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Australian Energy Market Commission
PO Box A2449
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Mirvac wish to lodge a submission to the AEMC for consideration for the Local Generation Network Credits Rule Change, Reference # ERC0191. With more than 40 years' experience in the Australian development and construction industry, we create, own, and manage a diverse portfolio of assets across the office, retail, industrial and residential sectors. We have strong experience with embedded generation, with several systems operational in the Sydney CBD and new systems under commissioning in Melbourne and Perth.

Mirvac believe that there are several overriding principles which need to be taken into account when determining the merits of this rule change. We are happy to discuss any elements of the below submission with the AEMC as required.

Key Principles

No inclusion of Carbon
It is disappointing that throughout the paper there is no mention of carbon. Whilst Mirvac recognise that this is not part of the current NEO, it is a fundamental issue for Australia and the overriding reason for much of the existing investment in embedded generation. Given the shift toward carbon reduction both domestically and internationally along with several organisations utilising low emission distributed generation in the NEM, it is critical that this be included in the discussion.

Timeframe for Consultation
Mirvac believe that the consultation process must allow appropriate time to consider the results of the LGNC trial conducted by the ISF.

Definition of Embedded Generation
Mirvac believe that the definition of embedded generation needs to be more clearly defined. The paper notes 1KW to 160MW systems operating as small residential solar arrays to gas fired peaking plants. To make this rule change more meaningful will require a more refined definition of embedded generation.

Given the range in size of potential embedded generators, classes of generation could be introduced to allow different types, sizes and availability of generator to participate and be fairly incentivised but considered appropriately.

Flexibility/Timing/Availability/Generation Hours
The LGNC needs to consider the network support period. The paper appears to be silent on the actual support period required. This will need to be clearly defined and potentially broken into realistic intervals to simplify the management of the LGNC.

Certainty of Generation
There is no certainty provided by the networks as to if/when generation will likely be required. The expectation that generation will occur without a clear understanding of requirements will expose the embedded generators to significant financial risk. There is a need for embedded generators to have a firm understanding of potential "peak" generation times to allow for accurate forecasting – an activity which is currently undertaken by both DNSPs and TNSPs.

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One Sided Benefits
The paper gives significant consideration to the network provider's requirements and investment needs but there appears to be limited consideration of the impact to embedded generators and how these generators will need to be incentivised. There is also limited discussion of collaboration between potential embedded generators and networks, while all pricing and investment signals appear to be provided by DNSP/TNSPs.

Transparency for all stakeholders is critical to ensure a successful LGNC implementation with a real opportunity to defer / avoid infrastructure, develop a mechanism to deliver reduced charges to consumers for partial network use and achieve a reduction in network costs for all consumers.

Grid Obsolescence
The availability of advanced technology is a powerful disruptive influence for the NEM and grid infrastructure. The rule change is an important opportunity for both the grid and network operators as a whole to evolve before obsolescence becomes a significant risk and customers migrate to off grid solutions.

Consistent Approach from Network Providers
We believe that while DNSPs and TNSPs trade on varying conditions across the country, a consistent approach in pricing structure for embedded generation is required in order to maintain consistency across the NEM.

Current Embedded Generation Capacity
A significant component of current embedded generation has been installed to provide carbon efficiency. With an effective LGNC incentive mechanism, there is a potential to achieve greater efficiency in the sizing and operation of this generation.

Mirvac are keen to continue in the consultation process with the AEMC and we see this as an important step to a low carbon future for Australia.

Yours Sincerely

Paul Edwards
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Question 1 – Assessment Framework

1.1 Would the proposed framework allow the commission to appropriately assess whether the rule change request can meet the NEO?
Mirvac believe that the NEO is too constrained and given its importance to Australia's economic and environmental future the NEO must be expanded to include de-carbonisation.

The proposed framework is too limited to DNSP factors and doesn't realistically consider the requirements of the embedded generators and customers. To adequately represent these stakeholders the framework should be expanded to include:

- Carbon efficiency of the generated electricity and the imperative for a low carbon economy
- Grid obsolescence – the framework should consider the evolution of the current grid infrastructure and its ability to adapt to new and emerging technology
- Investment considerations for embedded generators, especially certainty of investment and identifying the current factors for investment in embedded generation

The consultation paper does not demonstrate a clear view of what embedded generation is, the Consultation paper considers generation from a 1KW solar PV system to a 160MW generator. A clear definition of embedded generation is required and clarification of the different operating characteristics such as availability, reliability and responsiveness. There is also no consideration as to how embedded generation is currently operated or the focus of its operation with many plants installed to provide carbon reduction.

