Submission by

Alternative Technology Association

On

The Productivity Commission's Review of Electricity Network Regulation

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By email: electricity@pc.gov.au

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1.0 Introduction

Founded over 30 years ago, the ATA is a national, not-for-profit organisation whose 5,500 plus members are mostly residential energy consumers with an interest in sustainable energy and resource use.

Through the application of our in-house expertise and experience in the energy market to our continuing advocacy and research, and close collaboration with fellow members of the National Energy Consumer Roundtable, the ATA is an important voice for energy consumers Australia wide and in each of the NEM jurisdictions.

ATA presents a uniquely two-fold perspective in the energy policy debate: as well as directly representing all Australian energy consumers through our support of improving energy affordability through improvements to the energy market that have net benefits to all consumers, we speak with authority on behalf of the growing portion of the consumer base who have an active interest in demand side participation (DSP).

While ATA's membership is diverse, many members are of above average energy literacy and keenly await opportunities for DSP. Many ATA members play an important role in the development of DSP as the 'early adopters' of new and emerging technology, which in the context of DSP is vital to bring about the uptake and maturation of any new technology.

As a leading consumer organisation in the energy policy space, ATA plays an equally important advocacy role working with energy market participants and institutions, other energy businesses and State and Commonwealth governments to ensure that new opportunities for DSP are introduced in such a way that, by achieving the aspirations of the National Electricity Objective, DSP becomes part of the solution to the problem of increasing energy prices, caused by unrealised potential efficiencies in the NEM.

ATA applauds the Productivity Commission's draft recommendations – in particular for its recognition of the fundamental role of consumers in the future operations of the market.

We are appreciative for the opportunity to contribute to this review.

1.1 Position Overview

ATA contend that the current state of rising electricity prices at both a network and generation level is primarily driven by a failure to manage peak demand.

The inability – or reluctance by some parts of the market – to properly engage the demand side has lead to over-investment in the electricity system as a whole.

Whilst there are many improvements that would reduce prices for consumers, a fundamental problem with the disaggregated structure of the energy market is that typically, no single market participant can make a sound business case to promote any one of these improvements, based on the benefits to their part of the supply chain.

The only party who has an interest in all parts of the supply chain working with optimal efficiency are end consumers.

As such, ATA believes that greater policy intervention in the operation of the market is required to ensure the long term consumer interest is met.

In line with the above, we have three specific areas that we would like to draw the Productivity Commission's attention to – these are:

- Current demand side regulatory changes;
- Network targets for demand management;
- The role of 'green schemes'.

More detail is provided on these points below.

2.0 Current Demand Side Regulatory Changes

In considering the 'demand management' draft recommendations in the Productivity Commission's Overview report, we would draw the attention of the Commission to the draft decisions recently release by the AEMC as part of its *Power of Choice* Review.

The effect of these recommended changes will be to:

- Lower wholesale energy costs with a level playing field between demand side service providers and existing market participants and service providers;

- Improved competition and efficiency with load and generation aggregators – those businesses that commercially contract loads and generation to respond to specific wholesale market prices and network conditions; and

- Empowering consumers by allowing them to choose who provides energy services to them, and how.

We applaud these changes and commend them to the Commission.

We also attach our recent submission to the AEMC on their draft recommendations. With regard to specific issues of policy design and implementation, there is a significant level of material within this submission of relevance to the Productivity Commission's recommendations regarding implementation issues associated with time variant tariffs and demand management.

3.0 Network Targets for Demand Management

In relation to Chapter 5 on regulatory incentives, one area where ATA believes both the Productivity Commission's recommendations, and the AEMC's *Power of Choice* draft recommendations, fall short of effectively acting in the long term interest of consumers, is in relation to mechanisms that sufficiently incentivise network businesses to invest in demand management – where it is more efficient than network augmentation.

