



DEMAND MANAGEMENT AND ENERGY POLICY DEVELOPMENT: A CASE STUDY OF NEW SOUTH WALES

A REVIEW AND PROPOSALS FOR THE FUTURE



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This brief review examines policy development and opportunities for demand management (DM) in New South Wales at two levels. It should be noted that key findings have relevance to other states as well as Commonwealth action.

Firstly, on the economic plane in relation to 'cost effectiveness'. It should be noted there are differing interpretations of this concept. This is partly influenced by which economic methodology is applied - traditional or broader economic approaches; and also how economic concepts are expressed in legislation and used by regulatory agencies. In some ways 'cost effectiveness' is in the eye of the beholder.

Secondly, while barriers to demand management have been long acknowledged – and the solutions to overcoming these increasingly well known – there have been highly influential political issues, embedded cultural attitudes and regulatory approaches that have impeded their implementation. These need to be exposed in order to devise the next strategic attempt to mainstream demand management for baseload and peak power consumption which in turn will alleviate energy bill pressures on consumers and assist climate change policy.

While there is some evidence that a few of the recent DM policies have the potential to make a moderate degree of difference, we suggest a suite of recommendations that if implemented would firmly embed DM into our energy system with significant financial, social and environmental benefits. This will however only occur where the

political will exists and energy industry and regulator myopia about DM has been overcome or overridden. The recommendations can be fashioned for reform of the National Electricity Market (NEM) Rules and also in some circumstances via NSW action.

Recommendations

- 1 Expand the NSW or national Energy Savings Scheme to distributors to incorporate peak demand reduction targets and the surrender of certificates with priority for constrained areas.
- 2 Allocate a percentage of utility revenue to DM.
- 3 Require implementation of DM prior to augmentation of the transmission and distribution network systems through explicit terms and associated planning and revenue provisions in the NEM and state government directions.
- 4 Development of a risk-reward system to establish clear incentives for utilities.

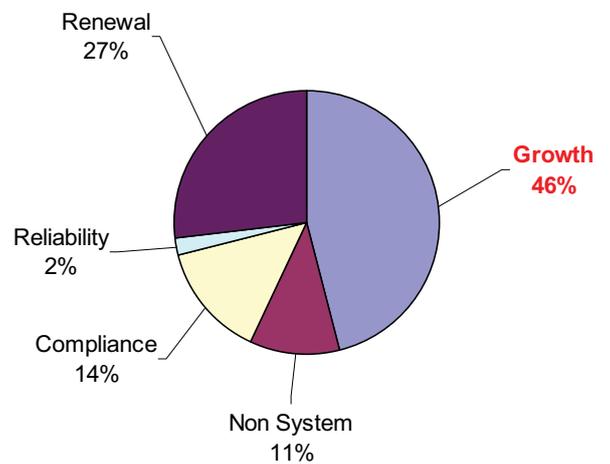
01

Demand growth has two components: baseload and peak. Both forms of growth have direct financial impacts on household, social service and business consumers; and, depending on the energy source, increase greenhouse gas emissions. When the financial and environmental costs rise, society, individuals and organisations now and in the future, are worse off. NSW and the National Electricity Market (NEM) are facing a number of very significant pressures to expand generation, transmission and distribution capacity which, if not curtailed, will entrench the worst aspects of our electricity system.

Around a third of total NSW distribution network expenditure over the next five years is for growth alone.¹ As significant parts of demand growth and subsequent infrastructure expansion are largely optional, as opposed to a foregone conclusion, this represents over several billion dollars of avoidable costs for which NSW electricity consumers will have to pay, not including the costs of additional generation and transmission infrastructure or resulting future carbon costs.

Networks such as Integral Energy have even higher rates of growth related capital expenditure. The graph below shows that 46% of Integral Energy's \$2,953 million capex spend is just to meet new growth.²

Components of Integral Energy's Capital Expenditure Program³



1.1 Peak Demand

A particularly serious problem is peak demand. About 10 percent of network capacity is required to meet peak demand that occurs only 1 percent of the year.⁴ Integral Energy notes that this is typically about 85 hours per year.⁵ Peak demand in the TransGrid/EnergyAustralia area of Inner Sydney Metropolitan indicates how infrequently maximum capacity is exceeded:

Peak Demand in the Inner Sydney Metropolitan Area⁶

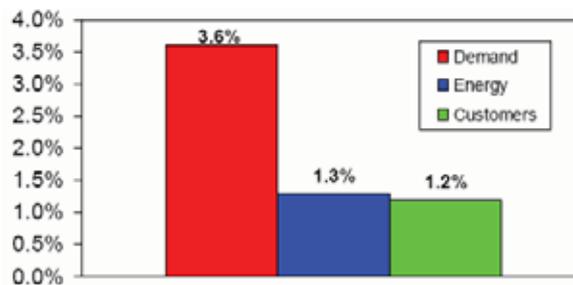
Year	Top 50 MW	Top 100 MW
2005/06	1 day, 4 hrs total	2 days, 7 hrs total
2006/07	1 days, 0.5 hrs total	2 days, 3 hrs total
2007/08	1 days, 2.5 hrs total	2 days, 9 hrs total
2008/09	4 days, 8.5 hrs total	6 days, 21.5 hrs total

Such peak demand spikes not only occur infrequently, but are growing disproportionately compared to overall energy consumption. For 2009-

01 THE DEMAND MANAGEMENT CHALLENGE

2014 Integral forecasts peak demand growth (3.6% pa) to be three times higher than both growth in customer numbers and energy consumption (1.2% and 1.3% pa respectively), as illustrated below.⁷ As Integral admits, the differing growth rates between peak demand compared to customer numbers and energy consumption contribute to upward pressure on tariffs.⁸

Integral Energy Average Yearly Growth 2009-2014⁹



In the residential sector, EnergyAustralia forecasts an even greater disparity between peak demand and consumption, with consumption growing at only 0.1% and peak demand growing at 3.7%, as illustrated below.

