

Minimum electricity feed-in tariff to apply from 1 July 2021

Final decision

25 February 2021



An appropriate citation for this paper is:

Essential Services Commission 2021, Minimum electricity feed-in tariff to apply from 1 July 2021:
Final decision, 25 February

Copyright notice

© Essential Services Commission, 2021



This work, Minimum electricity feed-in tariff to apply from 1 July 2021, is licensed under a Creative Commons Attribution 4.0 licence [creativecommons.org/licenses/by/4.0]. You are free to re-use the work under that licence, on the condition that you credit the Essential Services Commission as author, indicate if changes were made and comply with the other licence terms.

The licence does not apply to any brand logo, images or photographs within the publication.

Contents

| | |
|---------------------------------------------------------------------------------|-----------|
| Summary | 1 |
| What is a feed-in tariff? | 1 |
| Setting the minimum feed-in tariffs | 2 |
| Final decision | 3 |
| We have had regard to stakeholders' feedback | 9 |
| The main financial benefit of solar panels is avoiding retail prices | 9 |
| 1. Minimum feed-in tariffs final decision | 12 |
| Minimum flat feed-in tariff from 1 July 2021 | 12 |
| Minimum time-varying feed-in tariffs from 1 July 2021 | 13 |
| Components of the minimum feed-in tariffs | 14 |
| Minimum feed-in tariffs over time | 15 |
| 2. How we set the minimum feed-in tariffs | 16 |
| How solar energy interacts with the retail energy market | 16 |
| Factors we must consider in setting the minimum feed-in tariffs | 17 |
| Steps for setting the minimum feed-in tariffs | 18 |
| We used a futures market approach to forecast wholesale electricity prices | 19 |
| Other costs associated with wholesale electricity | 21 |
| The social cost of carbon and human health costs remain unchanged | 23 |
| 3. Customer notification | 25 |
| Retailers to give at least five days' notice of feed-in tariff changes | 25 |
| Notification requirements will take effect from 1 June 2021 | 26 |
| Stakeholder feedback | 26 |
| Solar customers are not being notified in advance of changes to feed-in tariffs | 26 |
| 4. Themes from submissions and our response | 28 |
| Most solar customers say feed-in tariffs are too low | 28 |
| Retailers consider feed-in tariffs should be lower | 33 |
| Some customers felt feed-in tariffs should equal retail rates | 34 |
| Stakeholders support earlier customer notification | 36 |
| Other matters raised | 38 |
| Appendix A: What is a feed-in tariff? | 44 |
| Who is eligible to receive minimum feed-in tariffs? | 44 |
| What feed-in tariff structures are available? | 45 |
| What offers are currently in the market? | 47 |
| How does solar energy fit in to the broader energy market? | 49 |
| What is the difference between a net and gross feed-in tariff? | 51 |
| What are the main benefits of solar? | 52 |
| What is our role in setting the minimum feed-in tariffs? | 52 |

| | |
|--------------------------------------------------------------------------------------|-----------|
| Appendix B: Historic feed-in tariffs | 55 |
| Appendix C: Amendments to the Energy Retail Code: Feed-in tariff notification | 57 |
| 1. Nature and commencement of this instrument | 57 |
| 2. Table of amendments | 57 |
| Appendix D: Feed-in tariffs in other jurisdictions | 59 |
| Other states regulate their feed-in tariffs based on wholesale electricity prices | 59 |
| The level of feed-in tariffs in other jurisdictions | 62 |
| Appendix E: Technical methodology | 64 |
| Forecasting wholesale electricity prices | 65 |
| Estimating market fees and ancillary service charges | 67 |
| Estimating avoided transmission and distribution losses | 69 |
| Estimating the avoided social cost of carbon | 70 |
| Structuring the time-varying feed-in tariff | 72 |
| Appendix F: The legislation governing the setting of minimum feed-in tariffs | 73 |
| Appendix G: Order in council – avoided social cost of carbon | 78 |
| Appendix H: Shortened forms & glossary | 82 |
| Appendix I: List of stakeholders who made a submission | 84 |

Summary

- The minimum flat feed-in tariff is 6.7 cents per kWh starting 1 July 2021.
- The minimum time-varying feed-in tariffs range from 6.1 to 10.9 cents per kWh starting 1 July 2021.
- The minimum feed-in tariffs are lower than last year due to a forecast reduction in wholesale electricity prices for 2021–22.
- Retailers can offer the flat feed-in tariff **and/or** time-varying feed-in tariffs.
- Retailers may offer feed-in tariffs higher than the minimum if they prefer.
- Starting from 1 June 2021, retailers must notify their solar customers of feed-in tariff changes at least five business days before the change takes effect.

What is a feed-in tariff?

A feed-in tariff is the rate at which customers are credited when they export electricity generated from their small-scale solar, wind, hydro or biomass generation facilities. This rate is in cents per kilowatt hour (cents per kWh).

Victorian electricity retailers with 5,000 or more customers must offer no less than the regulated minimum feed-in tariffs to eligible customers. You are an eligible customer if you have a small renewable energy generation facility with an installed or nameplate generating capacity of less than 100 kilowatts connected to a distribution system.

Retailers with fewer than 5,000 customers do not have to offer customers the minimum feed-in tariffs but can if they choose.

For simplicity, this final decision refers to eligible customers as solar customers, given solar accounts for 99.9 per cent of small-scale renewable energy generation in Victoria.¹

¹ Clean Energy Council, Postcode data for small-scale installations, accessed 25 January 2020, <http://www.cleanenergyregulator.gov.au/RET/Forms-and-resources/Postcode-data-for-small-scale-installations#Installation-numbers-for-small-scale-systems-by-stateterritory>.

Setting the minimum feed-in tariffs

Under the Electricity Industry Act 2000, we must determine one or more minimum rates for the electricity that solar customers export to the grid. We refer to these rates as the minimum feed-in tariffs. Retailers can pay solar customers rates higher than the minimum feed-in tariffs, but they cannot pay less.

In setting the minimum feed-in tariffs, the costs we can include are set out under the Electricity Industry Act 2000.² These costs are wholesale electricity, avoided transmission and distribution losses, the social cost of carbon and human health costs. We discuss these costs in more detail in chapter two.

Under the Essential Services Commission Act 2001 and the Electricity Industry Act 2000, our objectives are to promote the:

- long term interests of Victorian consumers³
- protections for customers, including in relation to assisting customers who are facing payment difficulties⁴
- development of full retail competition.⁵

Each year we must make our determination of the minimum feed-in tariffs no later than 28 February.⁶ The minimum feed-in tariffs we set apply from 1 July.

To determine the minimum feed-in tariffs to apply from 1 July 2021 we used the same approach we used in our previous feed-in tariff reviews.

Appendix A provides additional details on our role in setting the minimum feed-in tariff including matters we must have regard to. Appendix F sets out the legislative framework.

Matters outside the scope of our review

Retailers who have less than 5,000 customers do not have to offer feed-in tariffs. But they are free to offer and set their own feed-in tariffs. We do not regulate their feed-in tariffs.

² Electricity Industry Act 2000, s. 40FBB(3)(a),(b) and (c).

³ Essential Services Commission Act 2001, s.8.

⁴ Electricity Industry Act 2000, s.10(c).

⁵ Electricity Industry Act 2000, s.10(b).

⁶ Electricity Industry Act 2000, s. 40FBB(2)(a).

Solar customers on the 60 cents per kWh premium feed-in tariff, which will remain in place until 2024, are not affected by our feed-in tariff determination.

The Victorian Government through the Department of Environment, Land, Water and Planning sets the goals, policies, targets for the development of small-scale generation facilities. The government's Solar Homes Program also provides incentives (for example through interest free loans) to encourage households and businesses to install small renewable generation facilities.⁷

Final decision

The minimum flat feed-in tariff for 2021-22 is 6.7 cents per kWh. This is 34 per cent lower than the rate for 2020–21. The time-varying feed-in tariffs are also lower than for 2020–21. Table S.1 shows the details.

Table S.1: Minimum feed-in tariffs to apply from 1 July 2021, excluding GST*

| Flat rate | Time-varying rates (c/kWh) | | |
|-----------|------------------------------------------|---------------------------------------------------|------------------------------------|
| | Off peak | Shoulder | Peak |
| All times | Weekdays: 10pm-7am Weekends: 10pm-7am | Weekdays: 7am-3pm, 9pm-10pm Weekends: 7am-10pm | Weekdays: 3pm-9pm Weekends: n/a |
| 6.7 | 6.7 | 6.1 | 10.9 |

* Feed-in tariff rates of solar customers registered for GST are subject to GST.⁸ Most residential solar owners are not registered for GST, hence their feed-in tariff rates will not be subject to GST.

The decrease in minimum feed-in tariffs is mainly due to recent reductions in wholesale electricity prices, particularly during the middle of the day when most solar is exported. Annual changes in the minimum feed-in tariffs largely mirror movements in forecast wholesale electricity prices, which account for 60 to 70 per cent of the costs covered by the feed-in tariffs (see figure S.1).⁹

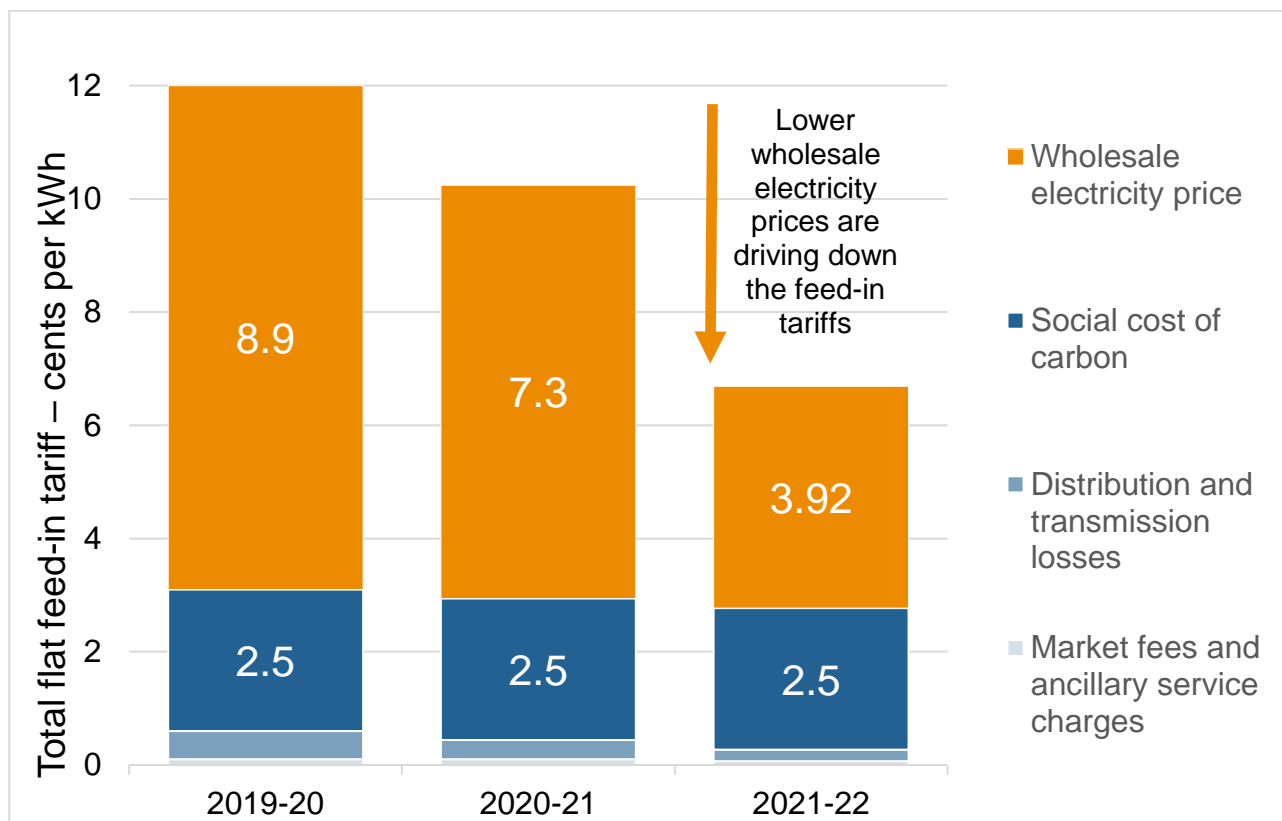
⁷ Solar Victoria, Solar Rebates, accessed 25 January 2020, <https://www.solar.vic.gov.au/solar-rebates>.

⁸ Australian Tax Office, Electricity and Gas Industry Partnerships, accessed 15 October 2020, https://www.ato.gov.au/business/gst/in-detail/gst-issues-registers/electricity-and-gas-industry-partnerships---issues-register/?page=1#1_Are_there_any_GST_implications_for_owners_of_grid_connected_solar_power_generation_equipment_in_respect_of_electricity_supplied_via_the_network.

⁹ Wholesale electricity prices accounted for almost 71 per cent of the 2020–21 feed-in tariffs, 63 per cent of the 2021–22 draft decision feed-in tariffs and 60 per cent of the final feed-in tariffs for 2021–22.

Summary

Figure S.1: Components of the minimum flat feed-in tariff over time



Recent falls in wholesale electricity prices have also led to lower retail electricity prices. The Victorian Default Offer we set for standing offers in 2021 dropped by ten per cent for residential customers. Some retailers have also passed on the savings from lower wholesale electricity prices to their customers.¹⁰ Their prices for market offers for residential customers decreased by five to 11 per cent.

The fall in minimum feed-in tariffs is not matched by equivalent changes in retail rates for a number of reasons. Wholesale electricity prices account for about 60-70 per cent of the costs included in the minimum feed-in tariffs but only 30 per cent of those recovered through retail rates. This difference in cost shares means that any changes in wholesale electricity prices will have a bigger impact on the minimum feed-in tariffs than retail rates.

¹⁰ Origin Energy, Electricity prices to fall 11 per cent to four-year low, Victorians to pay \$180 a year less on average, accessed 25 January 2021, Origin https://www.originenergy.com.au/about/investors-media/media-centre/electricity_prices_to_fall_11_per_cent_to_four_year_low_victorians_to_pay_180_a_year_less_on_average.html; EnergyAustralia, EnergyAustralia's Victorian household electricity bills set to fall in 2021, accessed January 25 2021, <https://www.energyaustralia.com.au/about-us/media/news/energyaustralias-victorian-household-electricity-bills-set-fall-2021>; AGL, AGL announces reductions on Victorian electricity, accessed 25 January 2021, <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2020/december/agl-announces-reductions-on-victorian-electricity>.

Summary

In addition, the fall in wholesale prices has mostly been during solar generating hours. This means the wholesale prices used to set retail prices have not dropped as much as those used for the feed-in tariffs.

For 2021–22, the minimum off-peak feed-in tariff is higher than the shoulder feed-in tariff because it captures a small morning peak in wholesale electricity prices, and low overnight prices are not captured since solar exports do not occur at night. This reflects rapidly changing patterns of supply and demand in the electricity market as new distributed renewable generation technologies replace older centralised generation.

The minimum feed-in tariffs are lower than in the draft decision

Our final decision on the minimum feed-in tariffs is based on forecasts of wholesale prices in the futures market as of 2 February 2021.

The average ASXEnergy prices (futures prices) over the 12 months up to and including 2 February 2021 have declined relative to our forecast in the draft decision. This change reflects the fact that the market's expectations of average prices across 2021–22 are now lower than when the draft decision was made last November. See chapter one and the Frontier Economics report for details.

In our draft decision paper, we said we would update the wholesale electricity price forecasts for in the final decision.¹¹ This is the standard approach we take each year. Sometimes this means final decision prices are higher than draft decision prices and sometimes they are lower.

A feed-in tariff set at the true value of solar exports is consistent with our objectives

We cannot set the minimum feed-in tariff equal to retail rates

We set the minimum feed-in tariff based on the true value of solar exports. Under the Electricity Industry Act 2000, this means considering the costs retailers avoid when they purchase electricity from solar customers rather than from the National Electricity Market, plus the avoided social cost of carbon.¹²

Retail rates are made up of the energy purchase cost, the cost of transporting electricity, environmental compliance costs and retailers' overhead costs. If retailers paid solar customers

¹¹ Essential Services Commission, Minimum electricity feed-in tariff to apply from 1 July 2021: Draft decision, November 2020, p.7.

¹² Electricity Industry Act 2000, s. 40FBB(3)(a),(b) and (c).

more than energy purchase costs (the costs they avoid when purchasing solar exports) they would have to increase retail tariffs for all other customers. This outcome has been previously established.¹³

Our decision is in the long term interest of Victorians. Solar customers benefit from self-consuming the electricity they produce and will get the true value of their solar exports without non-solar customers subsidising them through higher retail rates. Cross-subsidies to solar customers may also cause unnecessary hardship or costs for customers that cannot invest in solar systems.

The minimum feed-in tariff changes each year

Many solar customers submitted that the minimum feed-in tariffs are too low.

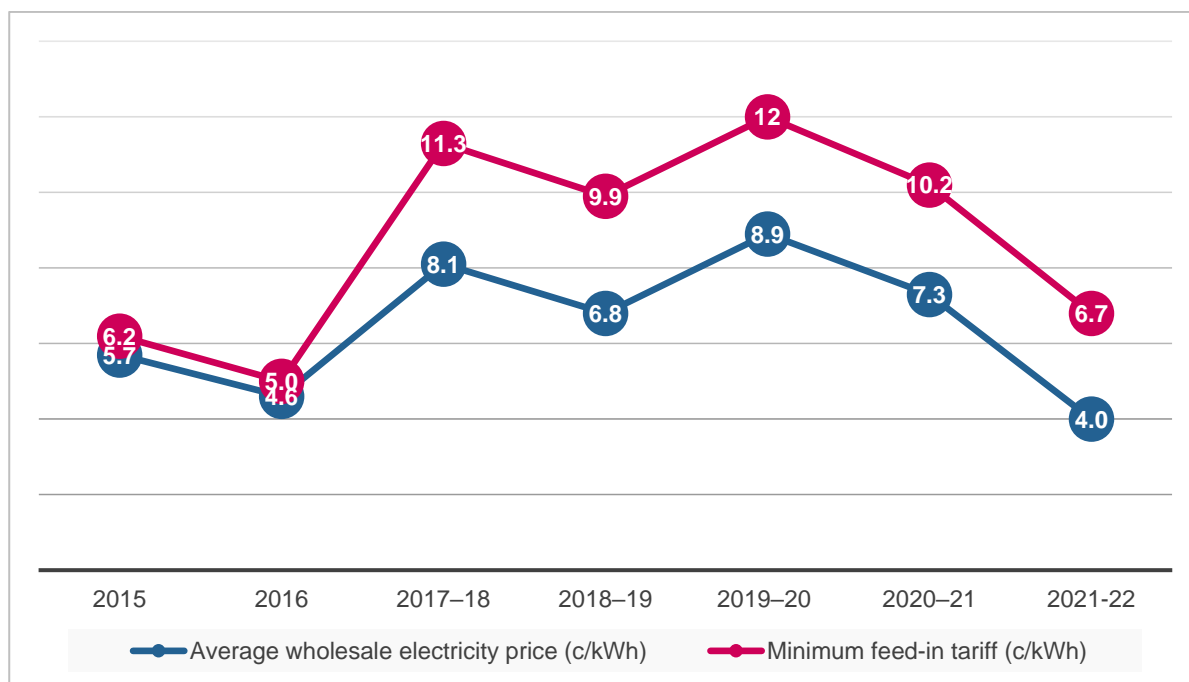
The minimum feed-in tariffs for 2021–22 are lower due to falls in wholesale electricity prices during ‘solar hours’ compared to 2020–21.

If wholesale electricity prices were forecast to be higher for 2021–22 then the minimum feed-in tariffs would be too. We do not have control over the wholesale electricity prices. They are set in a competitive market by the demand for and supply of electricity.

Figure S.2 shows how minimum flat feed-in tariffs (excluding the social cost of carbon, introduced in 2017–18) have changed in line with the movement of wholesale electricity prices in recent years.

¹³ Australian Competition and Consumer Commission, Restoring electricity affordability and Australia’s competitive advantage: Retail Electricity Pricing Inquiry—Final Report, June 2018, p. v.

Figure S.2: Minimum flat feed-in tariff



Our approach is consistent with other Australian jurisdictions

Other Australian jurisdictions who still regulate retail feed-in tariffs set them based primarily on the wholesale electricity prices and avoided transmission losses, like we do. We discuss this in detail in Appendix D.

The Independent Pricing and Regulatory Tribunal of NSW also shares the same view that a higher feed-in tariff would result in higher costs for retailers and in turn higher retail prices for customers:

If all retailers did pay a higher feed in tariff, this would result in higher costs to retailers, which would mean that they would have to increase their prices. For example, if all retailers paid a feed-in tariff of 25 c/kWh (equal to the current average retail price of electricity), the average annual household bill would need to increase by around \$70 (to recover additional costs of \$190 million each year).

Households without solar panels should not have to pay higher retail prices to reduce the bills of customers with solar panels. This would disadvantage the households who are unable

to install a solar system themselves (for example, because they rent or they cannot afford the upfront costs).¹⁴

Avoided social costs and human health costs

The current Order in Council sets the social cost of carbon at 2.5 cents per kWh.¹⁵ If the government amends the Order we will update our feed-in tariff calculation in future reviews. See Appendix G for a copy of the Order.

We reviewed the associated health benefits of distributed solar generation as part of our inquiry into distributed generation.¹⁶ However, due to a lack of sufficient evidence and data, we could not place a monetary value on them.

The 2017 Order in Council also does not specify a methodology for determining the avoided human health costs of lowering air pollution from non-renewable energy sources. We will raise this matter with the Department of Environment, Land, Water and Planning for further consideration.

If the Victorian Government amends the Order in Council to include a methodology for determining human health costs, we will have regard to that amendment in future decisions.

Time-varying feed-in tariffs remain optional

In 2020–21, we did not mandate a time-varying feed-in tariff. We engaged Frontier Economics to conduct a cost-benefit analysis of mandating one. This showed that time-varying feed-in tariffs were unlikely to change consumer behaviour but would impose costs on retailers.¹⁷

Higher retail rates give much stronger price signals than minimum feed-in tariffs. Solar customers are better off minimising their purchase of electricity from the grid by using their own solar generation to avoid paying higher retail rates. Given the difference between retail rates and the minimum feed-in tariffs we still consider this is the case.

¹⁴ Independent Pricing and Regulatory Tribunal, Solar feed-in tariff benchmark: Final report, April 2020, p.7.

¹⁵ Victorian Government 2017, Victoria Government Gazette No. S 36, Tuesday 21 February 2017, Order specifying a methodology and factors for the determination of the avoided social cost of carbon (the Order).

¹⁶ Essential Services Commission 2016, The energy value of distributed generation, August 2016, pp. 62-63.

