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ELECTRICITY SUPPLY IN NSW: ALTERNATIVES TO PRIVATISATION

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ELECTRICITY SUPPLY IN NSW

Alternatives to Privatisation

Research Report

For Public Interest Advocacy Centre

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Institute for Sustainable Futures

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Executive Summary

Background

In its 2006 Statement of Opportunities, NEMMCO projected that NSW would require 327MW of additional electricity generating capacity to reliably meet projected demand by 2010/11 (NEMMCO 2006). On 9 May 2007, as part of its response to this forecast deficit in future electricity generating capacity, the NSW Government invited Professor Anthony Owen to undertake an *Inquiry into Electricity Supply in NSW*. The NSW Government provided the Owen Inquiry with the following terms of reference:

1. Review the need and timing for new baseload generation that maintains both security of supply and competitively priced electricity.
2. Examine the baseload options available to efficiently meet any emerging generation needs.
3. Review the timing and feasibility of technologies and/or measures available both nationally and internationally that reduce greenhouse gas emissions.
4. Determine the conditions needed to ensure investment in any emerging generation, consistent with maintaining the NSW AAA Credit Rating.

Professor Owen delivered his report on 11 September 2007 (Owen 2007) and the NSW Government is expected to announce its response soon. In brief, the report identifies a need for additional investment in baseload generation by 2013-14 and recommends privatisation of state-owned generation and retail businesses.

The Public Interest Advocacy Centre (PIAC) commissioned the Institute for Sustainable Futures (ISF) at the University of Technology, Sydney (UTS) to consider the economic case for and against privatisation of electricity assets in NSW. This report reviews Australian and international experiences with electricity privatisation, critically examines the case for privatisation made by the Owen Report and proposes alternatives that have the potential to deliver a more sustainable future for the NSW electricity industry.

Experiences of electricity industry privatisation

While the circumstances of each privatisation project are unique, lessons can be learnt from privatisation experiences elsewhere. Victoria, South Australia and the United Kingdom have completely privatised their electricity industries. Evidence from these jurisdictions on the costs and benefits of privatisation is mixed and contested. While some claim that experiences of privatisation have been primarily positive and have delivered a great economic boost, others claim they have been disastrous for consumers, leading to price rises and reductions in reliability. Table ES1 summarises the claimed benefits and claimed costs or risks of electricity industry privatisation. Many of these claims are contradictory. The reality may lie somewhere between these two extremes.

The privatisation of the Victorian electricity industry is widely regarded as one of the most successful privatisations because of the high price obtained for the assets. However, Quiggin (2002) demonstrates that the fiscal impact of the privatisation was neutral. That is, despite the high sale price, there was no net benefit to the public sector.

It is fair to say that Australian and international experiences of electricity industry privatisation have not been universally positive. In fact, there is credible evidence for net negative impacts on the economy and on consumers. Given these previous experiences, there is no basis for simply assuming that privatisation will deliver economic benefits. Instead, it falls on the Owen Report (and subsequently the NSW Government) to build a credible, evidence-based case for why privatisation will deliver benefits in NSW.

<i>Claimed Benefits</i>	<i>Claimed Costs/Risks</i>
<ul style="list-style-type: none"> • Improvement to public finances • Transfer of commercial risk to private sector • Reduction in electricity prices • Labour productivity increases • Improvement in generator availability • Reduced number of disconnections • Refurbishment of old plant • Investment in more efficient power stations • Greater choice for consumers 	<ul style="list-style-type: none"> • Loss of revenue-generating assets • No improvement to public finances • Increase in electricity prices • Job losses and increased use of external contractors • Negative environmental outcome due to refurbishment of old polluting plant • Negative environmental outcome as no incentive to reduce consumption • High level of corporate debt and increased risk of company collapses and government bail outs • Negative impacts on vulnerable consumers • Greater potential for coercion of customers to switch retailers

Table ES1: Claimed benefits and costs/risks of electricity industry privatisation from literature review.

A critical review of the Owen Report

The case for privatisation of the electricity generation and retail assets owned by the NSW Government is seriously overstated in the Owen Report. The key problems with the case presented in the Owen Report are as follows:

- The electricity demand projections used by the Inquiry fail to adequately account for the impact of existing energy efficiency measures, particularly the measures introduced in recent years. Further, there is no consideration of the potential impact of stronger energy efficiency measures as an alternative to new baseload.
- The electricity supply projections have already been overtaken by events with the announcement of the proposed Silverton Wind Farm and the new Federal Labor Government's promise to increase the Mandatory Renewable Energy Target to 20% by 2020
- As a result, it is very unlikely that new baseload power will be required as early as 2013-14.
- The Owen Report fails to give due consideration to the urgency of climate change response in its consideration of options for ensuring future energy security
- The scale of investment required if the NSW Government retains its existing electricity assets is greatly overstated
- The positive impact of privatisation on State finances is much less than is claimed and there appear to be inherent economic benefits associated with State ownership. Even the unlikely worst-case scenario of a downgrading of the State's credit rating would have minimal economic impact.

- Privatisation is not necessary to encourage private sector investment in the electricity sector. Alternative options are available in which the State retains some or all of its existing electricity assets.
- Many of the issues raised above are either ignored by the Owen Report or given inadequate attention.

Alternative scenarios

Decision-making processes like the Owen Inquiry need to be supported by high-quality independent analysis that deals appropriately with uncertainty. In the Owen Report, the choice of assumptions used to deal with uncertainty almost invariably strengthened the case for privatisation. It is hard to avoid the conclusion that the desired outcome of the Inquiry had been determined in advance and the analysis was shaped to fit that outcome.

A more appropriate way to deal with future uncertainty is to establish multiple scenarios that map out a plausible future territory and to examine differing assumptions that flow from these scenarios. In the case of the Owen Inquiry, this might have prompted a more adequate consideration of the impact of existing energy efficiency measures and possible future measures. It might also have drawn attention to the urgent need for climate change response.

A detailed scenario-based approach would need more resources than were available for this research report. However, we have undertaken a basic scenario analysis to demonstrate the kind of results that emerge. We developed the following four alternative scenarios for the future of the NSW electricity industry:

- Owen Inquiry Proposal: A scenario based directly on the analysis and recommendations of the Owen Inquiry.
- Revised Owen: A scenario in which several of the key assumptions of the Owen Inquiry are revised based on the findings of the critical review in Section 3. We believe this scenario is much more plausible than the Owen Inquiry scenario. However, it does not go far enough to respond to climate change.
- Strong Climate Change Response (private): A scenario in which there is a strong government and business response to climate change, with the private sector taking the lead after privatisation of electricity assets. This scenario achieves a reduction in greenhouse gas emissions but is likely to have negative impacts on consumers and on the State's finances.
- Strong Climate Change Response (public): A scenario in which there is a strong government and business response to climate change, with the NSW Government taking the lead after retaining electricity assets. This scenario achieves a reduction in greenhouse gas emissions and is likely to have a positive impact on consumers.

The four scenarios are summarised in Table ES2.

	<i>Scenario</i>			
	<i>Owen Inquiry Proposal</i>	<i>Revised Owen</i>	<i>Strong Climate Change Response (private)</i>	<i>Strong Climate Change Response (public)</i>
<i>Growth in energy demand by 2016-17</i>	12,720 GWh (16% increase)	10,720 GWh (13% increase)	5,830 GWh (7% increase)	5,830 GWh (7% increase)
<i>Timing of new baseload</i>	2013-14	2013-14	2016-17	2016-17
<i>Likely fuel source to meet demand growth</i>	Coal for baseload; gas for intermediate and peaking load	Existing energy efficiency measures, new natural gas CCGT and new renewable energy generation	New energy efficiency measures and new renewable energy generation	New energy efficiency measures and new renewable energy generation
<i>Cost to State of continued public ownership¹</i>	\$12-15 billion (NPV = \$6.2 billion)	\$6-8 billion (NPV = \$3.4 billion)	\$6.4-8.4 billion (NPV = \$3.4 billion)	\$6.4-8.4 billion (NPV = \$3.4 billion)
<i>Impact of privatisation on State finances</i>	Net benefit of \$77 million per year	Net loss of \$295 million per year to net benefit of \$387 million per year	Net loss of \$295 million per year to net benefit of \$387 million per year	Net loss of \$295 million per year to net benefit of \$387 million per year
<i>Fate of assets</i>	Privatised	Depends on sale price	Privatised	Public retention
<i>2016-17 GHG emissions (relative to 2007-08)</i>	14% increase	8% increase	3% reduction	3% reduction

Table ES2: Summary of scenarios.

¹ NPV = net present value. This is the discounted present value of future cash flows used to compare the commercial merit of alternative scenarios. In this case, we have used a discount rate of 12%, which is typical for investment decisions.

Conclusion: A sustainability assessment

Climate change response

Perhaps the most serious criticism of the Owen Report is that it asks the wrong questions. In a time when urgent action is needed to avoid dangerous climate change, the Owen Report takes future electricity demand as given and asks how we can best continue to build fossil fuel power stations to supply that demand. This is old thinking, particularly now that Australia has committed to ratify the Kyoto Protocol. The right questions for the NSW Government to ask about the NSW electricity industry are:

- What level of greenhouse gas reduction is required in the NSW electricity industry to contribute to avoiding dangerous climate change?
- What are the most cost-effective technological and institutional measures for achieving this target in the NSW electricity industry, while maintaining a reliable supply?
- How can these measures be rapidly deployed to achieve the target?

The cost of climate change will dwarf any of the costs considered in the Owen Report and it is on this much bigger issue that the NSW Government should be focusing its attention.

On the key question of climate change response, it is clear that the Owen Inquiry scenario and the Revised Owen scenario fail to deliver what is needed. Both would deliver substantial increases in emissions over the next ten years, at a time when we need to stabilise and reduce emissions. The two Strong Climate Change Response scenarios deliver a 3% reduction in emissions over the next ten years, which is consistent with the NSW Government's target of stabilising greenhouse gas emissions at 2000 levels by 2025.

The Strong Climate Change Response scenarios demonstrate that future demand can be met through a combination of new energy efficiency measures and new renewable energy, consistent with the requirements of an expanded MRET of 20% by 2020. This raises the prospect that NSW could leap to low-emission baseload power to meet future needs without building any additional high-emission power stations. A combination of renewable energy sources that are currently viable, particularly wind power and biomass, could provide a viable substitute for baseload now.

In the longer term, technologies that could become viable over the coming years include geothermal hot rocks, large scale solar thermal power and carbon capture and storage. The existence of these prospective low-emission technologies provides a strong incentive to pursue additional energy efficiency measures to allow time for these technologies to become available. In addition, the NSW Government should provide specific support for each of these technologies to assist them to become available in time to meet any future baseload shortfall. If NSW is to meet its target of reducing greenhouse gas emissions by 60% by 2050, it needs to be developing and supporting low-emission baseload technologies now.

Ownership and investment strategy

Strong climate change response is possible under either public or private sector ownership but would have different characteristics. A recommended approach is as follows.

The NSW Government should retain the State-owned generation and retail assets and invest as necessary to maintain the viability of these assets and reduce their environmental impact. This will definitely require some investment in the retail businesses to transform their business models, preferably to transform them into energy service companies focused on delivery of energy services with the lowest economic and environmental impact. The NSW Government should also invest strongly in energy efficiency and low-emission baseload technologies, and may also need to invest in carbon-reduction technologies at existing coal-fired power stations in the future.

We do not accept the Owen Report's assertion that this approach would lead to the public sector funding all future investment in the NSW electricity industry. The private sector has already shown its willingness to invest in the NSW electricity industry under the current arrangements, through the Tallawarra and Uranquinty gas-fired power stations and the proposed Silverton Wind Farm. Additional private sector certainty should be provided through a clear policy statement from the NSW Government on the conditions that would cause it to intervene to ensure supply security. The NSW Government could also choose to offer suitable sites for sale to interests that wish to develop low-emission baseload power, while retaining existing generation assets.

The impact of this strategy on State finances would be far less serious than indicated by the Owen Report. Even with strong investment in energy efficiency and low-emission technologies, the scale of investment will be much less than the \$12 to \$15 billion indicated by the Owen Report. An investment in the order of \$6-8 billion is more likely. Further, this investment will earn a rate of return, delivered through ongoing dividends to the NSW Government and profit accrued by the State-owned businesses. This revenue could, and should, be used to invest in the transformation to a low-carbon electricity sector.

Ultimately, electricity consumers will fund any investment in the NSW electricity industry, whether public or private, through their electricity bills. Public retention of existing assets and strong investment in energy efficiency offers the strongest potential to keep electricity bills down.

Consumer impact

The four scenarios presented above have quite different impacts on consumers. The cost of energy service provision is higher under private ownership due to the higher cost of capital investment. This additional cost will inevitably be passed on to consumers.

In addition to these short-term consumer impacts, there will be long-term consumer impacts under any scenario that does not respond urgently to climate change. These impacts are of two kinds. First, there are the negative impacts of climate change on the NSW economy. Second, as demonstrated by Stern (2006), the cost of responding to climate change increases over time. Delayed response is more costly than responding now. The Owen Inquiry and Revised Owen scenarios delay serious climate change response and therefore incur greater eventual costs to consumers.

The only scenario that avoids the higher cost of private ownership and the higher cost of delayed climate change response is the Strong Climate Change Response (public) scenario. This scenario has clear benefits for consumers.

Concluding remarks

The scenario that strikes the best balance between environmental protection, economic well-being and consumer impacts is the Strong Climate Change Response (public) scenario. This scenario demonstrates that it is possible to achieve a reduction in greenhouse gas emissions over the next 10 years without the need for privatisation and without putting supply reliability at risk. The NSW Government should put its efforts into realising this scenario, rather than investing time and resources in an unnecessary and potentially counterproductive push for privatisation.

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Abbreviations

AER	Australian Energy Regulator
BASIX	Building Sustainability Index
CCGT	Combined cycle gas turbine
CCS	Carbon capture and storage
CO ₂	Carbon dioxide
DNSP	Distribution network service provider
DTEI	Department for Transport, Energy and Infrastructure
ECNSW	Electricity Commission of New South Wales
ESAA	Energy Supply Association of Australia
ESCO	Energy Service Company
ETSA	Electricity Trust of South Australia
FRC	Full retail contestability OR Full retail competition
GGAS	Greenhouse Gas Reduction Scheme
IMF	International Monetary Fund
IPART	Independent Pricing and Regulatory Tribunal of NSW
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal rate of return
ISF	Institute for Sustainable Futures
NCP	National Competition Policy
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NFEE	National Framework for Energy Efficiency
NPV	Net present value
NSW	New South Wales
PIAC	Public Interest Advocacy Centre
ROLR	Retailer of Last Resort
SECV	State Electricity Commission of Victoria
TEC	Total Environment Centre
UK	United Kingdom
USA	United States of America
UTS	University of Technology, Sydney

1 Introduction

1.1 Background

In April 1995, all Australian governments reached agreement on a National Competition Policy (NCP) for Australia. The objectives of the NCP included restructuring of public sector monopoly businesses and application of competitive neutrality principles to government businesses.

The electricity industry was a key target for restructuring and reform. At the time, statutory authorities in each State were responsible for electricity supply. These authorities were widely perceived as inefficient and overstuffed, with poor labour productivity. Further, many of the State authorities had significant excess generating capacity as a result of overly optimistic electricity demand forecasts (Evans 2004). Improvements had been made; public sector reforms during the 1980s and early 1990s had resulted in a 'more streamlined and commercially oriented' electricity industry (Evans 2004, p.20) with improved productivity (McDonnell 2004). The introduction of competitive energy markets was expected to deliver further productivity gains (Commonwealth of Australia 1993).

The principles established under the NCP for electricity reform sought 'separation of transmission, distribution, supply and generation, and creation of a distribution and supply industry capable of providing effective bidders to generators in a competitive national market' (McDonnell 2004, p.81). A key element of the reforms was the establishment by the State Governments of the National Electricity Market (NEM), a physical wholesale spot market for electricity. The NEM delivers electricity to large users and electricity retailers, which in turn supply almost 90% of the Australian population, covering Queensland, NSW, ACT, Victoria, South Australia and Tasmania (MacGill, Outhred & Nolles 2006). In the NEM, generators bid every five minutes to supply the market with a specified amount of electricity at a specified price. The National Electricity Market Management Company (NEMMCO) determines which bids to accept to meet prevailing demand at the lowest cost.

The other major element of electricity industry reform was the disaggregation and corporatisation or privatisation of state electricity authorities. In NSW, the Electricity Commission of NSW (ECNSW) was responsible for electricity generation and transmission; distribution and retail were the responsibility of 25 separate businesses. After a process of restructuring, corporatisation and mergers, the following government-owned corporations emerged:

- Macquarie Generation, owner of the coal-fired Bayswater and Liddell Power Stations
- Delta Electricity, owner of the coal-fired Mt Piper, Wallerawang, Vales Point and Munmorah Power Stations
- Eraring Energy, owner of the coal-fired Eraring Power Station
- TransGrid, owner of the high voltage electricity transmission network in NSW
- Three combined distribution and retail businesses – EnergyAustralia, Integral Energy and Country Energy.

