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John Pierce
Chairman
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Dear John

Consultation Paper: Local Generation Network Credits

AusNet Services welcomes the opportunity to make this submission to the AEMC's Consultation Paper on the proposed Local Generation Network Credits Rule Change.

Over the past five years technological advancements, jurisdictional feed-in tariffs and the Small-scale Renewable Energy Scheme (SRES) have led to dramatic improvements in the economics of some sources of embedded generation. This has led to rapid uptake of technologies such as solar PV. This rapid pace of change is expected to continue, as the commercialisation and residential marketing of battery technology leads to an uptake in usage. To avoid inadvertent inefficient investment decisions during this period of rapid change, it is essential to get the policy settings right.

The network value of embedded generation is driven by its ability to defer future network investment. This depends on its proximity to existing and future network constraints and whether its availability is guaranteed at the peak demand times when the network requires it. In the current demand conditions, there are relatively few impending network constraints, meaning that there are limited locations where embedded generation helps to defer network investment. To enable a network to defer investment due to embedded generators, there needs to be a guarantee that the generation will be available at peak demand times. This reduces the value of some sources of embedded generation, such as solar and wind.

To accurately reflect the network value of embedded generation the credits would need to reflect the degree to which the generation meets the criteria above. If the value of a credit does not accurately reflect the network value in the specific circumstances of the embedded generation it will either over or undercompensate these generators. Both of these scenarios are inefficient. However, introducing a credit which is set at a very granular level to better match the credit paid to network value will be very costly to implement. This may not be justified through a cost benefit analysis.

AusNet Services considers that, at the current time, the regulatory framework is providing appropriate incentives for DNSPs to contract with embedded generators, or undertake alternative cost-effective non-network options, where they provide value to the network. 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.

Due to the variations in the value of embedded generators, the bespoke arrangements that the existing framework encourages are more appropriate at this time than a broad-brush approach, which risks leading to inefficient investment decisions. The current arrangements also have the advantage of encouraging DNSPs to consider the value of non-network solutions on an equal footing, without imposing a cost burden on other network uses for generation which does not provide a network benefit.

Responses to the questions raised in the Consultation Paper are provided in Attachment 1. Supplementary data showing the contribution of solar PV to meeting peak demand is contained in Attachment 2.

AusNet Services looks forward to continuing to engage in this Rule Change process. Please contact Charlotte Coster, Principal Economist on 03 9695 6309 if you have any questions.

Sincerely,

Tom Hallam
Manager Regulation and Network Strategy
AusNet Services

Attachment 1: Responses to the Questions in the Consultation Paper

Question 1: Assessment Framework

Item	Question	Response
1	Would the proposed framework allow the Commission to appropriately assess whether the rule change request can meet the NEO?	AusNet Services supports the proposed Rule Change assessment framework. It is sensible that the assessment criteria consider the arrangements best benefit consumers in terms of reduced prices and/or superior reliability outcomes.
2	What is the relevance, if any, of reliability and security for the purposes of assessing the proposed rule (or a more preferable rule)?	Reliability and security are relevant aspects of the NEO for assessment of this rule change. They are elements of the network service which need to be accounted for in valuing the net benefit to the network of embedded generators. Any detrimental impact on network reliability must be taken into account when assessing the net benefit of embedded generation.
3	What changes, if any, to the proposed assessment framework do you consider appropriate?	The proposed assessment framework could clarify that the assessment of the benefits of embedded generators to consumers will not include the benefits the same party may receive as an embedded generator. We note that the AEMC proposes to consider the impact the LGNC will have on those consumers who have embedded generators and those who do not (page 16). This is appropriate, however, the assessment undertaken must assess the net benefits to the consumer as a consumer, separately from the benefits that customer may receive as an embedded generator.

