



ECONOMICS AND INDUSTRY STANDING COMMITTEE

INQUIRY INTO ENERGY EFFICIENCY AND RENEWABLE ENERGY IN WESTERN AUSTRALIA

ISSUES PAPER

21 December 2004

The Economics and Industry Standing Committee has released this paper to reflect progress in its *Inquiry into Energy Efficiency and Renewable Energy*. The Committee's workload has prevented the completion of this inquiry and the tabling of a Report in Parliament. Consequently, the Committee resolved to complete an Issues Paper for release in December 2004 to provide a summary of Committee activity and identify issues for further consideration.

Section 1 of the Paper highlights issues that may require further consideration, including the potential for energy efficiency measures and renewable energy in Western Australia. Section 2 summarises submissions received during the course of the inquiry and sections 3 and 4 provide a record of briefings undertaken by the Committee.

Background

On 7 April 2004, the Economics and Industry Standing Committee resolved to conduct an Inquiry into Energy Efficiency and Renewable Energy with the following terms of reference:

The Economics and Industry Standing Committee will review and make recommendations on measures available to Western Australia:

- (a) Which encourage efficiencies in electricity production and consumption;*
- (b) Which encourage use of renewable energy; and*
- (c) Any other relevant matters.*

The Committee invited submissions from the general public through an advertisement in *The West Australian* newspaper on 10 April 2004 and had received seventeen submissions at the time of writing. The Committee would like to thank the individuals and organisations that provided evidence and information as part of the inquiry.

The Economics and Industry Standing Committee is comprised of the following: Mr Tony McRae, MLA (Chair); Hon John Day, MLA (Deputy Chair); Mr John Bowler, MLA; Mr Bernie Masters, MLA; and Mr Mick Murray, MLA.

Further details about the Committee and this inquiry are available at the Parliament website (www.parliament.wa.gov.au). For further information please contact the Committee's Chair, Mr Tony McRae, MLA, (08 9457 1282) or the Committee Office (08 9222 7495 or 08 9222 7488).

1 ISSUES FOR FURTHER DISCUSSION

Western Australia covers the largest geographical area in the country and has an energy intensive economy, which includes export-oriented industries such as alumina production and silicon smelting. Its natural advantage lies in the competitive low cost of energy. Many of Western Australia's large energy intensive trade exposed industries have a respectable record in improving energy efficiency. However, the low cost of energy can dilute messages that encourage consumers to use energy efficiently and the Committee understands that significant gains are still available.

Energy use is the single largest contributor to Western Australia's greenhouse gas emissions, responsible for 69% of net emissions.¹ ABARE forecasts that Western Australia's energy related greenhouse gas emissions will exceed the estimated growth rate for the nation as a whole.² A number of submissions to the Committee noted that the environmental impact of energy was not incorporated into the cost of energy in Western Australia. Energy use can have negative outcomes, such as pollution and climate change, but these costs are not built into the price of energy.

It has been suggested that cuts in emissions of up to 50% by 2050 will be required to successfully manage climate change. Energy efficiency is a cost effective way to reduce energy related to greenhouse gas emissions and renewable energy also offers significant scope for reducing emissions while supporting security and quality of supply, especially in remote areas. These two areas are expected to be key components of any coordinated effort to meet future emissions targets.

Increasing Demand

ABARE predicts that electricity demand in Western Australia will increase by 2.8% per annum over the next 15 years, exceeding national growth estimates of 2.4%.³ Based on current assessments, an estimated 420MW of new capacity may be needed to meet peak load in this state in 2007-2008.⁴ In order to meet the increased demand, considerable resources will be needed to improve the capacity of networks and generation. The Electricity Supply Association of Australia (ESAA) estimates that national investment of \$12-15 billion will be required in the next five years to meet increased demand.⁵ Given Western Australia's strong growth in electricity demand, a significant component of this investment can be expected in this state.

In recent years, efforts have been made to improve capacity for the SWIS. The Committee has also been made aware of plans to address power needs for regions not covered by the SWIS, such as the state's Mid West and Kimberley regions.

