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Revised Demand Side Response and Distributed Generation Case Studies

This submission has been prepared by the Consumer Utilities Advocacy Centre Ltd (CUAC), an independent consumer advocacy organisation, established to ensure the interests of Victorian consumers, especially low-income, disadvantaged, rural, regional and Indigenous consumers are effectively represented in the policy and regulatory debate on electricity, gas and water.

The submission is in response to “Revised Demand Side Response and Distributed Generation Case Studies” (the Report) published by NERA, August 2007.

In summary, CUAC has concerns about the quality and depth of analysis behind some of the recommendations made in the Report and subsequently the recommendations themselves. There appears to be a level of deficient information provision and methodology application.

Our concern is deepened in that the consultation on the 21st September did not address any recommendations made in the Report despite the consultation finishing ahead of schedule. By avoiding consultation on the Report, it appears that the Report and subsequent lack of consultation is looking to justify or protect a pre-determined position. This may not be the case, however from our perspective it is very difficult to draw any other conclusion.

We also feel unease over the lack of attention paid to environmental and social outcomes in the Report. The legislated objective of the National Electricity Market 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.” Issues facing the Australian Electricity Market are:

- water scarcity for generators;
- the impact of emissions on global climate;
- the cost of delayed action on emission reductions being greater than immediate action; and
- the impact all this has on affordability and reliability of energy for consumers in the long run

As such, it seems entirely reasonable that where distributed generation or demand side response offers social and/or environmental benefits – and hence the efficiency of investment - attempts would be made to incorporate this value into the regulators’ decision making. Yet the Report has not made an attempt at accounting for the economic impact of environmental and social outcomes despite a wide variety of national and international literature on the topic to draw on. CUAC finds this approach troubling.

For future reviews we recommend that genuine consultation is undertaken prior to the development of conclusions and recommendations in order to minimise the risk of either selective or inadvertently deficient analysis.

This submission is structured as a response to each of the recommendations (in *italics*) made in the Report.

Large scale PV roll out

Rule recommendations

The Rules should require that, once the appropriate form of regulation is determined for domestic distribution use of system charges, DNSPs should be required to allow such customers to install and use PV on the basis of the same usage and capacity tariff elements applying to equivalent sized load;

- *Where tariff reassignment restrictions are to be included in the Rules, these should be limited to principles that ensure tariff assignment and reassignment are based upon:*
 - *customers’ usage and connection characteristics, i.e. the drivers of network costs; and*
 - *providing equal treatment to customers with similar usage and connection characteristics.*

CUAC believes this recommendation is based on the erroneous reasoning used in the Report. These errors include that PV does not reduce peak demand materially because:

- it is uncorrelated with peak demand (residential peak);
- it cannot be guaranteed as ‘firm’; and
- it is not large enough to make a difference to peak supply capacity planning.

Firstly, we take issue with a recommendation to adopt technology specific rules. The nature of PV is continually changing and assumptions on its current performance and assumed benefit may limit its uptake where the technology performs differently in the future. Any rule adopted should be based on the function/output of a distributed generation (DG) system.

Secondly, the case studies show that PV output, averaged over the course of a year, correlates very well with peak loads at substations. The Report discounted this on the basis that in Homebush, there was not enough PV to have a significant impact on the DNSP's planning. Of course, this discounts the potential that if deployed on a significant scale by consumers, PV could have a material impact on the cost of peak distribution infrastructure.

We appreciate the Report's argument that 'common mode failure' due to shading and cloud cover *may* (our emphasis) limit the firmness of PV, but among other things, new and emerging PV technology is becoming more resistant to shading cover (see amorphous silicon technology, dyesol cells, sliver cells etc). This highlights that technology specific rules should not be adopted. Additionally, the failure of PV, in the context of network capacity planning, is only likely to be an issue where the failure coincides with a network peak. That is, PV does not need to be firm all year round to reduce peak demand, it needs to be firm at times of peak demand. In the Report, no analysis was shown on the correlation between cloudy days (currently the cause of common mode failure) and network peaks – the two key variables to be understood in the determining how firm current PV technology is in reducing network peaks. In place of such analysis, it seems that it was assumed, given there is potential for PV failure, PV cannot be relied upon. If such analysis was applied to any other form of generation, we could assume that no generation technology should be considered firm.

Thirdly, the orientation of PV can either be fixed or 'tracking'. If it is tracking, it adjusts its orientation to maximise its output over the course of the day meaning it will retain peak, or near peak output from early morning until late in the afternoon. If it is fixed, it can be orientated to the west to create a later peak, or to the east to create an earlier peak. In short, it is overly simple to say PV does not correlate with peak demand because PV can be adapted to peak at a wide variety of times, depending on when peak output is most desirable. PV can also be used in conjunction with storage mechanisms so while PV generation may not be at peak times, the energy produced and stored will be used at peak times, and hence reduce peak demand. Again, this highlights the need for regulation based on the function/output of distributed energy systems, not technology.