Question 2: Perceived issue with current NER

Item	Question	Response
1	Are the current NER provisions (including changes that have been made but not yet come into effect) likely to provide appropriate price signals for efficient embedded generation? That is, do the NER provide incentives to individually or collectively (including through small generation aggregators) invest in and operate embedded generation assets in a way that will reduce total long-run costs of the electricity system?	This question refers to incentives to reduce the total long-run costs of the electricity system. This includes generation infrastructure and operating costs as well as network costs. The Consultation Paper has identified NER mechanisms which support this objective (section 2.2). AusNet Services' BAU approach is to assess the economic merit of non-network solutions to network constraints and to adopt the highest net benefit solution. Examples include contracting with generators (e.g. Traralgon generator) and contracting demand management (e.g. chicken farm). This is an effective approach as it is targeted at deferring investment in specific parts of the

		network. AusNet Services has also applied Critical Peak Pricing for its large customer tariffs, which has led to peak demand reduction and consequent deferral of augmentation. It is noteworthy that the current NER provisions do not distinguish between generation and other network demand management solutions. The rule change proposal would alter this, and the value of other DM solutions that may be more cost effective may be lost – this could be an inefficient outcome in the context of the achievement of the NEO. The rule change proposal covers a wide range of generation sizes. The small generation aggregator framework is an important element of the framework to facilitate the participation of small generators. Our experience is that there is little evidence of generators, or agents, proactively offering network support as an alternative to planned network augmentation. AusNet Services has received a single proposal for a non-network alternative in the last few years and that option was adopted. However AusNet Services itself is proactive in seeking out non-network solutions to ensure all solutions are appropriately tested and the highest net benefit option is adopted. The NER provisions provide a comprehensive package of incentives for networks to adopt the most cost effective solution applicable for the options availability and relevant to a specific constraint at a location on the network. NSPs necessarily consider the alleviation of network constraints on a case by case basis and so it is entirely appropriate, and most cost effective, to consider the alternative solutions in this way. However, the approach is instead likely to exacerbate cross-substitution and other market distortions. Further, as the current environment is not characterized by high demand growth and there are relatively few network constraints, the potential for EG to reduce network costs is relatively small. Therefore the current NER provisions (including changes that will shortly come into effect) which encourage this case-by-case assessment are suitable.
2	Do the current NER provisions (including changes that have been made but not yet come into effect) appropriately incentivise network businesses to adopt both network and non-network solutions to achieve efficient	The Demand Management Incentive Scheme and Innovation Allowance has yet to be developed and implemented. This will provide an important addition to the balance of investment incentives. With this provision the NER provides appropriate incentives for networks to adopt non-network

	investment in, and operation of, the electricity system that minimises long-term costs?	solutions where efficient. AusNet Services will always seek out non-network alternatives and examine their cost/benefit as part of its BAU network investment assessment approach. Currently, AusNet Services has contracts with approximately 50MW of non-network constraint management support service. This includes both generation and demand reduction services. AusNet Services intends to develop this capability to include residential generation, and this would typically be a strategy to apply where LV network sections are facing constraint. This strategy has been successful when applied to higher capacity constraints on the HV network, and is expected to also yield benefits on the LV network. This example demonstrates that the current NER provisions encourage networks to seek out non-network solutions where they provide value for the network. It is important to recognize that the current provisions in the Rules do not favour one form of non-network solution over another, i.e. demand response and generation are treated equally. We do not accept the fact that network tariffs are not required to compensate generators is a 'gap' in the NER. Attempting to shoehorn consumption pricing rules to apply to generators risks exacerbating cross-subsidies and other distortions. Instead, the current, bespoke approach to adopting non-network solutions where they add value to the network maximises the benefits to consumers.
3	If your answer to questions 1 or 2 is 'no', what is the specific area in which the current NER provisions do not achieve these outcomes – for example, is the issue with the current provisions only related to embedded generators of a certain type or below a certain size, or is there an issue for all embedded generators?	AusNet Services does not accept that there is a gap in the NER in relation to this matter.

Question 3: Determining avoided costs

Item	Question	Response
1	What are the factors that influence the long-run network costs that can be avoided through embedded generation? For example, do these cost savings depend on the location,	The two key factors impacting the long-run network costs that can be avoided through embedded generation are location and whether there is a firm guarantee of generation at times of peak demand. These are explained in further detail below.

