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Philip Weickhardt
Electricity Network Inquiry
Productivity Commission
GPO Box 1428
Canberra City ACT 2601

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Dear Mr Weickhardt,

Electricity Network Regulatory Frameworks: submission on draft report

EnerNOC welcomes this opportunity to respond to the Productivity Commission's draft report on Electricity Network Regulatory Frameworks, released on 18 October 2012.

We consider the draft report to be well-reasoned and comprehensive: it correctly identifies the key issues, and we agree with most of the observations and recommendations. In particular:

- We agree that there is at present a bias in favour of capital expenditure by network businesses, resulting in inefficient investment; we strongly support changes to remove this.
- We agree that the long-term interest of consumers, although enshrined in the National Electricity Objective, often seems to have been forgotten in the detailed implementation of the market and regulatory system.

However, there are two areas in which we believe the treatment of issues is somewhat imbalanced, and one in which we believe the arguments are flawed, leading to a harmful recommendation:

1 Commercial and industrial customers should be a big part of the solution

We realise that the Commission has deliberately afforded less attention to commercial and industrial customers, because it expects the Australian Energy Market Commission's (AEMC's) Power of Choice review to address the issues that relate to them. This has, however, led to a rather skewed perspective on the issues and possible solutions.

We would like to emphasise that, although extreme peaks in demand from residential customers are a major cause of increasing peakiness, and hence lower productivity, it does not necessarily follow that initiatives targeting residential customers are the most efficient way to address the problem.

Residential customers may place a very high value on the amenity afforded by their electricity consumption during extreme peaks. For example, if someone has bought an air conditioner for their home, it is very difficult to persuade them not to use it on

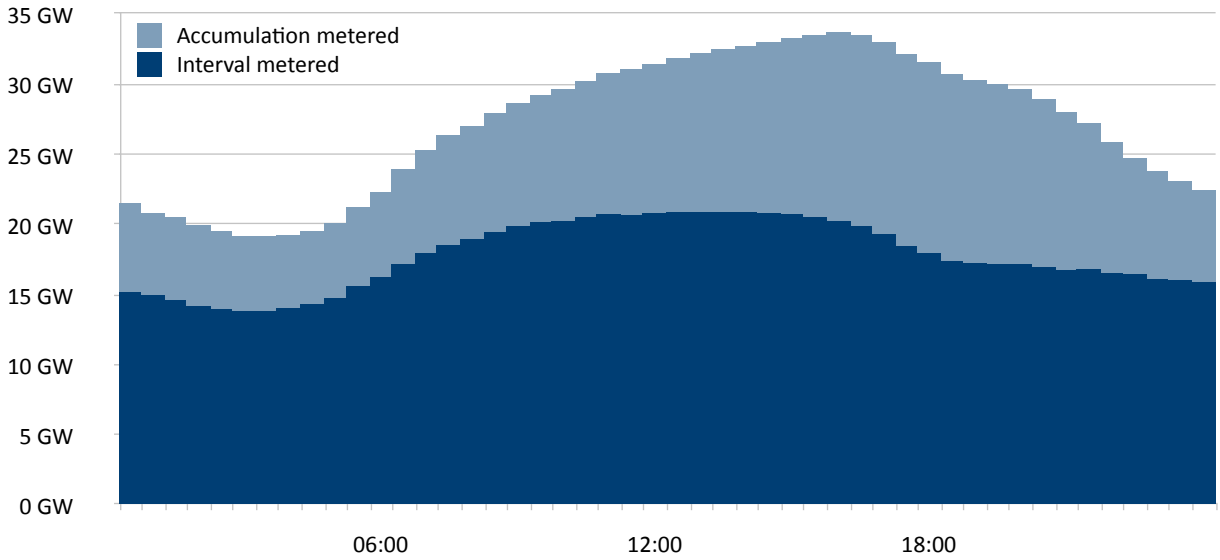

Figure: NEM 30-minute "total demand", excluding Tasmania, on 2 February 2011. Accumulation-metered load was deduced from net system load profiles for that day. Data: AEMO.

the hottest day of the year. Such demand may be highly inelastic; changing the behaviour would require an impractically strong price signal.

In contrast, for many commercial and industrial customers, the hottest days of the year are just ordinary days. Many commercial and industrial customers do not value all of their consumption at these peak times to the same degree as residential customers; indeed much commercial and industrial load is not weather dependent.

Commercial and industrial customers do not need unusually strong price signals to persuade them to respond using their discretionary loads at times when demand is extremely high due mostly to consumption in the residential sector.

