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16 FEB 2009

Mr Mike Buckley
General Manager
Network Regulation North Branch
Australian Energy Regulator
GPO Box 3131
Canberra ACT 2601

By email *AERInquiry@aer.gov.au*

Dear Mr Buckley

Australian Energy Regulator on the NSW Draft Distribution Pricing Determination 2009-2014

Thank you for the opportunity to comment on the Australian Energy Regulator (AER) Electricity Draft Determination on Distribution Network Pricing 2009-2014 (Draft Determination).

The City of Sydney recognises the need for investment in NSW's energy infrastructure, particularly in Sydney; however, we are concerned that the Draft Determination doesn't encourage progress towards long term sustainability.

Sustainable Sydney 2030 - our vision to make Sydney green, global and connected by 2030 - reflects our residents' aspiration for our local government area. Following the most comprehensive consultation on the future of our city, *Sydney 2030* outlines how we can significantly reduce greenhouse gas emissions and take a holistic approach to planning Sydney's future.

Through our consultations, we received a remarkably clear and consistent message: Sydneysiders are seeking a city that is more liveable and will continue as Australia's economic powerhouse. As a result, *Sydney 2030* includes a greenhouse gas emission reduction target of 70% by 2030 compared to 2006 levels.

The key to achieving this ambitious target is a co-ordinated effort to promote energy efficiency, renewable energy and the development of a local energy generation and distribution network that will deliver electricity, heating and cooling more cleanly, efficiently, and with lower emissions intensity. We believe this approach can achieve:

- lower future electricity costs for households and businesses;
- lower greenhouse gas emissions; and

- improved energy security and 'climate proofing' of energy infrastructure, without compromising regulated service quality and security of supply requirements.

Early action is crucial if we are to realise this target as we must forward plan investment in critical infrastructure. It is the City's view that instead of recommending investment in infrastructure that will transition the Australian economy towards an energy industry that will survive and flourish in a carbon constrained future, the Draft Determination and the regulatory proposals which underlie it appear centred around the business-as-usual model of electricity generation and distribution.

This will have the effect of locking Sydney into the existing modes of centralised energy supply and distribution.

This lack of strategic vision will cause even greater costs to be borne by the City and its communities in the longer term. These will be in addition to the alarming scale of the network tariff increase sanctioned by the Draft Determination of up to 172% for residential consumers that is likely to result in a doubling of customer electricity prices.

As the AER states in the Draft Determination: *"The increasing discrepancy between maximum demand and energy consumption growth reduces the overall efficiency of the networks and increases the need for effective and reliable demand management."*[1]

It is the City's view that greater focus needs to be placed on demand management and lower carbon dioxide generation and distribution options.

The City believes that it is the AER's role to create an energy sector that can effectively minimise financial and environmental costs to consumers by reducing the drivers behind energy consumption and peak load growth. A key element of that should be the fostering of options for innovation in electricity demand management. It is the City's view that the Draft Determination is contrary to those outcomes and that the AER must address the following key issues in formulating its final Determination:

- the AER should report on the implications of its network pricing Determination for typical residential and business customers' bills over the full period of the determination to 2014;
- the AER should report on the greenhouse gas emissions implications of the Draft Determination, particularly in relation to scenarios which include a greater proportion of demand management projects (including energy efficiency, load management, renewable energy and distributed generation);
- the Determination should facilitate major investment and innovation in demand management projects that reduce greenhouse emissions, energy consumption and peak demand growth;
- the AER should acknowledge that the Determination covers a period in which greenhouse emissions must start to decline in order to achieve Australian and State reduction targets. Implicit in this is a reduction of energy consumption (and perhaps even peak demand);

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[1] *Draft Decision New South Wales Draft Distribution Determination 2009–10 to 2013–14*, 21 November 2008, p. xxxvi

- the AER should clearly describe how its Determination provides effective incentives for EnergyAustralia and other energy providers to redirect their expenditure towards measures which moderate growth in energy consumption and peak demand; and
- if the AER believes it doesn't have the appropriate powers to protect consumers in these ways, it should clearly state this in its Determination.

AER needs to ensure that the Final Determination achieves the following outcomes:

1. explicitly states that it encourages EnergyAustralia and other distribution network businesses to redirect proposed distribution network investment costs into more sustainable and cost effective means (such as demand management), wherever this represents a lower cost than network augmentation;

2. considers and reports on the greenhouse gas emissions implications of the Final Determination relative to alternative investment options (such as greater investment in demand management);

3. supports open, competitive and transparent processes for identifying, procuring and implementing alternatives to network augmentation, wherever the cost-effectiveness (and greenhouse gas emissions) of "distributed energy options" is equivalent or lower than business-as-usual network investment practices;

4. either sets targets for demand management outcomes (as in California) or, if it considers it doesn't have the power to do this, indicate to Governments and the Australian Energy Market Commission whether it believes such targets are warranted;

5. ensure that EnergyAustralia and other distribution network businesses clearly and consistently report progress on the above items to the AER throughout the regulatory period (annually). If the AER considers it doesn't have the power to do this, then it should indicate to Governments and the Australian Energy Market Commission that it believes such reporting is desirable;

6. Allow EnergyAustralia and other distribution network businesses to invest in demand management a year or two prior to expected network capacity constraints, which would allow network businesses to better manage risk while building greater expertise in demand management;

7. commission a robust and transparent assessment of the potential for cost effective demand management, based on international best practice;

8. remove barriers for re-assigning customers to tariff classes particularly in relation to time of use tariffs;

9. report on the full network and retail price implications of its Determination;

10. ensure distributed generators receive the full benefit of avoided transmission use of system charges and distributor network businesses aren't disadvantaged in this process; and

11. address street lighting concerns raised in the Southern Sydney Regional Organisation of Councils' submission to the AER with specific regard to excessive increases of network charges, the high cost of energy efficient lighting types, and allowing access to Network Tariff 401 for Council-owned lighting.

The rationale for these recommendations is set out more fully in the attached paper.

The Draft Determination represents a major change from past pricing trends with unprecedented capital investment and retail electricity price increases. However, responding to climate change is likely to represent an even more fundamental change. Accordingly, the AER has a unique opportunity to drive investment in a new sustainable future for Australia whilst at the same time ensuring the long term reliability and security of energy supply.

The City urges the AER to revise its Draft Determination, and in doing so act to enable rather than obstruct efforts by the City, EnergyAustralia and others to address climate change and limit future costs to electricity consumers.

If the AER considers it doesn't have time to address the above issues in this Determination, the City recommends that the AER defer its decision, pending comprehensive consultation with the NSW community, for whom electricity prices may as much as double as a result of this decision.