	voltage and type of generation?	• Location – where a network constraint is imminent (for example, within a 5 year planning horizon), distributed energy resources located downstream of a constraint can provide network support, as it may defer planned investments. However, it is noted that the existing NER provide incentives for networks to seek to exploit this value. In parts of the network where no network constraint is imminent, embedded generation will provide no value to the network, and may instead result in a net cost. • Firm guarantee of supply at times of peak demand – networks have an obligation to supply electricity at all times, including at times of peak demand. If an embedded generator cannot guarantee its availability at times of peak demand (e.g. through contractual arrangements), the network may be unable to meet its requirements to supply load at these times. It may not be able to avoid investing in network solutions that can meet the peak demand. A firm guarantee of supply from an embedded generator would need to be identified up to three years in advance of the network investment that is to defer, due to the lead time in delivering the network solution. The ability to commit to supply at peak demand times may depend on the source of generation considered. For example, solar and wind generation are less controllable than diesel generation and batteries. Data on the contribution of solar PV to meeting peak demand on AusNet Services' network is shown in Attachment 2. In addition to these two factors, there may also be differences in value to the network based on the connection voltage, that is, whether the embedded generator is connected to the LV network (furthest downstream), the HV network or the sub-transmission network. Connection to the LV network could enable benefits in each or any of the three networks, but depending on the time proximity of constraints (this is unlikely however in current demand conditions). Embedded generation may also impact on the operation of the network, e.g. there is potential for higher coincident export into the LV network than coincident load e.g. could be due to solar PV generation peaking at the same time in a localized area, such that network sections may need to be designed to accommodate peak generation rather than peak load (note that whilst this is entirely feasible we are not aware of this occurring to date)

2	Can embedded generation materially reduce DNSPs' ongoing operating and maintenance expenditure? If so, to what extent do these cost savings depend on the location, voltage and type of generation?	The rule change proposal seeks a credit to the extent that 'export' from the embedded generator connection reduces operating and maintenance costs. We do not believe that there would be any reduced ongoing operating and maintenance cost. Indeed, where there are relatively large, or multiple small, embedded generation sourced from wind or solar connecting in localised areas and peak generation does not offset peak demand, this could create an additional 'peak' in asset utilisation. There may be a peak in demand around breakfast time, then a solar generation peak at around midday and then an early evening peak (with the peak flow in the middle of the day being in the opposite direction to the morning and evening peaks). This additional peak can accelerate asset deterioration as there is a shorter period of time for assets to cool off in between peaks. In this way, it is feasible that embedded generation can contribute to increases, rather than decreases, in operating and maintenance expenditure. In addition, there is potentially increased, rather than reduced, volatility in network voltage. This would increase the switching of devices on the network (tap changing, capacitor switching, updating of protection settings), leading to increased operating and maintenance requirements for these assets. It is noted that under the current arrangements, where an embedded generator connects to a part of the network with no emerging constraint, it is highly likely that network operating costs will rise (albeit by a small amount). This is ultimately paid by the broader consumer base. The Rule Change proposal does not propose that embedded generators should fund any net cost that they may impose on the network. This results in an asymmetric outcome for consumers, who must fund both net network costs and net network benefits due to embedded generators.

Question 4: Specificity of calculation

If LGNCs of some form were to be introduced:

Item	Question	Response
1	What is the appropriate degree of specificity in the calculation of avoided network costs and, if	Consumers will benefit most if the arrangements are tailored to deal with specific constraints. The incentives provided by the NER for planning and

	relevant, operating and maintenance costs? For example, should different calculations be made for different voltage levels and/or geographic locations and, if so, what would be the criteria for distinguishing between levels/locations?	investment support this approach. The NSP identifies where constraints will occur and then invests in the solution(s) with the greatest net benefit – this bespoke, targeted approach provides the best value for customers. To be as effective, an LGNC would need to be triggered to alleviate actual and impending constraints. This means it would need to be applied based on location and whether the embedded generator could guarantee output at peak times. However, it would not be practical to calculate a different LGNC value for every situation and hence broad criteria would need to be applied. This will result in a trade-off between the need for practicality and the ability of the LGNC to provide efficient incentives. As the Rule Change proposal advances a 'broad brush' approach, rather than the targeted arrangements that NSPs currently implement, it accepted, it would result in a deadweight cost borne by customers due to the inevitable mismatch between the level of the LGNC and the network value of each particular embedded generator.
2	How often should this calculation be updated, recognising that the potential network cost savings can increase and decrease significantly over time as demand patterns change and network investments are made?	An LGNC should only be triggered by an impending constraint. Network capability to meet demand is reviewed annually by the NSPs, and reported in the DAPRs published each December. If an LGNC was implemented it would need to be updated in conjunction with or as part of the DAPR work. Once a network augmentation can no longer be deferred and economic non-network solutions are exhausted, the network augmentation will proceed. It would no longer be efficient for embedded generators to receive a LGNC in relation to the particular network constraint. Also, any network support contracts associated with the constraint will not be renewed. These contracts are generally short term as they may not provide on-going benefit once the augmentation ultimately occurs.

