Tasmanian Renewable Energy Alliance

www.tasrenew.org.au

eo@tasrenew.org.au

(0407) 486-651

Not FiT for Purpose

A response to the Office of the Tasmanian Economic Regulator's March 2019 Draft Investigation Report on the Regulated Feed-in tariff Rate for Standard Feed-in Tariff Customers.

30 April 2019

Summary

Overview

TREA believes that the current FiT review process as mandated by the ESI Act and the Pricing Regulations is an inadequate mechanism for supporting the solar industry and other distributed energy resources in Tasmania.

Greater support for the implementation of distributed generation could contribute to reducing the cost and environmental impact of electricity supply in Tasmania and contribute to energy security and industry development.

There are three basic problems with the current FiT review process:

- The terms of reference focus mainly on the direct savings to retailers, rather than looking at the overall benefit to Tasmania.
- Even where indirect benefits are identified by OTTER, they are dismissed as not appropriate to include in a FiT rate because they do not flow through to consumers under current pricing arrangements.
- Identified benefits are dismissed as too small to be significant based on the currently small percentage of total electricity consumption represented by solar exports to the grid. This is an argument that implicitly entrenches the existing system of electricity generation and distribution and devalues both the existing contribution made by solar and the potential benefits of a move to a greater role for distributed energy resources.

Setting a fair feed-in tariff

As we have argued in many previous submissions, a fair feed-in tariff should take into account:

- a wholesale price that reflects the total benefit to Tasmania, not just the saving to Aurora
- the fact that locally generated and used energy does not make use of, and should not pay for, the transmission network
- avoided losses from transmitting electricity over long distances
- savings from less demands placed on the distribution network
- the reduced greenhouse gas emissions resulting from solar's role in reducing imports from Victoria
- the health benefits from reducing import of fossil fuel based electricity.

Our calculations on a fair FiT based on these factors is summarised in Appendix 1 and in more detail in the TREA submission to the Tasmanian state government Solar FiT Review {TREA 2018b}.

Time-varying FiTs

TREA does not see the introduction of time-varying FiTs as a priority for either consumers or the network. See page 7 for details.

Metering problems

TREA has been actively researching and lobbying on this issue since we identified it in 2013 {OTTER 2019, p.55}.

We welcome the fact that OTTER has again drawn attention to this unresolved problem which is short-changing solar owners. We acknowledge that this problem is outside the terms of reference for the OTTER FiT investigation.

Alternative mechanisms to support distributed generation

TREA has consistently argued that a higher flat rate FiT is in the long term best interests of Tasmanian electricity consumers. However a flat rate FiT is only one mechanism for supporting greater uptake of distributed energy resources.

Additional mechanisms are described starting on page 7.

We acknowledge that most of these alternatives are outside the scope of the current OTTER FiT determination process. However they should be considered by OTTER in view of the wider role of the economic regulator in ensuring that the electricity system operates fairly and in the best long term interest of Tasmanian electricity consumers.

Context

The solar industry in Tasmania

TREA represents solar sales companies and solar installers operating in Tasmania. The solar industry is a highly competitive but highly regulated industry. Solar installers have to be licenced electricians.

In addition all solar installations have to be individually designed by a Clean Energy Council (CEC) accredited designer and the installation has to be supervised by a CEC accredited installer. Additional qualifications are required to design and/or install off-grid solar and battery systems and to design or install on-grid PV systems with batteries.

In Tasmania, *every* solar installation is inspected for standards compliance and electrical safety under a contract issued by Consumer, Building and Occupational Services in the Department of Justice. (Tasmania is the only state with 100% inspection of solar installations.) In addition, nationally, a sample of solar installations are inspected by the Clean Energy Regulator.

Fluctuations in the demand for solar driven by sudden changes in government policy make it more difficult to maintain a local industry that can deliver the required quality standards.

Support for the solar industry will ensure the continuation of these highly skilled jobs located throughout the state.

The move to a decentralised grid

There is widespread agreement that the electricity system is moving to a much greater role for renewable energy and for distributed generation and storage of energy. (See for example {TasNetworks 2018} and {ENA 2017}.) Nationally the ENA/CSIRO Roadmap maps out a future in which by 2050:

- *Networks pay distributed energy resources customers over $2.5 billion per annum for grid support services*
- *Electricity sector achieves zero net emissions*
- *$16 billion in network infrastructure investment is avoided by orchestration of distributed energy resources*
- *Reduction in cumulative total expenditure of $101 billion by 2050*
- *Network charges 30% lower than 2016*

- *$414 annual saving in average household electricity bills (compared with roadmap counterfactual, business as usual, pathway)* {ENA 2017 p.iv}.