Demand growth in EnergyAustralia's network area (2009-14)¹⁰

Energy Growth (percent)

Residential 0.10

Peak Demand Growth (percent)

Residential 3.70

As IPART has noted, the cost of providing distribution peak load can be around 400 times the cost of baseload.¹¹

02. COST EFFECTIVENESS OF NETWORK DM

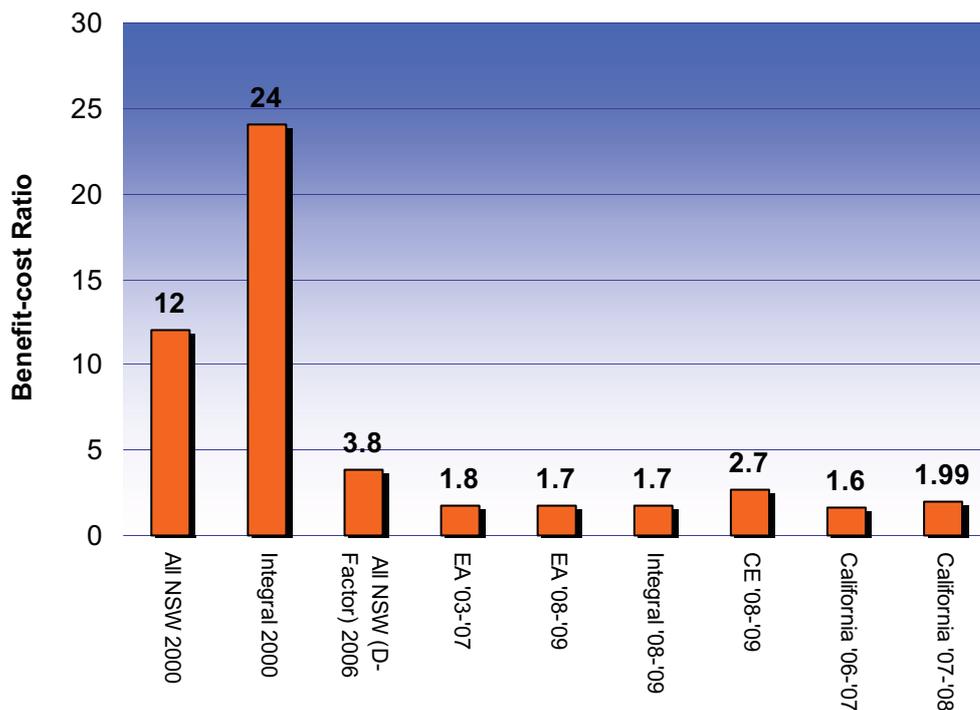
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One of the key barriers that must be overcome to transform regulator and network myopia on DM is the way in which cost-effectiveness is defined. Australian distribution network companies and regulators currently calculate the cost-effectiveness of DM on the most narrow of terms. Excluded from their calculations are:

- Avoided transmission costs
- Avoided generation costs
- Avoided carbon costs

Instead, the only value recognised is that of deferring or avoiding an upcoming, local augmentation compared to estimated build costs. Even when defined within such narrow boundaries,

Cost-effectiveness of Network DM Since 2000¹²



(Any value greater than one indicates that benefits have exceeded costs)

actual experience has demonstrated DM's cost-effectiveness in NSW and elsewhere. The following graph demonstrates the cost-effectiveness of NSW network DM.

Research conducted by the Institute for Sustainable Futures in 2007 for Total Environment Centre has shown that actual distribution network DM undertaken with IPART's 'D-Factor' between 2004 and 2006 was almost four times more cost-effective than augmentation, delivering a benefit to cost ratio of 3.8 to 1. DM costs were \$5.1 million, while the expected avoided network cost was reported as \$19.3 million.¹³

In 1999-2000 DM investments by all the NSW

02. COST EFFECTIVENESS OF NETWORK DM

distributors delivered a benefit to cost ratio of over 12 to 1. This involved \$5 million of expenditure that delivered \$62 million in operating and capital cost savings.¹⁴ A highlight was in 1999-2000 when Integral Energy's DM achieved a benefit to cost ratio of 24 to 1, with DM costs of \$1.2 million for \$29 million of capital investment deferral.¹⁵ DM carried out by NSW networks in 2008-09 shows more moderate benefits.

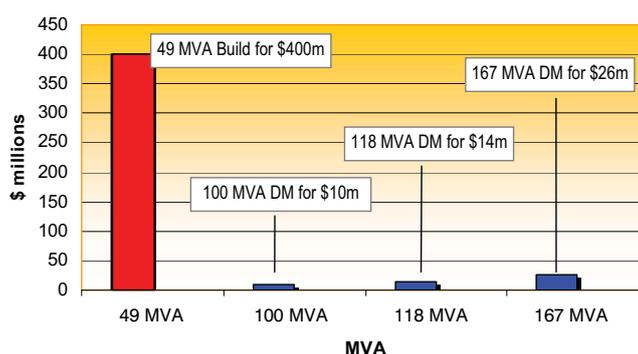
Cost-effectiveness of NSW Distribution Network Demand Management

Network	Year	DM spending \$m	Opex and Capex Savings	Benefit to Cost Ratio	Tonnes GGE Reductions
All	1999-00	5	62	12 : 1	
Integral	2000	1.2	29	24 : 1	
All (D-factor only)	2004-06	5.1	19.3	3.8 : 1	
EnergyAustralia ¹⁶	2003-07	5	9	1.8 : 1	
IntegralEnergy	2004-07				
EnergyAustralia ¹⁷	2009	7.9	13.4	1.7 : 1	2,421 - 1 yr 2,201 - 9 yrs
IntegralEnergy ¹⁸	2008-09	1.3	2.2	1.7 : 1	2,762 pa
Country Energy ¹⁹	2008-09	10.3	27.9	2.7 : 1	40,538 – 20 yrs
Californian Utilities Verified ²⁰	2006-07	1,353	2,190	1.6 : 1	3,417,782
Californian Utilities Projected ²¹	2006-08	2,724	5,419	1.99 :	1 1,419,025

The experience in California demonstrates that energy savings still deliver almost double the return on the investment after 30 years of aggressive energy efficiency activity. This indicates that there would still be exceptionally good value DM available in NSW and across the NEM for many years.

