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Dr Ron Ben-David
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Essential Services Commission
Level 37 / 2 Lonsdale Street
Melbourne Victoria 3000

Via email: anna.panarina@esc.vic.gov.au

Dear Dr Ben-David

Re: Inquiry into the true value of distributed generation
Stage 2 – the network value

Introduction

AusNet Services welcomes the opportunity to make this submission in response to the Essential Services Commission's (the Commission's) discussion paper for stage 2 of the inquiry, the network value of distributed generation.

Fairness is important in how consumers are both charged for their imports from the network and rewarded for the electricity they feed back into it. With an increasing proportion of electricity being supplied by distributed generation, it is important these generators are recompensed in a manner that reflects their true value, noting this will vary significantly depending on time and location. Imposing an averaged value risks unfairly increasing prices for many consumers and has implications for the efficient investment in the electricity supply system overall.

Several reviews are examining this question at present. These include the Commission's inquiry, an inquiry by the Queensland Productivity Commission[1] and the review of the Local Generation Network Credit Rule Change Proposal being conducted by the AEMC. It will be important for the implementation of findings from the Commission's inquiry to support existing and developing national framework mechanisms to ensure effective integrated arrangements that will benefit consumers, avoiding the risk to efficient service delivery from competing obligations and incentives and the potential for duplication.

In our earlier submission, in response to the Commission's proposed approach paper in February 2016, we made the following key summary statements:

> *The network value of distributed generation is driven by its ability to defer future network investment. This depends upon the proximity of the generator to existing and future network constraints and whether it is available at the peak demand times when these constraints*

[1] Inquiry into Solar Feed-in Pricing in Queensland, Queensland Productivity Commission, conducted following request of Queensland Government in August 2015. Final report delivered to the government 20 June 2016.

would bind. In the current demand conditions there are relatively few impending network constraints such that there are limited locations where embedded generation will help defer network investment. The value to the network can therefore also be seen to be variable over time.

Networks are able to contract with distributed generation and with demand response providers to offer network support where specifically required, indeed the National Electricity Rules require the networks to publish demand side engagement strategies. AusNet Services has contracted with both forms of network support service. Our experience is that at the current time, the regulatory framework is providing appropriate incentives for DNSPs to apply network support options where these are the most efficient solutions. The AEMC's objectives for the forthcoming Demand Management Incentive Scheme and Innovation Allowance to be developed by the AER this year will be an important addition to these incentives.

Our broad views on identifying value to the distribution network are shared by other stakeholders. The Commission notes that *"the majority of submissions supported our initial view that distributed generation could produce benefits in relation to the operation of the distribution network, and that these benefits were highly time and location specific"*[2].

In this submission we provide a detailed response to the matters raised by the Commission in the discussion paper.

Scope of the Inquiry

We recognise the scope excludes connection related costs. However, the Commission has extended this beyond the reasonable interpretation of this term. We agree that connection and on-going maintenance etc. can be considered to be costs of connection and are subject to separate funding arrangements prescribed by the Rules. However, just as the operation of distributed generation can provide benefits to the network, its operation can also cause additional operating costs. Accordingly, the assessment of value should be in terms of net value to the network. We discuss this further in our response to Question 8 of the consultation paper.

The discussion paper is incorrect in its assessment of how the connection costs for embedded generators are recovered (page 5). It suggests that this is from all consumers, however this is not the case. It depends on whether the generator is part of a basic connection (typically micro-generation has a notional connection application fee). Larger generation must pay network augmentation costs.

Phases 2 and 3 of the Commission's work will explore how the current regulatory framework accounts for the value of distributed generation and whether any changes are necessary[3]. As noted in our earlier submission, our experience is that at the current time, the regulatory framework is providing appropriate incentives for DNSPs to apply network support options where these are the most efficient solutions. We also noted that the AEMC's objectives for the forthcoming Demand Management Incentive Scheme and Innovation Allowance to be developed by the AER this year will be an important addition. The mechanisms in the regulatory framework mean that the most efficient solutions are adopted, which can include demand reduction options not backed up with local generation. In our view, these phases of the work should seek to ensure that the framework remains technologically neutral.