The TasNetworks Transformation Roadmap suggests that in Tasmania by 2025:

- 40,000 customers will have their own renewable energy source (mainly solar)
- 17,000 people will be driving an electric car
- 5,000 people will have battery storage.

Tasmania is particularly well placed to benefit from this transformation as a result of:

- the ability of our hydro system to provide long term storage to back up variable renewable energy generation (both centralised and distributed)
- the skill base resulting from over a hundred years of renewable energy engineering
- state ownership of the major generation, network and retailing businesses.

To ensure the maximum shared benefit from this transformation it is important that Tasmania has a shared vision of our energy future which translates into integrated policies across government and GBEs. A vibrant solar industry is the basis on which to develop an industry sector leading the way in new technologies of energy management, distributed storage, and the optimal integration of electric vehicles into the electricity network.

Inadequacy of an incremental approach

The current FiT determination process is intended to set a methodology for the next two years. Many new technologies are likely to impact on the electricity industry over this period, in particular local grid-connected battery storage and the integration of electric vehicle charging into home energy management systems.

These technologies provide the potential for distributed generation to be fed into the grid when it is of most benefit, rather than just when the sun is shining. To encourage this benefit, price signals need to be sent to customers.

The Draft Investigation Report argues in several places[1] that the impacts of distributed generation are small because exported solar makes up only a small proportion of total consumption. We believe that this is a backward looking approach. Given the potential benefits of a more decentralised system, appropriate incentives should be provided to facilitate faster take-up of distributed energy resources.

[1] For example p.34 and p.47 in relation to impact on wholesale prices, p.38 in relation to energy security.

Responses to questions in the Draft Investigation Report

Section 1.5 of the Draft Investigation Report invites submissions on specific topics. This section summarises the TREA position on those topics on which we have provided responses, together with links to more detailed discussion of these issues.

Chapter 5: "the proposed adoption of the 'net financial benefits to retailers' approach and the proposed inclusion of wholesale electricity costs, network losses and National Electricity Market (NEM) fees in determining the FiT rate"

As argued elsewhere in this submission, we believe that the basis assumption behind setting a fair FiT should be the overall benefit to Tasmania not the net financial benefit to retailers.

We support the inclusion of network losses and NEM fees as factors in setting the FiT.

Chapter 5: "the proposed approach of estimating wholesale electricity costs using the regulated wholesale electricity price adopted as part of the Regulator's determination and approval of standing offer retail prices, or a relevant WEP Order, rather than the market price method"

As detailed in the section *Wholesale electricity price* (p.13) we believe the wholesale price used to calculate the FiT should reflect the value to Tasmania and not the saving to retailers. For this reason we believe a price in the range 9.8c/kWh to 11.8c/kWh is appropriate.

Chapter 6: "the proposed exclusion of all the indirect impacts of distributed generation on Tasmania's electricity supply industry in determining the FiT rate"

The Draft Investigation Report acknowledges that

> *"Conceptually, transmission costs can be avoided through the supply of electricity from distributed generation as less electricity is purchased from large-scale generators and consequently less electricity is transmitted through the transmission network to customers."* (p.26)

TREA believes that the savings in transmission charges from distributed generation should be included in the FiT rate.

The arguments for not recognising this saving in the FiT rate are based mainly on the fact that this saving is not passed on to retailers and hence to customers under current pricing arrangements. The arguments for including transmission savings in the FiT rate are on page 14 and in the fact sheet on transmission charges referenced in {Backroad 2017b}.

The Draft Investigation Report gives a number of reasons for excluding the benefits of distributed generation in reducing distribution network costs. We agree that these benefits are variable in time and location and for this reason we believe that network support payments (p.8) are a more effective way of providing an incentive for the installation and operation of distributed energy resources in ways that reduce network costs.

Chapter 7: "Issues surrounding the possible introduction of a time-varying FiT rate, including any potential benefits, barriers and costs, to both the network and customers"

TREA does not see the introduction of time-varying FiTs as a priority for either consumers or the network. See page 7 for details.