Question 5: Potential benefits of the proposal

Item 1: Compared with the current NER provisions, would the proposal:

Item	Question	Response
a	Provide superior or inferior price signals to embedded generators (including small-scale embedded generators) to incentivise them to invest in and operate those assets efficiently, thereby reducing long-term total system	The proposed LGNC approach would be inferior to the approach currently supported by the NER because it: • Would require broad-brush credit values to be workable, rather than targeting actual constraints. This will reduce the efficiency of the incentive provided.

	costs?	• Promotes generation as the non-network solution, even though it may not always be the lowest cost solution. The current targeted approach NSPs adopt to contract non-network solutions takes into account alternative, possibly lower cost, options provided by other non-network solutions. • Will be costly to implement as a new payment relationship will be established between the DNSP and embedded generators.
b	Provide superior or inferior incentives to DNSPs to adopt efficient network and non-network solutions (including small-scale embedded generation) so as to reduce long-run total system costs?	The LGNC approach provides inferior incentives to DNSPs, since the (less efficient) incentive is handed over to generators. If the Rule Change is implemented, it may dissuade DNSPs from considering generation options as part of their assessment of non-network solutions, as they may presume that that LGNC has driven embedded generation to its economic optimum. Not only would the LGNC provide inferior incentives to DNSPs, it would not be expected to lead to reduced long-run total system costs since it would be extremely difficult for the LGNC to target specific network constraints, given the practicalities of administering the credit.
c	Have any potential beneficial or detrimental effects on any non-price attributes of the service, such as network reliability and/or security of supply?	If the proposed Rule Change were implemented, there may be an increase in the number of embedded generators connecting to the network, as they will receive an addition payment in the form of the LGNC. Any resulting deterioration in network reliability or the security of supply would be the responsibility of the network. The extent of this deterioration would depend heavily on the extent of the incentive provided by the LGNC and the different sources of embedded generators connecting to the network. However, under the Rule Change proposal, the cost of deterioration in network reliability or the security of supply would ultimately be borne by the NSP (through inferior service standards performance) and consumers (through an increase in outages experienced, with no offsetting price reduction).
d	Reduce or increase the prices consumers pay for electricity?	The LGNC approach would be expected to increase prices to consumers, for the reasons discussed in this response. In particular, as the Rule Change proposes that 100% of the network value of embedded generation will be passed on to the embedded generators, there is no scope for savings for customers at the network level. Any net reduction in prices for consumers would come from wholesale market outcomes, but these have not been established or quantified.

		AusNet Services routinely identifies the most cost effective solution to relieve network constraints, considering all types of non-network solutions. It logically follows that this bespoke assessment must result in lower prices for consumers than the outcomes that would result from implementing a LGNC.

Item 2. To what extent do your answers to 1(a) to (d) depend on:

Item	Question	Response
a	To whom LGNCs are applied (e.g. whether it is applied to all embedded generators or whether there are criteria based on a generator's capacity, availability and/or location)?	If the LGNC only applied to embedded generators located to address particular network constraints that could guarantee supply at times of peak demand, this would be a better match for its actual network value, which would encourage greater efficiency than a broad-brush approach. However, the practicalities of tailoring the credit to the value of each specific embedded generator will always mean that there will be a trade-off limiting the efficiency of the outcome. The priority treatment given to embedded generation rather than other (potentially lower-cost) non-network solutions also limits the efficiency of the LGNC approach. As outlined above, non-network solutions are best targeted via the existing annual planning review work of NSPs, which allows the lowest cost option for addressing particular constraints to be identified and implemented.
b	The degree of specificity in the calculation of avoided network costs (i.e. whether separate calculations are made for different voltage levels and/or locations) and how often it is updated?	See response above.
c	The proportion of the estimated avoided network costs that are reflected in the LGNCs paid to embedded generators?	As the AEMC notes, the rule change proposal would allocate the entire avoided long run marginal cost (LRMC) to the generator. In addition, the implementation costs faced by networks would also be recovered from consumers, meaning that there would not be a price benefit to consumers at the network level. Therefore, any overall price reductions can only result from the wholesale market outcomes. The assessment of impacts on the wholesale market falls outside the scope of the proposed Rule Change. However, we note that the Demand Management Incentive Scheme and Innovation Allowance shortly to be developed by the AER is intended to capture

		the benefit of non-network solutions across the entire electricity supply chain. Once again, AusNet Services considers this incentive scheme will be a valuable complement to the existing NER provisions relating to non-network solutions.

