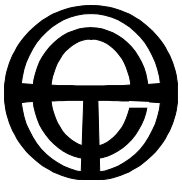

TOTAL ENVIRONMENT CENTRE

Manager – EMR Projects
National Energy Market Branch
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Attention: Standing Committee of Officials

Please find attached a joint submission from Alternative Technology Association (ATA) and Total Environment Centre (TEC) to the Ministerial Council on Energy National Framework for Electricity and Gas Distribution and Retail Regulation Forward and Issues Paper.

ATA and TEC wish to thank the National Electricity Market Advocacy panel for funding to make this submission possible. ATA and TEC also wish to acknowledge the efforts and input from Jeff Washusen (Marsden Jacobs Associates).

The ATA and TEC have also commissioned a paper by Prof Gavan McDonell which will be presented as a second and separate submission.

ATA is a consumer organisation that was established in 1980. It stimulates uptake of sustainable technologies in order to protect our environment. The organisation provides service to over 3000 members who are actively walking the talk in their own homes by using good building design, and installing water conservation and renewable energy. ATA advocates in both government and industry arenas for easy access to these technologies as well as continual improvement of the technology, information and products needed to change the way we live.

Total Environment Centre (TEC) was established in 1972 as Australia's first full-time environment advocacy centre. It has a long history of active participation in and advocacy for end users of electricity by advocating for sustainable electricity policy, regulations and market structure. TEC's advocacy has resulted in numerous advances, including

establishment of the Community Energy Organisation to assist low-income energy consumers, the inclusion of Demand Management provisions in NSW electricity utility legislation, initiation of the joint environment group survey, Green Electricity Watch and the establishment of greenhouse gas reduction targets for the NSW electricity industry.

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1. Summary of Recommendations

1. The National Electricity Market should acknowledge and support the need for immediate and deep cuts to greenhouse gas emissions through:

    - Energy efficiency (EE)
    - Demand management (DM)
    - Distributed Generation of renewable energy (DG)

2. National regulation should incorporate best practice mechanisms and initiatives which support DM, EE and DG.

3. Regulation should prevent retailers from promoting and encouraging consumers to purchase energy inefficient appliances.

4. Incentives should be established to offer AC users a voluntary DM response.

5. Explicit obligations should be placed on distributors and retailers to established ToU metering and tariffs to ensure tariff structures reflect the true cost of energy.

6. Support for DM innovations should be adopted and standardised now, ensuring the barriers to uptake are reduced.

7. Obligations should be placed on distributors and retailers to positively facilitate the connection of small renewable DG.

2. The MCE Energy Market Reform Program (EMRP)

A primary objective pursued by both the ATA and TEC is to promote the use of energy and other utility services to improve environmental outcomes. Within the institutional framework that is proposed by the MCE Energy Market Reform Program (EMRP), the ATA and TEC believe it is essential that explicit recognition be given to achieving improved environmental outcomes for both the distribution and the retail sector.

Australia currently has among the highest level of emissions of greenhouse gas (GHG) per capita, requiring immediate and deep cuts to minimise the impacts of global warming. ATA and TEC believe that Australia must commence an immediate transition to cleaner and renewable fuel sources for energy generation and implement demand management and energy efficiency to achieve significant reductions in emissions. Bringing about these changes will also affect greater efficiencies to the benefit of all electricity consumers.

The national energy market (NEM) presents significant barriers to the achievement of these objectives and ATA and TEC believe that the EMRP provides a key opportunity to address these failings. Support for this need is evident in the draft report published by the

Productivity Commission, *Review of National Competition Policy Reforms*[1]. The Commission recommends that CoAG immediately take a greater role in addressing fragmentation and uncertainty in relation to GHG abatement policies. The report suggests priority be given to develop a more effective process for achieving a national approach to greenhouse gas abatement.

ATA and TEC believe that these environmental issues must be addressed within the NEM, now more than ever, and require a paradigm shift in the way the NEM is structured and regulated. This submission provides pragmatic and sensible suggestions on how improved environmental outcomes may be achieved without any fundamental departure from market focused arrangements and without any major distortions to the current regulatory practices and policies applied to the distribution and retail sectors.[2]

The impact on GHG emissions is of greatest concern to ATA and TEC. Current CO2 emissions attributed to electricity generation amount to around 182 MT/y (*National Greenhouse Gas Inventory*, 2002). If Australia is to make any significant impact on these increasing GHG emissions, it needs to find a means to stimulate changes in consumer behaviour that will lead to improved outcomes without denying those consumers services they have a legitimate right to expect.