Chapter 8: “Software and non-software solutions for customers with Type 4 and Type 6 meters to address the issue where some customers with distributed generation are purchasing electricity from a retailer and exporting some electricity at the same time, at a higher net cost to these customers.”

We welcome the fact that OTTER has again drawn attention to this unresolved problem which is short-changing solar owners. We acknowledge that this problem is outside the terms of reference for the OTTER FiT investigation. For more information see page 8 and Appendices 2 and 3.

Alternative mechanisms to support distributed generation

The value of energy fed back into the grid from distributed energy resources is strongly dependent on both time and location:

- Wholesale energy prices in the National Electricity Market (NEM) are set every 30 minutes. Energy fed into the grid is of most value when wholesale prices are high.
- Much of the network costs that make up around 40% of the retail cost of electricity result from building a network that can meet peak demand. Energy fed into the grid that reliably reduces peak demand can significantly reduce the need for network investment.
- In some locations the local distribution network is at close to capacity. Locally exported energy can delay or avoid expensive upgrades to wires and transformers.

Time-varying FiTs

TREA supports moves to cost-reflective tariff arrangements where these are implemented on an opt-in basis and can provide benefits to both consumers and the network.

OTTER has performed a valuable service in investigating and documenting the issues around introducing a time-varying FiT.

We do not see introduction of a time-varying FiT as a priority for a range of reasons including those set out in the Draft Investigation Report.

For solar owners

Solar owners have limited capacity to vary the time of export of surplus solar generation. To the extent that consumption patterns can be changed, a greater financial benefit is likely to be obtained from increasing self-consumption at times of maximum solar generation rather than trying to move consumption patterns to export more at time of a higher time-varying FiT.

For consumers with other distributed energy resources

With home battery storage and/or grid connected electric vehicles, consumers will have more capacity to shift the pattern of their grid consumption and solar export. However it is still likely to be more financially rewarding to maximise self-consumption and minimise purchase of grid energy at peak prices, rather than use distributed energy resources to benefit from exporting on a time-varying FiT.

General complexity and confusion

The Draft Investigation Report highlights some of the metering and billing software costs that introducing a time-varying FiT would involve.

In addition we are aware of the difficulty of introducing new arrangements that require customer education, behavioural change and the implementation of new technology before customers can realise potential benefits.

TREA has been actively promoting the opt-in availability of tariff 93 and we believe this is a more effective way of moving to cost-reflective arrangements.

Introduction of a time-varying FiT does not seem worth the cost, complexity and confusion for potentially limited benefits.

Fix the metering problem

Most solar owners in Tasmania who are not on the transitional FiT are not receiving the full value of the energy they generate because of a problem with their meter software. Solar has to be connected to either the tariff 31 (light and power) or tariff 41 (heating and hot water) circuit. Most people connect it to the tariff 31 circuit. If they are generating solar and using electricity on the tariff 41 circuit at the same time **solar owners are charged 9.1c for using their own electricity**[2]. A software solution is available to fix this but both Aurora and TasNetworks have declined to implement this.

For more information see Appendices 2 and 3.

Network support payments

Locally generated solar electricity stored in batteries can provide additional value at times when the local distribution network is close to capacity. This is the basis of the very successful TasNetworks trial on Bruny Island. Customers with batteries are paid a premium of around $1/kWh to feed energy back into the grid when demand is high via an arrangement known as network support payments.

This arrangement should be available to customers in other locations where the local distribution network is sometimes at close to capacity. This would provide an additional incentive for customers to install solar PV with batteries. With sufficient battery capacity in those locations, expensive network upgrades can be delayed or avoided, reducing network costs for all customers in future.

Aggregation of distributed energy resources

The value of distributed energy resources (solar PV, batteries, electric vehicle charging and energy management systems in houses) is greater if they can be coordinated to deliver reliable services to the electricity network. A recent in-principle announcement by the AEMC to support moves to allow "energy users to participate directly in the wholesale electricity market" will facilitate this participation[3].

Tasmania should support rule changes which allow organisations to offer these aggregation services without having to work through an energy retailer.

Size of eligible systems

Which systems are eligible for a regulated FiT is set at the state level. Eligible system sizes vary enormously, typically around 10-30 kW but ranging up to 100 kW in Victoria.