In summary, it would be limiting and cumbersome for the rules to adopt technology and situation specific principles which are likely to change, and continue to do so for quite some time. It would be better to adopt high level principles which can be applied across DG technologies based on their ability to reduce or defer the capital cost of distribution infrastructure.

Customers should be able to recoup the value of their generation based on capacity and usage charges applied to a load as a minimum condition. If private investment by commercial and non-commercial entities reduces or defers the capital cost of supply infrastructure, and peak supply infrastructure in particular, they should be rewarded for the capital costs savings which the entire market will benefit from. So any DG technology which reliably reduces the capital cost of peak distribution infrastructure should be valued at above the average cost of use.

We recommend that the AER does not regulate technology. Rather a framework should be created to reward investment in DSR and DG where it creates market wide benefits, keeping in mind that while individual action may not have material impact, a framework which facilitates large scale collective action can.

Recommendations for consideration beyond the revenue and pricing Rules

- *DNSPs should be encouraged or required to ensure that customers subject to large scale PV roll-out receive priority in the roll-out of AMI, thereby facilitating the development of network tariff structures that provide efficient signals for the installation of PV.*
- *Further analysis should be undertaken on whether or not the current treatment of losses is consistent with promoting efficient distributed generation projects.*

We realise that with the roll-out of AMI, there will be implementation constraints meaning not all customers can receive AMI simultaneously. Where prioritisation occurs, it should be given to those projects most likely to both benefit from AMI and have an impact on improving supply efficiency and quality. For this reason, large scale PV should not necessarily be prioritised, rather large scale clean distributed generation projects should be prioritised.

Advanced Metering Infrastructure (AMI)

Rule Recommendations

- *DNSPs should be required to reassign customers to a time of use tariff following installation of advanced metering infrastructure at the customer's connection point.*
- *Reassignment should be accompanied by a requirement for customer education regarding ways in which they can manage their demand to affect their bill. Further work is required to identify whether this is a role best served by retailers or DNSPs.*

The persistence of this recommendation is troubling. Customers must be given the opportunity to opt in to time of use tariffs when it is in their interests.

The benefits of AMI have been assumed as part of the 'case study'. No field data or primary analysis has been used to demonstrate that time of use pricing will result in efficient market investment and performance. It is based on assumptions which expect all

consumers to be rational decision making agents, capable of simultaneously being willing and able to:

- receive and understand a price signal
- calculate the value of action
- calculate the optimal strategy for responding to the price signal
- physically implement their strategy in the home – requiring that they can either:
 - afford to upgrade appliances
 - afford to upgrade building fabric affecting appliance performance
 - be in the home to implement a response, also requiring that they can actually defer the relevant load – i.e. it is non-discretionary at that time

The tenuous nature of these assumptions and expectations cannot be overstated. This is supported by the elasticity of demand to price signals being weak, with research suggesting that 30-40% price increases may only elicit a 4% drop in demand (National Institute of Economic and Industry Research in Langmore, 2004)¹. This is hardly a firm or material reduction in peak demand.

Furthermore, requiring all customers installed with AMI to be reassigned to time of use tariffs ignores that some customers are unable to shift demand and will be penalised for no practical market benefit. Eliciting a demand response to a price signal is complex and has been massively over simplified in the ‘case study’.

Furthermore, CUAC finds the inherent duplicity of standards across the case studies concerning. In the case of PV, market wide, technology specific conclusions were drawn based on two limited case studies. In the case of AMI, we have no case studies and even greater leaps of faith between the application of the technology and its market wide significance.

It is worth noting that in their recent stakeholder consultation on the upgrade of Melbourne CBD network security, CitiPower openly acknowledged that they do not expect the roll out of AMI to reduce baseline growth rates in peak demand. This highlights the tenuous nature of extolling the benefits of AMI based on expected efficiencies created by cost reflective pricing.

Lastly, the requirement for ‘education’ at the customers site again oversimplifies practical realities:

- customers move house;
- there are language and communication barriers across certain demographics;
- there are behavioral, cultural and psychological impediments to customers understanding education, indicating honestly that they understand the education given and taking action on what they have learnt.

Exacerbating all these issues is that consumption in many houses is inelastic to price, particularly for non discretionary consumption. It would be more appropriate for

¹ <http://www.cuac.org.au/docs/2004%20June%20-%20St%20VdP%20report%20Electricity%20Elasticities.pdf>

education to occur firstly, followed by the option to opt in to a time of use tariff if it is in a customer's interest.

Recommendations for consideration beyond the revenue and pricing Rules

- *Where a direct load control facility is available at a customer's connection point, consideration should be given to ways to ensure the controller of this infrastructure provides access (on reasonable or regulated terms) to that customer's retailer, DNSP, TNSP or other DSR intermediary engaged by the customer for the purposes of load control.*

While we recognise the importance of this recommendation in the context of direct load control as a form of demand side response, we are concerned about the lack of attention given to fundamental consumer protections around such a service.