It is entirely reasonable and economically efficient to pursue a lower cost and socially acceptable policy to induce commercial and industrial customers to reduce discretionary loads to address peakiness, rather than to pursue the isolated and impractical strategy of exposing residential customers to oppressive price signals to induce reductions in residential peak demand.

Commercial and industrial customers merely need a framework which makes it worthwhile for them to participate – this is what is largely unavailable, or woefully underdeveloped, with network businesses at present. In this way, commercial and industrial customers can aid in improving the load factor of networks efficiently; this will generally be a cheaper way to address extreme peaks in demand.

Our understanding is that network congestion due to extreme peaks usually manifests itself at the zone substation level, or higher, where assets are serving a mix of classes of load. Accordingly, all classes of customer can contribute to addressing the extreme peakiness problem.

Furthermore, the focus on residential customers may have led the Commission to overstate the importance of deploying smart meters. Consider, for example, 2 February 2011, when the peak NEM demand[1] for that year occurred. As shown in the figure above, even during the peak interval, 60% of demand came from customers who already had interval meters.

1 The figure and calculations exclude demand in Tasmania, as AEMO only recently started publishing net system load profile data for that region. Type 7 metered load is counted as interval-metered.

Given this, it is difficult to conclude that rolling out smart meters is essential, or that it will necessarily fix the current problems.

Before investing in a roll-out of smart meters, we should understand why customers who already have interval meters are not already providing an efficient level of demand response, and fix those flaws first. We have a regulatory or market design problem, not a technological one.

The same comment may also apply to the discussion of direct load control. This expensive form of demand response is necessary for residential participation. However, for commercial and industrial customers, it is only really needed for programmes which feature frequent dispatches or dispatches at short notice (e.g. less than 30 minutes). Demand response programmes for clipping network peaks tend to feature infrequent dispatches which are predictable many hours in advance: direct load control is not needed for most commercial and industrial customers.

2 Paying for demand response is a very powerful tool

Possibly because of the emphasis on residential customers, the discussions of demand management largely centres on tariff-based measures – i.e. charging more for demand at peak times.

In EnerNOC's experience with commercial and industrial customers, paying customers a predictable amount on a continuing basis in exchange for them agreeing to provide demand response when needed – an availability payment – is the most effective way to elicit significant participation and reliable performance.[2] The practical reasons for commercial and industrial customers' preference for an availability payment structure as a gateway to demand response participation are discussed more fully below.

If the best use is to be made of the potential for commercial and industrial demand response, it is important that the frameworks allow for demand response programmes which provide availability payments. The same effect may well occur with residential customers.

Note that this availability payment approach differs in several ways from most tariff-based measures:[3]

1. It involves paying the customers for providing demand response, rather than merely allowing them to avoid high costs by reducing their consumption when high tariffs apply. Although the two approaches may seem equivalent from an economic viewpoint, actually paying people seems to cause them to pay more attention in practice.

2 This is demonstrated by the impressively high levels of demand response participation in wholesale electricity markets in which demand response is eligible to participate and which include so-called capacity payments to address supply adequacy – for example in Western Australia and the PJM Interconnection in the Eastern United States.

3 Such as the time-of-use tariffs and critical peak prices discussed in the draft report, and the "flexible pricing" initiative in Victoria.

2. The presence of an explicit revenue stream makes it straightforward for third parties to become involved. Leveraging third-party expertise has proven the most effective means of attracting and sustaining meaningful amounts of demand response.

3. It involves paying them for making the capacity available, rather than merely paying them for energy when needed. Since all network issues essentially boil down to capacity constraints, this makes sense. This formulation leaves much of the forecasting risk with the buyer of demand response, rather than with the individual customers. Generally, customers need to be enabled with equipment and training before they can provide demand response reliably. A known and certain availability payment makes it easier for the customer or third party to evaluate and finance investments in demand response enablement. Customers are less likely to invest in demand response capabilities on the basis of speculation about possible future cost avoidance than on the basis of a solid business case.

4. The availability payment approach also seems to lead to better reliability because customers consider themselves to have made a commitment in return for the availability payments they have received and want to continue to receive.

Demand response programmes with availability payments provide a more targeted approach than can be achieved with any tariff: only customers willing and able to respond to the price signal will enrol, and only with the loads they consider discretionary; there are no accidental windfalls or losses.

From the network planner's perspective, the key benefit of contracted demand response programmes is that their performance is predictable: if a network has established a demand response programme with a reputable aggregator, then the network can reasonably expect the contracted capacities to be delivered. If the programme is intended to be deployed to reduce peaks by a certain amount, the planner should have sufficient certainty right away that they can cancel the supply-side augmentation that would otherwise be needed.