In the days of premium FiTs there was a case for limiting the size of eligible systems. Once the FiT is calculated to reflect the benefit of the energy exported there is no logical reason to set a low limit on the size of eligible systems. Some cut-off point between eligibility for a FiT and generators that fall within the NEM rules is necessary. Given that eligibility for STCs for solar projects is capped at 100 kW it would be logical to use the same level for FiT eligibility.

Larger embedded generators can cause problems for network operation in some locations but the logical mechanism for this is at the connection agreement stage with TasNetworks, not by a blanket limit on the size of eligible systems.

[2] With current meter software, excess generation on tariff 31 is treated as exports and a FiT of 8.5c is paid, the energy then flows back into the tariff 41 circuit without leaving the building and is charged at 17.6c. For more information see http://tasrenew.org.au/metering/

[3] For more explanation see https://reneweconomy.com.au/this-is-huge-rule-changes-to-boost-solar-pv-and-batteries-99826/ and https://www.aemc.gov.au/news-centre/media-releases/supporting-reliable-and-secure-power-system-least-cost-consumers

If the FiT methodology includes consideration of health and environmental benefits, it would be logical that only renewable energy sources (wind, solar, hydro) should be eligible rather than other embedded generators (eg gas co-generation).

Eligibility should be for any embedded generator connected to the distribution network (rather than the transmission network).

Smart meter roll-out

The value to a customer of solar PV depends partly on how much of the generated electricity is self-consumed (saving around 25c/kWh) and how much is exported at the FiT rate. This in turn depends on how much electricity consumption occurs while the sun is shining. Most existing electricity meters do not provide this information. However smart meters do. Having a smart meter and analysing the pattern of electricity use can help calculate the value of installing solar, as well as informing other energy and money saving strategies such as changing to a time of use tariff or installing batteries.

As a result of recent national rule changes, Aurora Energy has started the roll-out of communicating smart meters in Tasmania[4]. Due to constraints in the capacity to roll out smart meters, customers who want to voluntarily install smart meters are facing long delays. Action to speed up the roll out of smart meters would assist the take up of solar, as well as facilitating other ways for customers to save on their electricity bills.

Network voltage regulation

In some locations high voltage levels in the distribution network result in customers not being allowed to install solar, or being restricted in the amount of energy they are allowed to feed back into the grid[5]. TasNetworks is currently trialling methods to cost effectively control distribution network voltages[6]. These measures should be supported and extended.

Non-monetary benefits of solar in Tasmania

Solar PV has many additional advantages to Tasmania that cannot be readily translated to a c/kWh value for energy fed into the grid:

Contribution to 100% renewable electricity: household PV contributes to Tasmania becoming the first Australian state to reach 100% renewable electricity (and one of the few in the world).

Private capital investment: Households and businesses invest their own money to make savings on their electricity use, and to contribute to a sustainable energy system. Part of the energy generated is exported to the grid and used by other consumers. This replaces energy which would otherwise require capital investment by Hydro Tasmania or other generators.

Energy security: Distributed PV contributes to diversity of supply and makes Tasmania's electricity system less dependent on rainfall, or single points of failure such as Basslink. Solar contributes most to our energy supply in summer when our rainfall is lower. As battery prices decrease there will be increasing opportunities for distributed generation and storage to provide secure energy supplies at times of network outage, for both individual consumers and through local microgrids.

[4] For more information on smart meter rollout see https://www.auroraenergy.com.au/metering
[5] For more details on voltage problems see http://tasrenew.org.au/solar/overvoltage/
[6] see page 46 of the TasNetworks 2018 Annual Planning Report https://www.tasnetworks.com.au/our-network/planning-and-development/planning-our-network/

Direct jobs: The Tasmanian solar industry employs the equivalent of around 400 full time people. These highly skilled jobs are located throughout the state. Many more jobs would be created with a more ambitious goal for solar.

Industry development: Beyond the direct jobs in solar installation, building Tasmania's capacity in emerging technologies such as battery storage, smart grids and demand management will create the jobs of the future as the world moves to a decentralised and decarbonised energy system.

Price stability: Renewable energy technologies have high capital costs, but very low and predictable running costs. This contributes to long term price stability compared with the fossil fuel based alternatives, either coal fired power from Victoria or gas fired power from the Tamar Valley Power Station.