Electricity assets in NSW and Tasmania remain in public ownership. In contrast, the electricity industry in Victoria and South Australia was completely privatised. In Queensland, the Gladstone Power Station was privatised in 1994 and the retail operations of the State-owned energy businesses were sold in 2007; the other electricity generation, transmission and distribution businesses remain in public ownership. In the ACT, there is a joint venture between the privately-owned AGL and government-owned ACTEW Corporation.

In 1997, the first Carr Government in NSW also sought to privatise the electricity industry but this policy was fiercely opposed by trade unions (McDonnell 2004). The unions and their allies succeeded in rejecting the proposal at the 1997 Labor Party State conference. Subsequently, the defeat of the Liberal-National Coalition in the 1999 NSW election has been attributed to its support for privatisation (McDonnell 2004). At the time, privatisation was criticised on economic, social and environmental grounds (Public Sector Research Centre 1997). The issue of privatisation subsequently faded from political debate and the electricity industry in NSW remained in public ownership.

Privatisation of the electricity industry returned to the agenda in NSW in 2006, when the NSW Government, Victorian Government and Australian Government proposed to privatise Snowy Hydro. The privatisation plans came to nothing, after the Australian Government withdrew from the proposed sale in the face of strong public opposition. However, a new recommendation for privatisation of electricity assets in NSW has emerged from the recent Owen Inquiry into Electricity Supply in NSW.

The Public Interest Advocacy Centre (PIAC) commissioned the Institute for Sustainable Futures (ISF) at the University of Technology, Sydney (UTS) to consider the economic case for and against privatisation of electricity assets in NSW. This report reviews Australian and international experiences with electricity privatisation, critically examines the case for privatisation made by the Owen Report and proposes alternatives that have the potential to deliver a more sustainable future for the NSW electricity industry.

1.2 The Owen Inquiry into Electricity Supply in NSW

In its 2006 Statement of Opportunities, NEMMCO projected that NSW would require 327MW of additional electricity generating capacity to reliably meet projected demand by 2010/11 (NEMMCO 2006). On 9 May 2007, as part of its response to this forecast deficit in future electricity generating capacity, the NSW Government invited Professor Anthony Owen to undertake an *Inquiry into Electricity Supply in NSW*. Professor Owen is Professor of Energy Economics in the School of Economics and Finance at Curtin University of Technology in Western Australia. He was previously a Director of the Centre for Energy and Environmental Markets at the University of NSW.

The NSW Government provided the Owen Inquiry with the following terms of reference:

1. Review the need and timing for new baseload generation that maintains both security of supply and competitively priced electricity.
2. Examine the baseload options available to efficiently meet any emerging generation needs.
3. Review the timing and feasibility of technologies and/or measures available both nationally and internationally that reduce greenhouse gas emissions.
4. Determine the conditions needed to ensure investment in any emerging generation, consistent with maintaining the NSW AAA Credit Rating.

The Owen Inquiry sought submissions from interested individuals, organisations and peak groups with an interest in the future of electricity supply in NSW. It received 72 submissions. Professor Owen also met with a range of stakeholder groups, including market and regulatory bodies, peak industry bodies, individual market participants, environmental groups and groups representing small and large energy consumers.

In addition, the Owen Inquiry commissioned three expert reports to provide more detailed information:

- A report by Connell Wagner (2007) on NSW power generation and CO₂ emissions reduction technology options
- A report by Wood Mackenzie (2007) on availability and cost of gas for NSW baseload generation
- A report by Morgan Stanley (2007) on securing private investment in new generation in NSW.

After considering all of this information, Professor Owen delivered his report on 11 September 2007 (Owen 2007) and the NSW Government is expected to announce its response soon. In brief, the report identifies a need for additional investment in baseload generation by 2013-14 and recommends privatisation of state-owned generation and retail businesses. Section 3.1 provides additional detail on the findings of the Owen Inquiry.

1.3 Alternative perspectives

The release of the Owen Report prompted mixed reactions. Energy industry associations (e.g. ESAA 2007) and private sector participants in the energy industry (e.g. Origin Energy 2007) welcomed the recommendations. In contrast, environmental groups and unions rejected the recommendations, citing concerns about the impacts on greenhouse gas emissions, workers and consumers (ABC 2007).

The Total Environment Centre (TEC) released an environmental scorecard on the Owen Report, giving it a rating of 14 out of 60 (TEC 2007). The major criticism was as follows:

The Owen Report makes the basic mistake of failing to properly evaluate the contribution that can be made by energy efficiency. As a result it is only half a report and wrongly recommends a new baseload power station on a premature timeframe (TEC 2007, p.1).

From a social perspective, Unions NSW raised concerns about job losses and higher prices flowing from privatisation (ABC 2007). The Public Interest Advocacy Centre (2007a) echoed these concerns:

Privatisation often leads to cost-cutting and job losses, as companies try to maximise their returns to shareholders. This also leads to pressure for greater deregulation. Interstate and overseas experience shows that this usually results in residential consumers being charged higher prices.

It is clear, therefore, that the prospect of electricity industry privatisation in NSW draws out conflicting opinions. This report considers the case for and against privatisation from the perspective of long-term sustainability. Sustainability is commonly recognised as having three interrelated dimensions: economic well-being, environmental protection and restoration, and social justice. Therefore, this report examines the economic, environmental and social case for and against privatisation. The focus is particularly on the economic case, as the arguments for privatisation in the Owen Report are primarily framed in economic terms.

1.4 Research questions

Consistent with the above, this report particularly addresses the following questions:

- What do previous experiences with electricity industry privatisation tell us about the likely experience in NSW?
- Is a baseload power station really needed to ensure security of supply in NSW?
- Whether or not a baseload power station is needed, is privatisation in the long-term economic interest of electricity consumers (and taxpayers)?
- Are there alternatives to the approach recommended in the Owen Report that would deliver more sustainable outcomes?
- If the NSW Government decides to privatise, what environmental and consumer protection measures are required to deliver a sustainable outcome?

1.5 Report structure

The report is structured as follows:

- Section 2 reviews Australian and international experiences with electricity industry privatisation to provide a foundation for understanding the likely impact of privatisation in NSW
- Section 3 provides a detailed critical review of the case for privatisation outlined in the Owen Report
- Section 4 presents three alternatives to the Owen Report recommendations
- Section 5 concludes with a sustainability assessment of these alternatives.

2 Experiences of electricity industry privatisation

This section reviews positive and negative experiences of electricity industry privatisation outside NSW. While the NSW context is unique, the general experiences of privatisation elsewhere are likely to be indicative of experiences in NSW. Table 1, at the end of this section, summarises the benefits, costs and risks of privatisation based on experiences elsewhere.

In considering previous experiences with electricity industry privatisation, it is important to distinguish between the impacts of privatisation and the impacts of the market reforms that preceded or followed privatisation. Privatisation is only one step in a longer process that usually includes disaggregation of State-owned entities, may include corporatisation and often includes deregulation or re-regulation. These other steps may also have positive or negative impacts on the economy, environment or consumers. While it is difficult to tease out the specific impacts of privatisation, we have tried to focus in this section on impacts resulting from privatisation rather than associated reforms.

Section 2.1 focuses on privatisation of electricity assets in Victoria and South Australia. Section 2.2 provides a short overview of international experiences and then focuses on the United Kingdom (UK).

2.1 Australian experiences

One of the many reforms that have taken place within the Australian electricity industry has been the privatisation of state electricity industries in both Victoria and South Australia. The privatisations in South Australia and Victoria have followed disaggregation and corporatisation of government owned electricity service providers as well as competition reforms as detailed in Section 1.1.

The privatisations have been both highly praised and highly criticised. For example, Moran considers the corporatisation and competition reforms followed by privatisation to have 'formed one of the cornerstones of the remarkable productivity surge from which Australia benefited in the 1990s' (Moran 2004, p.139-140). Conversely, Beder has slammed the privatisations saying that 'the benefits that were supposed to follow from reduced government budget deficits as the result of selling electricity systems have turned out to be a mirage in most cases' (Beder 2006, p. 61). It is interesting to note that the State Governments responsible for these privatisations were each defeated at subsequent elections.

2.1.1 Victoria

The Victorian electricity industry experienced many changes after a decision in 1994 by the Kennett government to disaggregate and privatise the State Electricity Commission of Victoria (SECV). During the period 1995-96, the state's five distribution businesses and single generation company were sold to private investors. The stated objectives of the sell off were: to realise efficiency gains and therefore price reductions; to transfer commercial risk to the private sector and away from taxpayers and customers; to promote contestability in the supply of services; and, to reduce public debt (Victorian Auditor-General's Office 1996).

Following the privatisation, prices in the contestable markets dropped to a level lower than many had expected and the sale appeared to have been a success with many of the expected benefits apparently realised (Quiggin 2002). Quiggin explains that the drop in prices was a reflection of oversupply and 'the willingness of market participants to use the cash flow from vesting contracts to subsidise unprofitable or marginally profitable contracts in contestable markets' (Quiggin 2002, p.9). As a result 'retail prices of electricity in Victoria generally improved compared to price levels prior to privatisation, both for contestable and non-contestable customers' (Ward & Hodge 2001, p.49).

Many saw the sale as successfully enabling the government to wipe clear the State's debt after the sale achieved higher than expected asset sale prices (Moran 2004). Moran considers the Victorian project to have resulted in 'a classic win-win outcome' for the state (Moran 2004, p.139). However Quiggin's analysis of the fiscal impacts of the privatisation shows otherwise. Quiggin concedes that in comparison to other privatisation projects in Australia, the sale of the Victorian electricity industry might be considered a success, but stresses that 'if a successful sale barely yields a break-even outcome, the viability of privatisation as a method of improving public finances must be regarded as doubtful' (Quiggin 2002, p.13). He argues that the fiscal impact of the privatisation on the public sector was more or less neutral as 'the interest savings realised by selling the assets were about equal to the earnings those assets would have generated under continued public ownership' (Quiggin 2002, p.12).

It has also been claimed that the privatisation led to technical efficiency and labour productivity benefits. For example, Ward and Hodge argue that:

The time availability of generators to produce power increased from around 80 per cent in the four years leading up to 1992-93, to around 90 per cent in the two years following privatisation. Labour productivity in terms of electricity generated per employee tripled as well, though these figures are difficult to interpret since following privatisation, external contractors carried out a much greater proportion of the work (Ward & Hodge 2004, p.48, citing ESAA 1995; 1997; 1999; 2000).

On the other hand, it could be argued that this improvement of availability would have happened regardless of privatisation. With the institution of the NEM, the Victorian brown coal generators had greater scope to sell their relatively cheap power and more incentive to operate for longer periods.

The refurbishment of the Hazelwood power station is also used to support the claim that privatisation had brought about technical efficiency improvements, as it had previously been scheduled for closure after a record of very low availability factors (Quiggin 2002, Ward & Hodge 2004). Some thought this a symbol of the success of the privatisation project and demonstration of a technical efficiency benefit being delivered by the private sector. On the other hand, extending the life of this old power station complete with 1950s technology is cause for concern for many because of its status as Australia's most greenhouse polluting power station (Environment Victoria 2003). Clearly, there are environmental factors which were overlooked in the process of privatisation.

Beder's view of the privatisation was less positive. In short she considers the privatisation to have failed to deliver the promised benefits of efficiency, lower prices and better service for electricity consumers (Beder 2003). Beder (2003) claims that any efficiency gains that could have been achieved by slashing the workforce occurred in the lead up to the privatisation, and under government ownership these benefits could have been passed through to consumers in the order of a 30 per cent price reduction.

Beder (2003) also discusses how the high asset prices were of concern due to the large amount of corporate debt required to fund these prices. As the debt came at a higher price than government debt, 'analysts claimed that the cost savings available to the private sector would not be enough for them to make a profit and service the debt, and therefore they would inevitably have to increase electricity prices or go out of business' (Beder 2003, p.236).

In terms of the impact on service quality for consumers, Ward and Hodge (2004) discuss how following privatisation the average length of time customers spent "off supply" declined and the number of customers disconnected for non-payment fell by around two-thirds for residential customers since 1995 and halved for business customers. However, Quiggin (2002) sees the privatisation and regulatory change to have impacted on consumers in differing ways depending on their desirability to retailers. He discusses how the more attractive consumers such as business and high income households have benefited the most through greater choice and, in many cases, lower average prices, whilst 'by contrast,

suppliers have sought to dump less desirable customers or to force them into residualist arrangements designed to minimise the costs of serving them' (Quiggin 2002, p.12).

Further, Sharam (2004) believes that 'the reform of the electricity industry in Victoria has directly influenced a growth in demand for electricity that will require very substantial levels of new investment in generation and network services, resulting in price increases for customers' (Sharam 2004, p.151). Sharam argues that incentives for consumption were implicit in the regulatory approach and led to 'retailers such as AGL offering domestic customers no-deposit, 12-month interest free loans for the purchase of refrigerative air conditioning' (Sharam 2004, p.147).

Thomas (2004) agrees that with a field of competing retailers companies will make more money the more power they sell whereas under government control, 'generators can be instructed as to what technologies to deploy and measures can be taken to ensure that the profits of retailers are not dependent on how much power they sell' (Thomas 2006, p.13). Privatisation may make it more difficult to ensure that environmental concerns are appropriately addressed; regulatory changes become more difficult after privatisation because private owners are much more likely to resist government policy changes that they perceive to impact on their commercial interests.

The response to the privatisation project in Victoria has been mixed. While some believe it to have been a success in delivering reduced budget debt and increasing technical and labour efficiency, others claim that the fiscal impact was neutral, consumer benefits were not as promised and the outcome was environmentally unfavourable.

2.1.2 South Australia

The South Australian Government gave a similar rationale to the Victorian privatisation when it chose to privatise the Electricity Trust of South Australia (ETSA). It was thought that South Australia's entry into the NEM would carry a range of risks to taxpayers, which the government hoped to eliminate through privatisation (Spoehr 2004). The retirement of state government debt was another motivation even though ETSA had contributed strongly to state revenue over the decade before. The retail component of ETSA was sold and the generation, transmission and distribution components were divested through long-term leases.

Despite widespread community opposition, the government proceeded with the privatisation in 1999. Following the introduction of Full Retail Contestability (FRC), the hostility towards privatisation deepened as 'both business and household consumers faced price hikes of around 30 per cent, exposing many in the community to great financial hardship' (Spoehr 2004, p 74). There were reports of low-income families, in the effort to avoid disconnection or late payment fees, having to forgo essential items such as food and medication (Adelaide University 2004). The Government of South Australia's Strategic Infrastructure Plan concludes that 'the privatisation of South Australia's electricity system has resulted in increased prices charged to business and household consumers' (DTEI 2007, p. 125).

Analysis undertaken by Spoehr and Quiggin 'indicates that the privatisation of ETSA has not only fuelled spiralling prices, but denied the State Budget the substantial dividends that would have flowed from ETSA to help fund education, health and other services' (Adelaide University 2004).

According to Quiggin (2001) the privatisation resulted in a reduction in public sector net worth. Quiggin (2001) argues that this is consistent with most Australian experiences of privatisation, explaining that:

South Australia is an electricity importer, so the bulk of the sale price (more than \$4 billion out of a total of \$5 billion) was realised through the sale of transmission and distribution assets. In the final year of ownership, earning before interest and tax were \$368 million, of which the

distribution and transmission assets contributed \$300 million. In the absence of regulatory decisions that reduce the nominal return to these assets, the interest savings on the sale price will fall consistently short of the earnings foregone through privatisation (Quiggin 2001, p. 28).

Furthermore, the South Australian Department for Transport, Energy and Infrastructure (DTEI) (2007) note that 'augmentation of the system to meet increased demand has been made more difficult by privatisation' (DTEI 2007, p. 125). According to the Government, under public ownership 'augmentation of the system proceeded somewhat in advance of demand and associated costs were amortised over a long period of time' (DTEI 2007, p. 125).

The South Australian electricity privatisation project has largely resulted in negative impacts for consumers and although the government did achieve an improvement in the state's credit rating, some argue that it resulted in a reduction in public sector net worth (e.g. Quiggin 2001). The South Australian case does not instil confidence that privatisation can deliver its purported benefits in every case.

2.2 International experiences

Changes in the way electricity industries are organised, including privatisations, have occurred around the world over the past decade. In some cases countries have sought to copy reforms undertaken by countries such as the UK. In other cases, and particularly in the case of developing countries, re-organisations or privatisations have occurred in response to pressure from donor agencies such as the World Bank and the International Monetary Fund (IMF), whose loans for example, are frequently conditional on such actions (Parker 2004, Thomas 2006). Thomas provides an example of IMF and World Bank influence in Cameroon, where such 'conditions imposed a privatisation which resulted in the creation of a private, poorly regulated, vertically integrated monopoly' (Pineau 2002 in Thomas 2004, p. 2).

In addition to these influences, countries have been attracted to the touted benefits of privatisation such as improved efficiency and the prospect of attractive revenue receipts. Other drivers of change include the general perception of state-run enterprises being technically inefficient and overstuffed, and the 'need for more electricity capacity which the state is deemed to be unable to fund' (Parker 2004, p. 216).

