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Mr John Pierce
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Dear Mr Pierce

Thank you for the opportunity to comment on the Australian Energy Market Commission's (AEMC) *Power of Choice – Giving consumers options in the way they use electricity – Issues Paper (EPR 0022).*

The Energy Division (the Division) of the South Australian Department for Transport, Energy and Infrastructure is pleased the Commission will be investigating demand side participation (DSP) options, the market conditions required to facilitate them and the necessary market and regulatory arrangements.

Peak demand creates significant costs, through higher wholesale electricity prices and increased investment in network infrastructure, resulting in substantial increases in retail electricity prices. The Commission has forecast[1] that residential electricity prices in South Australia are to increase by 31 per cent, in nominal terms, between 2009/10 and 2012/13. A significant proportion of this increase (76 per cent) is related to increases in wholesale electricity and distribution costs. In order to realise the full benefits stemming from an improvement in the level and effectiveness of DSP in Australia, the Division considers that this Review needs to focus on the issues that hinder DSP options that can reduce peak demand.

The issue of peak demand and the efficient utilisation of the existing infrastructure are challenges that South Australia is tackling. As evidenced in this submission, in South Australia peak demand is substantially driven by residential demand, particularly from air conditioners. As such, the Division would expect the Commission to review opportunities to facilitate DSP options to assist in addressing this particular issue. The Division also supports the Commission investigating further the incentives and opportunity for load from large consumers to respond during high demand and high price. Demand response from such loads can help to mitigate some of the residential peak demand, which as noted later, is likely to be relatively difficult to reduce.

[1] AEMC (2010), ' Future Possible Retail Electricity Price Movements: 1 July 2010 to 30 June 2013'

The Division is concerned that implementation of pricing signals like critical peak pricing or time of use tariffs will not lead to a significant reduction in peak demand. We are unconvinced that consumers would make a significant demand response during extended heat-wave periods, which is the driver for the infrastructure requirements in South Australia. The Division supports the Commission in exploring the potential of alternative pricing arrangements such as capacity charges or the better utilisation of two part tariffs. The Division does not consider it appropriate or necessary that retail price regulation be included in this Review as this matter is the subject of separate competition reviews by the Commission.

The Division notes that potential harmful impacts and necessary protections for vulnerable customers should be a key consideration for any recommendation the Commission makes as part of this Review.

Should you have any questions in relation to this submission, please contact Rebecca Knights, Director, Energy Markets on (08) 8204 1715.