I look forward to discussing any issues raised in this submission with you should you require further information. If you would like to speak to a Council officer about our submission, you can contact Chris Derksema, Manager Sustainability on 02 9265 9733 or at cderksema@cityofsydney.nsw.gov.au.

Yours sincerely

Clover Moore.

Clover Moore MP
Lord Mayor of Sydney

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Submission to the Australian Energy Regulator on the NSW Draft Distribution Network Pricing Determination 2009-2014

EXPLANATORY PAPER

Council of the City of Sydney[1]

Key messages:

- The AER should report on the implications of its network pricing determination for typical residential and business customers' bills over the full period of the determination to 2014.
- The AER should report on the greenhouse gas emissions implications of the Draft Determination, particularly in relation to scenarios which include a greater proportion of demand management projects (including energy efficiency, load management, renewable energy and distributed generation).
- The determination should facilitate major investment and innovation in demand management projects that reduce greenhouse emissions, energy consumption and peak demand growth.
- The AER should acknowledge that the determination covers a period in which greenhouse emissions must start to decline in order to achieve Australian and State reduction targets. Implicit in this is a reduction of energy consumption (and perhaps even peak demand).
- The AER should clearly describe how its determination provides effective incentives for Energy Australia to redirect its expenditure towards measures which moderate growth in energy consumption and peak demand.
- If the AER believes it does not have the appropriate powers to protect consumers in these ways, it should state this clearly in its determination.

1 Overview

1.1 Council Greenhouse Gas Emissions Reduction Target and Green Transformers Plan

The City of Sydney has a population of approximately150,000 and is a major commercial hub which contributes 8% of Australia's GDP.

The City's Sustainable Sydney 2030 Vision includes a target to achieve a 70% reduction in greenhouse gas (GHG) emissions from 2006 levels by 2030. Such a target is vital to demonstrate leadership in climate change abatement, and when implemented strategically, can not only reduce costs through improving efficiency, but also jointly achieve the goal of 'climate-proofing' the city's vital infrastructure for the benefit of its residents and businesses.

Of the City of Sydney's GHG emissions, 85% per cent are from the stationary energy sector, and this is where much of the cost-effective emissions reduction potential lies.

The key to achieving this ambitious target is a major coordinated effort to promote energy efficiency and renewable energy and the development of a network of Green Transformers across the City. These would incorporate cogeneration and trigeneration, and waste to energy plants that provide electricity, heating and cooling economically to consumers.

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[1] Prepared with the assistance of the Institute for Sustainable Futures at the University of Technology Sydney.

A network of Green Transformers could supply 330MW of power by 2030 and it is projected that this would supply 70% of the City's electricity requirement, deliver a 20% reduction from business as usual greenhouse gas emissions, and when combined with renewable energy supplies, eliminate dependence on coal fired electricity generation, while deferring investment in new power stations and network augmentation.

For the planned potential of these green energy options to be realised by 2030, early action is crucial, due to the lead times and forward planning involved in critical infrastructure investment. Thus, to initiate the transition towards a distributed and diversified lower carbon energy supply for the CBD, the City of Sydney has recognised the urgent need to address the barriers to planning and investment in greener energy options. In particular, as Energy Australia will be the main provider and funder of energy infrastructure to the City of Sydney over this period, it is essential that Energy Australia actively supports these plans. To this end, the City of Sydney has begun discussions with Energy Australia regarding collaboration opportunities in developing the City's energy plans. For Energy Australia to be able to play this role, it is essential that the economic regulation administered by the AER is supportive.

1.2 Implication of Regulatory Proposals and AER Draft Determination

The Council believes that the implications of the Draft Determination are not widely appreciated in the community and the AER should do more to bring these issues to public attention.

In June 2008, Energy Australia's regulatory proposal to the AER outlined plans for $8.659 billion investment in network infrastructure[2] – of which $612 million is earmarked for network investment in the "Sydney CBD Area Plan", covering two new zone substations and increased downstream capacity.[3]

The AER's NSW Draft Distribution Network Pricing Determination 2009-2014, based on the regulatory proposals submitted by Energy Australia and other utilities, largely approved Energy Australia's proposed network investment plan, with a 2.6 per cent reduction in the original estimate of capital expenditure. Energy Australia's revised proposal (January 2009) reflects some revisions in methodologies and lowered cost calculations in response to the AER Draft Determination. However, the plans for massive investment in replacing and upgrading network infrastructure remain largely unchanged.

The proposed network investment costs are to be funded through steep increases in the network component of the consumer electricity prices. This has significant financial implications for the City and all of its resident businesses and constituents, and in particular, for vulnerable consumers.

As illustrated in Figure 1, the AER Draft Determination involves a proposed network tariff increase of as much as 172% for domestic customers; that is, almost a trebling in network prices. As network charges comprise about 50% of the total electricity price, this is likely to result in a doubling of the total retail price paid by households in the City of Sydney area. Network charges for smaller business (those connected at the low voltage level) are expected to rise by 145%. Network distribution charges for street lighting, which are borne by local government, are also due to increase by 150%.[4]

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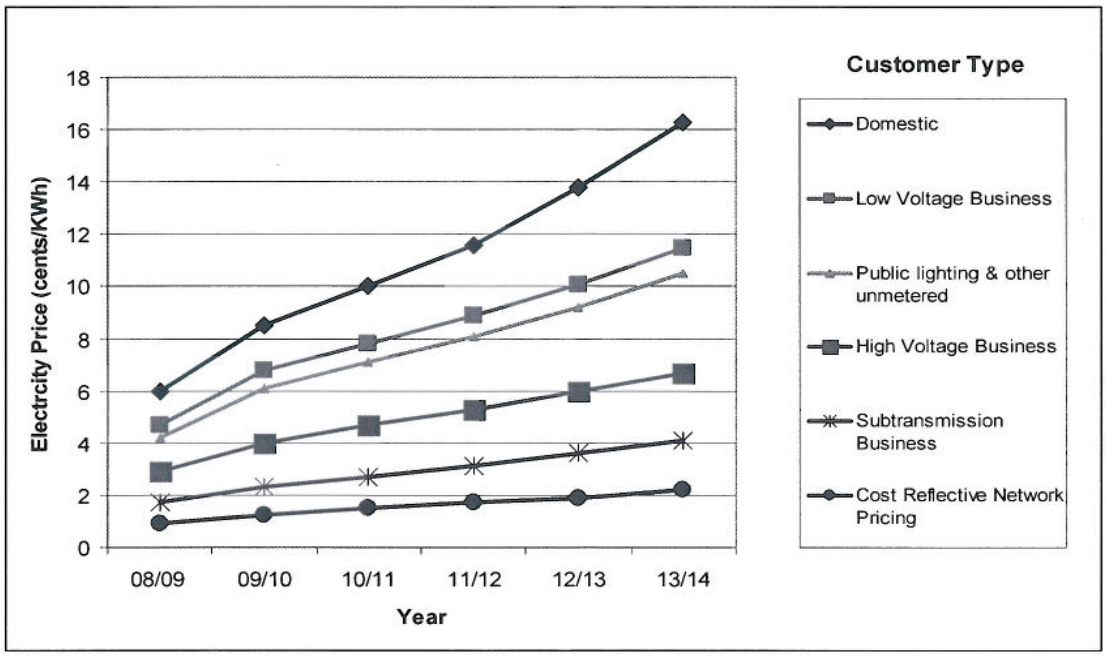
[2] Australian Energy Regulator, *Draft Decision New South Wales Draft Distribution Determination 2009–10 to 2013–14*, 21 November 2008, p. xxxi
http://www.aer.gov.au/content/item.phtml?itemId=723824&nodeId=1da17c2b79d0464144fd898e3920196c&fn=NSW%20DNSPs%20draft%20decisions.pdf

