source their own energy requirements.

Competitive Energy - The Issues (Energy Price Regulation)

Issue

Should the Government control retail tariffs? Is price regulation required in the future? How can remote communities be assisted/ how can we maximise benefits of cost reflective energy tariffs?

Comment

- Over time, retail tariff setting should be taken out of Government control and handed to a body such as the ERA.
- FRC is a good option or at least allow both main retailers to operate on a level playing field
- Any subsidies should be transparent and not interrelated to the process of energy supply. This is the only way to have credible and efficient markets.
- Dual fuel contracts/customers have significant synergies for reducing delivery/overhead costs.
- As with buying prices, selling prices should not be regulated. Free market conditions must prevail across all energy sections.
- Look at the way it is done in other credible markets - using an independent price regulator and setting fallback pricing of last resort at levels that new entrants can compete under.
- Gas and electricity retail price regulation will always be required in a small market. However, it must be at arms length from day to day political process with a regulator reporting to government.
- Retailers could be audited and reported against gazetted customer service standards and obligations.
- CSO's:
  - should be clearly identified and distinct from the market;
  - are very small part of the market and should not influence cost reflective tariffs policy setting;
  - direct payments should be favoured and not cross subsidies;
  - list CSO's in budget papers for annual review;
  - remove CSO's from current pricing structures so that cross subsidies are transparent;

  - these processes can be implemented aimed at improving supply to these communities and groups more efficiently.
- Time of use metering is ultimately required - however the cost of implementation will be another significant burden on top of a number of significant cost burdens that someone is going to have to meet (likely the consumer).
- Smart metering is part of the solution.

Competitive Energy - The Issues (Electricity)

Issue

What reforms are needed for the WEM? Should Government continue to own Verve, Synergy, Western Power and Horizon Energy?

Comment

- The ERA has reviewed the WEM operations – the SEI should refer to that review as it was based on the views of market participants.
- Privatisation should be considered as an option. Should the government own the electricity businesses? Verve – No. Synergy – No. Western Power – Yes. Horizon – Yes... though the latter two under more corporatized designs. Alternatively, they could all be private and competitive.
- Synergy should be split (into at least 2) and retail tariffs need to be set around 10% higher than the average cost of supply so that other retailers can enter the market.
- Western Power's cost structure is a key concern under government ownership.
- The SWIS needs transmission adequacy. It is a difficult situation where if economic tests are applied, it will be unlikely to deliver the large scale capacity expansion required – which will lead to more of the same distributed generation, which is ultimately inefficient. However, some renewable and emerging technology is best on a smaller scale and so ideal for distribution generation).
- The SWIS needs significant investment in transmission and other infrastructure to enable private investment in generation assets (private money can be used for infrastructure investment, but funding guarantees required at the least).
- The WEM needs a blueprint for a diverse generation mix, including gas, coal/nuclear and renewable energy.

Competitive Energy - The Issues (Gas)

Issue

Are there any additional measures that should be put in place to improve the transparency and liquidity of the gas market?

Comment

- There is a vibrant secondary market for gas but it is informal and privately run. The move to a more formal bulletin board system for all energy should be a priority.
- Spare pipeline transport capacity should be available via a similar system.
- Bring back *Energy WA* publication – more transparency in the market.

Competitive Energy - The Issues (Liquid Fuels)

Issue

What other measures could be put in place to promote competition in petrol, diesel or LPG markets?

Comment

- Cyclical pricing remains a concern for many in the community and creates a poor reflection of oil company attitudes.
- LNG/LPG facilities are becoming very cost competitive and can be part of an expansion in domestic fuel supplies.
- Local production of bio fuels/ethanol should be encouraged.
- LNG domestic supplies are currently restricted in capacity – reflecting WA as a small market.

4. CLEANER ENERGY

Promoting cleaner or sustainable energy production is a goal of most energy markets and policy makers around the world. This is not only to minimise impacts on the environment, but it is recognised as providing diversity, security and reliability for energy systems. The policy issues though are often about how to fund or incentivise cleaner energy production without unduly distorting markets or leading to unintended consequences.

Cleaner Energy - Scope and Definition

Issue

Are there any other areas to be considered in the scope for cleaner energy?

Comment

- There should be mention of the 20% Renewable Energy Target and how the State plans to achieve it.
- Demand side management is the cleanest form of energy management. In Europe and perhaps USA it will be included in RET calculations.

Cleaner Energy - The Issues

> *"Sustainability means delivering energy services in a manner which meets the needs of the present generation without compromising the ability of future generations to meet their needs."* Brundtland, G. *"Our Common Future"*

Issue

What are the technical, regulatory and market barriers to the introduction of renewable energy projects in WA? How can they be overcome? Are any incentives warranted? Should there be aid for embedded generation advanced metering and smart grid options?

Comment - General Policy Issues and Role of Government

- There are going to be difficulties in meeting the 20% Renewable Energy Target in WA.
- Other markets (Europe) have successfully integrated clean energy solutions into their generation portfolio. WA can create, with the appropriate incentives, similar solutions.
- Government framework/regulation needs to be robust / and in place over the longer term with clear direction.
- There are too many programs and schemes. It is confusing and inefficient.
- In WA, the Government is one of the only entities that can underwrite new clean energy projects. It needs to consider mechanisms for transparent subsidies via long term contracts that apportions appropriate risk to the investors; however it should also enable investors to finance efficient projects.

Comment - Regulatory and Market Barriers

- Our market mechanism in the WEM (e.g. Capacity Market) is actually a barrier to entry to some new technology renewable such as solar power. This needs reform.
- There is limited evidence of any regulative barriers. There are commercial constraints and some technical issues – the latter can be overcome at a cost.
- A major market barrier is securing an adequate off-take contract to underpin project financing. The State needs to step in as a credible counterparty. Our electricity market is not set up for merchant risk.