Yours sincerely,

Vince Duffy
EXECUTIVE DIRECTOR
ENERGY DIVISION

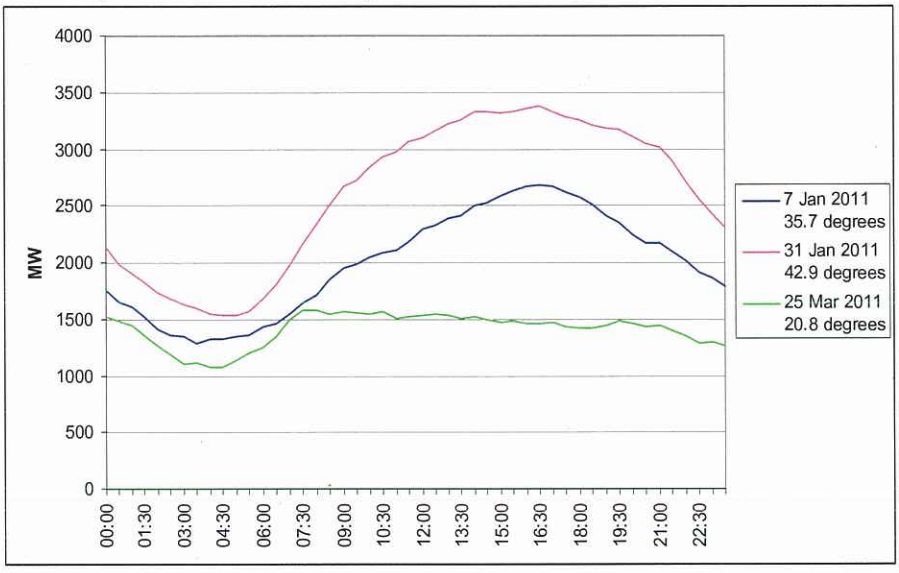
26 August 2011

ELECTRICITY DEMAND IN SOUTH AUSTRALIA

Peak Demand

The peak demand issue in South Australia is more severe than any other state in Australia. Between 2004/05 and 2008/09, peak demand in South Australia grew 29 per cent[2]. At 4.3 per cent, South Australia also has the highest annual growth rate since 2004/05 of maximum demand across the five regions in the National Electricity Market (NEM), which is well above the average of 3.5 per cent. This growth is expected to continue at 1.9 per cent per annum for the next 10 years[3] which will intensify the issue for South Australia. Figure 1 illustrates the extent of the peaky nature within South Australia by comparing three days with significantly different weather conditions.

Figure 1: Comparison of electricity demand for South Australia[4]



As can be seen in Figure 1, South Australia's peak demand is temperature dependant, with hot days having significantly higher demands than average. Growth in demand from residential air conditioners is a significant contributor to peak demand in South Australia. Around 90 per cent of households have an air conditioner in South Australia[5] and there are approximately 105,000 air conditioner sales each year in South Australia with this projected to continue through to 2020[6]. Both the number of units and their typical size/capacity has substantially increased.

The state's peaky demand profile increases electricity generation and network costs, placing upward pressure on South Australia's electricity prices. Electricity distribution investment over the current five year regulatory period

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[2] AEMO (2010) 'Electricity Statement of Opportunities for the National Electricity Market', Table 4.17
[3] AEMO (2011) 'South Australian Supply Demand Outlook'
[4] AEMO aggregated demand data - http://www.aemo.com.au/data/aggPD_2011to2015.html and Bureau of Meteorology - http://www.bom.gov.au/climate/dwo/IDCJDW5002.latest.shtml
[5] ETSA Utilities - http://www.etsautilities.com.au/centric/our_network/demand_management.jsp and Australian Bureau of Statistics, Catalogue 4602
[6] Equipment Energy Efficiency Program (2010) 'Minimum Energy Performance Standards for Air Conditioners: 2011, Decision Regulatory Impact Statement'

in South Australia is expected to exceed investment in the previous regulatory period by 88 percent and 61 per cent for the transmission network[7]. The cost of meeting peak demand is ultimately passed on to all consumers through both the network and energy cost components of their electricity bills.

Much of the generating plant and network capacity to deliver electricity during peak demand days in South Australia is under utilised for the remainder of the year. Figure 2.5 in the Issues Paper presents the load duration curve for 2008/09 for the NEM jurisdictions. The curve illustrates the extreme situation in South Australia compared to other jurisdictions. The load duration curve reflects that South Australian demand only reaches levels greater than or equal to 60 per cent of its maximum demand 10 per cent of the time. This clearly demonstrates that significant infrastructure capacity, and its associated cost, is required to meet demand that occurs for a very small proportion of the year.

As the Commission highlights, the 'peaky' nature of electricity demand is suggestive of a declining load factor in the NEM. In fact, South Australia's load factor of 0.52 in 2010/11 is lower than other states or territories[8] and is also lower than the NEM-wide load factor which is projected to plateau at just above 0.6 over the next 10 years[9]. It is this poor utilisation of our electricity infrastructure which is a critical issue for South Australia.

Contributors to Peak Demand

In South Australia, peak demand is driven by the residential demand. Figure 2.1 in the Issues Paper shows that industrial and commercial electricity consumers account for approximately 72 per cent of consumption. A breakdown of consumption by sector during a peak day would be significantly different. In South Australia, residential demand can contribute to almost half of the total peak demand[10].

Electricity consumption in large commercial and industrial sectors in South Australia is not highly correlated with temperature. Analyses show that the demand for these sectors is not notably higher on peak days than low demand days[11]. Residential peak demand occurs on extremely hot summer days and predominantly in the afternoon where residential air conditioners are being run in households in addition to other appliances (e.g. televisions, pool pumps, washing machines) and often while the commercial and industrial load is still operating.