Over the past decade, there have been numerous incentive-based schemes (i.e. schemes that offer monetary reward, without penalty or mandatory compliance) in most jurisdictions, for network businesses to deploy demand management.

These have led to very little investment in more cost effective demand side measures and no change to the predominant network culture of augmentation[1] - at significant expense to consumers.

ATA strongly believe that non-punitive, incentive-based policies will continue to be insufficient to overcome the significant barriers and biases that exist within most network businesses with regard to network augmentation.

Given the experience and cultural biases of network businesses, built up over decades of asset-based investment and management, and the clear tendency of the current arrangements to encourage business earnings from the regulated asset base, ATA have no confidence that incentives on their own will be able to spark any meaningful level of investment in more cost effective demand management alternatives.

In this regard, ATA suggest that the most effective way to achieve a meaningful level of investment in demand management at the network level, while ensuring a reasonable pass through of benefits to consumers, is through the provision of mandatory targets. These targets would impose a minimum level of investment in demand management on network businesses, with penalties for compliance failure.

3.1 DM Targets – Potential Scheme Design

A demand management target or obligation would be a regulatory instrument designed to reduce peak demand on transmission and distribution networks and could be configured in a number of different ways.

As an example, a target could be based on:

- a reduction of peak demand when compared with forecast or historical demand; or
- capital expenditure to meet peak demand as a proportion of:
  - network wide peaks (e.g. 5% of forecast maximum demand); or
  - peak growth (e.g. 75% of the forecast increase in maximum demand).

[1] While in Queensland there has been more investment in demand side measures, this is attributable to the price setting mechanism as opposed to mandatory regulation.

The target could be applied to all or part of transmission and/or distribution networks. To ensure it delivers cost-effective reductions in network augmentation, an average target could be applied to a network with the business itself able to nominate the areas of most effective deployment of DSP, based on the areas of emerging constraint on transmission and distribution networks.

The target could also be:

- set annually or in line with five yearly distribution pricing reviews; and
- based on the exact same demand forecasts derived from independent modelling to estimate projected peak demand increases.

Importantly, ATA believe, any such incentive scheme should be designed in such a way that the businesses are only penalised for failing to reach their targets and are financially rewarded for reaching or exceeding their targets.

If designed properly, a demand management target will facilitate investment in DSP where it is more cost effective than network augmentation, placing downward pressure on network pass through costs, and therefore having a net cost benefit for all consumers.

ATA strongly recommends that the Commission consider this approach and investigate the policy alternatives with regards to its implementation.

4.0 Distributed Generation

ATA have extensive expertise in distributed generation (DG) technology – including its proper valuation within the energy market.

In this regard, ATA notes the following comment on page 15 of the Overview report:

> *"Current subsidies to particular forms of distributed generators have had few benefits for the network and, in the face of carbon pricing, now play a redundant (and inefficient) role as a measure for reducing emissions."*

ATA would generally agree with the first part of this statement – that is that network benefits, including the ability to defer investment in network asset, is not the primary market wide benefit of DG (and in particular solar photovoltaic).

However, in considering the economic benefits of DG such as solar PV, accurate economic analysis needs to value all of its benefits – including its benefit to all consumers in the form of lower wholesale energy prices.

Distributed generation, along with energy efficiency markets and even wind developed under the Renewable Energy Target (as a 'price-taker' on the wholesale market), all place downwards pressure on the wholesale price for energy. This results in a net benefit for all electricity consumers.

There is no better example of this than in South Australia, where the penetration of wind energy is amongst the highest in the world – and where wholesale energy prices are now the lowest in Australia.

At the same time, AEMO has concluded that rooftop solar in SA contributes significantly towards meeting peak demand.

The prevalence of increasing levels of solar PV, along with energy efficiency and wind power in SA has resulted in recently, a decision by the South Australian regulator to reduce the regulated tariff by 8.1%, in response purely to price reductions at the wholesale level.

