



**Investigation to determine the Regulated Feed-in Tariff
Rate for Standard Feed-in Tariff Customers**

Final Report

May 2016

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EXECUTIVE SUMMARY

A Feed-in Tariff (FiT) is a pricing mechanism whereby an electricity utility pays a customer for the excess electricity generated by the customer's micro distributed generation systems and exported (ie 'fed-in') to the electricity grid.

The *Electricity Supply Industry Act* 1995 (the ESI Act) requires the Tasmanian Economic Regulator (Economic Regulator) to make a FiT rate determination, which sets the rate to be paid by authorised retailers to Standard FiT customers for energy exported to the electricity grid.

Before the Economic Regulator makes a determination it is required to conduct a pricing investigation. The Economic Regulator's Notice of its intention to conduct an investigation, was published on 2 July 2015. The objective of the pricing investigation was to gather information to assist the Economic Regulator in making a determination.

Section 44H of the ESI Act sets out the legislative principles the Economic Regulator is required to consider when making a FiT rate determination. In addition to these legislative principles the Economic Regulator has considered:

- decisions made by regulators in other jurisdictions;
- the specific circumstances applying in Tasmania; and
- issues raised in submissions on its Draft Report and Draft Determination.

In February 2016, the Economic Regulator released its Draft Report discussing a range of costs and issues the Economic Regulator proposed considering in calculating a 'fair and reasonable' FiT for standard customers in Tasmania. The Economic Regulator sought written submissions during a consultation period ending on 15 March 2016. Submissions were received from the Tasmanian Renewable Energy Alliance, the Tasmanian Greens, Save our Solar and a number of private citizens. Issues raised during public consultation and the Economic Regulator's decisions on these issues are set out in a separate Statement of Reasons which is available on the Economic Regulator's website.

This Final Report discusses a range of costs and issues the Economic Regulator has considered in determining the FiT rate.

The Economic Regulator has also made its 2016 Regulated FiT Rate Determination for the regulatory period 1 July 2016 to 30 June 2019. The Determination is available on the Economic Regulator's website: www.economicregulator.tas.gov.au.

The Determination will apply to Standard FiT customers for the duration of the regulatory period and to Transitional FiT customers for billing periods, and parts of billing periods, that expire on or after 1 January 2019. Standard FiT customers are customers who have an eligible system, but do not meet the Government's requirements for the Premium FiT rate available to Transitional FiT customers.

CALCULATING AND UPDATING THE FIT RATE

Based on the final decisions outlined in this Report, the Economic Regulator will calculate the FiT rate for each period of the regulatory period using the following formula:

$$\text{FiT}_y = (\text{WEP}_y \times \text{MLF}_y \times \text{DLF}_y) + \text{AEMO}_y$$

Where:

FiT_y is the regulated fair and reasonable feed in tariff in c/kWh

y is the period

WEP_y is the wholesale electricity price calculated by the Economic Regulator in accordance with Aurora Energy Pty Ltd's 2016 Standing Offer Determination, during the annual standing offer price approval process, expressed in c/kWh.

MLF_y means the load weighted average marginal loss factor at the regional reference node for Tasmania for the relevant period as approved by the Economic Regulator in accordance with Aurora Energy Pty Ltd's 2016 Standing Offer Determination during the annual standing offer price approval process.

DLF_y means the load weighted average distribution loss factor for the relevant period as approved by the Economic Regulator in accordance with Aurora Energy Pty Ltd's 2016 Standing Offer Determination during the annual standing offer price approval process.

AEMO_y means the forecast charge, as billed by AEMO for market participant and ancillary services fees estimated by the Economic Regulator in accordance with Aurora Energy Pty Ltd's 2016 Standing Offer Determination, during the annual standing offer price approval process, expressed in c/kWh.

Applying the formula set out in Chapter 7 of this report and adopting the Wholesale Electricity Price (WEP) calculated by the Economic Regulator on 19 April 2016 for its 2016 Standing Offer Pricing Investigation, the indicative FiT Rate for the period from 1 July 2016 to 30 June 2017 is 6.639 c/kWh.

This FiT Rate is indicative only as the actual rate to apply for 2016-17 will be determined during the standing offer price approval process in June 2016. The FiT Rate for 2016-17 will be published in mid-June 2016 at the same time as standing offer prices for 2016-17 are published.

The Economic Regulator will also update the FiT Rate each time standing offer prices are updated.

ISSUES OUTSIDE THE SCOPE OF THIS INVESTIGATION

During the consultation period the Economic Regulator received submissions raising a number of issues which were outside the scope of its investigation.

Issues requiring legislative change

Submissions recommended that:

- the FiT rate be determined by the Treasurer, not the Economic Regulator, and
- the generation capacity threshold for eligibility for the regulated FiT be raised to 100 kW.

The *Electricity Supply Industry (Pricing and Related Matters) Regulations 2013* (Pricing Regulations) state that the Economic Regulator is responsible for determining the FiT rate while the ESI Act specifies the qualifying system requirements that must be met in order to be eligible for the FiT rate. Both proposals would therefore require legislative amendment and are, therefore, outside the scope of this investigation and outside of the Economic Regulator's control.

Economic and employment impacts

A number of submissions suggested that, in setting the FiT rate, the Economic Regulator should account for the employment opportunities associated with a growing solar industry. The Economic Regulator considers that this is an issue beyond the scope of its investigation and further notes that to raise the FiT rate in order to promote employment or industry development would contravene its legislative obligations to prevent cross-subsidisation.

Energy security impacts

A number of submissions suggested that, in setting the FiT rate, the Economic Regulator should account for the energy security benefits of distributed generation.

Energy security encompasses a wide range of issues and considerations. Determining what role, if any, the FiT rate should have in ensuring the security of Tasmania's energy supply would require analysis of both its advantages and disadvantages, as well as its merits relative to large-scale generation. This analysis is beyond the scope of this investigation.

Technological development

A number of submissions suggested that, in making the FiT rate determination, the Economic Regulator should take into account the impact of technological developments such as battery storage and electric cars. The Economic Regulator continues to monitor the development of new technologies and the influence they may have on the Tasmanian electricity network. However, at this stage these developments are still in their infancy and the Economic Regulator considers it too early to know what role, if any, the regulated FiT rate could have on their development.

Metering issues

Several submissions raised concerns that homeowners who invested in solar after 2013 were not receiving the full benefit of their contribution to the grid due to software issues with TasNetworks' meters. Metering is TasNetworks' responsibility, and issues relating to metering solutions and their funding are a matter for the Government and TasNetworks.

DIRECT IMPACTS CONSIDERED AS PART OF THIS INVESTIGATION

The Economic Regulator has decided that the following direct impacts should be considered when determining a 'fair and reasonable' FiT for standard FiT customers in Tasmania:

- wholesale electricity costs;
- network losses; and
- National Electricity Market (NEM) fees.

As part of its investigation, the Economic Regulator considered whether it should include any of the following direct impacts in its FiT rate calculation:

- reduced wholesale electricity costs;
- avoided transmission and distribution network charges;
- Renewable Energy Target costs;
- retail operating costs; and
- retail margin.

However, the Economic Regulator was not presented with evidence of material and measurable benefits arising from these items, it was unable to take any of these impacts into account in determining the FiT rate. These issues are discussed in more detail in Chapter 5 of this Report.

INDIRECT IMPACTS CONSIDERED AS PART OF THIS INVESTIGATION

As part of its investigation the Economic Regulator considered whether it should include any of the following indirect impacts when making its FiT rate determination:

- reductions in average network loss factors as a result of increased solar PV uptake;
- the impact on wholesale electricity prices of increased distributed generation;
- the deferral of network augmentation costs; and
- the potential need for network reinforcement costs.

In respect of each of these issues the Economic Regulator was not persuaded there was evidence of material or measurable benefits in relation to these impacts. As a result, the Economic Regulator has not taken any of these issues into account in determining the FiT rate.

Environmental impacts

The Economic Regulator acknowledges the environmental benefits of solar PV, however it was not presented with any evidence that existing mechanisms (such as the Small-scale Renewable Energy Scheme) were not sufficiently compensating solar PV owners for these benefits. In fact, as discussed in Section 6.5 of this Report, recent evidence gathered by the Queensland Productivity Commission suggests that the FiT is actually an inefficient mechanism for carbon emissions abatement.

1 INTRODUCTION

A Feed-in Tariff (FiT) is a pricing mechanism whereby an electricity utility pays a customer for the excess electricity generated by the customer's micro distributed generation systems and exported (ie 'fed-in') to the electricity grid.

1.1 Legislative framework and requirements

Section 44G of the *Electricity Supply Industry Act 1995* (ESI Act) requires the Economic Regulator to make a FiT rate determination, which sets the rate to be paid by authorised retailers to standard FiT customers for energy exported to the electricity grid. The determination applies to the regulatory period that commences on 1 July 2016 and ends on 30 June 2019.

Under section 44C(d) of the ESI Act, standard FiT customers are those customers who installed a qualifying system but did not qualify for the Government's transitional FiT rate.

Specifically, standard FiT tariff customers are customers who entered into a contract to install a qualifying new micro distributed generation system or extend an existing micro distributed generation system after 31 August 2013.

A qualifying system is defined in section 44B of the ESI Act as a system that:

- generates electricity from either solar, wind or water;
- complies with Australian Standard AS4777; and
- has a maximum generating capacity of 10kW (single phase) / 30kW (three-phase).¹

Transitional FiT customers are customers who:

- had a qualifying micro distributed generation system installed as at 31 August 2013; or
- who entered into a contract to install a qualifying new micro distributed generation system or extend an existing micro distributed generation system, and submitted an application which was accepted with respect to that installation before 31 August 2013 with the new system or extension installed and connected before 31 August 2014.

¹ Customers with systems with generating capacity greater than 10kW continue to be eligible for the transitional feed-in rate where, prior to 31 August 2013, an application to connect a larger capacity system was submitted and accepted by the electricity distributor.

In respect of billing periods, and those parts of billing periods that expire before 1 January 2019, transitional FiT customers continue to be entitled to receive the FiT rates specified in Table 1.1.

Table 1.1 Feed-in tariff rates for transitional feed-in tariff customers

Customer Type	Column 1 c/kWh	Column 2 c/kWh for first 500 kWh supplied during each billing period	Column 3 c/kWh for each kWh supplied after the first 500 kWh during each billing period
Residential	28.283 (including GST)	N/A - see Column 1	N/A - see Column 1
Small Business	N/A – see Columns 2 and 3	38.577 (including GST)	28.319 (including GST)

Before the Economic Regulator makes a determination, Regulation 47B of the *Electricity Supply Industry (Pricing and Related Matters) Regulations 2013* (Pricing Regulations) requires the Economic Regulator to conduct a pricing investigation. The Economic Regulator's Notice of the intention to conduct an investigation, was published on 2 July 2015.²

The objective of the pricing investigation was to gather information to assist the Economic Regulator in making a determination.