¹⁷ Frontier Economics, Cost-benefit analysis of mandating time-varying feed-in tariff, February 2020.

Summary

Customer notification

Our final decision is to require retailers to notify their solar customers of feed-in tariff changes at least five business days before the change takes effect. The changes to the Energy Retail Code will come into effect on 1 June 2021.

Our decision is aimed at ensuring solar customers are given notification before the new feed-in tariffs take effect and does not affect the customer notification timeframe for retail rates. This allows customers to evaluate the ongoing suitability of their retail contract before any changes that will affect their bill happen.

We have had regard to stakeholders' feedback

We received a total of 79 submissions and questions from 50 stakeholders on our draft decision. The submissions were from 46 solar customers, three retailers and a biogas company.

We sought stakeholders' feedback in a number of ways. We gave them seven weeks to make a submission instead of the minimum four weeks. We held two online public forums to ensure people could attend. We also set up a virtual public forum on our Engage Victoria page, for questions and answers.

We considered all submissions in reaching our final decision. We summarise and address the key themes from submissions in chapter four. We have also released a public engagement summary report with this decision.

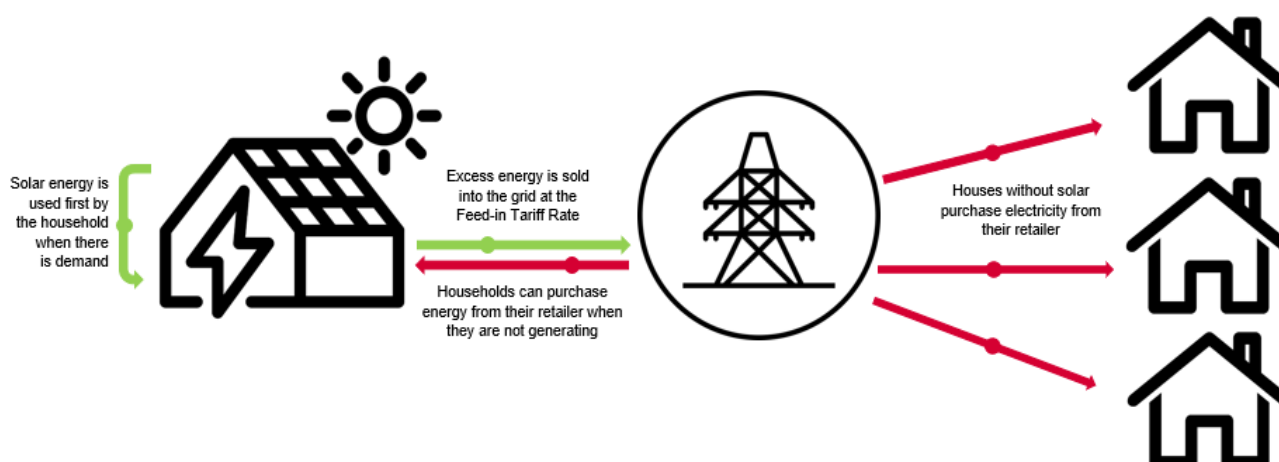
Almost all solar customers disagreed with the minimum feed-in tariffs in our draft decision. In general, they provided feedback on areas where we have little discretion. The methodology we must use to set the minimum feed-in tariffs is set out in the Electricity Industry Act 2000.

The main financial benefit of solar panels is avoiding retail prices

The main financial benefit for solar customers is the savings from using the electricity they generate in their home or business – rather than paying retail rates. The feed-in tariff provides a financial benefit to solar customers when they export unused electricity, but on average solar customers will have greater savings if they use the electricity they generate themselves.

Figure S.3 illustrates the net feed-in tariff approach that applies in Victoria. The electricity your solar panels produce is automatically used in the household if you need it. If you are not using electricity while your solar panels are generating electricity then the output is automatically sold to the grid. Your electricity bills are based on how much electricity you use from the grid less the total amount you sell to it.

Figure S.3: Net feed-in tariff rate approach



Retail tariffs are higher than the feed-in tariffs. This is because of the other costs retailers face when they deliver electricity to their customers. To avoid paying the higher retail rates it is in solar customers' interest to use as much of the electricity they generate from their solar panels as possible.

The payoff on your solar panels should include the value of avoiding retail tariffs

It is critical to include the value of avoided electricity imports from the grid when calculating how long it will take for a solar system to pay for itself. To maximise the return on investment on a solar system, it is best to install a system that roughly matches your daytime electricity requirements and not significantly more. If you connect a system which far exceeds your daily usage (without a battery system) the return per kwh will be lower, and your payback period will be longer.

Changing when you use electricity can also help maximise savings

Solar Victoria's Solar Superheroes has a number of examples of how solar customers have maximised savings from their solar systems.¹⁸

During the day when the sun is shining, solar customers should run their washing machine, dishwasher, water heater and other energy intensive appliances. If they are not home during the day, they can set a timer to have these appliances start at certain times during the day or switch them on just before they leave the house.

¹⁸ Solar Victoria, Solar Superheroes, accessed 20 January 2020, <https://www.solar.vic.gov.au/solar-superheroes>.

Consider both feed-in and retail tariffs when shopping around

As the solar export profile is different for each individual customer, the best combination of feed-in tariffs and retail tariffs will be different for everyone.

You should think of your energy consumption and generation as a whole when you choose an electricity plan: including both the rates you will pay for the electricity you use and the electricity you export.

It is important not to focus only on the feed-in tariffs when deciding on an electricity plan. Some plans which offer higher feed-in tariffs may also have higher prices for the electricity that you consume from the grid, and this may more than offset any benefit from the higher feed-in tariffs.

1. Minimum feed-in tariffs final decision

Our decision is to set two minimum feed-in tariffs to apply from 1 July 2021: These are:

- a minimum flat feed-in tariff rate **and**
- a minimum time-varying feed-in tariff, comprising of peak, shoulder, and off-peak rates.

Retailers must offer either flat or time-varying feed-in tariffs to their solar customers. They are free to offer both tariff structures.

Retailers can offer feed-in tariffs higher than the minimum if they choose to.

(Chapter two outlines the approach we have used to calculate the tariffs.)

Minimum flat feed-in tariff from 1 July 2021

The flat feed-in tariff applies regardless of the time of day or day of the week.

Table 1.1 shows the minimum flat feed-in tariff of 6.7 cents per kWh for 2021–22, which is 34 per cent lower than the flat tariff that we set for 2020–21.

This is driven by falling wholesale electricity prices. Lower oil and gas (i.e. input) prices, and lower demand have led to lower wholesale electricity prices in Victoria. See chapter three of Frontier Economics' report for details.¹⁹

Table 1.1: Minimum flat feed-in tariff – 2021–22 (cents per kWh)

| | Flat rate to apply at all times |
|------------------------|---------------------------------|
| Minimum feed-in tariff | 6.7 |

Retailers who choose to offer the flat feed-in tariff must offer customers at least the minimum feed-in tariff in this final decision. Retailers can offer rates above this.

Currently, two Victorian retailers offer a flat feed-in tariff that exceeds the 2020–21 minimum flat tariff of 10.2 cents per kWh – these retailers offer 12 cents per kWh.²⁰

¹⁹ Frontier Economics, Wholesale price forecasts for calculating minimum feed-in tariff, final report for the Essential Services Commission, February 2021, chapter 3.

²⁰ Publicly available information submitted to the government energy price comparator website Victorian Energy Compare as at 19 January 2021, <https://compare.energy.vic.gov.au/>.

Other retailers have higher feed-in tariffs available under special plans or terms and conditions, for example if you also buy solar panels from that retailer (see Appendix A for examples).

Minimum time-varying feed-in tariffs from 1 July 2021

Table 1.2 sets out the time-varying feed-in tariffs for 2021–22 and the relevant time blocks, in which the time-varying tariffs apply. Retailers offering the time-varying feed-in tariff option must offer at least the minimum rate that applies in each time block, meaning they are free to offer rates above the minimum we set. So long as retailers meet the minimum rate at each point in time, there is significant flexibility for designing their own time-varying tariff profiles.

Table 1.2: Minimum time-varying feed-in tariffs – 2021–22 (cents per kWh, solar-weighted)

| Time block | Off peak | Shoulder | Peak |
|------------------------|--------------|---------------------------|-------------|
| Minimum feed-in tariff | 6.7 | 6.1 | 10.9 |
| Applicable period | | | |
| Weekdays: | 10 pm – 7 am | 7 am – 3 pm, 9 pm – 10 pm | 3 pm – 9 pm |
| Weekend: | 10 pm – 7 am | 7 am – 10 pm | n/a |

The minimum time-varying feed-in tariffs for 2021–22 is lower across all time blocks than in 2020–21 for the same reasons that the flat tariff is lower: because wholesale electricity prices have fallen.

For 2021–22, the off peak feed-in tariff is higher than the shoulder tariff because the off peak time period captures a small morning peak in electricity prices, while low night time prices are excluded since solar exports do not occur at night. The shoulder tariff also captures a dip in national electricity market prices during the middle of the day (electricity supply is plentiful, and demand is stable), which also coincides with higher quantities of solar exports at this time.

Time-varying feed-in tariffs will remain optional

The time-varying feed-in tariffs are optional because it is unlikely to change behaviour for solar customers as shown by Frontier Economics’ cost benefit analysis included in our last review.²¹

We agree with Frontier Economics’ findings that²²:

- retail electricity import tariffs are much higher than the minimum feed-in tariffs and

²¹ Frontier Economics, Cost-benefit analysis of mandating time-varying feed-in tariff, February 2020.

²² Frontier Economics, Cost-benefit analysis of mandating time-varying feed-in tariff, page 17, February 2020

- the greater benefit is to shift consumption to avoid high retail import tariffs rather than adjusting consumption to respond to time-varying feed-in tariffs.

Solar customers would be better off minimising their purchase of electricity from the grid to avoid higher retail electricity prices and self-consume their solar generation, rather than shift consumption to respond to time-varying feed-in tariffs.

Components of the minimum feed-in tariffs

When setting the minimum feed-in tariffs we must have regard to certain cost components that retailers avoid when they receive solar exports.²³ These include:

- wholesale electricity prices
- market fees and ancillary service charges for participating in the National Energy Market
- network or line losses
- the avoided social cost of carbon and human health costs.

Annual movements in feed-in tariffs are affected primarily by changes in forecast wholesale electricity prices, which account for 60 to 70 per cent of the feed-in tariff.²⁴ Table 1.3 sets out how the various cost components contribute to the feed-in tariffs.

Table 1.3: Components of the 2021–22 minimum feed-in tariffs (cents per kWh)

| Component | Flat | Off-peak | Shoulder | Peak |
|-------------------------------------------------------|------------|------------|------------|-------------|
| Wholesale electricity prices | 3.92 | 3.87 | 3.39 | 7.91 |
| Market fees and ancillary service charges | 0.07 | 0.07 | 0.07 | 0.07 |
| Value of avoided transmission and distribution losses | 0.22 | 0.22 | 0.19 | 0.45 |
| Value of avoided social cost of carbon | 2.49 | 2.49 | 2.49 | 2.49 |
| Value of avoided human health costs | 0.00 | 0.00 | 0.00 | 0.00 |
| Total²⁵ | 6.7 | 6.7 | 6.1 | 10.9 |

²³ Electricity Industry Act 2000, s. 40FBB(3)(a),(b) and (c).

²⁴ Wholesale electricity prices accounted for almost 71 per cent of the 2020–21 feed-in tariff rates, 63 per cent of the draft decision feed-in tariff rates for 2021–22 and 60 per cent of the final feed-in tariff rates for 2021–22.

²⁵ Table may not add due to rounding.

1. Minimum feed-in tariffs final decision

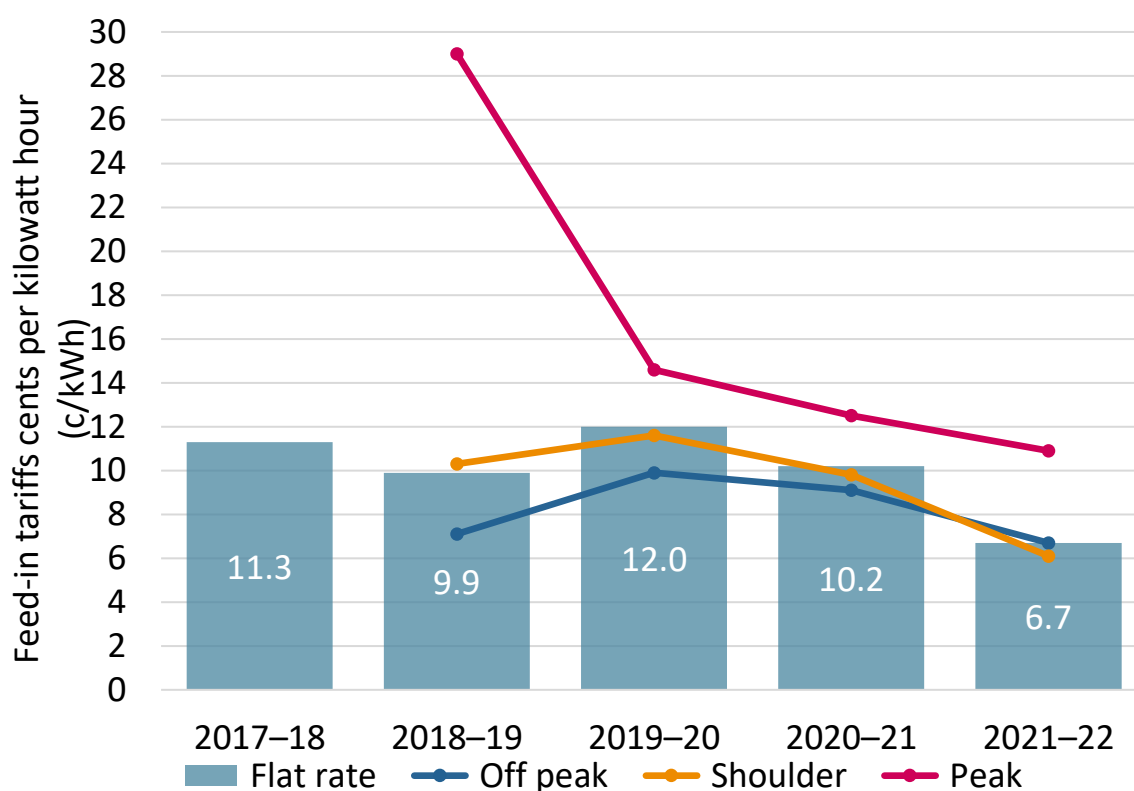
Minimum feed-in tariffs over time

Table 1.4 and Figure 1.1 show the fluctuations of the minimum feed-in tariff over the last five years. This illustrates that our pricing methodology leads to both increases and decreases in the feed-in tariff. This fluctuation is primarily due to changes in forecast wholesale electricity prices. For further information see Appendix B.

Table 1.4: Comparison of minimum feed-in tariffs, 2017–18 to 2021–2022

| Period | 2017–18 | 2018–19 | 2019–20 | 2020–21 | 2021–22 |
|-------------------|---------|---------|---------|---------|---------|
| Flat rate | 11.3 | 9.9 | 12.0 | 10.2 | 6.7 |
| Time-varying rate | | | | | |
| Peak | n/a | 29.0 | 14.6 | 12.5 | 10.9 |
| Shoulder | n/a | 10.3 | 11.6 | 9.8 | 6.1 |
| Off peak | n/a | 7.1 | 9.9 | 9.1 | 6.7 |

Figure 1.1: Comparison of minimum feed-in tariffs, 2017–18 to 2021–2022



Note: Minimum time-varying tariff option was first set by the commission in 2018–19.

1. Minimum feed-in tariffs final decision

2. How we set the minimum feed-in tariffs

The minimum feed-in tariffs aim to reflect the costs that a retailer avoids when purchasing electricity from a small-scale renewable generator. In other words, it is an estimate of the price a retailer would pay if the electricity provided by small-scale renewable generators needed to be purchased in the National Electricity Market instead.

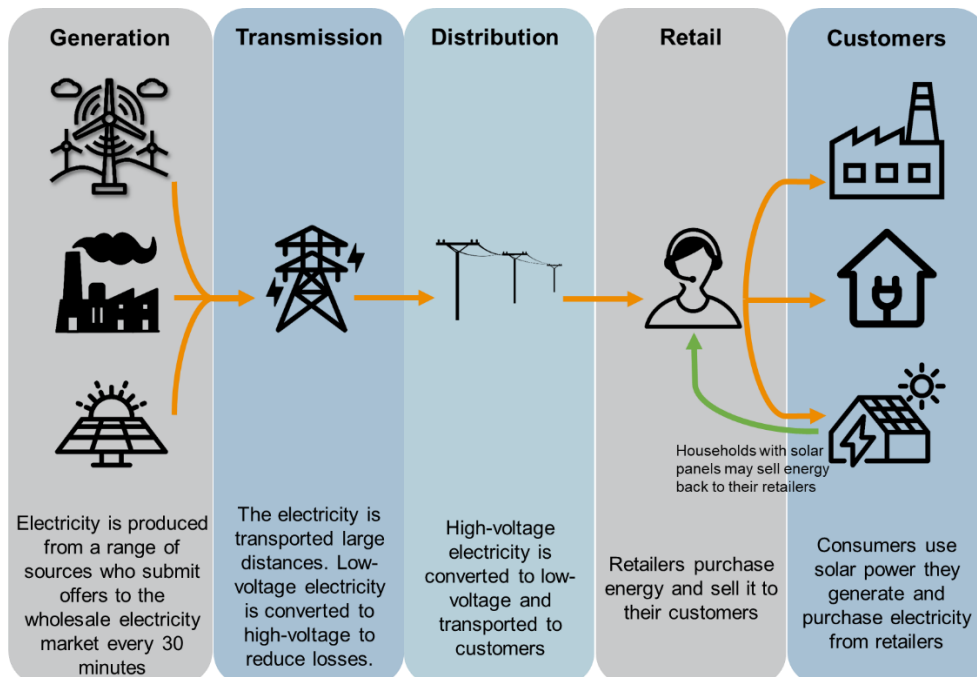
This means solar customers receive a credit for the energy they generate that reflects the value of that energy.

To determine the minimum feed-in tariffs to apply from 1 July 2021 we used the same approach as in our previous feed-in tariff review. Further details on the method used to calculate the minimum feed-in tariffs can be found in Appendix E.

How solar energy interacts with the retail energy market

Energy supplied to Victorians is generated by various sources, such as coal, hydro, gas, and renewables. Large generators, like coal-fired power stations, provide most of the energy in the National Electricity Market. Renewable energy generation, such as rooftop solar panels, provides a smaller share. Figure 2.1 shows the links between solar customers and the different participants in the electricity market.

Figure 2.1: Solar customers' role in the Victorian electricity market



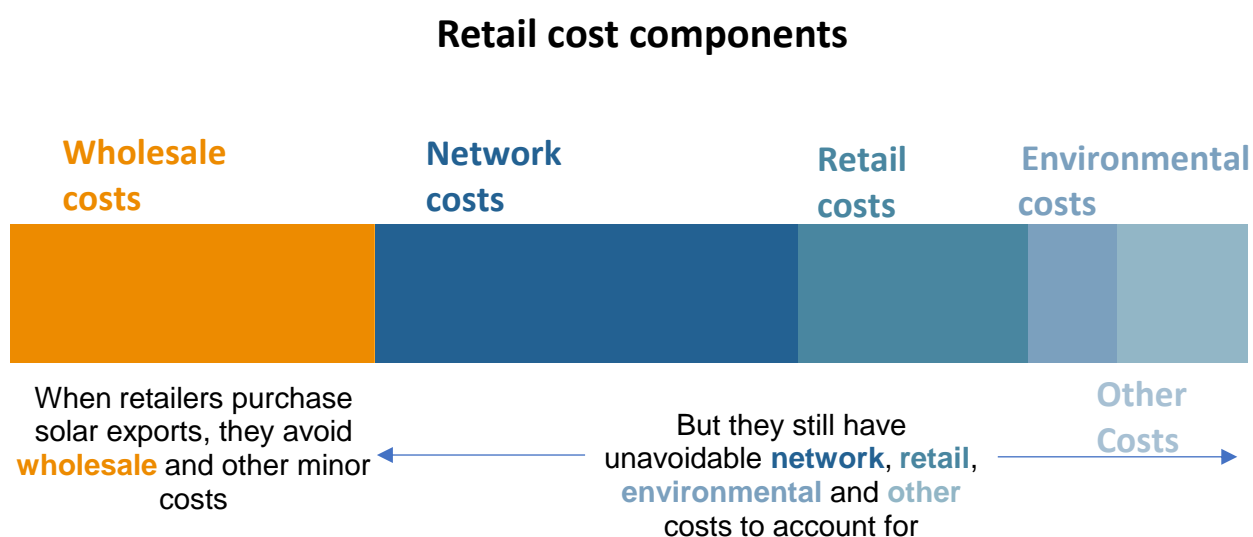
2. How we set the minimum feed-in tariffs

Solar customers play a dual role in the electricity market. They are generators when they export electricity to the grid, and customers when they purchase electricity from their retailers.

Buying electricity from the National Electricity Market and selling it to customers imposes certain costs on retailers, such as transmission and distribution network costs and losses, retail operating costs, market fees and ancillary charges, licence fees, environmental program costs, and the wholesale price of energy. Retailers avoid some of these costs when they buy electricity from solar customers. These avoided costs include network costs and losses, market fees and ancillary charges, and the price of wholesale electricity. Figure 2.2 below shows the cost components that contribute to retail energy prices.

We set the feed-in tariff equal to the avoided costs plus the social cost of carbon. Under this approach we ensure minimum feed-in tariffs represent the value that solar customers provide to the energy market and the social benefits of lowering carbon emissions.

