Solutions for the future SEDA

SEDA Submission
to
IPART Demand Management Inquiry

22 July 2002

1. Introduction

SEDA welcomes IPART's Interim Report on Demand Management as an important contribution to the debate about applying Demand Management wherever it is cost effective. While awareness of the potential for electricity DM has grown significantly in recent years, the practice of DM in NSW (other than the longstanding off peak electric water heating and a small number of large scale industrial interruptible tariffs) has grown very slowly from a small base.

Recent developments have heightened the urgency of finding effective mechanisms to promote cost effective DM. These developments include:

- Growing demand for electricity has now virtually eliminated NSW's twenty year old surplus of electricity generation capacity;
- Retailer and consumer exposure to electricity market price volatility has never been greater; and
- The local and international drivers to abate greenhouse gas emissions continue to strengthen.

While DM has long been recognised for its potential environmental and financial benefits, these are now being overshadowed by the importance of DM for maintaining security of supply and ameliorating likely increases in energy bills.

Given the plethora of reports and studies which have been produced on Demand Management over the past decade or so (see below), SEDA endorses IPART's intention " to distil the extensive and complex issues raised in the inquiry into a limited number of practical suggestions that could lead to action in the short to medium term." [Interim Report, p.2] SEDA also supports IPART proposing targeted temporary measures to "transform the market for demand management". Provided regulatory and market barriers are clearly identified and addressed, and the short term proposals are adequately resourced and well designed, then SEDA would concur that "[o]ver time as the market develops, the need for many of these proposals should decline." [Interim Report, p. 16]

The following comments respond directly to the Interim Report and therefore reflect its structure. That is;

- Potential for greater use of DM
- Encouraging environmentally driven DM
- Encouraging network driven DM
- Encouraging retail market driven DM

2. Potential for Greater Use of DM in NSW

For over a decade, numerous studies have concluded that there is large cost effective potential for DM. Attachment 1 provides a summary of some of these studies. Key conclusions of these studies include:

- Total annual energy demand could be reduced by or 17%, including a reduction in electricity consumption of 27% through measures, which are economic, and in most cases would increase production efficiency and international competitiveness. [Wilkenfeld et al 1990, pp. 30-31]
- Recommended DM programmes have the potential to save approximately $200 million over 3 years, and savings in the State Government sector could approach $15 million in the first year of operation. More than $500 million in energy usage costs could be saved through longer term cost effective actions. [NSW Government Minerals and Energy Committee 1990, p. ii]
- Across Australia, in 11 applications alone, net savings of about $3.3 billion could be achieved while reducing CO_2 emissions by 45 million tonnes by 2005. [Federal Government Ecologically Sustainable Development Energy Use Working Group 1991, pp. 85- 88]
- Energy consumption could be reduced by 17% below business as usual by the year 2005 through increased energy efficiency at no net cost to the economy. [Australian Commission for the Future 1991, pp, 26, 37-39]
- "The realistically achievable reductions in electricity consumption and CO_2 emissions from electricity production by 2005 are together estimated to reduce CO_2 emissions from these areas by at most 25%, relative to the reference forecast." [Business Council of Australia 1991, p. xi]
- Carbon dioxide savings from electricity use of about 10% [or 4 million tonnes per annum] can be achieved through measures that pay for themselves within four years. [NSW Department of Minerals and Energy 1991, p. 1].
- "No regrets" energy conservation measures could reduce the carbon intensity of the national economy by 7% or 35 million tonnes per annum relative to the reference case by 2020 while *increasing* the Gross Domestic Product by 0.12%. [National Institute of Economic and Industry Research (commissioned by the Electricity Supply Association of Australia (ESAA)) 1994, p. 8]
- The Final Report of the State Electricity Commission of Victoria's Demand Management Action Plan (DMAP) noted that in the early 1990s the former State Electricity Commission of Victoria invested $25.2 million in energy efficiency and related programs and delivered ***net*** economic benefits to the state of $44.5 million. [Electricity Services Victoria 1994, pp. 79, 101].