Item	Question	Response
3	If you do not consider that the proposed rule would enhance the NEO, are there potential alternative approaches that may do so?	AusNet Services does not consider that the proposed Rule Change would enhance the NEO at this time, for the reasons outlined above. Instead, the development of the AER's incentive scheme should be a focus for development in this space. Once this has been implemented, its effectiveness should be monitored before further reform is warranted. It is noted that in the current environment of low demand growth, the existing bespoke approach to addressing network constraints is workable. Should demand growth increase, such that network constraints become more prevalent, reforms based on broader-brush approach, such as that proposed in the Rule Change, may warrant further consideration as the expected deadweight costs may reduce. However, an imminent return to a high demand growth environment is not expected at this time.

Question 6: Potential costs of design, implementation and administration

Item 1. What changes would DNSPs and other parties need to make to their existing systems and processes to enable the design, implementation and administration of LGNCs? To what extent does this depend on:

Item	Question	Response
a	To whom LGNCs are applied (i.e. whether it is applied to all embedded generators or whether there are criteria based on a generator's capacity, availability and/or location)?	Given AusNet Services' concerns with the proposal to implement any LGNC at the current time, the implementation is a second order issue. However, in general the design, implementation and administration costs would increase as: • The degree of specificity in the calculation of the LGNC increases. • The calculation of LGNC is more frequently updated. • The more often the LGNC needs to be paid (although this transaction cost is marginal).
b	The degree of specificity in the calculation of avoided network costs (and, in turn, LGNCs) – i.e. whether separate calculations are made for different voltage levels and/or locations?	
c	How often the calculation is updated?	
d	How often the LGNCs need to	

	be paid?	

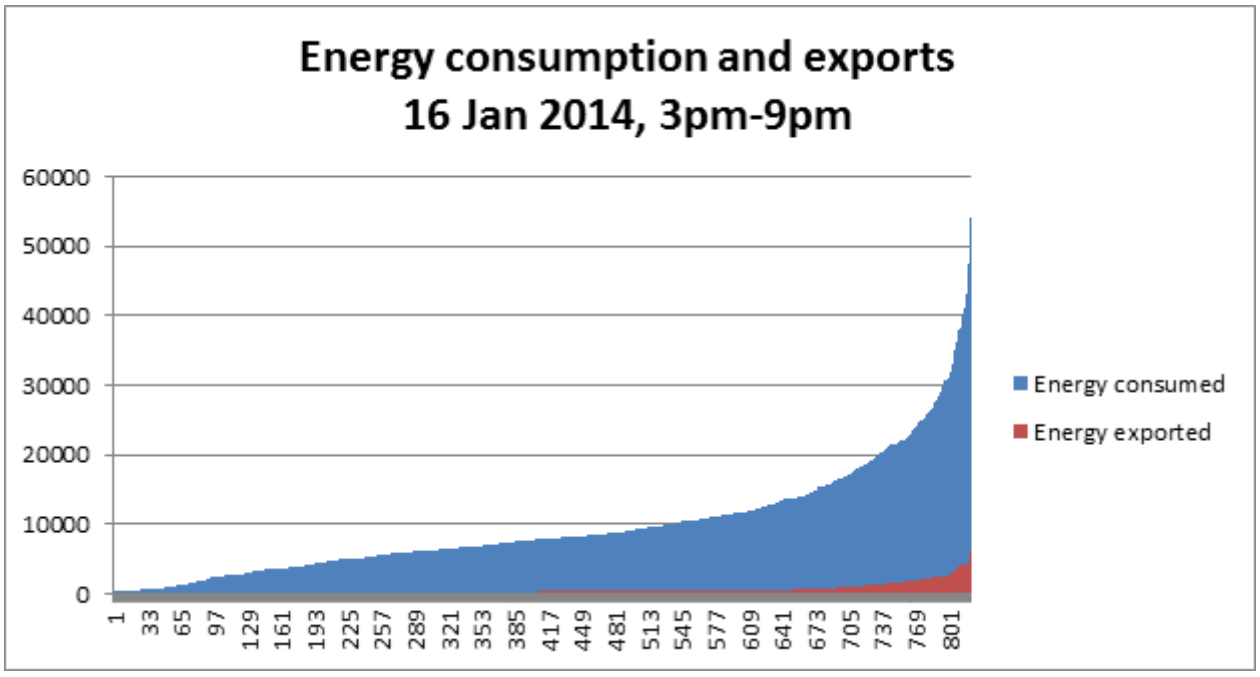
Item	Question	Response
2	What are the likely costs associated with undertaking the changes described above and how are these likely to vary depending on the factors set out in 1(a) to (d)?	If the Rule Change proposal is implemented in its current form, the cost of changes to the NSP's payment systems would be significant. One reason for this would be the new payment relationship that would need to be established between the NSP and embedded generators. The identification and categorisation of embedded generators and calculation of avoided network costs would also be a costly exercise. The Rule Change proposal does not contemplate in detail how networks will recover the revenue to fund the payment of the LGNC and the implementation costs. If obtained via the revenue allowance set by the AER, there would need to be clear provisions in the NER to cover this expenditure.
3	How do these costs compare to the expected benefits of the proposed rule change?	The expected benefits of the proposed Rule Change have not yet been established. Therefore they cannot be compared to the expected cost.