[3] Energy Australia, Regulatory *Proposal*, June 2008 , p. 7.
http://www.aer.gov.au/content/item.phtml?itemId=720441&nodeId=803ecb8d858605c2a4aec066c0c2ea03&fn=EnergyAustralia's%20Regulatory%20Proposal.pdf

[4] Energy Australia, *Revised Regulatory Proposal and Interim Submission*, January 2009, p. 190

It should be emphasised that these anticipated price increases exclude the likely impact of including a price on greenhouse gas emissions through the Federal Government's proposed Carbon Pollution Reduction Scheme. The relative increase in peak demand will also exacerbate the retail price rises by encouraging a greater reliance on more expensive peaking power generators such as open cycle gas turbines.

Figure 1: Indicative Network Prices (cents/kWh nominal)[5]



Electricity forecasts

Energy Australia is now anticipating a ***reduction*** in total energy consumption of 10%, from 27,652 GWh p.a. in 2008/09 to 24,968 GWh per annum in 2013/14.[6] In this context of falling energy consumption, the forecast ***increase*** in peak demand of about 14% over the same period appears all the more dramatic.[7]

This increase of peak demand over the determination period where there is a forecast reduction of total energy consumption in the order of 10%, strengthens the argument for innovative approaches to demand management in place of network augmentation.

As the AER states, *"The increasing discrepancy between maximum demand and energy consumption growth reduces the overall efficiency of the networks and increases the need for effective and reliable demand management."*[8]

The AER does not appear to have undertaken or commissioned as part of this determination process any assessment of the scale or cost effectiveness of potential demand management opportunities in NSW. Moreover, the AER does not appear to have considered or assessed existing studies of such potential.

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http://www.aer.gov.au/content/item.phtml?itemId=726072&nodeId=bb87812ab12a7a84496d39afa012ee3a&fn=EnergyAustralia%20Revised%20Proposal.pdf

[5] Energy Australia, *Revised Regulatory Proposal and Interim Submission*, January 2009, p. 190

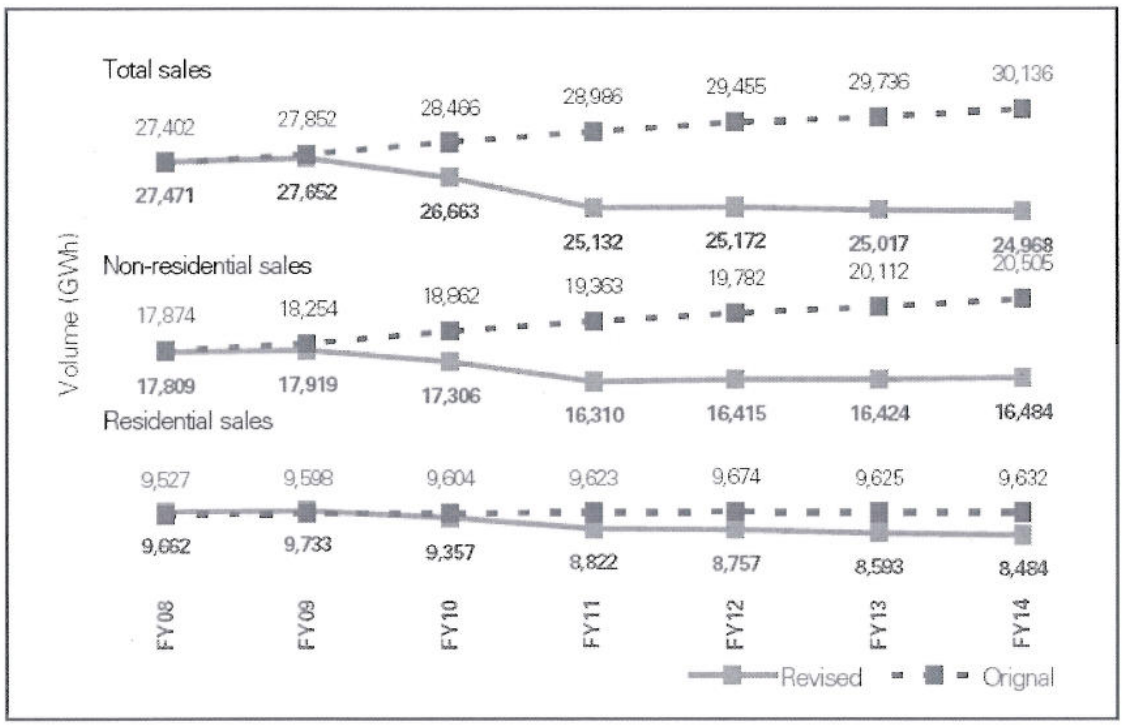
[6] Energy Australia, *Revised Regulatory Proposal and Interim Submission*, January 2009, p. 121

[7] Energy Australia, *Revised Regulatory Proposal and Interim Submission*, January 2009, p. 24

[8] *Draft Decision New South Wales Draft Distribution Determination 2009–10 to 2013–14*, 21 November 2008, p. xxxvi

In particular, the Draft Determination does not even make reference to the $10 million Demand Management and Planning Project which was run jointly by Energy Australia, Transgrid and the NSW Department of Planning between 2003 and 2008. This project was established specifically to assess the potential for demand management in the eastern half of the Sydney metropolitan area[9].