1.2 What is the relevance, if any, of reliability and security for the purposes of assessing the proposed rule (or a more preferable rule)?
Mirvac recognises the importance of reliability and security of supply to the NEM, and the DNSPs strong focus on guaranteeing consistent supply and "keeping the lights on" for their customers. However, we feel that the proposed rule change is an important opportunity to fully integrate the benefits provided by embedded generation.

The paper needs to clearly define the scope and scale of targeted generation and provide a more in depth overview of what is currently available in the market. Following this, generators could be classified based on generation type and availability, as well as size of the generator. As an example, a 160MW gas fired power station in Somerton does not meet our understanding of a true embedded generator, rather it is an "actual" generator. There needs to be a firm classification of what embedded generation is. Our strong suggestion is if an electricity invoice is not received on site then there is no actual embedded generation occurring and as such, the participant should not be considered for this scheme.

From a customer perspective, investment certainty and carbon efficiency are critical, and the rule change must be relevant for customers as well as DNSPs. Customers will not invest in embedded generation with greater focus on network support, unless they are fairly incentivised to do so.

Whilst recognising that availability and security of supply is critical to the network, it should not be used as an opt-out clause by the DNSPs in considering the opportunities of embedded generation. DNSPs cannot be expected to

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willingly change if their revenue stream is directly linked to installed infrastructure. Section 2.1 notes that embedded generators can attract payments from DNSPs and TNSPs for any network support provided but Mirvac is unaware if any embedded generators have been successful with this initiative.

1.3 What changes, if any, to the proposed assessment framework do you consider appropriate?
We consider the following points to be crucial to allow the proposed rule change to work effectively:

- The proposed framework needs to be tightened significantly to ensure that no one party is favoured and that all aspects of this process are transparent
- Further consideration needs to be given to customer requirements in conjunction with those of the DNSPs. In its current format the framework appears highly focused on the DNSP, but any rule change will be redundant if customers are not incentivised to invest
- Price signals need to be clear and require independent consultation, employing an independent body similar to I-Part is crucial to ensure transparency is maintained and consumers have sufficient protection
- There needs to be further consultation as to how the credits are applied, with preference given to quarterly payments
- There is no consideration given to network pricing increases across the NEM over the past 5 – 10 years and if the current approach is providing best value to customers and the lowest LRMC achieve
- There needs to be a consistent approach across all networks to reduce costs for embedded generators
- There will need to be close collaboration between the DNSPs and the embedded generators in order for this rule change to work effectively
- Carbon must be a consideration if Australia is to meet our international carbon targets

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Question 2 – Perceived Issue with current NER

2.1 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?
Mirvac would like the paper to clearly articulate what is meant by efficiency in this context. For customers, this would relate to carbon efficiency, generation efficiency and utilisation, all of which appear to be unrelated to DNSPs and TNSPs.

The DNSPs need to be incentivised to reduce long run marginal cost, the current system of payment based on installed infrastructure does not provide sufficient incentive to investigate and invest in alternative methodologies, such as embedded generation.

We are not aware of any participant currently sizing embedded generators based on this requirement in a typical 1KW – 5MW generator size range. If this is the case, it clearly points to the NER provisions not sufficiently incentivising embedded generation, or at least embedded generation is not contemplating network support. While there is considerable embedded generation in the marketplace, it is not currently being considered for network support.

2.2 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 investment in, and operation of, the electricity system that minimises long term costs?
Regrettably in both the current and proposed states there appears to be no long term commitment required from any network to participate in embedded generation. Without incentives and potentially obligations, it is unlikely that networks will participate in embedded generation. This also poses the question of who will likely bear the cost of any additional incentives.

Regrettably current experience suggests that a number of DNSPs are unlikely to participate and specific obligations will be required to ensure participation.

2.3 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?
This question refers back to a lack of scope and clear definition of exactly what constitutes embedded generation. Again, current practical experience indicates that some DNSPs are particularly difficult to deal with when installing embedded generation such as co/tri-generation systems, especially in relation to cost, planning and network connections.