Figure 2.2: Retail cost of providing electricity and costs avoided with solar exports

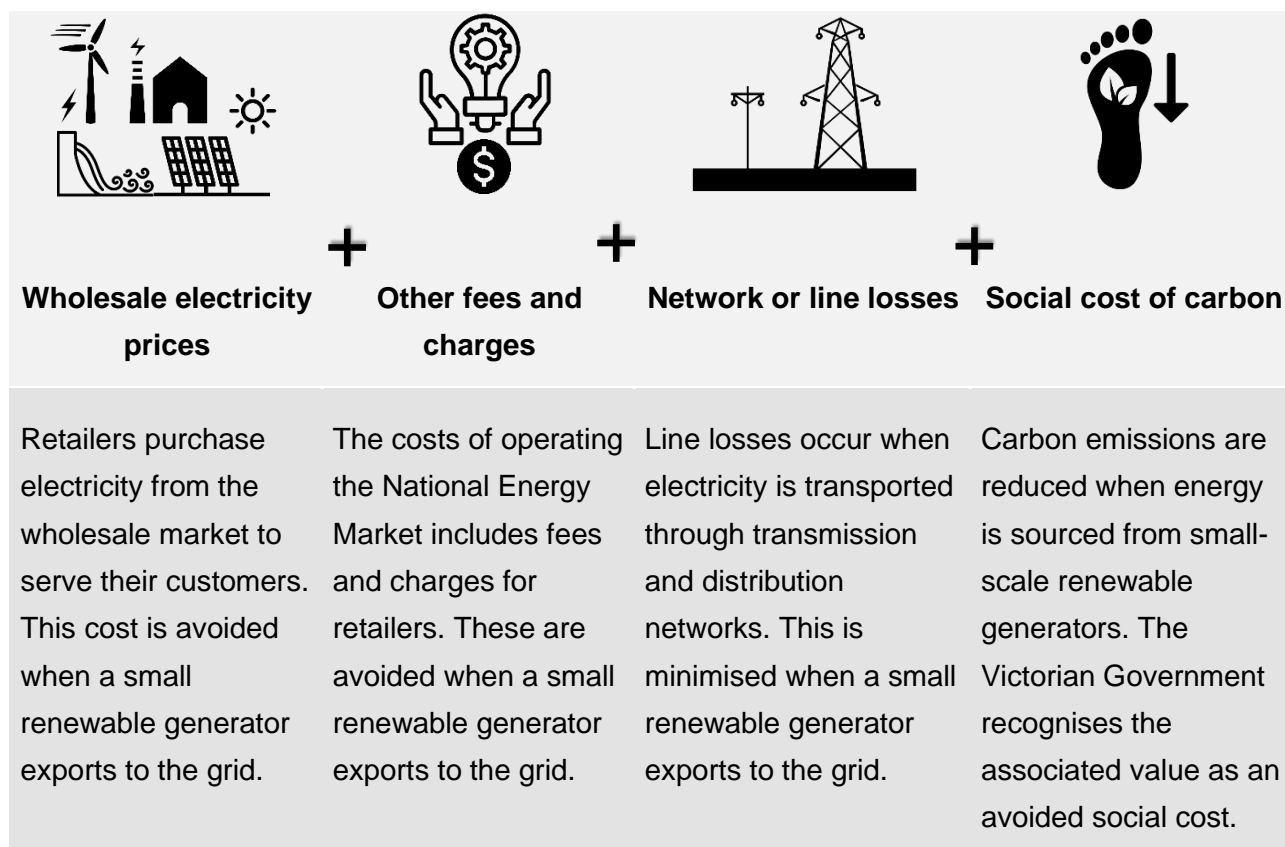


Factors we must consider in setting the minimum feed-in tariffs

The Electricity Industry Act 2000 requires us to have regard to certain costs in setting the annual minimum feed-in tariffs.²⁶ These costs are shown in Figure 2.3.

²⁶ Electricity Industry Act 2000, s. 40FBB(3).

Figure 2.3: Costs we must have regard in setting the feed-in tariff



Steps for setting the minimum feed-in tariffs

In line with previous years, we have used the following process to determine the minimum feed-in tariffs:

1. Develop a forecast of wholesale electricity prices for the relevant year (2021–22):
 - a) For the minimum flat feed-in tariff – using the forecast wholesale prices, calculate the average value of wholesale electricity weighted by the export share during the hours that solar photovoltaic systems typically export to the grid.
 - b) For the minimum time-varying feed-in tariffs – using the forecast wholesale prices, calculate the average value of wholesale electricity weighted by export share, during the hours that solar photovoltaic systems typically export to the grid, within each time block under this tariff structure.
 - c) Incorporate market fees and ancillary service charges that retailers avoid when they purchase electricity from small-scale generators rather than from the wholesale national electricity market.
2. Adjust the resulting values to account for avoided network losses.

2. How we set the minimum feed-in tariffs

3. Incorporate any value associated with the avoided social cost of carbon and avoided human health costs.²⁷

Apart from the different time blocks used to find the wholesale component of the feed-in tariff, all other steps of the above method are the same for the flat feed-in tariff and time-varying feed-in tariffs.

We used a futures market approach to forecast wholesale electricity prices

Calculating the minimum feed-in tariffs requires us to estimate the price of wholesale electricity that retailers avoid paying when a small-scale renewable generator exports electricity to the grid.

For energy retailers to provide electricity to their customers they must secure a supply of wholesale electricity from generators on the spot market. The spot market can be volatile, and retailers are at risk of high wholesale electricity prices.

A method to mitigate this risk is to 'hedge' wholesale prices. Some energy retailers own generators but most either hedge the wholesale prices by contracting directly with a generator or through the futures market on ASX Energy.

We have used a 'futures market' approach to forecast the wholesale prices that influence the minimum feed-in tariff decision. Future prices are transparent as they are publicly traded and our approach to calculating the minimum feed-in tariffs and the Victorian Default Offer based on forecast wholesale prices reflects the outcome of a workable competitive market.²⁸

We have used Victorian baseload swap futures contracts that are traded on the Australian Securities Exchange to forecast wholesale prices. This is the same approach we used in our 2019–20 and 2020–21 tariff decisions (see Appendix E for more information) and our Victorian Default Offer decisions.²⁹

²⁷ The Victorian Government gives an indication of these values, and we adopt them as a straight pass through into our modelling.

²⁸ Essential Services Commission 2020, Victorian Default Offer 2021, November 2020, p. 10.

²⁹ Essential Services Commission, Victorian Default Offer to apply from 1 July 2019: Advice to the Victorian Government. May 2019; Essential Services Commission, Victorian Default Offer to apply from 1 January 2020: Final report, November 2019; Essential Services Commission, Victorian Default Offer 2021: Final Decision, November 2020.

2. How we set the minimum feed-in tariffs

Industry stakeholders supported the futures market method to set tariffs.³⁰ Tango Energy, Simply Energy and EnergyAustralia all provided submissions that support our approach to determining wholesale electricity prices. Chapter four addresses stakeholder feedback in detail.

Calculating the minimum flat feed-in tariff

Solar panels account for 99.9 per cent of small-scale renewable generation in Victoria³¹ and export electricity to the grid during daytime. Since feed-in tariff exports almost exclusively happen during the day, futures prices underlying the feed-in tariff need to be adjusted to reflect solar export profiles.

To calculate the minimum feed-in tariff we use prices from the times when exports occur. This more accurately reflects the value of the electricity produced by small-scale renewable systems, accounting for variations in the wholesale value of electricity that occur throughout the day.

Solar-weighting ensures that the value of electricity during periods in which solar panels are not exporting or generating electricity – such as at night – is not included in the calculation of the feed-in tariff.

Calculating the minimum time-varying feed-in tariffs

Our previous review determined both a minimum flat feed-in tariff and minimum time-varying tariff. We allow retailers to choose if they offer a time-varying feed-in tariff, a flat tariff or both.

We have used the same off-peak, shoulder and peak time blocks for 2021–22 as we have in our previous feed-in tariff reviews. These are set out in Table 2.1.

³⁰ We acknowledge that during our previous feed-in tariff reviews some stakeholders did not support our approach, although they sometimes failed to give reasons for doing so, while others suggested linking the feed-in tariff to the retail electricity tariff was a more appropriate methodology. We have addressed other stakeholders' feedback on this in the following final decisions and report: Essential Services Commission 2020, Minimum electricity feed-in tariffs to apply from 1 July 2020: Final Decision, 25 February; Essential Services Commission 2019, Minimum electricity feed-in tariffs to apply from 1 July 2019: Final Decision, 28 February; Frontier Economics 2020, Wholesale Price Forecasts for Calculating Minimum Feed-in Tariff: Final Report for the Essential Services Commission, 24 February.

³¹ Australian Government Clean Energy Regulator, Postcode data for small-scale installations, accessed 28 January 2021, <http://www.cleanenergyregulator.gov.au/RET/Forms-and-resources/Postcode-data-for-small-scale-installations#Installation-numbers-for-small-scale-systems-by-stateterritory>.

2. How we set the minimum feed-in tariffs

Table 2.1: Time block structure for the time-varying feed-in tariffs

| Period | Weekday | Weekend |
|----------|---------------------------|--------------|
| Off peak | 10 pm – 7 am | 10 pm – 7 am |
| Shoulder | 7 am – 3 pm, 9 pm – 10 pm | 7 am – 10 pm |
| Peak | 3 pm – 9 pm | n/a |

The forecast wholesale prices for 2021–22 used to calculate the flat and time-varying feed-in tariffs are the same. But for the latter, we calculated the weighted average value of wholesale electricity for each time block.

Other costs associated with wholesale electricity

Market fees and ancillary service charges

When retailers purchase energy from the wholesale spot market, they pay market fees and ancillary service charges to the Australian Energy Market Operator.³² Retailers avoid these fees when they source electricity from small-scale renewable generators. Therefore, market fees and ancillary service charges are included as a key cost component of the feed-in tariff. This is consistent with the approach we used for the 2020–21 feed-in tariff review, with two exceptions.

Transmission planning costs

Prior to 1 July 2020, the market operator recovered National Transmission Planner costs from energy retailers via a market fee. The market operator is no longer charging this fee to retailers.³³ We have therefore removed it from our feed-in tariff calculations.

National Electricity Market fee

Also, the market operator has not published an estimate of the National Electricity Market fee to be levied on retailers in 2021–22. This is due to several factors that may impact fees beyond 2020–21

³² The Australian Energy Market Operator manages electricity and gas systems and markets across Australia. This includes the National Energy Market which connects the power systems of Queensland, New South Wales, the Australian Capital Territory, Victoria, South Australia and Tasmania. The market operator provides ancillary services to ensure the power system is managed safely, securely, and reliably.

³³ Australian Energy Market Commission 2020, National Electricity Rules Version 156, December 2020, Clause 2.11.1(c)(5A), p. 43, accessed 8 February 2021, <https://www.aemc.gov.au/sites/default/files/2020-12/NER%20v156%20full.pdf>.

2. How we set the minimum feed-in tariffs

including the ongoing Electricity Market Participant Fee Structure Review,³⁴ new regulatory developments, and unforeseen impacts and new responsibilities resulting from the coronavirus pandemic.³⁵ Therefore, we have used the market operator's budget market fee for 2020–21 as an estimate for 2021–22 in our feed-in tariff calculations.

The above changes only have a very minor impact on the feed-in tariff.

Network or line losses

Most of the electricity supplied to the National Electricity Market is produced by large central generators located long distances from the points where electricity is consumed.

Electricity is then transported to households and businesses via a transmission and distribution network (also known as the grid). During transportation, some of the electricity is lost as heat. These are referred to as 'network losses' or 'line losses'.

Small-scale renewable generation reduces line losses because electricity does not need to be transported far from the point of generation to the end consumer. The associated cost saving varies depending on the location of the generation facility (and other factors such as the quality of the line and the amount of electricity flowing through it). We have incorporated the value of this cost saving into the feed-in tariff.

We have used the market operator's estimates of distribution loss factors and marginal loss factors for 2020–21 to develop a loss factor for Victoria. We then applied this 'loss factor' to the avoided cost of purchasing electricity in the wholesale market (including market fees and ancillary service charges) to derive the cost saving.

More details on the calculation of network losses and market fees can be found in Appendix E.

³⁴ The draft report does not propose any changes to the percentage of the market fee allocated to retailers prior to 1 July 2023. Australian Energy Market Operator 2020, Electricity Fee Structures – Draft Report and Determination, November 2020, pp. 44-45, accessed 8 February 2021, https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2020/electricity-market-participant-fee-structure-review/second-stage/aemo-electricity-fee-structure-draft-report-and-determination.

³⁵ Australian Energy Market Operator 2020, 2020–21 AEMO Budget and Fees, June 2020, p. 5, accessed 8 February 2021, https://www.aemo.com.au/-/media/files/about_aemo/energy_market_budget_and_fees/2020/budget-and-fees---final.pdf.

2. How we set the minimum feed-in tariffs

The social cost of carbon and human health costs remain unchanged

Social cost of carbon

Energy sold in the National Electricity Market is generated using a variety of fuel sources and technologies. These include coal, natural gas, wind, solar and hydro power.

The damage caused by carbon emissions released during gas and coal-fired generation impose a cost to society known as the social cost of carbon. Carbon emissions are reduced when energy is sourced from small-scale renewable generators displacing a portion of fossil fuel-based generation. The avoided social cost of carbon included in the feed-in tariff reflects the value of resulting emissions reductions.

In determining the value of the avoided social cost of carbon added to the feed-in tariffs, we must have regard to the methodology and factors specified in the Victorian Government's 2017 Order in Council.³⁶ This approach results in an avoided social cost of 2.5 cents per kWh of electricity exported to the grid by a small-scale renewable generator. This value is the same as the value we used in 2020–21.

We note that the share of National Electricity Market energy supply produced by renewable generators has changed since 2017. If the Victorian Government amends the Order in Council to update the methodology for determining the social cost of carbon we will have regard to those changes in future feed-in tariff reviews.³⁷

More detail can be found in Appendix E.

Human health costs

Human health costs are the estimated costs of bad health outcomes due to air pollutants (including but not limited to carbon emissions) from electricity generation. These potential health costs include hospital admissions and deaths relating to cardiovascular and respiratory diseases that are directly caused by outdoor air pollution.

There is some overlap between the human health costs and the social cost of carbon. For example, hospital admissions for and deaths from respiratory diseases caused by carbon dioxide emissions would be both a social cost of carbon and a human health cost. However, if the

³⁶ Victorian Government 2017, Victoria Government Gazette No. S 36, Tuesday 21 February 2017, Order specifying a methodology and factors for the determination of the avoided social cost of carbon (Order in Council).

³⁷ Electricity Industry Act 2000, S.40FBB (3A) and 3(B)

diseases were caused by a different air pollutant, such as sulphur dioxide, nitrous oxides or particulate matter, they would only be human health costs.

The 2017 Order in Council does not specify a methodology for determining avoided human health costs attributable to a reduction in air pollution driven by renewable energy sources.

As part of our inquiry into the energy value of distributed generation, we examined the health benefits associated with distributed generation.³⁸ However, due to a lack of sufficient evidence and data, we could not place a monetary value on it.

The Department of Environment, Land, Water and Planning has also noted that lack of data in the Australian context reduces the reliability of human health costs estimated for Victoria based on international studies.³⁹ Therefore, the avoided human health costs are set at 0 cents per kWh.

Although we have set the avoided human health costs at zero for this decision we will raise this matter for consideration with the Department of Environment, Land, Water and Planning. If the Victorian Government amends the Order in Council to include a methodology for determining human health costs, we will have regard to that amendment in future decisions.

During public consultation on our draft decision, we received several submissions on the avoided social cost of carbon and human health costs. These are discussed in chapter four.

³⁸ Essential Services Commission 2016, *The energy value of distributed generation*, August 2016, pp. 62-63.

³⁹ Department of Environment, Land, Water and Planning 2019, *Estimating the health costs of air pollution in Victoria*, pp. 3-5, accessed 8 February 2021, https://www.climatechange.vic.gov.au/__data/assets/pdf_file/0022/421717/Final_Health-costs-of-air-pollution-in-Victoria.pdf.

2. How we set the minimum feed-in tariffs

3. Customer notification

This chapter sets out our final decision on requirements for retailers to notify solar customers of changes in feed-in tariffs before they take effect.

Retailers to give at least five days' notice of feed-in tariff changes

In our draft decision, we found the most common notification requirement for a feed-in tariff change was 'as soon as practicable and no later than the next billing period'. This is at odds with giving customers clear, timely and easily understood information to allow them to evaluate the ongoing suitability of their contract before any changes come into effect. To address this, we proposed that retailers give solar customers at least five business days' notice before feed-in tariffs change.

After considering stakeholder feedback, our final decision is to adopt our draft decision. Retailers must notify solar customers at least five business days before changes in feed-in tariffs. We encourage retailers to give customers as much notice as possible given any operating constraints.

Only customers directly affected by changes to feed-in tariffs are to be notified in advance, and therefore the obligations would only apply to solar customers. This means that customers who do not have solar installations will not receive the notification.

The feed-in tariff alert must include the information in the box below.

We require retailers to issue their solar customers a feed-in tariff change alert. The alert must:

- be in writing (this can be via email or SMS)
- use the customer's preferred method of communication
- be issued at least five business days before the feed-in tariff change takes effect
- state the customer's metering identifier
- state that the customer can use a price comparator website to compare offers and provide the name of the site and web address as well as a hyperlink to the site
- include the nature of the feed-in tariff change and the date that it will take effect:
 - identify the customer's current feed-in tariffs
 - identify the customer's feed-in tariffs as varied by the change
 - state the minimum feed-in tariff set by the commission at the time of the change.

The schedule of amendments to the Energy Retail Code to give effect to these new requirements can be found in Appendix C.

It is important that solar customers be given notification of changes in feed-in tariffs before they take effect. This allows customers to evaluate the ongoing suitability of their retail contract, before any changes that will affect their bill occur, and take steps to find an alternative retail contract.

Notification requirements will take effect from 1 June 2021

In our draft decision, we proposed the code amendments would come into effect on 1 June 2021.

We adopt our draft decision as our final decision. We consider this requirement will not place unreasonable regulatory burdens on retailers because they already have similar processes to notify customers of other benefit and price changes.

Stakeholder feedback

In reaching our final decision, we considered stakeholders' feedback on our draft decision. Eight solar customers and Tango Energy supported our draft decision while Simply Energy and EnergyAustralia provided alternative views on customer notification. We discuss and address these submissions in chapter four of this paper.

Solar customers are not being notified in advance of changes to feed-in tariffs

We have made this decision as our analysis found:

- that the most common notification requirement for a feed-in tariff change was 'as soon as practicable and no later than the next billing period'.⁴⁰ This is at odds with giving customers clear, timely and easily understood information to allow them to evaluate the ongoing suitability of their contract before any changes come into effect.
- that the Energy and Water Ombudsman (Victoria) reported in their 2019–20 annual report that some customers with solar systems had raised billing complaints including complaints about feed-in tariff rate changes without notice.⁴¹
- that in 2020, we also noticed a significant increase in complaints about the feed-in tariff many of which we received starting from July 2020 and onwards. While these complaints are not specific

⁴⁰ Essential Services Commission, Minimum feed-in tariff review 2021-22: draft decision, November 2020, pp.41-43.

⁴¹ Energy and Water Ombudsman (Victoria), Annual Report 2020, 2020.

about late or non-notification, the timing of receipt seemed to suggest that many customers became aware of the feed-in tariff change after receiving bills for the first period after the 1 July change.

Furthermore, the Energy Retail Code requires retailers to provide customers with a bill change alert at least five business days before prices or benefits change. The objective of the bill change alert is to give small customers an entitlement to clear, timely and easily understood information.

This allows customers to evaluate the ongoing suitability of their retail contract, before any changes that will affect their bill occur, and take steps to find an alternative retail contract.

We consider solar customers should receive the same entitlement of early notification of feed-in tariff changes as other customers in relation to benefit or price changes under the code.

We also consider that it is reasonable for retailers to have a consistent approach to proactively notifying customers of feed-in tariff changes, which has not been the case based on our analysis. This helps to ensure a consistent customer experience across retailers.

As for the costs associated with this change, we consider for customers notified by email or SMS they will be minimal but acknowledge that they could be higher for customers who prefer to be notified by post. However, retailers can notify their customers of upcoming feed-in tariff changes anytime between when we release our decision in February and five days before the new minimum feed-in tariffs take effect each July. As such, the notification requirement will only impose significant costs on retailers if they delay their decision on updated feed-in tariffs and as a result cannot combine notification with other postal communications between February and July.

The notification requirements also apply if a retailer chooses to change its feed-in tariffs for its customers at any other time during the year. However, the decision to change feed-in tariffs at other times is a decision for each individual retailer (as long as the change in tariffs are above the minimum we set)

3. Customer notification

4. Themes from submissions and our response

In this chapter, we address the key themes raised by stakeholders. We received 79 submissions and questions from 50 stakeholders in relation to our draft decision. These included:

- 47 written submissions made through our page in Engage Victoria and our fitreview@esc.vic.gov.au email
- 32 questions raised through a virtual public forum at our Engage Victoria page.

The 50 stakeholders were made up of 46 solar customers, three retailers and a biogas company.

Our responses to the 32 questions raised through Engage Victoria's virtual forum are publicly available and can be accessed here <https://engage.vic.gov.au/minimum-feed-in-tariff-review-2021-22>.

Almost all solar customers disagreed with the minimum feed-in tariffs in our draft decision. They consider them to be too low and unfair to people who have invested in solar systems. In contrast, Tango Energy and EnergyAustralia consider the minimum feed-in tariff to be too high and inefficient. Three solar customers supported our draft decision.⁴²

Most solar customers say feed-in tariffs are too low

The majority of the 46 solar customers who made a written submission disagree with our proposed minimum feed-in tariffs. Many of them find the minimum feed-in tariffs to be low, unfair, not sufficient to recover investment in solar systems and a disincentive to install solar panels.⁴³

⁴² David Blum, submission received 20 November 2020; Anonymous 7, submission received 21 November 2020. Stephen Jeremiah supported our draft decision but also have some concerns with our approach.

⁴³ Julie Mcculloch, submission received 20 November 2020; Hong Le, submission received 20 November 2020; Stephen Jeremiah, submission received 23 November 2020; Eugene Legat, submission received 25 November 2020; Robert Owen, submission received 26 November 2020; Colin Westmore, submission received 26 November 2020; Maria McKinnon, submission received 4 January 2021; Anonymous 1, submission received 18 November 2020; Anonymous 2, submission received 18 November 2020; Anonymous 3, submission received 20 November 2020; Anonymous 4, submission received 20 November 2020; Anonymous 5, submission received 20 November 2020; Anonymous 10, submission received 22 November 2020; Anonymous 13, submission received 24 November 2020; Anonymous 14, submission received 24 November 2020; Anonymous 15, submission received 26 November 2020; Anonymous 17, submission received 30 November 2020; Anonymous 18, submission received 30 November 2020; Anonymous 19, submission received 10 December 2020; Anonymous 21, submission received 5 January 2021.

The minimum feed-in tariffs reflect the true value of solar exports

Some solar customers felt that our proposed feed-in tariffs were too low and unjustified. One solar customer wrote:

The feed in rates specified in the draft decision are too low, unfair, and a disincentive to install a solar system. A 3 cent drop per kwh is not justified.⁴⁴

The reason for our proposed decrease is that wholesale electricity prices for 2021–22 are lower than those for 2020–21. If forecast wholesale electricity prices were higher for 2021–22 then the minimum feed-in tariffs would be too.

Forecast wholesale electricity prices, which account for about 60 to 70 per cent of the true value of solar exports, are the main factor influencing the annual change in the minimum feed-in tariff.⁴⁵ Figure 4.1 shows how the minimum feed-in tariffs have fluctuated over the last five years following movements of the wholesale electricity price. Had there been no 2.5 cent per kWh social cost of carbon, the minimum feed-in tariff would have been roughly the same as the wholesale electricity prices as shown for 2015 and 2016.