In February 2016 the Economic Regulator released its Draft Report discussing a range of costs and issues the Economic Regulator had considered in calculating a 'fair and reasonable' FiT for standard customers in Tasmania. The Economic Regulator sought written submissions during a consultation period ending on 15 March 2016. Submissions were received from the Tasmanian Renewable Energy Alliance, the Tasmanian Greens, Save our Solar and a number of private citizens. A Statement of Reasons has been released which addresses the issues raised by submissions and outlines the Economic Regulator's decision in respect to each issue.

This determination applies to Standard FiT customers for the entirety of the regulatory period and to customers who are currently Transitional FiT customers in respect of billing periods, or parts of billing periods, that expire on and after 1 January 2019 until the end of the regulatory period on 30 June 2019.³

² The Economic Regulator decided on 29 April 2016 to extend the date for completion of its Final Report and the making of its Determination and advised stakeholders, through the OTTER website, that it would release its Final Report and make its Determination on or before 6 May 2016. An amended notice was published on the OTTER website on 3 May 2016.

³ According to TasNetworks' *Annual Electricity Distribution Network Performance Report 2014-15*, as at 30 June 2015 there were 18 665 Transitional FiT customers and 4 127 Standard FiT customers.

1.2 Matters to be considered

In accordance with section 44H of the ESI Act, the Economic Regulator is required to consider the following matters when making a FIT determination:

- (a) the fair and reasonable value to authorised retailers of electricity supplied to the distribution network by feed-in tariff customers;
- (b) the net financial benefit, to authorised retailers, of electricity supplied to the distribution network by feed-in tariff customers, having regard to the costs of authorised retailers, including, but not limited to including –
 - (i) the costs to authorised retailers of purchasing wholesale electricity; and
 - (ii) other costs of authorised retailers in operating their retail electricity businesses;
- (c) the other costs, or other benefits, that –
 - (i) include those related to the distribution networks or transmission networks; and
 - (ii) result, either directly or indirectly, from the supply of electricity to distribution networks by qualifying systems at premises of small customers;
- (d) the COAG National Principles for Feed-in Tariff Arrangements, as those Principles apply from time to time;
- (e) any arrangements of the Commonwealth, whether legislative or otherwise, in relation to the pricing of carbon emissions or other mechanisms to reduce the use of carbon-emitting fuels;
- (f) the principle that the feed-in tariff rate specified in the determination should not have the effect that any customer would effectively be cross-subsidising any other customer;
- (g) approaches, methodologies, findings or recommendations, taken or made in other jurisdictions for determining fair and reasonable feed-in tariff rates;
- (h) any prescribed matters; and
- (i) any other matter the Regulator thinks relevant.

Regulation 47C of the Pricing Regulations requires the Economic Regulator to give notice of its intention to conduct a pricing investigation. Regulation 47C(2) requires the notice to specify the following:

- (a) The objective of the investigation; and

- (b) The period within which, and the form in which, submissions may be made to the Regulator; and
- (c) The matters that the Regulator would like submissions to address; and
- (d) The date by which the Regulator is to complete the pricing investigation by providing a final report in relation to the investigation.

Notice of the 2016 Investigation (setting out the above requirements) was published on the Economic Regulator's website on 2 July 2015.

In response to the Economic Regulator's Notice of intention to conduct a Regulated Feed-in Tariff Investigation, the Tasmanian Renewable Energy Alliance (TREA) lodged an initial submission. This initial submission provided TREA's comments on the contents of the Notice and the proposed investigation process and identified the factors it considered should be taken into account when determining the FiT rate. TREA lodged a more detailed submission on the Economic Regulator's Draft Report and Draft Determination. A copy of TREA's initial submission is available on the Economic Regulator's website.

The Economic Regulator advised stakeholders on 29 April 2016 that it would release its Final Report and make its Determination on or before 6 May 2016. Copies of both notices are available on the Economic Regulator's website: www.economicregulator.tas.gov.au.

1.3 Investigation process and timing

In preparing this Final Report the Economic Regulator considered the matters listed in section 1.2 of this Report and in particular considered:

- decisions made in other jurisdictions;
- the specific circumstances applying in Tasmania; and
- issues raised in submissions on the Draft Report and Draft Determination.

The release of this Report signifies the completion of the investigation, as outlined in Table 1.2.

Table 1.2 Investigation timetable

Milestone	Date
Publish Notice of Investigation	July 2015
Release Draft Report	31 January 2016
Submissions due on Draft Report	15 March 2016
Release Final Report	5 May 2016

1.4 Report structure

This Final Report discusses a range of costs and issues the Economic Regulator has considered in calculating a 'fair and reasonable' FiT for standard FiT customers in

Tasmania. The Economic Regulator's decisions are included in this Final Report. Issues raised during public consultation, and the Regulator's decisions on these issues are set out in a separate Statement of Reasons which is available on the Economic Regulator's website.

The Report is structured as follows:

- Chapter 2 provides background for the investigation, including the Council of Australian Government's (COAG's) agreed principles.
- Chapter 3 provides a summary of decisions made by regulators in other jurisdictions.
- Chapter 4 summarises the issues raised by stakeholders that were outside the scope of the investigation.
- Chapter 5 considers the direct financial impacts on retailers as a result of purchasing excess electricity generated by micro distributed generation systems and the implications for a 'fair and reasonable' FiT for Tasmania.
- Chapter 6 considers the indirect impacts of micro distributed generation systems and the implications for a 'fair and reasonable' FiT for Tasmania.
- Chapter 7 outlines the formula for calculating a 'fair and reasonable' FiT for Tasmania, an indicative value for the FiT from 1 July 2016, the process for updating the FiT and details of when the FiT rate for 2016-17 will be published.

2 BACKGROUND

Electricity produced by grid-connected customers is generally referred to as 'distributed generation', the most common form of which is small-scale, solar Photo Voltaic (PV) panels. Distributed generation systems are typically connected to the grid through 'import/export' meters. These meters record the quantity of electricity drawn from the grid separately from the amount that the micro distributed generation system feeds into the grid.

Up until 30 August 2013, Aurora Energy offered, on a voluntary basis, a FiT based on a net metering buyback scheme (NMBS) which offered customers a 'one-for-one' (1:1) FiT at the regulated light and power tariff (Tariff 31 for residential customers) or general supply tariff (Tariff 22 for small business customers) for their net exported electricity.

In December 2012, the Council of Australian Governments (COAG) agreed to revised National Principles for Feed-in Tariff Arrangements (see Attachment A). These revised principles outline, amongst other issues, that all premium FiT arrangements are to be closed to new participants by 2014. Furthermore, all other FiT customers are to receive a 'fair and reasonable' value for their exported electricity. Consistent with this, all Australian jurisdictions including Tasmania have now closed their premium FiT schemes (with various 'grandfathering' provisions put in place for customers receiving the benefit of those premium FiT schemes as at the date of the change) and have determined new 'fair and reasonable' values for exported electricity for new FiT customers.

Consistent with the COAG reforms, a review of the FiT rate for Tasmania was conducted in 2013. Following the release of an issues paper on 16 May 2013 and consideration of submissions received on that paper, the following policy position was announced on 18 August 2013:

- the then current one-for-one FiT arrangement to be closed at midnight on 30 August 2013 and grandfathered for existing (or contracted) installations until 1 January 2019;
- customers applying to install eligible micro distributed generation systems on or after 31 August 2013 to be entitled to a FiT of 8 cents per kWh from 31 August 2013 until 31 December 2013;
- the Economic Regulator to be required to determine the FiT rate to apply from 1 January 2014 for all new installations occurring on or after 31 August 2013; and
- the Economic Regulator to be required to review the FiT rate on an annual basis.

In accordance with Terms of Reference received from the then Minister for Finance on 20 August 2013, the Economic Regulator conducted an investigation and, on

31 October 2013, provided a special report to the Minister in accordance with section 9 of the ESI Act. In its special report, the Economic Regulator recommended the 'fair and reasonable' value of a FiT to apply from 1 January 2014.

Legislation was passed in November 2013 which, amongst other things, provided the legal power for the first FiT determination to be made, consistent with the recommendation made by the Economic Regulator as to the minimum FiT rate in its report of October 2013.

The Economic Regulator subsequently made its *Regulated Feed in Tariff Determination for Standard Feed in Tariff Customers* on 6 December 2013, following the commencement of the relevant legislation. The 2013 Regulated FiT Rate Determination reflected the recommendations made in the Economic Regulator's October 2013 inquiry report. The 2013 Regulated FiT Rate Determination commenced on 1 January 2014 and expires on 30 June 2016.

The regulated FiT rates applying to standard FiT customers under the Regulated FiT Rate Determination are as shown in Table 2.1.

Table 2.1 Regulated FiT rates for standard FiT customers by period⁴

Period	c/kWh (excluding GST)
1 January 2014 - 30 June 2014	8.282
1 July 2014 - 30 June 2015	5.551
1 July 2015 - 30 June 2016	5.500

2.1 Scope and structure of the FiT

The Economic Regulator is required to determine a 'fair and reasonable' FiT for micro distributed generation systems, as defined in Chapter 1. The Economic Regulator, is also required to assess the costs accruing, and benefits flowing, to customers, authorised retailers and distributors.

The Economic Regulator understands that solar PV systems are by far the most common source of micro distributed generation system in Tasmania. Given this, and considering the costs and benefits of determining different FiT rates for different generation technology types, the Regulator is proposing to determine a single FiT rate. As a consequence, much of the analysis in this report focuses on solar PV systems, though not exclusively. This approach is largely consistent with the approach adopted in other Australian jurisdictions.

That said, the Economic Regulator understands that other forms of eligible micro distributed generation systems exhibit similar characteristics to solar PV. Specifically, this includes how it is used by customers, how it is exported and the impact on the

⁴ The Economic Regulator determined the FiT rates to apply for 2014-15 and 2015-16 in June 2014 and June 2015 respectively.

electricity network more broadly. Furthermore, based on the analysis in this report, the conclusion reached with respect to a 'fair and reasonable' FiT would, at present, be similar irrespective of the electricity generation technology source.

However, should conditions materially change in the future the Economic Regulator may consider differential FiT arrangements based on generation technology.

Given the above, the terms 'micro distributed generation' and 'solar PV' are interchangeable throughout this Report.

3 DECISIONS MADE BY REGULATORS IN OTHER JURISDICTIONS

This Chapter provides an overview of recent FiT decisions in other jurisdictions with respect to calculating the 'fair and reasonable' value of energy exported to the grid by small customers.

The information outlined in this Chapter has been used to inform the Economic Regulator's decision in respect to the regulated FiT for Tasmania in subsequent sections of this Report.

3.1 Methodologies

Australian state and territory regulators have used one of two main methodologies to determine the FiT:

- the direct financial gain to retailers method; and
- the wholesale market method.

Each of these methods are discussed below.