ATA and TEC believe that increasing the following measures is key to achieving these objectives, reducing energy consumption and GHG emissions:

- Energy efficiency (EE)
- Demand management (DM)
- Distributed Generation of renewable energy (DG)

Current regulation limits the implementation of these initiatives to the detriment of the environment and energy consumers and will be the focus of this submission from ATA and TEC.

ATA and TEC believe that a paradigm shift is required which acknowledges the changing future of energy supply and consumption. An example of these types of initiatives are evident in the Woking Borough Community in the United Kingdom which aims to achieve the Council's energy efficiency and environmental agenda at a much more accelerated rate than could be otherwise achieved.[3] Projects such as this recognise the benefits of sustainable DG, DM and EE and reflect the future importance of local sustainable green energy rather than high emission fossil fuels.

The MCE regulatory review must acknowledge these future energy paradigms, rather than simply conforming and supporting incumbent energy supply systems.

[1] http://www.pc.gov.au/inquiry/ncp/draftreport/
[2] The ATA and TEC have also commissioned a paper by Prof Gavan McDonell which examines some of the basic deficiencies in the economic and legal foundations of energy market policy. If these deficiencies can be remedied, the ATA/TEC recommendations would not constitute a fundamental shift in policy.
[3] For example, see: http://www.woking.gov.uk/html/queensaward/W-13.pdf

3. Institutional and Regulatory Framework

ATA and TEC believe the EMRP must provide for better environmental and consumer efficiency outcomes through changes to key mechanisms such as the National Electricity Code (NEC), the National Gas Access Code, the national market and regulatory frameworks, jurisdictional regulatory frameworks and federal and state policy areas. Improving environmental and efficiency outcomes in the electricity and gas industries will require changes in policies, changes to energy market rules and changes to the way that network service providers and energy retailers are regulated.

A primary focus of these changes is to promote incentives for consumers to pursue EE and DM and to support investment in and implementation of DG by both small and large consumers as suitable and affordable technologies becomes available. Changes in these areas should facilitate improved environmental and financial outcomes for consumers in the short term through higher uptake of EE appliances and devices, and in the longer-term by increasing consumer acceptance of voluntary DM (particularly for AC load) and by removing obstacles to the rollout of DG technologies.

3.1. Barriers to DM, EE and DG

The EMRP presents significant barriers to this occurring due to the current proposal to integrate network regulation into the Australian Energy Regulator (AER) while leaving the regulation of retail pricing with the jurisdictions. ATA and TEC agree in principle with the EMRP objectives to consolidate regulation within the AER and ensure greater regulatory consistency across all NEM jurisdictions. However, the proposal to leave responsibility for retail pricing regulation within jurisdictions offers significant challenges to achieving improved environmental outcomes and consumer efficiencies.

As set out below, the information that may assist consumers in making decisions about their energy use which could lead to improved environmental outcomes requires a consistent application of market, regulatory and pricing policies which are consistent (as far as possible) across all sectors of the ESI. In particular, there is a clear need for consistency between the pricing of distribution network services and retail service delivery that provides clear signals about the financial and economic cost of the consumption choices made by different cohorts of consumers.

ATA and TEC are aware of considerable variation in policy and regulatory approaches throughout Australian jurisdictions. There is concern, therefore, that the EMRP will result in jurisdictional consistency based on lowest common-denomination agreement. While there are some important differences between jurisdictions (based on industry structures, level of privatisation and infrastructure and geography), ATA and TEC believe that the more progressive measures that have been implemented aimed at delivering the EE, DM and DG and their benefits must be retained and promoted across all jurisdictions.

The ERMP process provides an opportunity to ensure such initiatives are incorporated in national regulation and best practices shared across all jurisdictions. Further, where many

initiatives and mechanisms have been absent from any jurisdiction and the NEM, the EMRP offers a chance for their inclusion. These initiatives are explored in more detail in the following sections.

4. Energy Efficiency Initiatives

A range of measures to improve energy efficiency are currently being undertaken through the National Framework for Energy Efficiency (NFEE). These include the extension of minimum energy performance standards (MEPS), prohibitions on the sale of the lowest energy efficiency household appliances and improving energy efficiency performance requirements for habitable buildings, appliances and equipment. While NFEE may capture some of the gains available in EE, there are a range of important measures that should be undertaken to ensure that the NEM also supports these developments.