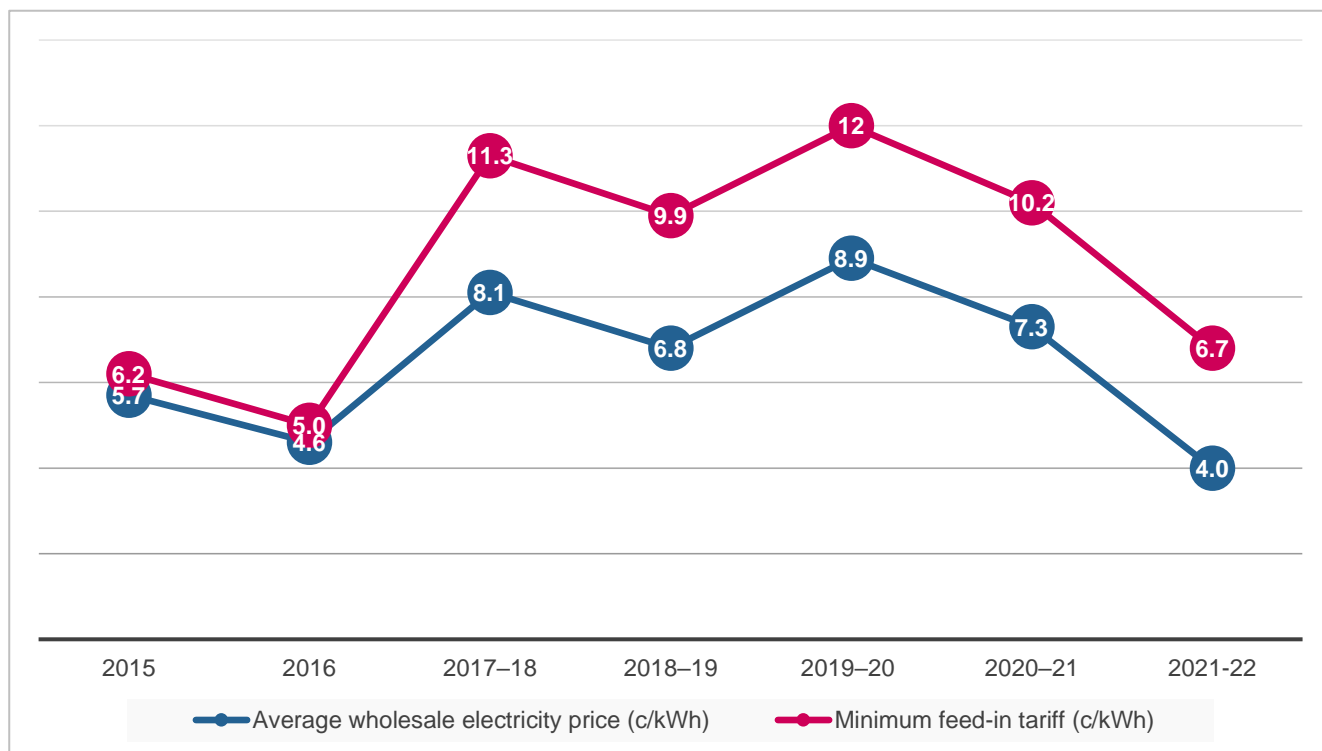
We consider our approach to setting the minimum feed-in tariff to be appropriate and consistent with our objectives to promote the long term interests of Victorian consumers. Our approach is also largely consistent with other Australian jurisdictions' approach in setting the feed-in tariffs (see Appendix D for more details).

⁴⁴ Anonymous 2, submission received 18 November 2020.

⁴⁵ Wholesale electricity prices accounted for almost 71 per cent of the 2020–21 feed-in tariff rates, 63 per cent of the draft decision feed-in tariff rates for 2021–22 and 60 per cent of the final feed-in tariff rates for 2021–22.

4. Themes from submissions and our response

Figure 4.1 – Minimum flat feed-in tariff rates (cents per kWh), 2015 to 2021–22



The minimum feed-in tariffs promote the interests of both solar and non-solar customers

Some solar customers felt that our proposed feed-in tariffs were unfair. For example, one solar customer wrote:

The Proposed FIT price and the current FIT pricing is unreasonable, unfairly disadvantages consumers and is heavily and solely weighted in favour of promoting the interests of retailer profits rather than protecting and adequately compensating consumers.⁴⁶

We consider that the minimum feed-in tariffs for 2021–22 give solar customers the right payment for their exports without other customers paying too much for electricity.

Solar customers get the true value for their solar exports. Under the legislation, this means considering the costs retailers avoid when they purchase electricity from solar customers rather than from the National Electricity Market plus the avoided social cost of carbon.⁴⁷

⁴⁶ Colin Westmore, submission received 26 November 2020.

⁴⁷ Electricity Industry Act 2000, s. 40FBB(3)(a), (b) and (c).

4. Themes from submissions and our response

If retailers pay solar customers at a rate higher than the true value of solar exports they would incur increased costs from selling solar customers' exports. To recover these increased costs, retailers would have to increase the retail rates for all their customers. It would not be fair for non-solar customers to pay higher retail rates in order to subsidise solar customers.

Our decision is consistent with our objectives of promoting the long term interests of Victorians. Solar customers receive the true value of their solar exports without non-solar customers subsidising them through higher retail rates.

The avoided imports from the grid will help most in recovering investments

Some solar customers felt that our proposed feed in tariff would not allow them to recover the investments they have made on their solar panels. One solar customer wrote:

The minimum feed-in tariff is a joke at 7.1 cents per kilowatt. Where is the incentive for householders to invest in solar or other forms of electricity generation when the pay-back period is so long?⁴⁸

We acknowledge that the minimum feed-in tariff affects solar customers' payback for solar panels but so does household consumption habits, solar panel orientation, size and manufacturing quality, and even the degree of shading of panels.

The main economic benefit of installing solar panels is reducing electricity consumption from the grid. Retail rates will always be higher than the value of rooftop solar generation. Retail rates include the cost of transporting electricity and overhead costs in addition to generation costs. Further, generation costs are only a part of the supply chain (roughly 30 percent for the average customer in Victoria).

It is critical to include the value of avoided grid imports (this is where the greatest economic benefit is) when calculating solar pay back periods.

We are not tasked to subsidise investment through higher feed-in tariffs

Many solar customers expressed concerns that our decision will discourage solar uptake and that the commission is acting in opposition to the Government's climate policies which are intended to promote renewable energy generation.⁴⁹ A solar customer wrote:

⁴⁸ Hong Le, submission received 20 November 2020.

⁴⁹ Anonymous 2, submission received 18 November 2020; Anonymous 3, submission received 20 November 2020; Anonymous 4, submission received 20 November 2020; Anonymous 6, submission received 20 November 2020;

You guys apparently do not believe in climate change and are hell bent on preventing the use of solar panels thereby increasing carbon omissions (sic).⁵⁰

We are responsible for setting an efficient price that mirrors the true value of solar to maximise the well-being of all Victorian consumers. If we were to set a feed-in tariff above the true value of solar exports with the aim of incentivising solar investment, then Victorians without solar panels would pay for this inefficiency. This would undermine our legislative obligation to promote the long-term interests of all Victorian consumers.

The commission also observed that installations of solar panels across Victoria continued to increase, with solar customers largely benefiting from using the electricity they produce and reducing electricity purchased from the grid.⁵¹

Several consumers also requested that the commission act beyond its jurisdiction in setting the feed-in tariff by subsidising batteries or lobbying for low income rebates to apply before feed-in tariff credits.⁵² These policy issues are not for the commission to decide.

The Victorian Government provides subsidies to make solar installation cheaper for any customer who wants it. It continues to encourage Victorian households and small businesses to access solar energy via its Solar Homes Program.⁵³ The program, which is administered by Solar Victoria, provides solar and battery rebates to eligible customers. See Solar Victoria for more details.⁵⁴

In contrast, we must determine the value of solar exports to the grid. The decision to subsidise solar installations (a policy decision) and measuring the value of exports (a regulatory decision) are independent exercises, and our role is only the latter.

Anonymous 8, submission received 22 November 2020; Anonymous 9, submission received 22 November, 2020; Anonymous 13, submission received 24 November 2020; Anonymous 15, submission received 26 November 2020; Anonymous 17, submission received 30 November 2020; Anonymous 19, submission received 10 December 2020; Anonymous 21, submission received, 5 January 2021; Hong Le, submission received 20 November 2020; Julie Mcculloch, submission received 20 November 2020; Maria McKinnon, submission received 4 January 2021.

⁵⁰ Anonymous 4, submission received 20 November 2020, p. 1.

⁵¹ Total solar installations in Victoria increased by 51 per cent from 2017 (336,955) to 2020 (508,796). Source: Clean Energy Regulator, Post code data for small-scale installations, accessed 16 February 2021, <http://www.cleanenergyregulator.gov.au/RET/Forms-and-resources/Postcode-data-for-small-scale-installations>.

⁵² Anonymous 3, submission received 20 November 2020; Anonymous 6, submission received 20 November 2020; Roland Adkins, submission received 17 December 2020.

⁵³ Solar Victoria, Welcome to the Solar Homes Program, accessed 25 January 2021, <https://www.solar.vic.gov.au/>.

⁵⁴ Solar Victoria, Solar Rebates, accessed 25 January 2021, <https://www.solar.vic.gov.au/solar-rebates>.

4. Themes from submissions and our response

Retailers consider feed-in tariffs should be lower

EnergyAustralia and Tango Energy consider that the minimum feed-in tariff could still be lower.⁵⁵ Their two main concerns are the cost of carbon and wholesale price components of the minimum feed-in tariffs.

Wholesale electricity prices have dropped further

EnergyAustralia expected to see further reductions in the commission's wholesale electricity price forecast for the final decision given 'material and recent decline in spot prices owing to outages of higher cost thermal units in NSW' and the commissioning of new utility scale renewable generation in New South Wales and Victoria over 2021.⁵⁶ It also suggested that we should consider the 'new transmission constraints affecting power flows between NSW and Victoria'.

We updated our forecast wholesale electricity prices to reflect the most recent market expectations in 2021–22. The average ASXEnergy prices for the 12 months to 2 February 2021 have declined relative to our forecast in the draft decision. This reflects the fact that the market's expectations of average prices across 2021–22 are now lower than they were at the time of the draft decision. See section six of Frontier Economics' report for details.⁵⁷

We agree with Frontier Economics' view that the effects of generator outages, new generation capacity and network constraints on future electricity prices will be reflected in the prices at which contracts trade on ASXEnergy. The approach of using the most recent 12-month historical data in forecasting the wholesale electricity price is likely to best capture these factors.

The cost of carbon should be updated

EnergyAustralia, Simply Energy and Tango Energy stated that the social cost of carbon is outdated, overstated and needs to be reviewed by the Government.⁵⁸ They submitted that this leads to inefficient feed-in tariffs which are not in the long term interests of consumers.

EnergyAustralia wrote:

⁵⁵ EnergyAustralia, submission received 8 January 2021, pp.1-2; Tango Energy, submission received 8 January 2021, pp.1-2.

⁵⁶ Energy Australia, submission received 8 January 2021, pp.1-2.

⁵⁷ Frontier Economics, Wholesale price forecasts for calculating minimum feed-in tariff: Final report for the Essential Services Commission, February 2021, s.6.

⁵⁸ EnergyAustralia, submission received 8 January 2021, p.1; Simply Energy, submission received 8 January 2021, p.1; Tango Energy, submission received 8 January 2021, p.1.

4. Themes from submissions and our response

These distortions ultimately affect the price and quality of supply for customers generally, as well as equity considerations in terms of cross subsidies arising between customers with PV versus those without. These are factors the Commission should be addressing in accordance with sections 8 and 8A of the Essential Services Commission Act.⁵⁹

Tango Energy noted that customers who install renewable distributed generation systems are already compensated for carbon abatement through the allocation of Small-scale Technology Certificates. It is concerned that as a result, the inclusion of the social cost of carbon in the calculation of the minimum feed-in tariff duplicates the compensation provided to solar customers. Tango Energy wrote:

This is, in turn, increasing the overall cost of electricity paid by Victorians and is disproportionately penalising those who cannot afford to install renewable energy systems.⁶⁰

Regarding the social cost of carbon, the Electricity Industry Act 2000 is specific in requiring the commission to have regard to the avoided social cost of carbon 'determined in accordance with the methodology or factor specified in the Order for the relevant avoided costs'.⁶¹ The Governor in Council has yet to replace the Order issued in 2017 which sets the social cost of carbon at 2.5 cents per kWh.

Some customers felt feed-in tariffs should equal retail rates

A number of solar customers suggested that the minimum feed-in tariffs should equal or be a percentage of the retail electricity rates.⁶² For example, one solar customer wrote:

The FIT pricing model is simply flawed and if it was motivated to protect consumer interests, then it ought to be a direct compensatory offset, i.e. measured and paid at the retailer individual electricity rate, exchanged for Exported electricity.⁶³

⁵⁹ EnergyAustralia, submission received 8 January 2021, p.1.

⁶⁰ Tango Energy, submission received 8 January 2021, p.2.

⁶¹ Electricity Industry Act 2000, s.40FBB(3)(c), 3A.

⁶² Colin Westmore, submission received 26 November 2020; Anonymous 1, submission received 18 November 2020; Anonymous 13, submission received 24 November 2020; Anonymous 17, submission received 30 November 2020; Anonymous 18, submission received 30 November 2020.

⁶³ Colin Westmore, submission received 26 November 2020.

4. Themes from submissions and our response

Retail rates reflect the costs of buying and delivering electricity to individual households and businesses. We consider that the more appropriate comparison should be between solar customers and generators who sell electricity in the wholesale electricity market.

Currently, solar customers are receiving better rates than the 'going price' generators receive from selling into the wholesale spot market.

When these generators sell electricity into the National Electricity Market, they do not receive more than the 'going price' in the wholesale market. They do not receive additional compensation for other costs incurred by retailers in servicing customers. The same approach applies to solar customers. Except solar customers also capture the benefit from the social cost of carbon and avoided network losses in the feed-in tariff, so they receive more than the average spot market price.

Over the period 2021–22, we forecast average wholesale prices will be 4 cents per kWh while the flat feed-in tariff is 6.7 cents per kWh.

If we set the feed-in tariff above 6.7 cents per kWh, then it would not make financial sense for retailers to buy electricity from solar customers. It would be more profitable for them to buy electricity from the wholesale spot market at the 'going price'.

However, eligible retailers are mandated to buy solar exports in Victoria (subject to network constraints). If we oblige them to pay feed-in tariffs higher than 6.7 cents per kWh then they would have to increase their retail rates to recover their increased costs from buying solar exports. This would eventually lead to all consumers paying higher retail rates including non-solar customers. That is not in the long term interests of Victorian consumers.⁶⁴

Many solar customers also expressed dissatisfaction with the gap between retail rates and the feed-in tariff.⁶⁵ This discrepancy is unavoidable. In providing these services, retailers incur costs associated with running a retail business that solar exporters do not.⁶⁶ These are legitimate costs

⁶⁴ Essential Services Commission Act 2001, s.8.

⁶⁵ Anonymous 1, submission received 18 November 2020; Anonymous 2, submission received 18 November 2020; Anonymous 5, submission received 20 November 2020; Anonymous 15, submission received 26 November 2020; Anonymous 17, submission received 30 November 2020; Anonymous 18, submission received 30 November 2020; Anonymous 20, submission received 14 December 2020; Anonymous 21, submission received 5 January 2021; Colin Westmore, submission received 26 November 2020; Eugene Legat, submission received 25 November 2020; Maria McKinnon, submission received 4 January 2021; Maria McKinnon, submission received 7 January 2021, Paolo Cardinali, submission received 20 November 2020; Roland Adkins, submission received 19 December 2020; Roland Adkins, submission received 28 December 2020.

⁶⁶ Customer acquisition and retention costs, normal business expenses, environmental compliance expenditures and a return on investment.

4. Themes from submissions and our response

that retailers can recover from their customers, otherwise, they will have no incentive to continue to provide their services.

Stakeholders support earlier customer notification

Eight solar customers and Tango Energy supported our proposal that retailers notify solar customers of annual feed-in tariff changes at least five business days before the change takes effect.⁶⁷ Tango Energy wrote:

Tango Energy has observed that many customers are confused about the ESC's role in setting the minimum feed-in tariff and that there is often miscommunication across the industry about upcoming changes in feed-in tariff rates. Tango Energy, therefore, considers that the proposed changes to customer communications, including imposing express obligations on energy retailers to provide clear advice about feed-in agreements, will help alleviate this confusion.⁶⁸

However, one solar customer suggested that it should be a month rather than five days to give solar customers more time re-evaluate their position and look for better providers if needed.⁶⁹

EnergyAustralia disagreed with our proposal. It submitted:

We disagree that the Commission should be imposing regulations to standardise customer experiences rather than letting this become a point of differentiation in the competitive market.⁷⁰

EnergyAustralia also noted that it is not clear whether the complaints and enquiry data constitutes sufficient basis for imposing the obligation.⁷¹

Both EnergyAustralia and Simply Energy provided alternative views in terms of customers notification:

⁶⁷ Tango Energy, submission received 8 January 2021, p.3; Anonymous 1, submission received 18 November 2020; Julie Mcculloch, submission received 20 November 2020; David Blum, submission received 20 November 2020; Anonymous 5, submission received 20 November 2020; Anonymous 7, submission received 21 November 2020; Adrian Tusek, submission received 22 November 2020; Stephen Jeremiah, submission received 23 November 2020; Indar, Ghikpal, submission received 10 December 2020.

⁶⁸ Tango Energy, submission received 8 January 2021, p.3.

⁶⁹ Eugene Legat, submission received 25 November 2020.

⁷⁰ EnergyAustralia, submission received 8 January 2021, pp.2-3.

⁷¹ EnergyAustralia, submission received 8 January 2021, pp.2-3.

4. Themes from submissions and our response

- EnergyAustralia suggested that if there are no current customer concerns regarding the commonly used notification requirements of ‘as soon as practicable and no later than the next billing period’, then the commission should adopt this if it believes consistency is important to customers.⁷²
- EnergyAustralia also suggested that targeted enforcement action for specific retailers may be preferable to any codified requirement.⁷³
- Simply Energy supported the intent of the commission but suggested expanding the definition of price and benefit changes to include feed-in tariffs, to avoid the need to duplicate existing requirements in the Energy Retail Code.⁷⁴
- Simply Energy also suggested that we change the notification date for feed-in tariff changes to before 1 August, to make it consistent with the retail notification and to allow proper comparison of feed-in tariff and retail offers.⁷⁵

The intent of our decision is to ensure solar customers are given notification before the new feed-in tariff rates take effect (1 July each year), not after.

Our analysis shows that many retailers’ feed-in tariff terms and conditions were unclear about when notification would take place. In 2020, we also noticed a significant increase in complaints about the feed-in tariff many, of which we received starting from July 2020 and onwards. We observed the same in previous years. While these complaints are not specific about late or non-notification, the timing of receipt seemed to coincide with customers becoming aware of the feed-in tariff changes after receiving bills for the period after the 1 July change.

Seven solar customers stated that they do not receive a feed-in tariff change notification or they do not know whether they are receiving one.⁷⁶

We consider that solar customers should be given notification before the new feed-in tariff rates take effect. This allows customers to check if their current retail contract is still the right one for them before changes take effect. We consider that our analysis of retailers’ terms and conditions,

⁷² EnergyAustralia, submission received 8 January 2021, p.3.

⁷³ EnergyAustralia, submission received 8 January 2021, p.3.

⁷⁴ Simply Energy, submission received 8 January 2021, pp.1-2.

⁷⁵ Simply Energy, submission received 8 January 2021, pp.1-2.

⁷⁶ Anonymous 1, submission received 18 November 2020; Julie McCulloch, submission received 20 November 2020; Anonymous 5, submission received 20 November 2020; Anonymous 7, submission received 21 November 2020; Adrian Tusek, submission received 22 November 2020; Stephen Jeremiah, submission received 23 November 2020; Indar Ghikpal, submission received 10 December 2020.

4. Themes from submissions and our response

Energy and Water Ombudsman Victoria's billing complaints findings, the commission's complaints data and stakeholder submissions show this is not always happening.

Five days before the change takes effect is the latest retailers can notify their solar customers. Retailers are free to notify much earlier than five days, which means customer notification could still become a point of differentiation in the competitive market, as EnergyAustralia suggested.

EnergyAustralia also noted that 'it may also be that targeted enforcement action for specific retailers is preferable to any codified requirement'.⁷⁷ It is not clear from EnergyAustralia's submission how the commission could undertake targeted enforcement action for specific retailers without a relevant general or codified obligation and empowering enforcement provisions.

We also note Simply Energy's concerns about duplicate obligations in relation to notification of price and benefit changes and feed-in tariff changes. On balance, we consider there is benefit in keeping the two sets of obligations. This is because there are significant differences and keeping them separate may allow retailers to better manage the differences. Multi-layered definitions under the Energy Retail Code could also be confusing for users.

Simply Energy's proposal to move the feed-in tariff changes notification to before 1 August would not be consistent with our objective of proposing a feed-in tariff change alert, which is to give solar customers advance notice of the change.

On balance, we consider five business days prior notification is reasonable because it is consistent with the notification period for changes to other prices and benefits. Noting we consulted widely on price and benefit change notification periods when we implemented a suite of reforms in 2018 relating to building trust through new customer entitlements in the retail energy market.⁷⁸

Other matters raised

Avoided human health costs

Several stakeholders noted that the avoided human health costs component of the minimum feed-in tariff is priced at zero cents per kWh.⁷⁹ These stakeholders doubted whether this value truly reflects the costs to human health that are avoided when energy is sourced from solar panels. One solar customer wrote:

⁷⁷ Energy Australia, submission received 8 January 2021, p.2.

⁷⁸ Essential Services Commission, 2018, Building trust through new customer entitlements in the retail energy market, October.

⁷⁹ Maria McKinnon, submission received 4 January 2021; Anonymous 21, submission received 5 January 2021.

4. Themes from submissions and our response

Your report does not specify the costs for human health due to air pollution as there was no evidence or data. I put it to you that there is much evidence available on the high costs to human beings' health and wellbeing due to air pollution.⁸⁰

The Electricity Industry Act 2000 requires the commission to have regard to the 'avoided human health costs attributable to a reduction in air pollution' determined in accordance with the methodology or factor specified in the Order for the relevant avoided costs.⁸¹ The Governor in Council may specify a methodology or factor for the determination of the avoided human health costs.⁸²

The 2017 Order in Council does not specify a methodology for determining the avoided human health costs. We will raise this matter with the Department of Environment, Land, Water and Planning for further consideration.

If the Victorian Government amends the Order in Council to include a methodology for determining human health costs, we will have regard to that amendment in future decisions..