Energy literacy: Installation of solar PV gives homeowner a strong interest and motivation to better understand and manage their energy consumption. This will be an important driver of the uptake of new technologies such as local storage, demand management and integration of electric vehicle charging which ultimately can lead to a more flexible and economical electricity system.

References and further information

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Appendices

Appendix 1 – Calculation of a fair FiT

The following calculations are from the TREA submission to the Tasmanian state government Solar FiT Review {TREA 2018b}.

A fair feed-in tariff should take into account:

- a wholesale price that reflects the total benefit to Tasmania, not just the saving to Aurora
- the fact that locally generated and used energy does not make use of, and should not pay for, the transmission network
- avoided losses from transmitting electricity over long distances
- savings from less demands placed on the distribution network
- the reduced greenhouse gas emissions resulting from solar's role in reducing imports from Victoria
- the health benefits from reducing import of fossil fuel based electricity.

Taking the above factors into account our estimate of the value of a fair price for energy fed into the distribution network is in the range of 18 to 21.6c/kWh as per the following table.

Source of value	Minimum	Maximum
Wholesale value of energy	9.8	11.8
Avoided network losses	0.1	0.1
Avoided transmission costs	2.5	2.5
Reduced distribution costs	1.9	2.8
Reduced CO_2 emissions	2.4	3.1
Health benefits	1.3	1.3
	18	21.6

Wholesale electricity price

The current OTTER FiT rate is based on the wholesale price of energy set by the Treasurer {Gutwein 2018}. This was set by the government with the explicit objective of minimising regulated retail electricity prices and has been set at 7.968c/kWh for 2018-2019.

An alternative calculation of a Tasmanian wholesale price is that conducted by OTTER in accordance with clause 8.1(a) of the *Standing offer price approval process in accordance with the 2016 Standing Offer Determination (28 April 2016)*. For 2018-2019 this price is 9.806c/kWh.

The value of exported household energy in Tasmania should be the value to the state, not the saving to Aurora from the purchase of energy from Hydro Tasmania at regulated prices.

The two-way operation of Basslink allows Tasmania to export electricity to Victoria when Victorian prices are high and import from Victoria when Victorian prices are low. Tasmania's ability to maximise gains from this process is constrained by the export capacity of Basslink (500 MW) and the availability of water in dams in Tasmania.

We have calculated the value of Basslink imports and exports using data for Basslink flows and Victorian wholesale NEM prices obtained with the NEM Review product from Global Roam. Using data for every 30 minutes in 2017-2018, the average price for exported electricity was 11.8c/kWh and the average cost of imported electricity was 7.4c.

Any additional Tasmanian generation (or energy conservation) reduces the energy we import from Victoria and increases the amount we can export over Basslink at time of highest prices.

On the basis of these various approaches, we argue that the value to Tasmania of additional energy exported to the grid is between 9.8c/kWh and 11.8c/kWh depending on assumptions.

Transmission costs

Aurora passes on to consumers TasNetworks charges for the use of the transmission network irrespective of whether the energy is sourced via the transmission networks or locally from solar PV. Customers pay for a service that is not provided — use of the transmission network for the proportion of their energy that comes from distributed generation. Transmission charges should only apply to the electricity actually carried on the transmission network. These savings should be shared with solar owners. Allocating 80% of these savings to solar owners and 20% to the retailer would provide an incentive to the retailer to encourage distributed generation.

In the calculations above we have used 80% of the 3.19c transmission component of Tasmanian typical electricity costs as described in {Backroad 2016}.

Network losses

In Tasmania about 5% of centrally generated electricity is lost in the transmission and distribution networks[7]. Distributed solar PV avoids almost all these losses because the energy is used in the immediate vicinity. Applied to the 2018-19 Standing Offer determination rate of 9.8c this would equate to 0.5c. We have used a lower figure because we believe that no transmission costs and reduced distribution costs should be charged for solar PV and this would constitute double counting.

Distribution network savings

There are at least two ways in which distributed generation makes less use of the distribution network and reduces its costs. Exported energy from solar PV is typically used close to the point of export and therefore makes significantly less use of the 'poles and wires'. Also a significant proportion of the cost of the distribution network is the transformers which convert higher voltages down to 230V. Solar inverters have this capability built in and export power at 230V.