Guiding Principles of the Inquiry

We support the guiding principles proposed by the Commission. It should be recognised however that the achievement of non-distortionary behavioural response may be in tension with the principle of simplicity. A balance may be required and the decision criteria should optimise the net benefit to consumers taking into account the implementation costs.

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[2] Essential Services Commission, The Network Value of Distributed Generation, Discussion Paper, page 6, June 2016

[3] ibid, page xi

We note the Commission's intention to have regard to its own legislated objectives, which are aligned to the NEO, being the promotion of the long term interests of Victorian consumers with regard to price, quality and reliability of essential services. Both sets of objectives relate to the price of providing services. We therefore consider there is a need to determine whether environmental and social benefits that may be identified should be funded by electricity consumers as part of the cost of providing network services, or by an alternative mechanism, to ensure this does not contribute market distortion.

In our assessment, the environmental and social benefits that have been identified by stakeholders and are listed by the Commission in the Discussion Paper do not provide incremental value, or any benefit is primarily an internal benefit. We have not identified any additional indirect benefits. It is not clear that the potential indirect benefits of distributed generation would be accessible to, or valued by, all consumers, to the extent that they should be funded via network charges. The likely subjectivity risks creating price signal distortions, inefficient investment decisions and unfairly increasing prices for those that cannot access distributed generation.

The remainder of our submission responds to the questions presented by the Commission in the discussion paper.

Consultation Questions on Approach, Concepts and Definitions

Question 1 **Are there any other aspects of our definition of distributed generation that we should consider, in this stage of the inquiry?**

We appreciate that the Commission's brief is to inquire into the value of embedded generation. However, throughout this submission we make the point that the framework should be technology neutral. Distributors are able to obtain network support from providers of generation and controllable load (demand management).

Question 2 **What data and evidence is available about the potential network benefits of battery storage?**

Various network businesses are conducting trials with batteries to better understand the how they can support network services. The discussion paper has referenced the findings of a trial with residential customers conducted by AusNet Services. These trials will help networks and stakeholders identify the circumstances where storage can be effectively deployed for network support. AEMO's 2015 Emerging Technologies Information Paper and 2016 National Electricity Forecasting Report discuss the contribution of battery storage to offsetting peak demand aggregated at the transmission level, while highlighting the uncertainties. AEMO states that *"Given that battery storage technology is new, there is little information available to AEMO to indicate the future charging and discharging logic affecting storage use. For this NEFR, AEMO has assumed the period of discharge occurs over a number of hours in the evening. This results in a small offset to maximum demand"*[4].

Question 3 **On what basis should the network benefit from distributed generation be assessed – on the total output or on the total exports of the distributed generation system?**

The assessment cannot be simply based on either of 'total output' or 'total exports', however we consider total output is the correct starting point. This is because it has regard to the load reduction benefits as hence aligns better with the concept of neutrality. Having said this, other factors are in play which must be accounted for, to ensure only net value is included, two of which are discussed in the following paragraphs.

[4] AEMO, 2016 National Electricity Forecasting Report, page 7

In AusNet Services demand management arrangements reimbursement to the service provider is made based on their behavioural change. For large customers that may be combining load curtailment with distributed generation, a baseline approach can be established, which identifies change in the customer's behaviour in response to a price signal.

The approach is not so readily applicable for small customers with generators which are not controlled, as customer behaviour is not so readily observable. This is because, having made the investment in generation, the customer's use of energy may be quite different from the 'without' case. An approach to assessing the extent to which this may be the case and how this may affect fair compensation to the customer appears necessary.