Feed-in tariffs at the wholesale price would undercompensate solar customers

Some solar customers suggested the minimum feed-in tariffs should equal the wholesale electricity price.⁸³ One solar customer wrote:

Why shouldn't it match the wholesale price? There is no difference between a consumer investing in power generation and a business investing in power generation. Does that mean a large business investing in solar generation will also only get 7.1c/kWh?⁸⁴

Solar customers will be better off with the minimum feed-in tariff of 6.7 cent per kWh than with wholesale electricity prices. That is because the addition of the social cost of carbon leads to higher minimum feed-in tariffs than the wholesale electricity prices.

In contrast, one solar customer considers that it is not reasonable to link the minimum feed-in tariff with the wholesale electricity price because they are not sufficiently related.⁸⁵ Another solar customer noted that they should not be subjected to the variations in the wholesale market

⁸⁰ Maria McKinnon, submission received 4 January 2021, p. 1.

⁸¹ Electricity Industry Act 2000, s.40FBB(3)(b), 3A.

⁸² Electricity Industry Act 2000, s.40FBB, 3B.

⁸³ Anonymous 15, submission received 26 November 2020; Adrian Tusek, submission received 22 November 2020.

⁸⁴ Anonymous 15, submission received 26 November 2020.

⁸⁵ Colin Westmore, submission received 26 November 2020.

4. Themes from submissions and our response

because unlike commercial/wholesale producers they have little or no capacity for demand response generation'.⁸⁶

Our approach to base the minimum feed-in tariffs on the wholesale electricity prices is consistent with the matters we must have regard to under the legislation. It is also consistent with the approach of other Australian regulators as we discuss in Appendix D.

The commission promotes the long term interests of Victorian consumers

Eight solar customers who made a written submission felt the commission is protecting retailers rather than solar customers.⁸⁷

Your report seems to be very concerned about the cost to the electricity provider rather than the cost to the ratepayer who has forked out a considerable amount of money to purchase solar panels for very little return.⁸⁸

Seven other solar customers raised similar views on our Engage Victoria virtual public forum.⁸⁹

In our draft decision, we said:

Retailers would incur losses if the minimum feed-in tariff rates are set at the level of retail electricity rates. They would most likely recover these losses by increasing retail electricity rates.⁹⁰

Our decision is not about protecting retailers' profits. It is about protecting the long term interests of all customers.

When a retailer buys electricity from the wholesale spot market, it incurs generation costs and recovers them from their customers. The same applies to the electricity they buy from solar customers. Retailers should therefore only pay for the true value of solar exports, any higher than

⁸⁶ Anonymous 17, submission received 30 November 2020.

⁸⁷ Maria McKinnon, submission received 4 January 2021; Colin Westmore, submission received 26 November 2020; Robert Owen, submission received 26 November 2020; Stephen Jeremiah, submission received 23 November 2020; Anonymous 12, submission received 23 November 2020; Anonymous 18, submission received 30 November 2020; Anonymous 19, submission received 10 December 2020; Anonymous 21, submission received 5 January 2021.

⁸⁸ Maria McKinnon, submission received 4 January 2021.

⁸⁹ Engage Victoria, Minimum feed-in tariff review 2021–22: Our virtual public forum, accessed 17 January 2021, <https://engage.vic.gov.au/minimum-feedin-tariff-review-2021-22>.

⁹⁰ Essential Services Commission, Minimum feed-in tariff to apply from 1 July 2021: Draft decision, p.8.

4. Themes from submissions and our response

that and they would incur increased costs and possibly losses which would lead them to increase their prices for customers that do not have solar panels.

A more frequently reviewed feed-in tariff is impractical

Some stakeholders suggested the feed-in tariff be reviewed and set more frequently.⁹¹

In order to ensure we set an efficient feed-in tariff and are able to receive and consider all stakeholder submissions, each price change requires a draft decision, a public consultation and a final decision. This process generally takes more than six months.

Repeated changes to feed-in tariffs would also likely inconvenience many solar consumers. That is because wholesale prices, which are the largest component of the feed-in tariff, vary seasonally. As such, if the feed-in tariff were to be set more than once per year, there would be substantially larger variation in the feed-in tariff making it harder for households to budget expected feed-in tariff income into their economic decisions.

Finally, such frequent changes would impose a large regulatory burden on retailers who would be required to notify customers of these frequent changes to the feed-in tariff.

We conducted an open and transparent consultation process

Some consumers expressed their belief that the commission's pricing decision was made behind closed doors and that the annual reviews are not real consultation processes.⁹²

We make decisions pursuant to the requirements of the Essential Services Commission Act 2001, one of which is public consultation on our draft decision.

Due to a significant increase in the number of inquiries about the feed-in tariff in 2020 and the coronavirus pandemic, we further extended and improved our stakeholder engagement for this review:

- We gave stakeholders seven weeks to make a written submission, from 17 November 2020 to 8 January 2021. This is significantly longer than our minimum four-week consultation period.
- We held two online public forums featuring question and answers. To ensure wider participation, we advertised the invitation via social media. We also invited 171 different stakeholders to the public forums including those who have engaged with us previously about the feed-in tariff. A recording of the forum can be viewed at:

⁹¹ Roland Adkins, submission received 17 December 2020.

⁹² Anonymous 12, submission received 23 November 2020; Eugene Legat, submission received 25 November 2020; Anonymous 21, submission received 5 January 2021.

4. Themes from submissions and our response

<https://www.youtube.com/watch?v=eTQ9vnrVlqo> and a recording of the question and answer session at <https://www.youtube.com/watch?v=U76GaXlx7As>.⁹³

- For the first time, we also provided a virtual public forum on our Engage Victoria page. Solar customers were free to raise questions which we responded to. These are all publicly accessible.⁹⁴

We have also been active in publishing information on the various ways in which stakeholders can engage with the commission and the decision-making process on social media.

Based on the number of submissions we received and the level of stakeholder participation in our public forums, we are satisfied that stakeholders had ample opportunity to provide the commission with feedback on the draft decision.

We do not have the legislative power to deregulate feed-in tariffs

Tango Energy questioned whether a regulated feed-in tariff is in the best interest of Victorian consumers and suggested a deregulated feed-in tariff would better serve consumers:

*Tango Energy is strongly of the view that competitive markets are better placed than regulated pricing to efficiently serve the needs of Victorian energy consumers.*⁹⁵

As acknowledged by Tango Energy, the regulation of the feed-in tariff is not a decision made by the commission. The commission is an independent regulator tasked with determining the minimum feed-in tariff in accordance with the Essential Services Commission Act 2001 and the Electricity Industry Act 2000. Nonetheless, we have relayed Tango Energy's submission to the Department of Environment, Land, Water and Planning.

Retail electricity prices are decreasing

Various consumers made submissions asking why retail electricity prices are not going down when wholesale prices are.⁹⁶ Similar questions also appeared on our Engage Victoria site.

⁹³ Essential Services Commission, Feed-in tariff: your questions answered, accessed 3 February 2021, <https://www.youtube.com/watch?v=U76GaXlx7As>.

⁹⁴ Minimum feed-in tariff review 2021-22, accessed 25 January 2021, <https://engage.vic.gov.au/minimum-feedin-tariff-review-2021-22>.

⁹⁵ Tango Energy, submission received 8 January 2021, p. 3.

⁹⁶ Anonymous 2, submission received 18 November 2020; Anonymous 5, submission received 20 November 2020; Anonymous 21, submission received 5 January 2021; David Blum, submission received 10 December 2020; Eugene Legat, submission received 25 November 2020; Maria McKinnon, submission received 4 January 2021; Robert Bennett, submission received 28 November 2020; Stephen Jeremiah, submission received 23 November 2020.

4. Themes from submissions and our response

Firstly, we note that wholesale electricity prices are just one component, about 30 per cent, of what customers pay when they receive a bill from a retailer. A reduction in wholesale electricity prices can be offset by increases in the other components of retail electricity rates which would explain decreasing wholesale prices concurrent with constant or increasing retail prices.

However, we do not accept that retail electricity rates are not decreasing in 2021. We are responsible for setting the Victorian Default Offer for standing offers. We determined that on average for residential customers the Victorian Default Offer prices would decrease by 10 per cent in 2021 primarily due to decreased wholesale prices.

We do not have the legislative power to regulate retailers' market offers but we observed that major retailers have announced lower market offers in 2021 due to falling wholesale prices. For example, Origin Energy lowered its prices by 11 per cent:

Prices are falling due to a significant reduction in wholesale electricity costs and network costs, which make up a large share of a customer's bill.⁹⁷

EnergyAustralia also lowered its prices, with households on market offers set to see a 6.1 per cent decrease in their electricity bills:

EnergyAustralia has today announced that electricity rates for Victorian household and business customers will decrease in 2021, reflecting lower wholesale prices and network costs.⁹⁸

Additionally, AGL have announced that a typical Victorian consumer on a market offers will decrease:

From 1 February 2021, an average Victorian household on a variable market contract with an annual usage of 4.7MWh will see a reduction between 5-10.3%, or between \$84-\$138⁹⁹

⁹⁷ Origin Energy, Electricity prices to fall 11 per cent to four-year low, Victorians to pay \$180 a year less on average, accessed 18 January 2021, https://www.originenergy.com.au/about/investors-media/media-centre/electricity_prices_to_fall_11_per_cent_to_four_year_low_victorians_to_pay_180_a_year_less_on_average.html.

⁹⁸ EnergyAustralia, EnergyAustralia's Victorian household electricity bills set to fall in 2021, accessed 18 January 2021, <https://www.energyaustralia.com.au/about-us/media/news/energyaustralias-victorian-household-electricity-bills-set-fall-2021>.

⁹⁹ AGL, AGL announces reductions on Victorian electricity, accessed 25 January 2021, <https://www.agl.com.au/about-agl/media-centre/asx-and-media-releases/2020/december/agl-announces-reductions-on-victorian-electricity>.

4. Themes from submissions and our response

Appendix A: What is a feed-in tariff?

A feed-in tariff is the rate per kilowatt hour (kWh) that customers are credited when they export excess energy generation from their small-scale solar, wind, hydro or biomass generation sources. We set the minimum feed-in tariffs that energy retailers must pay solar customers for feeding their energy back into the grid.¹⁰⁰

Who is eligible to receive minimum feed-in tariffs?

The minimum feed-in tariff is available to residential households, businesses and community organisations. The property does not need to be your primary place of residence.¹⁰¹

To be eligible for a feed-in tariff customers must have small renewable energy generation facilities with capacities of less than 100 kilowatts (kW) which produce electricity using renewable energy sources such as wind, solar, hydro or biomass and must be connected to a distribution system.¹⁰² For example, a solar hot water system is not eligible under the minimum feed-in tariff as it does not generate electricity.¹⁰³

Solar customers that install small-scale batteries as part of their current renewable energy system will continue to be eligible to receive feed-in tariffs for the electricity generated and exported by their system to their retailers.¹⁰⁴

An important exception is that a 'small renewable energy generation facility' does not include a generating facility that is under the premium or transitional solar feed-in tariff scheme.¹⁰⁵

Further, the Governor in Council can specify a facility or class of facility that generates electricity in any way as a small renewable energy generation facility, by order published in the Government

¹⁰⁰ Electricity Industry Act 2000, s.40F(1). The relevant electricity retailer is a person that holds a licence to sell electricity and sells to more than 5,000 customers

¹⁰¹ Department of Environment, Land, Water and Planning, Minimum feed-in tariff frequently asked questions, accessed 19 January 2021, <https://www.energy.vic.gov.au/renewable-energy/victorian-feed-in-tariff/frequently-asked-questions>.

¹⁰² Electricity Industry Act 2000, s. 40F.

¹⁰³ Department of Environment, Land, Water and Planning, Minimum feed-in tariff frequently asked questions, accessed 19 January 2021, <https://www.energy.vic.gov.au/renewable-energy/victorian-feed-in-tariff/frequently-asked-questions>.

¹⁰⁴ DELWP advice to the commission, email dated 30 October 2020. Also see, Department of Environment, Land, Water and Planning, Minimum feed-in tariff frequently asked questions, accessed 19 January 2021, <https://www.energy.vic.gov.au/renewable-energy/victorian-feed-in-tariff/frequently-asked-questions>.

¹⁰⁵ Electricity Industry Act 2000, s. 40F(1).

Gazette.¹⁰⁶ The Department of Environment, Land, Water and Planning advised the commission that no order has been issued about this matter to date.¹⁰⁷

What feed-in tariff structures are available?

Retailers may offer rates above the minimum feed-in tariffs we set and can offer either a flat rate and/or a time-varying rate. Since 2018–19 the commission has set the minimum rate for both the flat and time-varying feed-in tariffs that a retailer can offer.

The flat feed-in tariff is paid to each customer regardless of the time of day the energy is being exported back to the grid.

The time-varying feed-in tariff is a peak, shoulder and off-peak structure of rates and is intended to reflect more precisely the underlying value of electricity, which is based on a wholesale electricity market with prices changing every 30 minutes. It tends to be higher at times of peak electricity demand. The peak, shoulder and off-peak rate structure varies between weekend and weekday, Figure A.1 below shows the weekday time-varying tariffs and Figure A.2 shows the weekend time-varying tariffs for 2021–22.

¹⁰⁶ Electricity Industry Act 2000, s. 40F(2).

¹⁰⁷ Department of Environment, Land, Water and Planning email to the commission dated 30 October 2020.

Figure A.1: Weekday minimum time-varying and flat feed-in tariffs, 2021–22

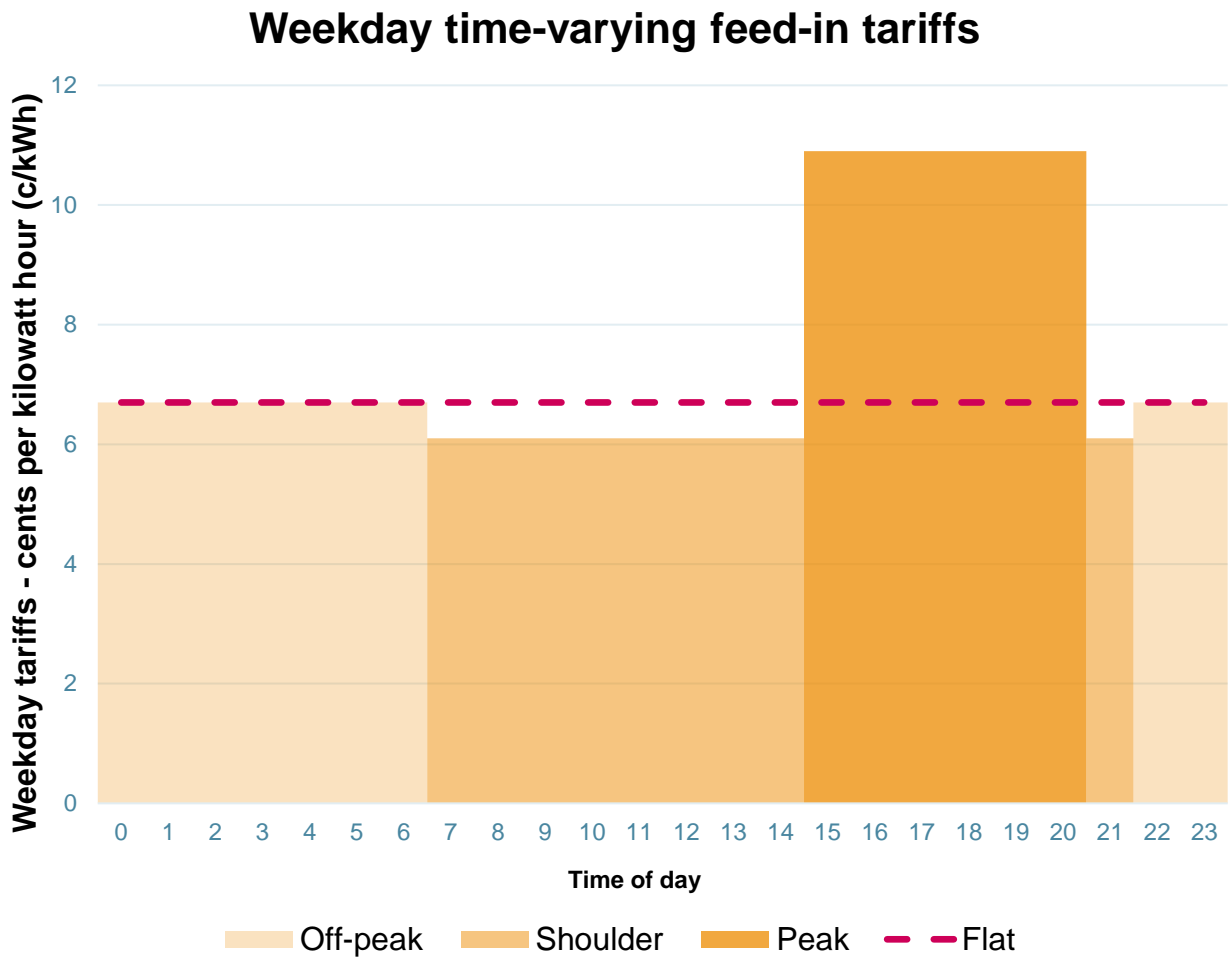
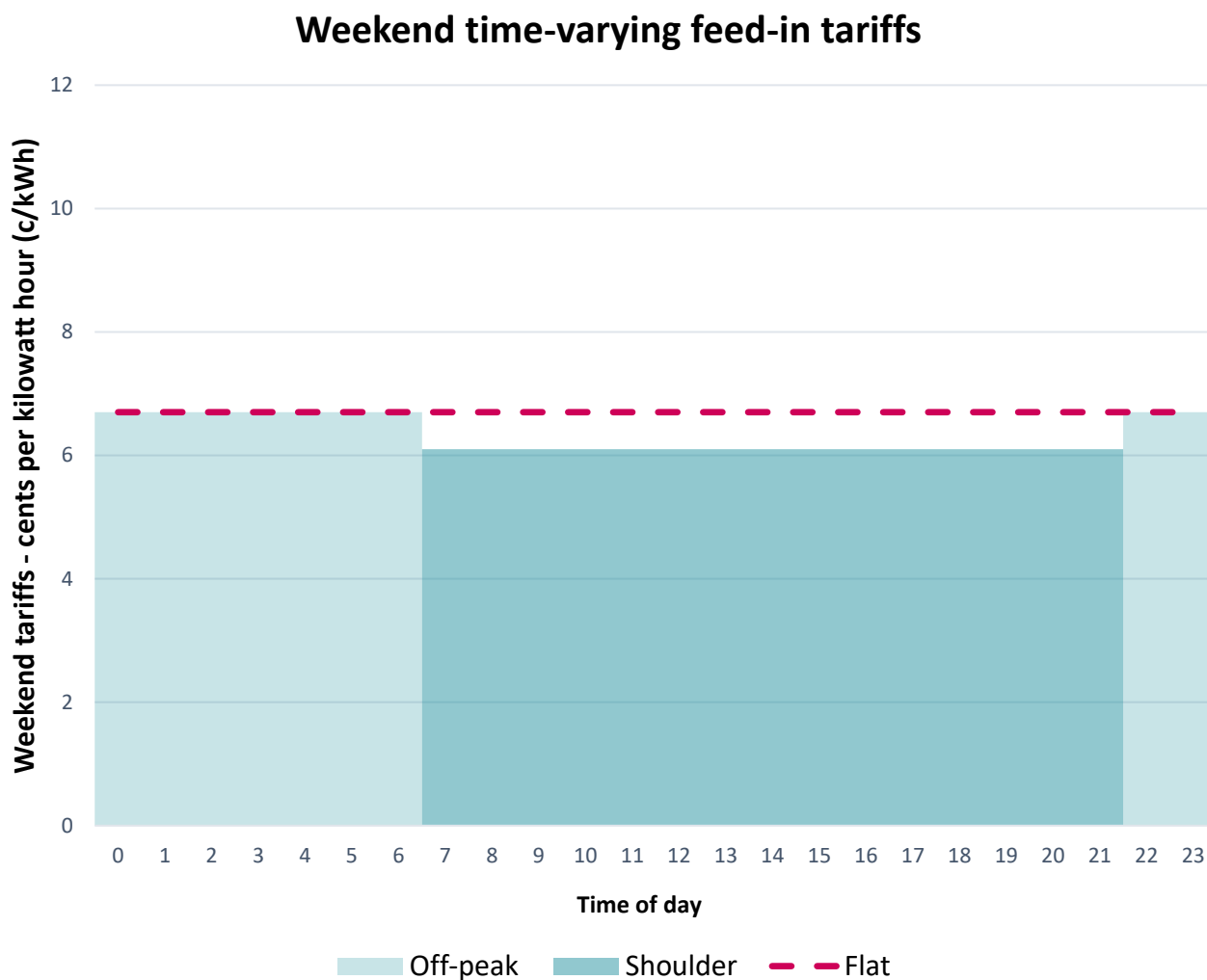


Figure A.2: Weekend minimum time-varying and flat feed-in tariffs, 2021–22



What offers are currently in the market?

All relevant Victorian energy retailers are required to provide at least the minimum feed-in tariffs in all their offers.¹⁰⁸ Retailers are free to offer a feed-in tariff above the minimum we set. We surveyed the flat feed-in tariffs available in the residential retail energy market in January 2021, see Figure A.3 for the results.¹⁰⁹

¹⁰⁸ The relevant electricity retailer is a person that holds a licence to sell electricity and sells to more than 5,000 customers in Victoria. See section 40F Definitions of the Electricity Industry Act 2000.

¹⁰⁹ Publicly available information submitted to the government energy price comparator website Victorian Energy Compare as of 19 January 2021, <https://compare.energy.vic.gov.au/>.

Figure A.3: Residential feed-in tariff offers available in January 2021



Source: Victorian Energy Compare, accessed 19 January 2021, <https://compare.energy.vic.gov.au/>.

Our search found two retailers offering flat feed-in tariffs higher than the 2020–21 minimum of 10.2 cents per kWh. Figure A.3 shows Dodo Power and Gas and EnergyAustralia offer 12 cents per kWh – which is the minimum flat feed-in tariff rate for 2019–20. Retailers could also offer higher feed-in tariffs throughout the year.

We found some retailers offer higher feed-in tariffs on certain plans or under special terms and conditions. For example, Tango Energy and Origin Energy offer a 20 cents per kWh flat feed-in tariff if new customers buy solar panels from them, and Origin Energy offer 14 cents per kWh if existing solar customers switch to Origin Energy.

EnergyAustralia is the only retailer to offer a time-varying feed-in tariff and a flat feed-in tariff as part of their electricity plans for Victorian customers.

Several other retailers offered contractual arrangements to battery owners which involved dynamic pricing of electricity exports. We will continue to monitor whether more retailers offer time-varying feed-in tariffs in the future.

The premium feed-in tariff (60 cents per kWh, which is closed to new customers), or any bonus that retailers may offer above this, is outside the scope of our role to set a minimum feed-in tariffs.