Attachment 2: The Contribution of Solar PV to meeting AusNet Services' Peak Demand

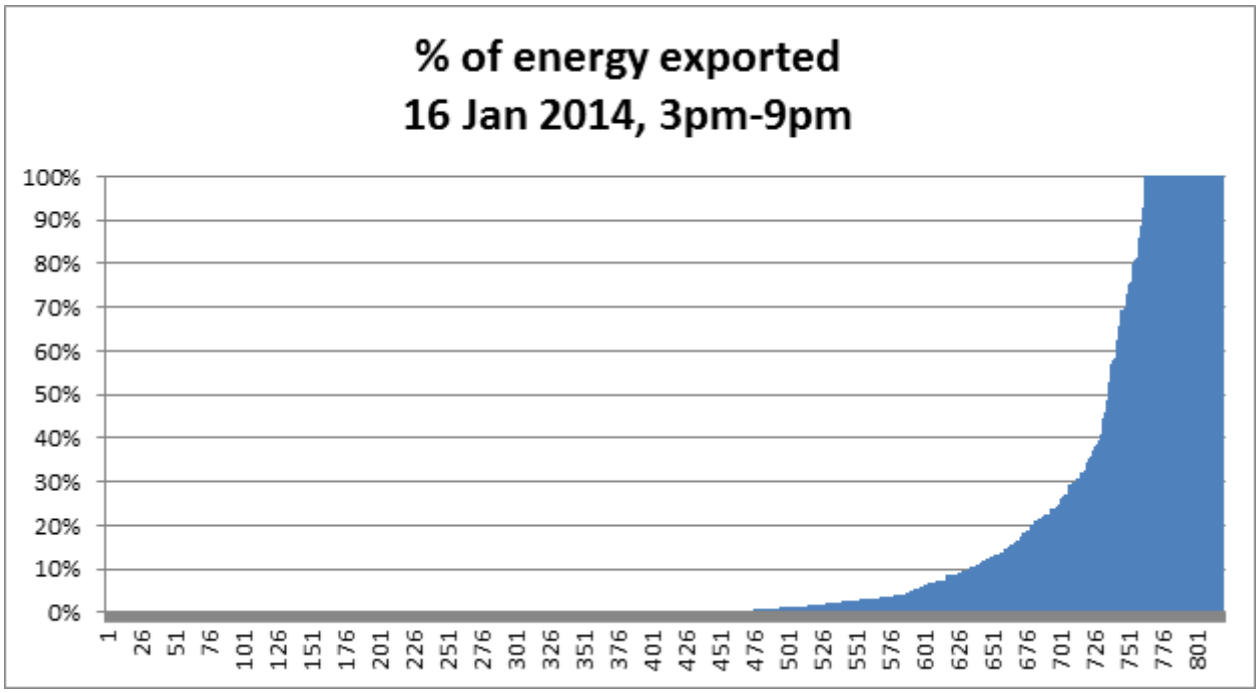
The charts below illustrate the relatively limited contribution that solar PV makes to meeting the peak demand on AusNet Services' network. This data is based on the exporting and consumption patterns of a sample of over 800 solar customers. While the data is from a single day (16 January 2014), it is representative of general behaviour.
The following conclusions can be drawn from the data below:

- Energy consumed by solar PV consumers far exceeds energy exported during peak demand times (3pm to 9pm window); and
- Very few solar customers export any energy during peak demand times.