NSW transmission networks, EnergyAustralia (EA) and TransGrid (TG) are currently not required to report DM expenditure and savings. This makes it difficult to assess the cost-effectiveness of their programs. However, as part of the current MetroGrid project, EA and TG have undertaken analysis of DM opportunities. The following graph illustrates the radically superior financial benefits that DM is projected to deliver compared to the augmentation alternatives.

MetroGrid Cost of Augmentation versus DM



Based on 2 years of investigations, TG and EA have concluded that compared to a 49MVA augmentation to meet the summer demand in 2012-13 costing \$400 million, DM could deliver double the amount of DM for one year at a mere 2.5% of this cost, 100MVA for \$10 million.²² Charles River Associates go further to project 118 MVA of DM for \$14 million or 167 MVA of DM for \$26 million, using a variety of DM techniques.²³

03

There has been much work done on identifying barriers to demand management.²⁴ One of the most significant has been IPART's (2002) *Inquiry into the role of Demand Management and other options in the provision of energy services* which highlighted the following key barriers and provide a useful summary:

- Full economic costs of energy use are not included in prices
 - For example, greenhouse gas emissions, locational peak demand costs
 - Weak price signals – tariffs
 - Regulated tariffs are 'flat' tariffs that provide no information / incentive related to peak prices to end-users
 - Weak price signals – metering/profiling
 - Standard meters for smaller customers do not allow charges / incentives for load management during peak periods. Standard profiles do not differentiate between 'high' and 'low' cost consumption patterns (eg those with and without air conditioners)
 - Imperfect information
 - End-users do not have easily accessible or credible information on energy-saving technologies or processes, suitable suppliers, or case studies
 - Risks and Transaction costs
 - These can be real costs and valid assessment of uncertainties, but are frequently ignored in assessments of DM costs and potential
 - Includes marketing and signing-up participants, investigating options and supporting decision-making, monitoring and evaluation, payments and processing, etc
 - Risks include unknown performance, costs or lifetime of new technologies or processes
 - End-user preferences for simplicity, convenience, reliability, 'luxury'
 - These are a real reflection of value perceptions and preferences of end-users
 - Not all apparently 'wasteful' or sub-optimal energy choices would be changed if end-users had perfect information and efficient prices.
- Appendix 2 of their report reviews additional barriers including:
- Financial
 - Up-front cost of equipment, long paybacks and lack of price certainty.
 - Regulatory
 - Lack of penalties in retail licence conditions and certainty for treatment of DM cost
 - Information and capacity
 - Of end users assessing savings
 - Structural
 - Split incentives in building area; lack of influence by consumer on appliance standards
 - Cultural
 - Utility attitudes and preference for 'tried and tested' technologies and practices
 - Technical
 - Cost of conversion to new technology and integration of embedded generators.

It should be noted that the National Electricity Law and Market was only just evolving its regulatory architecture and the national grid connections by the time the IPART report was published, however NEM simply absorbed key barriers rather than resolve them – and in our view developed significant additional ones.

03 BARRIERS TO DEMAND MANAGEMENT

Research by TEC and its consultants has exposed a number of NEM derived barriers. In our 2004 report, *The National Energy Market Environmental and Social Issues - NGO position paper*, we wrote:

The Parer Report recognised the importance of DM and recommended several measures to improve demand-side participation, including the establishment of a demand-side bidding pool, the roll-out of interval meters, the removal of retail price caps and improving access for embedded generators to the grid. However, underlying these recommendations was the assumption that the market would naturally lead to a demand-side market able to compete with the supply-side. What Parer and others have failed to recognise is that the market that they are attempting to develop is a market to *sell electricity*. This is in sharp contrast to a market that aims to save electricity.

In the same year TEC commissioned NextEnergy to review demand management in the NEM and compare DM policies in other jurisdictions, including several Australian case studies of network expansion.²⁶ The consultants reported additional barriers, including:

- the lack of funding to help establish DM capacity in the marketplace;
- the invisibility of proposals to expand the system and thus the timely opportunity to develop alternatives;
- the failure of utilities to consider DM before embarking on planning and construction of additions to the system; and,
- the absence of an 'intensive' national framework for energy efficiency.

Next Energy stated:

The unfortunate truth is that in practice, no substantial demand management market has evolved in the first five years of the NEM and it is highly unlikely to do so without the types of changes recommended in this document. The two case studies reviewed in this paper (Sydney CBD Transmission Augmentation and the Latrobe Valley to Melbourne Augmentation) clearly demonstrate this point. Unless prompt and decisive action is taken, economic demand management opportunities will continue to be lost.²⁷

Particular regulatory barriers related to the way in which network revenue is regulated have also been highlighted in the Headberry/Lim 2008 report, *Does Current Electricity Network Regulation Actively Minimise Demand Side Responsiveness in the NEM?*²⁸ The report shows how the building block form of regulation creates significant disincentives to demand management. In addition, price caps as opposed to revenue caps on network revenue, adopted in NSW by IPART in 2004, further discourage DM by rewarding networks for increased sales of electricity to consumers.