We have argued for additional mechanisms to reflect the higher value of distributed generation in areas where the distribution network is constrained. In order to determine the general value of distribution network savings we have used a somewhat arbitrary allowance of 20-30% of the 9.37c/kWh distribution component of Tasmanian typical electricity costs as described above.

Reduced CO_2 emissions

Each kWh of solar PV that displaces imported coal fired electricity from Victoria creates a reduction in CO_2 emissions that is worth a minimum of 2.4c to 3.1c using current carbon pricing estimates. Carbon pricing that met the global objective of keeping global warming well below 2°C would translate to a much higher value.

The Victorian single rate FiT for 2018-2019 is 9.9c/kWh {ESC Vic 2018} and this includes an allowance of 2.5c/kWh for the "avoided social cost of carbon". A similar allowance should be applied to the Tasmanian FiT since any increased solar generation in Tasmania reduces imports of mainly coal fired Victorian electricity.

[7] For example in the OTTER Final Report for the 2016 Regulated FiT Investigation Marginal loss factor and Distribution lost factor increase the FiT by a combined factor of 5.3%.

Health benefits

The best available Australian research suggests that each kWh of solar PV that displaces coal fired electricity contributes 1.3c in reduced health costs {ATSE 2009 p.46}. The health impacts of coal fired electricity are felt mainly on the mainland but this should not absolve Tasmania from the moral obligation to reduce these impacts when they arise from generating electricity imported into Tasmania.

This benefit is not currently reflected in any Australian FiTs but recent Victorian legislation makes provision for future FiTs to include a component based on the “avoided human health costs attributable to a reduction in air pollution”.

Appendix 2 – TREA letter to Aurora re metering software

Appendix 3 – Aurora response on metering software

Tasmanian Renewable Energy Alliance

www.tasrenew.org.au

221 Main Rd, Derwent Park TAS 7009

(0407) 486-651

5 February 2019

Rebecca Kardos
CEO
Aurora Energy
GPO Box 191
Hobart TAS 7001

by email: rebecca.kardos@auroraenergy.com.au

Dear Ms Kardos

Re: metering of solar PV

I am writing to request that Aurora ensure that residential customers with solar PV have access to meters (and meter software) that accurately reflects their actual consumption of energy from the grid. Specifically, we seek assurances:

- that all new meter installation on premises with new or existing PV installation are automatically provided with meters which correctly offset solar generation against consumption on both tariff 31 and tariff 41.
- that existing solar owners can request a meter swap (or a meter software upgrade) to fix this problem for free or a nominal cost.

As you are probably aware, this is a long-standing but still unresolved issue.

In August 2013 the Tasmanian Government's *Feed-in Tariffs: Transition to Full Retail Competition – Final Position Paper* stated that:

> *"The Government has instructed Aurora's network business to investigate and implement, as soon as practicable, a technical metering solution that provides small customers who connect a distributed generation system with the option of off-setting their on-site electricity consumption for hot water and heating – in addition to light and power – before any electricity is exported to the grid."*

TREA followed up on this issue with Aurora, with the Minister's office and then with TasNetworks when metering became their responsibility.

We worked with TasNetworks to document the problem and ensure that a meter software solution was available. Eventually we received a letter from Lance Balcombe on 1 March 2016 stating that a workable had been identified, but that:

> *"That solution involves bespoke firmware and software upgrades to our existing meters, and would require metering changes that could only be delivered to established feed-in tariff customers by an exchange of meters at the customer's premises."*

TasNetworks declined to implement this solution.

In November 2018 the *Solar Feed-In Tariff Review: Final Report* concluded that:

> *"…to improve customer benefits from solar, household metering arrangements that allow customers to offset all of their usage with the output from solar PV are desirable." (p.31)*

As solar installation in Tasmania are continuing at a rate of over 2000 per year and Aurora is undertaking an extensive program to upgrade meters across Tasmania to communicating smart meters we believe it would be unfair and irresponsible for Aurora to continue to install meters knowing that these short-change solar owners and that a software solution to fix this problem is available.

Please feel free to contact me by phone (0407) 486-651 or email at eo@tasrenew.org.au if you would like to discuss this further.