One likely reason why there has not been more activity to take up these opportunities in NSW is that since the early 1980's, when 5280 MW of new coal fired generation capacity (equal to 61% of peak generation output in 1986) was commissioned in the space of four years, there has been substantial excess generation capacity in NSW[Pacific Power Annual report 1993 pp. 76-77]. This situation has now changed so dramatically that NSW faces the prospect of spending in excess of $8 billion to provide new capacity to meet demand growth by 2011 [MEU, Statement of System Opportunities, 2002, p. 1]. This is in addition to an estimated capital expenditure

budget for NSW distribution networks of $3.1 billion between 1999 and 2010 [Worley, *Report to IPART in Capital Expenditure Review in NSW Electricity Distribution, 1998, pp. 5.12, 6.12, 7.12, 8.8, 9.8, 10.],* and in excess of $1 billion in investment in transmission capacity by Transgrid by 2010. Given the scale of investment to be undertaken, it is important that the NSW community and NSW electricity consumers have confidence that effective incentives are in place to ensure that DM options are applied, at least in all applications where they would lead to an equal level of energy service provision at lower cost to end consumers. (Moreover, if account is taken of the environmental costs associated with additional major supply projects, the community would benefit from additional positive incentives to promote DM.)

Distributed Energy Solution Compendium

In response to a request by IPART, SEDA undertook to compile current data on DM options into a single comprehensive and consistent compendium that allows individual energy efficiency, load management distributed generation technologies to be compared with traditional centralised supply options. The draft report, *Distributed Energy Solutions: Cost and Capacity Estimates for Decentralised Options for Meeting Electricity Demand in NSW* ("the Compendium") was released in February 2002. SEDA widely publicised the Compendium and invited interested parties to review the draft report and to provide more extensive or reliable data where they believed the draft report to be deficient or inaccurate.

The Compendium characterises each technology in gross cost terms. That is, it is intended to offer comparison of DM options with the cost of generation **plus** the cost of new network investment where the DM option provides an alternative to network augmentation. In other words, the appropriate benchmark for comparison is the long run marginal cost of centralised supply. SEDA estimated this to be about the current average cost of centralised supply or about $91/MWh [projected average price in NSW for 2001/02 in ESAA, *Electricity Prices in Australia 2001/2002]*[1]. Given the recent upward trend in electricity prices, this is likely to be an underestimate of the long run marginal cost of supply.[2]

SEDA has noted several public and private general comments that the data as a whole or particular elements are either too optimistic or too conservative. However, it has received only received specific comments from two external parties in relation to the Compendium (Ministry of Energy and Utilities and Allen Consulting Group). To date, the only substantive error that has come to light is that the estimated cost for coal fired power station generation efficiency (which is not a demand management measure) has been included at net cost instead of gross cost. (This raises the average cost of improved power station efficiency from $10/MWh to $19/MWh).

[1] Strictly speaking, for distributed generation traded commercially, the appropriate benchmark is average retail price less retail margin and market overheads such as ancillary service charges

[2] If the long run marginal cost is lower than average retail prices, then average retail prices will fall over time. If on the other hand, average retail prices increase, it means that the LRMC of supply is above the current average retail price. In other words, if average prices increase over the next few years, then the appropriate benchmark for comparing the cost of DM options is greater than $91/ MWh.

3. Encouraging Environmentally Driven DM

SEDA recognises that DM, can provide major environmental benefits. This is particularly true for "base load" DM such as energy efficiency and low emission distributed generation options that reduce demand over much of the year rather than simply "clipping the peaks". However, the use of the term "environmentally driven DM" should be used cautiously, as it may focus attention away from the major economic benefits that such forms of DM can also provide.

While the exclusion of environmental costs from prices is a major barrier to the efficient use of such options, there is still much energy efficiency and distributed generation that is already cost effective given current prices, which is currently not undertaken due to other barriers.

Strengthening retail licence conditions

In NSW, the *Electricity Supply Act 1995* requires electricity retailers to reduce greenhouse emissions in line with greenhouse benchmarks. The NSW Government has recently announced its intention to enforce this requirement from January 2003 through the imposition of specific penalties for parties who fail to comply, and to extend the scheme to wholesale energy users (in addition to licensed electricity retailers). The mandatory benchmarks can be expected to drive additional investment in the sustainable energy industry – including renewable energy, other forms of low emissions energy generation (gas, cogeneration and waste coal mine gas) and energy efficiency. Economic modelling suggests that investment of $327m (NPV 2003-2012) will be required in response to both growing energy demand and the greenhouse benchmarks. SEDA is working with the Ministry of Energy and Utilities, industry stakeholders and retailers to help deliver optimal greenhouse outcomes in line with the benchmarks.

Establishing an appropriate electricity sales foregone framework

The environmental guidelines provide for three forms of greenhouse abatement:

- Sourcing electricity from less greenhouse intensive generating sources (via "assigned generation declarations")
- Reducing end use energy consumption and encouraging end use fuel switching (through "electricity sales foregone")
- Removing carbon dioxide from the atmosphere by forest carbon sequestration (via "assigned sequestration declarations").