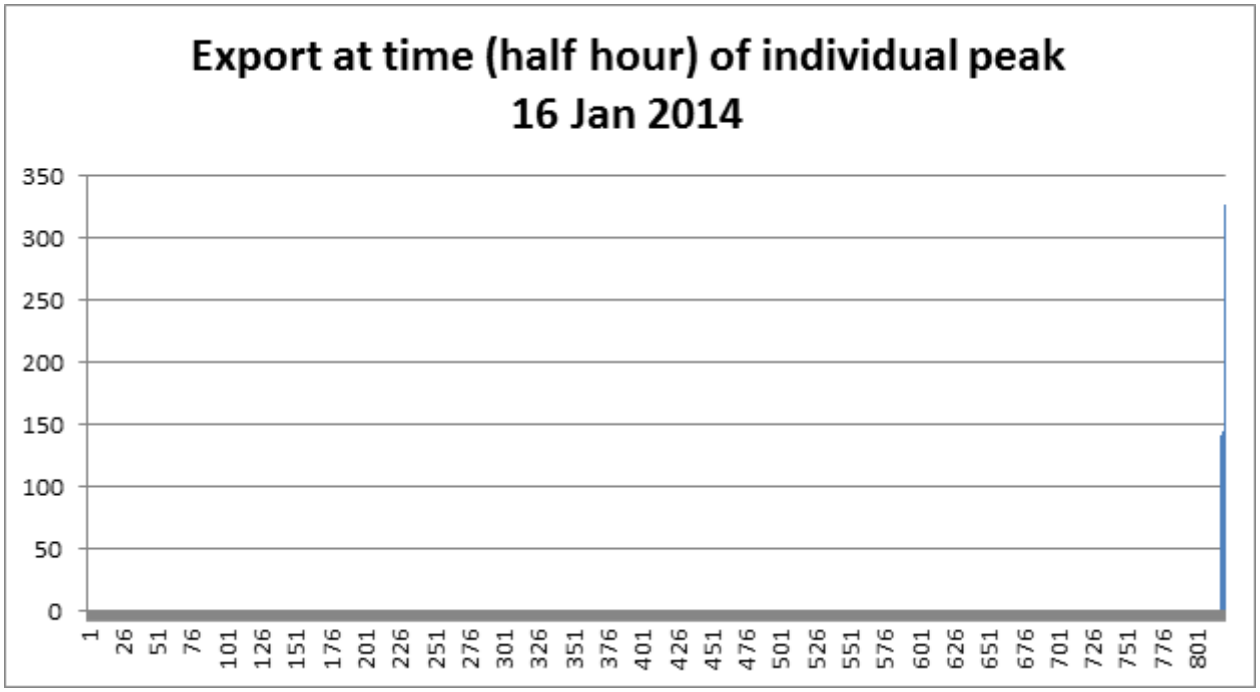
The first chart shows is energy consumed (from the grid) and energy exported during the 3pm-9pm window, ranked from lowest to highest exporting and consuming customers. It's important to note that the two series are ranked independently (i.e. the highest consumer isn't also the highest exporter).



The second chart shows the volume of energy exported in the 3pm-9pm window as a proportion of total energy usage. For example, if a customer consumed 10kWh in that period and also exported 1kWh, that customer's proportion would be 10%. The chart has been truncated at 100%, i.e. some customers exported more energy than they consumed.



The third chart shows the volume of energy exported in the individual customer's highest half hour of energy consumption. Almost zero percent of customers exported energy during their peak half hour of energy consumption.



The final chart shows the energy exported during the coincidental peak half hour of the customers contained in the sample. This was at 6:30pm on 16 January. Only around 5% of customers were exporting energy at this time.