¹ NGGI (2004), National Greenhouse Gas Inventory 2002

² ABARE, (2004), Australian Energy: National and State Projections to 2019-20

³ Akmal, M., et al, (2004) *Australian Energy: National and State Projections to 2019-2020*, ABARE

⁴ Office of Energy, *Energy Reform News*, Issue 08, December 2004, p2

⁵ ESAA (2003), *Electricity Australia 2003*, Melbourne

A number of reforms to the energy industry will soon commence, following the recent passage of legislation through Parliament.⁶ The reforms intend to provide new market arrangements for the electricity industry. A central aspect of the legislation is the establishment of the Independent Market Operator (IMO), which will remove Western Power's sole responsibility to provide capacity for the market. The IMO will be charged with undertaking long term generation planning for the entire system, identifying possible shortfalls in capacity and securing future capacity to meet peak demand.⁷

Electricity is an essential service that cannot be cost effectively stored on a large scale and, therefore, electricity supply and demand must be balanced simultaneously. Demand can fluctuate significantly across the course of a day and the generation, transmission and distribution components of the delivery system must be capable of accommodating those needs at any particular point in time. The costs of meeting these variations can be significant. Western Power estimates that the generation required to supply the final 10% (approximately 260 MW) of demand on the South West Interconnected System (SWIS), operates for less than 24 hours a year. Western Power reported that maximum demand during summer has increased by around 5% per annum since 1999, due largely to consumer demand for air conditioners.⁸

A number of submissions to the Committee noted that energy efficiency and renewable energy could reduce electricity demand during peak periods and consequently defer the need for further investment to expand capacity of generation and network infrastructure. It is therefore important to maximise the potential of energy efficiency and avoid unnecessary energy consumption associated with buildings and equipment that are poorly designed and operated.

Demand Management

Information for consumers is a key factor in modifying approaches to energy use by households and business. Electricity demand can fluctuate greatly during any given day, including peaks that require considerable resources to be managed. In many national and international jurisdictions, demand management is increasingly accepted as an effective tool in changing the way in which energy is used. The Committee is particularly encouraged by the goal of reducing the total load in Western Australia by improving the efficiency of energy use.

A number of issues raised in this Paper and in submissions to the Committee are likely to contribute to more efficient use of energy. The Committee notes the Energy Smart program that aims to decrease energy use in the public sector by 12% over the next five years. Overall Government energy consumption in Western Australia was reduced by 3.3% in 2002-2003.

Generation and infrastructure

With Western Australia's electricity demand continuing to grow, renewable energy offers an opportunity to ensure that part of the growth is serviced without corresponding increases in greenhouse gas emissions. The state has excellent renewable energy resources, with good

⁶ *Electricity Industry Act 2004*

⁷ Office of Energy, *Energy Reform News*, Issue 08, December 2004

⁸ Western Power, (2004) Generation Status Review

wind regimes, high solar radiation levels and abundant sources of biomass in the form of wood and landfill gas. Despite these advantages, renewable energy currently provides around 3% of Western Australia's final energy requirements.

Replacing fossil fuels with renewable energy is an effective way of reducing greenhouse gas emissions and renewable energy technologies are now well established. Although capital costs have reduced significantly over the last decade, they are still generally high, making it difficult for renewable energy to compete with fossil fuels.

Although the majority of the state's population lives in the relatively mild climate of the state's South West, many others live in regions of extreme climate. Large parts of these isolated areas of the state are also outside the interconnected electricity grids, with the cost of supplying electricity significantly higher than for these interconnected systems.

Transmission and distribution systems have a finite capacity and constraints can significantly impact on the quality of supply. Where local electricity demand exceeds the capacity of transmission and distribution systems, system reliability can be compromised. Areas where the networks are operating at capacity may find that new loads can not be supplied with existing infrastructure, potentially impacting on economic development in network constrained areas.

Renewable energy technologies can create particular issues for transmission and distribution networks, particularly for systems the size of those in Western Australia. The SWIS is a loosely meshed network and may be limited in its capacity to connect some forms of renewable energy generators. Western Power has indicated that there may be an upper limit of wind energy (around 150MW) that can be supported by the existing network.

A Potential for Energy Efficiency Improvement

Buildings

Buildings are long term investments and many submissions to the Committee supported increasing the energy efficiency requirements for housing.

Temperature control (space heating and cooling), water heating and refrigeration dominate energy consumption in the home. Notwithstanding personal preferences, temperature control requirements are largely determined by the thermal efficiency of the building envelope. Currently there are energy efficiency requirements for some new homes, whereby the house design must satisfy prescriptive design requirements or achieve a minimum of 4 stars using an approved house energy rating. However, there is evidence that the expected impact of these prescriptive mechanisms may not be eventuating. Other states have stricter energy efficiency requirements for residential buildings and are experimenting with requirements for installing major appliances, such as water heating.