Figure 2: Energy Australia's Revised Energy Forecasts[10]



While the Draft Determination considered the NSW Distribution Network Service Providers' (DNSPs) efficiency in continuing to provide distribution services to consumers (and adjusted allowable expenditures accordingly), the regulatory proposals and Draft Determination were both strongly centred around a business-as-usual (BAU) model of electricity generation and distribution. Some small allowance was made for demand management options to supplement the BAU case, but as in past regulatory periods, this continued to be at the margins of the approach to meeting demand.

The City of Sydney believes that demand management in the form of direct utility support for energy efficiency, peak load management and low emission distributed generation (including cogeneration, trigeneration and renewable energy) is essential to providing affordable and sustainable energy services for the residents and businesses of Sydney.

A network of cogeneration and trigeneration plants has the potential to reduce future costs for businesses and households, through reducing the distance between producer and consumer, capturing wasted heat from electricity generation to service heating and cooling needs that would otherwise have required vast amounts of electricity, and offsetting the need for upgrading expensive network infrastructure and new power stations.

Capturing the value of avoided network investment is an important component in the cost assessment of trigeneration. That is, if billions of dollars are simply invested in providing abundant network capacity, this potential value stream of avoided costs will be

[9] See Demand Management and Planning Project (DMPP) website: http://www.planning.nsw.gov.au/dmpp/background.asp

[10] Energy Australia, *Revised Regulatory Proposal and Interim Submission*, January 2009, p. 121

neutralized, thereby undermining the cost-effectiveness of targeted non-network approaches such as trigeneration.

Therefore, not only are there short to medium term implications for consumer costs, but there are perhaps even more significant longer term costs associated with locking Sydney into the existing modes of centralised energy supply and distribution.

Looking to the future in a carbon-constrained economy, with electricity costs rising sharply due to investment in new network and power stations that is driven strongly by spiralling peak demand, there is inherent danger in reinforcing the status quo of centralised electricity generation and distribution.

The City of Sydney believes that it is the AER's role to create an energy sector that can effectively minimise financial and environmental costs by reducing the drivers behind energy and peak load growth. Fostering, or at the very least not closing off, options for innovation in electricity Demand Management is necessary to achieve the most economically and environmentally effective outcome.

Street Lighting

There are longstanding issues with the pricing and governance regime for public lighting in NSW. The City is concerned about Energy Australia's proposed price increases in street lighting network charges over the coming regulatory period and the lack of transparency in the pricing submissions.

The City endorses the Southern Sydney Regional Organisation of Councils' submission to the AER on the draft determination, specifically in reference to network price increases, high costs for energy efficient lighting technologies, and inappropriate network tariffs for Council-owned lighting.

Under the current proposal, the City would be charged an extra 30 to 40 per cent due to an inability to access the appropriate Network Tariff 401 for Council-owned lighting. The City is improving the greenhouse efficiency of its own lighting for example by trialling LED technology and should not be penalised for taking this initiative.

1.3 Purpose and Structure of this Submission

This submission argues that the appropriate, large-scale application of demand management and distributed generation embedded in the distribution network can achieve:

- Reduced future electricity costs for households and businesses;
- Reduced greenhouse gas emissions; and
- Improved energy security & 'climate proofing' of energy infrastructure, without compromising regulated service quality and security of supply requirements.

This submission also argues that that the AER could, through insufficient attention to non-network approaches in its regulatory ruling, close off avenues for the City of Sydney to achieve the critical first phase of the energy plans of its Sustainable Sydney 2030 Vision. The submission comprises the following sections:

Section 2 discusses the potential for demand management.

Section 3 illustrates the economic case for the demand management, by presenting an analysis of trigeneration, including the value streams of redirecting some of the network expenditure proposed for the forthcoming 2009-2014 regulatory period.

Section 4 considers other demand management initiatives that could be effectively implemented in tandem with trigeneration to achieve greatest cost savings and impact.

Section 5 considers some specific barriers to investment in demand management and proposes opportunities to address these.

Section 6 makes practical recommendations to the AER to encourage demand management in the next regulatory period.

2 Potential for Demand Management

There are some mechanisms in place to support Demand Management. These mechanisms include:

- The 'D factor' established by the AER's predecessor, IPART, for the current (2004-09) regulatory period. This mechanism is intended to neutralise (at least in part) the financial losses that the Distribution Network Service Provider would otherwise suffer from supporting demand management.

- The NSW Demand Management Code of Practice for Electricity Distributors. This Code of Practice is intended "to provide guidance for electricity distribution network operators in meeting the requirement to carry out Demand Management activities in their operating licences."[11]

While both of these are very important mechanisms that should be continued, they have not led to a significant level of demand management being undertaken. A recent study of the impact of the D Factor found that:

> *"Distributors following the creation of the D-factor delivered a reduction in peak demand in NSW of 29.4 MVA in 2004/05 and a further 12.4 MVA in 2005/06. This is equivalent to about 7% and 3% respectively of the average annual growth in summer peak demand in NSW. The cost to the Distributors of undertaking these demand management measures was reported as $5.1 million, while the expected avoided network cost was reported as $19.3 million. This represents a very attractive benefit-cost ratio of 3.8 to 1; that is, Distributors reported savings of $3.80 for every $1 they spent on demand management. This suggests that there are very significant further cost-effective demand management opportunities that have yet to be tapped."*[12]

Similarly, while Energy Australia has undertaken numerous assessments of demand management as required by the Demand Management Code of Practice, very few demand management projects have been implemented. In its 2007/08 Network Performance Report, Energy Australia reported:

> *"43 Demand Management Screening Tests have been completed, leading to five full Demand Management Investigations and one viable project."*[13]

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[11] NSW Dept of Energy Utilities and Sustainability, *Demand Management for Electricity Distributors NSW Code of Practice,* September 2004 http://www.deus.nsw.gov.au/Publications/NSW%20Code%20of%20Practice%20Demand%20Management%20for%20Electricity%20Distributors%202004.pdf