Improvement in EE allows consumers to obtain the outcomes they are seeking while at the same time reducing GHG emissions and total energy bills. Almost every energy retailer in the country offers some form of information to consumers about energy efficiency. However, a large number also provide direct commercial incentives for consumers to purchase high energy consuming appliances (in particular, ACs). For example, Origin Energy, which promotes itself as a retailer of green energy and a supporter of improved environmental outcomes, provides direct cash rebates in the form of a bonus two months of free electricity to consumers purchasing split-system AC units.[4]

There is no incentive for retailers to encourage consumers to purchase energy efficient units; in fact, current regulation rewards them for marketing and encouraging the uptake of larger and less efficient units.

Improved environmental outcomes would be achieved if the incentives were structured so as to promote take-up of higher energy efficiency appliances. For example, Utah Power offers direct cash rebates and incentives for consumers who purchase very high energy efficient air-conditioners through a *Cool Cash Incentive* program and bill credits for consumers who allow their (suitably equipped) air-conditioners to be remotely controlled through the *Cool Keeper* program.[5] These two programs allow consumers to gain the benefits of AC use while promoting take-up of EE AC units and providing a means to manage coincident peak demand on the supply network.

The Utah Power programs are just two examples of how consumers can be given direct and positive incentives to pursue EE outcomes which have the potential to also improve environmental outcomes without causing economic or financial discomfort to the ESI.

Implementation of these programs in Australia are distinguished by their complete absence. The failure of Australia's energy markets to voluntarily offer such services is

[4] see: http://www.origin.com.au/home/shops/shop_page.php?pageid=1468
[5] see: http://www.utahpower.net/Article/Article36338.html

compounded by the conservatism of network service providers (NSPs) and the reluctance of regulators to take any initiative in supporting or promoting R&D expenditure by NSPs for up-to-date remote load control technologies. These technologies are explored further in the next section.

A pragmatic and effective way to overcome these market and regulatory failures is to amend policy to require energy retailers to offer cash incentives only for high energy efficient appliances and for NSPs and regulators to pursue and support take-up of up-to-date remote load control technologies.

5. Demand Management Initiatives

The EMRP explicitly recognises the benefits of promoting and developing the take-up of DM. However the primary focus is to stimulate DM by large industrial and commercial customers, when the major challenges created by increasing demand are largely derived from residential consumers and their increasing use of AC.

Effective DM has the potential to deliver greater economic and financial benefits to the ESI and to energy consumers and provide moderate environmental benefits. The ATA and TEC fully support incentives to stimulate DM response from large consumers and believe the following key issues must be addressed to ensure this occurs:

- provide cost reflective price signals that identify opportunities for DM;
- encourage planning processes and clearer regulation that allow DM solutions to be implemented; and
- incorporate into decision making environmental and social objectives that acknowledge the true benefits of DM solutions.

The scope for variance of electricity supply and quality among end use appliances varies considerably. Computer equipment and lighting, for example, require a high level of quality and reliability in supply of electricity. However, storage water heaters (for example) are less sensitive and require electricity supply for just a few hours per day and are therefore tolerant to lower quality and reliability of supply. However, there is currently only limited scope for realising the potential for such domestic appliances as storage water heating (and almost none for AC) to provide DM solutions during peak demand periods.

5.1. AC and the costs of increasing demand

The single biggest challenge for consumers and for the electricity supply industry (ESI) in particular, that has arisen over the last decade is increasing penetration and use of residential and small businesses air conditioning (AC). AC use creates several very distinctive load impacts on residential consumption.

- The first is that AC load typically adds a very substantial increment of load to a household load profile. It is not uncommon for AC use to increase maximum demand in individual households by a factor of at least three to four - and even up to 10 times or more - of the 'normal' household load profile.
- The second is that AC load typically only occurs when ambient and household temperature rises to a level that consumers find uncomfortable6
- The third and most important impact is that a very large number of consumers choose to use their ACs at exactly the same time. They may not do this every day of hot weather, but if there is a run of hot days it is inevitable that consumers with access to ACs will want to use them as the ambient temperature increases.

The simultaneous use of large numbers of ACs for a relatively small number of hours during the peak summer demand period increases the utilisation of the total ESI infrastructure for very short periods, decreases the load factor of the ESI infrastructure and creates very significant drivers for increased investment in supply assets and for increased costs that must ultimately be borne by consumers. This demand and these costs are increasing.

