ESSENTIAL SERVICES COMMISSION

Minimum electricity feed-in tariff to apply from 1 July 2020

Draft Decision

3 December 2019

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Summary

The commission's draft decision is to set two minimum feed-in tariff (FiT) rates to apply from 1 July 2020, with retailers required to offer both:

- a single rate feed-in tariff and
- a time-varying feed-in tariff.

We have signalled in our previous two FiT decisions that the optional offering of a time-varying FiT in 2018–19 and 2019–20 was a transitional measure. Our draft decision now gives customers, irrespective of which retailer they are contracted to, the ability to choose which minimum FiT best suits their circumstances.

The draft tariff rates are set out in tables S.1 and S.2.

Table S.1 Single rate minimum feed-in tariff – draft 2020–21 tariff rate

	Minimum rate to apply (all times) (c/kWh)
Rate	10.0

The draft single rate FiT of 10.0 c/kWh represents a 2.0 cent/kWh decrease from the single rate FiT for 2019–20.

Table S.2 Time-varying minimum feed-in tariff – draft 2020–21 tariff rates

	Minimum rates to apply (c/kWh)		
	Off peak	Shoulder	Peak
Times	Weekdays: 10pm-7am Weekends: 10pm-7am	Weekdays: 7am-3pm, 9pm-10pm Weekends: 7am-10pm	Weekdays: 3pm-9pm Weekends: n/a
Rates	9.0	9.7	12.3

We will update these FiT estimates in the lead up to our final decision in February 2020 to reflect wholesale electricity prices in futures markets at that time.

We are proposing some changes in the approach to setting the minimum FiT

Wholesale electricity price is based on a 12-month average

We have used a futures market approach to forecast the wholesale prices that underpin the FiT draft decision. This is the same approach we used for our FiT decision last year with one exception. For 2020–21, we have taken a 12-month average of future wholesale electricity prices instead of the 40-day average used in 2019–20. The 12-month average approach aligns with our approach to setting the Victorian Default Offer that has applied since 1 July 2019.

Time-varying FiT is now based on solar-weighted wholesale electricity prices

During the 2015 distributed generation inquiry, the commission recommended that the time-varying FiT should be time-weighted and not solar-weighted to ensure that it was technology neutral. This would be appropriate if the mix of renewable exports comprised a range of technologies, such as standalone solar, solar with batteries, small scale wind turbines, and exports from the batteries of electric cars charged by solar. We used this approach in our two most recent FiT determinations.

However, since 2015 the take-up of rooftop solar generating units has continued to increase and has remained by far the dominant source of small scale renewable generation in Victoria. This means that under the technology neutral time-weighting approach, solar owners under a mandated time-varying FiT are likely to be paid more than the true value of their exports to the grid.[1]

If all current solar customers were to switch to a time-varying FiT, this would entail additional FiT payments from retailers to customers with solar panels of about $12 million (upper bound), and ultimately these additional costs could be borne by retail consumers.[2]

Given the high share of rooftop solar in Victoria and our draft decision to mandate a time-varying FiT, we propose that the wholesale electricity price used for setting the time-varying FiT should also be solar-weighted. This approach better reflects the true value of solar exports to the grid.[3] We will continue to monitor changes to the composition of Victoria's small scale generating mix when making future FiT decisions.

We seek stakeholders' views on our draft decision that:

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[1] During our consultation with stakeholders in September 2019, some retailers and consumer groups have also expressed concerns about customers without solar panels subsidising customers with solar panels.

[2] Difference between single FiT (10 c/kWh) and average of time-weighted time-varying FiT (11.4 c/kWh) multiplied by the assumed solar export for 2020–21 of 950 GWh. We acknowledge that this upper bound is highly unlikely to occur.

[3] This generation has occurred during the middle of the day and has been one factor suppressing wholesale electricity prices to near zero during those times.

- wholesale electricity price forecasts be based on a 12-month average
- time-varying FiT be based on solar-weighting of exports within each time period.

Time-varying FiT to be mandatory from 2020–21

During consultation, we heard strong views from retailers about additional administrative and billing systems costs likely to be incurred if a time-varying FiT is mandated in 2020–21. Some retailers indicated that it would take from 3 to 12 months to update their systems to accommodate a time-varying FiT. One retailer also suggested that we should extend the optional offering of a time-varying FiT for two more years given ongoing reforms they are facing in relation to retail and distribution tariffs.

The commission is also aware that a range of new products relating to the export of small scale renewable energy have been introduced, either in Victoria, or elsewhere, in recent years. These can involve dynamic pricing of exports (such as through virtual power plants) and stakeholders may have evidence on how these changes have affected the costs and benefits of mandating time-varying FiTs.