However, in spite of these pressures, in a number of developing countries, plans for privatisations or re-organisations have been dropped after governments have reviewed experiences in other countries or in response to strong public opposition (Thomas 2006). For example, in 2004 the Korean Government made the decision to halt its electricity reform program, which had aimed to introduce market competition and privatisation to the industry (Lee & Ahn 2004). A joint study team was tasked with reviewing the validity of the government's plan; they reported that 'the alleged benefits of reform are theoretical and uncertain, while the real costs and risks are substantial' (Lee & Ahn 2004, p. 1115).

Also, in the United States, many of the states which deregulated their electricity industries back in the 1990s in order to induce competition have begun 'rolling back their initiatives or returning money to individuals and businesses' (Johnston 2007, p.1). For example, 'the Illinois legislature last month approved a \$1 billion rate-relief package' (Davidson 2007, p.1). This has been in response to findings showing that energy costs have risen faster in the deregulated states (Johnston 2007, p.1).

According to Beder, around the world, 'the privatisation of electricity is not something that citizens have demanded or wanted' and in general the level of public consultation on such reforms has been limited; the issue has sparked many angry protests (Beder 2006, p. 57). Beder provides examples of such protests; in the Dominican Republic 'several people were killed during protests against blackouts imposed by privatised companies' and in Papua New Guinea 'students were killed when thousands rallied against the planned privatisation of government services including Elcom, the electricity authority' (Beder 2006, p. 57).

2.2.1 United Kingdom

The UK's electricity industry was its biggest privatisation. In 1987, with little forewarning, the Thatcher government announced it would privatise the industry. The privatisation was largely complete by 1991 (Beder 2003). The overall outcome of the privatisation has been a matter of controversy (Stubbs & Macatangay 2002).

According to Parker (2004), the privatisation 'led to a significant rise in economic efficiency in the industry'. For example, there was a dramatic increase in the amount of electricity provided by new cost efficient combined cycle gas turbine (CCGT) plant (Parker 2004). Labour efficiencies were also realised, as demonstrated by a fall in the number of employees in the sector in the order of 50,000 (Parker 2004). At the same time the amount of electricity supplied increased (Parker 2004).

Electricity bills reduced in real terms by around 2.5 per cent following privatisation, however the decline was probably due more to lower fuel costs during the 1990s than as a result of privatisation (Beder 2003, Parker 2004). Beder (2003) believes that prices would have fallen if the industry had remained under public ownership, but 'in the new world of private electricity the greatest gain from those fuel cost reductions went to shareholders rather than consumers' (Beder 2003, p. 205). Branston's price analysis of British electricity privatisation concludes that 'observed prices are indeed significantly higher than they would have been had privatisation not occurred' (Branston 2000, p.31).

Stubbs and Macatangay (2002) argue that 'the fall in costs was not matched by a similar fall in prices, as corporate profits grew in the mid-1990s and shareholders made substantial capital gains' (Stubbs & Macatangay 2002, p. 123). Beder (2003) also contends that:

Although British prices for electricity have fallen since privatisation, the decrease has been a fraction of the real reduction in costs involved in producing and supplying electricity. Retail prices for small households still remain high by European and US standards, and many countries that have not liberalised their electricity markets continue to offer cheaper electricity (Beder 2003, p. 219).

The UK experience also demonstrated that, even with a privatised industry, the responsibility for ensuring access to an essential service always falls back on the government and therefore taxpayers. For example, in 2002, almost all of the independent generators collapsed after the wholesale electricity price dropped and 'at one point, about 40 per cent of the [sic] Britain's generating capacity was owned by collapsed companies' (Thomas 2006, p. 6). At a huge cost to UK taxpayers, the government had to rescue the privatised nuclear company British Energy after its collapse (Thomas 2006). This experience reveals an unresolved tension associated with the competitive supply of electricity; in a truly competitive market, there must always be a risk of an electricity supplier going out of business, whereas political realities mean that the supply of electricity cannot be allowed to fail.

Privatisation in the UK appears to have deterred investment in conservation and energy efficiency as Beder explains that 'the original privatisation legislation provided no incentives to electricity suppliers to conserve energy or encourage efficiency. In their absence, the suppliers' only incentive was to sell as much electricity as possible' (Beder 2003, p. 217). Beder (2003) believes that 'the success of the British electricity privatisation experiment was greatly exaggerated by proponents who sought to spread the gospel elsewhere' and that in the initial years 'the biggest beneficiaries were the private companies themselves, reaping huge profits and paying out large dividends and executive salaries' (Beder 2003, p.221).

More recent developments in the UK electricity industry have seen the retail market become highly concentrated by the so called 'Big Six' energy suppliers; British Gas, EDF Energy, Npower, Powergen, Scottish and Southern Energy and Scottish Power. Last year saw the 'Big Six' levy 14 major price rises between them (Energywatch 2007b). As a result of this market concentration, 'the advantages liberalisation has brought to UK household

consumers have been eroded over the last two years' (Energywatch 2007b, p. 4). Between 2004 and 2006, residential electricity prices increased by 16% in real terms in the UK compared to 8% in six peer EU nations (Belgium, Germany, Spain, France, Ireland and Italy) over an equivalent period (Energywatch 2007b).

The UK experience demonstrates the need to consider the number of competing energy businesses that may result after implementing reforms such as privatisation. There is a risk that concentration in the market could reach unacceptable levels, stifling effective competition and leading to poor outcomes for household consumers (PIAC 2007b, p. 5).

2.3 Discussion

Whilst Victoria, South Australia and the United Kingdom have completely privatised their electricity industries, in many other countries, reform programs have stopped short of full privatisation. Where the private sector has entered an industry, governments have 'tended to retain a strategic shareholding, mindful of the economic and social importance of reliable electricity supplies' (Parker 2004, p. 226).

Evidence from overseas and interstate suggests that privatisation has the potential to result in diminished levels of service delivery and negative impacts on electricity consumers; while on the other hand, there has been evidence of improved efficiency and productivity gains for the industry. Furthermore, whether the sale of electricity industry assets can improve a state's budgetary position is questionable. As Beder explains, 'governments do not gain in the long-term if the savings in interest repayments, together with the tax payments from the new private companies, are less than the combination of lost dividends and additional costs resulting from privatisation' (Beder 2007, p.8).

It would appear that privatisation brings a mixture of positive and negative outcomes. For example, Quiggin (2002) notes that 'whereas the spare capacity maintained by public infrastructure enterprises may have been excessive, private enterprises tend to maintain too little capacity, reflecting the fact that most of the costs of systems failure are borne by the community as a whole' (Quiggin 2002, p. 10). Also, while privatisation projects have apparently improved economic efficiency they have also resulted in reductions in employment and loss of job security for employees. Beder notes also that:

Private companies, freed from social obligations, are able to undertake profitable activities whilst the government continues to pay for unprofitable aspects of electricity supply like environmental protection and equitable access. Previously governments were able to subsidise the unprofitable activities with the profitable ones. The inability to spread costs across a whole service means more expense to taxpayers and savings to industry (Beder 2006, p.61)

Meggison and Netter (2001) in their survey of empirical studies of privatisation, conclude that strong evidence exists to show that privatisation improves operating performance, but caution that the expected benefits of privatisation may be undermined by poor regulation. Meggison and Netter (2001) recommend that further investigation is required to 'examine the sequencing and staging of privatisation' and whether 'reforms other than government divestiture can effectively serve as a substitute for privatisation' (Meggison & Netter 2001, p. 49). They add that until these aspects are addressed, 'large-scale privatisation programs will remain a leap of faith' (Meggison & Netter 2001, p. 49).

Further, Hattori and Tsutsui (2004) in their analysis of the economic impact of regulatory reforms in the electricity supply industry find that they 'cannot draw a strong conclusion as to the effect of private ownership' (Hattori & Tsutsui 2004, p. 830). Hodge (2004) has also commented on the lack of independent analysis and academic evaluation saying that 'several years after these privatisations and restructuring activities, so little has been formally researched and so few policy assessments have been completed'.

The circumstances of each privatisation project have been unique and experiences of electricity privatisation generally appear to be mixed. While the NSW context is likewise unique, lessons can be learnt from privatisation experiences elsewhere. For example, if NSW were to achieve as positive an outcome as did Victoria in terms of asset prices, there would remain a risk that the outcome may be only fiscally neutral at best. Table 1 below summarises the claimed benefits and claimed costs or risks of electricity industry privatisation as identified in the literature. Many of these claims are contradictory, and the reality may lie somewhere between these two extremes. Nevertheless, these claims need to be kept in mind for the review of the specific case for privatisation in NSW that follows in Section 3.

<i>Claimed Benefits</i>	<i>Claimed Costs/Risks</i>
<ul style="list-style-type: none"> • Improvement to public finances • Transfer of commercial risk to private sector • Reduction in electricity prices • Labour productivity increases • Improvement in generator availability • Reduced number of disconnections • Refurbishment of old plant • Investment in more efficient power stations • Greater choice for consumers 	<ul style="list-style-type: none"> • Loss of revenue-generating assets • No improvement to public finances • Increase in electricity prices • Job losses and increased use of external contractors • Negative environmental outcome due to refurbishment of old polluting plant • Negative environmental outcome as no incentive to reduce consumption • High level of corporate debt and increased risk of company collapses and government bail outs • Negative impacts on vulnerable consumers • Greater potential for coercion of customers to switch retailers

Table 1: Claimed benefits and costs/risks of electricity industry privatisation from literature review.

3 A critical review of the case for privatisation in NSW

Section 2 demonstrated that Australian and international experiences of electricity industry privatisation have not been universally positive. In fact, there is credible evidence for net negative impacts on the economy and on consumers. Given these previous experiences, there is no basis for simply assuming that privatisation will deliver economic benefits. Instead, it falls on the Owen Report (and subsequently the NSW Government) to build a credible, evidence-based case for why privatisation will deliver benefits in NSW. This section critically reviews the case for privatisation put forward in the Owen Report. It examines the evidence for and against key elements of the case for privatisation.

Section 3.1 begins with a brief summary of the findings of the Owen Report. Subsequent sections review each of the main elements of the argument for privatisation in more detail.

3.1 Summary of findings

The key recommendation of the Owen Report is as follows:

On the basis of submissions made to the Inquiry, together with expert consultant reports, I have determined that there is a need to be prepared for additional investment in baseload from 2013-14. Further, the most efficient means of providing for baseload is to improve the commercial and policy signals used by the private sector when investing in generation capacity in New South Wales. My key recommendation, therefore, is that the Government of New South Wales divests itself of all State ownership in both retail and generation (Owen 2007, p.i).

This recommendation emerges from a series of arguments and assumptions that can be summarised as follows:

1. Growth in electricity demand will average 1.8 per cent per annum over the next decade (Owen 2007, p.iii). As a result 'New South Wales needs to prepare for baseload supply by 2013-14' (Owen 2007, p.1-7) and needs to start now.
2. 'Coal or gas will meet most of the new baseload generation needs' (Owen 2007, p.1-8).
3. 'The impact on the State could be up to \$15 billion to ensure security of supply, compliance with regulatory requirements and commercial competitiveness' (Owen 2007, p.1-12).
4. It is preferable that the private sector, rather than the NSW Government, funds this investment (Owen 2007, p.v)
5. The private sector will 'invest in new generation in the NEM under the right conditions (including access to a stable revenue stream, to generation development sites and to fuel sources)' (Owen 2007, p.1-13).
6. Therefore, the NSW Government should 'divest the State of the generation businesses of Macquarie Generation, Delta Electricity and Eraring Energy' or 'implement an appropriately structured long-term leasing of current generation assets' (Owen 2007, p.1-14).
7. The NSW Government should also 'divest the State of the retail arms of EnergyAustralia, Integral Energy and Country Energy' (Owen 2007, p.1-14) to avoid \$2 billion to \$3 billion in capital investment needed to make these businesses competitive (Owen 2007, p.xii) and to provide the private sector with opportunities for vertical integration of generation and retail businesses (Owen 2007, p.xiii).

Each element of the argument for privatisation is considered in more detail below.

3.2 Supply and demand projections

Owen's argument that a new baseload power station is needed by 2013-14 rests heavily on electricity supply and demand projections. These projections are very uncertain and the timeframe for a new baseload power station varies significantly depending on the assumptions used in projections. Specific issues with the supply and demand projections used in the Owen Report are discussed below.

3.2.1 Demand projections

The Owen Report uses forecasts prepared by TransGrid to estimate future electricity demand. TransGrid prepares Annual Planning Reports (e.g. TransGrid 2007) that set out its electricity supply and demand forecasts. The forecasts take into account historical trends, economic data and known large industrial loads. They include low, medium and high growth scenarios. The forecasts have proven to be quite reliable in recent years (TransGrid 2007).

TransGrid forecasts a reduced rate of growth in energy demand over the next 10 years (under the medium growth scenario) of 1,600 GWh per annum compared to the historical rate of increase of 1,700 GWh per annum over the previous decade (Owen 2007, p.2-6). As a result, electricity sent out from major power stations is projected to grow from 73,091 GWh in 2005-06 to 87,540 GWh in 2016-17 to meet anticipated demand (Owen 2007, p.2-8).

Despite the apparent reliability of these demand projections to date, they fail to take into account three major issues that could have a significant impact on future demand. First, they fail to adequately account for the many new energy efficiency measures that have been implemented in recent years. TransGrid's energy forecast does not 'explicitly identify the contribution that energy efficiency makes to reducing the growth in energy demand' (Owen 2007, p.4-2). However, according to Owen (2007, p.4-2), 'energy efficiency is implicitly factored into their work, through their forecast of a continuation of the reduced rate of energy demand growth observed since 2001'. This claim is problematic.

Analysis of long-term trends in Australian energy intensity indicates that the observed decline in energy intensity over 1973-74 to 2000-01 is primarily due to changes in the structure of the economy and the fuel sources used to meet demand (Tedesco and Thorpe 2003). The shift towards a service-oriented economy has reduced the energy required by the economy. Greater use of natural gas at the point of use, which burns more efficiently than other fuels, has also reduced energy requirements. Technical improvements in energy efficiency contributed very little to the observed decline in energy intensity up to 2000-01. It is reasonable to assume that structural change and changes in the fuel mix, rather than technical efficiency improvement, continue to drive much of the observed lower rate of growth after 2001. Consequently, by projecting forward the rate of growth after 2001, the TransGrid forecast is not accounting for ongoing energy efficiency improvements but for ongoing structural changes in the economy and fuel mix.

Further, although many new energy efficiency initiatives have been introduced since 2001 (as discussed in Chapter 4 of the Owen Report), most of these have been introduced very recently and their impact on energy demand is not yet observable. The most recent actual energy demand data used in the Owen Report is for 2005-06, so only initiatives introduced by 2004-05 could be expected to have any observable influence on demand, and this would only be evident in the final year of data.

The Greenhouse Gas Reduction Scheme (GGAS), BASIX and mandatory efficiency standards for appliances would have had some impact on energy demand in 2004-05 and 2005-06 but these programs ramp up slowly and most of their impact will only be evident in future years. One or two years of data are not sufficient to establish a trend for the purpose of projection.

More recent programs, like the Climate Change Fund, Energy Savings Action Plans and Energy Efficiency Opportunities would not be taken into account at all in the TransGrid forecast. In summary, the TransGrid projections fail to adequately incorporate the impact of existing energy efficiency measures on future demand. The impact of existing schemes should have been estimated and subtracted from the projected demand to give a realistic representation of future demand.

The second problem with the TransGrid demand forecasts is that they do not take account of impacts on demand from price increases due to the introduction of emissions trading and a carbon price. It is also unclear whether account has been taken of the significant increase in electricity prices due to the current massive expansion in network investment.

The third problem with the TransGrid demand projections is that they take the future as given and fail to reflect the urgent need to take strong action to respond to climate change over the next decade. There is an emerging consensus that the next decade is critical in determining whether we can avoid dangerous climate change. Consider the following statement from one of Australia's leading climate experts, Dr Graeme Pearman:

I hear people talking about getting our emissions under control by carbon trading and other interventions sometime in the next 10 years. We don't really have 10 years... We're bang in the middle of the window identified by scientists in the Intergovernmental Panel on Climate Change report - between 2000 and 2015 - when a turnaround might just hold warming to two degrees, beyond which the consequences become dire. But there's no sign of it happening.

You have to recognise the urgency, and it doesn't seem to be there. I'm not making a partisan comment, it's not recognised by either of the parties. We really need to scale up the efforts nationally and internationally (Chandler 2007).

The most recent report of the Intergovernmental Panel on Climate Change (IPCC) makes it clear that if we are to avoid dangerous climate change, we need to act in the next decade to transform the way we use energy (IPCC 2007). This requires strong government action to improve energy efficiency, reduce energy demand and facilitate the uptake of low-emission technologies. In this context, an energy demand forecast that assumes continuation of current trends is of little value. Instead, what is needed is an approach that sets appropriate greenhouse gas reduction targets and then works out the cheapest way to meet these targets, through demand-side and supply-side actions.