Another factor to be considered is the interaction with prevailing tariffing arrangements. In Victoria, network tariffs are flat tariffs, and whilst an opt-in approach to cost-reflective tariffs will be introduced from next year, the extent to which these will be taken up is unclear. The attractiveness may also vary between customers with and without generation and between different generator technologies, depending on alignment of generation output with the network peak demand period. However, with any of the tariff options, customers with generation, and thereby having reduced consumption, attract reduced charges in respect of the distributor's recovery of both the LRMC component and the residual cost component. The compensation provided through each of these avenues should be taken into account in the Commission's assessment.

Question 4 **What do you see as the main differences between network-led and proponent-led DG in terms of the network benefits they deliver?**

Network-led distributed generation is deployed on an economically optimised basis. The regulatory regime incentivises DNSPs to minimise the cost of providing network services to customers. The incentives are to be enhanced with the Demand Management and Embedded Generation Incentive Scheme to be developed by the AER.

The DNSP is able to evaluate options to relieve constraints and improve operating efficiencies at the most granular network level. If a differentiating feature of proponent-led distributed generation is that its value to the network is measured and compensated on a non-specific basis, e.g. via averaging, then price distortions will occur and there is very likely a negative benefit to the network and its customers due to this form of treatment.

Opportunities for dynamic or market platform based determination of localised value may arise in the future if locational marginal pricing, or other highly granular approaches become feasible, and are accepted by stakeholders.

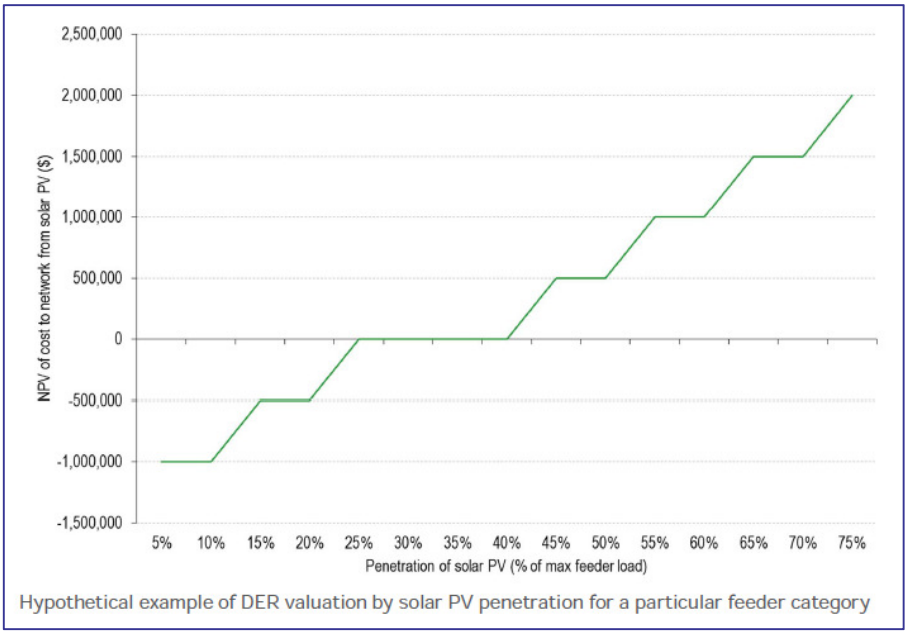
Question 5 **Are there any other aspects to our definition of value that we should consider, in this stage of the inquiry?**

We disagree with a view that the operational implications for the network arising from distributed generation can be considered to be connection related costs. We also disagree with view expressed in the discussion paper (page 39) that the AER guideline in respect of the National Electricity Rules small customer connection framework is structured to prevent retail customers making a contribution towards augmentation. Instead, the guideline requires that no contribution is made toward a future augmentation need until a connection proposal that will exceed the threshold arises. The assessment of applicable customer contribution is, therefore, made for each connecting customer on an actual needs basis.