The net system load profile provides a proxy for a state's residential demand as the demand from larger consumers with interval meters and other predictable loads such as off peak hot water has been removed, leaving only those consumers with traditional accumulation meters remaining. Figure 2 shows the net system load profile for South Australia over three days where temperatures were mild, hot and extreme.

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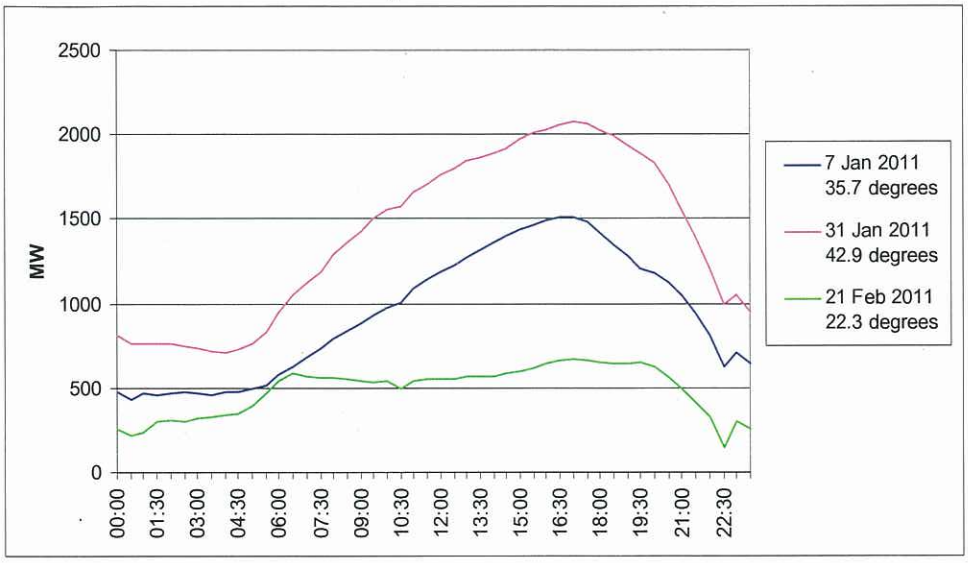
[7] AER (2010) 'State of the Energy Market'
[8] AEMO (2011) 'South Australian Supply Demand Outlook'
[9] AEMO (2010) 'Electricity Statement of Opportunities for the National Electricity Market'
[10] Charles Rivers Associates (2004) 'Peak Demand on the ETSA Utilities System'
[11] Ibid

Figure 2: South Australian Net System Load Profile for three different days[12]



While in South Australia the residential demand is the major contributor to the peak demand issue, the Division recognises it is a difficult sector to address, even through demand side participation (DSP) options. For that reason, the Division strongly supports DSP options in the industrial and commercial sectors as a reduction of demand in these sectors can assist in flattening out or even reducing the overall peak.

DEMAND SIDE PARTICIPATION IN SOUTH AUSTRALIA

Residential Demand Side Participation

As an alternative to investing in additional infrastructure to meet the peak demand, ETSA Utilities and the South Australian Government have investigated a number of demand management tools. These approaches have included incentivising consumers to move their hot water systems to the off peak period, so that their impact is removed from the peak period altogether. ETSA Utilities was also provided with $20 million by the Essential Services Commission of South Australia (ESCOSA) for demand management trials during the 2005-2010 regulatory period. These trials have provided promising results which will be further explored by ETSA Utilities in its current 2010-2015 regulatory period.

A promising DSP option that addresses peak demand is the direct load control (DLC) of air conditioners. This occurs when ETSA Utilities remotely turns off an air conditioner's compressor for short periods with the fan continuing to operate to provide circulation, with previous trial results showing peak reductions of 19 to 35 per cent. ETSA Utilities commenced testing an integrated smart grid and DLC solution in North Adelaide early in 2011, which includes 5,000 homes and businesses. ETSA Utilities will analyse the results from this trial in the coming years. If the trial is successful, the challenge will be to ensure the framework allows and encourages take up of the DSP option. For example, what incentives could be used to ensure the take up of DLC solutions?