If we are serious about responding to the threat of climate change, governments need to implement policies that will reduce demand well below the trends assumed in the Owen Report. As Owen (2007, p.4-4) notes: 'There is a general acceptance in the community that there is significant potential to improve the efficiency with which electricity and other forms of energy are used'. Governments can, and should, influence future electricity demand by helping to realise the potential of energy efficiency. The Owen Report makes no attempt to examine a scenario in which the NSW Government pursues strong energy efficiency measures that go well beyond those that are currently in place, as a way of responding to climate change. This is a serious omission. Section 4 proposes alternative scenarios in which there is stronger pursuit of energy efficiency measures as a key way to reduce future electricity demand.

3.2.2 Supply projections

The Owen Report determines that current and committed large power stations in NSW can generate up to 85,000 GWh per annum when operating at maximum technical capacity (Owen 2007, p.2-10). Imports from other States may provide additional capacity, ranging from zero to 9,000 GWh per annum, depending on the assumptions used (Owen 2007, p.2-21). Non-scheduled demand (from smaller power stations, including renewable energy) is projected to supply 2,050 GWh per annum in 2005-06, growing to 4,000 GWh per annum by 2016-17 (TransGrid 2007, p.27).

It is reasonable to assume that imports from other States may be less available in the future due to growth in demand in those States. Therefore, the firm scheduled supply capacity of 85,000 GWh per annum is the appropriate one to use to determine whether supply is sufficient to meet demand. Non-scheduled demand adds to the available energy supply, giving a maximum projected generation of 89,000 GWh per annum by 2016-17.

The key problem with these projections is that they are being rapidly overtaken by events. Since these supply projections were developed, there have been major developments in renewable energy that will increase the amount of non-scheduled energy available and reduce the need for scheduled energy. These include:

- The announcement of the proposed 1,000MW Silverton Wind Farm, to be constructed in western NSW by Epuron. This wind farm alone would provide 3,000 to 3,500 GWh of non-scheduled generation each year (AEP 2007) and could be operational by 2010. The TransGrid forecast of non-scheduled generation has only an additional 839 GWh per year by 2010-11, so this project would provide all of that capacity plus another 2,161 to 2,661 GWh per year. This extra capacity would directly reduce the need for scheduled generation.
- Additional Australian Government support for renewable energy. Under the newly elected Federal Labor Government, annual renewable electricity generation will be increased to 60,000 GWh (about 20% of total generation) by 2020. While it is unclear how much of this new capacity will be located in NSW, it could significantly increase the amount of scheduled and non-scheduled generation. In addition, the Labor Party has promised a \$500 million Renewable Energy Fund to develop, commercialise and deploy renewable energy in Australia (Australian Labor Party 2007).

These increases in the amount of renewable energy generation above what is assumed in the Owen Report raise another issue, which is the ability of distributed generation to meet demand closer to the source, with fewer losses. Of the total scheduled generation in 2005-06 of 76,979 GWh, only 69,210 GWh (90%) reaches the point of end use due to own use by the generator and losses during transmission and distribution. Non-scheduled generation is typically located closer to loads and has lower losses, so a given quantity of non-scheduled generation can substitute for a greater amount of scheduled generation.

3.2.3 Timing of investment

Based on the supply and demand projections, Owen recommends being prepared to build a new baseload power station, to be delivering power by 2013-14. He argues that:

The cost to the State of not being prepared in time is large relative to the cost of investing, with hindsight, a little earlier than may have been required. Further, being prepared today does not prevent delay in the future if the time horizon for additional baseload requirements moves outwards (Owen 2007, p.iii).

The NSW Government employed a similar argument in relation to the role of desalination in supplying water to Sydney. They argued that being ready to construct a desalination plant when dam levels fell to a trigger level did not prevent delay if dam levels rose again. As it happened, the trigger level was never reached, dam levels did rise and the desalination plant is being constructed anyway, so arguments for 'baseload readiness' should be considered in this light.

There are two reasons why the 2013-14 date for a new baseload power station may be overly cautious. First, under TransGrid's low demand growth scenario, additional baseload capacity is not needed until 2016-17 (Owen 2007, p.2-21).² This scenario becomes very plausible when the impact of existing energy efficiency measures, which are excluded from

² Under the low growth scenario in Table 2.3 of the Owen Report, 2016-17 is the first year in which the currently available capacity of 85,000 GWh per year is exceeded.

the TransGrid projections, is taken into account. Indeed, an even lower scenario would be plausible with strong additional action on energy efficiency. Strong pursuit of energy efficiency could delay the need for additional baseload power until large-scale renewable technologies (such as solar thermal and geothermal power) or carbon capture and storage plants become commercially available.

Second, the Silverton Wind Farm and additional renewable energy under an expanded MRET could delay the need for a new baseload station to at least 2014-15 and possibly 2015-16, even under TransGrid's medium growth scenario. Under the more plausible low growth scenario, these developments would push the need for new baseload out beyond 2016-17. This will help to buy sufficient time for the development of low-emission baseload options that are more consistent with climate change response. For example, 'Geodynamics expects to be able to provide 500MW of baseload to the NEM by 2015-16' from its low-emission geothermal hot dry rock technology (Owen 2007, p.3-11).

With stronger pursuit of energy efficiency, there is time for a more considered approach that gives sufficient attention to climate change response and greenhouse gas reduction and allows time to observe the full impact of energy efficiency measures that have already been implemented.

3.3 Choice of technology

The Owen Report argues that:

Most of NSW extra baseload energy needs are likely to be met by coal-fired and/or gas-fired generation as other technologies can only contribute on a relatively small scale or will not mature until 2020 at the earliest... Technologies with minimal carbon emissions, such as Solar Thermal, and Geothermal Hot Rock could offer much as baseload generation in the future, but not for stations that are to be operational within the next ten years (Owen 2007, p.1-8).

Further, carbon capture and storage 'is unlikely to be commercially viable for the next tranche of baseload plant in New South Wales' (Owen 2007, p.vi).

A major problem with the technology analysis in the Owen Report is that it considers the baseload potential of each technology on an individual basis; there is no attempt to consider how different technologies might work together to provide baseload substitution. This type of analysis is particularly important when considering the role of renewable energy sources, which have variable availability.

While a single wind farm is unable to provide guaranteed baseload, multiple wind farms that are sufficiently distributed to take advantage of differing wind regimes can provide much more reliable capacity (Diesendorf 2007). Even greater reliability is possible when wind power is combined with energy efficiency and other renewable sources, particularly biomass and solar thermal power (which both have some storage capacity).

A diverse portfolio of energy efficiency and renewable energy technologies with differing generation profiles can provide a firm substitute for baseload power, even when the individual technologies cannot. Diesendorf (2005, p.4) shows that:

a mix of energy supply from natural gas, wind power and bioenergy, together with firm implementation of substantial demand-side energy efficiency policies and strategies, could economically substitute for both the energy generation and the contribution to the peak load of a new 1000 MW coal-fired power station by 2010.

Diesendorf (2005) does not include solar thermal power, but recent developments in this technology indicate that it may become commercially viable more quickly than previously thought. Ausra, the solar thermal company established by an Australian – Dr David Mills – has signed an agreement with several American utilities to deliver at least 1,500MW of solar thermal power in the United States over the next five to seven years (Ehrlich 2007). In addition, as noted above, Geodynamics expects to deliver 500MW of baseload power to the

NEM by 2015-16 (Owen 2007, p.3-11). With these developments, the possibility of using low-emission energy sources to meet future baseload requirements should not be ruled out.

There are two other problems with the technology analysis in the Owen Report. First, the analysis depends heavily on the assumed price of carbon in a future emissions trading market, which remains very uncertain at present. Under a high carbon price, a portfolio of renewable energy technologies would be viable immediately and other low-emission baseload technologies (such as solar thermal, geothermal hot dry rocks and carbon capture and storage) could be developed more rapidly. Second, as shown in Section 3.2, the projections used in the Owen Report fail to consider the role of current and future energy efficiency measures in delaying the need for new baseload.

With strong action on energy efficiency to delay the need for a new baseload power station, and strong support for low-emission technologies, the NSW Government could avoid the need to build any more high-emission power stations. This is the only strategy that can reasonably be supported in a carbon-constrained world and the only approach that will put the NSW Government on the right path to achieve its target of reducing greenhouse gas emissions by 60% from 2000 levels by 2050.

3.4 Scale of investment

According to the Owen Report, the scale of future NSW Government investment required to 'ensure compliance with regulatory requirements and commercial competitiveness' is between \$12 billion and \$15 billion (Owen 2007, p.v). These figures have the following components:

- \$7 billion to \$8 billion investment in new generation capacity over the next 10 to 15 years (Owen 2007, p.iv)
- \$2 billion to \$3 billion investment in the State-owned retail businesses to 'adjust their business model to suit the competitive environment in which they operate' (Owen 2007, p.v)
- \$3 billion to \$4 billion to retrofit some existing power stations with carbon reduction technologies over the next 10 to 15 years (Owen 2007, p.v).

In addition, the NSW Government is investing an estimated \$10 billion in the electricity transmission and distribution network over the next four years (Owen 2007, p.v). Clearly, the scale of this projected investment and its impact on the State's finances is a key driver behind the current push for privatisation. It is therefore important to consider how these estimates were derived.

3.4.1 Investment in generation

The methodology used to arrive at the estimates of the scale of investment is outlined in Appendix 6 of the Owen Report. To determine generation investment costs, the Owen Report used a simulated generation investment pathway for NSW from NEMMCO (2006). This investment pathway, which was actually developed to assess the viability of inter-regional transmission upgrades, appears to seriously overestimate the actual capacity increases required in NSW. It proposes additional investment in 750MW of open cycle gas turbine power to become operational between 2009-10 to 2011-12, 770MW of combined cycle gas turbine power between 2010-11 and 2011-12 and 2,000MW of coal-fired power between 2012-13 and 2015-16 (Owen 2007, p.A6-2). At the capacity factors used in the Owen Report, these plants could deliver more than 20,000 GWh/year of additional power by 2015-16. Yet the shortfall identified by the Owen Report for 2015-16 is only in the order of 6,000 GWh/year. The assumed generation investment used in the Owen Report would deliver a huge amount of surplus capacity and is unjustifiable.

A more reasonable investment assumption can be developed by examining NEMMCO's 2007 Statement of Opportunities (NEMMCO 2007), which finds that additional capacity of 134MW is required in NSW by 2013-14 to ensure supply reliability, growing to around 1,100MW by 2016-17. This could be met by combined cycle gas power or coal power coming on-line progressively from 2013-14. If we rule out coal-fired generation due to its greenhouse gas intensity and assume that this shortfall will be supplied using CCGT, an appropriate investment pathway would have 385MW of generation coming on-line each year from 2013-14 to 2016-17. This would deliver an additional 1,540MW of capacity by 2016-17. At a capacity factor of 70%³, this capacity would deliver an additional 9,400 GWh per year by 2016-17, which is sufficient to meet the shortfall identified by the Owen Report under TransGrid's medium growth forecast.

Of course, as discussed in detail above, the need for much of this investment is questionable once the impact of existing energy efficiency measures and support for renewable energy is taken into account. A more likely scenario is presented in Section 4.

Even if the scale of generation investment proposed in the Owen Report is accepted at face value, it is far from clear that the cost of this investment would be \$7 billion to \$8 billion. The method used to cost the capital investment assumed in the Owen Report is not transparently documented. However, using the figures provided in Appendix 6 of the Owen Report and the limited detail on method, we have calculated the capital investment required as only \$4.6 billion in 2007-08 dollars. Using the more appropriate assumptions about capacity expansion discussed above, the cost would be only \$1.6 billion over the same period. The impact of existing energy efficiency measures and renewable energy installed in response to the expanded MRET would further reduce and delay the scale of the necessary investment. Without a more transparent discussion of how the \$7 billion to \$8 billion was derived, it is not possible to be confident that this is a reasonable figure.

An additional problem with the estimate of \$7 billion to \$8 billion is that it uses new entrant costs to estimate the scale of investment. This ignores existing proposals for refurbishment or upgrade of existing plants that could deliver increased capacity at lower cost than new entrants. An example is Delta Electricity's proposed upgrade of the Munmorah Power Station. Munmorah is excluded from the Owen Report's consideration of available capacity due to its age and reliability problems. An upgrade of Munmorah, as proposed in Delta Electricity's submission to the Inquiry, would deliver 700MW of additional baseload capacity at a lower cost than a new coal-fired power station.

As noted previously, stronger pursuit of energy efficiency could delay investment in baseload beyond 2013-14. There is a great deal of evidence that investment in energy efficiency would deliver similar outcomes to expansion of baseload capacity at much lower cost. As the Owen Report recognises, energy efficiency is 'regarded as having untapped potential to meet energy needs in a reliable and cost-effective manner, with low environmental impacts' (Owen 2007, p.4-4). Indeed, most Australian evidence indicates that investments in energy efficiency have short payback periods and a net benefit to Gross Domestic Product (MMA 2004; NFEE 2007; The Allen Consulting Group 2004). This is supported by international research, which finds that:

a concerted global effort to boost energy productivity – or the level of output we achieve from the energy we consume – would have spectacular results. By capturing the potential available from existing technologies with an internal rate of return (IRR) of 10 percent or more, we could cut global energy demand growth by half or more over the next 15 years (McKinsey Global Institute 2007).

Similarly, the IPCC (2007, p.13) finds that: 'Energy efficiency options for new and existing buildings could considerably reduce CO₂ emissions with net economic benefit. Many barriers exist against tapping this potential, but there are also large co-benefits'.

³ This is at the low end of the range specified in Table 3.11 of the Owen Report for baseload CCGT.

Capturing the potential of energy efficiency will require investment to remove market and institutional barriers. However, the scale of investment required to avoid construction of a new baseload power station is very likely to be less than the investment required to build such a station.

3.4.2 Investment in retail businesses

The Owen Report argues that capital expenditure of between \$2 billion and \$3 billion is needed to improve the competitiveness of the State-owned retailers (Owen 2007, p.A6-8). This expenditure is needed to pursue vertical integration with generation and upstream gas, allowing better management of risks and optimisation of returns. The expenditure comprises:

- \$1 billion to \$2 billion to develop an upstream gas position by acquiring an existing upstream gas company or investing in gas exploration
- \$1 billion to invest in generation, such as a gas-fired peaking plant.

The need for this expenditure is not disputed although the precise basis for the estimates is not transparently defined in the Owen Report. One point to note, however, is that the best way to compete with the privately-owned retailers may not be to mimic their business model, as proposed by the Owen Report, but to identify new business models that deliver more to customers. Section 5.2.4 proposes an alternative business model.

3.4.3 Carbon reduction investment

The Owen Report estimates that an additional \$3 billion to \$4 billion in capital investment might be required from 2020 to retrofit 'at least one major existing baseload coal plant with carbon capture and storage (CCS) technology over the foreseeable future' (Owen 2007, p.A6-7). There is very little basis for this estimate, given that the cost of CCS (if it ever becomes commercially available) remains highly uncertain. The method used to allocate emissions permits to existing coal-fired power stations also remains uncertain – it is entirely possible under the proposed emissions trading schemes that existing power stations will be issued with sufficient permits to cover their existing emissions well into the future. Consequently, the estimated cost of carbon reduction investment is highly speculative and of little merit in building a case for privatisation.

3.4.4 Discussion

The discussion above indicates that the total capital investment required by the NSW Government if it retains its generation and retail assets could be much lower than the Owen Report estimates, perhaps as low as \$4 billion (comprising \$2 billion to invest in baseload CCGT and \$2 billion to invest in the retailers). Further, presenting the investment as a lump sum is misleading. The investment would be spread over a significant period of time. Using the Owen Report's inflated figures, the investment would amount to \$700 million per year through to 2013-14, increasing to \$1.5 billion per year after that (Owen 2007, p.A6-10). With more reasonable figures, the necessary investment would be more like \$400 million per year through to 2012-13, increasing to \$500 million per year in subsequent years.

This remains a significant investment and it might be higher if the NSW Government chose to invest strongly in energy efficiency and renewable energy. It is therefore worth noting that investment in energy efficiency and distributed energy (including cogeneration and renewable energy) would have the added benefit of reducing the need for electricity network investment by reducing peak demand. The NSW Government is intending to spend about \$10 billion over the next four years on investment in the electricity network (Owen 2007, p.v). Some of this money could be much better spent on energy efficiency and demand management, bringing the dual benefit of reducing the need for spending on network augmentation and delaying the need to spend on new baseload power.

By investing immediately in energy efficiency and demand management, the NSW Government could delay major spending on baseload power, giving more time for the development of low-emission baseload technologies. A final point to note is that the investments discussed here are all dwarfed by the costs that will be imposed on the NSW economy if we do not act to avoid dangerous climate change. As the Stern Review (Stern 2006) showed, the cost of climate change will be far greater than the cost of reducing greenhouse gas emissions and costs increase the longer we delay.

3.5 Private or public investment

The Owen Inquiry considered the costs and benefits of private versus public sector investment in the NSW electricity industry to fund changes to the structure of the State-owned retailers, new baseload power stations and possible carbon reduction technologies. It found that private investment would be preferable. The sections below consider the arguments for private versus public sector investment.