Comment - Transmission Barriers

- Western Power's queuing policy and monopoly in SWIS transmission is a barrier to entry. Western Power has too much power in making decisions on which projects can connect to the grid.
- Allow investors flexibility with availability transmission requirements, overseen by ERA not Western Power.
- Transmission regulation is treated separately from the rest of market regulation but the two should be linked. Transmission investment issues are critical for distributed generation (and edge-of-grid) technologies.
- Western Power regulations which require ultimate control of the generation facility are an impediment to new entrants.

Comment - Technology Risk

- There is a need to consider co-generation and combined cycle gas generation as fuel efficiency measures available through existing technology.
- Technical risk makes new renewable projects difficult to finance. It requires State/Federal Governments to remove some of this risk (e.g. Flagships).
- While it is nice to say we try to treat all technologies equally, we do not. Government is going to have to bite the bullet and identify some prospective technologies; create transparent subsidy measures (in the form of long term contracts in order to secure financing) and allow the private sector to bring these technologies to market in the most efficient manner.
- Acknowledge that in this space, there is not a lot of technology substitution. So by setting transparent pricing mechanisms (i.e. to transmission, ancillary services etc) and by applying transparent subsidies to these prices for specific technologies, we allow private investors to make efficient investments.
- No subsidies - let the market decide the most cost effective technology.

Comment - Smart Meters and Demand Responses

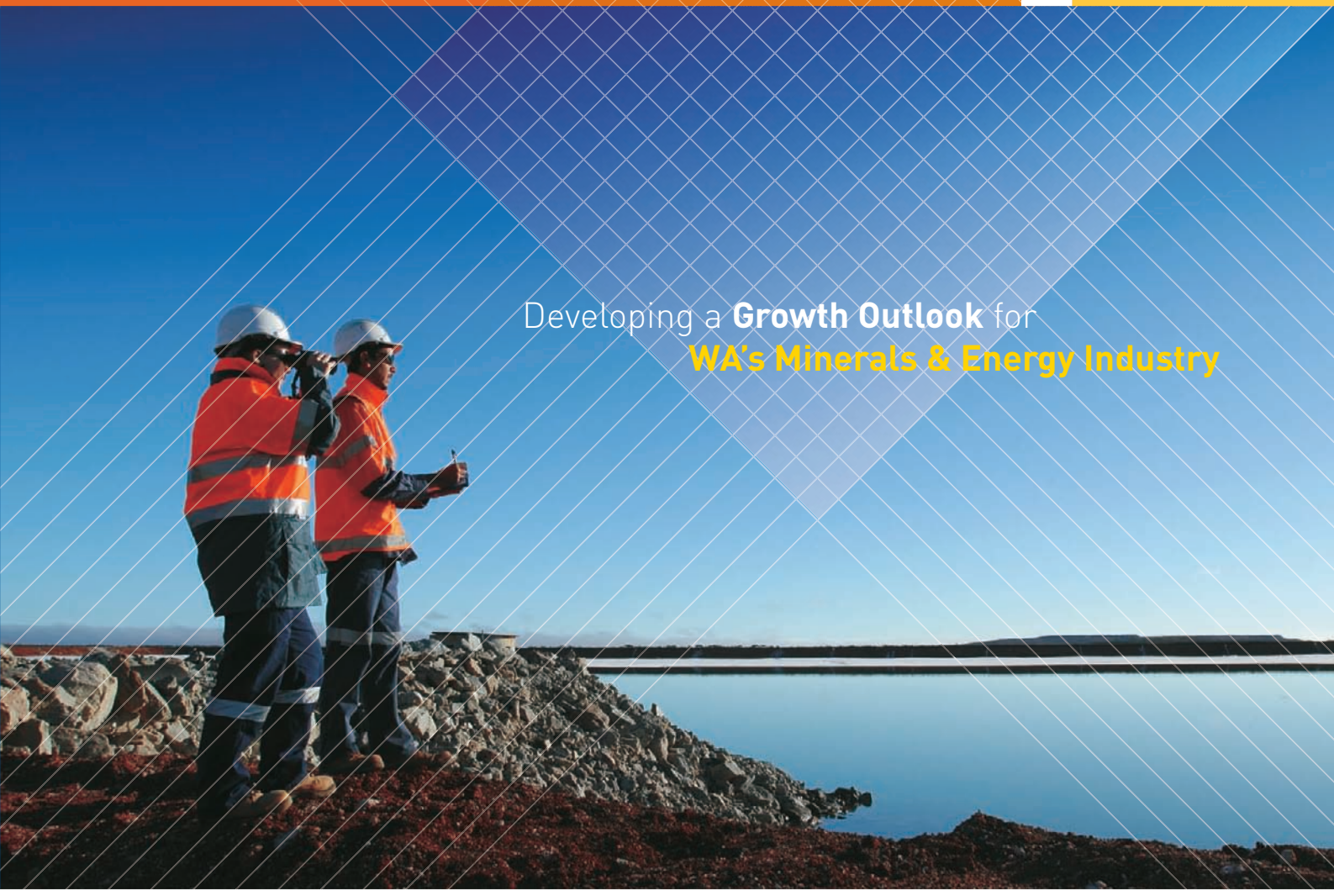
- Key enabling technologies like smart meters need urgent government support. A market solution alone will not deliver.
- If it was an overwhelmingly NPV positive investment, widespread investment in smart meters would have been done by now. Economic regulation is a difficult framework in which to make decisions on new technology innovation of this sort. Generally, a regulator will not approve such a massive investment unless the case to do so is clear – which it is not with smart meters as we just don't know the true scope of economic benefit (not only to the electricity sector) that can be achieved (similar to the internet)
- This is a perfect space for government intervention to be appropriate.

- There have been several significant studies performed on the roll-out of smart meters in Australia and overseas – mostly inconclusive. This is why this requires government intervention.
- Behavioural change is a long term assignment, however it can be achieved. The recycling industry is a good example of initiating grass roots changes in the community with the assistance of local councils etc
- Smart metering/real time pricing has real potential to change behaviours. This requires an education revolution on the change in use of electricity.