This degree of certainty is a significant advantage over a purely tariff-based approach to peak demand management. Tariffs are designed and deployed based on various assumptions about customer behaviour. However, the planner is unlikely to be sufficiently confident about the resulting reduction in peak demand to reduce their peak demand forecasts, and hence cancel an augmentation, until the results have been observed for a few years.

In this way, the predictability brought by the use of contracted demand response gives the planner the ability to make more prudent decisions about the timing and need for augmentations. A planner who relied only on tariff-based demand response would find it much more difficult, perhaps impossible, to do this, and hence be likely to planning decisions that lead to the over-building of network infrastructure.

Because of this key difference between the two approaches, we support the recommendations for making the tariff-setting process more prescriptive about the

use of Long-Run Marginal Costs (LRMC).[4] Tariffs are a useful tool for reducing the cross-subsidies between customers over the longer term; they are not particularly useful for addressing specific constraints.

3 Revenue caps are preferable to Weighted Average Price Caps

It is in the area of revenue control mechanisms that we believe the Commission's reasoning is mistaken. In fact, the Commission's recommendation is dangerous in that it will be counterproductive: it will lead to barriers to demand management and energy efficiency, higher administrative costs, and unnecessary opportunities for gaming by the regulated businesses.

Draft recommendation 12.1 favours Weighted Average Price Caps (WAPCs) over revenue caps for Distribution Network Service Providers (DNSPs). The draft report explains that this is because "a WAPC is more likely to facilitate adherence to efficient pricing principles than a revenue cap."[5] The reasoning behind this is not fully explained in the draft report, but it becomes clear from the references, and we will attempt to explain it:

Under a WAPC, the utility's revenues vary with the volume of energy consumed. Since it is not possible to forecast consumption precisely, the utility faces unpredictable variations in revenue. This could lead to unpredictable variations in profit – a risky and undesirable thing. However, if the utility sets its tariffs such that they accurately reflect its marginal costs, then its revenue should vary up and down in proportion to its costs, leaving its profits largely predictable and decoupled from the volume variations – a much less risky situation. Hence, the argument goes, the presence of a WAPC provides a strong incentive for cost-reflective tariff setting.

This reasoning makes sense, but **it does not apply to Australian DNSPs**. This is because DNSPs' costs are almost completely independent of volumes, and largely independent of peak demand.

In the long term, peak demand growth does drive costs, but, crucially, this occurs almost entirely beyond the current 5 year regulatory cycle. If increases in peak demand lead to a need for expenditure after the next regulatory reset, this expenditure will be included in the revenue allowance in the next regulatory determination, which the DNSP will be allowed to recover from revenues in that period; it has no effect on profits in the current period.

We suspect that this argument in favour of price caps over revenue caps came from other regulatory situations, in which the regulated entity's costs were largely volume dependent – e.g. a vertically-integrated power utility in which energy costs make up a major part of the total costs. This is not the case for DNSPs.

If a DNSP were to set tariffs intended to decouple its profits from volumes – as incentivised by the WAPC – they would have to reflect only the DNSP's costs within the current regulatory cycle. This is explained by the AEMC:

4 Draft recommendations 11.1, 11.3, and 11.5.
5 Draft report, p.417.

> *"For the network business profit to be neutral to changes in volumes the network tariff needs to provide the right economic signals. This means that the network tariff must correctly allocate the network's sunk costs to be recovered through the fixed charge and the variable charge correctly signals the marginal cost of increased consumption – which could be zero if there is sufficient spare capacity."*[6]

This is nothing like any current network tariff, and the extreme short-term focus required is quite unlike the LRMC-based tariffs envisioned by the Commission.

The Power of Choice draft report elaborates on this:

> *"It now appears that this assumption may not hold in practice … the link between volumes at peak times, higher costs and lower profits is not straightforward for a network business. … The additional consumption at peak times will only lead to a profit loss to the businesses if firstly, the costs were not foreseen at the start of the regulatory period and secondly, the costs cannot be deferred to the next regulatory period. The link between pricing at efficient cost and networks' profitability is not as strong as would be the case in other competitive market situations."*[7]

It is hence not reasonable to conclude that WAPCs will lead to efficient tariff setting.

Since, as we have seen, DNSPs face largely fixed costs, and a WAPC provides volume-dependent revenues, there is a strong incentive for the DNSP to game its forecasts so that they are much more likely to over-recover than under-recover.