3.5.1 Impact on State finances

The central argument raised by the Owen Report in support of private sector investment is the impact on State finances of continued public sector investment in the NSW electricity industry. The Owen Report argues that: 'The current arrangement in New South Wales will ultimately lead to Government funding nearly all, if not all, investment in the State's electricity industry over the next 10 to 15 years' (Owen 2007, p.iv). Using its estimate of the required scale of investment, the Owen Report goes on to examine the impact of such an investment on State finances. It finds that:

additional debt funding, particularly for investment in assets that rely on market-determined revenues, may have an adverse impact on the State's AAA credit rating (Owen 2007, p.iv).

Further:

The combined impact of both the divestment of generation and retail and the avoidance of new generation investment means that total State net debt would be up to \$26 billion lower in 2020 compared to a 'retain and invest' scenario. This would significantly improve the State's fiscal position and the Government's ability to meet its State Plan objectives (Owen 2007, p.1-13).

This estimate of the impact on State finances includes an estimate of \$10 billion in proceeds from the sale of the generation and retail assets. It is worth noting that the possible price received is far from certain – Debnam (2007) considers that the likely range is between \$4 billion and \$15 billion. The Owen Report makes no attempt to consider how variation in the sale price would affect the case for privatisation. Section 4.5 considers this issue in more detail.

There are several problems with these estimates. First, it is by no means clear that the current arrangements would lead to the State delivering all investment in the NSW electricity industry over the next 10 to 15 years. Section 3.6 demonstrates that private sector participation can occur despite government retention of the State-owned generators and retailers as long as various conditions for private sector investment are met. Steps that the NSW Government would need to take to encourage investment without privatising its assets are outlined in Sections 3.6.

Second, as shown in Section 3.4, the Owen Report's estimates of the scale of investment required are unjustifiably high. Even if the NSW Government had to fund the entire investment, the impact on State finances of the more moderate investment path discussed in Section 3.4 would be much less problematic. With investment in energy efficiency to reduce the ongoing cost of network augmentation, the impact on State debt could be even further reduced.

Third, any investment in the electricity sector, whether by private or public interests, will earn a rate of return. According to Robins (2007): 'Since the Labor Government was elected in 1995 it has banked more than \$11 billion in returns from the electricity sector'. In the financial year to 30 June 2006, the State-owned electricity businesses provided distributions to government (tax and dividends) totalling \$1.1 billion (Auditor-General 2006). This comprised:

- \$211.2 million from Macquarie Generation
- \$201.9 million from Delta Electricity
- \$97 million from Eraring Energy
- \$304 million from EnergyAustralia
- \$169.1 million from Integral Energy
- \$158.5 million from Country Energy.

Of this \$1.1 billion, \$689 million was paid in the form of dividends. The portion of this income flowing from the generators and the retail components of the combined retail and distribution businesses would be lost if the State-owned businesses were sold.

In addition to the revenue transferred directly to the NSW Government, the State-owned businesses have also increased their own value through profits. Thus, the best measure of the value that would be lost is the after-tax profit of each business. The after-tax profit for these businesses amounted to \$1,057 million in 2006 (Auditor-General 2006). Some of this value would be retained via the distribution arms of the combined retail and distribution businesses. It is not clear how much of the profit is made by the retail arms and how much by the distribution arms. According to the Owen Report, around 10 per cent of the operations and staff are retail-related (Owen 2007, p.7-21) so a reasonable assumption is that 10% of the profit is retail-related. On this basis, \$543 million per year would be lost through sale of the assets.

The question that needs to be asked is whether the benefits from selling public assets and foregoing this revenue outweigh this lost revenue. The proceeds from sale of the State-owned generation and retail businesses could be used to reduce debt and reduce interest payments from service of this debt. In addition, the NSW Government could avoid further investment in the electricity industry, which would prevent it from taking on higher debt levels in the future. However, as we saw in Section 2, it is uncertain whether privatisation can really be considered a successful method of improving public finances. Quiggin's analysis of the Victorian and South Australian cases showed that the fiscal impact on the public sector was either negative or more or less neutral (Quiggin 2002; 2001). Some NSW-specific analysis is appropriate.

The price that would be paid for the State-owned generators and retailers is speculative. However, assuming a price of \$10 billion (as mentioned in the Owen Report), and that the NSW Government could immediately retire this amount of debt, the reduction in interest payments would be \$620 million per year at the NSW Treasury Bond Rate of 6.2%. This represents a net benefit of \$77 million per year.

Additional savings would be possible through avoidance of future investment, amounting to another \$248 million per year (on \$4 billion of avoided investment). However, additional investments in the generation and retail businesses would be expected to earn a rate of return that should at least cover any additional interest payments incurred due to that investment. In other words, future dividends would be higher due to the increased and more competitive scale of the businesses. Debt, in itself, is not necessarily a bad thing (Walker and Walker, 2000). It is an enabling mechanism that can support greater earnings.

It seems, therefore, that the net benefit of privatisation to the State's finances is only \$77 million per year when assumptions are used that are more reasonable than those used in the Owen Report. Further, this estimate is highly dependent on the sale price. If the sale price fell to \$8.8 billion, the net benefit to the State's finances would be zero. Given the many risks involved with privatisation, the benefits appear minimal.

The other key issue considered in the Owen Report with respect to State finances, flowing from the Terms of Reference, is whether a higher level of debt resulting from electricity sector investment would threaten the State's AAA credit rating. This is much less likely under the more reasonable investment path considered in Section 3.4. Further, a net benefit of \$77 million per year would make little difference to the result.

In fact, as Beder (2007) discusses, 'ratings agencies, such as Standard & Poor's recognise that state governments have an obligation to fund infrastructure development and that this may be through debt' (Beder 2007, p. 10). Ratings agencies would be more interested in how the debt is managed, what it is used for and the level of risk involved (Beder 2007). In determining a government's credit rating, Standard & Poors for example, 'view the debt burden in the context of an LRG's [local or regional government's] ability to maintain certain amounts of debt obligations' (Kochanov and Dimitrijevic 2007, p. 17; Beder 2007).

In the unlikely event that the State's credit rating was downgraded, would this be a disastrous event? In 1999-2000, the negative impact of a fall in the NSW credit rating of one level would have been only \$30 million per annum (Walker and Walker 2000). Selling off the State-owned generation and retail businesses may reduce short-term budget pressure slightly but this is likely to be at the expense of long-term value.

In summary, it is true that significant investment would be required to maintain the viability of the State-owned businesses. Further, electricity generation is a risky business where ongoing returns are not guaranteed. However, the positive impact of privatisation on State finances has been grossly overstated.

3.5.2 Consumer impacts

Another important consideration is whether consumers would be better or worse off under private ownership. A key issue here is the cost of capital to the public and private sectors. Several authors argue, convincingly, that the cost of capital to governments is lower than the private cost of capital (Quiggin 1997; Thomas 2007; Walker and Walker 2000). As a result, it is cheaper for the public sector to fund the necessary investment in the NSW electricity sector and these savings could be passed on to consumers.

Critics of this argument contend that the risks are the same for public or private sector finance, but that taxpayers implicitly bear the additional risk under public sector financing arrangements (Webb and Pulle 2002). While this is an interesting theoretical argument, it does not change the fact that governments can borrow money at a cheaper rate than the private sector. For consumers, it is this reality that matters. There is little doubt that there is an inherent consumer benefit in retaining public ownership of electricity assets due to the lower cost of capital to governments.

The Owen Report does not discuss the cost of capital. This is a serious failing, as the assumed cost of capital critically determines whether a proposed privatisation will be assessed as having a positive or negative economic impact (Walker and Walker 2000).

While, on one hand, the cost of capital creates an inherent benefit for government ownership, on the other hand it is often argued that the private sector operates more efficiently than the public sector and can therefore deliver the same level of service at lower cost or greater profit. If the benefit of higher private efficiency outweighs the benefit of government's lower cost of capital, then privatisation may deliver a net benefit to consumers. Again, the Owen Report fails to analyse this issue. However, in an era when State-owned corporations are operating in a competitive market, there is little reason to believe the State-owned

corporations are operating less efficiently than the private sector would. State-owned corporations have been forced to increase their productivity to maintain their competitive position in a contestable market. There is no inherent reason why a State-owned corporation is unable to operate as efficiently as a private competitor and the Owen Report provides no evidence that this is the case. On balance, we believe there is an inherent consumer benefit in retaining public ownership.

There is also a more practical concern associated with private ownership, which is the potential for consolidation of market power in the hands of a small number of players. If the market is not sufficiently competitive, then private operators may be able to raise prices relatively easily, with negative impacts on consumers. As discussed in Section 2, and as has been documented extensively by the UK electricity and gas watchdog Energywatch, this situation has occurred in the UK electricity market which is now dominated by the 'Big Six' energy suppliers, with resulting negative consequences for UK electricity consumers. The likelihood of this outcome appears to be different for the generation and retail businesses.

Generators sell the electricity they generate through the NEM, which is a competitive market that is generally working well. There are numerous generators bidding into this market and the lowest cost bids are accepted by NEMMCO. There appears to be little scope for generators to raise prices unless the market as a whole is doing so. Of course, this could change with greater market concentration, which could follow from a sale of the State-owned generation assets.

The situation is somewhat different in retail, where competition in the residential market remains uneven. By 2005-06, 42% of customers in EnergyAustralia's standard supply area had taken up negotiated contracts, compared to 28.8% in Integral Energy's area and only 4.6% in Country Energy's area (IPART 2007). The majority of customers in NSW had chosen to stay on regulated retail tariffs. While there is a growth trend in the uptake of negotiated contracts and IPART has taken steps in its latest retail pricing determination to encourage competition, a competitive retail market is still developing in NSW. The Australian Energy Market Commission is due to undertake a review of the effectiveness of retail competition in NSW in 2009. In advance of this review, it would be risky to assume that the retail market in NSW is sufficiently competitive to prevent private operators from exercising market power.

The experience in the UK is cautionary. There, market concentration and integration since the introduction of full competition has acted as a barrier to real competition, and consumers have seen significant recent price rises (Energywatch 2007b). Many residential customers, particularly low-income and disadvantaged customers, have little real choice of market contracts. In NSW, the retailers have tended to market to the most profitable customers and ignore the rest. With all retail concentrated in private hands, the risk of significant price rises for at least some residential customers is very real.

If the State-owned generation and retail businesses are sold, strong customer protection measures will be needed to prevent negative impacts on consumers.

3.5.3 Discussion

In relation to public versus private investment, the Owen Report concluded as follows:

I conclude that Government funding, in place of private sector funding, is not essential to allow Government to ensure security of supply or achieve appropriate price, social or environmental outcomes from the State's electricity industry (Owen 2007, p.v).

While we concur with this finding, it needs to be qualified. First, the impact on the State's finances of retaining public ownership of the State-owned energy businesses is seriously overstated in the Owen Report. This greatly reduces the incentive to privatise. It is far from clear that there would be a net benefit to State finances, and any benefit would be much less than the Owen Report claims.

Second, there appears to be an inherent economic benefit from retaining public ownership due to the lower cost of capital for governments. The Owen Report fails to examine or quantify this benefit.

Third, private sector ownership is only appropriate when sufficient mechanisms are in place to protect customers and the environment. Continued government ownership may be preferable when competitive markets have not yet developed, as is the case for the residential retail market and the emissions trading market. There is a strong case for delaying privatisation of at least the State-owned retail businesses until the AEMC completes its review of the effectiveness of retail competition in NSW in 2009, at which time the parameters of a future emissions trading market will also be clearer.

Finally, it is important to consider how risk is managed under public and private ownership. While it is often argued that privatisation transfers commercial risks associated with electricity provision in a competitive market to the private sector, it only does so to a limited degree. As noted by McDonnell (2004, p.84):

Governments are confronted with “the sovereign risk of universal service” of electricity, that is, the de facto residual and in-eradicable risk attendant upon a government’s obligation in a modern society to assure the supply of electricity to all, households and businesses alike, as an essential service.

In other words, the public sector will always retain the risk associated with the need to provide an essential service. If private firms collapse, the NSW Government will be left to pick up the pieces at taxpayer expense, as has been the case in the UK (Thomas 2007). There is no consideration of this risk in the Owen Report.

3.6 Private sector participation

Having determined that private sector investment in the NSW electricity industry is preferable to ongoing public sector investment, the Owen Report goes on to consider ways to secure private sector investment. According to the Owen Report:

Submissions to the Inquiry from those parties likely to invest in generation, are confident that the private sector will invest in generation capacity when a demonstrable market need reflected in wholesale electricity prices is predicted, and an investment case can be made for commercially viable operation and financing (Owen 2007, p.7-3).

The Owen Report then goes on to explore the conditions for private sector investment in more detail. These can be summarised as follows:

- Investors need access to a stable revenue stream
- Investors need access to suitable sites
- Investors need access to competitively priced fuel
- Investors need to be able to obtain sufficient revenue, via retail tariffs
- The impediment of government ownership needs to be removed
- The impediment of carbon uncertainty needs to be removed.

The Owen Report concludes that the best way to meet these conditions and encourage private sector investment is to sell the State-owned generation and retail businesses. Each of the conditions and the final argument for privatisation are considered below.

3.6.1 A stable revenue stream

Investors in the electricity industry need access to a stable revenue stream (Owen 2007, p.7-6). Electricity industry participants have developed several business models to provide revenue stability, including fully contracting a power station's future output, vertical integration of generation and retail assets, and development of generation portfolios. Where there has been investment in new generation capacity in the NEM it has usually been consistent with one of these models.

The Owen Report goes on to argue that:

Selling the State's retail operations would increase the private sector's commercial exposure to the retail load in New South Wales and facilitate businesses adopting a vertical integration approach to underwrite investment in generation capacity in the State (Owen 2007, p.7-19).

This is true; however, it is by no means the only way to facilitate further investment in generation in NSW under a suitable business model. One alternative is for the NSW Government to pursue vertical integration by merging State-owned generation businesses with State-owned retail businesses. These more competitive State-owned generation and retail businesses could then compete with private operators to deliver generation in response to price signals in the NEM. A second alternative is for the private sector to invest in new generation as part of a generation portfolio approach, avoiding the need to purchase a retail operation. A third alternative is for the private sector to develop new generation and fully contract the future power station output. This could be particularly attractive for developers of renewable energy.

With these other options available, privatisation is not necessary to provide public or private investors with a stable revenue stream.

3.6.2 Access to suitable sites

Investors also need access to suitable sites. At present, government businesses 'own some of the most suitable and progressed generation development sites in the State' (Owen 2007, p.7-8). These sites have favourable access to 'fuel, water supply and transmission infrastructure' and are 'considerably progressed in the project feasibility and development approval stages' (Owen 2007, p.7-9). Again, privatisation of the State-owned generation and retail businesses is not necessary to provide access to these sites. Suitable development sites could be leased or sold to private investors while retaining public ownership of existing generation assets.

It is also worth noting that suitable sites for development of renewable energy may be quite different to sites that are suitable for coal-fired and gas-fired power stations. For example, wind farms often occupy rural land that can be retained by the owners – the wind farm operators pay the landowner a fee for siting their wind turbines on the land. With a greater focus on renewable energy, there would be no shortage of suitable development sites for the private sector.

3.6.3 Access to competitively priced fuel

In addition, investors need access to competitively priced fuel. It is for this reason that the Inquiry recommends not prohibiting or favouring any particular fuel, as this could weaken competition between fuels and lead to higher prices. Owen (2007, p.7-10) argues that emissions trading should be used to let the market achieve environmental outcomes without specifically favouring any fuel. This approach seems reasonable as long as the emission reduction targets in any emissions trading regime are adequate to achieve environmental objectives. The danger is that a new coal-fired power station, without carbon capture and storage, will achieve concessions from government to reduce its exposure to future emissions trading and limit investment risk. Regardless, there is no evidence that privatisation would have any influence on access to competitively priced fuel. Other factors are much more influential.

The Inquiry also recommends further streamlining of planning approval processes for power station development. Recent reforms under Part 3A of the Environmental Planning and Assessment Act 1979 have been criticised by the Environmental Defender's Office NSW:

In effect, Part 3A of the Environmental Planning and Assessment Act 1979...dramatically reduces the involvement of the community in the original decision making process and seeks to reduce any risk of concerned individuals or groups delaying or preventing significant development, by limiting the grounds on which, or the circumstances in which, they can seek merits or judicial review. Instead, the Minister for Planning and Director General, Department of Planning maintain the power to make all key decisions regarding significant development, with advice from 'expert panels', limited input from other key agencies and little opportunity for effective criticism where the bureaucracy 'gets it wrong' (Ratcliff, Wood & Higginson 2007).

In the interest of streamlining planning approvals, the community has been effectively sidelined. Further streamlining is not in the public interest. It is also worth noting here that any new coal-fired power station would inevitably be subject to protests and court challenges, as has been the case for all recent coal-related developments in Australia. This would further slow approval processes and makes investment in coal without carbon capture and storage a risky proposition.