The value to the network of distributed generation should be defined to be its 'net benefit'. The network operates within defined capacity and power quality limits, including bounds defined by safe practice. The operation of generation embedded in the network affects the operating conditions of the network which

can lead to action being required to ensure stable power system operation within those limits. The affect is illustrated with a hypothetical example in a report prepared by EY for the Clean Energy Council, which shows how the cost to the network could rise as a function of photovoltaic generation penetration on a feeder[5]. The CEC's webpage introduction to the report, consistent with the findings of the report, observes that "*… these new devices can provide new benefits and costs to networks, but calculating these outcomes is challenging and must capture numerous technical influences*".

The hypothetical example from the Clean Energy Council report is reproduced below.



Hypothetical example of DER valuation by solar PV penetration for a particular feeder category

Source: Clean Energy Council

The definition should also recognise that benefit may not be enduring over time. Whilst demand side solutions can contribute to deferral of network investment these benefits may be short run, and when the cost of energy at risk rises to levels exceeding the annualised cost of network investment, a scale investment in the network may be the optimal solution, and continuation of short run payments to distributed generation in these circumstances would be inefficient.

Finally, the valuation should be confined to future investment. Past investment decisions have been made based on their merit and additional payment now would not provide a price signal, but would represent a bulk distortion and be an inappropriate cost to place on consumers. Any consideration of value for pre-existing generators should be subject to base-lining, so that these generators would be rewarded for altered operation of the generator to deliver incrementally beneficial operation.

Question 6 **Are there any other aspects to our proposed framework for assessing network value that we should consider?**

Throughout this submission we have identified a number of considerations that should be taken into account in the assessment framework. These include:

- consideration of the benefits of a technology neutral approach;
- the assessment to identify net benefit, to account for increased operating costs of high penetration of distributed generation;

[5] Calculating the Value of Small-scale Generation to Networks, Clean Energy Council, July 2015, page 4

- the value returned to distributed generators through consumption based network pricing;
- the risk to efficiency of overlays on the national regulatory framework; and
- alignment of the assessment approach with Victoria's probabilistic planning approach.

Question 7 **Do you agree with the Commission's proposed framework for the network value stage of the inquiry? Are there alternative approaches?**

The Commission's framework will assess the extent to which the regulatory framework accounts for the value of distributed generation, and based on this assessment identify any changes to the frameworks or alternative frameworks for remunerating distributed generation. Integration into the holistic incentive based economic regulation framework is a critical consideration. The risk to efficient service delivery from competing obligations and incentives, potential for duplication and inefficient 'whole of supply chain' investment signalling which must be avoided. We retain the view expressed in our February 2016 submission into the Commission's approach phase for the inquiry, where we commented that *"We consider that the AEMCs review of the Local Generation Network Credits (LGNC) Rule Change Request should inform the ESC on the value distributed generation provides to the network and how this would be appropriately reimbursed"*.

Consultation Questions on Economic Benefits

Question 8 **Beyond those identified in the paper, are there other examples of applied methodologies for calculating network benefit that the Commission should consider?**

The discussion paper suggests that reductions in network operating costs may arise from distributed generation. Table 3.1 provides the typology for this consideration. The areas discussed do not offer material savings in operating expenditure and we are accordingly interested in reviewing the Commissions assessment method and outcomes for operating cost benefits. Indeed, for some of these are areas, distributed generation is equally likely to cause additional costs. The impact will grow with increasing penetration of distributed generation, as illustrated by the figure included in our response to Question 5.

Table 3.1 identifies the avoidance of Transmission Use of System Charges (TUOS) as an operating cost benefit. The National Electricity Rules provide for these payments proportionate to the extent to which the operation of the generation reduces network loading and thereby defers transmission network investment. However, a benefit will only arise if the transmission node is load heavy, i.e. if it is increasing generation that would lead to the need for investment then there is no associated benefit. Under these circumstances, at the point where a constraint occurs, it is expected that constrained generation would pay for a network augmentation, unless a Regulatory Investment Test demonstrated positive net market benefit from an augmentation.