To assist us in forming our final decision, we seek the following information from retailers and other stakeholders:

- costs and implementation issues associated with mandatory introduction of a time-varying FiT from 1 July 2020.
- costs and implementation issues that would support mandating a time-varying FiT from 1 July 2021.
- costs and benefits that support delaying mandating a time-varying FiT to an unspecified future date.

We also welcome stakeholders' feedback on other matters which you think the commission should consider in our future FiT reviews.

Customer notification

To better understand retailers' customer notification processes in relation to changes to FiT we seek from retailers the following information:

- method and timing of notifying customers regarding changes to the FiT
- whether the FiT rates credited and the charges payable by a customer are covered under the customer retail contract, or separate agreements.

In October 2018, the commission released a final decision requiring all charges and tariffs payable by customers to be shown including GST. As the FiT is not payable by a customer but is instead a credit on a customer's bill, this new rule is not applicable to the FiT for customers.

1. What is a feed-in tariff?

A feed-in tariff is the rate at which customers are credited when they export excess generation from their small-scale solar, wind, hydro or biomass generation sources. As set out in the Electricity Industry Act 2000 (Vic) (the Act), we are required to determine one or more rates an electricity retailer[4] must pay its customers for the electricity they export to the grid, referred to as the minimum FiT.[5] This is a credit paid to small renewable energy generation facilities which use fuel sources such as wind, solar, hydro or biomass.[6] We set the minimum FiT for small renewable generation for each financial year. Retailers may offer rates above this level.

To qualify for a FiT, the small renewable energy generation facility should have an installed or nameplate generating capacity of less than 100 kilowatts.[7]

We update the FiT on an annual basis to reflect changes in wholesale electricity market prices. Table 1.1 shows the minimum FiT from previous years.

Table 1.1 – Minimum FiT from previous years (c/kWh)[8]

	2017–18	2018–19	2019–20	2020–21 (draft)
Single FiT	11.3	9.9	12.0	10.0
Time-varying FiT				
Peak	n/a	29.0	14.6	12.3
Shoulder	n/a	10.3	11.6	9.7
Off peak	n/a	7.1	9.9	9.0

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

[5] See section 40FBB of the *Electricity Industry Act 2000*.

[6] An important exception is that a 'small renewable energy generation facility' does not include a generating facility that is under the premium solar feed-in tariff scheme (*Electricity Industry Act* section 40F(1)). Further, the Governor in Council, by order published in the Government Gazette, can specify a facility or class of facility that generates electricity in any way as a small renewable energy generation facility (*Electricity Industry Act* section 40F(2)).

[7] See section 40F Definitions of the *Electricity Industry Act 2000*.

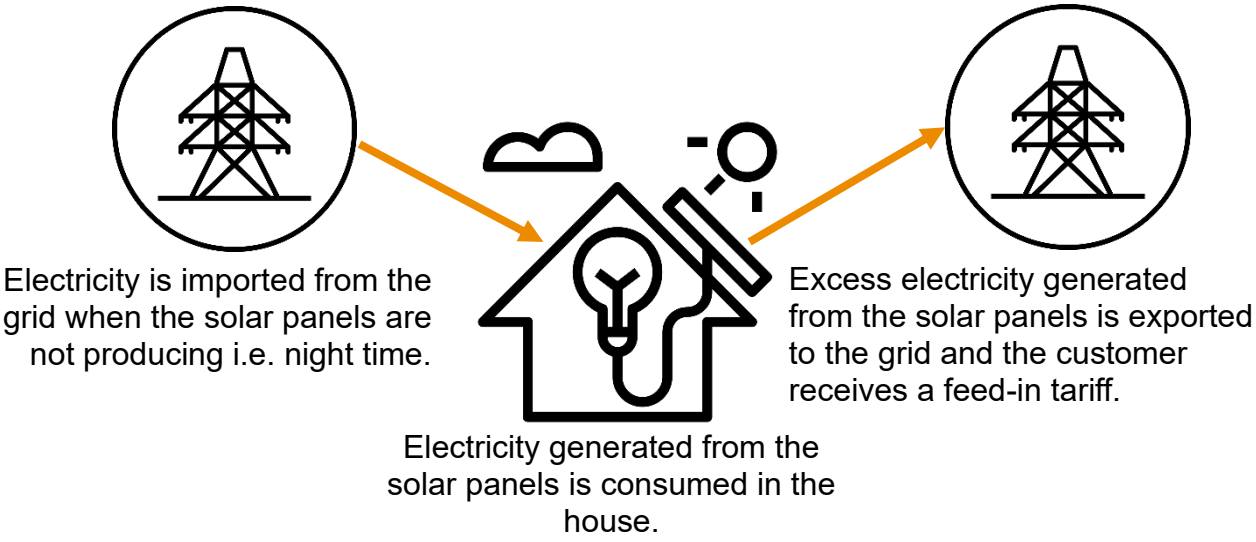
[8] The optional time-varying FiT was introduced in 2018–19. The time-varying FiT for 2018–19 and 2019–20 are time-weighted while the 2020-21 is solar-weighted. The carbon cost component was introduced in 2017–18.