SUMMARY

The above comments on the SEI Issues Paper come directly from CME members who are real players in the various energy markets in WA. The comments reflect their own experiences and considered views on ways these markets can be improved through clear Government policy settings.

CME and its members look forward to a continuing dialogue with the Government and its advisers in developing the State Energy Initiative.



Developing a **Growth Outlook** for WA's Minerals & Energy Industry

The Chamber of Minerals Energy Western Australia

ABOUT CME

The Chamber of Minerals and Energy of Western Australia (CME) is the peak resources sector representative body in Western Australia.

CME exists to champion the Western Australian resources sector and assist it in achieving its vision to lead the world in sustainable practice through innovation and underpin Australia's position in the global economy.

CME represents the views and needs of members, acts as a powerful voice to government, and provides opportunity for members to work together and build community understanding.

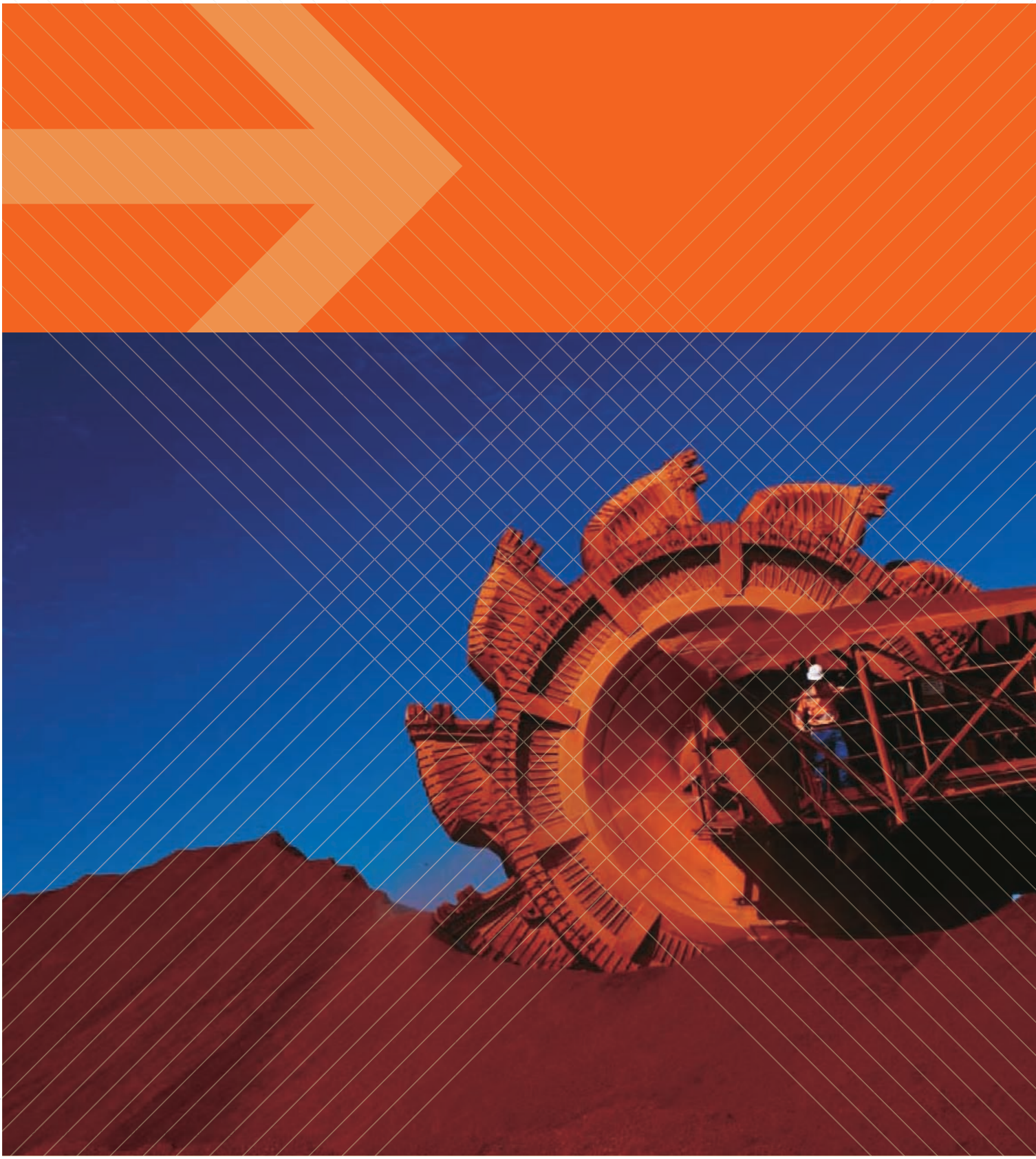


Photo courtesy BHP Billiton Iron Ore

"This report has significant value as a means of highlighting the **challenges anticipated growth** will bring."

The greatest threat to sustained development in Western Australia is the absence of a vision for growth.

Consideration must be given to planning, investment in people, land and water management and energy security, all key inputs into the economic prosperity of the State.

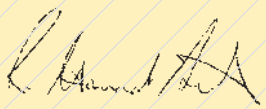
The Chamber of Minerals and Energy of Western Australia (CME) has captured the development intentions and plans of the minerals and energy industry and Government, to provide an integrated outlook for growth in the State. The main focus of the Growth Outlook Study was on demand for the key growth enablers of water, people and energy.

Results of the Study surveys, completed in July 2008, illustrated the outlook for growth was overwhelmingly positive. Since then, circumstances have changed and we are facing one of the most difficult economic times in our history.

The context of the Study was expanded to take into consideration the impacts of the global financial crisis. Scenarios for the future suggest growth will return and increasing demands will again place pressure on infrastructure, energy, labour and water supply.

This report has significant value as a means of highlighting the challenges this anticipated growth will bring. We have identified implications to demonstrate the need for better planning to meet future demands.