Despite these findings, the Australian Energy Market Commission (AEMC) recently claimed that, '...network businesses regulated under a price cap have private incentives to contract in a way that is consistent with socially efficient levels of DSP.'²⁹ The reasoning behind this claim appears to be that not consuming electricity is automatically seen as a social cost, as opposed to a benefit.³⁰

In an important recent review, the CSIRO (2009) points to institutional problems generated by specific policy/regulatory barriers, including³¹:

- **Short term policy horizon**, creating difficulty in setting policy frameworks that have a consistent long term horizon
- **Lack of understanding by policy makers of the value of energy efficiency**, in part driven by lack of data on the value of energy efficiency
- **Separation of energy policy from social and environmental policy**
- **The failure of market policies to internalise social and environmental benefits**

The last two barriers are noted in MMA's 2009 report for TEC, *Role of the NEM in responding to climate change policies*³². It is notable that exceptions to this problem such as California and the UK have energy policies that are aligned with climate goals.

TEC has also identified the lack of social and environmental objectives as a key barrier with the NEM which instead draws its focus from a narrowly and explicitly defined economic objective which reads:

The national electricity market objective is to promote efficient investment in, and efficient use of, electricity services for the long term interests of consumers of electricity with respect to price, quality, reliability and security of supply of electricity and the reliability, safety and security of the national electricity system.

03 BARRIERS TO DEMAND MANAGEMENT

Our 2006 report, Gilbert and Tobin *How should environmental and social policies be catered for as the regulatory framework for electricity becomes increasingly national?*³³ highlighted the problem of the objective, quoting NEMMCO's (the original system operator) interpretation:

Under the Rules, NEMMCO's charter focuses specifically on efficiency, security and reliability of power supply, and excludes favouring one fuel source over any other. Consequently, NEMMCO has neither the power nor the authority to make decisions based on considerations of sustainability and balance in resource management.³⁴

The NEM objective was deliberately simplified to avoid conflicting goals and overly complex decision making. But while this may have been administratively easier, it introduced a deep seated bias into its processes. It embedded the pre-

existing culture of the electricity industry focussed on sales not saving. Asymmetrical negotiations relationships also made connection for embedded generation complex, time consuming and impossible to overcome for some suppliers. Australia's key consumer, community and environment groups have called for the insertion of environmental and social sub-objectives in the National Electricity Law.³⁵

Overlaying and reinforcing this bias is the clear political sensitivity about 'the lights going out'. TEC's believes that the traditional energy industry and regulatory allies use this theme in their discussions with energy ministers and governments generally, as well as in public statements, at strategic times - to influence decisions.

04

There have been a wide range of policies implemented to address the problem of low demand management take-up. Some examples are below and the immediate question we will subsequently address is whether they have led to a mainstreaming of demand management and made substantial in-roads into planning for expanded generator capacity and distribution networks. Have the central barriers been addressed?

The policies fall into a number of categories with the politically and financially easier options used initially over the last two decades or more.

- 1 **Information** – NSW Energy Information Centre in the early 1990s, then SEDA Energy Smart Information Centre; brochures and rudimentary energy use information about some appliances; now detailed web based information and guides; Energy Efficiency Opportunities Act.
- 2 **Codes**, ratings and ‘consideration’ – model codes for energy efficient housing (SEDA); licence conditions via the Electricity Supply Act 1995 for distributors ‘to conduct investigations into the cost effectiveness of implementing demand management strategies that permit distribution network augmentation to be deferred or avoided’, resulting in the *Demand Management for NSW Distributors - Code of Practice*; NaTHERS rating tool for house designs.
- 3 **Inquiries**, reports, strategies – MCE’s Energy Efficiency Working Group which has auspiced the National Framework on Energy Efficiency (est 2001); IPART inquiry (2002); establishment of Demand Management and Planning Project subsequent to and with \$10m funding from MetroGrid decision in 2002; Productivity Commission to Inquiry into the Economic and Environmental Potential of Energy Efficiency (2005); National Strategy on Energy Efficiency 2009-2020; PM’s Taskforce on Energy Efficiency (2010); the Australian Energy Market Commission’s Review of Demand Side Participation in the NEM (ongoing);.
- 4 **Rebates**, grants, audits, revenue recovery – 1998 NSW rebates for low income housing and appliances, this instrument extended to a variety of energy efficient purchases for all consumers by successive governments; SEDA Energy Smart Business Program offered free audits; introduction of the ‘D-factor’ by IPART in 2004 to allow distributors to recover costs for DM; the Australian Energy Regulator’s ‘Demand Management Innovation Allowance’ Energy Savings Fund introduced in 2005 to support various DM projects. The most ambitious has been the Commonwealth Government’s recent insulation program.
- 5 **Agency targets and business plans** – in 1998 NSW public sector was required to reduce energy consumption by 15% by 2001 and 25% by 2005 along with energy performance contracts and purchasing 5% GreenPower; Energy Savings Action Plans (2005) to be produced by largest business consumers and councils under the Energy Savings Order.
- 6 **Regulation** - NSW Greenhouse gas Abatement Scheme specifying reductions in carbon intensity of power generation (including by use of offsets and energy efficiency) introduced as a mandatory measure in 2003 after failure of voluntary targets; converted to Energy Savings Scheme (ESS) in 2009 with targets on retailers for consumption reductions. BASIX in 2004 with targets for greenhouse gas reduction for new housing and (later) renovations. Minimum energy performance schemes – energy ratings for a range of appliances (ongoing); new reporting

04 POLICIES IN RESPONSE TO DM BARRIERS

requirements from the AEMC's for annual Distribution Annual Planning Reports, including Demand Side Engagement Strategies that are intended to "provide transparency on how DNSPs assess and consider non-network alternatives, and promote a clear and transparent process for DNSPs to engage with non-network proponents."

A number of NSW policies such as the ESS and IPART's 'D-factor' have shown state leadership and can be confidently transferred to the national level action as they have proven administrative and methodological practices.

Notably steep increases in prices have not been advocated strongly (even time-of-use pricing is not high on the list) as government policy was to moderate prices for consumers and business. This policy appears to have been abandoned with the recent announcement of a 60% price rise due to network expansion and a potential carbon price. About one third of the rise is due to system growth, much of which TEC estimates could be alleviated by DM. It may serve as a price shock that could open the way for more ambitious DM policies which if implemented early could reduce the annual price rises.