How can customers benefit from small renewable generation?

Customers who have small renewable generation capacity can benefit by:

- Using the electricity they generate in their home or business – rather than purchasing from their electricity retailer, and so avoid network and retailer charges.
- Exporting any excess renewable electricity generated to the grid and receiving a FiT for the amount of electricity exported.

Figure 1 illustrates an example of a solar customer both consuming and producing electricity.



What offers are in the market?

All relevant Victorian retailers are required to provide at least the minimum FiT in all offers.[9] They are free to offer a FiT that is higher than the minimum.

The FiT rate may vary across retailers and across different offers. As at September 2019, the single rate FiTs offered by Victorian retailers ranged from 12.0 c/kWh (the minimum FiT for 2019–

[9] The relevant electricity retailer is a person that holds a licence to sell electricity and sells to more than 5,000 customers. See section 40F Definitions of the Electricity Industry Act 2000. FiT is not mandated in many other Australian states.

20) to 20 c/kWh.[10] Publicly available information on retailers' websites and the Victorian Energy Compare website[11] provides further insight into the different retailer FiT offers.

As at September 2019, only EnergyAustralia offers both a single rate FiT and a time-varying FiT to Victorian customers. Several other retailers offered comparatively complex contractual arrangements to battery owners which involve dynamic pricing of electricity exports. We will continue to monitor whether more retailers offer the time-varying rates in the immediate future.

We do not consider the premium feed-in tariff (of 60 c/kWh), or any bonus that retailers may offer above this because it is outside the scope of our role.

What is our role?

The commission is required to determine one or more rates an electricity retailer must pay its customers for the electricity they export to the grid, referred to as the minimum FiT.

Since 2018–19, we have set both a minimum single rate FiT and a minimum time-varying FiT. The time-varying minimum FiT is a peak, shoulder and off-peak structure and has been optional for retailers to implement in 2018–19 and 2019–20. This was intended to reflect the underlying value of the electricity, which is based on a wholesale electricity market in which prices change every 30 minutes and tend to be higher at times of peak electricity demand.[12]

[10] Essential Services Commission, Victorian Energy Market Update: September 2019, section 4, p.9.

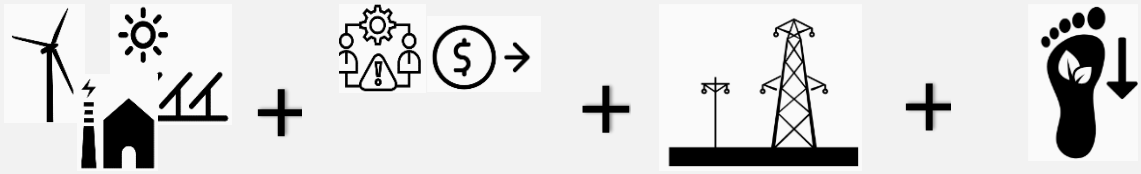
[11] Victorian Energy Compare (https://compare.energy.vic.gov.au/) is the government energy price comparator website.

[12] The wholesale spot price of electricity is determined through an auction, which is conducted every five minutes by the Australian Energy Market Operator. Currently, the process is repeated six times each half hour and generators are paid the average of the six marginal prices for the electricity they generate during that half hour. On 28 November 2017, the Australian Energy Market Commission made a determination to change the settlement period from 30 minutes to five minutes. As a result, the half hourly averaging process will not be required from the proposed commencement date of the rule change of 1 July 2021.

2. Our approach to estimating the minimum feed-in tariff rate

The minimum feed-in tariff rates aim to reflect the costs a retailer avoids when purchasing electricity from a small scale renewable generator (as outlined in figure 2.1 below), as well as including a value for the avoided social cost of carbon.