3.6.4 Retail pricing

According to the Owen Report, investors need to be able to obtain sufficient revenue, which ultimately comes from retail tariffs. Where tariffs are set 'below the full cost of generating, transmitting and distributing electricity, and providing retail services to customers' there is little incentive to invest (Owen 2007, p.7-13). This situation no longer exists in NSW – the recent IPART (2007) determination on retail prices effectively increased prices to above the level of efficient costs for the three incumbent retailers as a way of stimulating retail competition (IPART 2007, pp.5-6). The regulated retail tariff now exceeds the actual cost of electricity supply for the incumbent retailers.

3.6.5 Impact of government ownership

The Owen Report notes that:

The NSW Government is both policy-maker and owner of electricity businesses. This position creates a perception of a conflict for the Government...The conflict arises with the perception that an effective, although not the most prudent, way to keep the lights on is for the Government as owner to build (Owen 2007, p.7-14).

The essential argument here is that private sector investment is deterred because of fears that investment will be stranded by government investments made to address perceived energy security problems.

Several observations can be made here. First, as noted by the Inquiry, 'this perception has not stopped the private sector investors in both Tallawarra and Uranquinty', despite Delta Electricity's investment in Colongra (Owen 2007, p.7-14). The Inquiry goes on to state that:

The Inquiry has not been presented with any evidence of non-commercial investment and other market behaviour by the SOCs. Assertions are not well founded and the Inquiry notes in particular that the bidding behaviour of a public sector business is subject to the same regulation as bidding by the private sector. Investment decisions must meet the same sort of rate of return criteria that are sought in the private sector (Owen 2007, p.7-16).

In other words, if the private sector perceives that its investment will be stranded by poor government investment decisions, there does not appear to be any basis for this perception in fact.

Second, with appropriate separation of policy and commercial functions, the State-owned businesses are simply competitors with the private businesses. Like other competitors, they are under no obligation to reveal their capabilities or intentions to competitors to help them avoid the risk of a stranded asset. If the private sector is able to deliver generation capacity at a lower cost than the State-owned businesses then its investment will not be stranded. On the other hand, if the State-owned businesses are inherently able to deliver cheaper generation than private operators, then this merely strengthens the argument for continued public ownership.

Third, the Inquiry argues that the government can remove these private sector perceptions by making 'a credible commitment not to invest further in generation' (Owen 2007, p.7-15). If the government did wish to encourage private investment, it could make such a commitment without needing to sell its existing assets. For example, it could release a policy including a clear commitment to leave the private sector to invest in generation but setting a minimum projected reserve capacity level that would trigger emergency government investment to maintain energy security. This would provide clear parameters for private sector investment while ensuring energy security.

3.6.6 Carbon risk

According to the Owen Report: 'Submissions to the Inquiry are unanimous that investment in baseload generation will be delayed by uncertainty around a national emissions trading scheme' (Owen 2007, p.7-16). Further:

Without a timely resolution, the next tranche of significant investment in generation in New South Wales and the broader NEM will be made without an informed view of the future costs and regime for carbon. Under this scenario, it is unlikely the market will get the mix of generation technology right and ensure the most efficient market outcome (Owen 2007, p.7-16).

Under an Australian Labor Government, emissions trading is due to commence by 2010. Short-term targets are unlikely to be announced until the report of the Garnaut Review in mid-2008. Under a Coalition Government, emissions trading is due to commence no later than 2012; key elements of scheme design would not be determined until mid-2008. Whatever the result of the Federal election, the precise nature of a future emissions trading scheme is unlikely to become clear until well into 2008. There is very little the NSW Government can do to influence this situation.

The uncertainty created by this situation is an excellent reason to delay a decision on privatisation until more information is available. Fortunately, as discussed in Section 3.2, there is sufficient time available to wait for the structure of the carbon market to become clearer. In the meantime, the NSW Government could readily invest in energy efficiency and renewable energy, which will certainly not be disadvantaged by a future carbon price.

One of the biggest risks associated with moving quickly to privatise generation assets is that the private sector could require governments to provide guarantees that any new investment in generation will not be exposed to a future carbon price. This could amount to a very substantial subsidy over time. The NSW Government has already shown its willingness to sign agreements of this type, having provided BlueScope Steel with a range of guarantees relating to future exposure to carbon prices in response for investment (NSW Government and BlueScope Steel, 2006).

3.6.7 Sale of retail businesses

Having considered the conditions for private sector investment, the Owen Report recommends that 'the NSW Government should transfer its retail and generation interests to the private sector' (Owen 2007, p.7-1). The rationale for sale of the State-owned retail businesses is considered below.

The Owen Report argues that:

Selling the State's retail operations would increase the private sector's commercial exposure to the retail load in New South Wales and facilitate businesses adopting a vertical integration approach to underwrite investment in generation capacity in the state. Businesses that are exposed to a critical mass of retail load would have strong incentives to invest in new generation as part of their overall risk management strategy (Owen 2007, p.7-19).

This is certainly one option for stimulating private sector investment in baseload generation in NSW but it is not the only option. As discussed in Section 3.6.1, there are other investment models that provide a stable revenue stream without requiring the sale of the State-owned retail businesses. Investors could adopt a generation portfolio model or a forward contract model.

The Inquiry argues that the incentives to invest will be strongest when there is diversity of generation investment business models, however no evidence is presented for this assertion. Even if this is true, there is nothing preventing the private sector from pursuing a vertical integration model, albeit more slowly. By providing an attractive retail offer that lures customers from the incumbent retailers, private retailers could increase their retail exposure over time.

Given that sale of the State-owned retailers is not necessary to stimulate private investment, are there other benefits that make it an attractive prospect? The primary benefit identified by the Inquiry is the realisation of the current market value of the retailers and use of the equity to strengthen the State's fiscal position (Owen 2007, p.7-26). A closely related benefit is avoidance of the need to invest in the State-owned retailers to maintain their viability. This, when it comes down to it, is the real driver behind the push for privatisation – a short-term desire to reduce State debt by cashing in these valuable businesses. As shown in Section 3.5.1, the net benefit to State finances would actually be minimal.

Another argument in support of sale of the retailers is that 'the value of the SOC retailers will decline over time (without significant equity injections and permission to aggressively grow the businesses) and the State will be potentially required to write down the value of these assets on the State's balance sheet' (Owen 2007, p.7-25). If the State-owned retailers were to retain their current business model, this is probably an accurate assessment. However, there is a great opportunity to reinvigorate the State-owned retailers by transforming them into Energy Service Companies (ESCOs) focused on the delivery of efficient energy services (Outhred and MacGill 2006). These ESCOs could deliver energy efficiency measures under a new business model that does not try to directly compete with vertically integrated companies. This possibility is examined in more detail in Section 5.2.4.

Even if the retailers retain their existing business model and their value declines over time, it may be in the best interests of the public to retain these businesses. As Thomas (2007, p.8) points out:

The value of the government's businesses is only of interest if the government proposes to sell them. If it is not going to privatise them, their value is irrelevant. It is possible that measures that would maintain the value of these businesses may be detrimental to the New South Wales public, if, for example, the price of electricity is forced up, or the reliability of electricity supplies is adversely affected.

The potential costs of privatising the State-owned retailers are many. First, there is the loss of cash flow from dividends. Second, given that the residential retail market does not yet appear to provide effective competition, there is a risk that the new private owners will be able to exercise market power to raise prices. Likely buyers include AGL and Origin Energy, which are already the largest retailers in the NEM. Third, the government's lower cost of capital means that it could more cost-effectively invest in repositioning the State-owned retailers than the private sector. Fourth, the NSW Government would lose a key interface with electricity customers that could be used to deliver efficient energy services, perhaps using an ESCO model (see Section 5.2.4). Finally, there would be a need to design new

customer protection measures, for example to replace the existing Retailer of Last Resort (ROLR) arrangements.

None of these costs are given adequate attention in the Owen Report. When they are taken into account, the case for privatisation of the State-owned retailers becomes highly questionable. Alternatives to sale of the State-owned retailers are considered in Section 4.

3.6.8 Sale of generation

Likewise, it is not necessary for the NSW Government to sell its generation assets to encourage further investment in generation. The private sector can readily invest in new generation using a portfolio or forward contract model, regardless of whether the generation assets are privatised. Sale of generation sites may be necessary but this does not prevent retention of existing assets.

However, the case for retaining the generation assets is not as clear-cut as for the retailers. There are several important benefits to privatising the generation assets and fewer costs. In addition to the short-term benefit to the State's finances, sale of the generation assets would send a very clear signal that the government is relying on the private sector to invest in future baseload power stations. As the generators do not have a direct interface with residential customers, there are fewer concerns about customer protection. In addition, the competitive nature of the NEM greatly reduces the potential for the new private owners to unreasonably raise prices.

There is a more philosophical issue to consider as well: is it appropriate for a government that claims to be a leader in climate change response to continue to own greenhouse intensive coal-fired power stations? With a true separation of policy and generation functions, the NSW Government may be more able to regulate against greenhouse gas emissions without concerns about the impact on its own businesses.

On the other hand, there would still be costs associated with the loss of dividends and the higher cost of capital for the private sector. In addition, the NSW Government will lose some of its ability to easily invest in low-emission generation technologies. With direct control of the NSW coal-fired generators, the NSW Government would have greater control to implement carbon capture and storage, for example. Outhred (2007) argues that the urgency of climate change response is such that the NSW Government should retain the assets at least until a suitable response has been developed.

Perhaps the biggest concern associated with sale of the generation assets is the potential for delivery of concessions or subsidies to purchasers during the sale process, as discussed in Section 3.6.6. If the NSW Government does decide to sell its generation assets, it should avoid providing any guarantees to potential purchasers about their future treatment under emissions trading or any other climate change response policies.

On balance, the case for privatising the generators, while stronger than the case for privatising the retailers, is not sufficiently strong to allay concerns about negative impacts on consumers and the environment.

3.7 Discussion

The critical review of the Owen Report presented in this section demonstrates that the case for privatisation of the electricity generation and retail assets owned by the NSW Government is seriously overstated. The key problems with the case presented in the Owen Report are as follows:

- The electricity demand projections used by the Inquiry fail to adequately account for the impact of existing energy efficiency measures, particularly the measures introduced in recent years. Further, there is no consideration of the potential impact of stronger energy efficiency measures as an alternative to new baseload.

- The electricity supply projections have already been overtaken by events with the announcement of the proposed Silverton Wind Farm and the new Federal Labor Government's promise to increase the Mandatory Renewable Energy Target to 20% by 2020
- As a result, it is very unlikely that new baseload power will be required as early as 2013-14. Indeed, NEMMCO's 2007 Statement of Opportunities (NEMMCO 2007) recognises this, identifying a shortfall of only 134MW in 2013-14 compared to the 327MW deficit in 2010-11 that it had identified in its 2006 Statement of Opportunities (NEMMCO 2006).
- The Owen Report fails to give due consideration to the urgency of climate change response in its consideration of options for ensuring future energy security
- The scale of investment required if the NSW Government retains its existing electricity assets is greatly overstated
- The positive impact of privatisation on State finances is much less than is claimed and there appear to be inherent economic benefits associated with State ownership. Even the unlikely worst-case scenario of a downgrading of the State's credit rating would have minimal economic impact.
- Privatisation is not necessary to encourage private sector investment in the electricity sector. Alternative options are available in which the State retains some or all of its existing electricity assets.
- Many of the issues raised above are either ignored by the Owen Report or given inadequate attention.

In the next section, we outline some alternative scenarios that seeks to address many of the criticisms above while meeting the objective of "keeping the lights on".

4 Alternative scenarios for the NSW electricity industry

Decision-making processes need to be supported by high-quality independent analysis that deals appropriately with uncertainty. In the Owen Report, the choice of assumptions used to deal with uncertainty almost invariably strengthened the case for privatisation. As shown throughout Section 3, it is possible to identify alternative assumptions that have equal or greater support but do not contribute to the case for privatisation. It is hard to avoid the conclusion that the desired outcome of the Inquiry had been determined in advance and the analysis was shaped to fit that outcome.

A more appropriate way to deal with future uncertainty is to establish multiple scenarios that map out a plausible future territory and to examine differing assumptions that flow from these scenarios. In the case of the Owen Inquiry, this might have prompted a more adequate consideration of the impact of existing energy efficiency measures and possible future measures. It might also have drawn attention to the urgent need for climate change response. The Energy Futures Forum developed a series of energy scenarios for Australia that could have been used as a foundation for a detailed scenario-based approach (CSIRO 2006).

We have undertaken a basic scenario analysis to demonstrate the kind of results that emerge. We developed the following four alternative scenarios for the future of the NSW electricity industry:

- Owen Inquiry Proposal: A scenario based directly on the analysis and recommendations of the Owen Inquiry.
- Revised Owen: A scenario in which several of the key assumptions of the Owen Inquiry are revised based on the findings of the critical review in Section 3. We believe this scenario is much more plausible than the Owen Inquiry scenario.
- Strong Climate Change Response (private): A scenario in which there is a strong government and business response to climate change, with the private sector taking the lead after privatisation of electricity assets
- Strong Climate Change Response (public): A scenario in which there is a strong government and business response to climate change, with the NSW Government taking the lead after retaining electricity assets.

The four scenarios are summarised in Table 2. Sections 4.1 to 4.7 define the key elements of each scenario.

	<i>Scenario</i>			
	<i>Owen Inquiry Proposal</i>	<i>Revised Owen</i>	<i>Strong Climate Change Response (private)</i>	<i>Strong Climate Change Response (public)</i>
<i>Growth in energy demand by 2016-17</i>	12,720 GWh (16% increase)	10,720 GWh (13% increase)	5,830 GWh (7% increase)	5,830 GWh (7% increase)
<i>Timing of new baseload</i>	2013-14	2013-14	2016-17	2016-17
<i>Likely fuel source to meet demand growth</i>	Coal for baseload; gas for intermediate and peaking load	Existing energy efficiency measures, new natural gas CCGT and new renewable energy generation	New energy efficiency measures and new renewable energy generation	New energy efficiency measures and new renewable energy generation
<i>Cost to State of continued public ownership⁴</i>	\$12-15 billion (NPV = \$6.2 billion)	\$6-8 billion (NPV = \$3.4 billion)	\$6.4-8.4 billion (NPV = \$3.4 billion)	\$6.4-8.4 billion (NPV = \$3.4 billion)
<i>Impact of privatisation on State finances</i>	Net benefit of \$77 million per year	Net loss of \$295 million per year to net benefit of \$387 million per year	Net loss of \$295 million per year to net benefit of \$387 million per year	Net loss of \$295 million per year to net benefit of \$387 million per year
<i>Fate of assets</i>	Privatised	Depends on sale price	Privatised	Public retention
<i>2016-17 GHG emissions (relative to 2007-08)</i>	14% increase	8% increase	3% reduction	3% reduction

Table 2: Summary of scenarios.

4.1 Energy demand

One of the clearest failings of the Owen Report is that existing energy efficiency measures are not adequately accounted for in demand projections and the potential for a suite of additional energy efficiency measures to deliver the equivalent of a baseload power station is not analysed. Clearly, it is more difficult to model the combined impact of a diverse set of energy efficiency measures than it is to model the impact of a single power station. Nevertheless, the available evidence indicates that energy efficiency is the most cost-effective way to ensure that demand does not outstrip supply, while achieving substantial greenhouse

⁴ NPV = net present value. This is the discounted present value of future cash flows used to compare the commercial merit of alternative scenarios. In this case, we have used a discount rate of 12%, which is typical for investment decisions.

benefits (IPCC 2007; McKinsey Global Institute 2007; MMA 2004; The Allen Consulting Group 2004; The Climate Institute 2007).

Strong pursuit of energy efficiency, facilitated by the NSW Government, would be the cornerstone of an alternative approach. At worst, it will buy time before a new baseload power station is needed, allowing a more measured approach without the urgency recommended by the Owen Report. At best, it could buy sufficient time to ensure that the next major power station built in NSW is a low-emission power station.

Section 4.6 of the Owen Report collects together a list of energy efficiency options for the NSW Government to consider as part of its ongoing policy development process (Owen 2007, p.4-20). The options cover pricing issues, energy efficiency in homes, energy efficiency in commercial buildings, energy efficiency of appliances, industrial energy efficiency and energy efficiency trading. It is disappointing that the opportunity to model and evaluate the impact of these options was missed. For the NSW Government, evaluating the impact of these energy efficiency options on future demand and greenhouse gas emissions, and identifying ways to implement them, should be a higher priority than pursuit of privatisation.

It is not the purpose of this report to provide a detailed evaluation of the potential of specific energy efficiency measures. However, to identify plausible energy demand scenarios, we have undertaken review and analysis of the potential of energy efficiency in NSW.

4.1.1 Owen Inquiry assumptions

The Owen Inquiry assumes growth in electricity consumption from 79,730 GWh in 2007-08 to 92,450 GWh by 2016-17, following TransGrid's medium growth scenario.