4.1 Has DM Potential Been Achieved?

In its landmark Report on Demand Management, the Independent Pricing and Regulatory Tribunal (IPART, 2002) stated that it believed:

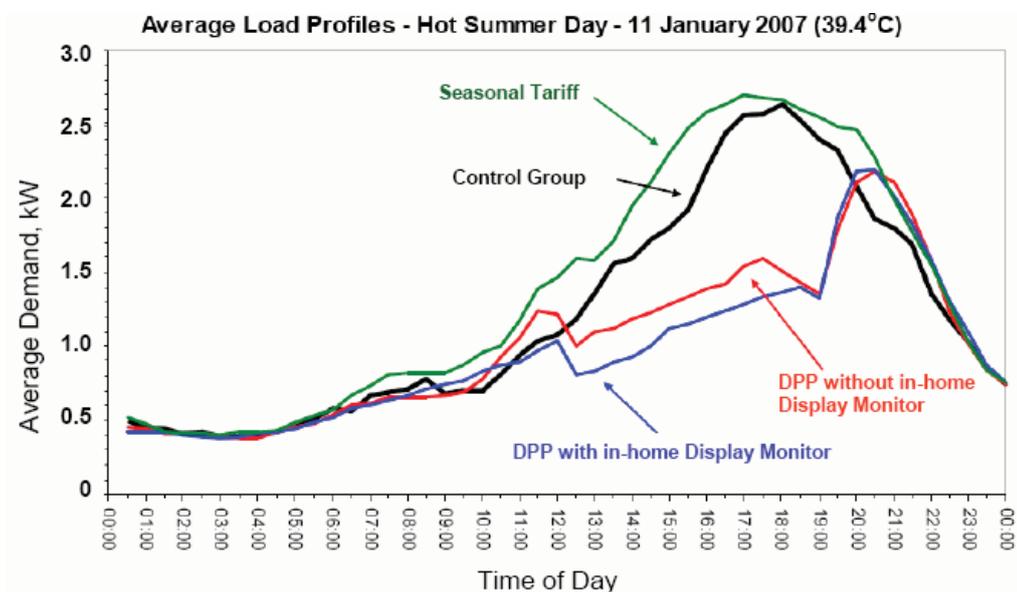
'...there are substantial cost-effective opportunities to use DM in NSW that are not being pursued. It also believes that the need to capture these opportunities is becoming more urgent.'³⁶

These opportunities remain untapped. Various desktop estimates have repeatedly projected these potentials, for the NEM for example:

- **National Framework for Energy Efficiency**³⁷ – 70% reductions in residential and commercial energy consumption (with average 4 year pay-back); 9% reduction in total stationary energy use (213PJ)
- **DM and the National Electricity Market**³⁸ – 2800 MW
- **Demand Management and Planning Project**³⁹ – 500MVA (Sydney only)
- **Energy Reform Implementation Group**⁴⁰ - 3000MW

There are a range of potential DM strategies that deliver DM capacity to the consumption sector. For example (and as noted above) pricing has been largely ignored and one particular instance of untapped potential is dynamic pricing. Trials continue to demonstrate the extraordinary potential to reduce peaks along with average energy use. An example is Integral Energy's Western Sydney Pricing Trial over 2 years which achieved the significant reductions illustrated below, saving \$3 million in electricity bills.⁴¹

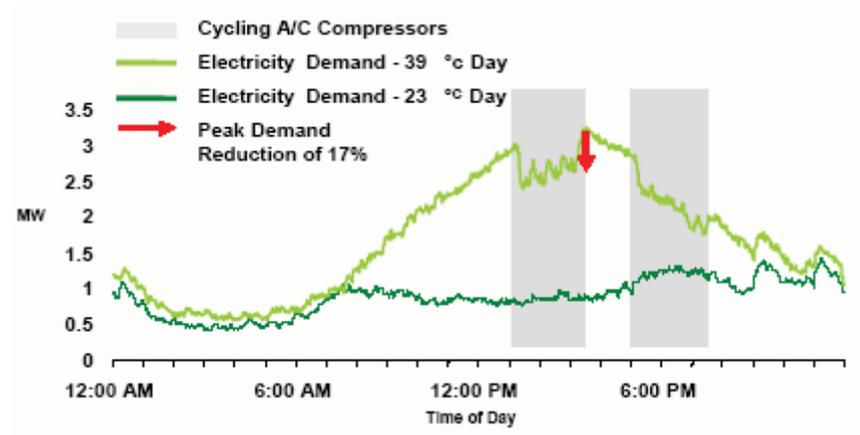
Integral Energy Western Sydney Pricing Trial



04 POLICIES IN RESPONSE TO DM BARRIERS

The remote cycling of air-conditioners can also be done without smart meters. In the summer of 2007-08, Energex (QLD) retrofitted 954 air conditioners with a CYCLEit™ device for its Cool Change trial. Peak reductions of 17% were delivered.

Energex Cool Change Trial



Even simple time-of-use tariffs without any other intervention can deliver meaningful reductions, as EnergyAustralia has found. EA's time-of-use tariffs have delivered a 1.1 percent drop in total summer peak demand, compared to regular tariffs.⁴²

Such significant reductions could be occurring across the NEM, but not without significant network incentives or mandates. According to Energy Futures Australia (2007) the accelerated roll-out of smart meters across the NEM could deliver an Australia-wide reduction of 10% of electricity consumption and emissions, but as Energy Futures Australia reported to TEC, not without significant engagement of consumers through in-home displays, dynamic peak pricing and other methods.⁴³

In general, demand management has been an 'add-on' to energy policy particularly in the early years. An examination of the recommendations proposed by IPART in 2002 while well targeted in a relatively narrow sense (and some were adopted by government) try to bolster only the option of demand management.

For example, a demand management fund, improving customer access to information, use of standard offers in the DM Code of Practice, review of the smart meter policy and trials of congestion pricing try to raise the profile of DM but don't guarantee it occurs.