The evidence of the past four years now strongly suggests that removing green schemes will actually increase wholesale energy prices for consumers. This needs to be considered when assessing the role of these schemes.

4.1 DG's Impact on Consumer Bills

On-site renewable energy such as solar photovoltaic is one way that consumers may reduce their electricity bills. Basing incentives for small to medium scale DG systems on the actual economic value of the electricity exported means that:

- some customers are able to tackle rising prices by investing in renewable energy; and
- all other consumers realise the broader benefit of reduced wholesale electricity prices that flow from having more DG in the electricity grid.

It is a common argument from centralised generation businesses, and the retail businesses that own or contract off-market with them, that incentives for DG drive up costs for other consumers.

This claim is incorrect and should be viewed within the context that reductions in energy demand at the wholesale level caused by DG causes a reduction in generator / gentailer profits.

Whilst 'premium' based feed-in tariffs may in the past have been set at a level where the cost of these schemes outweighs the benefits for all consumers, this is no longer the case as feed-in tariffs have been reduced to a level where the price set is actually lower than the value of the electricity exported from those DG systems in the market.

The latest round of feed-in tariffs, set by State Governments over the past two years, do not increase the bills of other consumers, but actually decrease them in the context of the value of the wholesale price reduction benefits.

The actual economic value of electricity exported from DG is made up of:

- its equivalent value if that electricity was traded on the wholesale market, at the time of generation (generally accepted by the industry and energy economists to be in the order of 5 – 10c / kWh);
- the value of the avoided distribution and transmission losses that DG offers by generating at the point of demand; and
- the value of the wholesale price reductions that the DG is causing, which provides a net benefit to all electricity consumers.

The majority of state-based feed-in tariffs have returned to a level no greater than 10c / kWh. In line with the principles above, the actual economic value of the electricity is greater than this – meaning that all other consumers experience a net benefit from having that DG in the market.

As a result, every new solar installation that occurs under current feed-in tariff settings results in a cross subsidy from PV owners to all other consumers.

4.2 Purpose of Feed in Tariffs

The proper purpose of feed-in tariffs is ultimately to remunerate DG for the economic value of the electricity that is exported to the grid from those systems.

The purpose of DG, from a society-wide perspective, is to utilise a form of generation that overcomes some of the inefficiencies that currently exist in an electricity market that is dominated by centralised power generation that is located at great distance from the majority of electrical demand.

The factors that contribute upward pressure on energy prices are generally well known, but the measures that place downward pressure on bills are generally less well publicised. These material benefits are rarely factored in to the simple appraisal of the cost of green schemes undertaken by the general media, regulators or government departments.

The wholesale price reductions in the spot market, caused by the demand reductions provided by both DG and energy efficiency schemes, is the benefit side of that equation that needs to be factored in when considering the net cost, or potentially net benefit, of green schemes on all electricity consumers.

In this context, properly designed feed-in tariffs can be used by policy makers to drive investment into DG assets that provide a cost benefit to all electricity consumers through the development of a more efficient electricity system.

4.3 How should Feed-in Tariffs be Designed?

DG technology such as solar photovoltaic is now below 'grid parity' with the retail price of electricity.

Grid parity is defined as when the levellised (i.e. average) cost of energy from a DG source equals the levellised cost of electricity purchased from the grid over the lifetime of the DG system. This has been the basis for the reduction in feed-in tariff and Small-Technology Certificate (STC) support for solar PV and other DG over the past two years.

The debate regarding feed-in tariff and other DG incentives has now therefore switched from providing short term, premium incentives to establish the solar PV market in Australia, to focusing on the long term fair and reasonable economic value of electricity fed into the grid from a DG system.

There remains significant misunderstanding regarding the value of distributed energy, and therefore about the role of feed-in tariffs and other pricing measures.

4.3.1 Value of DG Energy used On-Site by the DG Owner

The benefit gained by a consumer for the portion of electricity they generate and use on site can be considered to be whatever they are avoiding paying a retailer[2].