The Commission suggests that "errors" in forecasts should reduce if the Australian Energy Regulator (AER) takes into account alternative forecasts and benchmarks. The AER believes that they already do this:

> *"While the AER rigorously tests the forecasts proposed by the DNSPs, actual data for DNSPs with WAPCs (compared with the forecast data on which the WAPCs have been set) show actual sales volumes often, and perhaps consistently, exceed forecasts."*[8]

The AER notes that, in the 2006-10 regulatory cycle, Victorian DNSPs recovered $568 million more than their revenue allowance – an 8.3% over-recovery.[9] While it may be possible for the AER to improve its scrutiny of forecasts, so as to reduce the level of systematic over-recovery, it would be far better to remove the incentive for DNSPs to game these forecasts, so that they can instead set tariffs on the basis of neutral best estimates.

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6 AEMC, Power of Choice Review Directions Paper Supplementary Paper, *Demand Side Participation and Profit Incentives for Distribution Network Businesses*, 23 March 2012, p.20. (Note that the Commission's quotation at the bottom of p.417 of the draft report comes from the same page of this paper. However, it is taken out of context: it describes the AEMC's view in 2009, not its current view.)

7 AEMC, *Power of Choice Review Draft Report*, 6 September 2012, pp.127-128.

8 AER, *Discussion paper: Matters relevant to the framework and approach, ACT and NSW DNSPs 2014–2019; Control mechanisms for standard control electricity distribution services in the ACT and NSW*, April 2012, p.11.

9 *Ibid.*, p.55.

Ignoring the gaming problems, it is worth considering which party can best bear volume risks. In the long term, any volume risk is always borne by customers, due to regulatory resets. The only point at issue is which party should bear the risks of demand within one 5 year cycle deviating from forecasts. This risk has little to do with the efficient operation of the distribution network, and more to do with random variations in the weather and the economy.

Under a revenue cap, this risk is borne by customers: their network tariffs go up and down the following year so that the DNSP earns exactly the amount of revenue the regulator agreed was necessary for it to run the network. Under a WAPC, the risk is borne entirely by the DNSP: they earn their agreed revenue plus or minus some random amount that depends mostly on the weather.

Utilities are meant to be stable, low-risk businesses, with predictable, if unexciting, profits. They are rewarded for this predictability by being able to raise capital cheaply. Unnecessarily increasing the riskiness of their businesses in this way leads to an increased cost of capital, and hence higher total costs passed on to consumers.

Profits will become much more volatile if DNSPs move away from their current rather flat tariffs to ones with much greater price differentials at peak times, as it will not only be the total volumes that matter, but how they coincide with peak tariffs. This will make DNSPs riskier businesses still, and further increase the incentive to game the forecasts.

The Commission suggests that over- or under-recovery due to weather variation could be efficient "on the basis that revenues are more closely linked to the consumption that imposes the greatest system-wide costs and necessitates investment."[10] This would only be the case if the variation necessitated unforeseen investment **before the next regulatory reset**, which we suspect never happens.

For many of the reasons discussed above, the AER favours revenue caps, and explains that:

> *"The AER considers that the theoretical incentives for efficient pricing provided by the WAPC have resulted in little practical benefit in DNSPs' pricing."*[11]

The Commission notes this position in the draft report, but then dismisses it, postulating that the lack of any evidence to support the benefits of WAPCs may be due to the lack of smart meters, or directives from government to pursue equity objectives.[12]

Neither of these considerations apply to commercial and industrial customers: they already have interval metering, and there is no reason to suspect that governments direct DNSPs to set inefficient tariffs for businesses. Hence, if WAPCs did encourage DNSPs to set cost-reflective tariffs, we should expect all commercial and industrial customers to be on beautifully cost-reflective tariffs. This is not the case, suggesting that the AER's position is correct.

10 Draft report, p.419.

11 AER, *Preliminary framework and approach paper: Ausgrid, Endeavour Energy and Essential Energy; Regulatory control period commencing 1 July 2014*, June 2012, p.47.

12 Draft report, p.418.

Our conclusion is that, while revenue caps provide no incentive for efficient tariff setting, neither do price caps in the case of Australian DNSPs.

The AEMC notes in the Power of Choice draft report that a move to a revenue cap would have to be accompanied by more prescriptive guidance on tariff setting.[13] We note that the Commission is proposing to incorporate such guidance into the National Electricity Rules,[14] so this requirement should be no impediment to the adoption of revenue caps.

Since, as discussed in our previous submission, revenue caps are almost a prerequisite for the enthusiastic adoption of demand management and energy efficiency by utilities, and the usual arguments against adopting revenue caps do not apply, we suggest that the Commission review its recommendations with a view to mandating revenue caps for those network businesses to which they do not yet apply.

Yours sincerely,

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EnerNOC Pty Ltd

13 AEMC, *Power of Choice Review Draft Report*, 6 September 2012, p.130.
14 Draft recommendations 11.3 & 11.5.