The paper identifies the economic value of avoiding like-for-like replacement in a network area. Conceptually this is a reasonable assumed outcome from connection of distributed generation. However, this is always incremental, and so the ability of NSPs to actually deliver a different scale, or footprint, of network, and the economic timeliness of doing so may be difficult to assess. There are also factors that have a less direct relationship to network utilisation factor which are important considerations for management, and hence cost, of providing network services, in particular safety.

We would therefore be interested in understanding the actual technique that the Commission intends to apply in deriving value, for example, is the Commission intending to use a Long Run Incremental Cost approach. The various techniques may not be well tested in an electricity network context, and should be proven to be robust.

Question 9 Can you suggest any alternative or additional categories of network benefits regarding distributed generation?

In Victoria, networks are planned and developed according to the value of customer reliability, using a probabilistic planning approach. As a result, Capacity and Supply Risk categories have a common economic driver, which is energy at risk, and to a large extent may be treated as a bundled category.

In table 3.1 of the Discussion Paper it is noted that distributed generation "*may produce a benefit by reducing expenditure that would otherwise have been required to ensure that reliability. Distributed generation can provide islanding capability for consumers (or a group of consumers) to provide further assurance for reliability*". In assessing this benefit, the Commission will need to have regard to the way asynchronous generation interacts with the network. For example, solar generating systems will typically shut down when grid supply is interrupted. Islanding capability is not common but if an efficient solution, this could be considered by networks in responding to regulatory incentives for reliability performance. In any case, for the value of islanding capability to be realised by the network, the network would need this capability and its function to be established in contract.

Question 10 Can you suggest alternative or additional characteristics of distributed generation that effect the capacity of distributed generation to provide network benefits?

Value is substantially based on forward looking evaluation, in particular its ability to defer investment. Accordingly, the projected availability of the distributed generation technology is an important characteristic to be considered. For example, batteries need to have sufficient charge at the time of providing network support, and even then they only have a limited duration. Solar PV is intermittent and may not available in the period of peak demand. These factors can be readily taken into account in determining the potential value for network support in DNSP led solutions.

Question 11 Are there circumstances in which a fleet or 'portfolio' of passive distributed generation systems can provide suitably firm generation capacity to create circumstances in which network benefit is created?

Network led distributed generation can target and contract a portfolio of service providers where this provides value. We note that the demand management contracts AusNet Services has require the customer to provide services on a 'best endeavours' basis – there is no guarantee of performance. Portfolio effects of likely firmness are also assessed. Even where portfolio effects are captured, a portfolio of voluntary contracts will present more reliability risk than firm performance guarantees, however, through experience they can be quantified, which will enable them to be assessed on an economic basis to address network requirements in future. An assessment of likely firmness is made during discussions with potential customers and informs the commercial negotiations around both the performance fee and the annual retainer.

However, it is noted that when the expected output of EG / demand management solutions is highly correlated (as is the case for localised solar PV), the portfolio effects will be low.

Consultation Questions on Economic Value Methodological Approach

Question 12 What alternative or additional building blocks of a methodology should be considered for determining the network benefit of distributed generation?

Use of robust methodology is essential to delivering an assessment that stakeholders can have confidence in. In response to this question we seek clarification on aspects of the planned approach and make a number of observations.

We note that the discussion paper proposes assessment of value via a backward looking approach, i.e. comparing the current network with one that would exist if all embedded generation was removed. Presumably the generation to be removed would be that which is not subject to network support payments, although this should be clarified. We query whether, for practicality reasons, the assessment can be sufficiently granular so as to provide insights into critical aspects such as the locational nature of benefits and impacts. In its assessments for network support arrangements AusNet Services uses a forward looking approach, identifying the potential for demand side solutions to contribute to deferral of augmentation in the regional locations where constraints are identified through the network planning process. An evaluation of the relative merits of using a forward looking approach would be helpful.