Yours sincerely

Jack Gilding
Executive Officer

cc: Lance Balcombe, CEO, TasNetworks, by email CEOExecutiveSupport@tasnetworks.com.au
Guy Barnett, Minister for Energy, by email guy.barnett@parliament.tas.gov.au

17 April 2019

Jack Gilding

Executive Officer

Tasmanian Renewable Energy Alliance

By email: eo@trea.com.au

Dear Mr Gilding

Re. Offsetting Customer Embedded Generation

Thank you for your letter of 5 February 2019, in which you seek a metering solution to provide to residential solar customers to offset their generation against consumption on both Tariff 31 (Light and Power) and Tariff 41 (Hot Water and Heating).

As you have indicated, the manner in which all customers' meters are configured means that electricity generated by a customer on-site can only be used to offset consumption against the general residential light and power tariff (Tariff 31), before the installation starts to export 'excess' electricity from embedded generation to the grid. Customers with multiple tariffs cannot offset consumption against any additional tariffs prior to any excess being exported.

Aurora Energy is committed to supporting its customers to manage their energy costs, and by extension, helping our residential solar customers maximise benefits of their solar installation. As such, our team is in close consultation with our Metering Coordinator, Metering Dynamics, who have invested considerable effort into investigating possible solutions.

One option considered would see solar customers purchase and install a second inverter. This would allow one inverter to be connected to Tariff 31 and the other to Tariff 41. Utilising two inverters would effectively allow a solar customer to offset generation against consumption on both tariffs. Unfortunately, this option has the limitation of not being a 'true' offset between the two tariffs, as the inverters would operate independently of each other.

These limitations are illustrated using an example of a home with solar panels situated on both the east and west sides of a roof. Because each inverter is servicing just one set of panels and is connected to just one of the tariffs, generation cannot be divided equally across the tariffs (See Figure 1. Limitations of double inverter method in Attachment A).

Aurora Energy and Metering Dynamics also looked at the possibility of using a two-element meter, which could sum the input from two individual elements into a single virtual meter. While this setup allows for the total load to be calculated and offset within the meter, it also has significant limitations. Under the current metrology methods accepted and used by all parties, the Meter Data Provider (Metering Dynamics) is required to publish all channels (data from individual elements) to the National Electricity Market ('the market') through the Australian Energy Market Operator (AEMO). Aurora Energy is then billed by AEMO, according to the data provided by the Meter Data Provider. In the above scenario, Aurora Energy would be billed for the customer's total load, plus the individual load collected by each element, effectively meaning Aurora Energy would be charged twice for each customer's consumption (See Figure 2. Limitations of double element virtual metering method in Attachment A).

From a customer's perspective, under this option there would be inconsistency in the data Aurora Energy provides to the customer when compared against the basis on which they are billed. This would make it difficult for the customer to reconcile their consumption data with the bill they receive. This would be due to Aurora Energy having to manipulate the data received through the market to bill the customer. However, the data Aurora Energy provides the customer is required to follow the AEMO Metering Data Provision Procedure, resulting in a mismatch in billed consumption. This would also have the potential to cause an issue if it was ever necessary for Aurora Energy to reverse and rebill a customer as the standard billing process would not be followed, leading to a poor customer experience.

I understand members from Aurora Energy's Metering Services, and Corporate Affairs & Stakeholder Relations teams have informed you that due to these significant limitations, Aurora Energy cannot reasonably progress either option as a means to support solar customers.

While we have not been able to identify an in-meter solution, I would suggest that some solar customers currently on Tariff 31/41 would benefit from moving to a single tariff arrangement. The options available are time-of-use Tariff 93, or Tariff 31. The benefits of switching would vary from customer to customer, depending on a number of factors, including the times of day they use energy the most, and their primary method of heating. For other customers, investing in a battery may also be a beneficial option.

As each home and lifestyle is different, we encourage customers to contact a member of our team for advice on **1300 13 2003** (Monday to Friday 8am – 6pm).

Thank you again for your letter, Aurora Energy looks forward to continuing to work closely with you in future on both this matter and those which support the Tasmanian Renewable Energy Alliance and its members.