A common theme from the submissions was the potential for design features incorporated into the building shell to improve the comfort levels within the building, reducing the need for mechanical heating or cooling. Some submissions noted the potential for insulation to improve the efficiency of homes and reduce heating and cooling costs, but raised concern that the first choice of many homeowners was to install airconditioning.

Other jurisdictions have undertaken cost and benefit assessments on raising minimum standards and concluded that energy cost savings over the medium term exceeded the higher financing costs. Significantly, the research also found that more stringent standards are unlikely to impact on housing affordability or demand.

Appliances

While efficient building design is fundamental to improving the energy performance of buildings, it was noted in many submissions that improving the efficiency of appliances, as well as influencing the way in which appliances are used, offers significant scope for reducing energy consumption.

Addressing the behaviour of energy users can have a considerable impact on energy efficiency. Measures that improve utilisation of existing equipment include raising awareness, reviewing operating schedules and improving maintenance. These measures cost little to implement but can have a significant impact on energy consumption. SEDO informed the Committee that research conducted for the National Framework for Energy Efficiency (NFEE) showed that improving maintenance of existing plant and equipment could reduce energy consumption in the commercial sector by 11%.

The ABS recently conducted a survey on environmental views that considered household appliances. The survey reported that the usage of air conditioners in Western Australia had reached 59%, compared to 35% in 1994.⁹

The Committee is most concerned about the installation of airconditioners in houses without insulation. Insulation increases the thermal efficiency of a building and a question arises as to whether insulation should be required before domestic airconditioning can be installed.

Water heating is a significant user of energy in the residential sector. Comparative estimates provided by SEDO show solar water heating has significantly lower operational costs and greenhouse gas emissions than electric and gas water heaters. The ABS reported that solar hot water heaters comprised 20% of the market in 1994, which fell to 16% in 2002 - largely due to gas water heating.¹⁰ Recent reports suggest a reversal of this trend, possibly through the availability of state and federal rebates. It is worth noting that new manufacturers have appeared on the market in Western Australia and that the majority of Australian solar water heater manufacturers are based in Western Australia.

A view was also presented that the support for solar water heaters combined with the growth in the installation of reverse cycle airconditioning could threaten the viability of reticulated natural gas in new developments.

When compared to incandescent light bulbs, compact fluorescent lamps (CFL's) last approximately eight times longer, use approximately one fifth of the energy and are effective in reducing household greenhouse gas emissions. CFL's have reduced in cost and are still more expensive than incandescent lamps. However, the penetration of high efficiency lighting systems is still very low in Western Australia with nearly three quarters of households having no CFL's and only 16% of houses with two or more rooms illuminated with CFL's.

⁹ ABS, *Environmental Issues: People, Views and Practices*, Report 4602.0, Canberra, March 2002.

¹⁰ ABS, *Environmental Issues: People, Views and Practices*, Report 4602.0, Canberra, March 2002.

B Potential for Renewable Energy

Western Australia has considerable renewable energy resources including wind, solar and biomass. The state has a small, but established renewable energy industry, with strengths in particular niche areas, such as remote area power supply (RAPS) systems. It is also a world leader in the manufacture of solar hot water systems.

Bioenergy projects can provide economic and environmental benefits in regional areas and assist in the development of the local renewable energy industry.

The Mandatory Renewable Energy Target (MRET) has been a significant driver for the renewable energy industry in Western Australia and has provided a considerable boost to the wind and solar water heater industries. Programs such as the Renewable Remote Power Generation Program (RRPGP) and the Solar Water Heating Subsidy have also positively impacted on industry development.

In areas where the network may be operating at, or near, capacity, local (embedded) generation can improve the quality of supply and network stability. The output of solar photovoltaic (PV) broadly correlates to summer peak electricity demand. Using embedded solar PV to supply peak demand may be cost competitive with network expansion in areas of network constraint.

Barriers and Impediments

A number of submissions made reference to barriers that impact on the uptake of energy efficiency and renewable energy solutions.

Information

Consumers generally act in accordance with the quality and quantity of information available to inform their decision-making processes. In short, if information related to energy efficiency is inadequate, the issue will rank lower than other priorities. Individuals and organisations that fail to recognise the need, or understand the potential, to improve energy efficiency will not seek information or incorporate energy efficiency into their consumption habits or purchasing decisions.