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Question 3 – Determining Avoided Costs

3.1 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, voltage and type of generation?

- Loss factors
- Avoided or deferred infrastructure
- Avoided ongoing cost i.e. Network fees where these fees are based on the amount of infrastructure installed
- Avoided TUOS / DUOS payments
- Potentially less vulnerability during extreme weather/climate events with local embedded generation capacity

It seems reasonable to expect that the potential cost savings would be greater for those locations where network constraints are expected and hence network investment required. The type of embedded generation will also be a major consideration with differing levels of availability and responsiveness from different generation classes.

3.2 Can embedded generation materially reduce DNSP's ongoing operating and maintenance expenditure? If so, to what extent do these cost savings depend on the location, voltage and type of generation?

Logically embedded generation will impact future O&M expenditure where infrastructure is successfully avoided or deferred as O&M costs will not be incurred or at least deferred.

Mirvac recognise that the reduction in LRMC and O&M expenditure would be more related to those regions with network constraints and that certain types of generation would represent greater value due to higher availability.

However, consideration must also be given to the embedded generators and their requirements for certainty of investment or there will be very limited interest and ability to invest in embedded generation.

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Question 4 – Specificity of calculations

If LGNC's of some form were to be introduced:

4.1 What is the appropriate degree of specificity in the calculation of avoided network costs, and, if 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?

- Firm rules need to be established across the NEM and should not have the capability to be applied at the DNSP's discretion, rather a framework which can be applied uniformly across multiple networks and states should be created
- Regarding operating costs, on the DNSP side these should be minimal as the equipment is presumably owned by the embedded generators (not 160MW power stations). The only cost incurred by the DNSP would be during the initial connection of an embedded generator to the local network and ongoing operation of the LGNC scheme
- Regrettably a level of complexity cannot be avoided if an effective and robust scheme is to be developed. Obviously there will be difficulty in balancing the complexity of location specific payments but this will deliver greater accuracy and target resources to the location of greatest impact
- One proposal would be to split the calculations based on network area, similar to the way network tariffs are currently calculated. This would allow for a reasonable level of accuracy in terms of location, and could give DNSPs the option to add this onto an existing tariff within their network area
- Consideration needs to be given to existing incentive schemes such as feed in tariffs and whether the LGNCs should be available to these participants whilst receiving existing incentives

4.2 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?
Investors will require some level of certainty in the LGNC value and annual income if they are to invest in embedded generation with the capability to provide network support. An investment period of 5 years which is in line with network revenue/investment resets seems to offer the most reasonable balance between shifting demand patterns and investment timeframes.

In terms of calculation resets it makes sense to keep this in line with the investment period of 5 years to allow for consistency and accurate forecasting/calculations from both embedded generators and DNSPs. A five year time period does allow for some project lead time as it will realistically take at least 12 months to bring online a reasonably sized embedded generator.

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Question 5 – Potential Benefits of the proposal

Compared with the current NER provisions, would the proposal:

5.1a 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 costs?
In terms of the embedded generation capacity that we are aware, there seems to be little or no knowledge of any current incentives for embedded generators to provide network support. A considerable amount of embedded generation capacity has been installed across a range of property classes but this has been sized and is operated for building operations and carbon reduction. Obviously if there was a financial incentive there would be more consideration given to network support capability than currently exists.

The level of support will be highly dependent on the pricing methodology and how strong the pricing signal can be made to incentivise investment. The use of a location specific calculation appears reasonable and would be capable of providing a more focused pricing signal to those locations with the greatest opportunity and demand.

We note that the mention of efficiency appears to be in a network context, if so this definition needs to be expanded to include the operation and planning requirements of the embedded generators where efficiency of operation (conversion efficiency) and carbon efficiency is currently critical.

5.1b 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 proposal is unclear on how the DNSP's will be incentivised to adopt efficient non-network solutions. As a proportion of DNSPs fees are based on quantity of network, there needs to be consideration given to the efficiency of the network when fee structures are reviewed.

5.1c Have any potential beneficial or detrimental effects on any non-price attributes of the service, such as network reliability and/or security of supply?
The availability of advanced technology is a powerful disruptive influence for the NEM and grid infrastructure. The rule change is an important opportunity for both the grid and network operators as a whole to evolve before obsolescence becomes a significant risk and customers migrate to off grid solutions.