We encourage customers to shop around because some retailers offer feed-in tariffs higher than the minimum we set.

It is important to not just focus on the feed-in tariff when deciding on an electricity plan. Some plans which offer higher feed-in tariffs may have less competitive prices for the electricity you consume from the grid and this may outweigh the benefit received from a higher feed-in tariff.

You should consider your energy consumption and generation as a whole when you choose an electricity plan: including your patterns of use, the rates you pay for the electricity you use and the electricity you export.

How does solar energy fit in to the broader energy market?

The electricity available for consumption in the National Electricity Market is a mix of primarily fossil fuels (coal, oil and gas) and some renewable energy.¹¹⁰ This energy mix is supplied by electricity generators and the wholesale energy market matches generation with energy demand in real

¹¹⁰ Department of Industry, Science, Energy and Resources (2020), Australian Energy Statistics, Table C, accessed 19 January 2021, <https://www.energy.gov.au/data/energy-consumption>.

time.¹¹¹ Energy retailers engage with the National Electricity Market to provide electricity to their customers and meet their demand. This means the electricity sold to all energy consumers in Victoria, regardless of having rooftop solar or not, is a mix of fossil fuels and renewable energy.

Government subsidies such as the Small-scale Renewable Energy Scheme, Solar Homes Program and the premium feed-in tariff provide, or have provided, a financial incentive to households and businesses in Victoria to install solar panels and generate renewable energy.¹¹²¹¹³¹¹⁴

Energy generated from photovoltaic solar panels is first inverted to meet energy demand within the property, if demand for energy is low at the time of generation then the excess energy is exported to the grid the property is connected to. If a household needs energy when solar panels are not generating electricity, often at night-time, then energy is imported from the grid to meet that demand, charged at retail tariff rates.¹¹⁵

Before solar panels are installed some customers must seek pre-approval from their distributor to connect to the grid (a distributor is the business that owns and operates the poles and wires that transport energy). Most solar customers have a grid-connected solar system to ensure reliable access to energy at any time of day. However not everyone is able to export excess energy back to the grid, and customer can also experience export limits imposed by their distributor.¹¹⁶ Export limits can prevent a solar customer from receiving a feed-in tariff. Solar energy exports could also be impacted by proposed changes to the National Electricity Rules to allow distributors to charge for energy exported to the National Energy Market.¹¹⁷

¹¹¹ Clean Energy Regulator 2021, Post code data for small-scale installations, accessed 19 January 2021, <http://www.cleanenergyregulator.gov.au/RET/Forms-and-resources/Postcode-data-for-small-scale-installations#SGU--Solar-Deemed>.

¹¹² Clean Energy Regulator 2021, Small-scale Renewable Energy Scheme, accessed 28 January 2021, <http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/How-the-scheme-works/Small-scale-Renewable-Energy-Scheme>.

¹¹³ Solar Victoria 2021, Solar panel PV rebate, accessed 28 January 2021, <https://www.solar.vic.gov.au/solar-panel-rebate>.

¹¹⁴ Department of Environment, Land, Water and Planning, Premium feed-in tariff, accessed 28 January 2021, <https://www.energy.vic.gov.au/renewable-energy/victorian-feed-in-tariff/premium-feed-in-tariff>.

¹¹⁵ Solar Victoria 2021, Section 3: Grid-connected solar explained, accessed 19 January 2021, <https://www.solar.vic.gov.au/solar-panel-pv/section-3-grid-connected-solar-explained>.

¹¹⁶ Powercor/Citipower 2021, Solar Energy, accessed 19 January 2021, <https://www.powercor.com.au/solar-energy/>.

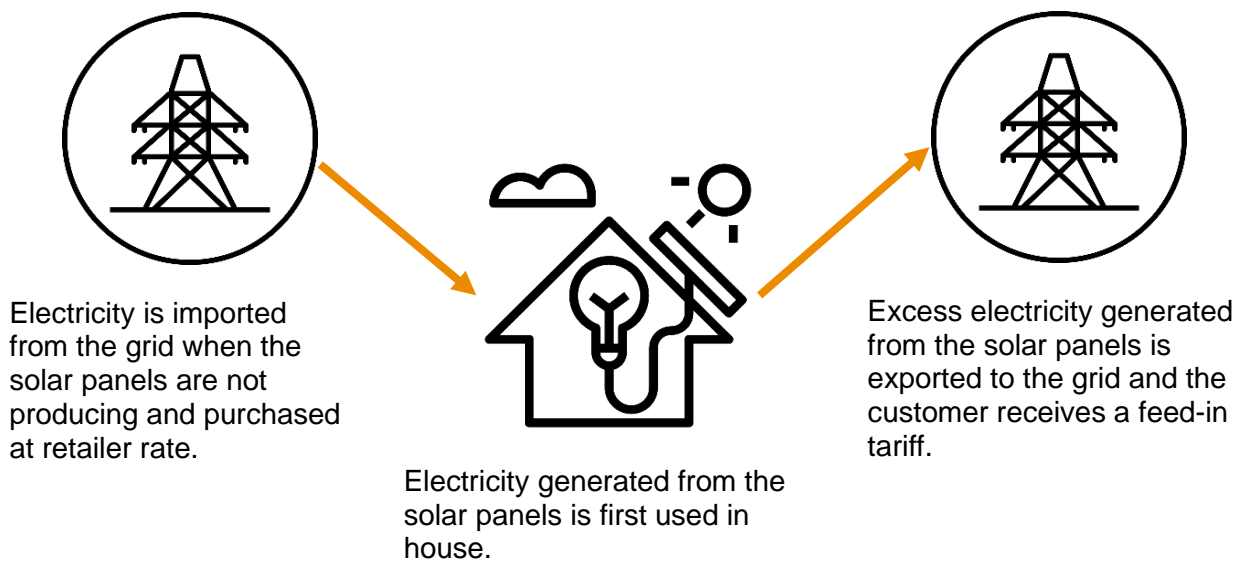
¹¹⁷ Australian Energy Market Commission 2020, Network planning and access for distributed energy resources, accessed 19 January 2021, <https://www.aemc.gov.au/rule-changes/network-planning-and-access-distributed-energy-resources>.

Appendix A: What is a feed-in tariff?

What is the difference between a net and gross feed-in tariff?

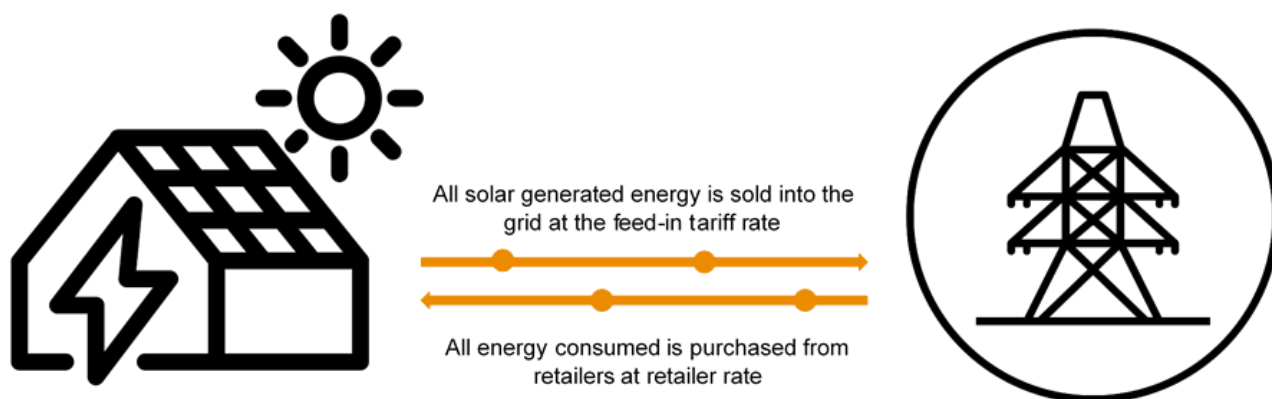
Victorian retailers currently offer net feed-in tariffs. This means, any solar energy a household generates is used first by the household to meet their demand. Unused solar energy is fed back into the grid and customers are paid the feed-in tariff. Extra energy needed by the household is imported from the grid and charged at the energy retailer's rate. This approach provides the greatest benefits to households when they use their own solar generated energy and avoid the need to import energy. Figure A.4 below explains a net feed-in tariff approach.

Figure A.4: Net feed-in tariff approach



Under a gross feed-in tariff approach all solar energy generated by a household is exported to the grid and solar customers are paid the feed-in tariff. When households use any energy, it is imported from the grid and the solar customer is charged at the energy retailer's rate. Households have no ability to use their own solar energy. Unlike under a net feed-in tariff approach, households can only save more by using less energy. Figure A.5 below explains the gross feed-in tariff approach.

Figure A.5: Gross feed-in tariff approach



What are the main benefits of solar?

Customers with solar panels benefit by:

- creating their own electricity, which is used in their property, saving them from purchasing energy from a retailer and therefore avoiding network and retailer costs; changing energy usage to during solar hours will also maximise savings
- receiving a feed-in tariff for exporting excess energy back into the grid
- installing a battery and saving excess energy generated during solar hours to maximise their savings.

What is our role in setting the minimum feed-in tariffs?

The Essential Services Commission is required under the Electricity Industry Act 2000 to determine the minimum rate or rates an electricity retailer must pay its customers, who are small renewable energy generators, for electricity they produce and export to the grid.¹¹⁸

When making the determination for the minimum feed-in tariff the commission must consider its objectives under the Essential Services Commission Act 2001 which are:

¹¹⁸ Electricity Industry Act 2000, s. 40FBB.

- to promote the long-term interests of Victorian consumers while having regard to the price, quality and reliability of electricity.¹¹⁹

We must also pursue our objectives under the Electricity Industry Act 2000. Those relevant to our role in setting the minimum feed-in tariff are:

- to promote the development of full retail competition
- to promote protections for customers, including in relation to assisting customers who are facing payment difficulties.¹²⁰

In addition to matters we must consider in seeking to achieve our objectives under the Essential Services Commission Act 2001,¹²¹ the commission must also consider specific factors in determining the minimum feed-in tariff under the Electricity Industry Act 2000.¹²² These factors are:

- the prices of electricity in the wholesale electricity market
- any distribution and transmission losses that are avoided, in Victoria, because of small renewable energy generation
- the avoided social cost of carbon and avoided human health costs which can be attributed to reduced air pollution caused by small renewable energy generators.

The Electricity Industry Act 2000 allows the Governor in Council to issue an order specifying a methodology or factors for determining the avoided social cost of carbon and avoided human health costs.¹²³ An order made in 2017¹²⁴ sets out factors and methodologies for determining avoided social cost of carbon comprising the following:

- methodologies for determining the number of units of carbon dioxide equivalent (CO₂e) reduced per unit of electricity exported from a small renewable energy generator
- the monetary value for each unit of CO₂e that is reduced because of the exports of a small renewable energy generator.

The order did not specify factors or methodologies for determining the avoided human health costs caused by a reduction in air pollution.

¹¹⁹ Essential Services Commission Act 2001, s. 8.

¹²⁰ Electricity Industry Act 2000, s. 10.

¹²¹ Essential Services Commission Act 2001, s. 8A.

¹²² Electricity Industry Act 2000, s. 40FBB(3).

¹²³ Electricity Industry Act 2000, s. 40FBB(3B).

¹²⁴ Victorian Government 2017, Victoria Government Gazette No. Section 36, Tuesday 21 February 2017

Each year, the commission determines the minimum feed-in tariffs for the forthcoming financial year. The feed-in tariff described in this decision will apply from 1 July 2021 to 30 June 2022.¹²⁵

¹²⁵ Amendments to Energy Legislation Amendment (Feed-in Tariffs and Improving Safety and Markets) Act 2017, assent date 14 February 2017, requires the commission to set one or more rates (Section 40FBB(2) of the Electricity Industry Act 2000) by 28 February in the financial year preceding the financial year in which it is to apply; previously determinations applied to the following calendar year.

Appendix A: What is a feed-in tariff?

Appendix B: Historic feed-in tariffs

Table B.1: Minimum flat feed-in tariff: 2015 – 2021–22 (cents per kWh)

| Tariff component | 2015 ¹²⁶ | 2016 ¹²⁷ | 2017–18 ¹²⁸ | 2018–19 ¹²⁹ | 2019–20 ¹³⁰ | 2020–21 ¹³¹ | 2021-22 |
|-------------------------------------------------------------|---------------------|---------------------|------------------------|------------------------|------------------------|------------------------|------------|
| Forecast solar-weighted average wholesale electricity price | 5.7 | 4.6 | 8.1 | 6.8 | 8.9 | 7.3 | 3.9 |
| Market fees and ancillary service charges | 0.05 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Value of avoided transmission and distribution losses | 0.4 | 0.3 | 0.6 | 0.5 | 0.5 | 0.3 | 0.2 |
| Value of the avoided social cost of carbon | n/a | n/a | 2.5 | 2.5 | 2.5 | 2.5 | 2.5 |
| Minimum feed-in tariff | 6.2 | 5.0 | 11.3 | 9.9 | 12.0 | 10.2 | 6.7 |

¹²⁶ Essential Services Commission 2014, Minimum feed-in tariff 2015: final decision, August 2014, p. 24.

¹²⁷ Essential Services Commission 2015, Minimum electricity feed-in tariff to apply from 1 January 2016 to 31 December 2016: final decision, August 2015, p.17.

¹²⁸ Essential Services Commission 2017, Minimum electricity feed-in tariff to apply from 1 July 2017: final decision, February 2017, p. 9.

¹²⁹ Essential Services Commission 2018, Minimum electricity feed-in tariffs to apply from 1 July 2018: final decision, 27 February 2018, p. 20.

¹³⁰ Essential Services Commission 2019, Minimum electricity feed-in tariffs to apply from 1 July 2019: final decision, 28 February 2019, p. 28.

¹³¹ Essential Services Commission 2020, Minimum electricity feed-in tariff to apply from 1 July 2020: final decision, 25 February 2020, p. 31.

Table B.2: Minimum time-varying feed-in tariffs: 2015 – 2021–22 (cents per kWh)¹³²

| Period | 2018–19 ¹³³ | 2019–20 ¹³⁴ | 2020–21 ¹³⁵ | 2021-22 |
|----------|------------------------|------------------------|------------------------|---------|
| Peak | 29.0 | 14.6 | 12.5 | 10.9 |
| Shoulder | 10.3 | 11.6 | 9.8 | 6.1 |
| Off peak | 7.1 | 9.9 | 9.1 | 6.7 |

See chapter three of Frontier Economics' report for details on the comparison of wholesale electricity price forecasts applied to the 2020–21 and 2021–22 minimum feed-in tariff decisions.¹³⁶

¹³² Optional time-varying feed-in tariffs were introduced in 2018–19. The time-varying feed-in tariff for 2018–19 and 2019–20 was time-weighted while the 2020–21 and 2021–22 rates are solar-weighted.

¹³³ Essential Services Commission 2018, Minimum electricity feed-in tariffs to apply from 1 July 2018: final decision, 27 February 2018, p. 20.

¹³⁴ Essential Services Commission 2019, Minimum electricity feed-in tariffs to apply from 1 July 2019: final decision, 28 February 2019, p. 28.

¹³⁵ Essential Services Commission 2020, Minimum electricity feed-in tariff to apply from 1 July 2020: final decision, 25 February 2020, p. 31.

¹³⁶ Frontier Economics 2021, Wholesale Price Forecasts for Calculating Minimum Feed-In Tariff, February 2021, pp. 17-19.

Appendix C: Amendments to the Energy Retail Code: Feed-in tariff notification

Amendments to the Energy Retail Code: Feed in tariff notification

FEBRUARY 2021

1. Nature and commencement of this instrument

- (1) This instrument amends the Energy Retail Code
- (2) This instrument comes into operation on 1 June 2021

2. Table of amendments

Clause 3 Definitions

- (1) After the definition of **family violence** insert the following definitions:

feed-in tariff agreement means an agreement between a retailer and a small customer, involving the purchase by the retailer of electricity from a *small renewable energy generation facility*;

feed-in tariff alert means a notice given under clause 70LA(1);

feed-in tariff change means a change to the rate a *retailer* pays a *small customer* for electricity from a *small renewable energy generation facility*, including a rate determined by the *Commission* under section 40FBB(1) of the *Electricity Industry Act*;

- (2) After the definition of **small customer** insert the following definition:

small renewable energy generation facility has the same meaning as in section 3 of the *Electricity Industry Act*;

Amendment to clause 70H

- (2) Insert new subclause (1B)

(1B) Prior to entering a *feed-in tariff agreement*, a retailer must communicate to the *small customer* in a readily understandable manner information about any terms pursuant to which the credit payable to the *small customer* may vary.

New clause 70LA

- (2) After clause 70L insert new clause 70LA

70LA Minimum standards – Notice of feed-in tariff change to be given

- (1) If a *feed-in tariff change* is to take effect, the *retailer* must provide the *small customer* who is a party to the relevant *feed-in tariff agreement* with a *feed-in tariff alert* of the *feed-in tariff change*.
- (2) The *feed-in tariff alert* must be given to the *small customer*,
- (a) in writing;
 - (b) using the *customer's* preferred method of communication (if nominated, for example by post or by email to a specified address);
 - (c) at least 5 *business days* before the *feed-in tariff change* will take effect.
- (3) The *feed-in tariff alert* must state:
- (a) the *customer's* metering identifier;
 - (b) the rate applying before and after the *feed-in tariff change*;
 - (c) the following words, 'the minimum feed-in tariff rate set by the Essential Services Commission is' immediately followed by the minimum rate set by the *commission* pursuant to s 40FBB(1) of the *Electricity Industry Act* as at the time the *feed-in tariff change* will take effect;
 - (d) the date on which the *feed-in tariff change* will take effect.
 - (e) that the *customer* may use a *price comparator* to compare offers that are generally available to classes of *small customers* in their geographical area;
 - (f) the name and web address of the *price comparator* including a hyperlink to the *price comparator* website on the notices provided electronically;
- (4) A *retailer* is not required to comply with this clause in respect of a *feed-in tariff change* where a *small customer* enters a *feed-in tariff agreement* less than 10 *business days* prior to a *feed-in tariff change* taking effect and the *retailer* notified the *small customer* of the *feed-in tariff change* prior to the *small customer* entering into the *feed-in tariff agreement*.

Amendment to clause 70M

- (3) In sub-clause 70M(2)(b) remove the words '*benefit change* or *price change*' and substitute '*benefit change, price change* or *feed-in tariff change*'.

Appendix D: Feed-in tariffs in other jurisdictions

Feed-in tariffs are regulated in other Australian jurisdictions except for South Australia, the Australian Capital Territory and South East Queensland.

In Victoria and Tasmania retailers can offer higher than the regulated rate.¹³⁷ In Western Australia, Northern Territory and Regional Queensland, a set rate is mandated.¹³⁸¹³⁹¹⁴⁰ New South Wales does not regulate feed-in tariffs but the Independent Pricing and Regulatory Tribunal (IPART), on request by the NSW government, sets a benchmark range annually as a guide.

Other states regulate their feed-in tariffs based on wholesale electricity prices

Different states have slightly different methodologies for calculating their regulated feed-in tariffs, though all set their rate based primarily on forecast wholesale electricity prices (see Figure D.1).

Wholesale electricity price component

New South Wales has the most similar methodology to Victoria when forecasting future wholesale electricity prices. IPART sources price data from NSW baseload electricity futures contracts from the ASX for the previous 12 months. These values are averaged over 40 trading days, given a range of +/- 10 per cent for uncertainty, and then reduced by 5 per cent for a contract premium. A 'solar multiplier' is then applied to adjust the forecast price to account for variation in the wholesale electricity price when solar exports occur.¹⁴¹

In Queensland, the Queensland Competition Authority approximates the half-hourly usage of customers by considering the distribution network system load profile. They use this data and the

¹³⁷ Office of the Tasmania Regulator, Feed-in Tariffs, accessed 14 January 2021, <https://www.economicregulator.tas.gov.au/electricity/pricing/feed-in-tariffs#:~:text=Feed%2Din%20tariff%20rate%20from,than%20the%202019%2D20%20rate.>

¹³⁸ Western Australia Government, Energy Buyback Schemes, accessed 14 January 2021, <https://www.wa.gov.au/organisation/energy-policy-wa/energy-buyback-schemes>.

¹³⁹ Northern Territory Government, Changes to Feed in Tariffs, accessed 14 January 2021, https://industry.nt.gov.au/_data/assets/pdf_file/0008/811628/changes-to-feed-in-tariffs-fact-sheet.pdf.

¹⁴⁰ Queensland Competition Authority, Regional Queensland solar feed-in tariff 2020-21, accessed 14 January 2021, <https://www.qca.org.au/project/customers/solar-feed-in-tariffs/regional-queensland-feed-in-tariff-2020-21/>.

¹⁴¹ IPART, Solar feed-in tariff benchmark, accessed 25 January 2021, <https://www.ipart.nsw.gov.au/files/sharedassets/website/shared-files/pricing-reviews-energy-services-publications-solar-feed-in-tariffs-202021/final-report-solar-feed-in-tariffs-202021-april-2020.pdf>.

trade-weighted average of the ASX Energy daily settlement prices of base, peak and cap contracts to estimate wholesale electricity costs. The wholesale electricity price for the upcoming period is then forecast by a third-party consultant through multiple simulations to cover a wide range of demand outcomes and potential risks.¹⁴²

To set the feed-in tariff at the appropriate rate, Tasmania uses the same wholesale electricity price which is determined by the Economic Regulator for standing offer prices. However, if there is a Wholesale Electricity Price Order issued by the Treasurer, that wholesale electricity price is used to set the feed-in tariff.¹⁴³

From our research, there is less publicly available data on the methodology adopted by Western Australia and the Northern Territory. Western Australia has introduced a time of export payment system to reflect the variation in the wholesale cost of electricity. Their new initiative, the Distributed Energy Buyback Scheme adopted in 2020, was introduced to 'better represent the actual cost of electricity at different times of day.'¹⁴⁴ The Northern Territory also seeks to provide a feed-in tariff which mirrors forecast wholesale electricity prices. The feed-in tariff is set, 'equivalent to the value of electricity exported to the grid'.¹⁴⁵

Other components

These states also explicitly factor in other costs to set the feed-in tariff. These include avoided network losses, avoided national energy market costs, and avoided ancillary costs.

Network costs, which are paid by retailers to the utilities that maintain and operate distribution networks, are an unavoidable cost for retailers. Our research indicates it is not added as a cost when setting feed-in tariff rates in any jurisdiction.

Victoria is the only state with a social cost of carbon component

Victoria is the only jurisdiction which quantifies the avoided social cost of carbon and the possibility of including avoided human health costs when setting a feed-in tariff rate.