Increasing AC penetration is also a significant contributor to increasing average household energy consumption and increased GHG emission rates. For example, average electricity consumption has been increasing by around 2% per year for several decades; and over at least the last decade peak summer maximum demand has been growing by at least twice as much[7]. In some regions of the NEM, peak demand growth has been three to four times as much as consumption growth - driven by increasing penetration and use of relatively high capacity AC units in residential/household sector.

More is required to stimulate incentives for small AC users to offer a voluntary DM response. Our preliminary analysis suggests that AC demand growth has been continuing for at least the last decade, and is projected to continue increasing (possibly at declining rates over the next decade). The level of material impact on the electricity supply system from AC load growth may be in the order of 1000 to 2000 MW per year. Even the most optimistic forecast would not expect large consumers to offer DM capacity anywhere near this volume. In fact, it would be impossible to stimulate that level of response across the whole market - even if appropriate incentives existed for residential AC uses to offer DM. But if no effort is made to activate DM response by residential AC users then it seems impossible to achieve even modest improvements in economic and financial efficiency, and no improvement at all in environmental outcomes.

The ATA and TEC recognise that DM is likely to include a significant, or even a substantial, amount of load shifting. Effective AC programs, such as remote load control technology, however, could also deliver substantially reduced energy consumption. For this reason, there is an urgent need to pursue changes in policy, market rules and

[6] Reverse cycle AC heating load, while still creating increases to greenhouse gas emissions, presents less of an economic and financial efficiency challenge for the ESI. This is because reverse cycle heating is required over much longer time periods in both hours per day and days per week (or days per heating season) than does AC load).
[7] ABS, *Detailed Energy Statistics, Australia, 2004.*

regulatory practices to better promote improved DM outcomes - particularly when one of those outcomes could be (in the longer term) through widespread, small scale DG.

So what is required to achieve these objectives? Energy markets will need to encompass ancillary services, spot energy and forward contracts and incentives or mandates on distribution and retail businesses to realise the potential of DM within the domestic energy market.

5.2. Time of Use Tariffs

A primary means of improving incentives to promote DM is to require distributors and retailers (and national and jurisdictional economic regulators) to develop cost reflective time-of-use (ToU) tariffs and pricing offers that provide direct benefits to those consumers practising and offering DM. Current regulation ignores the need for tariff structures that reflect the true cost of energy generation and supply and represents a clear example of policy failure.

- Absence of cost-reflective ToU tariffs in the Australian energy market (for all but high volume energy customers) results in the true costs of energy consumption being 'hidden' and smeared across all energy consumers. As peak energy demand increases with the penetration of AC, the increasing costs of supply at these peak periods are not borne by the consumers who are driving increased costs, but shared by all energy consumers. This absence of the user-pays principle presents inaccurate pricing signals which prevent effective energy efficiency from being adopted. Society pays (through economically inefficient cross subsidy and pollution) rather than promoting user-pays as the predominant principle.
- These cross-subsidies also exist between urban and rural energy consumers. The cost of supply per unit of electricity to rural customers is greater than for urban consumers. This is attributed to transmission losses incurred in transporting electricity long distances as well as the cost of physical infrastructure to transport. However, *postage stamp* pricing ensures that rural electricity customers' charges do not reflect the true cost of supplying electricity these distances. Again these cross subsidies impede accurate price signals which would otherwise result in EE. These subsidies to rural customers are paid by tax payers and also increase the fixed costs charged to urban customers and limit their ability to cost effectively implement energy efficiency (see below).

  While ATA and TEC recognises the need to provide equality to rural energy consumers, this should not come at the cost of economically efficient EE or DG. Government intervention is required to ensure that the full potential of EE and socially optimal outcomes are achieved, rather than continued support for inefficient energy consumption throughout rural Australia. This should ensure evaluation of EE, DM and DG solutions to reduce energy consumption and provide local generation, before network augmentation or continued subsidy.

- Electricity regulation in most jurisdictions applies tariff basket pricing structures that impose a regulated price cap on electricity utilities. Within that cap, utilities are free to structure tariffs at will (subject to "side constraints" that are intended to limit "price shock" to consumers – but which also slow the rate at which tariffs can be effectively made "efficient"). This regulatory "flexibility" allows monopoly utilities to adopt *Ramsey*[8] tariff structures, which discriminate by increasing tariffs for consumers with inelastic consumption levels, while reducing tariffs for those with more elastic consumption behaviours. This, in essence, allows utilities, particularly where there is no competition from low cost mains gas, to increase the total demand and energy consumption, while sending pricing signals which deter energy efficient investment.