3.1.1 Direct financial gain to retailers method

Under the direct financial gain to retailers method, changes in a retailer's costs and revenues arising from the export of excess electricity generated from solar PV systems to the grid are calculated taking into account the following costs:

- wholesale electricity purchases – since retailers are purchasing from solar PV customers and not from large scale generators;
- NEM market and ancillary fees – because these are levied on a retailer's net purchases through the NEM as measured by the Australian Energy Market Operator (AEMO); and
- electricity network losses - since solar PV exports are consumed close to where they are exported.

3.1.2 Wholesale market method

Under the wholesale method it is assumed that solar PV customers are like the large scale generators who sell electricity to energy retailers in the NEM. Importantly, under this method the price paid to the solar PV system owner for solar PV system exports takes into account the time when the excess electricity is exported.

This approach requires the following data to be obtained and analysed:

- obtain historical data on the market spot price on a half hourly basis;

- obtain historical data on the times of the day in which solar PV systems tend to be exporting to the grid; and
- forecast the spot price for the times of the day when solar PV systems are exporting to the grid.

The historical and forecast wholesale market values of solar PV exports are adjusted for electricity network losses on the basis that solar PV exports are consumed close to where they are exported.

3.2 Decisions of other regulators

3.2.1 New South Wales

In 2015, in response to a request made under s43ECA of the *Electricity Supply Act 1995* (NSW) by the New South Wales Government, the Independent Pricing and Regulatory Tribunal (IPART) was asked to determine the retailer contribution and the voluntary benchmark range for solar FiT as a guide for households and small businesses with solar PV installations.

The retailer contribution is the component the retailer is required to pay eligible customers in accordance with NSW's Solar Bonus Scheme⁵ for electricity exported to the distribution network.

The voluntary benchmark range is IPART's estimate of the wholesale market value of solar PV exports for net metered customers. In its previous 2012 report, IPART stated that it considered that publication of the benchmark range would exert competitive pressures on those retailers who did not offer a FiT at that time.⁶

In determining the FiT rate in both 2013 and 2015, IPART has adopted the wholesale market method. For 2015-16 IPART estimated a benchmark range of between 4.7 cents per kWh and 6.1 cents per kWh and a retailer contribution of 5.2 cents per kWh.⁷

3.2.2 Queensland

In June 2015, in response to a request from the Minister for Energy and Water Supply under section 93 of the *Electricity Act 1994 (Qld)*, the Queensland Competition

⁵ The Solar Bonus Scheme commenced on 1 January 2010 and operates until 31 December 2016. The Scheme provides a subsidised FiT of 60 cents per kWh and is closed to new applicants.

⁶ IPART, *Solar feed-in tariffs, Setting a fair and reasonable value for electricity generated by small scale solar PV units in NSW*, Final report, 2012, page 3.

⁷ IPART, *Solar feed-in tariffs, The subsidy-free value of electricity from small-scale solar PV units in 2015-16*, Energy – Final Report (October 2015).

Authority (QCA) was required to determine the FiT for customers in regional Queensland for the 2015-16 financial year.⁸

The QCA adopts the direct financial gain to retailer method for estimating a fair and reasonable FiT and, for 2015-16, estimated a FiT rate of 6.348 cents per kWh.⁹

3.2.2.1 Queensland Productivity Commission Inquiry

In August 2015, the Queensland Government requested the Queensland Productivity Commission conduct an inquiry with the objective of determining a fair price (or prices) for solar power generated by small (residential and business) customers that was exported to the electricity grid.

In March 2016 a Draft Report detailing the results of the inquiry was released for public consultation. The report proposes 'that a price for solar exports will be fair when solar PV owners are receiving an efficient price for the energy they generate – and remaining electricity consumers are not paying more (or less) than they should for solar PV generated energy.'¹⁰ Some key findings and recommendations from the Commission's Draft Report include:

- Solar export pricing arrangements should be assessed against the following principles to determine whether they are fair:
 - Efficiency - Are the pricing arrangements consistent with achieving economic efficiency? Efficiency is broadly defined to ensure resources are allocated to their highest valued use (including accounting for environmental externalities), output is produced at minimum cost and new processes, systems and services are introduced in a timely way.
 - Equity - Do the pricing arrangements avoid cross-subsidies? If a subsidy is proposed, is there a well-developed rationale? If so, how should it be funded?
 - Policy governance and practice — Where prices are regulated, is the regulatory framework transparent and robust? Is it as simple as possible and appropriately balances efficiency versus simplicity where there is a trade-off? Are policies and regulation technology-neutral?

⁸ The QCA was not required to determine a FiT to apply to customers in South-East Queensland in recognition of the competition that exists between retailers operating in that market.

⁹ QCA, *Solar feed-in tariff for regional Queensland*, Final Report, June 2015.

¹⁰ Queensland Productivity Commission, *Solar Feed-in Pricing in Queensland: Draft Report*, March 2016, page xvi.

- The Queensland Government should not increase feed-in tariffs to pay solar investors for reducing carbon emissions. Investors already receive a subsidy from the SRES for emissions reduction.
- The Queensland Government should not increase feed-in tariffs to induce industry development, wholesale market and network infrastructure effects or other social impacts. The evidence suggests that such a policy would come at a net cost overall, and would not be fair.
- The distributional impact of subsidies to Solar PV is to transfer income from non-solar households to solar households and raise the costs of living for those on lowest incomes.

3.2.3 Victoria

Under section 40FBB of the *Electricity Industry Act 2000* (Vic) the Essential Service Commission (ESC) may determine a FiT rate for purchases of small renewable energy generation electricity. In making its determination the ESC is required to take the following factors into account:

- prices of electricity in the wholesale electricity market; and
- any distribution and transmission losses avoided in Victoria by the supply of small renewable energy generation electricity.

Applying the direct financial gain to retailer method, the ESC estimated a FiT rate of 5.0 cents per kWh for the 2016 calendar year.¹¹

3.2.3.1 ESC Inquiry

On 11 September 2015, the Victorian Government requested the ESC to conduct an inquiry with the objective of establishing the true value of distributed generation to Victorian consumers.

In particular, the inquiry is to:

...investigate whether current regulations for compensating Victorian households and businesses for generating solar power are adequate. It will also consider the environmental and social value of distributed generation.

The inquiry findings will be used to inform how feed-in tariffs – the amount people are paid for the solar power they produce for the network – should be structured in Victoria.¹²

¹¹ ESC, *Minimum electricity feed-in tariff to apply from 1 January 2016 – 31 December 2016*, August 2015.

¹² Minister for Energy and Resources, "Getting a Better Deal for Families with Solar Panels", 12 September 2015, <http://www.premier.vic.gov.au/getting-a-better-deal-for-families-with-solar-panels/>

Under the Terms of Reference, the ESC's draft report was to be presented to Government by the end of November-2015 with the final report to be submitted to Government by the end of February 2016.

However, in December 2015, the ESC released a Proposed Approach Paper¹³ in which the ESC proposed that:

...the focus of this inquiry is on identifying the public benefit (as opposed to the private benefit) that arises from the investment in distributed generation, and determining whether and how a distributed generator is rewarded for any quantified public benefit it generates.

For the purposes of this inquiry, the Commission is proposing to define three elements of public benefit that could flow from the investment in distributed generation. These are:

- The economic benefit of distributed generation to the electricity market and distribution network.
- Any environmental benefit that can be attributed to distributed generation.
- Any other benefits that can be attributed to distributed generation.¹⁴

Based on the ESC's research at that time, the Proposed Approach Paper noted the following observations:

The electricity generated by a distributed generator can have an economic benefit to the wholesale electricity market. This is currently reflected in the feed-in tariff rate calculated annually by the Commission. The benefit to the electricity market varies by time and location. The Commission is proposing to evaluate the merits of developing a methodology for calculating the economic benefit on a time-of-use and locational basis.

The electricity generated by a distributed generator can reduce the carbon emissions associated with the supply of electricity. In the absence of a carbon price this benefit is no longer reflected in the electricity price. However, the existence of the Renewable Energy Target (RET) may mean that the environmental benefit of distributed generation is sufficiently reflected in the payments available via the RET. For sources of distributed generation not eligible for the RET, it is possible to calculate a carbon benefit based on the emissions intensity of the distributed generator.

Distributed generation can have an economic benefit to the distribution network. The extent of this value is highly dependent on the time and location of the generation. The Commission is proposing to take forward further work to

¹³ ESC, *Inquiry into the true value of distributed generation – Proposed Approach Paper*, December 2015.

¹⁴ Ibid, pages III-IV.

determine if it is possible to develop a methodology to enable the calculation of this benefit.

The Commission has so far been unable to identify specific environmental or other public benefits that a distributed generator provides to the distribution network, that are easily quantifiable. We are seeking evidence from stakeholders as to whether these benefits can be identified and quantified.¹⁵

Stakeholder submissions on the Proposed Approach Paper closed on 12 February 2016.

The Proposed Approach Paper also indicated that draft reports on the energy value of distributed generation and the network value of distributed generation would be released in April 2016 and October 2016 respectively with the respective final reports released in August 2016 and February 2017.

At the time of publication of this report the ESC's draft report on the energy value of distributed generation had not been released.

3.2.4 South Australia

Under section 25 of the *Essential Services Commission Act 2002* (SA) the Essential Service Commission of South Australia (ESCOSA) may make pricing determinations. Further, in accordance with section 35A(1)(ba) of the *Electricity Act 1996* (SA), ESCOSA may determine feed-in tariffs in relation to electricity fed-in to a distribution network having regard to the fair and reasonable value to a retailer of electricity fed into the grid (section 35A(2a) of that Act).

ESCOSA also adopts the direct financial gain to retailer method and considered, similar to the outcomes in other jurisdictions, that the avoided costs are limited to wholesale costs, network losses and NEM fees.

For the 2016 calendar year ESCOSA determined a FiT rate of 6.8 cents per kWh.¹⁶

¹⁵ Ibid, pages IV-V.

¹⁶ ESCOSA, *Retailer feed-in tariff 2016*, 2 December 2015.

4 ISSUES OUTSIDE THE SCOPE OF THIS INVESTIGATION

This Chapter addresses the issues raised during consultation on the Economic Regulator's Draft Report and Determination which were outside the scope of the investigation.

The Economic Regulator has also published a Statement of Reasons to accompany this Report and Determination which discusses, in more detail, the issues outlined in this Chapter.

4.1 Scope of the investigation and determination

A number of submissions considered that the FiT should be based on the system-wide benefits of micro distributed generation, and that the investigation and determination were too narrowly focused on the financial benefit to retailers. In particular, the Tasmanian Renewable Energy Alliance (TREA) noted that:

The "Principles to be taken into account in making feed-in tariff rate determinations" as set out in section 44H of the Electricity Supply Industry Act 1995 focus mainly on the benefits to retailers.

However section 44H (c) of the [ESI Act] does require the Regulator to take into account 'the other costs, or other benefits, that...the Regulator considers relevant, including, but not limited to including those related to the distribution networks or transmission networks'.

By recommending that only benefits that flow to retailers from distributed generation be included in the calculation of the FiT the Regulator has short changed Tasmanians.