The sort of collaboration necessary to create a report of this nature is unique and we could not have completed such a study without the provision by contributors of commercial in confidence information. The support and input of our member companies and Government representatives has been invaluable and we thank all contributors for their participation. Thanks also to our Stakeholder team, Working Group and Steering Group.



Reg Howard-Smith
Chief Executive

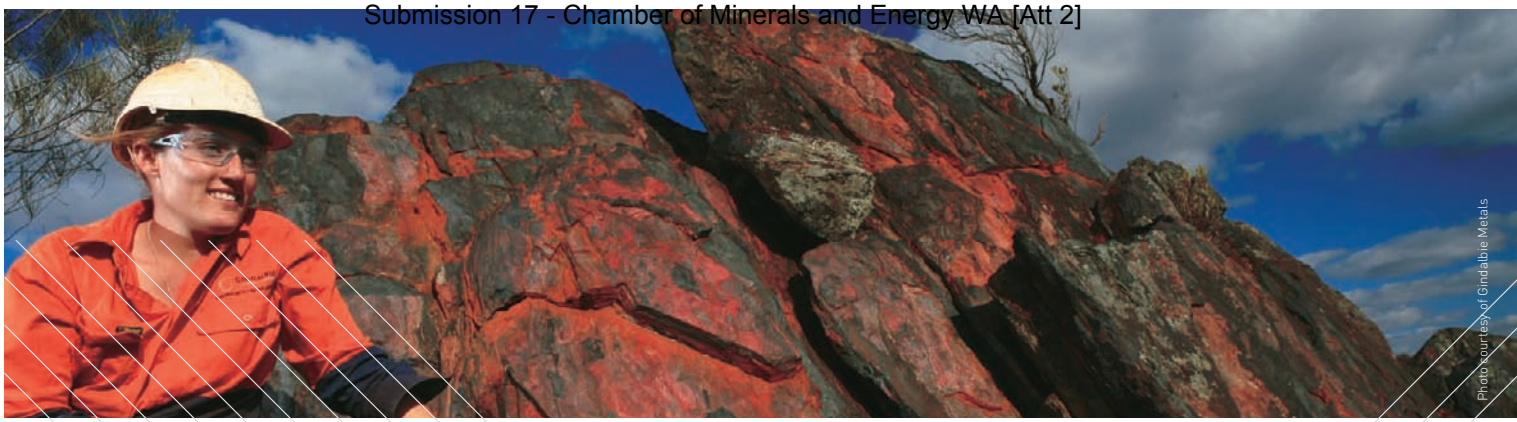


Photo courtesy of Gindalbie Metals

INTRODUCTION

The minerals and energy sector makes a significant contribution to the Western Australian and Australian economy. Sustaining its long term growth is key to future prosperity.

The unprecedented growth experienced in Western Australia in the recent past has resulted in significant demand for the key enablers of growth - people, energy and water.

The Chamber of Minerals and Energy of Western Australia (WA) commissioned a joint industry-government Study to provide an integrated view of industry and government development plans for the minerals and energy sector, and create an outlook for growth in the State.

The objectives of the Growth Outlook Study are to:

- Identify key potential gaps in the three defined growth enablers: people, energy and water;
- Provide a basis for identifying other implications that current growth plans may have for WA; and
- Provide valued input into industry and government planning and better position industry and government to fully capture the opportunities presented by the current growth environment.

The growth outlook is based on an industry survey. Its original high growth outlook has been modified to reflect current financial slowdown and two constrained scenarios are proposed.

The report develops scenarios rather than forecasts, but the underlying message is clear. Growth will return and demand for Western Australia's resources will grow strongly. Using the current slow down to plan constructively for the future is essential. Industry, Government and community need to work together to anticipate and shape the future.

Photo courtesy of Newmont Jundee

"Growth will return and demand for Western Australia's resources will grow strongly. Using the current slow down to **plan constructively for the future** is essential."

GLOBAL FINANCIAL CRISIS

The current financial situation is evidence of the cyclical nature of the global economy, and the periods of growth and times of decline it experiences.

The impact of the financial crisis on the State's outlook for growth has been examined in this Study, resulting in three scenarios for the period 2008 to 2020:

Photo courtesy of Iluka Resources

SCENARIO 1:
Based on a survey of projects in the minerals and energy sector completed prior to the global financial crisis

SCENARIO 2:
Moderate constrained growth scenario forecast representing a softer impact of the global financial crisis to the minerals and energy sector

SCENARIO 3:
Severe constrained growth scenario forecast representing a more severe, longer lasting impact of the global financial crisis to the minerals and energy sector

It is forecast that the current financial crisis will cause a major decline in general demand over the next few years.

However, the State's growth trajectory out to 2020 will be positive, with rapid growth set to resume in the early part of the next decade.

THE NEXT WAVE OF GROWTH IS INEVITABLE

Years of planning and development are required to deliver major infrastructure projects. The current economic climate provides Western Australia with the essential time required to better prepare for the next wave of growth.

To ensure that the opportunities made available to Western Australians by the next period of growth are fully realised, it is essential that this time is used effectively to improve management of growth, better infrastructure planning, coordination and delivery, and workforce planning.

Photo courtesy Woodside Energy Ltd

LABOUR DEMAND (PEOPLE)

SCENARIO ONE

Original Survey Data (July 2008)

Minerals and energy sector participants were surveyed on their anticipated labour demand through to 2020.

According to the survey findings, State-wide demand for labour from the minerals and energy sector is projected to grow significantly in the period 2008-2014.

State-wide direct labour demand from the minerals and energy sector is projected to grow at an annual average of 7% to 27,000 by 2014.

The direct minerals and energy sector labour demand is expected to peak in 2012 at ~38,000, driven by the coincident timing of a number of major construction projects in the State.

The highest growth regions are expected to be the Mid-West, Goldfields/Esperance and the Pilbara, with respective incremental demands for people of 60,000, 3,000 and 14,000 in 2014 over 2007 levels.