Notably, even if the consumer is reimbursed for exactly this amount there is still a benefit to all other consumers, in the form of the demand reduction that places downwards pressure on wholesale spot market prices, most significantly at times of peak demand on the NEM[3]. This is known as the Merit Order Effect.

4.3.2 Value of DG Energy Exported to Other Consumers

The electricity exported to the grid from a DG system has an inherent value in the energy market and therefore to all consumers – just as electricity traded in the wholesale market from centralised generators has a value (e.g. the pool price at that time).

[2] This assumes a net metering arrangement.

[3] The value of this component that DG brings to all consumers can reach many thousands of dollars per megawatt hour on the wholesale market, by preventing the more expensive energy from peaking generators from being purchased in the wholesale market.

As an example, if a consumer purchases one kilowatt hour through their retailer from a centralised generator receiving a wholesale price of eight cents per kilowatt hour (or $80/MWh, as traded on the spot market) then in terms of wholesale energy cost this is no different to that same consumer purchasing a kilowatt hour through their retailer from a neighbour's solar system.

In simple terms, at the time the solar electricity is purchased by a non-solar consumer through a feed-in tariff arrangement, it has the same wholesale energy value as any other energy being traded on the wholesale market. Other energy market supply chain values that go into making up the retail price add further to the value.

Given that greater investment in DG under the right circumstances is of greater benefit to all electricity consumers than continued over-investment in centralised generation, at a time when most governments are implementing policy that reacts strongly to the false perception that feed in tariffs are inherently inequitable, it is necessary that a robust and consistent set of national principles are developed for valuing the exported electricity to the NEM from household, community scale and SME-scale DG systems.

5.0 Time Variant Pricing

Time variant tariff design should be based on considered principles that reflect the needs and interests of consumers by balancing the risks and the opportunities of energy pricing for all consumers.

ATA proposes the following ten principles for basic or 'vanilla' tariff offerings:

1. Single rate tariffs will be available for all consumers.

More cost reflective pricing across the NEM will result in significant market-wide efficiency benefits for consumers, but of course this creates winners and losers and the availability of single rate (or non-time-variant) tariffs will help protect those who would be placed at risk by ToU tariffs.

2. A two rate tariff will be available when replacing extant controlled load tariffs.

Consumer's legacy controlled load tariffs need to be accounted for, at least as a transitional measure when moving to ToU tariffs.

3. Three-part time of use pricing will be available to all consumers.

Three-part ToU tariffs are an example of a time-variant tariff, which is anything whereby the rate varies according to when a unit is consumed. All consumers should have the opportunity to reduce their energy bills though access to ToU pricing, should they choose to do so.

4. Retail ToU tariff rates should be broadly cost reflective, both of energy generation and network costs structures.

While network peaks are a large contributor to household energy bills, so is the wholesale cost of energy, particularly during times of high prices on the national energy market. While sometimes these peaks coincide, they often don't.

Importantly, the pattern of costs and cost triggers of networks are very different to those of generation:

- The bulk of networks costs are based on the capex of building parts of the networks to the highest level of forecast demand (power) in a number of years. The costs are incurred in large chunks, such that the portion relevant to an individual consumer's supply may, effectively, be zero for a number of months or years at a time, then many hundreds or thousands of dollars on a given week or month.

- Generation costs, however, are based on energy consumption (not peak power) and supply constraints/contingencies in a given region (jurisdiction), and range from minus $1,000/MWh to plus $12,900/MWh at any given time.

As such, simply aligning ToU tariff design with only network peaks and ignoring market prices, or with only generation costs and ignoring network cost triggers, is not necessarily cost reflective and so may not send the right sort of price signal, running the risk of not addressing the peak problem.

At best, this could restrict an individual's ability to monetise a market or network cost saving brought about by managing their energy use, and at worst it can send a perverse signal to use more energy at a time that places more load on the network or drives up the wholesale cost.