There were two more substantial recommendations that had the potential to retard energy consumption growth. IPART proposed mandating greenhouse gas benchmarks with penalties and foreshadowed the 'D-factor'. On the one hand GGAS was regulatory intervention for retailers and on the other, the 'D-factor' for networks attempted to compensate for sales foregone and make inroads into the 'sell more, make more' mentality of the industry. They were directed at the culture of the industry.

A review of 'D-factor' by the Institute of Sustainable Futures (2007)⁴⁴, commissioned by TEC found that:

...although the D-factor is an important precedent in supporting DM and should be built upon, the D-factor is not a cure-all for DM and, without reform and complementary measures, it is very unlikely to deliver an efficient level of DM activity.⁴⁵

The report advocated a number of other measures, as the 'D-factor' was regarded as insufficient to fully change traditional attitudes and expand the savings.

Undoubtedly the combination of GGAS (and now ESS) with BASIX has impacted on demand growth. A significant portion of the GGAS certificates were in the area of demand side abatement. This should have contributed to a reduction in consumption; while BASIX should have reduced expected growth due to the take-up of solar hot water and housing achieving over 4 star NaTHERS ratings.

04 POLICIES IN RESPONSE TO DM BARRIERS

In 2007, the Owen Inquiry into the state's electricity supply concluded that:

'TransGrid forecasts that total energy consumption in New South Wales in 2016-17 will be some 2,000GWh lower than it would have been if energy consumption growth continues at the pre 2001 rates. Despite data limitations, this is at least in part due to energy efficiency. For indicative purposes this is equivalent to around half the maximum annual output of one 660MW coal fired unit at the Vales Point power station. This is in addition to the reduction in forecast scheduled generation in 2016-17 following the 4,000GWh contribution from renewable energy and embedded generation.'⁴⁶

Owen also noted the current difficulty of forecasting and lack of inclusion of the contribution of future programs. However, the ESS with its specific targets and the experience gained from other key policies may help alleviate this problem. Additionally the Commonwealth insulation program was at such a scale that its energy savings should be able to be accounted for in demand projections. Retrofitting ceiling insulation is equivalent to increasing the star rating of a previously uninsulated home from around 0.5 stars to 2 stars. This represents an energy saving of between 25 to 50 per cent, depending on the climate region in Australia.⁴⁷

There have been suggestions that a 'rebound' effect, or comfort creep takes up energy savings and that this needs to be taken into account.⁴⁸ However this was specifically allowed for in the Department of Climate Change analysis of the insulation program. A 66 per cent 'comfort factor' was used when estimating the potential energy efficiency savings per previously uninsulated house. Compared to the literature on this topic, this is an extremely conservative estimate.

DM as a mainstream policy has only begun to attract attention. Whether this can be taken further will depend on the policies that government adopts for DM and in relation to the NEM.

One of the key problems in recent years has been that while governments have begun to be interventionist with various regulations, the NEM continues to advance in the opposite direction creating unnecessary tension between policies and efficient implementation. DM is not a prerequisite in the NEM (because this would counter the 'level playing field' between energy sources) and in fact the AEMC has recently tried to relieve distribution

expenditures under \$5m of any cost-benefit analysis which if approved would kill off potential for demand management options to compete more fully with supply.

With the NEM agencies taking over much of the regulation from state-based bodies such as IPART, governments will face difficult decisions about keeping their best DM policies directed at energy utilities operating in their state or continuing to cede control to a national approach that may result in a lowest common denominator approach.

While some recent policy initiatives such as the ESS have potential, today's challenges require more to help abate climate change and the increasing price burden on households and business.

In terms of the future shape of the electricity system, demand management should play the primary role in delaying investment in expanding the system by creating sufficient time for:

- new peak and baseload generation requirements for population and economic growth to be met by clean and green technology including DM
- replacement of current centralised power plants by clean and green generation at the end of their lives.

The financial and environmental benefits to consumers and society as a whole should be prioritised above building more 'old' generation that embeds pollution and inefficiency for decades into the future and prejudices the choices and success of climate change and efficiency policies. Consumers should be afforded greater control over their energy supply and bills rather than being captured in a fossil fuel growth paradigm.

05

5.1 Political Will and Regulatory Context

The conjunction of public concern about climate change and steep price rises should elicit a substantial demand management response from governments. With the collapse of the CPRS, the only substantial policy is energy efficiency; with price rises mainly influenced by energy supply system expansion. The best response is to make energy consumption more efficient.

However there appears to be a 'hands-off' approach from government ministers when it comes to the National Electricity Market which is driving the price rises over the next few years. Governments need to talk about unnecessary expansion (in fact, energy waste) as a problem and elevate efficiency as a multi-benefit solution.

Changes in NEM regulatory decisions would be more easily accomplished if the National Electricity Law adopted either an environmental sub-objective, allowing regulators to consider wider benefits, or an energy savings objective, that would allow regulators to prioritise energy savings over augmentation and supply options.

There is an important role for NSW both in its own jurisdiction (through state legislation and directions to government owned utilities) and as a major state represented on COAG and the MCE in progressing this and the following recommendations.

5.2 NSW - DM Targets

At its inception the intention for GGAS was for it to be applied to both retailers and networks. However at the time the NSW distribution networks argued that a Demand Management Code of Practice would be better tailored to deliver reductions. In effect, only half of the GGAS program was ever delivered. The Code of Practice that requires

investigation and reporting on DM opportunities, even supplemented with the 'D-factor', has not delivered significant reductions.

Expanding what is now the Energy Savings Scheme to complete the policy would be one option if peak demand reductions are to be sought and expensive augmentation avoided. Subsequent to the modelling of peak demand management opportunities available to NSW distribution networks, the ESS could be expanded to include a peak demand reduction target on NSW networks. Networks would be required to acquire or create reduction certificates, just as NSW retailers currently are. The difference would be that a higher value could be attributed to peak demand reduction certificates from highly constrained areas, to ensure that the value of avoiding or deferring expensive augmentation was prioritised over general energy savings.