Yours sincerely

Rebecca Kardos

Chief Executive Officer/Managing Director

Attachment A

Figure 1. Limitations of double inverter method

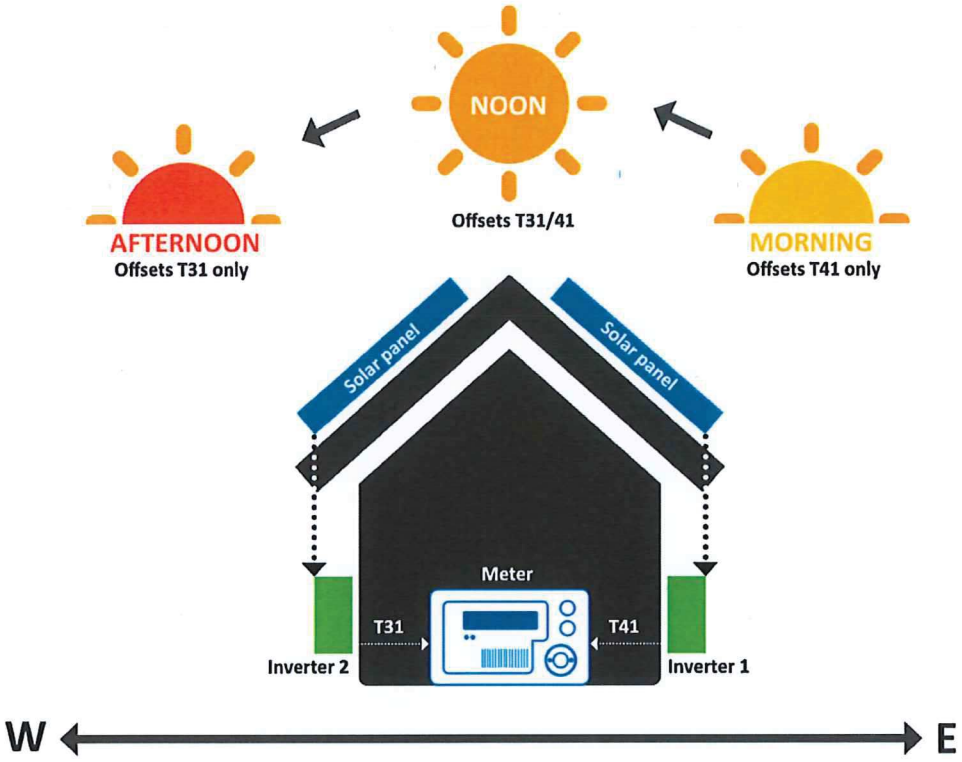
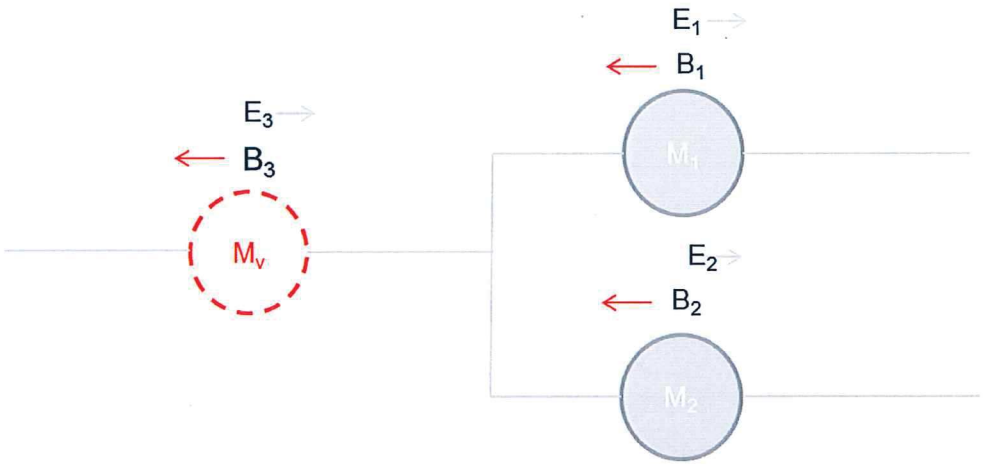


Figure 2. Limitations of double element virtual metering method



Data provider to the market by Meter Data Provider:

- E1 – Load Element 1
- B1 – Solar Element 1
- E2 – Load Element 2
- B2 – Solar Element 2
- E3 – Total Load less total Solar Offset
- B3 – Total Solar Export

Data required for accurate Billing (unsupported):

- M1 – Load used of Tariff1 (less solar contribution)
- M2 – Load used of Tariff2 (less solar contribution)
- M3 – Total Solar Export