In principle, the guidelines are intended to provide equal incentives for electricity retailers to adopt each of these abatement options.

If incentives provided for these three options are *equal in practice,* then this should provide a strong driver for energy efficiency. However, it is significantly more complex and imprecise to measure "electricity sales foregone" resulting from energy efficiency, than it is to simply meter output from a generator or estimate the mass of carbon stored in a plantation forest. This added complexity and uncertainty means that the cost of acceptably robust measurement of "electricity sales foregone" is likely to be significantly higher than the cost of adequately measuring abatement from low emission generation and from carbon sequestration. Furthermore, as energy

efficiency options are much more diverse and diffuse than generation or sequestration, these higher costs will be incurred on average on projects on a much smaller scale.

As a consequence, while recognising that the guidelines for accounting electricity sales foregone are currently being reviewed, it appears likely that energy efficiency will be largely ignored as a means of meeting greenhouse gas abatement targets except for large energy users. This is despite energy efficiency often being significantly cheaper than generation or sequestration alternatives [as noted in the Interim Report, p. 22]. Therefore, in relation to energy efficiency, the likely effect of enforcing the emissions benchmarks will be to replace one barrier (the externalisation of environmental costs of greenhouse emissions from energy prices), while replacing it with another (high transaction costs in the form of high administration costs in measuring emissions abatement through energy efficiency).

One possible response to this situation is to relax the criteria for estimating electricity sales foregone, particularly for smaller customers or applications. However, given the diversity of energy efficiency measures, anomalies in the application of such criteria are likely to proliferate. To avoid granting an unfair advantage to any one retailer relative to others it would be crucial to ensure consistent treatment of all retailers in all, including unforeseen, situations. This would be particularly onerous for the regulating body. Therefore, the most prevalent result of relaxing the measurement criteria in the context of the prevailing vigorous competition in electricity retailing, is likely to be more *overestimation* of the impact of energy efficiency that is undertaken (or is claimed to have been undertaken), rather than more energy efficiency actually being *undertaken*. In the context of robust competition, it would be irrational for retailers not to exploit more relaxed criteria to the fullest extent possible under the law (or guidelines).

This situation is particularly undesirable as energy efficiency has the potential, through reduced energy consumption and therefore reduced energy bills, to provide direct benefits to households, particularly low-income households that spend a larger proportion of their income on energy costs. As the costs of benchmarks compliance are likely to be allocated among customers in proportion to their energy consumption, it is desirable that major sectors of consumers are not excluded from enjoying the benefits that may ensue.

Possible role of a Demand Management Fund

A Demand Management Fund as proposed in the Interim Report could provide a more effective solution to the above dilemma. A Fund could offer the following advantages over simply relying on the greenhouse benchmarks to deliver energy efficiency:

- Such a Fund could be administered by a body whose key accountability is effective low cost abatement rather than profit maximisation in a competitive market.
- By involving a higher level of information disclosure than would be practical for retailers operating in a competitive environment, such a Fund could provide transparency and consistency without compromising commercial confidentiality.
- The measurement of greenhouse gas emissions abatement due to activities supported by the DM Fund would not need to be as accurately measured as they would effectively reduce the abatement task for all retailers and would not need to be attributed to any particular retailer and be monitored and verified over time.

- Such a Fund could operate according to a relatively simple set of high-level principles, with details to be left to the discretion by the administering body. Any unforeseen circumstances could be addressed when allocating money from the Fund, and then become a precedent for others to follow. (This is analogous to relying on an ombudsman for small claims rather than the prohibitive overheads of a court of law.)
- Such a Fund could support market transformation activities (see below).

Possible objectives of a DM Fund

Interim Report lists three options for potential sets of objectives for a DM Fund which range from direct funding support for specific quantified DM projects to sophisticated market transformation programs which address specific market barriers but the benefits of which may be very difficult to quantify. SEDA sees strong arguments to target DM market transformation in the short to medium term through a DM Fund

In recognising that the outcomes of some DM activities are innately more difficult to measure than others, SEDA is currently managing a number of major energy efficiency programs for which it does not currently attempt to estimate or claim the volume of energy saved or greenhouse gas abatement achieved. These programs include:

- The Australian Building Greenhouse Rating (ABGR) Scheme- a unique greenhouse and operational energy use performance benchmark and marketing scheme for commercial office buildings. It provides energy efficiency information that allows tenants to assess a building's future running cost and environmental performance, and allows property managers to capitalise on investment in energy efficiency.
- The National Energy Star Home Electronics Program- Its objective is to ensure that all home electronic products (TV, VCR, Audio and DVD) manufactured and bought in Australia are Energy Star compliant; that is, they are designed and configured to save energy when not in use.
- The Live Energy Smart program- this program aims to raise awareness of the benefits of purchasing energy efficient home products.