The majority of additional planned employees are fly-in, fly-out (FIFO) workers with a peak incremental requirement of 27,000 in 2012 versus a residential workforce requirement of 11,000 in the same period.

SCENARIO TWO

Moderate Constrained Growth

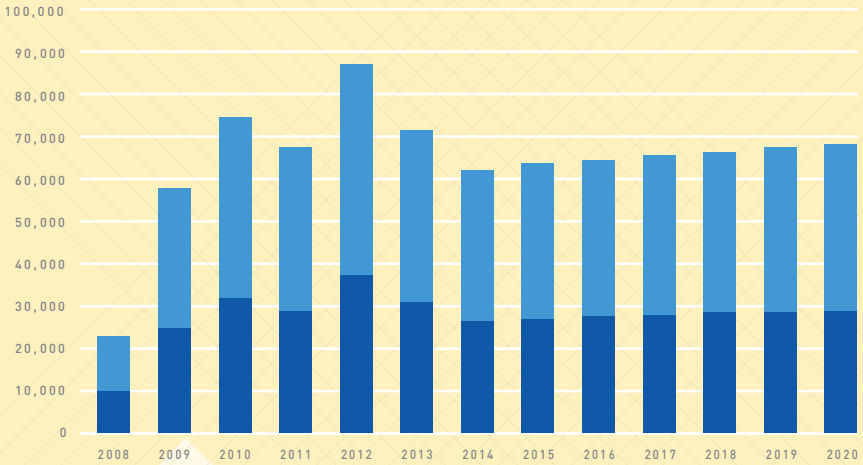
When a moderate constrained growth scenario is applied relatively slow growth in direct sector demand for the period 2008-2010 is forecast, followed by a sharp upturn in 2011. Incremental demand in 2012 under this scenario is ~ 38,000.

SCENARIO THREE

Severe Constrained Growth

When a severe constrained growth scenario is applied flat or negative growth in direct sector demand for the period 2008-2011 is forecast, followed by a sharp upturn in 2012. Incremental demand in 2012 under this scenario is ~ 17,500.

PEOPLE - MINERALS & ENERGY - DIRECT AND INDIRECT LABOUT DEMAND - SCENARIO ONE - ORIGINAL SURVEY DATA INCREMENTAL LABOUR DEMAND – STATE WIDE (HEADCOUNT INCREMENTAL TO 2007 LEVELS, 2008-2020)



Source: Direct Survey Data with extrapolated growth, GEM Consulting Analysis

"Future labour demand driven by the minerals and energy industry will continue to **create labour shortages**."

INCREMENTAL LABOUR DEMAND - STATE WIDE - ORIGINAL SURVEY DATA AND SCENARIO TWO AND THREE (Headcount Incremental to 2007 levels, 2008 – 2020)

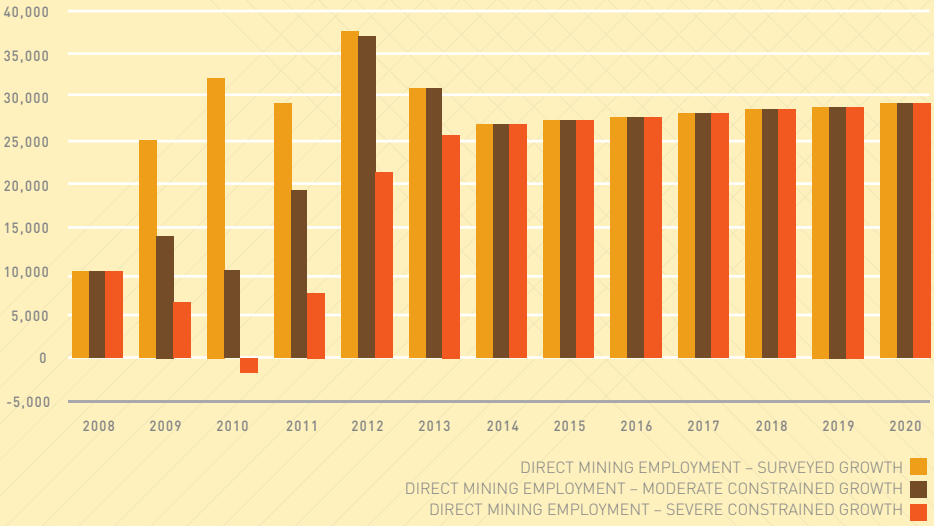


Photo courtesy of Downer EDI

IMPLICATIONS AND OPPORTUNITIES

- Increased Social and Economic Benefits: increased employment, royalties and other benefits for the State will continue to flow from ongoing growth in the minerals and energy industry.
- Perth and Regional WA Attractiveness: the ability of Perth and regional WA to attract and retain the forecast additional sector workers required under strong competition from other States and overseas remains a challenge.
- Pressure on Urban Infrastructure: the expected strong population growth in WA will continue to place pressure on civil infrastructure in Perth and regional towns. Land and housing availability and costs are major issues in many regional towns.
- Pressure on Labour Supply across all Industries: ongoing growth in labour demand driven by the minerals and energy industry will continue to create labour shortages in industries in the State while placing upward pressure on labour costs.
- FIFO Challenges: the majority of incremental labour demand forecast by the survey is expected to be met through FIFO sourcing from the Perth-Peel region. This growth in the FIFO labour force is likely to drive demand for a number of adaptations to traditional services to accommodate the different needs of this sector.
- Land Access: there will be increased pressure to maintain the balance between development, including mining and agriculture, and conservation of the State's biodiversity and environment.