  This regulatory policy failure also results in utilities providing declining tariff rates which rewards energy consumption and energy inefficiency and provides a further disincentive to DG.

  Fixed service charges make up a considerable portion of many householders total electricity charges. This significantly reduces the scope and incentive for householders to reduce their total energy bill through EE or DM.

- While Full Retail Contestability (FRC) has been implemented in states such as Victoria and South Australia and was anticipated to encourage more competitive cost reflective pricing, the reality is much different. The relatively low levels of "active" participation in retail competition, illustrated by low levels of customer switching (outside householders moving residence) in these states provides a clear indication that competition within electricity remains very limited. This allows incumbent retailers to persist with discriminatory tariffs, such as Ramsey pricing.

The ATA and TEC also note that the tariff assignment rules that exist in Victoria place limits on the ability of NSPs to assign innovative tariffs to consumers. If the ESI and consumers are to gain any benefit from the introduction of truly cost reflective ToU tariffs, then considerably greater flexibility will be required than exists at present.

The ATA and TEC note in particular that current regulatory practices proclaim the benefits of cost reflective pricing but place significant constraints around the ability of NSPs to restructure prices so as to be cost reflective. Current regulatory practices also place very little constraint on the way in which network tariffs are designed; and regulators (typically) have no legal power to require retailers in a competitive market to develop products that pass-through the cost impacts of truly cost reflective ToU network prices.

[8] *Ramsey pricing* is to charge a higher price to those households and small business customer who have the least ability to avoid the charges and who will not or cannot substantially alter their consumption

It is particularly notable that amongst the 11 distributors in the NEM regions, only United Energy in Victoria has moved to develop a suite of tariffs that apply to all its customers that attempt to reasonably reflects the ToU cost of increasing air-conditioning demand. A report prepared by Pareto Associates Pty Ltd for the Victorian Consumer Energy Coalition in 2003 demonstrated that United's ToU tariffs could have a dramatic impact on the total energy bill of any household with air-conditioning load of 2 kW or more and could deliver significant benefits overall to non-AC using households. United Energy introduced these tariffs in 2001 but no retailer in Victoria has since developed a matching retail product which transfers these costs and benefits directly to consumers (that United Energy assigns to these tariffs). This means that any benefits created by United's tariffs cannot be transferred to customers, and the explicit pricing signals intended to be conveyed by United's network tariffs are completely obscured from consumers because they are obliterated by the "back-smearing" of costs by Victorian retailers.

As a minimum, more explicit obligations for the design of ToU tariffs must be placed on distributors and retailers - and these obligations administered and enforced by regulators; and greater flexibility is required in assigning new tariffs to existing customers.

5.3. Fostering Demand Management Response

ATA and TEC believe that promoting more uniform response by both distributors and retailers to DM opportunities is also necessary.

Current regulatory arrangements affecting DM, while generally consistent, differ significantly between jurisdictions and between the NEC provisions which apply to TNSPs and jurisdictional provisions which apply to DNSPs. For example, the NEC requires NSPs to consider non-network and DM options whenever a major network augmentation is proposed, but refers explicitly only to networks above 66 KV which can be interpreted to exclude consideration of such matters at the distribution level. This deficiency is countered at the jurisdictional level by imposing obligations on distributors to also consider DM and non-network options, but the explicit obligations that are imposed on DNSPs differ markedly between jurisdictions. Arguably, NSW has the clearest, most stringent, and most interventionist process specified both in Distribution Licences and in the NSW DM Code of Practice. SA is following suit with its own a DM code based largely on the New South Wales precedent. Queensland is contemplating the same course of action, while Victoria simply requires distributors to identify potential DM opportunities in annual network planning reports - and leaves a dormant 'DM market' to respond to the identified opportunities.

While there is some evidence that the more focused approach in NSW is generating interest from prospective DM providers, the scale of responses remains relatively small compared to the increased demand growth from AC load. In material terms, none of the jurisdictional schemes is truly effective, and the requirements in the NEC which apply to TNSPs are equally ineffective. An overlay of cost reflective ToU pricing for both network and retail services would more clearly signal financial benefits of DM opportunities to prospective DM proponents.