As noted by TREA Section 44H(c) grants the Economic Regulator a wide degree of discretion to account for:

...other costs, or other benefits the Economic Regulator considers relevant.

However, section 44H(f) of the ESI Act also states that:

...the feed-in tariff rate specified in the determination should not have the effect that any customer would effectively be cross subsidising any other customer.

Further, section 44H(d) of the ESI Act requires the Economic Regulator to take into account the *COAG National Feed-in Tariff Principles (Attachment A)*, one of which states:

That any jurisdictional or cooperative decisions to legislate rights for micro generation consumers to receive more than the value of their energy must:

(c) give explicit consideration to compensation by public funds or specific levies rather than cross-subsidised by energy distributors or retailers; and

(d) not impose a disproportionate burden on other energy consumers without micro generation.

The Economic Regulator also notes that the QCA has found that:

...setting the retailer-funded feed-in tariff at a rate any higher than the direct financial benefit to retailers would likely result in retailers increasing electricity prices for all customers to cover costs that exceed the benefit that they receive.¹⁷

The Economic Regulator aims to recognise benefits associated with the uptake of solar PV insofar as they are material, measurable and don't breach other criteria for setting the FiT rate. The Economic Regulator considers that setting the FiT at a rate any higher than the direct financial benefit to retailers would likely result in retailers increasing electricity prices for all customers to cover costs.

Raising the FiT rate for reasons which are not measurable and material would introduce cross-subsidisation, thereby, contravening both the COAG Feed-in-Tariff Principles and the Economic Regulator's obligations under the ESI Act.

4.2 Approach to the determination

In its submission TREA recommended:

The Economic Regulator should identify and quantify the benefits of distributed generation. However the FiT should ultimately be set by the Minister to reflect the wider non-monetary benefits as well.

Under the ESI Act the Economic Regulator is responsible for determining the regulated FiT rate. The proposal for the Treasurer to set the FiT rate would require legislative amendment and is, therefore, outside the scope of this investigation and outside the Economic Regulator's control.

4.3 Technological developments

Submissions from the Tasmanian Greens and TREA suggested that, in making the FiT rate determination, the Economic Regulator should take into account the impact of technological developments such as battery storage and electric cars.

The Economic Regulator considers that the development of embedded battery storage technology and electric car technology are in their early stages and there is insufficient information at this time to assess what role, if any, the regulated FiT rate could play in their development. Further to this, as explained above, the Economic Regulator is obliged to avoid cross-subsidisation and any changes to the FiT to

¹⁷ Queensland Competition Authority (2013), *Estimating a Fair and Reasonable Solar Feed-in Tariff for Queensland: Final Report*, Page 10.

promote technological development would likely result in the retailer passing on costs to other consumers.

Based on the preceding discussion, the Economic Regulator has decided that the FiT rate should not be used as a mechanism to promote emerging technologies like embedded battery storage. The Economic Regulator will, however, continue to monitor the development of this and other technologies and their effect on the Tasmanian energy system.

The Economic Regulator also notes that it is currently conducting a Network Reliability Review and the potential impact of electric vehicles and battery storage on the network will be considered as part of this review.

4.4 Energy security impacts

A number of submissions suggested the energy security benefits provided by solar PV systems should be taken into account when determining the regulated FiT rate.

Energy security encompasses a wide range of issues and considerations. Determining what role, if any, the FiT rate would have in ensuring the security of Tasmania's energy supply would require analysis of both its advantages and disadvantages, as well as its merits relative to large-scale generation. Such analysis is beyond the scope of this investigation.

The Economic Regulator recognises that solar PV can provide energy security benefits. However, despite significant growth in the number of solar PV installations in Tasmania over the past decade, as at 30 June 2015, solar PV generation met only one per cent of Tasmania's total annual demand. While a higher FiT rate may encourage additional solar PV installations that has a positive impact on energy security in the longer term, this is highly unlikely to have a significant impact on Tasmania's energy security in the short-term.

4.5 Economic and employment impacts

A number of submissions suggested the economic and employment benefits of a growing solar industry should be taken into account when determining the regulated FiT rate. The Economic Regulator considers economic and employment issues are outside the scope of its investigation. The Economic Regulator notes that if it were to account for employment benefits in setting the FiT rate it would have to look at net employment impacts for the state, not just employment growth in the solar industry. Further to this, were it to set the FiT rate for the purposes of industry promotion it would be contravening its obligations to avoid cross-subsidisation.

4.6 Qualifying system eligibility requirements

Two submissions recommended that the generation capacity threshold for eligibility for the regulated FiT be raised to 100 kW. The current requirements for the regulated feed-in tariff are set out in section 44B of the ESI Act.

In particular, sections 44B(2)(a) and 44B(2)(b) specify that a “qualifying system” has a total generation capacity of not more than 10kVA (10 kW) for installations with a single phase inverter or not more than 30kVA (30 kW) for installations with a three phase inverter respectively.

Legislative changes would therefore be required to amend the definition of qualifying system to increase the total generation capacity to 100kW. This issue is therefore outside the scope of this investigation.

4.7 Economic Regulator’s final conclusion on scope and approach

Based on the above analysis, the Economic Regulator has made no changes to its Draft Report with respect to the scope of its investigation nor to the approach to determining the regulated FiT rate.

5 DIRECT IMPACTS TO CONSIDER

This Chapter analyses the direct impacts the Economic Regulator considered in determining a 'fair and reasonable' FiT rate.

5.1 Introduction

In accordance with section 44H of the ESI Act, in determining what is a 'fair and reasonable' FiT the Economic Regulator is required to consider the net financial benefits to retailers of exported electricity with respect to retailers' controllable (ie avoidable) costs. With the exception of IPART in New South Wales this is effectively the same methodology adopted by regulators in other Australian jurisdictions as outlined in Chapter 3.

In examining the net financial benefit to retailers the Economic Regulator has considered the ability of a retailer to avoid the following costs:

- the wholesale cost of purchasing electricity through the NEM;
- transmission network charges;
- distribution network charges;
- transmission and distribution losses;
- NEM fees;
- Renewable Energy Target (RET) costs;
- retail operating costs; and
- retail margin.

While the Economic Regulator notes that each of these items has been considered in other jurisdictions with similar conclusions, the Economic Regulator considers it important to consider each item on its merits in the Tasmanian context.

5.2 Wholesale electricity costs

Wholesale electricity costs are the costs of purchasing, through the NEM in the spot market, electricity that is then transmitted to customers through the transmission and distribution networks. Therefore, when a retailer purchases electricity from roof top solar PV systems the amount of electricity that must be purchased through the NEM is reduced.

Similar to the conclusions reached by regulators in other jurisdictions, the Economic Regulator considers that this is an avoided cost that delivers a net financial benefit to retailers and should be included when determining the FiT rate.

The challenge is to determine the appropriate method to measure the amount of those avoided costs. Two methods have typically been adopted by regulators in other jurisdictions to estimate the avoided wholesale electricity costs:

- market price method; and
- regulated wholesale price method.

5.2.1 Market price method

Under the market price method, a specific market price is determined at the actual time when rooftop solar PV systems tend to be exporting excess electricity to the grid. This involves determining the historical half-hourly times of solar PV system electricity exports and the spot price in the NEM at the time those exports occurred and then consider what future spot prices might be.

5.2.2 Regulated wholesale price method

Under the regulated wholesale price method the wholesale price adopted for FiT rate determination purposes is the price adopted under the standard offer price for regulated prices set by the relevant regulator.

The Economic Regulator adopted this approach in its 2013 FiT Determination. In estimating Aurora Energy's Notional Maximum Revenue, and in subsequently determining standing offer prices, the Economic Regulator is required, under section 40AB(3)(a) of the ESI Act, to calculate wholesale electricity costs based on a wholesale electricity price. The wholesale electricity price is based on the forecast price for the regulated load following swap product. More details about the Economic Regulator's approach to estimating the wholesale electricity price and wholesale electricity costs are set out in the Economic Regulator's 2016 Standing Offer Determination Final Report.¹⁸

The QCA also used this approach in its 2013 Determination. In its earlier Issues Paper, the QCA noted that:

For residential consumption, the retailer is charged according to its share of the Net System Load Profile (NSLP) in the local network area, rather than the individual consumption patterns of each household that it services. As such, the benefit to the retailer is the extent to which the PV exports reduce its share of the NSLP. This does not necessarily reflect the spot prices that the exports would have achieved in the NEM at the time they were exported.

¹⁸ Tasmanian Economic Regulator, 2016 Standing Offer Investigation Final Report (2016), Chapter 4.

The QCA also noted that:

The Authority is attracted by the simplicity of (re-)using the wholesale energy cost estimate that it uses for Tariff 11 as the value of the avoided wholesale cost in the feed-in tariff.and is likely to provide the Authority's best estimate of the value of the PV exports to retailers in Energex's distribution area.¹⁹

5.2.3 Economic Regulator's draft proposal on wholesale electricity costs

In its Draft Report, the Economic Regulator acknowledged that the market price approach appears to be theoretically more consistent with COAG's National Principles for Feed in Tariff arrangements. Specifically, Principle 1 states that:

Governments agree that residential and small business consumers with grid connected micro generation should have the right to export energy to the electricity grid and market participants should provide payment for exported electricity which reflects the value of that energy in the relevant electricity market and the relevant electricity network it feeds in to, taking into account the time of day during which energy is exported.²⁰

However, in terms of simplicity and transparency, the Economic Regulator considered that adopting the wholesale electricity price used in determining standing offer prices in Tasmania to be preferable.

The Economic Regulator in its Draft Report, therefore, proposed adopting the regulated wholesale electricity price as the basis for estimating the cost avoided by retailers in purchasing excess energy generated by solar PV systems.

5.2.4 Submissions

In its submission TREA recommended that the price of energy used to calculate the FiT should be based on a forward estimate of the wholesale market cost of electricity in Tasmania, plus an allowance for additional future generation costs not reflected in the regulated wholesale price.

5.2.5 Discussion

As acknowledged in the Draft Report, the Economic Regulator accepts that a market based price is more consistent with the COAG National Principles. However, the Economic Regulator's Draft Report relied on the regulated wholesale model calculation of the wholesale electricity price (WEP) on the basis that the WEP is the key input into the calculation of the energy component of the standing offer prices that

¹⁹ QCA, Issues Paper, *Estimating a Fair and Reasonable Solar Feed-in Tariff for Queensland*, August 2012, pages 9-10.

²⁰ Attachment A.

all small customers in Tasmania (including customers with solar PV installations) pay at present.

Additionally, the regulated wholesale price calculation already takes into account additional costs associated with future generation by pricing Tasmanian regulated cap products on the basis of the discounted cost of a notional future new entrant generating plant.

5.2.6 Economic Regulator's final conclusion on wholesale electricity costs

The Economic Regulator has decided it will continue using the regulated wholesale electricity price as the basis for estimating the cost avoided by retailers in purchasing excess energy generated by solar PV systems.