Figure 2.1 – Retailer avoided costs when purchasing from a small scale renewable generator



Wholesale electricity prices	Other fees and charges	Network losses	Avoided social cost of carbon
Retailers purchase electricity from the wholesale market to serve their customers. These costs are avoided when, and to the extent that, a small scale renewable generator exports to the grid.	Retailers incur other fees and charges reflecting the costs of operating the National Energy Market. These are avoided when, and to the extent that, a small scale renewable generator exports to the grid.	Network losses occur when electricity is transported through transmission and distribution networks, due to electrical resistance and the heating of conductors. These losses are not incurred when a small scale renewable generator exports to the grid.	Emissions are reduced when energy is sourced from small scale renewable generators. The Victorian Government recognises this as an avoided social cost.

In line with previous years, we have used the following process to determine the FiT:

1. Develop a forecast of wholesale electricity prices for the relevant year (2020–21):

a. For the *single rate* FiT – using the forecast wholesale prices, calculate the average value of wholesale electricity during the hours solar photovoltaic (PV) systems typically export.
b. For the *time-varying* FiT – using the forecast wholesale prices, calculate the average value of wholesale electricity during the hours solar photovoltaic (PV) systems typically export during each tariff structure time block.
c. Incorporate market fees and ancillary service charges that are avoided by retailers when they purchase from small scale generators rather than purchasing from the wholesale market.

2. Adjust the values above to account for avoided network losses.
3. Incorporate any value associated with the avoided social cost of carbon and avoided human health costs.[13]

With the exception of the time periods for the calculation of the wholesale component of the FiT, all elements of the method are identical for both the single rate FiT and the time-varying FiT.

We used a futures market approach to forecast wholesale electricity prices

Calculating the minimum FiT requires us to estimate prices retailers avoid paying on wholesale electricity purchases when a small scale renewable generator exports electricity to the grid. In other words, what would a retailer pay if the electricity provided by a small scale renewable generator needed to be purchased in the National Electricity Market in 2020–21?

We have used a futures market approach to forecast the wholesale prices that underpin the FiT decision. This is the same approach we used for our FiT decision last year (see Appendix B – Technical methodology for more information) and for setting the Victorian Default Offer that applies from 1 July 2019 and will apply from January 2020.[14]

Many stakeholders supported our approach in using the futures market method. AGL told us it agreed with the use of a futures market method for estimating wholesale electricity costs, as it more accurately reflects a retailer's costs when compared to other approaches.[15] Momentum told

[13] These are set by government. We take those costs as a straight pass through into our modelling.

[14] 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.

[15] AGL Energy 2018, submission on developing a reference price methodology for Victoria's energy market: consultation paper, 17 April.

us that it considered that a futures market based approach provides the best approximation of the wholesale market prices faced by retailers.[16]

Wholesale electricity price based on a 12-month average

Based on advice provided by Frontier Economics, the market's expectation of what wholesale prices will be in 2020–21 is best represented by Victorian baseload swap futures contracts that are traded on the Australian Stock Exchange (ASX). Energy Futures contracts generally trade at a premium to the expected prices in the wholesale electricity market, which requires a small downward revision to contract prices to arrive at the prices expected in 2020–21.[17] Table 2.1 provides the value of these contracts over the 12 months up to and including 25 October 2019.[18]

Frontier Economics will update these estimates for our February 2020 final decision, to reflect market expectations at that point in time. These updates will likely result in a difference between the estimates contained in the draft and final decisions.

Table 2.1 – Average baseload swap prices for 2020–21 (less 5 per cent premium)

Calendar quarter	Trade-weighted average price in 12 months to 25 October 2019 (c/kWh)
Q3 2020	7.48
Q4 2020	7.38
Q1 2021	10.42
Q2 2021	6.45

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

The use of a 12-month average price is new for this FiT review. Last year, we used the 40-day average price to forecast wholesale electricity prices for 2019–20 and noted we were not aware of any consistent view on what could replace the 40-day time period.

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[16] Momentum Energy 2018, submission on developing a reference price methodology for Victoria's energy market, 17 April.

[17] As advised by Frontier Economics, based on an analysis of historical data the average futures price appears to include a five per cent premium above average wholesale prices.

[18] Frontier Economics has advised the commission that a 40 day average is preferred over a 12 or 24 month average since base swaps further from maturity are less likely to be traded with accurate market information and are less representative of expected spot prices.

The 12-month average price is more reflective of retailers' approach to buying contracts over a longer period hence would likely result in FiTs that are more reflective of changes in retailer's actual costs. While it does not reflect the market's most current view of future electricity prices it would provide more stable prices over time. We know that price stability is valued by customers.