Even with these changes, the ATA and TEC would not expect a dramatic increase in DM response. This is because the current regulatory arrangements applying to NSPs create a major challenge for DM proponents. A primary focus of the economic regulation regimes is to provide strong incentives for DNSPs to invest efficiently. The primary incentive created in these regimes is for NSPs to find the least cost way of providing reliable services to consumers. Unfortunately and inevitably, DNSPs are far more familiar with the service capabilities of copper, poles and wires than they are with DM options; and DM proponents are typically unfamiliar with the service obligations and requirements placed on DNSPs, which makes it difficult for them to put forward proposals which provide greater financial and service benefits than the copper/poles and wires alternative.

In addition, the regulatory regimes provide protection to consumers by ensuring that the substantial capital investments required do not face any significant regulatory risk. The primary mechanism for containing the cost of augmentation investment is to provide an effective guarantee to NSPs that they will be able to recover the full economic cost of their investments (if it is an efficient response to service requirements/obligations). This effective guarantee is achieved by 'rolling in' the full value of efficient investment cost into a regulatory asset base, with the asset investment costs recovered through network tariff pricing. This guarantee is intended to have the effect of lowering the cost of capital (or explicitly lowering the equity beta in the CAPM formula), and thereby limiting the cost impact on consumers.

By comparison, the security offered to NSPs through the asset roll-in creates a limited window of opportunity for DM proponents to offer services that have any value to the NSP. An additional challenge is for a DM proponents (or group of proponents) to provide sufficient demand response to avoid the need of an increment of network capacity. If the total volume of DM offered is not sufficient to defer investment in an increment of network capacity, then that DM response again has no value to the NSP.

A second, but nonetheless, material impact of current regulatory policies is that there is very little incentive for DM proponents to contemplate making any significant investment to provide a DM capacity. If they did make significant investment, that investment would face far higher risk than an equivalent investment by the NSP because of the limited time horizon during which the value is seen by the NSP. All else being equal, this means that the DM proponent faces a higher investment risk than does the NSP - and that the cost of capital to the DM proponent would, accordingly, be expected to be higher. This means that if DM proponents are required to make any significant investment, the capital cost component of that investment would be expected to be higher than an equivalent capital cost component of the network solution. As a result, the DM proponents offer is likely to be of higher cost than equivalent network solution unless there is some particular technological advantage, or some particular offsetting benefit from the investment that the DM proponents may expect to recover.

In any event, it is likely that DM proponents would only come forward if they had a significant degree of operational flexibility in their energy use or they had 'spare' demand capacity that they could offer without incurring any significant additional investment cost.

While every effort should be made to access DM in the circumstances noted above, the number of opportunities and circumstances would be increased if both NSPs and retailers were required to offer cost reflective ToU pricing.

5.4. DM Innovation

ATA and TEC believe that regulation should be supporting infrastructure that contributes to DG and DM solutions. Rather than adding on DM features (such as time of use metering) for householders who want them, it's much cheaper to make it standard and then the barriers to adoption are much lower. These include:

- Response to signals from the grid to manage demand;
- Scope for customer to manage and determine load shift;
- Feedback mechanisms that allow users to select preferred options;
- Warning systems to indicate unusual variations, system faults, etc;
- Automatic load sequential shedding capability;
- Communication with and control of individual appliances/loads;
- Ability to monitor, report and manage consumption on separate circuits and, where equipment has suitable features, for individual items of equipment; and

Current regulation ignores these technology needs. The Victorian ESC's recent decision on Electricity Customer Metering is such an example. This decision mandated the rollout of manually-read interval meters, but does not commence for newly installed and replacement residential consumers until 2006. The slow rollout of this manually-read metering technology will ensure that few households have access to convenient, easy-to-use automated, remote load control technology that is suitable for 'sensitive management' of AC loads.

There are numerous international examples of power system technologies that are capable of offering a range of convenient, automated, remotely-activated services that would assist consumers manage their use of electricity. In particular, to lower their overall energy consumption and improve the efficiency of operation of electricity systems - as well as improved environmental outcomes. The Utah Power examples referred to above use technology that allows remote load control of AC units.

Another, more sophisticated, example is the roll-out of advance interval metering and two-way communications technology to 30 million plus consumers in Italy by the electricity utility ENEL Distribuzione. This roll-out, which uses technology developed for ENEL by AMPY Metering of the UK is over half complete and progressing at a rate

of around 700,000 installations per month[9]. The total cost of the roll-out, including meter replacement, a sophisticated 'powerline carrier' communications technology and the IT systems to support operation and service delivery has been reported at 2 billion Euros.