Further, the backward looking approach will not identify the costs that embedded generation can impose on the network, one factor being that the generation hosting limit of feeder sections is unlikely to have yet been reached in most instances. The approach is therefore not capable of fully calculating the net benefit, which would be the correct assessment.

As discussed in response to Question 5, benefits from embedded generation may be short run benefits, deferring investment in the network. The assessment of value should factor in that very often benefits will not be enduring. To illustrate, AusNet Services currently contracts with demand side service providers for a period that is consistent with the expected ability of that service to contribute to constraint management.

As noted in response to Question 9, Victorian augmentation planning applies a probabilistic approach. Using this approach, the network is augmented when the probability weighted annualised value of energy at risk grows to exceed the annualised cost of augmentation. This means that until this threshold is reached, there will be energy at risk at the most highly loaded points in the network, for some hours, on the peak loading days.

Demand side solutions that are able to reduce the energy at risk can add value, and this is what AusNet Services targets in its demand management programs, as short term solutions which meet the economic criteria and defer the ‘scale’ investment. However, once the scale investment becomes the efficient solution, the prior short term solutions no longer reduce energy at risk and these support arrangements expire.

We note that solar photovoltaic generation can contribute to reduction in energy at risk, hence providing benefit to load customers. Whilst in many cases on AusNet Services’ distribution network solar contributes minimal reduction in the network peak demand, a more material contribution may be expected over the broader set of hours for which there may be energy at risk. The value is calculated by weighting to the probability of network element failure. Additionally, because the contribution is from distributed sources, the residual energy at risk will require a feeder or feeders to be shed to maintain operation within capacity limits, thereby also shedding a portion of the distributed generation and this must be accounted for in determining its

actual contribution. It should be noted however that there is the likelihood of peak demand continuing to grow toward the point where load shedding would be required to avoid equipment failure, such that the risk of supply interruptions is on-going and the impact of an interruption may be increased.

The discussion above illustrates the complex considerations in determining how demand side solutions may contribute to the deferral of network augmentation. Network support value is only realised when it is targeted at constrained elements of the network. These occur at a small number of defined locations, for a short period in the day, and for a small number of days in the year. A less targeted approach would dilute any value. The operation of additional distributed generation may also impact the operation of the network, such that the net value of the contribution will vary by location. The effect is illustrated in our response to Question 5. For these reasons we believe incentives on NSPs provided through the economic regulatory regime provide the most effective means of ensuring efficient use of demand side solutions in minimising network costs.

Our response to Question 4 is also relevant to this question.

Question 13 What do you see as the most appropriate unit of analysis and level of granularity is for the assessment of network benefits?

In Victoria, with AMI rolled out, network businesses are able to identify the occurrence of constraints down to the LV reticulation level. Feasibly the businesses will therefore also be able to elicit demand side response from customers at this level, for example through offering critical peak rebates to customers in the constrained network area.

Question 14 What publicly available data sources can be accessed to apply the methodology, particularly with respect to network constraint and demand?

The Commission has identified a number of data sources which will help in its assessment. However, it is not clear that the information available from these sources can be sufficient to confidently identify value, and incorporate factors to establish net benefit. We do not know if additional data available to AusNet Services would help in the Commission's task but we would be pleased to discuss this with the Commission.

We are not aware of additional information publicly available that would assist, however the visual presentation of network utilisation and constraint projections in the Network Opportunity Maps[6] may be a useful resource.

Question 15 What are the appropriate time parameters of a study into the potential network benefits of distributed generation?

We do not have a direct answer to the question, however note that time period based alignment of data used in the assessment is critical to confidence in the outcome. Since the value of deferral is short run benefit, and network augmentation is a long run solution, the period of assessment should be for the longest period that can be attained from the available data.

[6] Network Opportunity Maps 2016, Australian Renewable Energy Mapping Infrastructure, 28th July 2016, http://nationalmap.gov.au/renewables/

Consultation Questions on Environmental and Social Benefits

Question 16 Can you suggest or provide evidence that supports those environmental or social benefits attributed to distributed generation listed in this discussion paper?