[12] AEMO Net System Load Profile data - http://www.aemo.com.au/electricityops/nslp.html and Bureau of Meteorology - http://www.bom.gov.au/climate/dwo/IDCJDW5002.latest.shtml

The Issues Paper highlights that there has been some evidence of take up of DSP in the NEM in recent years, as shown above. However, traditionally consumers have tended to be passive parties in the electricity market, and both availability and uptake of DSP opportunities has been relatively low. As part of its Review, the Commission should consider why, unlike Australia, other countries like the United States have had success with the uptake and penetration of DSP activities. For example, the State of California is considered to be one of leaders of DSP activities since it encountered extremely high prices and supply shortfalls around 2000 with the State Government, the counties/cities and the utilities developing and offering a range of DSP options for consumers. For example, some cities and utilities offer residential households loans for energy projects and recoup that financing through higher property taxes or through interest rates on their loans.

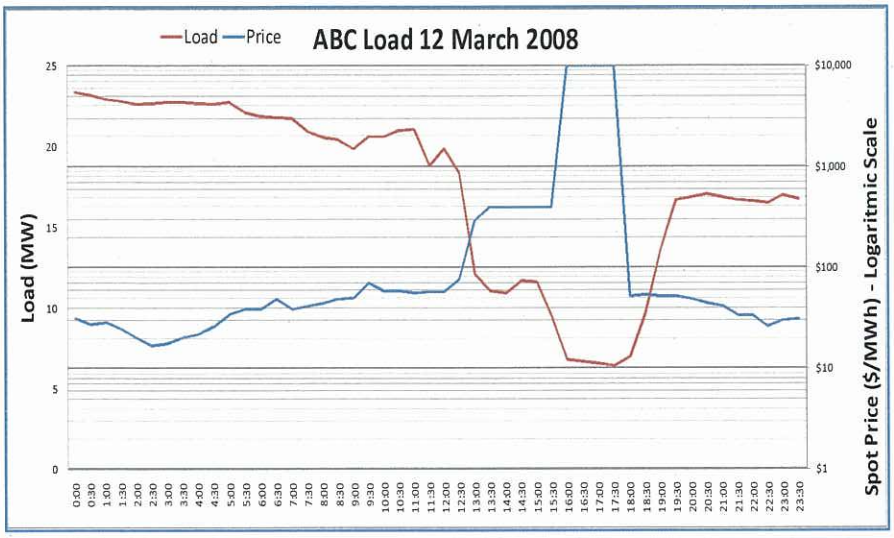
Some utilities like Southern California Edison (SCE) offer an air conditioner load control program with the consumer choosing whether they want to participate to achieve maximum savings or maximum comfort and whether the utility is limited by the number of interruptions it can perform or whether it is unlimited. SCE incentives range from US$25 to US$200 depending on the plan the consumer chooses and the size of their air conditioner. While the regulatory arrangements and structure of the energy market in California is different to the NEM, the Division questions whether there are learnings or even market conditions evident in examples such as this that could improve DSP uptake in the NEM.

Large User Demand Side Participation

As the Issues Paper notes, some large users already engage in DSP activities to avoid high wholesale electricity spot prices. This is certainly the case in South Australia. Strategies that large organisations are known to engage in include curtailable loads, power factor correction, thermal energy storage, remote load management and embedded generation.

One specific example is Adelaide Brighton Cement (ABC) in South Australia. In 2001 they entered into a retail supply contract which exposed them directly to the market spot price. As a result ABC has developed an electricity price risk management plan as well as a procedure and load shedding schedule. ABC ramps down or completely halts particular operations as the market spot price increases above particular levels. This is demonstrated in Figure 4 below. This strategy appears to have been quite effective with ABC noting considerable savings made compared to a retail contract and even the average market price over the same period.