Photo courtesy of North West Shelf Venture

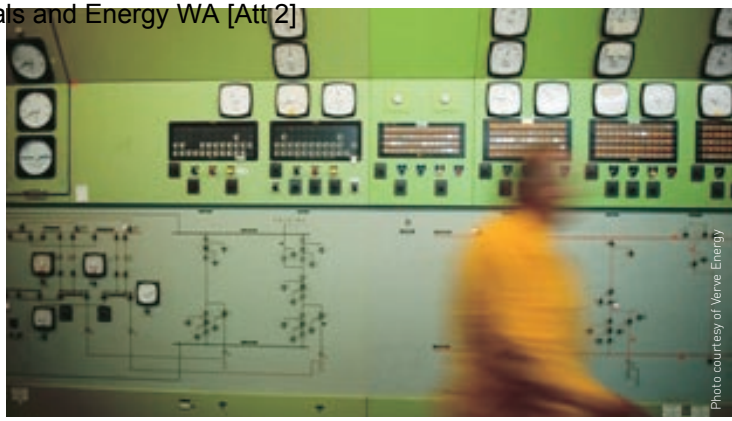


Photo courtesy of Verve Energy

ELECTRICITY DEMAND

SCENARIO ONE

Original Survey Data (July 2008)

As one of the key growth enablers, minerals and energy sector participants were surveyed on their anticipated energy demand through to 2020.

State-wide demand for both electricity and gas from the minerals and energy sector is projected to grow significantly in the period 2008-2014. The majority of this growth is expected in the Pilbara and Mid West regions where new and expanding projects, in particular iron ore, are planned.

Anticipated incremental State-wide electricity demand from the minerals and energy sector in 2014 is 16,758 Gigawatt hour per annum (GWH/a) over 2007 consumption.

In 2014, anticipated incremental electricity demand from the Pilbara sector over 2007 consumption is 13,766 GWh/a. This constitutes 82% of incremental State-wide sector demand.

In 2014, it is anticipated that 77% or 12,856 GWh/a of the total State-wide sector incremental demand over 2007 requirements will be met by self generation.

Minerals and energy sector electricity demand on the South-West Integrated System (SWIS) for the period 2008-2014 is anticipated to grow at a Compound Annual Growth Rate (CAGR) of 0.9%.

SCENARIO TWO

Moderate Constrained Growth

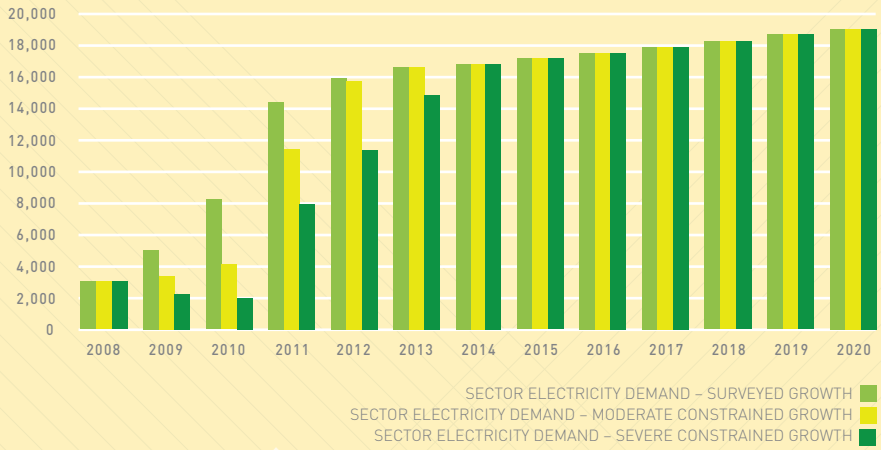
Incremental State-wide demand for electricity from the minerals and energy sector is forecast to remain relatively static for the period 2008-2010 followed by a sharp upturn in 2011. Incremental demand in 2010, under the constrained growth scenario, is approximately 4,100 GWh/a less than the surveyed growth forecast.

SCENARIO THREE

Severe Constrained Growth

Incremental State-wide demand for electricity from the minerals and energy sector is forecast to remain flat or decline marginally for the period 2008-2010 followed by a sharp upturn in 2011. Incremental demand in 2010, under the constrained growth scenario, is approximately 6,300 GWh/a less than the surveyed growth forecast.

INCREMENTAL MINERALS & ENERGY SECTOR ELECTRICITY DEMAND - ORIGINAL SURVEY DATA AND SCENARIOS (GWh/a Incremental to 2007 levels, 2008-2020)



"A long term **energy policy is needed** for the State in order to enhance future competitiveness."

DOMESTIC NATURAL GAS DEMAND

SCENARIO ONE

Original Survey Data (July 2008)

State-wide (all industries) demand for gas is anticipated to grow at a CAGR of 5.3% to 482 Petajoules per annum (PJ/a) by 2014.

Forecast State-wide minerals and energy sector demand for gas is anticipated to grow at a CAGR of 6.7% to 286 PJ/a by 2014, an additional 94 PJ/a over 2007 consumption.

The Pilbara region is expected to account for 82%, or 78 PJ/annum, or the minerals and energy sectors State-wide incremental gas requirements in 2010.

SCENARIO TWO

Moderate Constrained Growth

Forecast growth in State-wide demand for domestic natural gas from the minerals and energy sector is lower than the surveyed demand for the period 2008-2012. Sector demand in 2010, under this scenario, is approximately 24 PJ/a less than the surveyed demand.

SCENARIO THREE

Severe Constrained Growth

State-wide demand for domestic natural gas from the minerals and energy sector is forecast to remain relatively static for the period 2008-2010 followed by a period of rapid growth to 2014. Demand in 2010, under this scenario, is approximately 37 PJ/a less than the surveyed growth forecast.