Given the potential value of direct load control to distribution companies, where there is disaggregation in the market, consumers are likely to come under significant pressure to enter into contracts which allow direct load control. With retailer marketing practices we have seen that consumers understanding of contracts and opting in to contracts where it is in their benefit cannot be taken for granted.

In essence, in the case of direct load control, distribution companies will be asking consumers to take, or risk, a reduced quality or complete termination of a particular energy service for the benefit of the market. The rules should ensure that where consumers enter into such service contracts, they are rewarded proportionate to the value they deliver to the market. Particularly where efficiency is dependent on customer actions and sacrifices, we expect them to receive fair and equitable share in the benefits of any efficiency gains made.

We also recommend that certain customers be protected from direct load control services. Broadly, this includes ensuring any customer dependent on an energy service for their health or safety cannot enter into direct load control agreements affecting those energy services they are dependent on. Such protection is absolutely critical, particularly while the technology is relatively new and teething problems can be expected.

Large user with DG that requires back-up connection

Rule Recommendations

- *The requirement for the periodic review of side constraints should be retained in the initial Rules.*
- *DNSPs should be required to submit to the AER for approval and publish protocols for the assessment of capacity demand and determination of capacity charges including:*
 - *the period over which capacity demand will be reassessed before capacity charges are reset (say, every 12 months).*
- *The initial Rules should not permit DNSPs to levy on DGs either positive DUOS charges for energy exported to the grid or deep connection costs.*

In considering the value of any demand side response, it is apparent that the principal concern of the DNSP is the degree of firmness, predictability and materiality of any DSR measure. Any private or consumer investment in DSR which is firm, predictable and has a material impact on DNSP costs should be rewarded.

For this reason, we highly recommend the consideration of energy efficiency as a form of demand side response. Customers who can voluntarily invest in energy efficiency continue to receive the same energy service for less operating costs. However they are currently shut out from the benefit of reduced capacity costs because there is no mechanism which captures these benefits.

Consideration must be given to the benefits of energy efficiency in reducing distribution capacity costs and how this can be rewarded. Indicatively, the Office of Energy in Western Australia has estimated the cost of supplying a 2kW air conditioner to be \$6,000 in peak supply infrastructure. The Queensland Government estimates a figure of \$13,000 per air conditioner. In short, there is potential for big network savings to be made by creating a mechanism which funds more efficient appliances, where a peak load reduction can be guaranteed.

Recommendations for consideration beyond the revenue and pricing Rules

- *It is important that jurisdictional standard setters be cognisant of the DSR and DG incentive implications of network planning or service reliability standards. Consideration should be given to the use of probabilistic standards and their relative costs and benefits as compared with deterministic standards.*

CUAC supports the recommendation.

Mid-size DG supplying peak power & network support

CUAC supports all of the recommendations listed under this section.

Large DSR project to relieve CBD network constraints

Rule Recommendations

- *Provision in the Rules for the inclusion of payments made by DNSPs for 'network support' expenditure in the derivation of the building block revenue requirement should be retained.*
- *The method of recognising network support payments in the derivation of the building block revenue requirement should provide unbiased incentives for the efficient substitution of network support for network augmentation.*

CUAC supports the recommendations.

Recommendations for consideration beyond the revenue and pricing Rules

- *A review of the information requirements in Chapter 5 of the Rules is necessary to ensure that:*
 - *DNSPs provide DG proponents with the information necessary to apply the regulatory test to a DG connection proposal*
 - *DNSPs provide information on the emergence of network constraints as well as areas of substantial under-utilisation existing transfer capability in order to allow DGs to identify and site in the best location by reference to:*
 - *alleviating network constraints (and potentially earning network support payments); or*
 - *maximising energy transfer capability without incurring additional deep connection costs*
- *DG proponents reveal their intended energy export levels such that DNSPs can accurately assess deep connection costs and formulate any connection constraint conditions that are required to protect network performance where:*
 - *the DG does not satisfy the regulatory test; and*
 - *the DG proponent chooses not to fund the deep connection costs.*

CUAC supports the intent of the recommendation but believes a mechanism to ensure that the information shared is accurate will be necessary. Such a mechanism should provide a disincentive for either party to materially understate/overstate their respective costs, import/export levels etc.

Large industrial user actively engaging in demand side markets

Rule Recommendations

DNSPs should be required to submit to the AER for approval and publish protocols for the assessment and review of capacity demand and determination of capacity charges including:

– the period over which capacity demand will be reassessed before capacity charges are reset (this should be limited to say 12 months).

CUAC supports the recommendations.

Please contact Tosh Szatow on (03) 96397600 should you have any questions about this submission.

Yours sincerely,

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