These sorts of programs can have major market transformation benefits in removing barriers to energy efficiency, and while they are monitored to assess their impact, they are not amenable to easy quantification of their energy efficiency benefits or easily quarantined to specific customers. It would therefore be difficult to justify undertaking such programs within a structure that demands only quantifiable short-term results that can be directly attributed to an individual retailer (see the discussion of "formal performance agreement" in the section on Governance of the Fund below).

The crucial role of market transformation activities whose benefits are not easily quantified or quarantined should be recognised and accommodated, even if objectives for the DM Fund do not explicitly support this role.

Given the possible difficulties in accounting electricity sales foregone through residential energy efficiency, this is a logical potential focus for a DM Fund. However, the same difficulties also confront energy efficiency for small business, so servicing this sector could also be an appropriate objective for a DM Fund.

As the scope for end use fuel switching is much more limited than for energy efficiency and as it is more easily quantified, there is less urgency to direct a DM Fund towards fuel switching activities.

While SEDA and Sydney Water Corporation have cooperated on several projects, there remain significant untapped synergies in water and energy DM projects that a DM Fund could target.

SEDA does not believe the "concern, raised in a previous review of SEDA, that it is not clear how SEDA balances its objectives, and determines the extent to which each is Funded" is warranted [Interim Report, p.26]. It is worth noting that the two key items that this review alluded to in this context were SEDA 's support for solar photovoltaics (PV) and for the Community Housing Energy Program (CHEP), as these were perceived as being relatively expensive sources of greenhouse gas abatement. Given the major long-term economic prospects for the solar PV industry and the social equity benefits delivered by CHEP, SEDA would caution against establishing objectives for a DM Fund that are so limited as to exclude the flexibility to support activities which deliver such equity benefits and long term industry development. On the other hand, if such goals are deemed desirable they should be made explicit in the objectives of the Fund.

A further major potential objective of a DM Fund is to support DM by network businesses. This option is discussed below in the section *Encouraging Network Driven DM*.

Source and level of funding

The Interim Report notes that there are a variety of potential sources for a DM Fund and identifies three possible sources. Whatever the source for the Fund, there would need to be consideration of the equity implications of the sourcing and distribution of the Fund. For example, if the Fund were to be sourced from either penalties for non-compliance with benchmarks or a Public Benefits type charge levied on end users, then there would need to be some mechanism to ensure smaller consumers who would effectively contribute the majority of the Fund, were not disadvantaged in the allocation of the Fund. Indeed, given that larger energy users have benefited most from price reductions that have flowed from electricity market reform, there may be an strong argument to support providing a disproportionately large share of a DM Fund to smaller energy consumers.

SEDA's experience suggests that it may take several years for an energy efficiency program to reach maturity, particularly where it represents a new technology or service, or where it requires extensive stakeholder consultation. In this context, it is important that the administrator of a DM Fund be given a reasonable level of certainty over the future levels of the Fund to allow for orderly planning. However, depending on the type of activities supported by the Fund and provided a certain base level of the Fund is assured, there may be considerable scope to scale up or scale back programs or activities relatively quickly.

SEDA currently spends around half of its budget of $10 million per annum on energy efficiency. About $2 million per annum of this is directed towards residential energy efficiency. As the Interim Report notes, "Ultimately decisions on the source and level

of funding [for a DM Fund] are a matter for Government" [p.28]. However, it is possible to provide estimates of what could be achieved with a given level of funding. For example, SEDA's Community Housing Energy Program provided energy and water retrofits free of charge to 8,000 households for a cost of $2.1 million [see Interim Report, p.29]. Extrapolating from these figures, SEDA estimates that for a **budget of $20 million per annum over five years it would be possible to provide an energy (and water) retrofit free of charge to 400,000 households** (about 17% of NSW homes). Savings to households would outweigh the initial cost of the retrofits within about three years. Additional savings would flow to all consumers by deferring capital investment in new electricity network and generation capacity.