IMPLICATIONS AND OPPORTUNITIES

- Increased Cost of Energy: The cost of energy in Western Australia is likely to increase due to increasing capital expenditure, rising fuel costs and the Federal Government's Emissions Trading Scheme.
- North West Interconnected System ('NWIS'): The proposal for a NWIS may offer the potential for capital productivity improvement and, depending on the fuel used, the potential to reduce Green House Gas (GHG) emissions. The value of this proposal to industry needs to be established.
- Renewable Energy: The timing of the implementation of the Emissions Trading Scheme and proposed State and Federal renewable energy targets ('RET') will influence the choice of technology that is adopted by the sector.
- Gas Supply: While the current data suggests that the supply/demand equation will be finely balanced for the period 2008-2010, there are several other factors that could influence the domestic gas market. These include: the price of gas which is likely to increasingly trend toward international energy prices; quality of gas from new fields; and the State Governments 15% reservation policy.
- South West Interconnected System Infrastructure ('SWIS'): Challenges may exist in the generation and transmission of increasing electricity requirements on ageing SWIS assets, some of which are approaching peak capacity.
- Green House Gas (GHG) Reduction: Reducing GHG emissions, while sustaining strong growth in the minerals and energy sector, is likely to require significant investment in the deployment of energy efficient technologies and renewable energy generation.
- Energy Policy: A long term energy policy for the State is needed in order to enhance future competitiveness and provide certainty for investment.
- Regulation of energy market: Government regulation of the future energy market has to ensure a diversification of energy sources, from a range of public and private sources.
- Increased Cost of Living: Increasing energy costs, driven by required capital expenditure, fuel costs and the Emissions Trading Scheme, will potentially increase the cost of living in both urban and regional areas.

"With demand for **water predicted to grow**, increased planning and collaboration will be required to optimise scarce resources."

WATER DEMAND

SCENARIO ONE

Original Survey Data (July 2008)

State-wide demand for water from the minerals and energy sector is projected to grow significantly for the period 2008-2014.

Anticipated State-wide water demand from the minerals and energy sector is projected to grow at a Compound Annual Growth Rate (CAGR) of 5.4% to 1,129 Gigalitre per annum (GL/a) by 2014.

Greatest growth is forecast in the Pilbara, Perth-Peel, Mid West and South West-Great Southern regions.

The minerals and energy sector will continue to rely heavily on groundwater resources, however, there will be significant growth in demand for scheme water in the South West-Great Southern and Pilbara regions.

The South West region has experienced a 10-20% downturn in rainfall since the 1970's and an increased reliance on groundwater.

SCENARIO TWO

Moderate Constrained Growth

Under the moderate constrained growth scenario, incremental State-wide sector demand for water is forecast to grow marginally for the period 2008-2010 followed by a sharp upturn in 2011. Total sector demand in 2010, under this scenario, is ~113 GL/a less then the surveyed demand.

SCENARIO THREE

Severe Constrained Growth

Under the severe constrained growth scenario, incremental State-wide sector demand for water is forecast to remain relatively static of decline marginally for the period 2008-2010 followed by a sharp upturn in 2011. Total sector demand in 2010, under this scenario, is ~173 GL/a less then the surveyed demand.

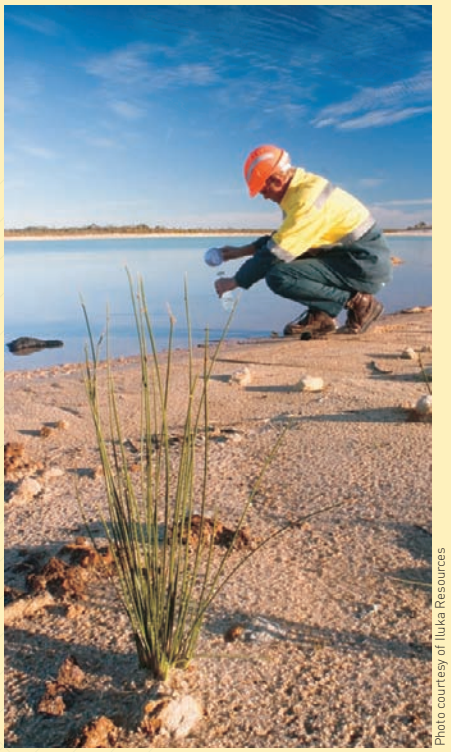


Photo courtesy of Iluka Resources

TOTAL MINERALS & ENERGY SECTOR WATER DEMAND - ORIGINAL SURVEY DATA AND SCENARIOS (GL/a, 2008-2020)