4.1.2 Revised Owen assumptions

Section 3.2.1 argued that the Owen Report failed to adequately consider the impact of existing energy efficiency measures on future demand, particularly those measures introduced during or after 2005-06. The impact of these measures is explicitly included under the Revised Owen scenario. Some of the significant measures that need to be accounted for include:

- Increase and expansion of BASIX energy targets (NSW)
- The Energy Savings Fund (NSW)
- The Climate Change Fund (NSW)
- Energy Savings Action Plans (NSW)
- The Energy Efficiency Opportunities program (Australia-wide)
- Other National Framework for Energy Efficiency measures (Australia-wide).

None of these existing measures would have achieved discernible savings prior to 2005-06 so their impact is ignored in the Owen Report.

Some data is publicly available on the savings achieved by the Energy Savings Fund. In Rounds 1 and 2 and the Public Facilities Program, the Energy Savings Fund provided \$29.5 million to projects that are expected to deliver electricity savings of 144 GWh per year (DEUS 2007). According to the Department of Environment and Climate Change, \$194 million has been allocated through the Energy and Water Savings Funds since 2005. Assuming that half is allocated to the Energy Savings Fund, and that this investment earns the same savings return as the projects identified above, the Fund will deliver energy savings of 473 GWh per year.

The Energy Savings Fund has now been incorporated into the NSW Climate Change Fund, which provides an additional \$340 million in funding, including:

- \$100 million Residential Rebate Program providing rebates for hot water systems, insulation and rainwater tanks
- \$30 million NSW Green Business Program
- \$30 million Public Facilities program
- \$100 million Recycling and Stormwater Harvesting Program
- \$40 million Renewable Energy Development Fund
- \$20 million School Energy Efficiency program
- \$20 million Rainwater Tanks in Schools program.

The Department of Environment and Climate Change (DECC 2007) estimates that the programs under the NSW Climate Change Fund will achieve the following savings:

- Residential solar hot water and insulation rebates – no estimates available
- NSW Green Business Program – 65 GWh per year
- Renewable Energy Development Program and Public Facilities Fund – 90 GWh per year
- School Energy Efficiency Program – no estimates available.

Therefore, the total known savings from the Energy Savings Fund and the Climate Change Fund add up to 628 GWh per year. However, this excludes the impact of the residential solar hot water and insulation rebates and the School Energy Efficiency Program.

An analysis of three programs under the National Framework for Energy Efficiency (NFEE) – Mandatory Energy Performance Standards, Energy Efficiency Opportunities and commercial and residential building code regulation programs – finds a projected national saving of 1,167 GWh per year by 2015 at a net GDP benefit of \$380 million per year (NFEE 2007). NSW consumes 32% of all electricity in Australia, so it is reasonable to assume that a similar proportion of these savings would occur in NSW, giving a saving of 373 GWh per year. This gives cumulative savings of 1,001 GWh per year when combined with the Energy Savings Fund.

Savings for the other listed programs are difficult to determine without more detailed analysis, which is beyond the scope of this report. A plausible assumption for the purpose of the Revised Owen Scenario is that the other measures that have not been specifically assessed above, including the Energy Savings Plans, BASIX, residential solar hot water and insulation rebates and changes to Mandatory Energy Performance Standards under the NFEE, will deliver additional savings of 1,000 GWh per year. This would deliver a total reduction in electricity demand of 2,000 GWh per year from TransGrid's medium growth scenario by 2016-17. The NSW Government should specifically evaluate the impact of all existing energy efficiency measures on electricity demand to determine whether this scenario is plausible.

4.1.3 Strong Climate Change Response assumptions

Under the two Strong Climate Change Response assumptions, there is stronger pursuit of energy efficiency, going well beyond existing measures. To understand how much demand could be reduced by 2016-17, we have reviewed several assessments of energy efficiency potential in Australia.

The National Framework for Energy Efficiency (NFEET) is a package of measures to improve energy efficiency in the stationary energy sector, supported by all Australian governments. Stage 1 commenced in December 2004 and will run until June 2008; Stage 2 will commence on 1 July 2008 (NFEET 2007). Modelling undertaken during the development of the NFEET showed that a National Energy Efficiency Target to reduce business as usual electricity demand by 1.5% per annum, if ramped up quickly, could deliver national energy savings in the order of 22,500 GWh/year by 2016-17 (MMA 2004). If savings in NSW were proportional to its share of electricity consumption, this would translate to a saving of around 7,000 GWh/year. Importantly, this target would deliver national savings of \$6.6 billion in net present value terms (MMA 2004).

Focusing on NSW, Diesendorf (2005) estimated that efficient energy use could achieve a reduction in NSW electricity consumption of 5,306 GWh per year by 2010 (for programs starting from 2005). Savings would increase over time, so a program starting in 2008 could deliver greater savings than this by 2016-17.

In research commissioned by The Climate Institute, Saddler (2007) examines the national potential of some specific energy efficiency measures in the residential and commercial sectors. In the residential sector, Saddler finds potential savings of 11,000 GWh per year focusing on existing buildings alone, for programs implemented over the next 15 years. In the commercial sector, Saddler finds potential savings of 19,500 GWh per year in existing buildings for programs implemented over the next 15 years. Assuming half of this potential is delivered by 2016-17 gives savings of 20,300 GWh per year, of which 6,500 GWh per year would be delivered in NSW. This is without considering the impact of additional measures for new buildings.

To realise TransGrid's low-growth scenario, a reduction in demand of 6,890 GWh per year needs to be delivered by 2016-17. The studies cited above demonstrate that this is feasible, particularly when the impact of existing measures is added. Realising the potential would require strong measures to remove recognised barriers to energy efficiency measures. The Strong Climate Change Response scenario assumes strong government action on energy efficiency to deliver TransGrid's low-growth scenario.

Some specific measures that should be considered include:

- Working with other Australian governments to establish a National Energy Efficiency Target. Senator Lyn Allison of the Australian Democrats introduced a private Senator's bill to the Australian Parliament in 2007 to establish a national market driven energy efficiency target. The National Market Driven Energy Efficiency Target Bill 2007 proposed to amend the Renewable Energy (Electricity) Act 2000 to introduce an energy efficiency trading scheme. This Bill provides an excellent foundation for a national energy efficiency target.
- Phase out the use of electric storage water heaters, replacing them with solar water heaters, electric heat pumps and natural gas water heaters. A large portion of baseload demand in NSW is artificially created by the practice of running off-peak water heaters overnight. According to analysis by the NSW Greens, a rapid phase-out of electric off-peak water heaters could save between 1,267MW and 2,189MW of overnight demand (Frew 2007). This, in turn, would increase the viability of solar technologies (solar thermal and photovoltaics) that provide power during daylight hours.
- Increase the BASIX requirements for high-rise residential buildings to match those for low-rise buildings
- Undertake a major energy efficiency retrofit program for existing buildings, including at least solar hot water and insulation, and focusing particularly on low-income households (for example, all suitable public housing)

- Mandate efficiency standards for commercial buildings, such as a 5-star Australian Building Greenhouse Rating
- Provide incentives for the use of cogeneration or trigeneration in residential high-rise and commercial buildings.

One of the failings of the Owen Report is that it did not investigate these and other energy efficiency options in detail to identify their potential contribution to greenhouse gas emission reduction and baseload deferral. No decision on privatisation should be made until the potential of these initiatives is appropriately investigated.

4.2 Timing of new baseload

4.2.1 Owen Inquiry assumptions

The Owen Report assumes that new baseload is required by 2013-14, as this is the point at which demand exceeds estimated supply under the TransGrid medium growth scenario.

4.2.2 Revised Owen assumptions

Under the Revised Owen scenario, the timing of new baseload investment is unchanged. Existing energy efficiency measures slightly reduce demand by 2013-14 but not enough to prevent the need for new baseload investment.

4.2.3 Strong Climate Change Response assumptions

Under the Strong Climate Change Response scenario, electricity demand follows TransGrid's low growth scenario, which means that additional baseload would not be required until 2016-17 (as this is the year in which demand exceeds available generation capacity of 85,000 GWh per year).

4.3 Scale and type of power station investment

4.3.1 Owen Inquiry assumptions

The Owen Report assumes that natural gas will supply intermediate and peaking loads via 750MW of new open cycle gas turbines and 770MW of new combined cycle gas turbines to commence operation between 2009-10 and 2011-12. A new coal-fired power station would provide additional baseload, delivering new capacity of 2,000MW between 2012-13 and 2015-16 (Owen 2007, p.A6-2). The cost of this new generation investment is estimated at \$7 billion to \$8 billion.

4.3.2 Revised Owen assumptions

Section 3.4 demonstrates that the scale of investment required to meet future demand is overestimated in the Owen Report. Under the Revised Owen scenario, future baseload requirements are met using combined cycle gas turbines and renewable energy, in recognition of the impact of the new Federal Labor Government's policies to implement emissions trading by 2010, achieve a 60% reductions in emissions by 2050 and increase renewable generation to 20% by 2020.

The Labor Government's 20% MRET will deliver an additional 32,000 GWh per year of renewable generation by 2020, based on ABARE (2006) projections. Assuming this is delivered in equal annual increments between 2010 and 2020, and that NSW receives a share of this new renewable energy proportional to its current share of electricity generation, new renewable generation exceeds the TransGrid non-scheduled energy forecasts by 2014-15. This means that renewable energy begins to make an additional contribution by 2014-15 that reduces the necessary scale of natural gas investment. The additional contribution reaches 3,200 GWh in 2016-17 and 5,900 GWh by 2019-20. To realise this scenario, the NSW

Government may need to take specific steps to ensure that NSW receives a proportional share of new renewable investment, or can access it through interconnectors.

After the impact of existing energy efficiency measures and new renewable generation under MRET is considered, the only additional baseload investment required is 385MW of CCGT to be delivered by 2013-14 and an additional 385MW of CCGT in 2017-18 (assuming a capacity factor of 70% as per the Owen Report. This capacity would deliver 2,400 GWh of additional generation by 2016-17 and 4,722 GWh of additional generation by 2019-20, which is sufficient to meet identified shortfalls when combined with existing energy efficiency measures and new renewable generation under MRET.

Using the assumptions from Owen (2007, p.A6-5), the cost of this new generation would be \$393 million in 2013-14 and \$385 million in 2017-18, for a total investment of \$778 million. No additional investment in energy efficiency is required under this scenario. There would be additional investment in renewable energy generation in response to MRET, however private investors (and ultimately consumers) would pay for this to meet regulatory requirements, so there would be no impact on State finances and no need for intervention by the NSW Government.

4.3.3 Strong Climate Change Response assumptions

Under the Strong Climate Change Response scenario, no additional baseload is required until 2016-17 due to the impact of new energy efficiency measures. Further, the new baseload requirement is entirely met by new investment in renewable energy under the new Federal Labor Government's expanded MRET scheme through to 2019-20. The combined impact of new energy efficiency measures and new renewable generation is to avoid or supply an additional 15,600 GWh per year in NSW by 2019-20, which is more than sufficient to prevent shortfalls.

4.4 Cost to the State of continued public ownership

4.4.1 Owen Inquiry assumptions

Under the Owen Inquiry scenario, the estimated cost to the State budget of the status quo is \$12-15 billion. This comprises \$7-8 billion for power station investment, \$2-3 billion to make the State-owned retailers more competitive and \$3-4 billion to retrofit coal-fired power stations with carbon reduction technologies. The Owen Report assumes that the costs will be spread over time so that \$750 million is required annually between 2008-09 and 2013-14 and \$1.5 billion annually between 2014-15 and 2019-20 (Owen 2007, p.A6-10). The net present value of this investment is \$6.2 billion (at 12% discount rate).⁵

4.4.2 Revised Owen assumptions

Under the Revised Owen scenario, the estimated cost to the State budget of the status quo falls to \$6-8 billion. The investments in the State-owned retailers and in future carbon reduction technologies are unchanged. However, the investment in baseload power falls substantially. New CCGT power stations require \$778 million. We have allowed another \$220 million in investment to encourage renewable generation in NSW, to ensure that the assumptions about the contribution of renewable energy are achieved. This could be delivered as a government subsidy to renewable energy generators in NSW of \$21/MWh, which should be sufficient to attract significant renewable energy investment to the State. This subsidy would be delivered on top of any incentives delivered through an expanded MRET and emissions trading. It could be specifically targeted to renewable energy generators that would contribute to baseload. The net present value of investment under this scenario is \$3.4 billion (at 12% discount rate).

⁵ As noted earlier, a 12% discount rate is a typical rate used to make commercial investment decisions, in both the public and private sector.

4.4.3 Strong Climate Change Response assumptions

Under the Strong Climate Change Response scenarios, all future demand is met through new energy efficiency measures and new renewable energy delivered under MRET. Section 4.1.3 indicated that a National Energy Efficiency Target sufficient to ensure that electricity demand in NSW follows the TransGrid low growth scenario would have a net economic benefit. The Target would not necessarily have any direct impact on public expenditure – liable parties would need to invest in energy efficiency to comply with the target but would recoup this investment over time. However, in practice, the NSW Government would likely provide funding support to assist with implementation of energy efficiency measures.

As part of the modelling for the NFEE, EMET examined the energy efficiency potential in the commercial sub-sectors (EMET 2004a) and residential sector (EMET 2004b). EMET identified measures with a total implementation cost of \$14.3 billion with payback periods up to six years. Assuming the opportunities available in NSW are proportional to its electricity consumption, the implementation cost of available measures would be \$4.6 billion. A reasonable assumption under the Strong Climate Change Response scenarios is that the NSW Government would provide funding to support uptake of these opportunities amounting to one quarter of this figure, or \$1.2 billion. The beneficiaries of these opportunities would need to provide the remaining \$3.4 billion, which is entirely reasonable given that these opportunities have short payback periods. The funding would be spread evenly over 12 years and would be prioritised towards measures with longer payback periods.

As with the Revised Owen scenario, we have also assumed \$220 million in investment to support renewable energy in NSW. The investments in the State-owned retailers and in future carbon reduction technologies are unchanged. This gives total investment of \$6.4-8.4 billion, with a net present value of \$3.6 billion.

4.5 *Impact on State finances of privatisation*

4.5.1 Owen Inquiry assumptions

The Owen Report finds that retention of the existing assets would increase State debt by \$12.8 billion by 2020. It assumes a sale price for the assets of \$10 billion. Consequently, if all of the sale proceeds were used to retire debt, then State debt in 2020 could be \$22.8 billion lower as a result of privatisation.

However, as argued in Section 3.5.1, any additional investment in the electricity sector should earn a return that is sufficient to cover the cost of that investment. This is particularly likely given the NSW Government's lower cost of capital compared to its private sector competitors. Further, the revenue from sale of the assets needs to be balanced against the loss of income from the assets. As shown in Section 3.5.1, the net benefit to State finances under the Owen Inquiry scenario is only \$77 million per year.

4.5.2 Revised Owen assumptions

Under the Revised Owen scenario, the investment required if the existing assets are retained is much less - \$6-8 billion. Again, this investment should earn a rate of return that at least covers the cost of the investment, so the net impact on State finances would be zero (or better). The net impact of privatisation therefore depends on the sale price obtained compared to the income received from the assets.

If the assets sold for \$4 billion, the reduction in interest payments would be \$248 million per year (at 6.2 per cent). If the assets sold for \$15 billion, the reduction in interest payments would be \$930 million per year. As the income from the assets is \$543 million per year, the net impact of privatisation ranges from a negative impact of \$295 million per year to a positive impact of \$387 million per year, depending on the sale price.

4.5.3 Strong Climate Change Response assumptions

The Strong Climate Change Response scenarios make the same assumptions as the Revised Owen scenario.

4.6 Fate of assets

4.6.1 Owen Inquiry assumptions

Under the Owen Inquiry scenario, the State's generation and retail assets are divested. The most likely approach is sale of retail assets and a long-term lease of generation assets. Although the Owen Report states a preference for sale of generation assets ((Owen 2007, p.7-9), a long-term lease is more likely to ensure consistency with the Premier's statement in Parliament on 9 May 2007 that 'there will be no sale of electricity generation, transmission or distribution' (Owen 2007, p.xiii). In other words, the choice of a long-term lease is a political choice, rather than an economic one. In practical terms, there will be no difference between sale of the assets and a long-term lease.

4.6.2 Revised Owen assumptions

Under the Revised Owen scenario, the fate of the assets would depend on negotiations with possible purchasers. If the likely sale price were high enough to ensure a positive impact on State finances, then privatisation would take place. If not, then the assets would be retained in public ownership. However, a key risk with this scenario is that sale of the assets would become inevitable once a process of negotiating with buyers commenced, regardless of the price obtained.

4.6.3 Strong Climate Change Response assumptions

There are two variants on the Strong Climate Change Response scenario. Under one variant, the State's generation and retail assets are divested. This achieves separation of regulation and ownership for the generation and retail sectors and potentially allows the NSW Government to adopt a strong regulatory approach on climate change without any conflict of interest. However, the NSW Government's retention of transmission and distribution businesses will still provide an incentive for greater electricity consumption under existing regulatory arrangements, as the profit of these businesses is linked to throughput.