In terms of reliability and security of supply it seems reasonable that integrating the ability to generate both locally and source power through the transmission distribution network will enhance reliability and improve security of supply across the NEM. The extent of this benefit is difficult to quantify at this point but the basic principles of distributed generation suggest that reliability and security should be enhanced if embedded generators can be safely integrated onto the network.

5.1d Reduce or increase the prices consumers pay for electricity?
Logically, if network infrastructure upgrades can be deferred or avoided and transmission network usage is reduced then there should be some savings passed onto consumers. Also given that there would be less network in place there should be less embedded network fees and costs.

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Reviewing historical network cost trends demonstrates rapid increases in network costs over the last 5 years, in some cases increases have been over 50%. This level of cost increase clearly demonstrates that there are issues with the current methodology and its ability to deliver cost efficiency to consumers without some level of adjustment as proposed by the rule change.

5.2 To what extent do your answers to 1(a) to (d) depend on:

5.2a To whom LGNCs are applied (eg whether it is applied to all embedded generators or whether there are criteria based on a generator's capacity, availability and/or location)?
If a class of generation were to be employed then LGNCs could be applied based on the class and availability of that generation – if the type of generation is not recognised it is difficult to determine how meaningful pricing signals/credits will be applied to vastly different forms of embedded generators.

The required frequency of network support will also be important in determining the business case for new embedded generators or for modifying the operation of existing assets. It is not economically feasible to hold generation capacity available for long periods without a return on this investment.

5.2b 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? Please refer to the response for question 4

5.2c The proportion of the estimated avoided network costs that are reflected in the LGNCs paid to embedded generators?
As stated previously, we believe that the network costs should reflect efficiency as well as size of the network. If this were the case, then LGNCs should be fully paid to embedded generators, otherwise a portion of the credits should be apportioned to DNSPs as an incentive for network efficiency.

If DNSPs costs are solely borne by the size of the network then the DNSPs will not be incentivised to implement alternative network support solutions.

5.2d If you do not consider that the proposed rule would enhance the NEO, are there potential alternative approaches that may do so?
Managed and implemented properly, we believe that this rule change will provide a benefit to the NEO.

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Question 6 – Potential costs of design, implementation and administration

6.1a 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?
In addition to the DNSP element it is critical that the AEMC consider the impact on embedded generators and consumers. The LGNC cost and administration requires clarity and simplicity to ensure adoption by the embedded generation operators and support from consumers.

From an embedded generation perspective the following systems would need to be developed:

- Systems to record generation during network support periods
- Billing mechanisms to claim and process LGNC credits
- Receipt and validation of LGNCs
- Consideration of company structures with potential tax implications
- Record keeping, data management and audit systems

To what extent does this depend on:

6.1a To whom LGNCs are applied (i.e. whether it is applied to all embedded generators or whether there are criteria based on a generators capacity, availability and/or location)?

There needs to be an element of capacity, availability and/or location applied to LGNCs. Mirvac feel that the priority would be location, class of generation (which would include partial availability) and capacity.

6.1b The degree of specificity in the calculation of avoided network costs (and, in turn, LGNCs) – ie whether separate calculations are made for different voltage levels and/or locations?
Mirvac believe that if location is the primary determining factor, then the importance of voltage levels would be reduced

6.1c How often the calculation is updated?
In line with an investment timeline of 5 years, which in turn is in line with the DNSPs 5 yearly revenue and investment reset.

6.1 d How often the LGNCs need to be paid?
Quarterly would be Mirvac's preference to balance billing costs and income.

6.2 What are the likely costs associated with undertaking the changes described above and how are these likely to vary on the factors set out in 1(a) to (d)?
From a customer / embedded generator perspective Mirvac believe that the following costs need to be considered:

- Set up costs – including legal and tax advice
- Administrative costs

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- Bill validation and processing
- Record keeping and data management
- Auditing
- Equipment operating and maintenance costs
- Reporting
- Tax and legal implications
- Potential dispute resolution

6.3 How do these costs compare to the expected benefits of the proposed rule change?
To answer this question the value of LGNCs and the potential frequency of network support would need to be estimated to determine any benefit to the embedded generators.