Requiring households to make a co-payment for such retrofits could increase the number of homes covered for the same budget but would also significantly increase overhead costs and reduce participation rates and could exclude many low income households, particularly those +in rental accommodation.

Governance of a DM Fund

As the administrator of the existing Sustainable Energy Fund (SEF), it is not appropriate for SEDA to comment on whether a DM Fund should be established through the SEF, except to say that it perceives no barrier to such an option.

However, regardless of who administers the Fund, SEDA endorses the principle of delineating between funder and provider roles. There is a range of means in which this separation can be achieved. For example, the responsible Minister or the Treasury could as funder, enter into a formal performance agreement for delivery against which the Fund administrator would be held accountable. The Fund administrator could then be required to publicly report its performance which would be subject to external audit and review by, for example, IPART, the EPA or NSW Treasury.

Another approach to separating funder and provider roles is require that the Fund administrator seeks competitive tenders for and contracts out all services paid for by the Fund to meet the objectives of the Fund. This is the current practice in SEDA's administration of the Sustainable Energy Fund.

4. Encouraging Network Driven DM

The *Electricity Supply Act* requires electricity distributors to investigate alternatives to network augmentation (eg demand side management and energy efficiency) in accordance with the 'Demand Management Code of Practice'. In response to this requirement, distributors have published forecasts of energy demand and anticipated network constraints so as to facilitate market participation in demand side responses. SEDA is working with network service providers and other stakeholders to promote cost-effective sustainable energy alternatives to network augmentation.

NSW Distribution Network Service providers (DNSPs) businesses are spending around $500m annually on network capital expenditure. Around 40% of this expenditure is related to growth and network constraints. By contrast, distribution networks were reported to have spent around $5 million on DM measures in the most recent year for which data is available [MEU, 1999-2000 NSW Electricity Network

Management Report, p.12]. Given that this $5 million is reported to have delivered $62 million of savings in operating and capital costs, this would suggest that there is substantial untapped economic potential for DM to defer or avoid network expenditure. This in turn suggests that there are substantial barriers to distribution networks implementing DM.

In this context, IPART's position that "DNSPs should have incentives to choose the most efficient and least cost option and the regulatory treatment should not create a bias towards a particular type of expenditure (e.g. capital or DM/distributed generation)" [Interim Report, p.42] is unlikely to overcome the existing barriers in the short term. Rather, it may be necessary to "tilt the playing field" in favour of DM for a time, in order to encourage a shift towards DM, at least until an emerging market for DM is established. With this in mind SEDA, offers the following comments on IPARTs proposal to encourage network driven DM.

Review of regulatory treatment of network capital expenditure and prudency of network investment

Given that the DNSPs have indicated that they lack certainty in whether they will be permitted to recover expenditure in DM, IPART should provide a clear articulation of how DM expenditure may be recovered. To state, as IPART has done, that DM expenditure can be recovered and rolled forward on the same basis as investment in new network infrastructure should provide a level of confidence for DNSPs to invest in DM. Indeed, there are some encouraging signs that such regulatory statements are beginning to have an effect. The three major DNSPs in NSW are now investigating a range of network constraints to assess the potential for DM. Through its new Distributed Energy Solutions Business Unit, SEDA is actively cooperating with the network businesses of Country Energy, Energy Australian and Integral Energy in these investigations. However, this has yet to translate into significant new investment in DM. Given the limited DM experience of DNSPs and potential service providers in NSW, this slow progress might reasonably have been expected.

Furthermore, anecdotal evidence suggests that networks are reluctant to invest in DM in new customer facilities (where it is most cost effective), because

- they are not convinced, or fear they be unable to demonstrate, that the DM measures would not have happened anyway,
- they are unable to ascertain exactly what minimum level of incentive is required to drive the DM measures,
- they are reluctant to offer benefits to some customers without a competitive process open to all customers and,
- they are uncertain about regulatory treatment of cost recovery of such investment (as discussed above).

In the absence of new incentives to promote DM, it is likely that investment in network driven DM will expand slowly. However, such an expansion is likely to be much slower than is economically warranted.

Appropriately targetted incentives could significantly accelerate this development. One such incentive would be for IPART to depart form its usual practice and to assess the prudency of a limited number of DM projects in advance of the investment being made. While such a process would require a rigorous assessment, it would clearly reduce the risk associated with DNSPs investing in DM.