Many stakeholders are of the view that ToU implementation should occur at the network tariff level. The resulting discussion around peak time so far is largely focussed on network peaks alone, and often the retail component is left 'to the market'.

5. The shape of tariffs for homes should be based on network and energy market load profiles for that customer class.

Across the NEM, only 25% of energy is used by households[4]. Household load profiles are different to commercial and industrial load profiles. In parts of the network where less of the total load is domestic, the load profiles, and particularly the peaks, of the networks may not resemble the domestic load shape.

For these reasons, ToU tariffs (and flat tariffs for that matter) for households should be based on household load profiles[5].

The problem with this principle is that, where the network load profile does not match the residential load profile[6], basing the tariff shape on a residential profile runs the risk of sending a perverse signal to households to use:

- less energy at a time where doing so provides little or no benefit to the network or market; and/or
- more energy at actual network / market peak times, which may accidentally:
  - reward a consumer for adding to the peak; and/or
  - penalise a consumers for using more energy at a time when demand is not high.

This risk of problem becoming material in a given part of the network is appropriately dealt with through targeted, location specific measures such as incentives for businesses and households to reduce or shift load from peak times.

[4] The portion across distribution networks would be higher due to some larger energy users being transmission connected. Some parts of networks are entirely residential and some solely commercial

[5] It is appropriate to also sub-divide the residential class into significant sub-classes of residential consumer, as noted in ATA's submission to the Power of Choice draft recommendations.

[6] Such as where the network load is predominantly commercial, or where a mix of dual and single fuel households results in a net load profile that does not match that of each customer class.

6. Off-peak periods must be sufficient for households to be able to access cheaper energy.

Feedback from ATA members suggests that a weeknight off-peak period of:

- a **minimum** 8 hours duration per night (which is consistent with current network practice); and
- starting (e.g. 9pm) or ending (e.g. 8am) at a time that is accessible to most consumers;

is the required **minimum** to allow most households access to lower cost energy for:

- traditional off-peak loads such as water heaters;
- household appliances such as dishwashers; and
- emerging technology, such as electric vehicles.

Having a broad window for the off-peak period is also important for network stability, as if it is too restricted there is a higher risk of simply shifting the peak to night time, rather than reducing peak in areas with significant penetration of controlled loads[7].

7. Peak periods must be of a duration that allows households move some loads to avoid higher energy costs.

Feedback from ATA members suggests the weekday peak period should be a **maximum** 4 hours duration per week day (e.g. 2pm to 6pm; or 4pm to 8pm), thus allowing more households to avoid using high consumption appliances such as washing machines, dishwashers, and clothes driers during times of higher demand and prices.

Some consumers have expressed concern at longer peak periods that do not allow them to effectively shift loads. For example, 6 hour peak periods in NSW with tariffs of up to 58.85c/kWh from 2pm to 8pm each weekday reduce the ability for consumers to respond to ToU pricing when compared to a peak period of four hours or less.

There is of course a trade-off between the length of the peak and the ability for that period to apply cost reflectively to all areas.

With regard to section 5 (above), if ToUs are aligned with customer types of 'single fuel' and 'dual fuel' (see 10 below) and there is no seasonal change (see 8 below) then a two hour peak window, during which the majority of 'peaks' fit, will be suitable for each of these classes while capturing that residential classes actual contribution to actual peak demand.

[7] As has happened in parts of SA where time switches for off peak hot water services have had to be adjusted to remove night time peaks.

8. A basic (standard or non-market) ToU pricing product may not include a seasonal variation greater in magnitude than the legacy standing offer at that residence already has, and all tariffs will be based on local time to account for daylight savings.

A seasonal ToU is where, for example, an area of the network that is winter peaking has higher tariff charges in the winter months. Seasonal pricing is already done on in gas and electricity, but could vary more (and hence be more confusing for consumers) when incorporated into ToU pricing.