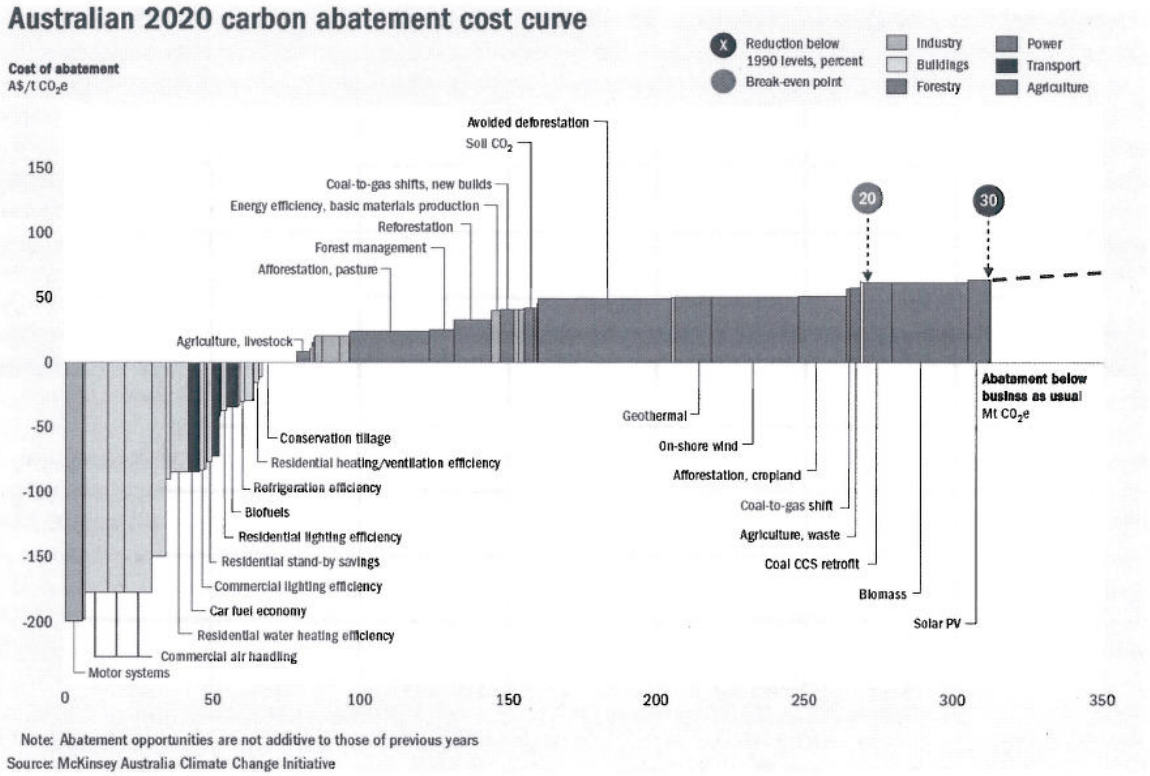
[12] Dunstan, C., Abeysuriya, K.R. & Shirley, W. 2008, *Win, Win, Win: Regulating Electricity Distribution Networks for Reliability, Consumers and the Environment: Review of the NSW D-Factor and Alternative Mechanisms to Encourage Demand Management*, [prepared for Total Environment Centre], Institute for Sustainable Futures, UTS, Sydney.

[13] Energy Australia, 2007/08 Network Performance Report, http://www.energy.com.au/energy/ea.nsf/AttachmentsByTitle/Electricity+Network+Performance+Report+0708/$FILE/07-08%20Network%20Performance%20Report%20-%20FINAL.pdf

The City of Sydney supports the AER's introduction of a Demand Management Innovation Allowance (DMIA). However, at a stipulated maximum level of only $1 million per annum, or roughly 0.06% of Energy Australia's annual revenue allowance, this is unlikely to make any discernable difference to Energy Australia's investment plans or peak load growth.

The current level of demand management activity in NSW (and Australia in general) appears very low compared to both the level of activity overseas and the identified potential for cost effective energy efficiency measures in Australia. For example, as illustrated in Figure 3, there are major greenhouse gas emission abatement opportunities in relation to energy efficiency available at "negative cost"; that is, they save more money than they cost to implement.

Figure 3: Australian Greenhouse Gas Emissions Reduction Potential[14]

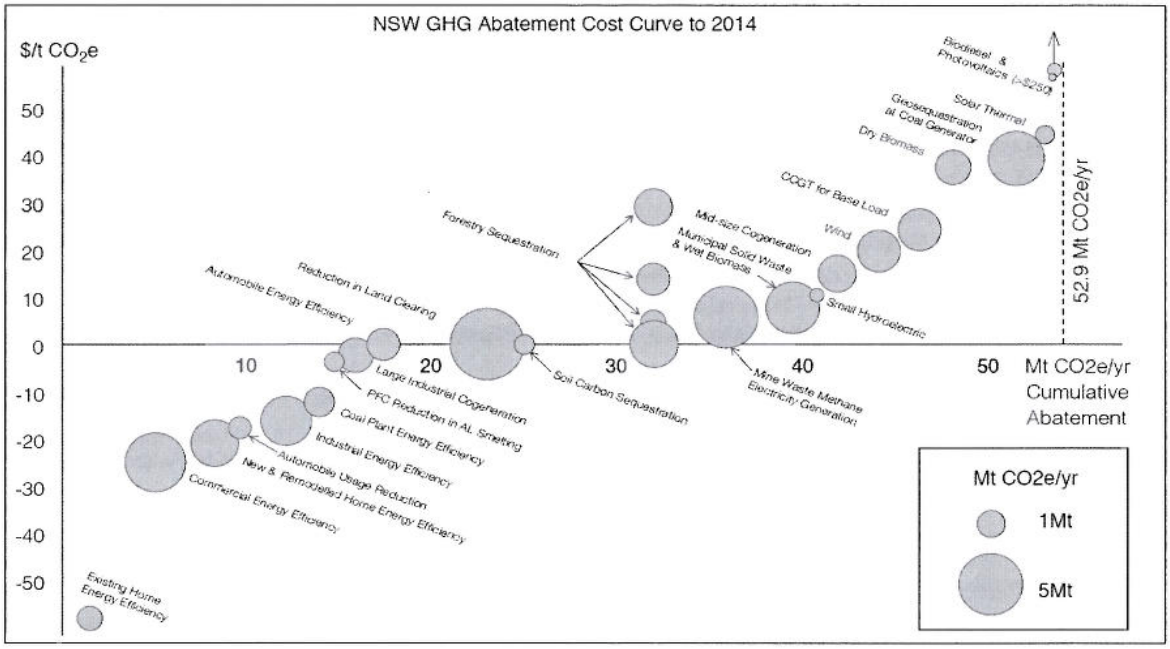


Many of these opportunities achieve both overall energy savings and reductions in peak demand and therefore have potential to reduce the need for network augmentation. In particular, efficiency measures related to motor systems, commercial air handling, commercial lighting, residential standby, refrigeration and residential heating/ventilation are all likely to contribute to reducing peak demand.

The NSW Greenhouse Plan provides a similar picture regarding low cost and negative cost greenhouse gas emissions reduction potential in energy efficiency as well as highlighting the specific potential for cogeneration to provide significant addition low cost emission reductions (Figure 4).