5.3 Transmission costs

Transmission costs are the costs of operating and maintaining the transmission network. In terms of whether or not this cost can be avoided by retailers, there has been much debate in other jurisdictions between what is theoretically achievable and what can practically be achieved through the existing transmission charging structure.

Conceptually, transmission costs can be avoided through the purchase of excess electricity generated by solar PV systems as less electricity is purchased from large-scale generators and consequently less electricity is transmitted through the transmission system to customers.

However, regulators in other jurisdictions have considered that these costs are not avoidable and, therefore, should not be taken into account in calculating the FIT rate.

Specifically, ESCOSA considers that retailers include transmission (and distribution) charges on a customer's bill as a way of collecting amounts due to distribution and transmission entities. It notes retailers do not have any ability to influence the amount that is charged.²¹

The QCA considered that:

Excess electricity exported by PV customers is ultimately used by other customers on the network and will therefore register as metered consumption. As retailers are charged a variable network charge according to metered energy consumption, any PV exports that a retailer on-sells will still attract the full variable network charge. As such, network costs are unavoidable when a retailer on-sells solar PV exports and should therefore be excluded from the estimated export value.²²

²¹ ESCOSA, *2012 Determination of solar feed-in-tariff premium, Final Price Determination* (2012), page 19.

²² QCA, *Estimating a fair and reasonable solar feed-in-tariff for Queensland* (2013), page 22.

More recently, IPART noted that it had:

...not included any avoided transmission expenditure in our wholesale market value because there is currently no mechanism available for retailers to claim avoided transmission costs on behalf of their PV customers.²³

In preparing its Draft Report, the Economic Regulator consulted with TasNetworks to determine the nature of the charging structure in Tasmania and whether costs could be avoided. Based on these discussions, and similar to the conclusions reached by regulators in other jurisdictions, the Economic Regulator understands that transmission charges levied on the retailer by TasNetworks are generally based on the amount of metered consumption at a customer's property. This means that transmission charges are imposed on customers regardless of where energy is sourced, be it from hydro generation through the NEM or from a neighbouring rooftop solar PV system. Furthermore, TasNetworks passes these transmission charges directly to the retailer. A retailer cannot, therefore, derive a financial benefit from avoided transmission charges due to the purchase of excess solar electricity exported to the grid by solar PV customers.

5.3.1 Economic Regulator's draft proposal on avoided transmission charges

Based on the above, the Economic Regulator proposed in its Draft Report that transmission charges are not avoidable costs to a retailer and therefore should not be taken into account when calculating the FIT rate.

5.3.2 Submissions

Submissions from TREA and the Tasmanian Greens recommended that an allowance for avoided transmission costs be included in the calculation of the FIT. These submissions noted that because electricity generated by solar PV systems is consumed close to the point of generation the costs of transmission are avoided. Both TREA and the Tasmanian Greens have argued that these avoided costs should be accounted for in determining the FIT rate.

In its submission TREA also suggested that

The most transparent way for these savings to be acknowledged would be for TasNetworks to provide an avoided TUoS credit to retailers in proportion to the percentage of energy they sell which comes from distributed generation by their customers.

²³ IPART, Solar feed-in tariffs, *The subsidy-free value of electricity from small-scale solar PV units in 2015-16, Final Report* (October 2015), page 11.

5.3.3 Economic Regulator's final conclusion on avoided transmission charges

The Economic Regulator investigated and discussed, with TasNetworks, TREA's and the Tasmanian Greens' recommendation with respect to avoided transmission charges.

From these discussions, the Economic Regulator notes two issues with providing an avoided TUoS credit to retailers:

1. TUoS charges in Tasmania are not locational and thus there is no way for the retailer, and ultimately the consumer, to financially benefit from the avoided transmission costs of solar PV.
2. At present the primary determinant of transmission costs is construction of the network to cater for peak demand. Because solar PV does not contribute to reductions in peak demand (solar generates electricity during the day, peak demand in Tasmania occurs in the morning and evening) its effect on transmission costs is not significant.

From the evidence presented by TasNetworks, the Economic Regulator has concluded that, at this time, solar PV does not contribute to reductions in peak demand and therefore does not lead to avoided transmission costs. Given that, currently, there is no material or measurable evidence of transmission cost reductions as a result of generation and export of excess energy from solar PV systems, the Economic Regulator is unable to account for avoided transmission costs in its FiT rate calculation.

5.4 Distribution costs

Distribution costs are the costs of operating and maintaining the distribution network. The issue is similar to that for transmission charges in terms of whether or not these costs can be avoided by retailers.

Other Australian regulators have concluded that distribution charges do not represent an avoidable cost for retailers and, therefore, should not be included in the calculation of the FiT. For example, IPART noted that retailers are required to pay variable network distribution charges based on the gross amount of electricity they supply to customers. Charges are, therefore, incurred for electricity supplied regardless of where and by whom it was exported to the grid.²⁴ IPART also acknowledged that whilst electricity produced from solar PV systems is often consumed in close proximity to where it is generated, such that very little of the distribution network is used, due to the current metering and billing arrangements retailers do not avoid distribution costs in respect of excess electricity generated by solar PV systems.

In preparing its Draft Report, the Economic Regulator consulted with TasNetworks to determine the nature of the Tasmanian distribution charging structure and whether

²⁴ IPART, Solar feed-in tariffs, *Setting a fair and reasonable value for electricity generated by small scale solar PV units in NSW, Final Report (2012)*, page 52.

distribution costs could be avoided. Based on these discussions the Economic Regulator understands that retailers cannot make a financial gain on distribution charges when purchasing and on-selling excess electricity generated by solar PV systems. That is, as distribution charges are based on metered consumption regardless of the source of generation, TasNetworks passes these charges directly to retailers.

5.4.1 Economic Regulator's draft proposal on avoided distribution costs

Based on the preceding discussion, the Economic Regulator proposed in its Draft Report that distribution costs should not be taken into account when calculating the FiT rate.

5.4.2 Submissions

Submissions from TREA and the Tasmanian Greens recommended that an allowance for avoided distribution costs be included in the calculation of the FiT. The TREA submission stated that:

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 from 11 or 22 kV to 230/415V. Solar inverters have this capability built in and export power at 230V single phase or 415V three phase.

TREA also recommended that:

in the absence of a mechanism in the NEM for reflecting the benefits of lower network usage by distributed generation, the Economic Regulator should reflect this benefit in the FiT.

5.4.3 Economic Regulator's final conclusion on avoided distribution costs

The Economic Regulator discussed the recommendations from TREA and the Tasmanian Greens with respect to avoided distribution costs with TasNetworks.

The Economic Regulator notes that it has identified similar issues with distribution costs as with transmission costs (outlined in Section 5.3). Currently retailers pay network costs regardless of where the electricity is generated, as a result they do not benefit financially from avoided transmission costs. As well as this, the primary determinant of distribution costs is the construction and maintenance of 'poles and wires' to cope with peak demand. Solar PV does not impact peak demand.

From the evidence presented by TasNetworks, the Economic Regulator has concluded that, at this time, solar PV does not contribute to reductions in peak demand and therefore does not lead to avoided distribution costs. Given that currently there is no material or measurable evidence of distribution cost reductions as a result

of generation and export of excess energy from solar PV systems, the Economic Regulator is unable to account for avoided distribution costs in its FiT rate calculation.

5.5 Transmission and distribution network loss factors

As electricity flows through the transmission and distribution systems, energy is lost due to electrical resistance and the heating of conductors. Due to these losses the amount of electricity generated must be greater than forecast demand to ensure that the network can meet forecast demand. Retail prices charged to customers include an amount for energy lost in the electricity network. There are two loss factors: the Distribution Loss Factor (DLF) and the Marginal Loss Factor (MLF).

The DLF represents the average energy loss incurred when electricity is transmitted over the distribution network.

The MLF represents the average energy loss incurred when electricity is transmitted over the transmission network.

Distribution Network Service Provider's determine the DLFs to apply in each financial year and, after approval from the AER, provide the DLFs to AEMO for publication. AEMO determines and publishes MLFs for each NEM region for each financial year.

Other Australian regulators include loss factors when calculating their respective FiTs. This is because when electricity is purchased from roof top solar PV systems it is consumed nearby. This means that the electricity does not travel long distances across the transmission and distribution networks and the quantity of electricity lost is, therefore, negligible.

5.5.1 Economic Regulator's draft proposal on transmission and distribution network loss factors

The Economic Regulator proposed that loss factors should be taken into in calculating the FiT rate, which is consistent with the position of regulators in other jurisdictions.

5.5.2 Submissions

In its submission, TREA agreed that Distribution Loss Factors should be included in the calculation of the FiT rate but noted:

If our argument is accepted that the FiT should include a credit for all avoided TUoS charges then it would not make sense to include transmission loss factors.

5.5.3 Economic Regulator's final conclusion on transmission and distribution network loss factors

The Economic Regulator has taken network loss factors into account in determining the 'fair and reasonable' FiT rate, which is consistent with the position of regulators in other jurisdictions. This includes both transmission and distribution network loss factors.

The Economic Regulator's decision not to include credit for avoided TUoS charges in the FiT is discussed in section 5.3.2 of this Report.

5.6 National Electricity Market fees

NEM fees are the market and ancillary fees charged to retailers based on the amount of wholesale electricity they purchase through the NEM. When a retailer receives solar PV exports from its customers the amount of wholesale electricity that it needs to purchase from large scale generators through the NEM is reduced. This means that the retailer's liability for market fees and ancillary service fees is also reduced as it is calculated on a lower volume of wholesale electricity.

5.6.1 Economic Regulator's draft proposal on National Electricity Market fees

In its Draft Report, the Economic Regulator proposed taking NEM fees into account when calculating the FiT rate, which is consistent with the position of regulators in other jurisdictions.

5.6.2 Submissions

TREA expressed its support for the inclusion of NEM fees in the FiT calculation.

5.6.3 Economic Regulator's final conclusion on National Electricity Market fees

The Economic Regulator has decided that NEM fees will be included when calculating the FiT rate.

5.7 Renewable Energy Target costs

The Australian Government's Renewable Energy Target (RET) scheme creates a guaranteed market for renewable energy, using a mechanism of tradable certificates with each certificate representing one megawatt hour of renewable electricity generated.

The RET comprises two separate schemes: the Large Renewable Energy Target (LRET) and the Small-Scale Renewable Energy Scheme (SRES).

The LRET supports development of large projects such as wind farms and solar power stations. Electricity retailers must purchase and surrender a set number of Large-scale Generation Certificates (LGCs) each year. The number of LGCs to be surrendered each calendar year is calculated using the Renewable Power Percentage (RPP) which is determined by the Clean Energy Regulator (CER).

The SRES supports investment in smaller technologies such as rooftop solar panels and solar hot water heaters through the generation of Small-scale Technology Certificates (STCs). The SRES is an uncapped scheme therefore all STCs created must be purchased by electricity retailers. The number of STCs electricity retailers must purchase and surrender over the course of each calendar year is calculated using the Small-scale Technology Percentage (STP) determined by the CER.