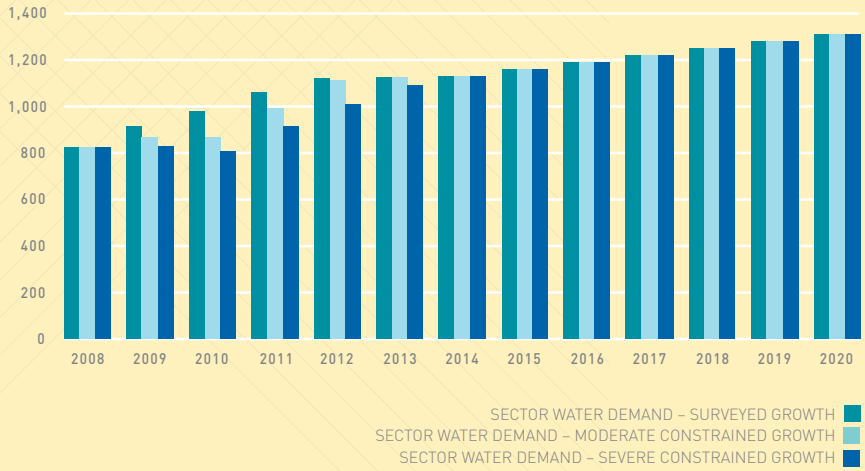
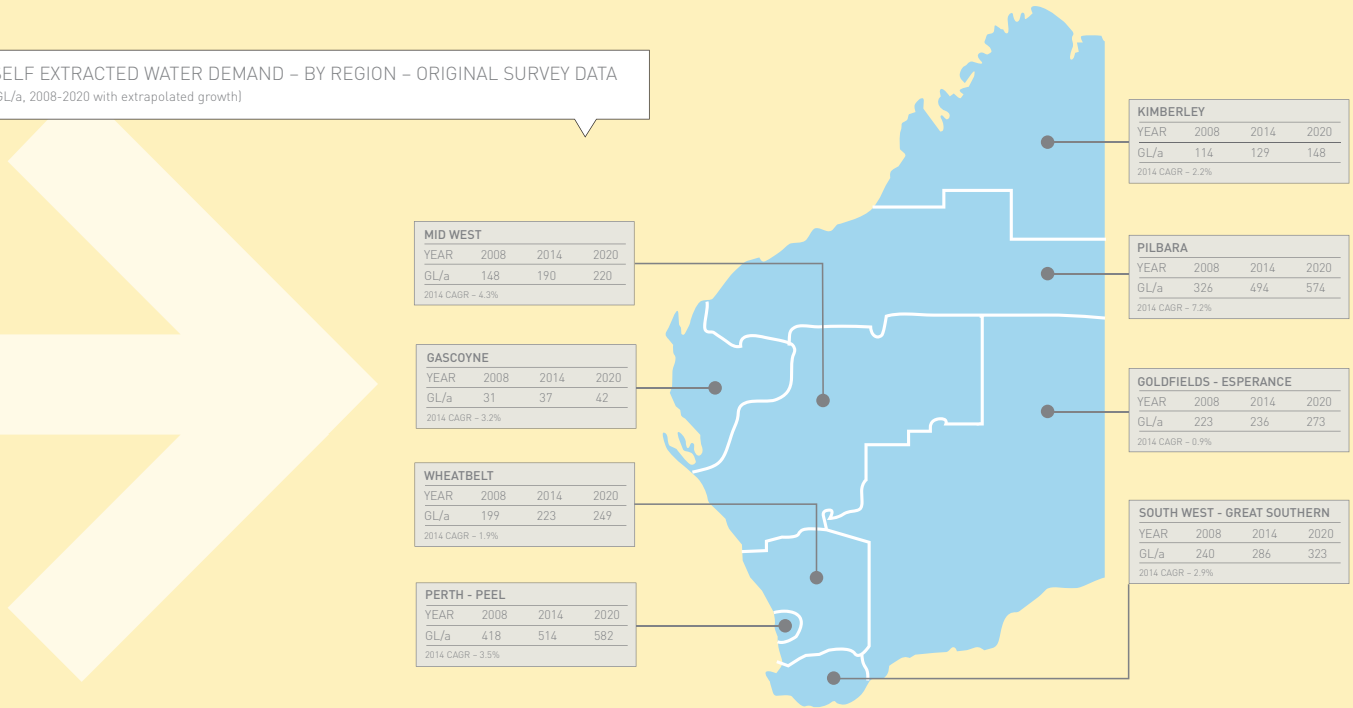


Photo courtesy of Barrick (Kanowna) Ltd

Photo courtesy of Argyle Diamonds

SELF EXTRACTED WATER DEMAND – BY REGION – ORIGINAL SURVEY DATA
(GL/a, 2008-2020 with extrapolated growth)



IMPLICATIONS AND OPPORTUNITIES

- Increasing Cost of Water: Cost of water is likely to rise as a result of increasing capital and operating expenditure.
- Increasing Competition for Water: With increasing demand, the competition for water is likely to increase, especially between the State's two largest user industries: mining and agriculture. In near urban areas, urban water uses will also compete strongly.
- Increasing Focus on Water Efficiency: With increasing costs and demand for water, the focus and value of water efficiency planning and technology is likely to increase.
- Value of Forward Planning and Collaboration: With demand for water predicted to grow, increased planning and collaboration between government and industry and across industry will be required to optimise scarce resources.
- Declining Rainfall in the South West: Management of the potential decrease in surface and groundwater availability in the South West, due to decreasing rainfall trends, will require vigilance and contingency planning.
- Water Access: On-going access to water is fundamental to industry growth. Industry requires a wide range of water quality and quantity.
- Water supply: Water supply for natural sources in the Pilbara and Mid-West present challenges for the future.
- Prioritisation of Water Usage: With forecast increasing demand for water from all industries, the prioritisation of water usage will become increasingly challenging, particularly if annual rainfalls in the south west of the state continue to decline. The NWI, State Water Plan and the anticipated regional water plans go to some length to address this challenge.
- Increased Cost of Living: The anticipated rising cost of water may contribute to the increasing cost of living in both regional and suburban areas of the state.
- Impact on Social Amenities: The increasing demand for water and potential of ongoing decline in rainfall in the south west may lead to restrictions on the allocation of water to non-essential uses.

Photo courtesy BHP Billiton Iron Ore

THE WAY FORWARD

Growth in Western Australia will return in the medium to long term. While this can deliver many positive outcomes, the implications are also clear.

The unprecedented growth experienced by Western Australia up until late 2008 resulted in increased pressure on many aspects of the State such as labour, water, energy, civil infrastructure and housing. In order to ensure that the challenges brought by future growth are addressed in a timely, efficient and coordinated manner some key elements need to be considered:

Need to focus on a vision for State and regional Western Australia

An integrated long term vision for the development of Western Australia and its regions is essential. This needs to be built with strong consensus among industry, Government and the community. Strong leadership throughout all levels of Government and industry is vital to coordinate its actions. Resourcing requirements should be based on agreed priorities.

Need for an infrastructure planning response from Government and Industry

The next 5 years are pivotal to address the existing land and infrastructure shortages and to plan for the State's future needs. It is fundamental that key land and infrastructure requirements are delivered through a timely and coordinated approach in order to address housing and accommodation issues facing Western Australia. A comprehensive program of land and infrastructure plans with a five year outlook needs to be developed and implemented.

Skilled labour demand remains a critical issue

The Minerals and Energy sector continues to have increased demand for highly qualified professionals and technical staff. An increased commitment to education training and development is crucial. Continued support for the skilled migration scheme provides industry with access to suitably qualified people, ensuring projects can progress on time and industry can move forward. The development of skilled workforces in the housing and construction sectors is also vital.

The current slowdown in the State's economy gives some breathing space for these strategic initiatives to be undertaken. The time needs to be used wisely and it is imperative these actions start now.

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