[14] McKinsey and Company, *An Australian Cost Curve for Greenhouse Gas Reduction*, Feb 2008, p.14 http://www.greenfleet.com.au/uploads/pdfs/McKinsey%20Report%20-%20greenhouse%20-%2015Feb08.pdf

Figure 4. Australian Greenhouse Gas Reduction Potential



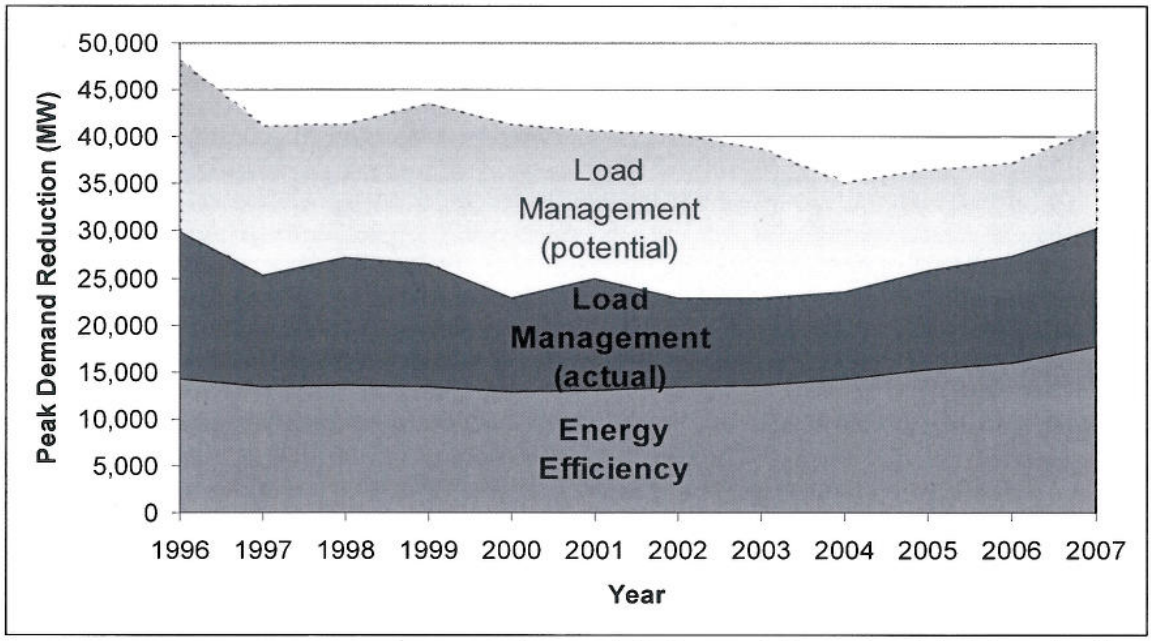
There is also ample evidence that this potential can be cost effectively captured through utility demand management programs. As illustrated in Figure 5, over 40,000 MW of peak demand is either currently being used or is available in the United States through energy efficiency and load management initiatives. This is roughly equivalent to the total peak demand in Australia.

The strategic importance of these demand management resources was highlighted in California in July 2006 when that state suffered an extraordinary heatwave, similar the recent one in Victoria and South Australia. Despite the extreme conditions, there were no power blackouts. The California ISO Independent Electricity System Operator (ISO) described the outcome as follows:

> *"The all time record peak demand on Monday, July 24 was 50,270 megawatts—an abnormally high demand at levels not expected until five years from now… The California ISO [Independent Electricity System Operator] extends a formal "thank you" to California for the impressive conservation levels that helped keep the lights on and wholesale prices low during the historic heat crisis of last week …*
>
> *[T]he state achieve[d] a conservation rate of at least 1,500 megawatts, which included general conservation, state water pump load reduction as well as a 25 percent reduction in power usage at state buildings… Commercial customers that voluntarily reduce demand on high demand days also did their part. Compensated for their curtailments, these customers shed an estimated 855 megawatts just as California was setting the new sky-high record demand for electricity on July 24. Additional business customers in the California ISO's Save-A-Watt: Voluntary Load Reduction Program also made a difference, producing about 50 megawatts in power savings without any form of compensation."*[15]

[15] California Independent Electricity System Operator, *Media Release*, 1 August 2006 http://www.caiso.com/1845/1845a636739d0.pdf

Figure 5: Reduction in Peak Demand in USA from Demand Management
(Large utilities only) [16]



Source: US Energy Information Administration[17]

3 Economic Case for Demand Management

3.1 Avoiding Energy Australia Planned Network Investment

Energy Australia's regulatory proposal to the AER outlined plans for $7.38 billion capital expenditure for distribution infrastructure during the 2009-2014 regulatory period[18]. Of this figure, $2.78 billion is for growth (demand related) investment, which represents 37% of the total proposed capital expenditure. Given that large-scale embedded trigeneration facilities installed in strategic locations have the potential to offset the growth related components of network investment, there is a highly significant avoided cost contributing to the business case for demand management.

In addition, demand management also has the potential to offset network investment driven by new "n-2" reliability standards licence conditions for the Sydney CBD. These falls within the 'reliability and quality of service enhancement' category, representing a further $0.37 billion capital expenditure. Demand management may also offer some potential to reduce planned investment in areas where network infrastructure is being retired and replaced with new equipment, by extending the life of existing assets and/or reducing the future load on the system in that location after replacement (representing $3.2 billion capital expenditure).

The increased demand to be met by the $2.78 billion demand related capital expenditure is in the order of 860 MW by 2014.[19] This represents an investment of $3,200 per kW of demand growth served. Therefore, if a strategically placed network of precinct-scale distributed generation and trigeneration were to capture the value of avoiding this demand-related infrastructure investment alone, it could be worth up to $3,200 per kW of

[16] US Energy Information Administration, *Electric Power Annual 2007*, January 2009, http://www.eia.doe.gov/cneaf/electricity/epa/epaxlfile9_2.xls#_ftnref2
[17] US Energy Information Administration, Electric Power Annual 2007, January 2009
[18] AER *Draft Determination*, 21 November 2008, at xxxii.
[19] Energy Australia, *Revised Regulatory Proposal and Interim Submission*, January 2009, p. 24

installed capacity. Where appropriate, a percentage of this avoided network cost could then be factored into the economics of trigeneration. In the analysis below, a conservative value of 50 per cent ($1,600 per kVA) has been used.

While only a proportion of above demand related avoidable costs are within the City of Sydney's Local Government Area,[20] additional investment in the order of $333 million will be driven by new licence conditions imposing an "n-2" security of supply requirement for the Sydney CBD.[21] This investment may also be avoidable at least in part with demand management.

3.2 Trigeneration Economic Case Study

For illustrative purposes, this economic analysis uses the installation of a hypothetical 3MWe[22] trigeneration facility. Based on a site of 10MW peak electrical demand, this example is typical of a large consumer and thus is useful for the purposes of demonstrating the economic case for trigeneration where there is demand for heating and chilled water produced by trigeneration.