Alternatively, if IPART is reluctant to create such a precedent of before-the-fact prudency assessment, the DM Fund proposed by IPART as a means to promote "environmentally driven DM" could also be used to promote network driven DM. In this case, a dedicated part of the DM Fund could be allocated for addressing network constraints in part or in full. This should not lead to any net cost increase for consumers or taxpayers, as the portion of the cost of the project funded from this source would be excluded from the DNSP's asset base and could not subsequently be recovered from customers through tariffs. The funding allocation could be made to networks (or other parties) by the Fund administrator. The administrator could then be effectively held accountable for the prudence of this allocation. This would reduce the risk for DNSPs without compromising IPART's commitment to after-the-fact prudency reviews.

The level of funding for such activities could be set at a fixed proportion of expected network capital expenditure budget, say 5% to 10% for a fixed period. At the end of this period, subject to the market having reached an adequate level of maturity, the application of the DM Fund to this purpose could be discontinued.

Encourage trials of congestion pricing

SEDA endorses IPART's encouragement of trials congestion pricing, particularly through "negative prices" for DM in times and places of emerging network constraint.

Clarify treatment of distributed generation and avoided TUOS

IPART's proposed approach to this issue appears to suggest passing through the benefit of avoided Transmission Use of System Charge (TUOS) in its entirety to the distributed generator. If this is the case, then IPART should indicate how it sees this as providing effective incentive to facilitate the establishment of such distributed generation. If this is not the case, IPART should provide some indication of how these benefits should be distributed.

Clarify treatment of distributed generation and avoided DUOS

SEDA endorses IPART's proposal to developing its approach in this area, and would be pleased to assist.

Support DM Code of Practice and use of standard offer contracts

Country Energy, Energy Australia and Integral Energy, have each issued Electricity System Development Reviews (ESDRs) as required by the NSW DM Code of Practice. Each contains a wealth of useful data about current and project network constraints and, although not all the data stipulated by the Code of Practice is included in each ESDR, they represent a major advance in informing the market about opportunities for DM.

Only Energy Australia's ESDR's includes estimates of supply augmentation costs. Where this information is not included, it is difficult to estimate whether and where DM could play a role cost effectively. Particularly given recent history of DNSPs issuing requests for proposals without implementing even the most attractive proposal received, potential DM suppliers will be reluctant to invest significant resources in developing proposals for network consideration until the market sees evidence of DNSPs investing in DM as an alternative to network augmentation.

In this context, standard offers as proposed in the Interim Report would represent a desirable extension of the approach required by the DM Code of Practice.

Consider mechanism to encourage DM at regulatory reset

Since releasing the Interim Report, IPART has announced that the form of regulation that it will apply to distribution tariffs for the next four-year regulatory period commencing 1 July 2004 will be a weighted average price cap. SEDA notes with concern that this will create short-run incentives for DNSPs to increase energy throughput and, other things being equal, will discourage end use energy efficiency.

IPART has indicated that the price cap will possibly "be calculated taking into account … A mechanism to provide incentives to undertake demand management." [IPART, Notice under Clause 6.10.3 of the National Electricity Code – Economic Regulatory Arrangements, June 2002, p 3]

Given IPART's avowed intention to ensure that "DNSPs should have incentives to choose the most efficient and least cost option and the regulatory treatment should not create a bias towards a particular type of expenditure (e.g. capital or DM/distributed generation)", it is essential that an effective DM mechanism be built into the regulatory reset process.

5. Encouraging Retail Market Driven DM

As electricity retailing is becoming increasingly competitive, the focus of electricity retailers is firmly on identifying activities that deliver commercial advantage. It is reasonable to expect that where the retail electricity market is able to function efficiently, DM will be adopted where appropriate. However, there are a number of aspects of the retail market that are likely to obstruct its efficient functioning. These obstacles include:

1. Exclusion of environmental costs from prices
2. Flat tariffs and absence of interval metering which mean that customers are not exposed to prevailing market prices fluctuations
3. Customer protection policy mechanisms that may shield the retailer from the prevailing market prices fluctuations

The first obstacle and the need for an effective and rigorous Electricity Sales Foregone methodology has been discussed in section 3 above.

The second obstacle is discussed in detail in Interim Report. IPART proposes addressing this obstacle by reviewing the rollout of interval meters. However, it

should be noted that there are a range of other options for signalling prices to consumers even where customers do not have time of use meters. One such option is the use of seasonal tariffs where tariffs are rebalanced throughout the year to reflect broad variations in wholesale energy prices. So, for example, if there is a need to increase default tariffs in future to recover increases wholesale energy prices during the summer peak, such increases could be passed through as premium on summer time tariffs while maintaining non-summer tariffs at current levels. Alternatively, a seasonal tariff could be offered as an option to customers who wish to adopt it.