The RPP and STP are applied to the amount of wholesale electricity purchased by the retailer in a calendar year adjusted for the applicable distribution loss factors.

Wholesale purchasers of electricity who are liable under the RET (generally retailers) are required to purchase and surrender certificates in accordance with the RET, in proportion to their total electrical purchases from an electricity grid (with an installed capacity of 100 MW or more).

On 17 February 2014, the Australian Government announced a review of the RET scheme by an Expert Panel. The Panel's review was released in August 2014 and concluded that the cost of the RET outweighed its benefits and that significant change was required. The review recommended that:

- the LRET be either closed to new entrants or modified so that targets to 2020 are set one year in advance and increase by half of projected additional electricity demand in that year; and
- the SRES be either terminated immediately or phased out more rapidly (by 2020 rather than 2030).

The Climate Change Authority subsequently conducted its biennial review as required by its enabling legislation and:

- stated that it did not favour any significant scaling back of the 2020 LRET of 41 000 GWh;
- recommended a rescheduling of the current target to increase the likelihood it will be met; and
- noted the challenges of climate change are ongoing and recommended the Government consider the role of the RET beyond 2020.

After considering the outcomes from these reviews, the Australian Government decided to set a new 2020 target for large-scale generation of 33 000 GWh. At the time the Government stated that this target will double the amount of large-scale renewable energy being delivered by the scheme compared to current levels and means that about 23.5 per cent of Australia's electricity generation in 2020 will be from renewable sources.²⁵ The legislation required to implement these changes was passed by the Australian Parliament on 23 June 2015.

By law, electricity consumers pay for this government requirement through obligations imposed on wholesale electricity purchasers (including retailers) who then pass through the cost of complying with the obligations to customers.

The Economic Regulator understands that given that RET costs are calculated on the amount of electricity purchased each year by a retailer, whether from roof top solar

²⁵ Australian Government Department of the Environment, "Renewable Energy Target Scheme," <http://www.environment.gov.au/climate-change/renewable-energy-target-scheme> (accessed 12 January 2016).

PV systems or from large-scale generators through the NEM, retailers are unable to avoid RET costs. This is consistent with the findings of other regulators and the advice provided by the CER as part of the FiT reviews conducted in other jurisdictions.²⁶ IPART also noted that it would not be appropriate to provide FiT customers with a premium on the FiT (as compensation for the value of the renewable energy generated) as FiT customers already received the benefit of the value of the renewable energy certificates created following the installation of solar PV system by offsetting the costs of installation.²⁷

5.7.1 Economic Regulator's draft proposal on Renewable Energy Target costs

As RET costs are unavoidable to the retailer, the Economic Regulator proposed not taking these costs into account when calculating the FiT rate.

5.7.2 Submissions

In reference to RET Costs, TREA's submission stated:

Given that RET charges are a relatively small part of electricity costs and that it would be extremely difficult to change the way this scheme operates, we accept the pragmatic reality that RET charges not be included in FiT Calculations.

5.7.3 Economic Regulator's final conclusion on Renewable Energy Target costs

The Economic Regulator will not take RET costs into account when determining the FiT rate.

5.8 Retail operating costs

Retail operating costs are those costs incurred in running a retail electricity business. These include:

- costs associated with billing and revenue collection;
- call centre costs;
- customer information costs;
- corporate overhead costs;
- regulatory compliance costs; and

²⁶ See IPART, *Solar feed-in tariffs, Setting a fair and reasonable value for electricity generated by small scale solar PV units in NSW, Final Report (2012)*, page 53, ESCOSA, *2012 Determination of solar feed-in-tariff premium, Final Price Determination (2012)*, page 42 and QCA, *Estimating a fair and reasonable solar feed-in-tariff for Queensland (2013)*, pages 23 and 24.

²⁷ See IPART, *Solar feed-in tariffs, Setting a fair and reasonable value for electricity generated by small scale solar PV units in NSW, Final Report (2012)*, page 53.

- marketing costs.

These costs tend to vary in proportion to the number of customers and are not avoided by purchasing excess electricity generated by solar PV systems rather than electricity produced by large-scale generation through the NEM.

Regulators in other jurisdictions also considered whether retailers operating costs for serving solar PV system customers would be higher than the cost of serving other customers. Other regulators have noted that, whilst different customers incurred different retail costs, there was insufficient evidence to suggest solar PV customers were more expensive to serve than non-solar PV system customers. IPART also considered that the cost to serve in respect to solar PV system customers would likely fall over time as these customers became more familiar with their solar PV systems and concluded that there could be cost savings in terms of reduced bad debt risks associated with solar PV customers due to the relatively lower bills received by those customers.²⁸

5.8.1 Economic Regulator's draft proposal on retail operating costs

The Economic Regulator agreed with the views noted above in Section 5.8 and proposed not taking retail operating costs into account when calculating the FiT rate.

5.8.2 Submissions and Economic Regulator's final conclusion on retail operating costs

There were no submissions on retail operating costs and the Economic Regulator has therefore retained its Draft Report conclusions on this issue ie retail operating costs will not be taken into account when calculating the FiT rate.

5.9 Retail margin

The retail margin is intended to compensate an electricity retailer for investing in the business and the risks it assumes in providing retail services. In relation to regulated standing offer prices the retail margin is a percentage applied to the sum of the retailer's costs as reviewed and approved by the Economic Regulator.

As noted in Section 5.1, the Economic Regulator has adopted the net financial benefit to a retailer method to measure the value of the FiT. Under this method the costs avoided by retailers by purchasing excess electricity generated by rooftop solar PV systems are passed on to rooftop solar PV system owners in the price they receive for that electricity. Hence, the net impact on the retailer is zero. Given this, the retail margin the retailer earns will not change.

²⁸ See IPART, *Solar feed-in tariffs, Setting a fair and reasonable value for electricity generated by small scale solar PV units in NSW, Final Report* (2012), page 51, ESCOSA, *2012 Determination of solar feed-in-tariff premium, Final Price Determination* (2012), pages 43 and 44 and QCA, *Estimating a fair and reasonable solar feed-in-tariff for Queensland* (2013), pages 27 and 28.

5.9.1 Economic Regulator's draft proposal on retail margin

As the retailer does not gain additional profit through the retail margin, the Economic Regulator proposed not taking the retail margin into account in calculating the FiT rate. This is the same conclusion reached by regulators in other jurisdictions.²⁹

5.9.2 Submissions and Economic Regulator's final conclusion on retail margin

There were no submissions on the treatment of the retail margin and the Economic Regulator has therefore retained its draft report conclusions on this issue. The retail margin will, therefore, not be taken into account when calculating the FiT rate.

5.10 Economic Regulator's final conclusion on direct impacts

Based on the above analysis, the Economic Regulator has decided that the direct impacts on the following items should be considered when determining a 'fair and reasonable' FiT for standard FiT customers in Tasmania:

- wholesale electricity costs;
- network losses; and
- NEM fees.

²⁹ See IPART, *Solar feed-in tariffs, Setting a fair and reasonable value for electricity generated by small scale solar PV units in NSW, Final Report* (2012), pages 51-2 and QCA, *Estimating a fair and reasonable solar feed-in-tariff for Queensland* (2013), page 28.

6 INDIRECT IMPACTS TO CONSIDER

This Chapter considers indirect costs and benefits associated with micro distributed generation systems and the appropriateness of including those costs and benefits when determining a 'fair and reasonable' FiT rate.

This Chapter examines the following issues:

- average network loss factors;
- wholesale electricity prices;
- potential deferral of network augmentation costs; and
- potential need for network reinforcement costs.

6.1 Average network loss factors

As discussed in Section 5.5, given that electricity exported from solar PV systems is consumed close to where it is generated, the energy losses that normally occur when electricity is transported across the transmission and distribution network are avoided. The Economic Regulator will take these specific energy losses into account as a direct financial impact for retailers when determining a 'fair and reasonable' FiT rate.

However, all other Tasmanian electricity users may derive an indirect benefit through a reduction in the average network loss factors. The more electricity produced and used from roof top solar PV systems (be it used directly by solar PV system owners or exported to the grid), the less is purchased from large-scale generators across the NEM. This means that less electricity is transported across the transmission and distribution networks resulting in lower average network loss factors. Lower loss factors mean lower costs and prices for all customers when loss factors are updated annually.

However, similar to the approach in other jurisdictions, network loss factors are averaged across the network for all customers. In this regard IPART noted that:

If PV exports lead to reductions in average energy losses, this will be reflected in lower loss factors. In turn, lower loss factors should lead to lower retail prices for all small customers (all else being equal). However, it would be very difficult to restrict this benefit to PV customers only. This is because, under the current arrangements, a single loss factor applies across an entire customer class within the low voltage network of a distribution network supply area. This means that any financial benefit associated with reduced loss factors will be equally shared among all customers within that particular tariff class. Furthermore, the extent to

which PV exports reduce network losses by any significant amount is unclear and would be practically difficult to calculate.³⁰

Furthermore, it is unclear as to the extent to which losses within the network may have changed. It is difficult therefore to estimate what the impact would be and what amount, if any, should be transferred to solar PV system owners.

6.1.1 Economic Regulator's draft proposal on average network loss factor reductions

The Economic Regulator proposed in its Draft Report that any reduction in average network loss factors should not be redirected to solar PV system owners in calculating the FiT rate. This is consistent with decisions of regulators in other Australian jurisdictions.

6.1.2 Submissions

Submissions from the Tasmanian Greens and TREA recommended that reduced overall network loss factors should be taken into account when determining the FiT rate. TREA also recommended that:

Further analysis should be carried out on the financial benefit of distributed generation in reducing network loss factors. This would inform a decision on whether credit for this benefit should be included in the FiT calculation.

6.1.3 Discussion

The Economic Regulator acknowledges that distributed generation may reduce overall network loss factors. However evidence from other states suggests that feed-in tariffs are not an effective mechanism for recognising these savings. The Queensland Productivity Commission recently released a report from its investigation into Solar Feed-in pricing which found that the NER already contains a number of mechanisms to incentivise efficient use of networks and that:

Where network benefits exist, they are best harnessed through mechanisms that can efficiently and effectively target these benefits, rather than paying all solar PV owners a uniform feed-in tariff unrelated to network impacts.³¹

The Economic Regulator considers that any benefits of embedded generators in terms of impact on network loss factors are most efficiently recognised through existing, specific mechanisms rather than through the FiT rate.

Additionally, it is not possible to gather data from, and measure the impact on the network of, customers with solar PV systems which are widely dispersed and may

³⁰ IPART, *Solar feed-in tariffs, Setting a fair and reasonable value for electricity generated by small scale solar PV units in NSW, Final Report (2012)*, page 78.

³¹ Queensland Productivity Commission, *Solar Feed-in Pricing in Queensland: Draft Report*, March 2016, page 87.

have little impact on the network depending on their location. It is therefore difficult to measure the benefits provided by solar PV systems in terms of reducing network loss factors.