The paper identifies a number of indirect benefits suggested to the ESC in submissions for which it is not immediately clear whether the beneficiary is the embedded generator, rather than consumers of network services more broadly. Consumers individually may determine that greater independence in energy supply is beneficial, however there is the risk of imposing additional cost on consumers more broadly and encouraging inefficient investment choices across the energy supply chain. Care is required in determining the extent to which environmental and social benefits are indeed benefits to the network.

Our comments at the front of this submission, in the section headed 'Guiding Principles of the Inquiry' are also relevant to this question.

Consideration should be given to the possibility (or likelihood) that environmental and social benefits will occur in different locations and in different periods of time to direct network benefits. For example, an identified benefit may not have equal or similar value in the urban and rural networks (for example bushfire risk, public amenity). Unless this discrepancy is accounted for in pricing, there will be distortions.

We note the comments relating to the benefits in respect of bushfire risk mitigation, and agree that there is a role for embedded generation. It can be anticipated that communities could rely on standalone power systems on the critical fire risk days, with the local network de-energised, for example. Alternatively, permanent separation from grid supply may be optimal. Bushfire mitigation strategy is an area where network businesses are able to engage with communities, the government and the regulator. However, it is questionable whether the mere existence of distributed generation contributes to fire risk mitigation, and that it can be monetised in such a way. It is likely an agreed operating regime would need to be agreed with customers, and reimbursement negotiated in respect of the specific services provided and costs avoided.

Question 17 Outside those potential benefits listed, are you able to provide (and support with evidence) of how distributed generation reduces the environmental impact of the transportation of electricity?

We have not identified other environmental considerations which the Commission should take into account.

Question 18 Outside those potential benefits listed, are you able to provide (and support with evidence) examples of how distributed generation provides social benefit, as it relates to the transportation of electricity?

We have not identified other social considerations which the ESC should take into account.

Consultation Questions on Operation of the Current Regulatory Framework

Question 19 Are there other aspects of the current regulatory framework outlined in this paper that the Commission should consider?

The network business Demand Side Engagement Strategies, required under the National Electricity Rules, and the Service Target Performance Incentive Scheme are not identified in the Discussion Paper and their operation should

be included in the Commission's considerations.

In addition, the capex and opex provisions of the AERs revenue decisions, to meet the service obligations, and customer engagement obligations, to identify customer preferences and priorities are relevant to the way in which embedded generation is integrated into network services.

Question 20 **Can you provide specific examples of payments made to distributed generators under the regulatory mechanisms listed in this discussion paper? What size of distributed generation systems received the payments? Were payments made to small-scale systems?**

AusNet Services has an active demand side strategy and currently has 24 contracts for network support. The high proportion of these are demand management contracts, however to be clear, AusNet Services evaluates all options and opportunities on their merits. There are presently 12 generators also receiving avoided TUOS payments in accordance with the provisions of the National Electricity Rules, of which 6 are small generators.

Question 21 **Are you able to provide data/evidence about the operation of the small scale generation aggregator framework as a mechanism by which network benefits of small scale distributed generation can be identified, valued and compensated?**

We are aware of aggregators, energy service providers and retailers looking to provide network support services based on distributed generation, however we do not know whether these proponents are also utilising the small generation aggregation framework. On the theoretical level, there is a strong overlap of capability required to aggregate small distributed generation for the purpose of accessing the wholesale market, as there is for accessing the network support market however we do not have data or evidence of this in practice.

Question 22 **To what extent do the Tariff Structure Statements published by Victorian distribution businesses provide an indication of the benefit distributed generation can provide through reducing peak network demand?**

Our response to Question 3 partly answers this question. In summary this discusses the compensation that customers with distributed generation receive through network tariffing. Cost-reflective tariffs would better signal the periods when reduction in load is most valuable than do the current flat tariffs. However, a limitation of cost reflective tariffs in the initial period that these will apply is that they are not locational. Distributors apply demand management initiatives on a locational basis, and hence there is a toolbox of techniques the distributor has available to facilitate efficient price signally and efficient network service provision.