Figure 4: ABC Load 12 March 2008[13]



One DSP option that is currently available but the Division understands is not utilised regularly, is for retailers or network operators to contract industrial and commercial loads for demand response during periods of high demand. The Division understands a significant barrier to this option is that the network operators and retailers perceive a significant risk in the amount of contracted load reduction not being guaranteed, or 'firm', when required, for various reasons (i.e. organisations are unable to stop operations at those specific times or on short notice). This often ends up with network or supply side solutions being preferred, for example investing in additional infrastructure. The Commission may wish to consider the significance of this barrier and if market conditions currently exist for market participants to appropriately manage risks associated with contracting load to provide demand response.

ISSUES FOR DEMAND SIDE PARTICIPATION

Costing Peak Demand

The Division notes the Commission aims to assess the costs and potential benefits associated with different DSP options in order to compare them with supply side options. We believe it is important for the Commission to identify and quantify the benefits and beneficiaries of reducing peak demand through DSP options. To this end, the Commission should note that a value of $3,000 per kW of reduced demand from demand response activities is currently used in national regulatory impact statements[14]. The Division has also requested that the Australian Energy Market Operator determine the marginal cost, in $/kW, to generate, transmit and distribute electricity to meet peak demand in South Australia. Initial analyses show this figure to be consistent with other values released publicly.

Price Inelasticity in South Australia

The Issues Paper identifies electricity prices as an effective DSP option. The Division is not convinced that the introduction of time of use pricing and smart

[13] Adelaide Brighton Limited, Australian Institute of Energy, Young Energy Professionals Presentation 4 May 2011
[14] Equipment Energy Efficiency Program (2010) 'Minimum Energy Performance Standards for Air Conditioners: 2011, Decision Regulatory Impact Statement'

meters will deliver a cost effective outcome for meeting the key peak demand issue facing South Australia.

If time of use tariffs were offered, the Division questions whether residential consumers would respond to them during extended periods of hot weather. The key demand side benefits would come from a response on typical South Australian four day heatwave conditions where temperatures are in excess of 40 degrees.

Noting that South Australia has an air conditioner penetration rate in excess of 90 per cent, it is considered unlikely that consumers (other than vulnerable and hardship consumers) will turn off their air conditioners (or reduce other power use sufficiently) in such circumstances in response to higher prices. The national smart meter cost benefit analysis was not able to answer this question, as there are no trials to date on consumer response to four day heatwave conditions (or 15 days as occurred in South Australia in March 2008). It would be considered dangerous to promote a demand side option which encourages only vulnerable and hardship consumers to turn off their air conditioners in extremely hot weather.

As noted in the Issues Paper, electricity price increases will likely spur consumers into considering and adopting ways to manage their electricity consumption. The media has given rising energy prices significant attention recently, highlighting the impact of prices on the average household. The awareness of price rises by the media and in some cases, ways to address the price rises, have encouraged consumers to invest in energy saving appliances and devices as well as changing their behaviour. The impact of these recent actions on a peak demand day is yet to be seen.

Unless there is a 'firm' reduction in consumer electricity demand, there is unlikely to be any significant reduction in generation and network infrastructure costs.

Recent research[15] supports this position and shows that for South Australia while price elasticity varies throughout the day, in extreme weather conditions, consumers' sensitivities to price are comparatively weak. This means that the infrastructure in South Australia is still required to meet that peak demand in extreme conditions when price signals are ineffective.

Pricing Mechanisms

The Issues Paper touches on making different pricing options available to motivate decision making by consumers in relation to managing their electricity consumption. However, there is also the possibility that different pricing options, such as mandating a time of use tariff (or removing flat standing tariffs) may introduce a level of complexity that many consumers will be unable to deal with. That said, the Division acknowledges that the current price structure provides little financial incentive for consumers to change their consumption behaviour and reduce their impact on peak demand. We support the Commission reviewing other pricing options, noting the issues

[15] Fan, S., & Hyndman, R. (2010) 'The price elasticity of electricity demand in South Australia', Monash University Department of Econometrics and Business Statistics

described above in relation to the price elasticity of residential electricity demand on hot days and the necessity for retail price regulation which is discussed in more detail below.