5.3 DM Fund, Network DM Plans and Targets

NSW's Climate Change Fund (CCF), originally the Energy Savings Fund established in 2005, is funded by a levy on electricity distributors (and water utilities for water use savings). This provides the basis for an effective funding mechanism for focused DM expenditure. The CCF could be partly recalibrated to target more substantial funding to and specific reduction targets and measurable outcomes for NSW networks.

In determining the size of funding that should be dedicated to network demand management it is useful to look at examples in other jurisdictions:

In 2006-07 the Californian Public Utilities Commission (CPUC) approved a consumption-based DM levy amounting to \$1.97 billion over three years. This equates to \$131 million pa for NSW.

05 RECOMMENDATIONS

In 2004, the Essential Services Commission of South Australia (ESCOSA) provided Electricity Transmission South Australia (ETSA) with \$20 million over 5 years to deliver DM programs.

In 2009, EnergyAustralia submitted to the Australian Energy Regulator that a DM allowance should be equal to 1 per cent of DNSP revenues, or \$10 million per annum⁴⁹, however, the AER has limited DM spending to:⁵⁰

- \$1 million per annum for EnergyAustralia
- \$600,000 per annum for Country Energy
- \$600,000 per annum for Integral Energy

The Energy Efficiency Council has recommended in its submission to the PM's Task Group on Energy Efficiency the networks spend 10% of their planned \$426m expenditure over the next 5 years, on DM

5.4 NEM - Requiring DM Implementation Before Augmentation

In 2008, Total Environment Centre became the first community group to submit and have accepted for consideration a Rule change proposal to the AEMC.⁵¹ The basis of the Rule change was to require transmission networks (and by extension, distribution networks) to implement DM before considering augmentation approaches. The Rule change comprised the following components:

1. Transmission network planning

Regulators to ensure that demand management solutions are prioritised and properly investigated in the planning stages of network development.

2. Annual Planning Reports

Networks be required to publish robust data on upcoming constraints that are relevant and useful to demand management service providers. This would inform the demand management market of upcoming opportunities and enable it to respond to these in an effective and timely manner.

3. DM Incentive

An explicit provision for the Australian Energy Regulator to develop and implement a demand side incentive scheme. This should address the chronic failure of networks to invest in cost-effective demand management.

4. Financial cover for DM investments

Energy regulator to clarify the circumstances in which networks can recover spending on demand management. This would create more certainty for networks regarding their ability to investigate, implement and recover demand management expenditure.

5. Revenue determinations

Revenue determinations for networks to ensure that demand management is prioritised ahead of the construction of more network infrastructure. Revenue determinations are an ideal process to facilitate demand management as they allow regulators to closely scrutinise and modify future spending by networks.

6. Acknowledgment of modest DM expenditure

Small scale demand side activities are enabled even when unrelated to particular network constraints or when covering relatively modest amounts of load. Modest but widespread demand reductions can provide long term benefits by reducing the need for a range of possible future network as well as generation augmentations.

7. Effective prudency reviews

Prudency reviews by the regulator must assess past capital expenditure. These should specifically and thoroughly assess the extent to which transmission networks have implemented, and not ignored, an adequate level of demand management. Such reviews are critical to ensure that transmission networks do not ignore demand management solutions at the expense of electricity consumers.

8. Regulatory Test

The Rules should specify that the Regulatory Test require demand management options to be investigated before augmentation options. This is likely to ensure that a more appropriate level of transmission networks' resources and attention are directed to DM before augmentation planning is underway.

9. Short-term and long-term price for DM

A price is set for demand management within the market pool. Setting a price for demand management will encourage greater investment in and facilitate growth of demand management aggregation as a market commodity. A market mechanism that provides the opportunity for proponents to bid into the market would encourage new demand management entrants and promote competition for existing demand management businesses.

After a consultation period in which networks vociferously opposed these proposals, the AEMC approved approximately 5% of the Rule change proposal. Unless there is an explicit directive from COAG and the Ministerial Council for Energy and

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the NEL objective is targeted to DM reductions, it is unlikely that other similar attempts to capture the full potential of DM will be successful.

5.5 NEM - Risk Reward Incentive Scheme

A system of rewards and penalties linked to specific DM targets is an approach that the Australian Energy Regulator, with the approval of the AEMC, could take. In California, the Risk Reward Incentive Mechanism (RRIM) seeks to align consumer and network interests with incentives for achieving and penalties for failing, to meet energy efficiency goals, which includes reduction of peak demand.⁵² Based on this methodology, the AER could apply these incentives in a three stage process:

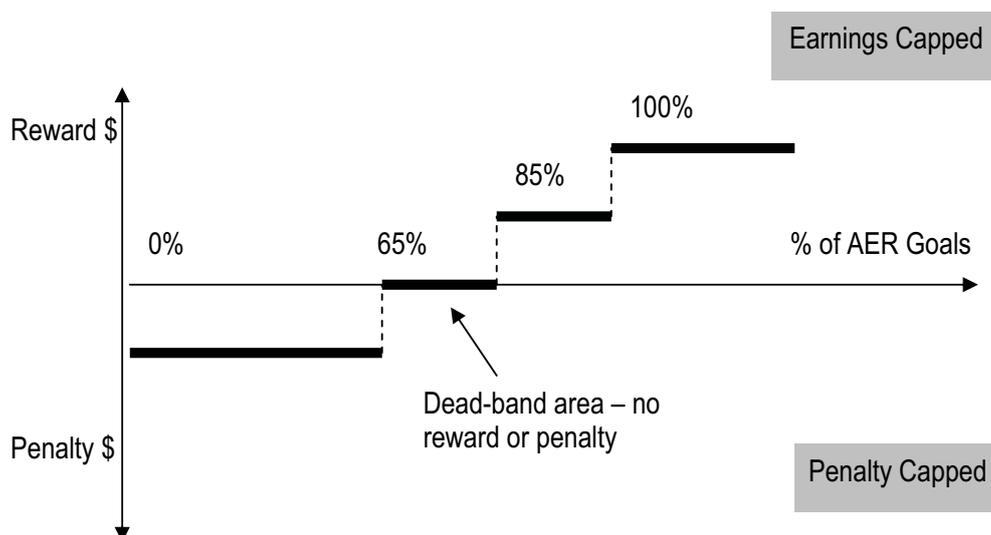
1. Establish the potential DM reductions available to transmission and distribution networks through a combination of: innovative pricing (including smart meters and ToU pricing); demand reduction projects (eg retrofitting shopping malls, factories etc); power factor correction; and demand-side response (using aggregators to contract interruptible loads).