The third obstacle could be addressed by similar strategies to ensure that retailers are not insulated form price signals that are intended to drive rational investment decisions.

As noted above, the recent release of the Statement of System Opportunity (SOSO) by the Ministry of Energy and Utilities' has emphasised the rapid decline in surplus generation capacity in NSW. .

The *Statement of System Opportunities* estimates that up to 25% more generation capacity and/or demand side responses will be needed by 2010 in order to meet future energy demand (at an estimated cost of $8.1-8.7 billion). SOSO notes that demand management is an important strategy that provides flexibility in meeting customer energy service needs. It also notes the importance of energy efficiency generally as a means to constrain growth, and the important contribution of alterative and renewable energy generation (which can also bring significant environmental benefits to the State).

Energy demand is growing rapidly and NSW's reserve generation capacity margin is shrinking, as are reserves elsewhere in the National Electricity Market (NEM). This trend is reflected in the recent change to NEM rules whereby the cap on wholesale power prices has been lifted from $5,000 to $10,000 per MWh (compared with an average price of around $35/MWh). This is intended to prompt investment in new generation capacity and encourage demand side measures to reduce demand at times of peak demand.

Given the projected investment in new network infrastructure, the need for adequate mechanisms for DM to compete with *both* new centralised generation *and* new network investment has never been more stark. The competitive generation market should facilitate this from a generation perspective. The DM Code of Practice should *help* to do this from a network perspective. As the organisation with the most direct relationship with the customer, retailers should be best placed to coordinate these various price signals, but they will only be able to do so if they are directly subject to cost reflective prices in both generation and network markets.

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Attachment 1: Studies of the economic potential for DM

The following is a brief review of some of the recent studies that have estimated the potential for saving money through energy conservation in Australia.

In 1990, the Federal Government's National Energy Research, Development and Demonstration Program (NERDDP, now the Energy Research and Development Corporation-ERDC) commissioned a report into Australia's energy related greenhouse gas emissions and the scope to reduce them. The comprehensive 234 page report analyses energy use by fuel type, by use and by state and concludes that total annual energy demand could be reduced by 399 PJ per annum, or 17% below "business as usual" consumption. This included a reduction in electricity consumption of 27%. The measures required to achieve these savings,

> "involve changes to the energy system which are in most cases financially cost effective for those making the changes, and are certainly all economic in that they involve no cost to GDP (and in most cases would increase it by increasing production efficiency and international competitiveness)." [Wilkenfeld et al 1990, pp. 30-31]

Cost effectiveness for the industrial and commercial sectors was based on "an internal rate of return of 25% or better, approximating a payback time of not more than three years under current energy prices." These cost effective measures would also reduce greenhouse gas emissions throughout the economy by over 20%. [Wilkenfeld et al 1990, p. 9]

Also in 1990, the Minerals and Energy (Backbench) Committee of the NSW Parliament, chaired by John Jobling (Liberal Member of the Legislative Council) reported to the then NSW Minister for Minerals and Energy, that:

> "It is estimated that the recommended programmes have the potential to save approximately $200 million over 3 years, and savings in the State Government sector could approach $15 million in the first year of operation. While these figures appear large, they are in fact small in the context of the over $8 billion p.a. turnover in the NSW energy supply business, and it is estimated that there is in excess of $500 million in usage costs which could be saved through longer term cost effective actions." [NSW Government Minerals and Energy Committee 1990, p. ii]

In 1991, the Ecologically Sustainable Development (ESD) Energy Use Working Group intensively considered issues relating to energy use, energy efficiency and conservation for over a year. The working group included representatives of the Australian Council of Trade Unions (ACTU), the NSW, Victorian and Commonwealth Governments, the Commonwealth Scientific Industrial Research Organisation (CSIRO), conservation groups, consumer groups and industry (Caltex and the mining company, CRA). After in depth study, this diverse group made 17 consensus recommendations. The membership of the Working Group and the full list of recommendations are included in Appendix A.

The Energy Use Working Group commissioned studies of eleven energy end use applications, from industrial smelting to major household appliances. These particular applications were neither the only, nor necessarily most cost effective areas for achieving energy savings. The studies found that across Australia, for these 11 applications alone, net savings of about $3.3 billion could be achieved while reducing CO_2 emissions by 45 million tonnes by 2005. [ESD Energy Use Working Group 1991, pp. 85- 88].