¹⁴² Queensland Competition Authority, Regional Queensland solar feed-in tariff 2020-21, accessed 14 January 2021, <https://www.qca.org.au/project/customers/solar-feed-in-tariffs/regional-queensland-feed-in-tariff-2020-21/>.

¹⁴³ Office of the Tasmanian Economic Regulator, Regulated feed-in tariff rate for standard feed-in tariff customers, accessed 25 January 2021, https://www.economicregulator.tas.gov.au/Documents/19_475_2019_FiT_Investigation_Draft_Report_March_2019.PDF.

¹⁴⁴ Synergy, Distributed Energy Buyback Scheme (DEBS), accessed 28 January 2021, <https://www.synergy.net.au/Your-home/Manage-account/Solar-connections-and-upgrades/Distributed-Energy-Buyback-Scheme>.

¹⁴⁵ Department of Trade, Business and Innovation, Changes to Feed in Tariffs, accessed 25 January 2021, https://industry.nt.gov.au/_data/assets/pdf_file/0008/811628/changes-to-feed-in-tariffs-fact-sheet.pdf.

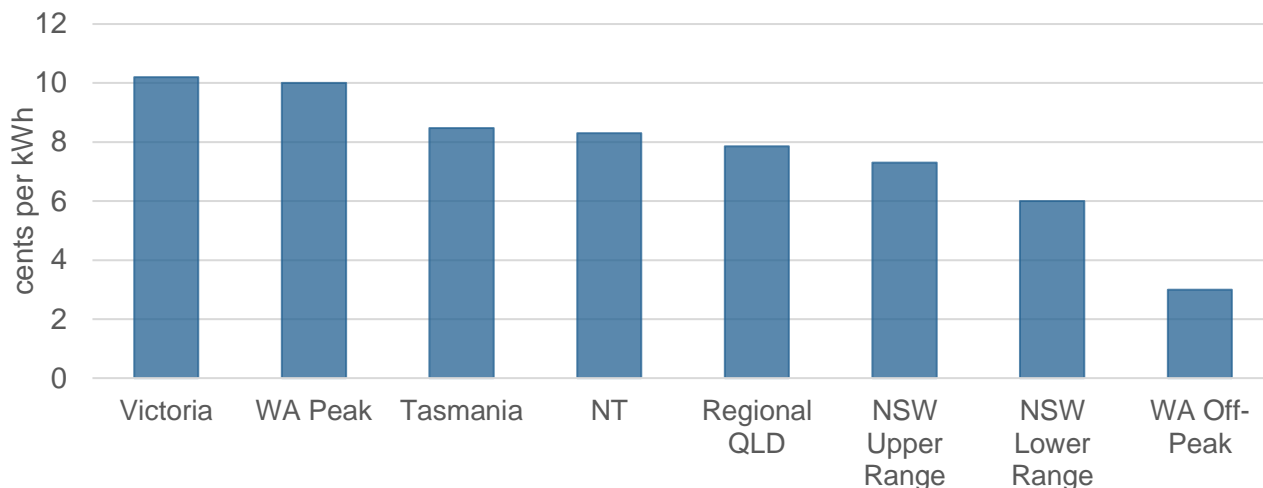
Figure D.1: Regulated feed-in tariff methodology comparisons in other jurisdictions
 (excluding South Australia, ACT, and South-East Queensland)

| State/Territory | Avoided wholesale electricity costs | Avoided network losses | Avoided ancillary & NEM costs | Avoided social cost of carbon |
|------------------------|-------------------------------------|------------------------|-------------------------------|-------------------------------|
| Victoria | ✓ | ✓ | ✓ | ✓ |
| New South Wales | ✓ | ✓ | ✓ | ✗ |
| Queensland (excl. SEQ) | ✓ | ✓ | ✓ | ✗ |
| Tasmania | ✓ | ✓ | ✓ | ✗ |
| Western Australia | ✓ | uncertain | uncertain | ✗ |
| Northern Territory | ✓ | uncertain | uncertain | ✗ |

The level of feed-in tariffs in other jurisdictions

Figure D.2 compares the regulated feed-in tariff rates across Australia in January 2021.

Figure D.2: Feed-in tariff flat rates in other jurisdictions 2021^{a,b,c,d}



^aVictoria also has time-varying feed-in tariff rates ranging from 9.1 to 12.5 cents per kWh. ^bfeed-in tariff rates are regulated in Regional Queensland only. ^cWestern Australia's new Distributed Energy Buyback Scheme has two rates: 10 cents per kWh (3pm-9pm) and 3 cents per kWh (all other times). ^dIPART also sets NSW benchmarks for different feed-in tariffs at different times of the day.

Victoria's minimum feed-in tariffs is currently higher than other regulated feed-in tariffs. This is largely driven by the additional avoided social cost of carbon which is accounted for when setting the feed-in tariff.

IPART, in New South Wales, also sets benchmarks for different periods of the day. This is to allow for fluctuations in the feed-in tariff when energy demand is lower during the day and solar exports are high, and in the evening when demand for electricity is high but solar has less capability to meet demand. As in Victoria, retailers do not have to offer time of usage feed-in tariffs and most do not.

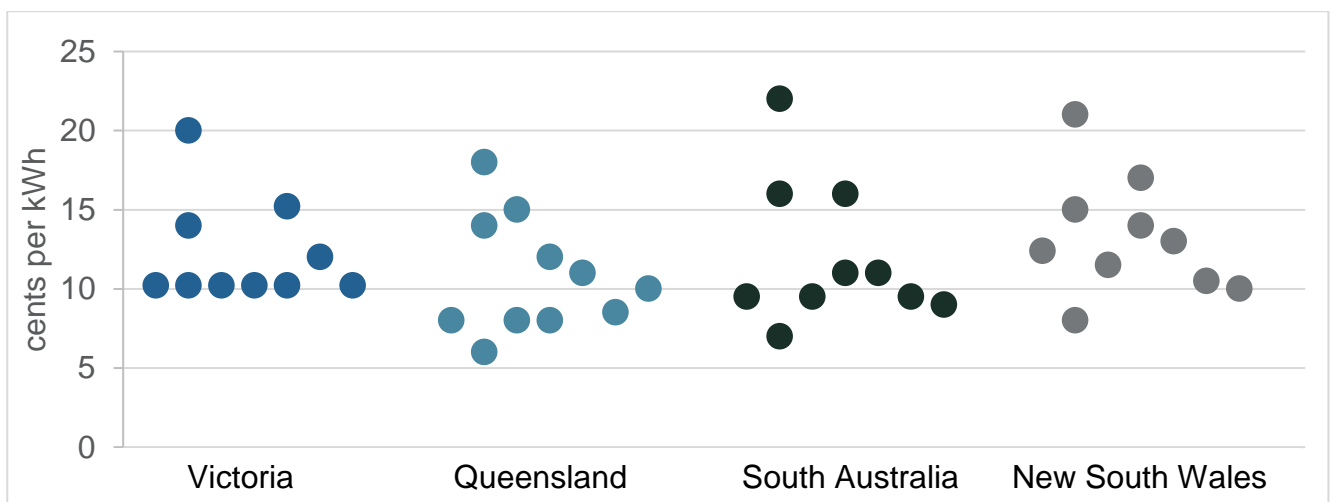
The 10 cents per kWh (3pm-9pm) and 3 cents per kWh (all other hours) under Western Australia's Distributed Energy Buyback Scheme has been set to encourage households to either use or store their solar energy generation in the middle of the day when it is plentiful and to install west facing panels.

Sample feed-in tariffs offered across Australia

In Victoria, many retailers offer the same 10.2c/kWh rate. In less regulated states, retailers tend to offer a wider range of feed-in tariffs, both below and above what is common in Victoria (Figure D.3).

It is worth noting higher feed-in tariffs are normally conditional on purchasing solar panels from the retailer or new solar customers changing retailers, and caution should be taken when directly comparing feed-in tariffs. Some retailers also offer a higher tariff until a certain threshold of energy is exported, once the threshold is reached, the feed-in tariff is reduced.

Figure D.3: Feed-in tariff rates offered by seven major retailers¹⁴⁶, 2021^a



a/ AGL¹⁴⁷, Origin Energy¹⁴⁸, Red Energy¹⁴⁹, Click Energy¹⁵⁰, 1st Energy¹⁵¹, Energy Australia¹⁵², Simply Energy¹⁵³

¹⁴⁶ Selected retailers all offer plans in Victoria, Queensland, South Australia and New South Wales, providing a more accurate comparison. WA, NT, ACT, and Tasmania excluded due to less directly comparable markets and retailers.

¹⁴⁷ AGL, Compare electricity and gas plans, accessed 13 January 2021, <https://www.agl.com.au/get-connected/electricity-gas-plans/vic/comparison>.

¹⁴⁸ Origin Energy, Feed-in tariff rates, accessed 13 January 2021, <https://www.originenergy.com.au/solar/feed-in-tariff-rates.html#vic>.

¹⁴⁹ Red Energy, Our current solar feed-in tariffs, accessed 13 January 2021, <https://www.redenergy.com.au/saving-energy/victorian-feed-in-tariff.html>.

¹⁵⁰ Click Energy, Find your perfect plan, accessed 13 January 2021, <https://www.clickenergy.com.au/solar-power>.

¹⁵¹ 1st Energy, Compare our plans, accessed 13 January 2021, <https://1stenergy.com.au/compare-plans/>.

¹⁵² Energy Australia, Solar rebates and feed-in tariffs, accessed 13 January 2021, <https://www.energyaustralia.com.au/home/electricity-and-gas/solar-power/feed-in-tariffs>.

¹⁵³ Simply Energy, Our policies and commitments, accessed 13 January 2021, <https://www.simplyenergy.com.au/help-centre/policies-and-commitments/solar-fit-policy>.

Appendix D: Feed-in tariff rates in other jurisdictions

Appendix E: Technical methodology

Our approach to determining the minimum feed-in tariff for 2021–22 is the same as the approach used to set the minimum feed-in tariff for 2020–21.

The methodology for deriving the value of electricity that retailers source from small-scale renewable generators comprises the following components:

- the avoided cost of purchasing an equal amount of electricity from the wholesale market, accounting for price changes throughout the day and seasonally, including:
 - both flat rate and time-varying rate wholesale electricity price forecasts
 - avoided market fees and ancillary service charges
- avoided transmission and distribution losses
- avoided social cost of carbon and avoided human health costs.

Table E.1 shows how the minimum feed-in tariff is calculated from these components.

Table E.1: Calculating the minimum feed-in tariff applicable from 1 July 2021

| Component | Calculation | Flat rate | Off peak | Shoulder | Peak |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|----------|-------|
| A: Wholesale electricity prices | Solar export-weighted average price forecast (cents per kWh) | 3.92 | 3.87 | 3.39 | 7.91 |
| B: Avoided market fees and ancillary service charges | Sum of 1) the budget National Electricity Market fee for 2020–21 used as a best estimate for 2021–22 and 2) average ancillary service charge recovered from customers between week 1 and week 52 of 2020 (cents per kWh) | 0.07 | 0.07 | 0.07 | 0.07 |
| C: Transmission and distribution loss adjustment | Inverse of the sum of overall losses attributed to each distribution business weighted by its individual share of the total low voltage customer base | 5.59% | 5.59% | 5.59% | 5.59% |
| D: Value of avoided transmission and distribution losses | Product of [A + B] and C (cents per kWh) | 0.22 | 0.22 | 0.19 | 0.45 |
| E: Value of avoided social cost of carbon | Product of the volume factor and the price factor (cents per kWh) – see page 77 for details | 2.49 | 2.49 | 2.49 | 2.49 |

| Component | Calculation | Flat rate | Off peak | Shoulder | Peak |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------|------------|------------|------------|-------------|
| F: Value of avoided human health costs | Set at 0 cents per kWh since the Victorian Government's Order in Council does not specify an applicable method | 0.00 | 0.00 | 0.00 | 0.00 |
| Total (rounded to one decimal place) | A + B + D + E + F | 6.7 | 6.7 | 6.1 | 10.9 |

Forecasting wholesale electricity prices

We have used a futures market approach to estimate the wholesale electricity prices in 2021–22. This approach best meets our legislative objectives.

We used the same approach as in our 2019–20 and 2020–21 feed-in tariff reviews and our Victorian Default Offer decisions including the most recent review.¹⁵⁴ Benefits of using a futures market approach include:

- more transparency to stakeholders than a market modelling approach
- alignment of our decision with the view of ‘the market’ as represented by contract prices.

Increased transparency provides customers with greater opportunity to understand and provide meaningful feedback on our decisions. This is consistent with our objectives of promoting protections for customers¹⁵⁵ and promoting the long-term interests of Victorian consumers¹⁵⁶.

Wholesale price forecasts for 2021–22

We engaged Frontier Economics to forecast wholesale electricity prices for 2021–22 using a futures market approach. The following section outlines this approach.

Wholesale price forecast for the flat feed-in tariff

There are 5 steps involved in forecasting the relevant wholesale price for the minimum flat feed-in tariff. The aim is to estimate what retailers would pay for customers’ solar exports in 2021–22 if they directly supplied to the wholesale spot market the same way other generators operate.

1. **Calculating the price level for 2021–22:** This is represented by the average price of 2021–22 quarterly base load swaps from the Australian Stock Exchange (after adjusting for an

¹⁵⁴ Essential Services Commission 2020, Victorian Default Offer 2021: Final Decision, November 2020.

¹⁵⁵ Electricity Industry Act 2000, s. 10(c).

¹⁵⁶ Essential Services Commission Act 2001, s. 8.

assumed contract premium of five per cent) weighted by volume traded across the most recent 12 months. This 12-month average price is reflective of retailers' approach to buying contracts. Table E.2 provides the value of these contracts over the 12 months up to and including 2 February 2021.

Table E.2: Forecast base swap prices for 2021–22 (excluding 5 per cent premium)

| Calendar quarter | 12-month trade-weighted average (cents per kWh) up to 2 February 2021 |
|------------------|-----------------------------------------------------------------------|
| Q3 2021 | 4.33 |
| Q4 2021 | 4.06 |
| Q1 2022 | 6.88 |
| Q2 2022 | 3.80 |

Source: Base swap price data from ASX Energy and analysis by Frontier Economics

2. **Selecting the appropriate export profile and historical prices:** The actual half-hourly export data from solar customers across each Victorian metropolitan and regional electricity distribution network is available for the period from 1 July 2019 to 30 June 2020. These most recent data is likely to be the best indicator of solar export profiles in 2021–22. Corresponding spot price data for the same time period is available from the Australian Energy Market Operator.¹⁵⁷
3. **Scaling historical prices to 2021–22 levels:** After taking a time-weighted average of historical prices for each quarter for the relevant base year i.e. 2019–20, they are compared to the quarterly futures prices from step 1 to determine a scaling factor for each quarter.
4. **Applying the scaling factor to the historical prices:** Each half-hourly price in the base year is scaled by the relevant factor calculated in step 3 to forecast the half-hourly prices expected in 2021–22.¹⁵⁸
5. **Calculating the flat feed-in tariff:** The wholesale electricity component of the flat feed-in tariff is calculated by averaging the half-hourly prices from step 4, weighted according to the time profile of solar exports from step 2. The relevant formula is:

¹⁵⁷ Australian Energy Market Operator, NEM data dashboard, <https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/data-nem/data-dashboard-nem>.

¹⁵⁸ The wholesale spot price of electricity is determined through an auction, which is currently conducted every 30 minutes by the Australian Energy Market Operator. In 2017, the Australian Energy Market Commission made a determination to adopt a settlement period of five minutes effective from 1 October 2021. However, due to lack of historical data on five-minute settlements, we are continuing with the average price generators are paid every half hour in our future's market approach to forecasting wholesale energy prices for 2021–22.

$$\text{Flat feed-in tariff rate export-weighted wholesale electricity price} = \frac{\sum_{t=1}^{17,568} (\text{expected price 2021-22}_t \times \text{solar exports}_t)}{\text{Total solar exports 2019-20}}$$

Where t = each half hour interval in the year.

Wholesale price forecasts for the time-varying feed-in tariffs

Steps 1 to 4 of forecasting the flat feed-in tariff are also applicable for forecasting the time-varying tariff. Similar to the approach taken for the flat feed-in tariff, we have set the time-varying feed-in tariff using a weighting based on solar export profiles. The only difference in relation to step 5 is that this weighting is applied three times – once for each time block – using only the expected prices and solar exports from the relevant time block.

Estimating market fees and ancillary service charges

When retailers purchase energy from the wholesale market, the Australian Energy Market Operator charges market fees and ancillary service fees from them. These fees are based on the amount of electricity retailers purchase from the spot market. Retailers can avoid them to the extent they source electricity from small-scale renewable generators. Therefore, these fees and charges are included as avoided costs in the feed-in tariff calculations.

Table E.3 below shows our total avoided cost estimate of 0.07 cents per kWh for 2021–22. It reflects the value of ancillary service charges and market fees a retailer avoids by purchasing electricity from a small-scale renewable generator.

Table E.3: Estimates of market fees and ancillary service charges for 2021–22

| Item | \$ per MWh | cents per kWh |
|----------------------------------|-------------|---------------|
| National Electricity Market fees | 0.37 | 0.04 |
| Ancillary service charges | 0.34 | 0.03 |
| Total | 0.71 | 0.07 |

Source: AEMO, 2020-21 Budget and Fees report and ancillary services recovery summaries for 2020 and 2021

Market fees

Prior to 1 July 2020, the market operator recovered its National Transmission Planner (NTP) function costs from retailers via a market fee. The market operator is no longer charging NTP fees

from retailers following an amendment made to the National Electricity Rules.¹⁵⁹ Therefore, we have excluded NTP fees from our calculation of avoided wholesale electricity purchase costs.

Annually, the market operator publishes estimates of the National Electricity Market (NEM) fee to be allocated to retailers in upcoming financial years. However, the market operator's 2020–21 Budget and Fees paper does not provide an estimate of the fee for 2021–22. This is due to several factors that may impact fees beyond 2020–21 including the ongoing Electricity Market Participant Fee Structure Review, new regulatory developments, and unforeseen revenue and system impacts and new responsibilities resulting from the coronavirus pandemic.¹⁶⁰ Therefore, we have used the budget market fee of 0.037 cents per kWh in 2020–21¹⁶¹ as a best estimate for 2021–22.

The above changes only have a very minor impact on the feed-in tariff.

Ancillary service charges

The market operator provides ancillary services to the National Electricity Market to ensure the power system is operated in a safe, secure and reliable manner. It recovers the associated costs from market participants including from retailers.

In determining the feed-in tariff applicable from 1 July 2021, we have assumed the average cost of providing ancillary services in 2021–22 will be consistent with its average over the last 12 months (or 52 weeks). We have used the same approach in setting the Victorian Default Offer.¹⁶² The cents per kWh rate used in this final decision is the average service charge recovered from January 2020 to December 2020.¹⁶³

¹⁵⁹ Australian Energy Market Commission 2020, National Electricity Rules Version 143, July 2020, p. 43, Clause 2.11.1(c)(5A), accessed 8 February 2021, <https://www.aemc.gov.au/energy-rules/national-electricity-rules/national-electricity-rules-version-143>.

¹⁶⁰ Australian Energy Market Operator 2020, 2020–21 AEMO Budget and Fees, June 2020, p. 5, accessed 8 February 2021, https://www.aemo.com.au/-/media/files/about_aemo/energy_market_budget_and_fees/2020/budget-and-fees---final.pdf.

¹⁶¹ Australian Energy Market Operator 2020, 2020–21 AEMO Budget and Fees, June 2020, p. 26, accessed 3 February 2021, https://www.aemo.com.au/-/media/files/about_aemo/energy_market_budget_and_fees/2020/budget-and-fees---final.pdf.

¹⁶² Essential Services Commission 2020, Victorian Default Offer to apply from 1 January 2020: Final decision, November 2019. Essential Services Commission 2020, Victorian Default Offer 2021: Final Decision, November 2020.

¹⁶³ Australian Energy Market Operator 2021, Ancillary services payments and recovery, accessed 3 February 2021, <https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/data-nem/ancillary-services-data/ancillary-services-payments-and-recovery>.

Estimating avoided transmission and distribution losses

Electricity supplied to the wholesale market is mostly produced by large central generators located some distance away from the points of energy consumption. Electricity is transported to households and businesses via a transmission and distribution network (also known as the grid). During this process, a small portion of electricity originally exported to the grid is lost as heat. These energy losses are referred to as ‘network losses’ or ‘line losses’.

Small-scale renewable generation reduces these losses because the exported electricity is typically consumed within a close distance.¹⁶⁴ The extent of the associated cost saving varies depending on the location of the generation facility among other factors (such as the quality of the line and the amount of electricity flowing through it). We have incorporated this cost saving to retailers into the feed-in tariff by applying a ‘loss factor’ to their avoided cost of purchasing electricity in the wholesale market.

Using the market operator’s estimates of distribution and marginal loss factors for 2020–21, we have estimated a single customer share-weighted loss factor of 1.0592 for Victoria. The inverse of this loss factor is then used to derive the value of avoided network losses included in the feed-in tariff.

Table E.4 below sets out the inputs to the loss factor calculation which are publicly available on the market operator’s website. Consistent with previous reviews, we have used category ‘E’ distribution loss factors.¹⁶⁵ Following the approach taken for the 2021 Victorian Default Offer¹⁶⁶, for AusNet and Powercor supply zones we have used the simple average of the short and long sub-transmission distribution loss factors. For other supply zones, we have used the short-sub transmission ‘E’ distribution loss factors consistent with previous reviews.¹⁶⁷ We calculated the average transmission loss factor for each retailer across individual supply zones.¹⁶⁸ The combined

¹⁶⁴ For households with rooftop solar PV, the point of power generation and consumption is the same – the house.

¹⁶⁵ Australian Energy Market Operator 2020, Distribution loss factors for the 2020-21 Financial Year, accessed 3 February 2021, https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/loss_factors_and_regional_boundaries/2020-21/df-2020-2021.pdf.

¹⁶⁶ Essential Services Commission 2020, Victorian Default Offer 2021: Final Decision, November 2020, pp. 16-17.

¹⁶⁷ Australian Energy Market Operator 2020, Distribution loss factors for the 2020-21 Financial Year, accessed 18 January 2021, https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/loss_factors_and_regional_boundaries/2020-21/df-2020-2021.pdf.