Research conducted in other jurisdictions on the issue of greenhouse labelling of electricity bills shows that there are a number of misconceptions in the general community about the source of electricity and the environmental impacts of its use.¹¹ These misconceptions revolve around the belief that electricity is a “clean” source of energy and a general lack of understanding regarding the fuel sources used to generate electricity.

Individuals or organisations that are aware of the potential to improve energy efficiency often need to seek outside expertise. Without a basic level of understanding of energy efficiency however, those seeking advice may have difficulty in assessing the quality of advice received.

¹¹ SEDA, (1999), *Electricity Labelling: Enhancing Competition and Consumer Choice Through Information Disclosure*, A SEDA Discussion Paper, SEDA

Purchasing Decisions

In the residential sector, operating costs may not be a principal consideration when choosing an appliance. Other factors are likely to take precedence such as cost, capacity (or fitness for the purpose) and aesthetic considerations. Additionally, the “need” or desire for an appliance may be affected by other factors such as consumer lifestyle expectations. All things being equal, however, people will tend to choose the more energy efficient appliance when they have access to the appropriate information. Minimum standards remove poor performing models from the market.

In order to raise the profile of energy efficiency, some submissions called for disclosure of housing energy performance to be mandatory at the point of sale or lease. Improving information on the operating costs will allow consumers to compare the expected costs of purchasing decisions and provide an incentive to improve building performance. This is also related to the provision of information, mentioned above.

Split Incentives

In many cases, the incentive to invest in energy efficiency is weakened because the investor is unable to capture all the benefits. An example of split incentives that reduce the benefits for the investor is installing insulation in a rental property. The owner of the building does not enjoy the benefit of reduced heating or cooling costs. Conversely, if the tenant invests in energy efficiency, they will gain some benefit in terms of reduced energy costs. However, the tenant’s capacity to recoup costs from the investment will be limited by the duration and terms of the lease.

Similarly, property developers and builders do not gain the benefits of designs that improve the energy utilisation of the building. Some parts of the building industry also often object to stricter standards citing adverse impacts on housing affordability. There is a perception that new houses with energy efficiency incorporated into the design can be significantly more expensive and existing housing stock will be more attractive.

Renewable Energy Barriers and Constraints

Many submissions raised as a barrier the weaknesses of both the physical capacity of the network to accept renewable energy generators and the process associated with gaining access to the Western Power owned asset. The role of government as a purchaser of renewable energy was also mentioned.

For renewable energy to compete effectively with traditional sources of power, fair and open access to the electricity network is essential. Some market participants felt that more could be done to support renewable energy by requiring Western Power to source it at the level stated in the Commonwealth’s Mandatory Renewable Energy Target (MRET). There was also concern regarding Western Power’s commercial directive and the need to improve access to the network.

Forthcoming changes to the electricity industry aim to improve opportunities for the private sector to invest in generation capacity, following the establishment of the Electricity Networks Access Code in December 2004. The Code is intended to address to reduce

Western Power's "monopoly dominance" in the market and promote a level of competition.¹² Initially, the Code will cover only the SWIS, but other networks may follow. The Code will work alongside newly created "Market Rules", which will gradually be implemented to oversee the wholesale electricity market.¹³

Upfront capital costs and the higher energy cost are also frequently cited as barriers to increased use of renewable energy. Many submissions called for incentives to encourage the use of renewable energy. Further investigation may be required to address these barriers.

Environmental Costs of Energy

Non-Transparent Pricing

The cost to generate electricity is determined by the type of generating unit providing electricity at a particular time – peak generators have higher costs than base load generators. Flat tariff pricing, such as that billed to the majority of residential consumers in Western Australia, may moderate signals to effectively manage energy consumption, especially during periods of peak demand.

Time of use metering offers the potential to provide customers with useful information on the actual cost of their energy consumption patterns and therefore with an incentive to manage their consumption more carefully. However, the Committee has been informed that the cost of metering is largely prohibitive at this time.

¹² Office of Energy, *Energy Reform News*, Issue 08, December 2004, p3

¹³ Office of Energy, *Energy Reform News*, Issue 08, December 2004, p3

2 SUBMISSION SUMMARY

The Committee wishes to draw attention to concerns and ideas that were expressed in submissions to the Inquiry. The following is a summary only and not necessarily representative of the entire content of submissions, nor has the Committee completed detailed analysis of submissions.