The Australian Commission for the Future issued a report in November 1991, which concluded that energy consumption could be reduced by 17% below business as usual by the year 2005 through increased energy efficiency at no net cost to the economy. Since the purpose of the study was to estimate the maximum *greenhouse gas emissions reduction* achievable at no net cost, it did not seek to estimate the maximum *potential financial savings*

available through energy efficiency. The Report presented itself as providing "a benchmark for identifying the known maximum potential savings given the projected growth in economic activity and energy prices" based on efficient energy use technologies available in 1991. [Australian Commission for the Future 1991, pp, 26, 37-39][3]

The Business Council of Australia has also recognised the potential for business and consumers to save money through energy conservation in a report it commissioned and released in 1991. This report concluded that although Australia could not achieve its national target of a reduction in greenhouse gas emissions to 1988 levels by the year 2000 and a 20% reduction below this level by 2005 without significant economic costs, the potential savings were nonetheless substantial. The report concluded that:

> "the realistically achievable reductions in electricity consumption and CO_2 emissions from electricity production by 2005 are together estimated to reduce CO_2 emissions from these areas by at most 25%, relative to the reference forecast. [Business Council of Australia 1991, p. xi]

The report went on to issue a challenge to governments,

> "... substantial energy savings are feasible and will be of benefit to Australian industry,... There is much that Governments can usefully do.... if the Government wishes to set targets for reducing greenhouse gas emissions, the onus must be upon the policy makers to demonstrate how this can be done without having a substantial net adverse impact on the Australian economy." [p. xii]

Policy makers in Australia are generally yet to rise to this challenge.

In 1991, another report for the NSW Government, this time for the Department of Minerals and Energy, examined the potential savings through improving the efficiency of energy use and substitution of low emission energy forms for electricity. It examined three scenarios:

> "1. The status quo of high (say 25% real) rates of return required for energy investments and minimal government and utility intervention. ...
>
> 2. Vigorous energy management stimulation by government and utilities, but no subsidisation (i.e. still with 25% real rate of return). This case assumes that all currently economical measures will be implemented. ...
>
> 3. An extreme case based on substantial subsidisation, such that the required rate of return for the user is reduced effectively to only 10% real."
> [NSW Department of Minerals and Energy 1991, p. 1].

The report concluded that the first case equates with very little improvement in energy efficiency. In the second case "CO_2 savings from electricity use of about 10% [or 4 million tonnes per annum] can be achieved." In the third case, savings are increased to about 20%. [NSW Department of Minerals and Energy 1991, p. 1].

To paraphrase the conclusion from case 2, customers could save one tenth of their energy consumption and energy supply bills through measures that pay for themselves within four years. These savings do not require subsidisation, but will not be achieved without vigorous stimulation of the energy services industry by Government and the utilities.

In 1992, the Electricity Supply Association of Australia (ESAA) commissioned the National Institute of Economic and Industry Research (NIEIR) to undertake an extensive two year study

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[3]The study estimated 1989 Energy consumption in Australia as 2,629 PJ and projected energy consumption rising to 3.605 PJ by 2005 in the "baseline" scenario. Under the "maximum economic potential" scenario, the projected emission in 2005 fell to 2999 PJ. The study estimates that under this scenario, "there is a cost of about $25 billion matched by benefits of the same order" [Australian Commission for the Future, p. v]

of the economic impact of reducing greenhouse gas emissions. As an association of electricity suppliers, the ESAA is not an organisation that would be expected to produce a report biased in favour of energy conservation. Yet even this report concluded that "no regrets" energy conservation measures could reduce the carbon intensity of the national economy (and therefore greenhouse gas emissions) by 7% or 35 million tonnes per annum relative to the reference case by 2020 while *increasing* the Gross Domestic Product by 0.12%. [NIEIR 1994, p. 8]

The above studies are estimates of what could potentially be achieved. There are also examples of what has been achieved.

The State Electricity Commission of Victoria's Demand Management Action Plan (DMAP) was the most extensive demand management and energy conservation project ever undertaken in Australia. The Final Report of the DMAP, noted that the former State Electricity Commission of Victoria invested $25.2 million in energy efficiency and related programs and delivered ***net*** economic benefits to the state of $44.5 million[4]. [Electricity Services Victoria 1994, pp. 79, 101]. The DMAP was scrapped by the Kennett Government "as a result of the restructuring of the Victorian Electricity Supply Industry" [Electricity Services Victoria 1994, p. 9].

[4] Based on total cost of programs, management and demonstrations, 1989/90 to 1992/93.