Taking into consideration the issues above, the Commission may wish to consider if current market and regulatory arrangements enable alternative pricing mechanisms that reflect cost impacts of increasing demand on network infrastructure. For example do current market rules and regulations provide incentives for network operators to directly recover the cost of providing capacity in the network to meet the demand of a large air conditioner at times of peak demand? The Commission should also consider the potential peak demand benefits from such mechanisms influencing consumer's choice in relation to the efficiency and sizing of their air conditioning units at time of purchase. The Division also notes that retailers presently do not have the incentive to pass through cost reflective network tariffs in their retail tariff structures. Currently, retailers can significantly dilute or remove these signals before they reach end consumers.

Such targeted pricing mechanisms also have the potential to address existing cross subsidies. Households that do not run their air conditioners during peak periods or do not have one at all are largely subsidising the cost to the network to service other households' air conditioners operating during those peak periods.

Retail Price Regulation

The Issues Paper states that the presence of retail price regulation can inhibit consumers from making informed choices about their electricity consumption.

In response to the AEMC's 2008 *Review of the effectiveness of competition in electricity and gas retail markets in South Australia* it was the South Australian Government's view that retail price regulation for both the electricity and gas markets be retained in South Australia.

The South Australian standing contract regulatory framework has enabled consumers to feel confident that the prices charged have been subject to stringent review by the independent economic regulator (ESCOSA). Vulnerable consumers particularly can have comfort that together with regulated terms and conditions they have an appropriate level of protection. Consumers who have entered market contracts also have the confidence of returning to the Standing Contract tariffs at any time.

Any decision to remove price regulation would need to assess the total impacts of such a decision, and not be made simply to provide signals to consumers of the higher costs of supplying electricity at certain times.

Sufficient levels of retail competition would need to exist before retail price regulation could be removed, otherwise dominant retailers could exercise market power to the detriment of consumers. Further, it is important that any decision to remove price regulation considers the level of effective competition in all relevant markets and sub-markets including both the electricity and gas

markets, regional consumers, vulnerable and low income consumers and those with differing levels of consumption.

Submissions received during the AEMC's effectiveness of competition review showed a differing range of views on the level of effective competition in the South Australian energy markets. The South Australian Government stated that it would need to see less polarisation in stakeholder views regarding effective competition before it removed price controls.

In 2009, ESCOSA initiated a review of the methodology for setting standing electricity contract prices because it believed there is significant volatility in the wholesale electricity market and that the market has developed considerably since the introduction of Full Retail Competition in 2003. ESCOSA has decided that the best methodology for determining electricity standing contract prices is to implement a hybrid cost-based and index-based, or the Relative Price Movement, approach. The Division considers that ESCOSA's approach strikes an appropriate balance between price flexibility to protect consumers and certainty to promote retail competition.

The Division does not believe retail price regulation should be considered as part of this Review as it is being considered in separate competition review processes.

Information Provision

The Issues Paper highlights the importance of informed consumers for DSP to be a success. When developing its Directions Paper, the Commission may wish to consider a survey commissioned in 2010 by ESCOSA and undertaken by market research company Colmar Brunton, called *Monitoring the Development of Energy Retail Competition in South Australia and Consumer Preference for Market Contract Information.*

The purpose of the survey was to understand South Australian consumers' information needs to ensure that ESCOSA through its regulatory regime was providing the best opportunities for consumers to access the benefits of the competitive electricity retail market. The survey explored a number of aspects including the nature, form, timing and availability of market information required by South Australian consumers so that they could engage with the market and make informed choices. It may be a valuable resource for the Commission to consider as part of this Review.

The Division considers that consumers would benefit from more information on how to reduce their consumption during peak periods, what is involved and what are the benefits other than financial savings (for example, reduced probability of blackout). Consumers would also benefit considerably by understanding how their choices (i.e. size of air conditioner and operating it at peak times) contributes to increases in electricity prices and what they can do to minimise this impact.