Submission 1: Mr P. Smith

- Enhanced access for smaller energy producers to supply the grid.
- Ensuring adequate grants to encourage renewable energy usage.
- Usefulness of establishing an energy efficient demonstration house in Western Australia.

Submission 2: Solar Engineering Services

- Western Power's objectives and integral position in the energy sector can stifle development of renewable energy.
- Energy efficient houses achieved through insulation, shading, building design and orientation.
- Renewable energy should be linked to a premium price due to its environmental benefits.
- Anaerobic digestion of wastes to biogas and fertiliser is superior on an energy basis and can be shown to be economically viable.

Submission 3: Hon Robin Chapple, MLC

- Government focus is largely on supply side strategies, such as making generation more efficient and building new power stations. Demand side management has been neglected.
- Western Power's profit motive appears fundamentally at odds with the development of renewable energy and energy efficiency.
- Market price for energy should include environmental and health costs of fossil fuels.
- Private renewable energy companies require fair access to Western Power's network.
- Submission provided numerous recommendations, including:
 - Any future desalination plant should utilise power from renewable energy.
 - Government should purchase all its power from renewable sources by 2006.

Submission 4: Royal Australian Institute of Architects (WA Chapter)

- Strongly supports measures to improve housing design with respect to energy efficiency.
- Supports mandatory energy ratings to be included in advertisements for new houses.
- Energy rating scale used for houses is inadequate and does not promote best practice - five star ratings should be used, rather than the four stars used currently.
- Occupant behaviour is an important factor in energy efficiency.
- Government should provide incentives for energy efficient measures in homes.

Submission 5: Mr W. Barry

- Energy for street lighting comprises a significant portion of total greenhouse emissions in the corporate sector.
- Renewable energy should be utilised for street lighting.
- Councils should lobby Western Power for optimised efficiency of street lighting.
- Street lighting should be reduced, when appropriate.

Submission 6: Midwest Renewables

- Midwest Renewables operates a renewable energy windfarm and has faced difficulties in accessing to the South West Interconnected System.
- Small, independent energy operators confront many obstacles, including unnecessary complications, high cost of entry to the market and high ongoing bureaucratic costs.

Submission 7: Alinta Network Services Pty Ltd

- Highlights the risk of implementing change without considering the possible impact on existing infrastructure for energy.
- Gas is an efficient source of energy in the current market, providing value for money, reliability and choice.
- Energy efficiency measures should encourage natural gas usage and not just work to reduce electricity consumption.
- Expansion of the gas reticulation network might be inhibited by the combination of measures to encourage the use of solar hot water systems and the effect of increased use of reverse cycle air conditioners.

Submission 8: RJ Fahl & Associates Refrigeration Engineering & Project

- Focuses on efficiencies of energy consumption by users of refrigeration, particularly in the supermarket industry.
- Majority of commercial refrigeration uses electrical energy very poorly. There is potential for significant savings and reduction in energy use by supermarkets through properly commissioned refrigeration systems.
- Government should provide incentives to reduce energy consumption by the Supermarket Industry and other commercial refrigeration users.

Submission 9: Mr P.R. Kennedy

- Supports reduction of carbon emissions.
- Supports energy efficiency and sustainable measures in the iron and steel industries.

Submission 10: Western Australian Sustainable Energy Association Inc.

- Introducing measures to improve energy efficiency and demand management could defer the need for capacity expansion.
- Supports expansion of the State's Solar Water Heater subsidy program and a requirement for installation of solar hot water heaters on all new government houses and buildings.
- Retail licence conditions should be used to promote energy efficiency and renewable energy generation.
- A comprehensive communication strategy must be developed to educate and inform consumers of the benefits of adopting sustainable energy practices.
- Western Australia's power procurement process should meet Federal and State Government targets for renewable energy generation and ensure renewable energy's integration into the grid.
- The electricity market should accommodate the small scale and variable nature of renewable energy generation.

Submission 11: Sustainable Energy Development Office

The Sustainable Energy Development Office provided details of its various programs for community, business and Government.

- Improve the energy efficiency of houses in WA through appropriate design.
- Promote the benefits of purchasing high star-rating appliances for the home.
- Provide the community with access to information on energy efficiency.
- Increase the energy efficiency of commercial buildings through utilising accredited assessors and a rating tool.