Note that while 3MW trigeneration is relatively small compared to the projected 20-30MW that might apply to the Green Transformers proposal, it is expected that implementing trigeneration at this larger precinct level is likely to capture economies of scale, offsetting the additional cost of reticulation and presenting an equivalent or better business case. Therefore, a 3MW facility is considered a conservative starting point.

Both current (Table 1) and a plausible future (Table 2) comparative economic cases are presented for 3MWe trigeneration facility, versus business-as-usual servicing through the electricity distribution network.

The key assumptions in the present case shown in Table 1 are as follows:

- Trigeneration capital expenditure of $4,500 per kVA installed;
- Bulk gas purchase price of $6 per GJ;
- Current time of use electricity prices reflective of a large 10MW peak demand customer with contract bargaining power; and
- A carbon price of $4 per tonne (approximate current price for NSW Greenhouse Gas Abatement Certificates).

It can be seen from Table 1 that trigeneration has a relatively long payback period without factoring in any additional value streams; the payback period improves as carbon emissions are given a plausible economic value; and when avoided network infrastructure is taken into consideration the economic case for trigeneration becomes significantly more attractive. However, note that the above is the current case, and there is likely to be steep increases in electricity tariffs in coming years, which brings us to the future analysis.

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[20] Major projects within the City of Sydney's LGA are: $612 million "Sydney CBD Area Plan" which presumably overlaps with the $800 million Sydney City Grid Project, See Plancom Consulting Pty Ltd, Sydney *City Grid Project Environmental Assessment*, December 2008 p. 4.13 http://majorprojects.planning.nsw.gov.au/files/28931/Volume%201_Main%20Report.pdf

[21] AER Draft Determination, 21 November 2008, at xii.

[22] 3 MWe = 3 MW electrical production

Table 1 - Current economic case for a 3MW scale trigeneration facility

	3MWe Trigeneration	Electricity only (BAU)
Peak demand on grid	6MW	10MW
Total annual running cost	$2,773,000	$3,456,000
Annual savings	$683,000	
Simple payback on capital expenditure	19.8 years	
▾ Annual GHG emissions	29,600 t-CO2e	35,000 t-CO2e
GHG emissions savings value	$21,600/year	
Revised simple payback on capital expenditure	19.2 years	
▾ Avoided network costs	$1600/kVA installed	
Revised simple payback on capital expenditure	12.4 years	

The key assumptions in the future case shown in Table 2 are the same as for the present case, with the following exceptions:

- Bulk gas purchase price of $11 per GJ;
- Current published Energy Australia "LoadSmart Business" time of use electricity tariffs, which are approximately 100% higher than current for present case; and
- A carbon price of $20 per tonne.

It can be seen from Table 2 that in the future case of higher electricity and gas prices, trigeneration has a short payback period without factoring in any additional value streams; the payback period improves somewhat as carbon emissions are given a significant economic value; and when avoided network infrastructure is taken into consideration the economic case for trigeneration is very strong.

Table 2 - Future economic case for a 3MW scale trigeneration facility

	3MWe Trigeneration	Electricity only (BAU)
Peak demand on grid	6MW	10MW
Total annual running cost	$4,596,000	$5,814,000
Annual savings	$1,218,000	
Simple payback on capital expenditure	11.1 years	
▾ Annual GHG emissions	29,600 t-CO2e	35,000 t-CO2e
GHG emissions savings value	$108,000/year	
▸ Revised simple payback on capital expenditure	10.2 years	
▾ Avoided network costs	$1600/kVA installed	
▸ Revised simple payback on capital expenditure	6.6 years	

It should also be noted that the following avoided costs are also relevant to the Trigeneration case, but have not been quantified:

- The benefits of reduced network losses of approximately 7%
- Avoiding investment in new generation capacity

4 Complementary Demand Management Initiatives

As discussed above, trigeneration (and cogeneration) are likely to become increasingly cost effective and prudent options for demand management. However, while they are important candidates for demand management in meeting customers energy needs in the short to medium term load management, they are by no means the only ones. As noted above, energy efficiency represents very large and low cost opportunities. The CitySwitch Program which focuses on energy efficiency in commercial office tenancies is a good example of such an opportunity that could be greatly expanded if the AER provided incentives for Energy Australia to invest in it. Led by the Committee of Capital City Lord Mayors, this program has recently expanded to Brisbane, Melbourne, Adelaide and Perth and therefore provides similar opportunities for other electricity network providers around Australia.

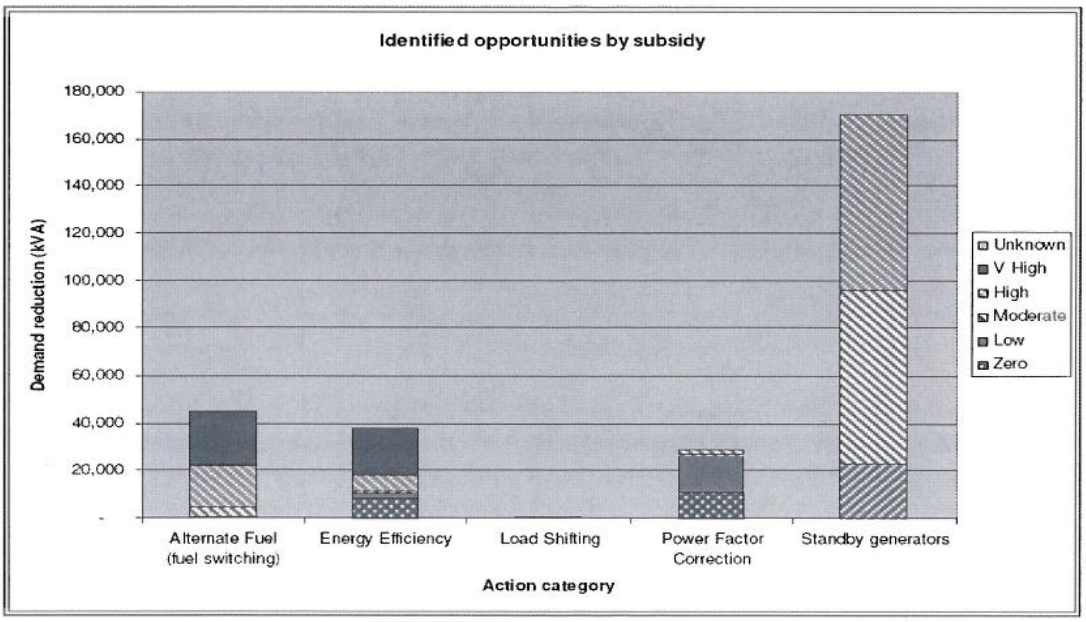
A well-targeted suite of demand management options will deliver the lowest cost, lowest emissions profile electricity supply for the City of Sydney. Furthermore, to take best advantage of the savings due to avoidable network investment, demand management options should be implemented aggressively to allow time for trigeneration within the Green Transformers Plan to come online.