Generally consumer advocates are of the view that seasonal variations should be allowed as long as the seasonal differences are not so great or confusing that it places consumers at unacceptable risk.

9. A basic (standard or non-market) ToU pricing offer may not include critical peak pricing.

Critical peak pricing is where cheaper energy is provided at a cheaper rate all year round, except for a few hours on a few critical peak days where it effectively costs a lot more to supply. On critical peak days, the price for energy is considerably higher, and consumers are notified the day before to allow them to take action to reduce their load on these days if they so choose. The general idea is that the average consumer has lower bills and greater opportunity to save more through load curtailment on peak days, but they carry higher risk.

The strongly held view by ATA and other consumer advocates is that critical peak pricing should not be allowed as part of any standard offer long as the risks to some consumers are not acceptable.

10. Consumers should be provided with the option of a common ToU tariff based on their fuel mix.

In Victoria as part of the staged introduction of 'flexible' pricing, stakeholders considered what a common ToU shape (eg. with 'the same' peak, off-peak and shoulder periods across the state) would look like, on the basis that a common standard ToU would help consumers make informed decisions about which energy retail products to choose and how best to use energy.

In most locations, there are two distinctly different average household load profiles at a network level: Dual fuel (where gas, or in some cases wood, is used for some or all heating and cooking loads) and single fuel (electricity only, with or without solar hot water)[8].

Dual fuel and single fuel households' load profiles are so different that a ToU tariff that is common to both household types cannot meet all of principles 5, 7 and 8 above at the same time: the peak duration having to be longer than four hours, and many single fuel houses in Vic are winter peaking while some dual fuel houses are summer peaking.

According to industry it is not practicable to offer electricity tariffs to specific households based on whether or not they also use gas, so the logical way to distinguish between the two household types is to generalise between city (largely dual fuel) and rural (mainly single fuel), or by postcode.

[8] There are also differing profiles for different classes of customers within those broad categories as previously noted.

6.0 Reliability (Distribution & Transmission)

The treatment of all residential consumers as equal in terms of their ability to compromise supply reliability in return for a financial trade off makes it highly difficult to assess the value of both demand side and supply side investments.

While 100% reliability of supply at all times is critical for a small number of consumers, it comes at a high cost, and the reliability incentives for distributors and market participants are inflexible and place artificial barriers on those consumers who can be more flexible in their energy use.

Such opportunities as Direct Load Control, voluntary Supply Capacity Control/Limiting and similar pricing and demand side solutions offer much potential for consumers to save money through demand side participation, however under current requirements on networks, the opportunity to do so is limited: the inability of informed customers to effectively 'opt-out' of more expensive continuous supply in return for cost savings is a barrier to efficient demand side participation.

The over-emphasis on inflexible, broad-brush measures (such as System Average Interruption Frequency and Duration indices and the energy-based common Value of Customer Reliability across consumer classes[9]) as a means of valuing the need for continuous supply leads to over-investment in many parts of electricity networks.

Further, the reliability incentives placed on networks are based on network-wide SAIDI and SAIFI figures are structured in such a way as to be inefficient and create inequity between rural and urban consumers.

7.0 Further Contact

Thank you for the opportunity to provide comment to this process and please do not hesitate to contact us at Damien.Moyse@ata.org.au should you have any queries regarding our submission.

Yours sincerely

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[9] Through AEMO's recent Review of the Value of Customer Reliability and related processes, the over-emphasis on metric used for VCR became apparent. In spite of a range of flaws being put forward and acknowledged by the reviewing body, there have been no apparent advances in the treatment of Consumer's reliability needs in the market.

One of the flaws in VCR is use of an energy-based absolute value which does not allow correct valuation of the many 'partial supply' options which could be available to those consumers who do not require unrestricted access to energy at all times, that could otherwise be put in place to benefit those individuals as well as all electricity consumers through reduced network expenditure or wholesale market prices.