The average cost of this roll-out is equivalent to approximately AU$110 per installation. This compares favourably with claimed installation costs (by Victorian electricity distributors) for manually read interval meters (with no automated load control capability) of around AU$650/installation[10].

6. Distributed Generation Initiatives

The wide scale deployment of DG could provide a direct means for delivering energy services that consumers require while achieving significant improvements in environmental outcomes. This is because the conversion of raw energy to electricity at the point of use avoids the need for (environmentally inefficient) remote generation and eliminates transport losses in the transmission and distribution sectors. On-site generation also provides an opportunity for the capture and reuse of waste heat which could lead to very substantial improvements in overall thermal efficiency of the energy conversion process.

Renewable technologies and particularly solar PV have another distinct advantage over traditional energy generators. As discussed above, electricity costs are impacted by the increasing peak summer demand. This demand, places a premium on electricity generated during periods of high ambient air temperature (and AC use). The generation capacity of solar PV has the potential to be at a maximum during parts of this period.

However the real economic benefits of solar PV to meet this summer peak demand is not recognised, due to the tariff structures which smear these peak costs across all energy consumers and times. ToU tariffs could address this discrimination and ensure that the economic benefits of solar PV and its ability to supply electricity when costs are at a premium are rewarded. ATA and TEC believe ToU tariffs would increase investment in solar PV and other DG.

The ATA and TEC recognise that there are significant cost barriers with existing and available distributed generation technologies, except perhaps for high-value applications such as emergency standby generation or large installations for industries with a significant need for process heat. For example, even with significant government subsidy, the cost of solar PV units remains well above $10,000 per kilowatt, substantially

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[9] ENEL Telegestore Project in On Track, Vincenzo Cannatelli – Enel Group, Italy, pp 16-20, Metering International, Issue 1 2004

[10] The ENEL roll-out offers opportunities to exploit economies of scale that could not be achieved by any of the Victorian distributors. However, it is inconceivable that a unit cost 400% higher could be efficient even for a small-scale roll-out. The total failure by Australian utilities to investigate, or undertake R&D on these types of technologies indicates either over-cautious conservatism on the part of Australian utilities and/or regulators, or a failure of policy. In either case, 'the problem' needs to be addressed by the MCE so that Australian consumers can be offered a wider range of services by network utilities.

higher than the cost of providing 'conventional' capacity in the ESI system (though it avoids the externalities associated with fossil fuel generation). Even so, there has been a substantial expansion of solar PV capacity since the establishment of the Australian Greenhouse Office Solar PV Rebate Program. Since 1999, the number of solar PV systems installed in Australia has increased from just a few to several thousand. In the medium to longer term, there is a range of emerging technologies that are being developed in both Australia and overseas that have the potential to achieve cost levels that increasing numbers of consumers may find acceptable, or which could be combined with household appliances (such as hot water or central heating units) that consumers would buy anyway - but which could come with DG capability built-in. Fuel cells are one example.

The ATA has recently completed a survey on the experiences of residential consumers negotiating grid connection of renewable DG that indicates many of them face very frustrating experiences. This research highlighted the great inconsistencies in the process and technical details that distributors apply to small renewable DG's. In addition to frequent delays in connecting the installation (which in some cases merely requires activation of a switch on the customers Inverter), this includes technical guidelines such as wiring and inverter requirements which exceed Australian Standards (and industry agreed best practice).

ATA's research revealed that this treatment varies significantly across jurisdictions and clearly highlights the failure of jurisdictional regulation to protect these consumers from being discriminated against by distributors.

ATA and TEC would welcome the removal of these discriminatory practices and regulation which supports fair treatment of DG and acknowledges the benefits that DG offers. This includes standard grid connection agreements throughout all jurisdictions of Australia that simplifies the process for grid connection while ensuring that the behaviour of distributors is consistent with agreed standards.

As a minimum, the obligations on distributors and retailers to positively facilitate the connection of small renewable DG are required through improved processes, procedures and practices.

These policies are required to stimulate adoption of innovative technologies and R&D into 'Intelligent Mini Grid' technologies that have the capability for two-way communications between energy networks and consumer's appliances and installations and this could facilitate effective implementation of both DM and wide scale DG.