Examples of demand management options will include:

- Taking advantage of numerous current and proposed State and Federal Government programs and initiatives, such as the NSW Energy Efficiency Trading Scheme and the National Energy Efficiency Strategy.
- A large-scale uptake of peak load reduction, similar to the current 50 to 100 MW of Demand Side Response currently being accessed by Transgrid.
- Maximising adoption of opportunities identified through the $10 million Demand Management and Planning Project (DMPP).

An example of the opportunities identified through the DMPP is presented in Figure 6.

Figure 6: Peak Demand Reduction Opportunities – Sydney CBD Area[23]



[23] Sinclair Knight Merz, *Identification and Investigation of Peak Demand Reduction Opportunities – Sydney CBD Area Roll-Up Report Final Report*, December 2006 . p. iv http://www.planning.nsw.gov.au/dmpp/pdf/cbd_rollup_report_final.pdf

5 Barriers and Opportunities

Depending on the investment, ownership and operating arrangements, there will be differing financial implications of the demand management. For example, it is possible that because Energy Australia is a monopoly network business it may be precluded from investing directly in cogeneration or trigeneration plant. This raises questions of how Energy Australia can earn an equivalent return from expenditure on demand management as it does from network investment.

Another barrier relates to the AER's apparently restrictive guidelines for reassigning customer to tariff classes. In its revised submission, Energy Australia has increased its forecast capital expenditure by $30 million for the impact of tariff based demand management. Energy Australia notes, *"This is to incorporate the change required by the AER's decision on the procedure for assigning customers to tariff classes which results in a $29.5 million increase in forecast capital expenditure.*[24] It is not clear why the AER would wish to obstruct the movement of customers from fixed rate tariffs to time of use tariffs, particularly when customers volunteer to switch over.

Energy Australia has undertaken some innovative studies of the application of Time of Use tariffs.

> *"Energy Australia's two and half year study to test customers' response to different Time of Use tariffs was completed in April 2008. About 1,300 customers volunteered to take part in the study, which involves real time access to electricity use and price signals. This information is communicated through in-house displays, SMS and phone messaging. These tariffs offer lower electricity prices for 99% of the year with only a small number of high priced periods during the year, which signal the limited occasions of congestion on the power system. Customer response to these innovative tariffs was substantial, with marked reductions of over 20% in energy use during periods of high electricity prices. Energy Australia is analysing the results of this study, with a final report to be completed shortly.*[25]

However, this progress has apparently come to halt, due to regulatory uncertainty:

> *"Energy Australia was the first utility in the world, that we are aware of, to introduce Time of Use (ToU) as the standard mandatory tariff for network charges. Energy Australia has installed over 400,000 meters and converted 200,000 of our largest residential and small business customers to time based tariffs. All larger users pay time based and capacity based tariffs. We have made these investments to promote long-term behavioural change by customers. This is a responsible demand management strategy aimed at reducing future capital expenditure. We have undertaken this long-term strategy in response to an increasing divergence between growth in peak demand and energy consumption growth.*
> *Energy Australia intends to continue to introduce time based pricing to its customers for all new and upgraded customer connections. However, the*

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[24] Energy Australia, Revised Regulatory Proposal January 2009, p. 28 , p.186
http://www.aer.gov.au/content/item.phtml?itemId=726072&nodeId=bb87812ab12a7a84496d39afa012ee3a&fn=EnergyAustralia%20Revised%20Proposal.pdf

[25] Energy Australia, 2007/08 Network Performance Report, p.18
http://www.energy.com.au/energy/ea.nsf/AttachmentsByTitle/Electricity+Network+Performance+Report+0708/$FILE/07-08%20Network%20Performance%20Report%20-%20FINAL.pdf

decision regarding AMI is imminent and Energy Australia has suspended our program to convert meters until that decision is made. [26]

6 Recommendations

In conclusion, the City of Sydney believes that in its final April 30 determination, the AER should:

1 Explicitly state that it encourages Energy Australia to redirect proposed distribution network investment costs into more sustainable and cost effective means (such as Demand Management), wherever this represents a lower cost than network augmentation.

2 Consider and report on the greenhouse gas emissions implications of the Final Determination relative to alternative investment options (such as greater investment in demand management).

3 Support open, competitive and transparent processes for identifying, procuring and implementing alternatives to network augmentation, wherever the cost-effectiveness (and greenhouse gas emissions) of "distributed energy options" is equivalent or lower than business-as-usual network investment practices.

4 Either set targets for demand management outcomes (as in California), or if it considers it does not have the power to do this, indicate to Governments and the Australian Energy Market Commission that it believes such target are warranted.

5 Ensure that Energy Australia (and other DNSPs) clearly and consistently report progress on the above items to the AER on an annual basis throughout the regulatory period. If the AER considers it does not have the power to do this then it should indicate to Governments and the Australian Energy Market Commission that it believes such reporting is desirable.

6 Allow Energy Australia and other distribution network business to invest in demand management a year or two prior to expected network capacity constraints. This would allow network businesses to better manage risk while building greater expertise in demand management.

7 As soon as possible, commission a robust and transparent assessment of the potential for cost effective demand management, based on international best practice.

8 Remove barriers for re-assigning customers to tariff classes particularly in relation to time of use tariffs.

9 Report on the full network and retail price implications of its determination.

10 Ensure distributed generators receive the full benefit of pass through of avoided transmission use of system (TUOS) charges and distributor network businesses are not disadvantaged in this process.

11 Address street lighting concerns raised in the Southern Sydney Regional Organisation of Councils' submission to the AER with specific regard to excessive increases of network charges, the high cost of energy efficient lighting types, and allowing access to Network Tariff 401 for Council-owned lighting.

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[26] Energy Australia, *Regulatory Proposal*, June 2008, p. 11 http://www.aer.gov.au/content/item.phtml?itemId=720441&nodeId=803ecb8d858605c2a4aec066c0c2ea03&fn=EnergyAustralia's%20Regulatory%20Proposal.pdf,

These recommendations alone are insufficient to overcome fully the longstanding barriers to demand management in the National Electricity Market. They would however, remove several key obstacles to providing a more competitive, sustainable and efficient electricity services to the citizens and business of the City of Sydney and beyond.