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Submission: Export limits on Solar Power Generation for Domestic Rural and Residential Grid Customers applied by Grid Operators (such as Essential Energy) should be considered as part of the Electricity Distribution Reliability Standards Review as they disadvantage renewable solar energy installation, are anti-competitive from a power supply perspective and result from poor grid design, operation, maintenance and improvement initiatives and therefore must be considered as a critical component of grid reliability.

Grid operators are enforcing low solar power export limits because their grids are not capable/reliable or they are acting anticompetitively or they have no incentives to provide world class grid connection consistent with a renewables supplied energy future.

As the applied export limits severely impact the financial viability of household solar energy systems and will result in the unconscionable waste of clean renewable energy, the Reliability Standards Review should ensure any application of export limits are consistent with renewable energy policies and initiatives and ensure the state grid is developed to meet the future requirements of a highly distributed power generation and storage network.

Grid Operators need to clearly recognise and understand that limitations on renewable energy infeed to the state power grid are resulting in the waste of extremely valuable green solar energy and therefore impeding the uptake of solar energy systems. The need to take action such that their business model should improve competition in the market place by incentivising the generation, storage and infeed of renewable energy by ensuring their grids are capable of in feeding the same quantity of energy that they are currently rated to supply at peak load.

Please see attached document for more detail and content.

Greg Hardie

Mr Gregory J Hardie

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[REDACTED] [REDACTED]

6 January 2019

## **Electricity Distribution Reliability Standards Review Submission**

Independent Pricing and Regulatory Tribunal  
New South Wales.  
PO Box K35  
Haymarket Post Shop  
NSW 1240

### **Executive Summary**

Export limits on Solar Power Generation for Domestic Rural and Residential Grid Customers applied by Grid Operators (such as Essential Energy) should be considered as part of the Electricity Distribution Reliability Standards Review as they disadvantage renewable solar energy installation, are anti-competitive from a power supply perspective and result from poor grid design, operation, maintenance and improvement initiatives and therefore must be considered as a critical component of grid reliability.

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The Commissioner,

I am making a submission to IPART concerning the review of the Electricity Distribution Reliability Standards currently accepting submissions as a result of initiatives to improve the reliability of power supply for my ageing Mother, Barbara Hardie, who owns and resides at a property located at:-

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

The property is currently connected to the power grid operated by Essential Energy and has a small 1kW solar power system installed in 2009 with a net consumption meter. She has a medical need for uninterrupted supply associated with her Vital Call emergency response system.

I am in the process of upgrading the solar power system to a larger 6kW capacity system with a 10kWhr lithium ion battery to:

**1. Address the appalling reliability of the existing grid system supply.**

There are typically 10 power outages a year (grid failure/disconnect and brownouts), often at the most inconvenient times for extended durations (up to 3.5 days duration on one occasion in the last few years!). There has been no improvement in the grid reliability and I would estimate that actual statistics would demonstrate a significant deterioration in reliability over time. With the inevitable impacts of climate change resulting in more intense weather systems and storms, the already fragile grid reliability can only deteriorate unless the operator takes concerted action to address the existing and impending problems.

From a very concerned consumer perspective, the Grid Network Operator (Essential Energy) are not incentivised to address grid reliability problems and suffer zero financial or regulatory penalty when there are power outages. As such it is unsurprising that the grid reliability issues are not being addressed and the quality of the service is deteriorating.

As I am not prepared to accept this deteriorating power reliability situation, the financially and environmentally viable solution of installing a larger solar PV power generator with a larger capacity 10kWhr battery at my Mother's property offers the potential to ensure uninterrupted supply when there are grid outages and dramatically reduce grid power consumption and earn some cash positive rebate from excess generation as exported solar power infeed to the grid. Critical to the viability of this approach is the **export of all surplus power generated at an attractive tariff.**

**2. Reduce the cost of power and pay off the new solar power system.**

Installation of a 6kW maximum capacity solar power system with a battery on a domestic residence provides sufficient generation in the winter months to limit grid power consumption to very low levels and should result in considerable export of power in the summer months generating a good cash flow to help pay off the significant investment. This critically depends on the ability to export all the excess power generated and achieving a good export tariff from the power supply company.