Question 23 **Are there alternative conceptual frameworks that could be used to examine the benefits provided by proponent-led distributed generation? In particular, are there conceptual frameworks for considering potential benefits that were not anticipated in the planning forecasts associated with the five yearly pricing determination process?**

Forward looking approaches forecasting energy consumption can include robust evaluation of the influence of a range of variables, including trends in uptake of distributed generation. In our Regulatory Proposal[7] to the AER,

[7] AusNet Electricity Services, Regulatory Proposal, Electricity Distribution Price Review 2016-20, Section 4.4, page 70

AusNet Services described how its approach to energy forecasting includes the following factors:

1. **Forecast customer numbers by individual tariff**. The net growth in customers in each of AusNet Services' tariff codes, including any transfers between tariffs.
2. **Weather correlations**. Like the demand forecasting methodology, regression analysis is used to determine the relationship between weather and energy consumption, at the tariff level. As a result, each tariff code has its own correlation which is used to profile energy consumption over the year.
3. **New v. existing customers.** Using smart meter data, AusNet Services knows that new customers use less energy per capita than the average of the existing customer base. Therefore, any new customers added to the model are separately modelled, using lower energy per customer volumes.
4. **Impact of solar PV uptake**. AusNet Services forecasts the number of customers who will install solar PV over the period, and the associated reduction in energy delivered from the network at times of solar generation.
5. **Price elasticity**. Retail electricity price forecasts are sourced from AEMO's National Electricity Forecasting Report (NEFR) and price elasticities for residential, commercial and industrial customers are applied to these prices.[8]
6. **Future energy efficiency impact.** Any continued energy efficiency improvements/schemes are able to be separately modelled.
7. **Impact of new technologies/policies.** The energy forecast model contains modules for the inclusion of emerging technologies and the impacts on energy consumption. However, AusNet Services does not presently include forecasts for the uptake of such technologies and policies because of the high degree of uncertainty in regards to their timing, materiality and direction (i.e. increasing or decreasing energy).

As noted in our response to Question 12, we think there are difficulties in capturing both the benefits and costs of embedded generation in the assessment. In relation to the second part of the question, we note that networks will prioritise resources based on the incentive regimes which encourage efficient investment. Hence, even if not anticipated, the areas of greatest risk should rise to the top of the priority list. In the future, the establishment of the Demand Management and Embedded Generation Incentive Scheme will provide further focus in this area.

Consultation Questions on Alternative Mechanisms

Question 24 How should the Commission consider the scope of the LGNC Rule Change Proposal with this current inquiry?

Our view, discussed earlier in this submission and in submission into the Commissions approach stage consultation, is that consumers best interests will be served through a consistent and integrated regulatory framework, avoiding the risk to efficient service delivery from competing obligations and incentives and the potential for duplication. The application of national framework, including any changes that may be adopted arising from the LGNC rule change proposal, will best achieve this outcome.

[8] Frontier Economics (2014), *Economic and Energy Market Forecasts*, p. 87.

Question 25 **Are there methodologies for calculating network value and/or regulatory mechanisms from any other jurisdiction that are suitable for consideration in the context of this inquiry?**

As part of its contribution to the LGNC rule change proposal, the ENA engaged Frontier Economics to prepare a report which includes discussion on experiences in other countries, including the UK, US and NZ. We also note the work of the Queensland Productivity Commission.

AusNet Services looks forward to continuing engagement in the inquiry process. Please contact Kelvin Gebert, our Regulatory Frameworks Manager, if you have any queries regarding our submission. We would be pleased to discuss these with you.

Yours sincerely,

Tom Hallam
Manager Regulation and Network Strategy