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- Provide businesses with access to information on energy efficiency.
 - Emphasise energy management as an ongoing part of agency operations to ensure agencies provide an example of good energy practices to the broader community.
 - Promoting uptake of renewable energy and development of the sustainable energy industry through:
 - Rebates for residential solar hot water systems that meet certain criteria
 - Grants for research, demonstration and education projects that increase the uptake and understanding of renewable energy and energy efficiency
 - Understanding of renewable energy and energy efficiency
 - Rebates for solar power systems on homes and community buildings

Submission 12: Conservation Council of WA

The Conservation Council made a range of recommendations, including the following:

- Broader diversity of grant schemes operated by SEDO.
- Change SEDO to a Statutory Authority.
- Government should commit to purchase all its electricity from renewable sources by the beginning of the 2006-7 financial year.
- Government should encourage all Local Government Authorities to subscribe to Western Power's Natural power, or similar schemes, for all their electricity needs.
- Implement a Sustainable Building Code that mandates:
 - A nationally consistent energy efficient rating for all new buildings
 - Greenhouse-efficient hot water systems for all new buildings
 - Disclosure of Energy Ratings at point of sale of all buildings
- Strategies for redistributing energy demand to reduce peak loads, as well as reducing overall energy consumption.

Submission 13: Mr L. Reid

- Introduce subsidies to connect distributed generation such as micro turbines in cogeneration applications, wind turbines and solar arrays.
- Discounts for domestic customers who have 'energy-efficient' insulation installed or a requirement that air conditioners only be installed in homes that are effectively insulated.
- Introduce subsidies for time-of-use electricity meters allowing domestic customers to better manage demand and save with off-peak power.
- Changes to the building code to enforce the application of energy efficient measures.

Submission 14: Western Power Corporation

Western Power Corporation has a legislated obligation to act in accordance with prudent commercial principals and to endeavour to make a profit while maximising the long-term value of the business. The overall commercial obligations create incentives to maximise the efficiency of electricity supply and to develop efficiency arrangements. The following table outlines Western Power's business-specific requirements and their implications.

	Energy Efficiency	Renewable Energy
Generation	<p>Ongoing commercial incentive to maximise efficiency of all generating plant</p> <p>Legislated requirement to minimise total cost of supply in procuring new generation in the SWIS (subject to reliability and safety requirements)</p> <p>Signatory to national Generator Efficiency Standards</p>	<p>Potential competitiveness of renewable generation, particularly in non-interconnected systems</p> <p>Longer term commercial incentives to research and develop renewable energy technologies</p>
Networks	<p>Responsible for efficient scheduling of all generation in SWIS</p> <p>Commercial incentive to minimise line losses and maximise system load factor</p>	<p>Facilitates connection of renewable generators to networks</p> <p>Schedules renewable generation and provides ancillary services to maintain overall system integrity</p> <p>Operates electricity market mechanisms to cater for renewable and thermal generators</p>
Retail	<p>Scope to optimise peak requirements through demand management and distributed generation</p> <p>Customer demand for energy management and advisory services</p>	<p>Requirement to acquire Renewable Energy Certificates (RECS) under MRET scheme</p> <p>Customer demand for renewable-based products</p>

Potential conflicts can arise through funding constraints where capital works need to be prioritised. The commercial obligations require that the highest priority in this regard be given to projects that have the greatest commercial benefit, potentially limiting the scope to develop discretionary renewable initiatives. This is typically the case in the interconnected systems where large-scale thermal generation generally has a lower cost structure than renewable generation.

Submission 15: Chamber of Minerals and Energy of Western Australia

- Extraction and processing of commodities is energy intensive. Access to a secure, reliable and competitively priced energy supply is crucial for the minerals and energy sector to continue maximising its worth.
- Issues of energy efficiency are fundamentally a fusion of economic and environmental outcomes. Energy efficiency and renewable energy strategies must be consistent with principals of sustainable development and lead to an effective environmental outcome, while avoiding a distortion of economic growth and development opportunities.
- The triple bottom line approach is fundamental, ensuring that economic outcomes of sustainable development are recognised equally with social and environmental outcomes.
- An open and competitive electricity market is vital for renewable energy to enter the market on an equitable basis.

Submission 16: Dr E. Karol

- Current building regulations do not adequately encourage energy efficiency and are based on the premise that the dwelling will require mechanical heating or cooling. Regulations require further adaptation to efficiently utilise that mechanical intervention.
- Steps to lessen the need for such mechanical intervention include houses designed with appropriate orientation, glazing, thermal mass, and insulation.
- The project home industry should be required to publish plans showing to show a north point to allow prospective purchasers to identify any shortcomings with glazing.