6.1.4 Economic Regulator's final conclusion on Average Network Loss Factor Reductions

Given the above discussion, the Economic Regulator has decided to retain its decision that any reduction in average network loss factors should not be redirected to solar PV system owners in calculating the FiT rate.

6.2 Impact on wholesale electricity prices

Regulators in other jurisdictions have also considered the benefit that solar PV generation can provide in lowering the wholesale spot price for electricity through what is referred to as the 'merit order effect'. In the wholesale market, generators offer to supply electricity at designated prices every five minutes of every day. AEMO stacks these bids from lowest to highest (a merit order), with the aim of meeting prevailing demand in the market in the most cost effective way. Solar PV generation reduces the amount of electricity that retailers need to purchase from the wholesale market. This means that the generation market can be settled at a lower bid in the merit order thereby lowering spot prices (the merit order effect). As such, retailers, and subsequently customers, receive the benefits of lower wholesale electricity prices.

The lower spot price is a normal part of the competitive market process which occurs when the supply of a good or service increases. As noted by IPART:

...any new source of generation in the wholesale electricity market may contribute to a reduction in wholesale spot prices. However the generator who contributes to this price reduction does not receive any payment to reflect a wider market benefit. Likewise, a customer who consumes electricity by switching on an appliance and thereby increasing the market demand for electricity and electricity prices for all customers is not required to compensate the other customers for these higher prices. These are just normal outcomes of a competitive market.³²

Unlike mainland Australia, which is capacity constrained, solar generation during the day in Tasmania can allow Hydro Tasmania to build up its storages to generate energy at later times or export to Victoria when prices are high. This may result in lower wholesale electricity prices in Tasmania overall (provided there are no water storage supply issues). However, it is considered that the relatively small scale of embedded solar PV generation, relative to the total amount of electricity generated in Tasmania, means it is unlikely to have a measureable impact on wholesale electricity prices.

³² IPART, *Solar feed-in tariffs, Setting a fair and reasonable value for electricity generated by small scale solar PV units in NSW, Final Report (2012)*, page 82.

6.2.1 Economic Regulator's draft proposal on the impact of solar PV on wholesale electricity prices

In its Draft Report, the Economic Regulator proposed not taking into account any potential decrease in the wholesale electricity spot price from the merit order effect or the impact of solar generation on Hydro Tasmania's storages when calculating the FiT rate.

6.2.2 Submissions and Regulator's final conclusion on the impact of solar PV on the wholesale electricity price

Apart from TREA's recommendation that the FiT rate should be based on a forward estimate of the wholesale market price, submissions did not specifically comment on the impact of solar PV on wholesale electricity prices. The issue raised by TREA is discussed in Section 4.2 of this Report.

The Economic Regulator has decided, therefore, not to take into account the impact of solar PV on the wholesale electricity price in calculating the FiT rate.

6.3 Potential deferral of network augmentation costs

On the face of it, the increased uptake of roof top solar PV systems may potentially lead to a reduction in future network costs. As demand for electricity increases so too does the need for electricity generation. Typically electricity is sourced from new large-scale generating plants. In addition, the transmission and/or distribution network may need to be extended to connect to the new power plant or be upgraded to handle the extra capacity. Since roof top solar PV systems do not use the transmission network or require electricity to travel long distances along the distribution network, some of this investment could potentially be deferred which avoids additional network costs for all customers.

However, the Economic Regulator notes that there may be several other reasons why a network extension or augmentation may not occur. These may include, for example:

- investment in energy efficient technology by some customers reducing overall demand;
- changes in economic conditions; and
- government policy changes with regards to network standards.

Under these circumstances, no individual party is compensated for their potential contribution towards the avoided network investment. All parties benefit from the avoided network expenditure, similar to how all parties benefit from reduced average loss factors and wholesale electricity prices through the merit order effect as discussed in Section 6.2. Individual parties would be compensated through lower charges as a result of their lower consumption. This is similar to the outcome for solar PV system owners who are charged less when they consume more of the electricity generated by their own solar PV system. The Economic Regulator considers that this is an appropriate market outcome and proposes not taking into account the value of

any potential deferred network investment/augmentation when calculating the FiT rate.

Additionally, the Economic Regulator understands that networks are built to supply customers at peak demand times, which are typically during the early morning in Tasmania during the winter period. However, as solar energy is generated only during daylight hours and peaks during the summer months, it does not make any significant contribution to meeting peak demand. Consequently, networks still need to be built to meet peak demand and operated regardless of whether or not solar energy is generated. As such, there would not appear to be any deferred network augmentation costs avoided due to the connection of solar PV installations to the network.

This is consistent with conclusions reached by regulators in other jurisdictions that suggest that potential benefits from deferred network investment are either small or difficult to measure.³³

6.3.1 Economic Regulator's draft proposal on deferral of network augmentation costs

In its Draft Report the Economic Regulator considered that the benefit of deferred network investment should accrue to all parties and proposed not taking this factor into account when calculating the FiT rate.

However, the Economic Regulator also acknowledged that the introduction of embedded battery technology may assist with 'peak shaving' thereby deferring the need to augment the network. The availability of Time-of-Use tariffs and Time-of-Use FiT rates in conjunction with battery technology may also be beneficial to the network as customers could offset their own consumption in addition to exporting electricity to the network when demand is high. However, the Economic Regulator considers that the development of embedded battery storage technology is in its early stages and there is insufficient information at this time to assess the benefits of Time-of-Use FiT rates, although this issue may be a matter for further consideration in the future.

In summary, in its Draft Report the Economic Regulator considered that it is too early to comment on the potential impact of embedded battery technology, and, in particular, on whether any impacts should be accounted for in the FiT rate.

The Economic Regulator's draft proposal did not specifically consider the impact of solar PV system uptake in terms of potentially deferring network augmentation costs.

6.3.2 Submissions

The Tasmanian Greens considered that solar PV systems have the capacity to support private investment in a renewable energy supply for Tasmania, as the capital cost of solar is met by the owner, which avoids the capital costs of new generation infrastructure. The Tasmanian Greens also referred to the deferral of investment in

³³ See for example, IPART, *Solar feed-in tariffs, Setting a fair and reasonable value for electricity generated by small scale solar PV units in NSW, Final Report* (2012), page 66.

the grid network, including future reduced peak demand when solar PV is coupled with distributed battery storage.

Submissions from the Tasmanian Greens and TREA also suggested that in making the FiT determination, the Economic Regulator should take into account the impact of technological developments such as battery storage and electric cars.

6.3.3 Economic Regulator's final conclusion on the potential deferral of network augmentation costs

The Economic Regulator recognises that solar PV coupled with distributed battery storage may assist network businesses in reducing peak demand, thereby saving on capital expenditure. However, for the regulatory period covered by the 2016 Regulated FiT Rate Determination, solar PV is unlikely to contribute significantly to reductions in peak demand. This is because most solar energy is exported to the grid during the day and peak demand in Tasmania is during the morning and evening. Until such time as the number of battery storage installations reach a 'critical mass' and can have a material impact on peak demand, solar PV does not assist in dealing with peak demand and thus does not significantly affect capital costs.

Given this, the Economic Regulator has decided not to take this factor into account when calculating a 'fair and reasonable' FiT. However, the Economic Regulator will continue to monitor the uptake of solar PV coupled with distributed battery storage and its effect on peak demand, and may consider these in future determinations.

The Economic Regulator also notes that it is currently reviewing the reliability of the network and the potential impact of electric vehicles and battery storage will be considered as part of this review.

6.4 Potential need for network reinforcement costs

The Economic Regulator also understands that increased installation of roof top solar PV systems has the potential to add additional costs and risks to the operation of electricity networks. Solar energy is recognised as an intermittent energy source. Unlike hydro, coal fired plants and other historical forms of generation, the primary energy/fuel source eg water and coal, cannot be stored and used when required. Solar energy must be converted into electrical energy as it becomes available, and consequently, solar generated electricity does not constantly flow into the electricity grid.

A side effect of this is that solar energy is not able to respond, with reasonable certainty, to the ongoing needs of the power system. As an example, solar energy cannot be relied upon to assist with the control of frequency deviations within the power system. Furthermore, because most solar inverters have been designed to disconnect themselves from the network if power system frequency does not meet a pre-defined operating band, there is the potential for many inverters to simultaneously disconnect from the system. A large volume of solar electricity may, therefore, stop being generated and exported with little warning, which may worsen the effects of any

initial system frequency deviation. This adds risks to the network in terms of maintaining a continuous stable flow of electricity to customers.³⁴

However, while this is the case, it is important to note that frequency control issues can potentially arise due to the connection of other generation sources including traditional synchronous generators, wind farms and HVDC (High Voltage Direct Current) interconnectors such as Basslink.

Frequency issues are currently managed by AEMO. AEMO is responsible, under the National Electricity Rules (NER), for ensuring that the power system is operated in a safe, secure and reliable manner. In order to fulfil this obligation, AEMO controls key technical characteristics of the power system such as frequency, voltage and system restart services through ancillary service markets. The NER provides AEMO with mechanisms to purchase required services and recover a proportion of the costs from retailers according to a set of recovery rules. The increased installation of solar PV systems therefore has the potential to increase some ancillary fees which would be passed on to all customers.

The Economic Regulator also understands that at present, it is difficult to predict when system frequency issues may arise due to the exportation of excess electricity generated by solar PV systems. The precise nature of the risks and any resultant costs to rectify identified issues, are therefore matters for future consideration. This is an ongoing issue which is being investigated not only in Tasmania, but in other mainland jurisdictions. It is relevant to note that the mainland regions of the NEM have solar PV system capacities that are now comparable with installed wind generation capacity.

6.4.1 Economic Regulator's draft proposal on potential need for network reinforcement costs

In its Draft Report, the Economic Regulator considered this to be a system wide issue in which roof top solar PV systems play an increasing role. On this basis, the Economic Regulator proposed that this issue is best considered at a system wide level rather than being incorporated in a FiT for rooftop solar PV owners.

The Economic Regulator therefore proposed not accounting for the potential need for network reinforcement costs in its FiT rate determination.

³⁴ The Regulator understands that in, early 2015-16, Standards Australia undertook consultation on proposed revised minimum performance and safety standards for the design, construction and operation of inverters intended for use in inverter energy systems used for the injection of electric power through an electrical installation connected to the electricity distribution network. The proposed replacement standards are AS/NZS 4777.1 Grid connection of energy systems via inverters - installation requirements and AS/NZS 4777.2 Grid connection of energy systems via inverters - inverter requirements.

6.4.2 Submissions and final conclusion on potential need for network reinforcement costs

The Economic Regulator did not receive any submissions relating to the potential need for network reinforcement costs and has therefore retained its Draft Report conclusions on this issue. The potential need for network reinforcement costs will therefore not be considered in calculating the FiT rate.