To facilitate greater dissemination of such information, the South Australian Government is implementing a Residential Air Conditioner Strategy that includes a variety of measures but importantly, promotes, through means like

the South Australian Government website, simple and effective ways for residential end users to improve the energy efficiency of their air conditioners, such as regular maintenance and using thermostats appropriately.

Technology and System Capability

The Division is supportive of the pursuit of smart grids and technologies however considers that the Commission should take into consideration learnings from the Commonwealth Governments' Smart Grid, Smart City demonstration and other smart technology trials like ETSA Utilities' North Adelaide trial. Using existing trial results will prevent any duplication of effort when the Commission investigates existing challenges to the introduction of smart grid technologies for the purpose of DSP.

The Issues Paper asks if there are any aspects of the National Electricity Legislation or Rules that prevent parties taking actions that would otherwise allow for more efficient levels of DSP. Past experience in South Australia has demonstrated that technologies already exist that could help facilitate DSP, for example ETSA Utilities DLC trials. A roll-out of such technology has not been justifiable on a cost benefit basis, particularly with the technology limited to load switching only. It is likely that with increased functionality, such as those included in the current ETSA Utilities trials in North Adelaide, additional operational benefits will improve this benefit cost ratio. There are also likely to be broader societal benefits, for example reduction in peak generation requirements and/or spot price, that are not likely to accrue directly to ETSA Utilities but none the less should be taken into account. The Commission should investigate if all benefits associated with new technologies such as smart grids are being appropriately considered under current market frameworks, when benefit-cost analysis of potential roll-outs are undertaken.

The South Australian Government is currently in the process of delivering a high quality sustainable living precinct in the suburb of Bowden. The South Australian Government's Land Management Corporation (LMC) is investigating the implementation of the tri-generation system as part of this project. This would utilise a local embedded generator to provide power, hot water and space conditioning services to premises in the precinct. Such projects have the potential to reduce the peak demand on the electricity system.

Stakeholders involved in the project believe that some regulatory ambiguity remains, especially in relation to residential applications and the retailing of thermal products. It appears the governance arrangements for these types of projects require more clarity as these issues do not appear to be in the scope of either the Australian Energy Regulator (AER) or ESCOSA. Initial enquiries by the LMC with the AER and ESCOSA indicate a preference for 'conventional' electricity connections for each consumer. The Commission should consider whether current frameworks are capable of facilitating innovative projects, such as the Bowden precinct tri-generation unit, which could reduce peak demand and the requirement to increase capacity of the electricity network in new developments.

Energy Efficiency

As part of this Review, the Commission should prioritise their consideration of issues to those energy efficiency measures including those in South Australia's Residential Energy Efficiency Scheme (REES) that have a direct impact on peak demand. For example, Stage 1 of the REES included measures on the installation of ceiling insulation where no insulation had previously been in place and the removal and destruction of primary or secondary refrigerators/freezers that were manufactured before 1996. Both of these measures will have some impact on the peak demand issue in South Australia. The Commission could also investigate whether retailers can be incentivised (i.e. a peak multiplier applied to relevant energy efficiency measures which go towards a retailer's overall target) to encourage greater roll out of energy efficiency measures that also address peak demand.

In addition to REES measures, there are other energy efficiency measures evident that have an impact of peak. For example, the South Australian Government is leading the nation on the creation of air conditioning standards, through the Minimum Energy Performance Standards (MEPS). As already established, air conditioners are a significant contributor to peak demand. In 2010, the South Australian Government introduced new air conditioning standards that incorporated higher levels of energy efficiency. This means that new air conditioners installed in South Australia will not be using the higher level of energy to operate at peak times. This action by South Australia had a flow on affect on products offered for sale nationally as most suppliers had to improve their product range to meet our requirements. Through the Ministerial Council on Energy, the South Australian Government continues to pursue further improvements in energy efficiency. This work will deliver a further 10 per cent increase in the MEPS for air conditioners

The Commission should also consider as part of its review other appliances such as pool pumps that may reduce the peak demand issue as regulatory arrangements are pursued that enable them to be more efficient or to have their loads shifted to other times.