**3. Contribute to a carbon free renewable energy solution consistent with limiting the impact of climate change.** Informed and credible examination of sustainable future has clearly identified that renewable energy in all forms and

capacities must be effectively installed and integrated with a capable grid that can make productive use of the variability of supply from individual renewable generators. The grid network must transition from a supplier to a fully integrated distributor and load manager. Whilst installation of a battery on a residential PV solar system can greatly help achieving this target, it also requires the grid operator to facilitate export of power when the system generates excess power. Any export limitation has greater financial impact on systems installed without storage batteries.

In the process of installing the 6kW solar 10kWhr battery system I have been informed by Essential Energy that the **power export limit for the designated rural property is only 3kW**. They advised that this limit is set such that other uses on this very small branch of the grid (only 12 customers on one transformer??) can also operate a solar system with a 3kW export limit and not exceed peak voltages which may damage household electrical equipment. Whilst not all users have solar systems installed and at least one customer/neighbour has a 5kW export limit as their larger system was installed many years ago, the 3kW export limit severely impacts the viability of installing solar power systems and therefore inhibits a viable pathway to a sustainable energy future.

There will be periods when the battery is fully charged and household consumption will be less than 100W and the system is generating 6kW, meaning that 2.9kW of available power will be wasted. This represents an unacceptable waste of green power in an energy and carbon constrained future and severely impacts the financial viability of the solar installation reducing cash return to customer by \$600 - \$1000/year with a 20c/kWhr infeed tariff. The financial impact is much greater without a battery. Given the Government incentives to install domestic solar power systems, regulators should be critically concerned by export limits and better define and regulate grid performance standards that incentivise power grid operators to overcome limits and maximise productive use of available renewable power.

Essential Energy advised that residential customers generally now incur a 5kW export limit. This 2kW difference from rural customers represents a significant disadvantage to rural customers considering solar power installation. This effectively means rural customers have an inferior grid connection and must suffer the associated disadvantages. If the connection genuinely is inferior to the residential customers, perhaps the metering and connection charges should be reduced to compensate?

It is important to note that the Essential Energy Grid can nominally supply 15kW of peak power to each residence without overloading the transformer and wires or resulting in low voltage, but now advise the system cannot handle a very small 3kW export.

3kW export limit being 20% of nominal infeed capacity for export seems to be an excessive limitation adopted by Essential Energy to handle a worst case scenario. By applying this export limit they are clearly acknowledging a serious grid reliability and capacity issue and by enforcing this limit are acting anti-competitively by reducing competition with the large Power Utility suppliers, their traditional customers. As there appears to be no incentives or regulations to

ensure the grid is capable of operating with > 20% of nominal supply and to maximise the productive use of available solar power, Essential Energy advised that they have no plans to remove the restriction and it therefore applies indefinitely.

### **Conclusion – Desired Outcome**

Grid Operators need to clearly recognise and understand that limitations on renewable energy infeed to the state power grid are resulting in the waste of extremely valuable green solar energy and therefore impeding the uptake of solar energy systems. The need to take action such that their business model should improve competition in the market place by incentivising the generation, storage and infeed of renewable energy by ensuring their grids are capable of in feeding the same quantity of energy that they are currently rated to supply at peak load.

The Grid operators must accept that the supply model is changing and their role is to enhance competition by efficiently and reliably facilitating the integration and networking of a highly distributed and integrated renewable power distribution system.

In the short term, the Grid Distributors need to find rapid, practical and cost effective means to reduce household power export limitations and incentivise the installation and export of power.

Yours Faithfully,



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Mr Gregory John Hardie