Submission No 17: Mr K. Bartle

- “Passive design” refers to house design that enables the house to achieve comfortable inside temperatures from the environment in which it is built.
- Passive design shifts thermal comfort issues from the post-building period to the pre-building period.
- Passive design building can be incorporated into the project home market.

3 BRIEFINGS

Local briefings held during the course of this Inquiry are detailed in the following table.

Date	Name	Position	Organisation
31/03/2004	Shelley Liddelow	A/Executive Director	Sustainable Energy Development Office
	Evan Grey	Senior Program Officer	Sustainable Energy Development Office
	Brett Sadler	Principal Project Officer, Electricity Reform Implementation Unit	Sustainable Energy Development Office
	Paul Ebert	Renewable Energy Project Director	Western Power Corporation
	Tony Perrin	Manager Energy Trading	Western Power Corporation
24/05/2004	Antony Piccinini	Project Manager	Diesel and Wind Systems
	Bruce Manning	Chief Executive Officer	Great Southern Development Commission
	Duane Schouten	Senior Development Office	Great Southern Development Commission
02/06/2004	Cindy Siano		Subiaco Sustainable Development House
	Griff Morris		Subiaco Sustainable Development House
	Elizabeth Karol		Subiaco Sustainable Development House
10/06/2004	Tony Robertson	Principal Advisor, Corporate Communications	Alinta
	Paul Gower	Principal Engineer, Power Generation	Alinta
10/06/2004	Phil Campbell	Refinery Manager	Alcoa World Alumina Australia
	Melinda Bott	Communications Team Leader	Alcoa World Alumina Australia
10/06/2004	Jim White	Operations Manager	Iluka Resources - Capel
	Brian Nichols	Maintenance & Engineering Manager	Iluka Resources - Capel
16/06/2004	Ken Brown	Manager System Operations	Western Power Corporation
	Peter Rowe	Manager Corporate Affairs	Western Power Corporation
30/06/2004	Shelley Liddelow	Executive Director	Sustainable Energy Development Office
	Tony Stewart	A/Senior Manager	Sustainable Energy Development Office
18/08/2004	Ken Brown	Manager System Operations	Western Power Corporation

4 INTERSTATE BRIEFINGS

In July 2004, the Committee travelled to Victoria, the Australian Capital Territory, New South Wales and Queensland. The following table shows briefings held during this trip.

Date	Name	Position	Organisation	Location
15.07.2004	Alan Pears	Director	Sustainable Solutions	Melbourne
	Julia Birch	Research & Policy Analyst	Australian Business Council for Sustainable Energy	Melbourne
	Tony Arnel	Building Commissioner	Building Commission (Victoria)	Melbourne
	Robert Enker	Manager, Policy Services	Building Commission	Melbourne
	Jeff Norton	Director, Policy Services	Building Commission	Melbourne
	Mick Pearce	Principal Design Architect	City of Melbourne	Melbourne
	Matt Plumbridge	Superintendent's Representative CH2 Project	City of Melbourne	Melbourne
	Robert Adams	Director City Projects, Arts & Culture	City of Melbourne	Melbourne
	Peter Cocks	Manager Corporate Affairs	Victoria State Emergency Services	Canberra
16.07.2004	Gene McGlynn	Branch Head, Energy Efficiency and Community Branch	Australian Greenhouse Office	Canberra
	John Jende	Manager, Renewable Energy Policy Team	Australian Greenhouse Office	Canberra
	Denis Smedley	Manager, Renewable Energy Technologies Team	Australian Greenhouse Office	Canberra
	Claude Morson	Manager, Generator Efficiency Standards Program	Australian Greenhouse Office	Canberra
	Emma McKibben	Policy Officer, Energy Policy Team	Australian Greenhouse Office	Canberra
	Hugh Saddler	Managing Director	Energy Strategies	Canberra
19.07.2004	David Eckstein	Local Government & Industry Liaison Officer, BASIX Program	NSW Department of Infrastructure, Planning and Natural Resources	Sydney
	Alison McCabe	Director, Environmental and Community Management	Leichhardt Council	Sydney
	Bridget Dwyer	Senior Environment Officer	Leichhardt Council	Sydney
	Mark Diesendorf	Director	Sustainability Centre Pty Ltd	Sydney
	Melanie Hutton	Climate Change Officer	WWF Australia	Sydney