¹⁶⁸ Australian Energy Market Operator 2020, Marginal loss factors for the 2020-21 Financial Year, accessed 3 February 2021, https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/loss_factors_and_regional_boundaries/2020-21/marginal-loss-factors-for-the-2020-21-financial-year.pdf.

loss factor for each retailer is then weighted by their share of the total low voltage residential and non-residential customers, to develop a Victoria wide loss factor.¹⁶⁹

Table E.4: Inputs for calculating the loss factor for Victoria

| Distribution business | Distribution loss factor | Transmission loss factor | Total loss factor | Low voltage customers |
|-------------------------------------|--------------------------|--------------------------|-------------------|-----------------------|
| CitiPower | 1.0509 | 0.9978 | 1.0486 | 340,180 |
| Powercor | 1.0830 | 0.9891 | 1.0712 | 844,706 |
| United Energy | 1.0563 | 0.9963 | 1.0524 | 687,490 |
| AusNet Services | 1.0680 | 0.9992 | 1.0670 | 753,412 |
| Jemena | 1.0394 | 0.9983 | 1.0376 | 355,744 |
| Customer share-weighted | | 1.0592 | | |
| Inverse i.e. $1 - \frac{1}{1.0592}$ | | 5.59% | | |

Estimating the avoided social cost of carbon

In February 2017, the Victorian Government issued an Order in Council specifying a methodology for determining the social cost of carbon including factors we must consider under this methodology.¹⁷⁰

The Order defines the avoided social cost of carbon for a relevant financial year as the ‘cost per kWh of small renewable energy generation electricity purchased by a relevant licensee’ (or retailer), determined in accordance with the following formula:

$$\text{Avoided social cost of carbon} = \text{Volume factor} \times \text{Price factor}$$

Under the Order, the volume factor is based on an emissions intensity coefficient factor of 1.27 kilograms of carbon dioxide equivalent (CO₂e) per kWh of electricity exported by a small renewable energy generator. In other words, 1.27 kilograms (or 0.00127 tonne) of CO₂e is assumed to be avoided per kWh of electricity exported to the grid by a small renewable energy generator.

¹⁶⁹ The latest customer numbers available are for 2019.

Australian Energy Regulator, Performance reporting, accessed 3 February 2021, <https://www.aer.gov.au/networks-pipelines/performance-reporting>.

¹⁷⁰ Victorian Government 2017, Victoria Government Gazette No. S 36, Tuesday 21 February 2017, Order specifying a methodology and factors for the determination of the avoided social cost of carbon (Order in Council).

Applying the method specified in the Order to determine the price factor results in a cost of \$19.63 attributable to a tonne of CO₂e typically produced via conventional electricity generation techniques. Following the above formula, we obtain an avoided social cost of carbon equal to 2.5 cents per kWh.

We note that the share of National Electricity Market supplied by renewable generators has changed since 2017. If the Victorian Government amends the Order in Council to update the methodology for determining the social cost of carbon we will have regard to those changes in our next feed-in tariff review.¹⁷¹

Human health costs

The Victorian Government's 2017 Order in Council does not specify a methodology for determining avoided human health costs attributable to a reduction in air pollution caused when emissions-intensive generation is replaced by small-scale renewable generation.

Our inquiry into the energy value of distributed generation in 2015¹⁷² also found the available evidence and data insufficient to assign a monetary value to these costs.

The Department of Environment, Land, Water and Planning has noted that lack of data in the Australian context reduces the level of confidence we can have on estimates of human health costs for Victoria based on international studies.¹⁷³ Therefore, the avoided human health costs are set at 0 cents per kWh.

Although we have set the avoided human health costs at zero for 2021–22 we will raise this matter for consideration with the Department of Environment, Land, Water and Planning. If the Victorian Government amends the Order in Council to include a methodology for determining human health costs, we will have regard to that amendment in future decisions.

¹⁷¹ Electricity Industry Act 2000, S.40FBB (3A) and 3(B)

¹⁷² Essential Services Commission 2016, The energy value of distributed generation, August 2017, pp. 62-63.

¹⁷³ Department of Environment, Land, Water and Planning 2019, Estimating the health costs of air pollution in Victoria, pp. 3-5, accessed 8 February 2021, https://www.climatechange.vic.gov.au/_data/assets/pdf_file/0022/421717/Final_Health-costs-of-air-pollution-in-Victoria.pdf.

Structuring the time-varying feed-in tariff

We have also set a time-varying feed-in tariff for peak, shoulder and off-peak time blocks.¹⁷⁴ The time periods or ‘time block structure’ for the time-varying feed-in tariff are set out in Table E.5.

Table E.5: Time block structure for the time-varying feed-in tariff

| Period | Weekday | Weekend |
|----------|-----------------------|------------|
| Off peak | 10pm – 7am | 10pm – 7am |
| Shoulder | 7am – 3pm, 9pm – 10pm | 7am – 10pm |
| Peak | 3pm – 9pm | n/a |

¹⁷⁴ These time blocks align with the time blocks operating for flexible retail prices for ease of understanding by market participants. See: Essential Services Commission, 2016, The Energy Value of Distributed Generation: Distributed Generation Inquiry Stage 1 Final Report, August.

Appendix F: The legislation governing the setting of minimum feed-in tariffs

Table F.1 – Relevant sections of the Essential Services Commission Act 2001

| Section | |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| s. 8(1) | <p>Objective of the Commission</p> <p>In performing its functions and exercising its powers, the objective of the Commission is to promote the long term interests of Victorian consumers.</p> |
| s. 8(2) | <p>Without derogating from subsection (1), in performing its functions and exercising its powers in relation to essential services, the Commission must in seeking to achieve the objective specified in subsection (1) have regard to the price, quality and reliability of essential services.</p> |
| s. 8A(1) | <p>Matters which the Commission must have regard to</p> <p>In seeking to achieve the objective specified in section 8, the Commission must have regard to the following matters to the extent that they are relevant in any particular case—</p> <ul style="list-style-type: none"> (a) efficiency in the industry and incentives for long term investment; (b) the financial viability of the industry; (c) the degree of, and scope for, competition within the industry, including countervailing market power and information asymmetries; (d) the relevant health, safety, environmental and social legislation applying to the industry; (e) the benefits and costs of regulation (including externalities and the gains from competition and efficiency) for— <ul style="list-style-type: none"> (i) consumers and users of products or services (including low income and vulnerable consumers); (ii) regulated entities [electricity distributors and retailers]; (f) consistency in regulation between States and on a national basis; (g) any matters specified in the empowering instrument [in this case, the Electricity Industry Act (the Act)]. |
| s. 8A(2) | <p>Without derogating from section 8 or subsection (1), the Commission must also when performing its functions and exercising its powers in relation to a regulated industry do so in a manner that the Commission considers best achieves any objectives specified in the empowering instrument [the Act].</p> |

Table F.2 – Relevant sections of the Electricity Industry Act 2000

| Section | |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| s. 10 | <p>Objectives of the Commission</p> <p>The objectives of the Commission under this Act are—</p> <ul style="list-style-type: none">(a) to the extent that it is efficient and practicable to do so, to promote a consistent regulatory approach between the electricity industry and the gas industry; and(b) to promote the development of full retail competition; and(c) to promote protections for customers, including in relation to assisting customers who are facing payment difficulties. |
| s. 40F(1) | <p>Definitions</p> <p>In this Division—</p> <p>biomass energy generation facility means a generation facility that generates electricity by utilising energy from the combustion of—</p> <ul style="list-style-type: none">(a) biomass; or(b) biogas; <p>general renewable energy feed-in terms and conditions has the meaning given by section 40FB;</p> <p>hydro generation facility means a generation facility that generates electricity by utilising the energy from moving water;</p> <p>non-complying licensee means—</p> <ul style="list-style-type: none">(a) a relevant licensee that has not complied with a condition set out in section 40FF(1) or 40G(1); or(b) a small retail licensee that has not complied with the condition set out in section 40FG(3); <p>qualifying customer, of a relevant licensee or small retail licensee, means a person who—</p> <ul style="list-style-type: none">(a) purchases electricity from that relevant licensee or small retail licensee; and(b) engages in the generation of electricity—<ul style="list-style-type: none">(i) at a property that the person occupies as their principal place of residence by means of one qualifying solar energy generating facility at the property; or(ii) at one or more properties—<ul style="list-style-type: none">(A) that the person occupies, otherwise than as a place of residence, by means of one qualifying solar energy generating facility at each of those properties; and(B) at which the person's annual consumption rate of electricity is 100 megawatt hours or less; and |

(c) has been exempted by Order under section 17 from the requirement to hold a licence in respect of the generation of electricity for supply and sale;

qualifying solar energy generating facility means a photovoltaic generation facility that—

- (a) has an installed or name-plate generating capacity of 5 kilowatts or less; and
- (b) is connected to a distribution system;

qualifying solar energy generation electricity means electricity that a qualifying customer generates and does not use;

relevant generator means—

- (a) a generation company; or
- (b) a person engaging in the generation of electricity for supply or sale that has been exempted by Order under section 17 from the requirement to hold a licence in respect of that activity;

relevant licensee means a person that—

- (a) holds a licence to sell electricity; and
- (b) sells electricity to more than 5000 customers;

small renewable energy generation electricity means non-pool electricity supplied by a relevant generator from a small renewable energy generation facility operated by that generator;

small renewable energy generation facility means a facility of the following kind, connected to a distribution system, that generates electricity and has an installed or name-plate generating capacity of less than 100 kilowatts—

- (a) a wind energy generation facility;
- (b) a solar energy generation facility;
- (c) a hydro generation facility;
- (d) a biomass energy generation facility;
- (e) a facility or class of facility specified for the purposes of this definition under subsection (2)—

but does not include a qualifying solar energy generating facility or a TFiT scheme generating facility that is connected to a distribution system under the premium solar feed-in tariff scheme or TFiT scheme;

small retail licensee means a person that—

- (a) holds a licence to sell electricity; and
- (b) sells electricity to 5000 or less customers;

solar energy generation facility means a generation facility that generates electricity by converting solar energy into electricity;

feed-in tariff

wind energy generation facility means a generation facility that generates electricity by converting wind energy into electricity.

s. 40F(2) The Governor in Council, by Order published in the Government Gazette, may, for the purposes of paragraph (e) of the definition of **small renewable energy generation facility**, specify a facility or class of facility that generates electricity in any way as a small renewable energy generation facility.

s. 40FB(1) **Meaning of general renewable energy feed-in terms and conditions**

General renewable energy feed-in terms and conditions are the prices, terms and conditions comprising an offer under which a relevant licensee will purchase, from a relevant generator, small renewable energy generation electricity.

s. 40FB(2) Without limiting subsection (1), on and after the commencement of section 4 of the **Energy Legislation Amendment (Feed-in Tariffs and Other Matters) Act 2013**, general renewable energy feed-in terms and conditions must, as a minimum, include terms and conditions under which—

(a) an amount, specified for a financial year under section 40FBA, is credited against the charges payable to the relevant licensee by a customer who is a relevant generator for electricity the licensee supplies to the customer (a **general renewable energy credit**); and

(b) a general renewable energy credit that arises during a period of supply of electricity to that customer is included in the electricity bill of that customer that relates to that period of supply; and

(c) if, in a period of supply of electricity to the customer, a general renewable energy credit exceeds the amount owed by that customer for electricity supplied to that customer in that period of supply, the excess general renewable energy credit amount is—

(i) credited against the charges payable to the relevant licensee by that customer for electricity the licensee supplies to that customer in the next period of supply of electricity to that customer; and

(ii) included in that customer's electricity bill that relates to that period of supply of electricity; and

(d) any excess general renewable energy credit amount referred to in paragraph (c) is extinguished on the day the contract for the supply of electricity by the relevant licensee to the customer ends.

s. 40FBA **Rates for purchases of small renewable energy generation electricity**

For the purposes of section 40FB(2)(a), in each financial year the amount to be credited against the charges payable to a relevant licensee by a customer who is a relevant generator is determined at—

(a) the rate or rates determined by the Commission under section 40FBB for that financial year; or

(b) if the Commission has not determined one or more rates under section 40FBB for that financial year—the rate or rates that applied immediately before the commencement of that financial year.

s. FBB(1) **Commission to determine one or more rates for purchases of small renewable energy generation electricity**

The Commission may determine one or more rates for the purposes of section 40FBA(a).

s. FBB(2) A rate determined under subsection (1) must be—
(a) determined not later than 28 February in the financial year preceding the financial year in which it is to apply; and
(b) published in the Government Gazette not later than that date.

s. FBB(3) In determining a rate for the purposes of section 40FBA(a), the Commission must have regard to—
(a) prices of electricity in the wholesale electricity market; and
(b) any distribution and transmission losses avoided in Victoria by the supply of small renewable energy generation electricity; and
(c) the following avoided costs—
(i) the avoided social cost of carbon;
(ii) the avoided human health costs attributable to a reduction in air pollution.

s. FBB(3A) If an Order under subsection (3B) is in effect, the avoided costs that the Commission must have regard to under subsection (3) are the avoided costs determined in accordance with the methodology or factor specified in the Order for the relevant avoided costs.

s. 40FBB(3B) The Governor in Council, by Order published in the Government Gazette, may specify a methodology or factor for the determination of—
(a) the avoided social cost of carbon; or
(b) the avoided human health costs attributable to a reduction in air pollution.

s. 40FBB(4) A determination of the Commission under this section is not a determination for the purposes of the **Essential Services Commission Act 2001**.

Appendix G: Order in council – avoided social cost of carbon



Victoria Government Gazette

No. S 36 Tuesday 21 February 2017
By Authority of Victorian Government Printer

Electricity Industry Act 2000

ORDER SPECIFYING A METHODOLOGY AND FACTORS FOR THE DETERMINATION OF THE AVOIDED SOCIAL COST OF CARBON

Order in Council

The Governor in Council makes the following Order:

- Purpose**

The purpose of this Order is to specify a methodology and factors for the determination of the avoided social cost of carbon which the Essential Services Commission (ESC) must have regard to under section 40FBB(3)(c) of the Electricity Industry Act 2000.
- Authorising provision**

This Order is made under section 40FBB(3B) of the Electricity Industry Act 2000.
- Commencement**

This Order takes effect on the day it is published in the Victoria Government Gazette.
- Definitions**

In this Order –
avoided, in relation to CO₂e, has the meaning given by clause 5;
CO₂e has the same meaning as *carbon dioxide equivalent of a greenhouse gas* (as defined in section 3(3) of the Victorian Energy Efficiency Target Act 2007);
relevant financial year means the 2017/18 financial year, for which a rate or rates determined under section 40FBB of the Electricity Industry Act 2000 will apply;
relevant period means the five-year period ending on 31 December of the calendar year that ends 6 months prior to the commencement of the relevant financial year.
- Meaning of avoided (in relation to CO₂e)**

For the purposes of this Order, CO₂e is *avoided* if demand for electricity generated by a generation facility that is not a small renewable energy generation facility falls because of the export of small renewable energy generation electricity.
- Methodology and factors for determining social cost of carbon**

For the purposes of section 40FBB(3)(c)(i) of the Electricity Industry Act 2000, the avoided social cost of carbon for the relevant financial year is the cost per kilowatt-hour of small renewable energy generation electricity purchased by a relevant licensee, determined in accordance with the following methodology and factors –
$$\text{Avoided social cost of carbon} = \text{Volume factor} \times \text{Price factor}$$
where –
Avoided social cost of carbon is the cost per kilowatt-hour of small renewable energy generation electricity purchased by a relevant licensee, expressed in dollars;
Volume factor is the volume of CO₂e that is avoided by each kilowatt-hour of small renewable energy generation electricity purchased by a relevant licensee, expressed in tonnes and calculated in accordance with the formula in clause 7; and
Price factor is the value of a tonne of CO₂e for the relevant financial year, expressed in dollars and calculated in accordance with the formula in clause 8.

SPECIAL

7. Formula for calculating Volume factor

For the purposes of clause 6, the Volume factor must be calculated in accordance with the following formula –

$$\text{Volume factor} = \frac{\text{Coefficient factor} \times X}{1000}$$

where –

Volume factor is the volume of CO₂e that is avoided by each kilowatt-hour of small renewable energy generation electricity purchased by a relevant licensee, expressed in tonnes; and
X is 1 (representing 1 kilowatt-hour of electricity exported by a small renewable energy generation facility); and

Coefficient factor is 1.27 (reflecting that 1.27 kilograms of CO₂e are avoided by the export of every kilowatt-hour of small renewable energy generation electricity).

8. Formula for calculating Price factor

(1) For the purposes of clause 6, the Price factor must be calculated in accordance with the following formula –

$$\text{Price factor} = \left(\sum_{m=1}^q P_m \right) \div q$$

where there are q months within the relevant period and –

Price factor is the value of a tonne of CO₂e for the relevant financial year, expressed in dollars; and

P_m is the VEET average market spot price of one tonne of CO₂e for month m of the relevant period.

(2) For the purposes of subclause (1), the *VEET average market spot price* is, for a month specified in column 1 of the following Table, the corresponding amount specified in column 2 of the Table opposite that month.

Table

| Column 1 | Column 2 |
|----------|--------------------------------|
| Month | VEET average market spot price |
| Jan 2012 | \$ 33.51 |
| Feb 2012 | \$ 23.81 |
| Mar 2012 | \$ 22.09 |
| Apr 2012 | \$ 21.89 |
| May 2012 | \$ 23.71 |
| Jun 2012 | \$ 23.95 |
| Jul 2012 | \$ 21.32 |
| Aug 2012 | \$ 21.17 |
| Sep 2012 | \$ 22.55 |
| Oct 2012 | \$ 21.56 |
| Nov 2012 | \$ 20.00 |
| Dec 2012 | \$ 20.00 |

| Column 1 | Column 2 |
|----------|--------------------------------|
| Month | VEET average market spot price |
| Jan 2013 | \$ 19.85 |
| Feb 2013 | \$ 18.13 |
| Mar 2013 | \$ 17.19 |
| Apr 2013 | \$ 17.60 |
| May 2013 | \$ 17.10 |
| Jun 2013 | \$ 14.80 |
| Jul 2013 | \$ 13.88 |
| Aug 2013 | \$ 14.84 |
| Sep 2013 | \$ 13.65 |
| Oct 2013 | \$ 12.64 |
| Nov 2013 | \$ 15.25 |
| Dec 2013 | \$ 16.59 |
| Jan 2014 | \$ 16.21 |
| Feb 2014 | \$ 18.38 |
| Mar 2014 | \$ 19.70 |
| Apr 2014 | \$ 19.13 |
| May 2014 | \$ 18.41 |
| Jun 2014 | \$ 19.29 |
| Jul 2014 | \$ 17.40 |
| Aug 2014 | \$ 15.76 |
| Sep 2014 | \$ 14.48 |
| Oct 2014 | \$ 14.37 |
| Nov 2014 | \$ 17.25 |
| Dec 2014 | \$ 19.96 |
| Jan 2015 | \$ 18.36 |
| Feb 2015 | \$ 18.42 |
| Mar 2015 | \$ 18.76 |
| Apr 2015 | \$ 18.73 |
| May 2015 | \$ 18.90 |
| Jun 2015 | \$ 19.24 |
| Jul 2015 | \$ 20.69 |
| Aug 2015 | \$ 26.10 |
| Sep 2015 | \$ 32.73 |
| Oct 2015 | \$ 32.97 |
| Nov 2015 | \$ 27.20 |
| Dec 2015 | \$ 27.25 |

Appendix G: Order in council – avoided social cost of carbon

Essential Services Commission **Minimum electricity feed-in tariff to apply from 1 July 2021**

| Column 1 | Column 2 |
|----------|--------------------------------|
| Month | VEET average market spot price |
| Jan 2016 | \$ 24.76 |
| Feb 2016 | \$ 23.07 |
| Mar 2016 | \$ 22.51 |
| Apr 2016 | \$ 20.87 |
| May 2016 | \$ 18.84 |
| Jun 2016 | \$ 17.78 |
| Jul 2016 | \$ 16.62 |
| Aug 2016 | \$ 14.61 |
| Sep 2016 | \$ 14.37 |
| Oct 2016 | \$ 16.13 |
| Nov 2016 | \$ 15.80 |
| Dec 2016 | \$ 15.40 |

Dated 21 February 2017

Responsible Minister:

HON LILY D'AMBROSIO MP

Minister for Energy, Environment and Climate Change

MONICA BIRD

Acting Clerk of the Executive Council

Appendix H: Shortened forms & glossary

Shortened forms

| Term | Definition |
|---------------|----------------------------------------------------------------|
| cents per kWh | cents per kilowatt hour |
| commission | Essential Services Commission |
| FiT | Feed-in tariff |
| IPART | Independent Pricing and Regulatory Tribunal in New South Wales |
| kW | Kilowatt |
| kWh | Kilowatt hour |
| MWh | Megawatt hour |
| MW | Megawatt |
| NEM | National Energy Market |
| NTP | National Transmission Planner |

Glossary

| Term | Definition |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| gross feed-in tariff | <p>All solar energy generated by a household is exported to the grid and paid a feed-in tariff rate. When households use any energy, it is imported from the grid at the energy retailer's rate. Households have no ability to use their own solar energy.</p> <p>Gross metering systems have been set up to send all the solar power generated to the grid. A gross generation meter measures all the electricity produced by a household and sent to the grid. A separate consumption meter measures all the electricity that has been consumed by the household.</p> |
| the market operator | Australian Energy Market Operator |
| net feed-in tariff | <p>Any solar energy a household generates is used first by the household to meet demand. Unused solar energy is fed back into the grid and paid the feed-in tariff rate. Extra energy needed by the household is imported from the grid at their energy retailer's rate.</p> <p>A net meter records the excess solar exported and the amount of electricity the household imported from the grid.</p> |
| Retailer | Relevant licensee means a person that holds a licence to sell electricity and sells to more than 5,000 customers ¹⁷⁵ . |
| Small renewable energy generator | A wind, solar, hydro, biomass energy facility (or other facility if specified by Order in Council) connected to a distribution system that generates electricity and has an installed (or name-plate) generating capacity of less than 100 kilowatts. ¹⁷⁶ |

¹⁷⁵ Electricity Industry Act 2000, s. 40F.

¹⁷⁶ Electricity Industry Act 2000, s. 40F(1).

Appendix I: List of stakeholders who made a submission

| Engage Victoria and fitreview email | Engage Victoria – our virtual public forum ¹⁷⁷ |
|-------------------------------------|-----------------------------------------------------------|
| Adrian Tusek | Hong Le |
| C-Loop Power and Thermal | Robert (submitted to 2 questions) |
| Colin Westmore | Alby (submitted 2 questions) |
| David Blum | Jorge |
| Eugene Legat | Why???? |
| Hong Le | Offgrid |
| Julie Mcculloch | Broke |
| Maria McKinnon | Phillip |
| Paolo Cardinali | Indar Ghikpal (submitted 2 questions) |
| Robert Bennet | Roland (submitted 4 questions) |
| Robert Owen | Whoisradkins (submitted 2 questions) |
| Roland Adkins | Dave |
| Stephen Jeremiah | Geoff (submitted 2 questions) |
| Simply Energy | Raymond Mifsud |
| Tango Energy | Stuart (submitted 2 questions) |
| Energy Australia | Spiros |
| Anonymous (21) ¹⁷⁸ | Rodney (submitted 7 questions) |

¹⁷⁷ This table shows stakeholders' screen names.

¹⁷⁸ There are 22 Anonymous submissions published on our website instead of 21. This is because one Anonymous stakeholder has made two separate submissions.