Under the other variant, the State retains its generation and retail assets and takes a leadership role in climate change response as both an owner and regulator. The NSW Government would need to act to transform the retail businesses into Energy Service Companies (ESCOs) with a strong focus on energy efficiency. It would also need to take action to reduce emissions from its coal-fired power stations or develop a plan for their retirement.

4.7 Greenhouse gas emissions

4.7.1 Owen Inquiry assumptions

Under the Owen Inquiry scenario, total electricity consumption grows from 79,730 GWh in 2007-08 to 92,450 GWh in 2016-17, an increase of 12,720 GWh of electricity per year. Using current full fuel-cycle emission factors for electricity consumption in NSW (1.068 kg CO₂-e per kWh from AGO 2006), greenhouse gas emissions in 2007-08 are 85 Mt CO₂-e.

The increase in electricity demand would be met by increased use of existing generators and new generation. Existing generators can supply up to 85,100 GWh, providing an additional 5,370 GWh per year (Owen 2007, p.2-10). Assuming this increased generation has the same emissions factor as current generation, the increase in emissions would be 5.7 Mt CO₂-e. The remaining 7,350 GWh would come from new generation, primarily a 2,000MW ultra-supercritical coal-fired power station with a greenhouse intensity of 785-820 kg/MWh

(Owen 2007, p.3-15). Greenhouse gas emissions associated with this new power station would be 5.8 Mt CO₂-e in 2016-17, assuming the lower range greenhouse intensity.

Therefore, the Owen Inquiry scenario delivers an increase in greenhouse gas emissions of 11.5 Mt CO₂-e by 2016-17. This is a 14% increase in emissions from NSW electricity generation, making it very difficult for NSW to meet its target of stabilising greenhouse gas emissions at 2000 levels by 2025 (NSW Greenhouse Office 2005) and for Australia to meet its commitments under the Kyoto Protocol.

4.7.2 Revised Owen assumptions

Under the Revised Owen scenario, growth in electricity demand is lower, with an increase of 10,720 GWh per year by 2016-17. This means that the energy that needs to be supplied by new power stations falls to 5,350 GWh per year. Approximately 3,100 GWh per year of this energy would be met by new renewable energy investment under MRET that is not included in the TransGrid medium growth scenario. This leaves 2,250 GWh per year that would need to be supplied by a new baseload CCGT power station, with a greenhouse intensity of 350 kg/MWh. Greenhouse gas emissions from this power station would be 0.8 Mt CO₂-e in 2016-17. Therefore, total greenhouse gas emissions from the Revised Owen scenario would increase by 6.5 Mt CO₂-e in 2016-17, an increase of 8% on 2007-08 emissions.

4.7.3 Strong Climate Change Response assumptions

Under the Strong Climate Change Response scenarios, electricity demand increases by 5,830 GWh per year by 2016-17. All of this new demand is met by new investment in renewable energy generation under MRET. In fact, the new renewable energy investment is sufficient to displace 2,700 GWh per year of generation from the 85,100 GWh per year that existing plant can deliver. This means that there would be a small reduction in emissions under the Strong Climate Change Response scenarios – about 2.9 Mt CO₂-e by 2016-17 (a 3% reduction in emissions).

5 Conclusion: A sustainability assessment

5.1 Climate change response

On the key question of climate change response, it is clear that the Owen Inquiry scenario and the Revised Owen scenario fail to deliver what is needed. Both would deliver substantial increases in emissions over the next ten years, at a time when we need to stabilise and reduce emissions. The two Strong Climate Change Response scenarios deliver a 3% reduction in emissions over the next ten years, which is consistent with the NSW Government's target of stabilising greenhouse gas emissions at 2000 levels by 2025 (NSW Greenhouse Office 2005).

5.1.1 Asking the right questions

Perhaps the most serious criticism of the Owen Report is that it asks the wrong questions. In a time when urgent action is needed to avoid dangerous climate change, the Owen Report takes future electricity demand as given and asks how we can best continue to build fossil fuel power stations to supply that demand. This is old thinking. If we are to avoid dangerous climate change, we can no longer afford to increase energy demand at the rate we have in the past and we can no longer use greenhouse-intensive power stations to meet that demand. A coal-fired power station built now might continue to emit greenhouse gases for 40 or 50 years. While there is a possibility that it could be retrofitted with carbon capture and storage technology, it is far from certain that this technology will ever be commercially feasible, particularly in comparison to other available options. In a carbon-constrained world, we can no longer afford 'business as usual' thinking. This is particularly the case now that Australia has committed to ratification of the Kyoto Protocol.

The right questions for the NSW Government to ask about the NSW electricity industry are:

- What level of greenhouse gas reduction is required in the NSW electricity industry to contribute to avoiding dangerous climate change?
- What are the most cost-effective technological and institutional measures for achieving this target in the NSW electricity industry, while maintaining a reliable supply?
- How can these measures be rapidly deployed to achieve the target?

The cost of climate change will dwarf any of the costs considered in the Owen Report and it is on this much bigger issue that the NSW Government should be focusing its attention.

5.1.2 Low emission baseload

The Owen Report contends that the only viable technologies to deliver baseload power in the necessary timeframe are coal or gas-fired generation. Construction of a coal-fired power station that is not fitted with carbon capture and storage to greatly reduce its emissions is inconsistent with the urgency of climate change response and should not be supported by the NSW Government. If additional baseload capacity is needed by 2013-14, then construction of a combined cycle gas power station, with less than half the emissions of coal, is a preferable option.

The Strong Climate Change Response scenarios demonstrate that future demand can be met through a combination of new energy efficiency measures and new renewable energy, consistent with the requirements of an expanded MRET of 20% by 2020. This raises the prospect that NSW could leap to low-emission baseload power to meet future needs without building any additional high-emission power stations. A combination of renewable energy sources that are currently viable, particularly wind power and biomass, could provide a viable substitute for baseload now. Further support for these technologies, and other small-scale generation technologies, could be provided via a feed-in tariff. Feed-in tariffs have been used successfully in Europe to stimulate the development of renewable energy (World

Future Council 2007). Under a feed-in tariff, grid operators are obliged to give grid access to renewable energy and to purchase the electricity at premium prices.

Other Australian States are moving ahead with feed-in tariffs. In South Australia, the *Electricity (Feed in Scheme – Residential Solar Systems) Amendment Bill 2007* allows domestic customers who operate a small-scale grid-connected photovoltaic electricity system to receive 44 cents per kilowatt-hour of electricity fed back into the grid - twice the standard retail price (Government of South Australia 2007). In addition, the Queensland Government (2007) has committed to introduce a feed-in tariff for solar power and the ACT Government (2007) has committed to introduce a feed-in tariff for renewable micro-generation. The NSW Government has not announced any plans to consider or implement feed-in tariffs; this option should be explored as a high priority, given its success in driving renewable energy internationally.

In the longer term, technologies that could become viable over the coming years include:

- Geothermal hot rocks – the Geodynamics submission to the Inquiry indicated that it expects to deliver 500MW of baseload capacity to the NEM by 2014-2016. In addition: ‘Phased development of the hot fractured rock resource beyond this time will see the geothermal industry able to provide some 4,000 MW of capacity for the NEM over the next 15 years to 2030’ (Williams 2007).
- Large-scale solar thermal power – as noted in Section 3.3, the company established by Australia’s Dr David Mills (Ausra) has signed an agreement with several American utilities to deliver at least 1,500MW of solar thermal power in the United States over the next five to seven years (Ehrlich 2007). If this technology is not already viable, its viability should improve during this five to seven year period.
- Carbon capture and storage – CCS technology is the subject of a great deal of research, development and commercialisation funding and may become available from 2015 (IPCC 2007).

The existence of these prospective low-emission technologies provides further incentive to strongly pursue energy efficiency to allow time for these technologies to become available. In addition, the NSW Government should provide specific support for each of these technologies to assist them to become available in time to meet any future baseload shortfall. If NSW is to meet its target of reducing greenhouse gas emissions by 60% by 2050, it needs to be developing and supporting low-emission baseload technologies now.

5.2 Ownership and investment strategy

This report has shown that sale of the State-owned generation and retail assets is not the only option available to fund further investment in the NSW electricity industry. Other options are available, with varying degrees of public and private sector investment. The scenarios presented in Section 4 indicate that privatisation could have a net benefit to the State’s finances but could equally have a net negative impact, depending on the sale price.

Strong climate change response is possible under either public or private sector ownership but would have different characteristics. These are considered below.

5.2.1 Private ownership

The Strong Climate Change Response (private) scenario has the NSW Government pursuing strong climate change response in a regulatory role and not as the owner of generation and retail assets. An advantage of this scenario is that it achieves a definite separation of regulation and ownership in the generation and retail sector, removing some of the potential for regulatory conflict of interest. The NSW Government would potentially be able to pursue stronger regulation on greenhouse gas emissions without being concerned about the impact on its own assets. However, the NSW Government’s continued ownership of transmission

and distribution businesses would continue to create a conflict due to the link between profit and energy transmitted. Nevertheless, private investment in energy efficiency and renewable energy could proceed with a degree of certainty, knowing that the NSW Government would not use its assets to intervene in the electricity market.

However, this scenario has some important disadvantages. During the sale process, purchasers may seek concessions that will insulate them from the commercial risk associated with future greenhouse gas regulation. Current uncertainty over greenhouse gas regulation may also put downward pressure on the price paid for the assets. Further, once the generators are in private hands, the new owners will have every incentive to ensure that they keep operating for as long as possible with minimal emission reduction requirements. The NSW Government would need to resist the temptation to provide concessions to increase the sale price and would need to establish a clear timetable for greenhouse gas reduction, in collaboration with the Australian Government. This likely means holding off on any sale process until late 2008 while the structure of a future emissions trading scheme becomes clear.

5.2.2 Public ownership

The Strong Climate Change Response (public) scenario sees the NSW Government retain its ownership of the generators and retailers and use this ownership to take strong direct action to respond to climate change. It could act to transform its retailers into energy service companies (ESCOs) focused on delivery of energy services with the lowest greenhouse intensity. It could act quickly to either reduce the greenhouse intensity of its coal-fired power stations or establish a timetable for their retirement. This ability to act urgently and directly is an important advantage of this scenario.

5.2.3 Recommended approach

A recommended approach is outlined below, with several variations.

The NSW Government should retain the State-owned generation and retail assets and invest as necessary to maintain the viability of these assets and reduce their environmental impact. This will definitely require some investment in the retail businesses to transform their business models; this is discussed in more detail in Section 5.2.4. The NSW Government should also invest strongly in energy efficiency and low-emission baseload technologies, and may also need to invest in carbon-reduction technologies at existing coal-fired power stations in the future.

We do not accept the Owen Report's assertion that this approach would lead to the public sector funding all future investment in the NSW electricity industry. The private sector has already shown its willingness to invest in the NSW electricity industry under the current arrangements, through the Tallawarra and Uranquinty gas-fired power stations and the proposed Silverton Wind Farm. Additional private sector certainty should be provided through a clear policy statement from the NSW Government on the conditions that would cause it to intervene to ensure supply security. The NSW Government could also choose to offer suitable sites for sale to interests that wish to develop low-emission baseload power, while retaining existing generation assets.

The impact of this strategy on State finances would be far less serious than indicated by the Owen Report. Even with strong investment in energy efficiency and low-emission technologies, the scale of investment will be much less than the \$12 to \$15 billion indicated by the Owen Report. An investment in the order of \$6-8 billion is more likely. Further, this investment will earn a rate of return, delivered through ongoing dividends to the NSW Government and profit accrued by the State-owned businesses. This revenue could, and should, be used to invest in the transformation to a low-carbon electricity sector. The State's credit rating is unlikely to be threatened by additional debt that will earn a reasonable rate of return. Further, as discussed in Section 3.5.1, the financial impact of a downgraded credit rating would be minimal if it was to occur.

Ultimately, electricity consumers will fund any investment in the NSW electricity industry, whether public or private, through their electricity bills. Public retention of existing assets and strong investment in energy efficiency offers the strongest potential to keep electricity bills down.

5.2.4 Energy service companies

One of the key arguments in the Owen Report is that the State-owned retailers are operating an outdated business model that reduces their viability in competition with vertically integrated competitors. The solution put forward by the Owen Report is to sell the retailers so that they can be incorporated into vertically integrated entities. Another way to transform the business model employed by the retailers is to transform them into energy service companies (ESCOs).

ESCOs assist end-users to meet their energy service requirements at minimum economic and environmental cost through appropriate use of distributed resources' (Outhred and MacGill 2006, p.2). An energy service is a need that is met using energy, such as lighting, heating or cooling. End users do not care how much or what kind of energy is used to provide this service, as long as the service is provided. The most cost-effective way to deliver an energy service may not be through centralised provision of electricity – it may be cheaper to install efficient equipment and deliver less electricity or install distributed generation. ESCOs work with customers to deliver energy services in the most appropriate way.

For existing retailers to successfully transition into ESCOs, they will need to be able to capture all of the value of their services. This means:

- Being paid by end-users for the energy services they provide
- Being able to sell greenhouse gas reductions through an emissions trading market
- Being paid by network owners for reducing peak demand and reducing network augmentation costs.

At the end user interface, ESCOs can provide financing options through electricity bills to cover the cost of energy efficiency installations. For example, an ESCO might install a solar water heater to replace an electric storage water heater and recover the capital cost through the savings on the electricity bill. The customer would see no difference in their bill until the capital cost was paid off but would not be exposed to the capital cost.

The ESCO would then need to be able to sell any greenhouse gas reductions through an emissions trading market as an additional revenue stream. This is already possible in NSW through GGAS and several ESCOs have emerged in response to GGAS, such as Easy Being Green. However, as noted by the Owen Report, a national emissions trading scheme is unlikely to include demand-side abatement measures to avoid double counting (Owen 2007, p.4-25). The NSW Government should promote specific measures to ensure that ESCOs are compensated for demand-side abatement, either through compulsory payments from liable parties or a separate energy efficiency trading mechanism (as proposed in the Owen Report).

The NSW D-Factor, introduced in IPART's 2004 review of NSW electricity distribution pricing, provides a mechanism by which distribution network service providers (DNSPs) can recover demand management implementation costs and revenue foregone as a result of demand management activities (IPART 2004). The D-Factor is a component of the weighted average price cap for DNSPs that allows recovery of:

- approved non-tariff-based demand management implementation costs, up to a maximum value equivalent to the expected avoided distribution costs
- approved tariff-based demand management implementation costs

- approved revenue foregone as a result of non-tariff-based demand management activities (IPART 2004).

Under the D-Factor rules, demand management activities can be undertaken on behalf of the DNSP, which means that an ESCO could reach an agreement to be paid by a DNSP for the network benefit associated with its demand management activities. However, future regulation of the NSW electricity distribution networks will be the responsibility of the Australian Energy Regulator (AER). It is far from clear whether the AER will retain the D-Factor or any other incentives for demand management. The NSW Government should actively work with the AER to ensure that appropriate arrangements are in place to provide incentives for demand management and to ensure that ESCOs can be paid for network benefits associated with demand management they undertake.

5.3 Consumer impact

The four scenarios considered in Section 4 have quite different impacts on consumers. As argued in Section 3.5.2, the cost of energy service provision is higher under private ownership due to the higher cost of capital investment. This additional cost will inevitably be passed on to consumers. If the sale of generation and retail assets in NSW entrenches the growing dominance of AGL and Origin Energy in the NEM, then there will also be potential for the type of market concentration and upward price pressure that has occurred in the UK.

In addition to these short-term consumer impacts, there will be long-term consumer impacts under any scenario that does not respond urgently to climate change. These impacts are of two kinds. First, there are the negative impacts of climate change on the NSW economy. Stern (2006) estimated the social cost of carbon at US\$85/tonne, which means that every tonne of greenhouse gas emitted now adds US\$85 to the eventual cost of climate change. Eventually, all consumers will pay this cost. The higher emissions under the Owen Inquiry and Revised Owen scenarios contribute to a higher cost of climate change in the future.

Second, as demonstrated by Stern (2006), the cost of responding to climate change increases over time. Delayed response is more costly than responding now. The Owen Inquiry and Revised Owen scenarios delay serious climate change response and therefore incur greater eventual costs to consumers.

The only scenario that avoids the higher cost of private ownership and the higher cost of delayed climate change response is the Strong Climate Change Response (public) scenario. This scenario has clear benefits for consumers.

Regardless of whether the NSW electricity industry remains in public ownership or is sold to the private sector, there will be a need for improved customer protection measures to ensure that all customers continue to have affordable access to the essential service of electricity. Climate change response will inevitably put upward pressure on electricity prices over coming years. This is appropriate, as the price we pay for energy does not currently reflect its environmental cost. However, without appropriate customer protection measures, higher prices will increase the financial stress on low-income and disadvantaged households.

5.4 Concluding remarks

The scenario that strikes the best balance between environmental protection, economic well-being and consumer impacts is the Strong Climate Change Response (public) scenario. This scenario demonstrates that it is possible to achieve a reduction in greenhouse gas emissions over the next 10 years without the need for privatisation and without putting supply reliability at risk. The NSW Government should put its efforts into realising this scenario, rather than investing time and resources in an unnecessary and potentially counterproductive push for privatisation.

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