6.5 Environmental benefits associated with the feed-in tariff

6.5.1 Overview

There are a number of environmental benefits associated with using solar generation compared to traditional forms of power generation such as coal power. These include reduced carbon emissions and reduced dependence on fossil fuels. It has been argued that the FiT should act as a mechanism for promoting increased solar PV installations due to the associated environmental benefits.

6.5.2 Economic Regulators draft proposal on environmental benefits associated with the feed-in tariff

The Economic Regulator's Draft Report did not specifically consider the impact of solar PV system uptake in terms of environmental benefits.

6.5.3 Submissions

Submissions from Eve White, Barb Jowett, Lorraine Perrins, Andrew Ross, Megan and David Marrison, Tim Rudman, Andrew Glenn, Fraser Petrie, TREA and the Tasmanian Greens pointed to the environmental benefits that would flow from an increased uptake in solar PV as a result of a higher FiT rate.

6.5.4 Discussion

As described in Section 4.1 of this Report, both the ESI Act and the COAG National Feed-in Tariff Principles, require the Economic Regulator to ensure that the FiT rate does not lead to a disproportionate cost burden on energy consumers without micro generation. Raising the FiT to increase the number of solar PV installations thereby delivering environmental benefits would likely result in consumers without distributed generation subsidising those who have installed a solar PV system. To do so would contradict the Economic Regulator's obligations to prevent cross-subsidisation.

There already exist a number of mechanisms which encourage the uptake of solar PV. For example, according to the QPC:

Investors in solar PV systems receive a subsidy from the national Small-scale Renewable Energy Scheme (SRES). The SRES reduces the up-front cost of purchasing and installing a solar PV system by around 30–40 per cent on average. Based on average solar PV system prices, the level of the SRES subsidy is between 2.8–2.9c/kWh generated over 20 years. In terms of energy

exported, households receive an additional 7.1c/kWh through the SRES for energy exported.³⁵

On this basis, the SRES provides some compensation for emissions abatement. The Economic Regulator also notes that the QPC found that:

Given the subsidy provided through the SRES, and that the subsidy is provided with the objective of achieving an environmental benefit through lower CO₂ emissions, the evidence suggests that solar PV investors are already financially compensated for any environmental benefits accruing from their solar PV systems.³⁶

And that:

Providing extra payments through a feed-in tariff would achieve relatively low emissions abatement at high cost...More than 85 per cent of the subsidy would go towards increasing the financial returns to solar PV owners, rather than inducing additional solar PV generation.³⁷

6.5.5 Regulator's final conclusion on the environmental benefits associated with the Feed-in Tariff

The Economic Regulator's investigation concluded that there was not enough evidence of material or measurable environmental benefits to justify raising the FiT for that purpose. As discussed above, the Queensland Productivity Commission found that a higher FiT is an expensive way of compensating solar PV owners for the environmental benefits associated with their installation. As well as this, the Small scale Renewable Energy Scheme (SRES) already compensates solar PV owners for emissions abatements and other environmental benefits provided by solar PV installations. Determining a higher FiT to account for environmental benefits, without evidence to justify it, would also be contrary to the Economic Regulator's obligations to prevent cross-subsidisation.

The Economic Regulator acknowledges the environmental benefits of solar PV. However it was not presented with any evidence that existing mechanisms (such as the SRES) were not sufficiently compensating solar PV owners for these benefits.

The Economic Regulator has therefore decided not to take into account for environmental benefits in its FiT rate calculation.

³⁵ Queensland Productivity Commission, Solar Feed-in Pricing in Queensland: Draft Report, March 2016, page 87.

³⁶ Queensland Productivity Commission, Solar Feed-in Pricing in Queensland: Draft Report, March 2016, page 75.

³⁷ Queensland Productivity Commission, Solar Feed-in Pricing in Queensland: Draft Report, March 2016, page 68.

6.6 Economic Regulator's final conclusion on indirect impacts

Based on the above analysis, the Economic Regulator has decided that, at this stage, none of the indirect impacts discussed in this Chapter should be taken into account in calculating a 'fair and reasonable' FiT rate. Nonetheless, the Economic Regulator continues to monitor technological developments and emerging trends in energy networks and markets, and recognises that the impact of the matters discussed in this Chapter may become more significant in future FiT rate investigations and determinations.

7 CALCULATING A FAIR AND REASONABLE FEED-IN TARIFF RATE

This Chapter outlines the formula the Economic Regulator will use to calculate the FiT rate for micro distributed generation systems for the regulatory period from 1 July 2016 to 30 June 2019 (Regulatory Period).

The Chapter also provides an indicative FiT rate for 2016-17 based on the currently available inputs, notes when the Regulator will publish the FiT rate to apply from 1 July 2016 and details the Economic Regulator's approach to updating the FiT rate during the regulatory period.

7.1 Calculating the FiT

Based on the final decisions outlined in this Report, the Economic Regulator will calculate the FiT rate for each period of the regulatory period using the following formula:

$$\text{FiT}_y = (\text{WEP}_y \times \text{MLF}_y \times \text{DLF}_y) + \text{AEMO}_y$$

Where:

FiT_y is the regulated fair and reasonable feed in tariff in c/kWh

y is the period

WEP_y is the wholesale electricity price calculated by the Economic Regulator in accordance with Aurora Energy Pty Ltd's 2016 Standing Offer Determination, during the annual standing offer price approval process, expressed in c/kWh.

MLF_y means the load weighted average marginal loss factor at the regional reference node for Tasmania for the relevant period as approved by the Economic Regulator in accordance with Aurora Energy Pty Ltd's 2016 Standing Offer Determination during the annual standing offer price approval process.

DLF_y means the load weighted average distribution loss factor for the relevant period as approved by the Economic Regulator in accordance with Aurora Energy Pty Ltd's 2016 Standing Offer Determination during the annual standing offer price approval process.

AEMO_y means the forecast charge, as billed by AEMO for market participant and ancillary services fees estimated by the Economic Regulator in accordance with Aurora Energy Pty Ltd's 2016 Standing Offer Determination, during the annual standing offer price approval process, expressed in c/kWh.

The Economic Regulator has also made a Determination, the *Regulated Feed-in Tariff Rate Determination for Standard Feed-In Tariff Customers, May 2016*. The Determination is available on the Economic Regulator's website: www.economicregulator.tas.gov.au.

Applying the above formula and adopting the WEP calculated by the Economic Regulator on 19 April 2016, the indicative FiT Rate for the period from 1 July 2016 to 30 June 2017 is 6.639 c/kWh based on the components specified in Table 7.1. It should be noted this FiT Rate is indicative only and the actual rate to apply for 2016-17 and later years of the regulatory period will be determined in line with the process outlined in Section 7.2.

Table 7.1 Economic Regulator's indicative regulated Feed-in Tariff Rate to apply from 1 July 2016

	2016-17
Wholesale electricity price (c/kWh)	6.2092
multiplied by	x
Marginal loss factor	1.0015
multiplied by	X
Distribution loss factor	1.0517
	6.5400
plus	+
NEM fees (c/kWh)	0.0988
Total FiT (c/kWh)	6.639

Source: The inputs in this table are based on the data presented in the Tasmanian Economic Regulator's 2016 *Standing Offer Pricing Investigation, Final Report, May 2016*.

The FiT has been calculated to three decimal places in line with the presentation of Aurora Energy's standing offer prices.

7.2 Updating the FiT Rate

The Economic Regulator will update the FiT Rate each time standing offer prices are updated.

As noted above, section 44H of the ESI Act requires the Economic Regulator to take into account the net financial benefits to retailers of exported electricity, among other things, when determining the FiT. This financial benefit will change each time the regulated standing offer price is updated because the elements that make up the estimated FiT are based on the same variables that are used to determine standing offer prices. The Economic Regulator considers therefore that updating the FiT rate when standing offer prices change is appropriate.

The FiT Rate to apply from 1 July 2016 will be calculated by the Economic Regulator in accordance with the formula outlined in its Determination and as reproduced above. The Economic Regulator will adopt the values it approves for each of the formula components it adopts in calculating Aurora Energy's Notional Maximum Revenue.

The FiT Rate for 2016-17 will be published in mid-June 2016 at the same time as standing offer prices for 2016-17 are published.

The FiT Rate will be updated in June 2017 and June 2018 with respect to the 2017-18 and 2018-19 financial years respectively.

ATTACHMENT A: COAG NATIONAL FEED-IN TARIFF PRINCIPLES

Council of Australian Governments Meeting

Canberra, 7 December 2012

National Principles for Feed-in Tariff Arrangements

Micro generation to receive fair and reasonable value for exported energy

1. Governments agree that residential and small business consumers with grid connected micro generation³⁸ should have the right to export energy to the electricity grid and market participants should provide payment for exported electricity which reflects the value of that energy in the relevant electricity market and the relevant electricity network it feeds in to, taking into account the time of day during which energy is exported.

Any premium rate to be jurisdictionally determined, transitional and considered for public funding

2. That any jurisdictional or cooperative decisions to legislate rights for micro generation consumers to receive more than the value of their energy must:
 - (a) be a transitional measure (noting that a national emissions trading system will provide increasing support for low emissions technologies), with clearly defined time limits and review thresholds and be closed to new participants by 2014;
 - (b) for any new measures, or during any reviews of existing measures, undertake analysis to establish the benefits and costs of any subsidy against the objectives of that subsidy (taking into account other complementary measures in place to support micro generation consumers);
 - (c) give explicit consideration to compensation from public funds or specific levies rather than cross-subsidised by energy distributors or retailers; and
 - (d) not impose a disproportionate burden on other energy consumers without micro generation.

³⁸ These national principles apply to grid connected micro generation compliant with the relevant Australian Standard (AS4777).

SCER to ensure fair treatment of micro generation

3. That the Standing Council on Energy and Resources (SCER) should maintain regulatory arrangements for micro generation customers, consistent with the objectives of the relevant electricity legislation, whereby the:
 - (a) terms and conditions for compliant micro generation customers should be incorporated into the regulation of the minimum terms and conditions for retail contracts such that they are no less favourable than the terms and conditions for customers without micro generation;
 - (b) connection arrangements for micro generation customers should be standardised and simplified to recognise the market power imbalance between micro generation customers and networks; and
 - (c) assignment of network tariffs to micro generation consumers should be on the basis that they are treated no less favourably than customers without micro generation but with a similar load on the network.

FIT policy to be consistent with previous COAG agreements (particularly the Australian Energy Market Agreement and COAG complementary principles)

4. That the arrangements for micro generation consumers by SCER and jurisdictions:
 - (a) should not deter competition for their business from electricity retailers in jurisdictions where there is full retail contestability and innovation in the tariff offerings available to micro generation customers;
 - (b) in relation to jurisdictions in the National Electricity Market (NEM), should not interfere with the regulation of distribution tariffs or operation of the NEM under the National Electricity Law or duplicate the regulatory arrangements that are part of that Law;
 - (c) should be subject to independent regulatory oversight according to clear principles; and
 - (d) should be consistent with implementation of other intergovernmental agreements relating to energy, competition policy or climate change.