2. Set savings goals (MW and MWh reductions), incentive payments and penalties for each network business
 - a. ensuring that penalties are taken out of revenue above that required for approved capital and operating costs – ie: profit
 - b. with a 'dead-band' range between 65% and 85% of goals where no benefit or penalty applies
 - c. earnings and penalties capped at a certain amount.
3. Measurement and verification to determine level of payment or benefit.

The diagram below indicates the reward-penalty system.

However, as with the requirement for networks to implement DM before augmentation, unless there is an explicit directive from the COAG/MCE and the NEL objective is targeted towards DM reductions, it is unlikely that this approach will be acceptable to the current regulatory mindset.

Risk Reward Incentive Scheme



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1 Australian Energy Regulator, New South Wales distribution determination 2009–10 to 2013–14, April 2009, p. 119-123, at: <http://www.aer.gov.au/content/item.phtml?itemId=728110&noDeld=4f4df21a216baa4054a6f28966bcd40f&fn=NSW%20DN%20SPs%20final%20decision.pdf>

2 Integral Energy Presentation, Regulatory Proposal to the Australian Energy Regulator 2009 to 2014, 30 July 2008 P. 28

3 Integral Energy, Regulatory Proposal, 2009, p. 104 IPART (Independent Pricing and Regulatory Tribunal of New South Wales) (1999) Regulation of network service providers, Discussion Paper DP-34, IPART, Sydney; IPART (2002) Inquiry into the role of demand management and other options in the provision of energy services, Interim Report, review report no. 02-1, IPART, Sydney.

4 IPART Inquiry into the Role of Demand Management and Other Options in the Provision of Energy Services, Final Report. 2002, p5

5 Integral Energy, Regulatory Proposal, 2009, p. 336 Energy Australia and TransGrid, Demand Management Investigation Report- Sydney Inner Metropolitan Area, Nov 2009, p.4, at: <http://www.transgrid.com.au/network/nsdm/Documents/Demand%20Management%20Investigation%20Report%20-%20Sydney%20Inner%20Metropolitan%20Area.pdf>

7 Integral Energy, Regulatory Proposal, 2009, p. 9

8 Integral Energy, Regulatory Proposal, 2009, p. 9

9 Integral Energy, Regulatory Proposal to the Australian Energy Regulator 2009 to 2014 30 July 2008 p 18

10 EnergyAustralia, Regulatory Proposal, p. 43.

11 IPART (1999) Regulation of network service providers, Discussion Paper DP-34, IPART, Sydney; IPART (2002) Inquiry into the role of demand management and other options in the provision of energy services, Interim Report, review report no. 02-1, IPART, Sydney, p. 6

12 Benefits for NSW network DM do not include the benefits of avoided generation or transmission infrastructure. NSW and Californian DM benefits do not include avoided carbon costs. See table on next page.

13 Institute for Sustainable Futures for Total Environment Centre, Win Win Win 2008 p. 5

14 IPART, Inquiry into the Role of Demand Management and Other Options in the Provision of Energy Services, Final Report, October 2002, p. 62.

15 IPART, Inquiry into the Role of Demand Management and Other Options in the Provision of Energy Services, Final Report, October 2002, p. 61.

16 Energy Australia, EnergyAustralia, Regulatory Proposal 2009-20014, p. 104, at:

<http://www.aer.gov.au/content/index.phtml/itemId/728473>

17 EnergyAustralia, Network Performance Report, 2008-09, p. 78, at: <http://www.energyaustralia.com.au/Common/Network-Supply-and-Services/Network-regulation-and-reports/~ /media/Files/SPR/Network%20Reports%20and%20PIans/0809NetworkPerformanceReportFinal.aspx>

18 Integral Energy, Electricity Network Performance Report, 2008-09, Nov 2009, p. 41, at:

<http://www.integral.com.au/wps/wcm/connect/6b981200405ac16eb201badccb7f5ab5/ENPR+2008-2009++FINAL+FOR+DWE.pdf?MOD=AJPERES>

19 Country Energy, Electricity Network Performance Report, 2008-09, p. 27, at

http://www.countryenergy.com.au/wps/wcm/connect/0396f08040b59982a6c1f7d4a66842a1/CE_NPR_2008_09.pdf?MOD=AJPERES

20 California Public Utilities Commission, Energy Efficiency and Conservation Programs: Report to the Legislature, July 2009, p. 27-28 at:

<http://docs.cpuc.ca.gov/PUBLISHED/GRAPHICS/104470.PDF>.

Cost-effectiveness includes avoided generation, transmission and distribution costs. Benefits are costs of supply-side resources avoided or deferred and costs include measures and installations as well as administration of programs. Programs are cost-effective when the value of total energy savings for ratepayers is greater than the total cost to ratepayers.

21 California Public Utilities Commission, Energy Efficiency and Conservation Programs: Report to the Legislature, July 2009, p. 20-21 at:

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<http://www.transgrid.com.au/network/nsdm/Documents/Demand%20Management%20Investigation%20Report%20-%20Sydney%20Inner%20Metropolitan%20Area.pdf>

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