Relevantly, we also used the 12-month average price in forecasting wholesale electricity costs for the VDO.[19] All stakeholders now support consistency in approach for setting the FiT and the VDO.[20]

Calculating the single rate minimum FiT

Table 2.1 represents the average wholesale price expected for each quarter in 2020–21 based on ASX Energy future contracts. It does not yet reflect how this relates to the period in the day when small renewable generation is being fed into the grid. Most small scale renewable generation in Victoria is rooftop solar photovoltaic (PV). Solar PV typically exports electricity to the grid during day, when the amount of electricity the solar PV system generates is greater than the household's demand.

The single rate FiT is based on expected wholesale electricity prices, weighted to account for the timing of solar exports. 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 occurs throughout the day.

Solar weighting ensures that the value of electricity during periods in which solar PV is not exporting electricity or generating – such as in the middle of the night – is not included in the calculation of the single rate FiT.

We have received aggregate 30-minute export data for customers across each metropolitan and regional Victoria electricity distribution network for the period from 1 July 2018 to 30 June 2019.

These historic export profiles are then correlated with the corresponding half-hourly wholesale spot prices over the same time period. This correlation is then used to project the expected relationship between wholesale electricity prices and exports throughout 2020–21. One (hypothetical) way of considering this concept is that it estimates what retailers would pay for customers' solar exports if

[19] 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.

[20] The commission has met with 17 stakeholders, which include retailers, renewable energy groups and consumer groups, over the period September-October 2019.

this electricity were sold into the wholesale spot market in 2020–21 in the same way as other generators' output.

Using the most up-to-date data as the best indicator of the level and pattern of 2020–21 exports, the relevant throughout the day wholesale electricity price forecast for the single rate FiT in 2020–21 is 7.12 c/kWh.

More discussion on data and calculations can be found in Appendix B – Technical Methodology.

Calculating the time-varying minimum FiT

Our previous FiT final decision determined both a single rate minimum FiT and a time-varying minimum FiT. For 2019–20, we allowed retailers to select whether to offer customers a time-varying FiT, a single rate FiT or both.

We have preserved off-peak, shoulder and peak time blocks for 2020–21, consistent with what we heard from stakeholders and our 2017 inquiry findings into the true value of distributed generation. These time blocks are identical to those used for flexible pricing in Victoria and are set out in table 2.2.

Table 2.2 – Time block structure for the time-varying FiT

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

Using the same wholesale futures market estimates and wholesale spot prices for the period 1 July 2018 to 30 June 2019, table 2.3 details the expected wholesale prices across each time block for 2020–21. Unlike our 2019–20 decision and what was proposed under the distributed generation inquiry, these rates are calculated using a solar-weighted average of wholesale prices in each period.

Table 2.3 – 2020–21 wholesale price forecasts for the time-varying FiT (c/kWh)

Time blocks	Off peak	Shoulder	Peak
Wholesale price forecast	6.08	6.78	9.29

Source: Frontier Economics

The wholesale price forecasts for all three time blocks are lower than what was estimated in 2019–20. This reflects changes to the patterns of the historical prices that we use as the basis for

forecasting half-hourly prices. In calculating the FiT for 2019–20, Frontier Economics used the most recent load and price data available at the time – from Q4 2017 to Q3 2018.

Market fees, ancillary services and line losses

Market fees and ancillary service charges

When retailers buy electricity from the wholesale spot market, they must pay market fees and ancillary service charges to the Australian Energy Market Operator. Some fees are based on the amount of electricity they purchase from the wholesale market. Retailers avoid these fees when they source electricity from small renewable generators. We have included these fees as part of calculating avoided wholesale costs.[21] This is the same as our approach for the 2019–20 FiT.

The market fees levied by the Australian Energy Market Operator are set in advance through its budgeting process. The Australian Energy Market Operator has estimated its relevant 2020–21 market fees to be $0.60/MWh.[22]

For the purpose of determining a FiT that applies from 1 July 2020, we have assumed that the average cost of ancillary services in 2020–21 will be consistent with the average for the last 52 weeks.[23] This is consistent with the approach we took in setting the VDO.[24] Adding this cost to the market fees described above, the value of ancillary service charges and market fees avoided when a retailer obtains electricity from a small scale renewable generator is $0.98/MWh.

Network or line losses

Electricity purchased on the wholesale market is mostly supplied by large central generators located some distance away from the point where electricity is consumed. Electricity is transported to households and other users via the transmission and distribution network (also known as the

[21] Section 40FBB(3) of the Act requires us to have regard to prices of electricity in the wholesale electricity market when determining a rate for purchases of small renewable energy generation electricity.

[22] Australian Energy Market Operator 2019, *2019–20 AEMO Final Budget and Fees*, June.https://www.aemo.com.au/-/media/Files/About_AEMO/Energy_Market_Budget_and_Fees/2019/Final-201920-AEMO-Final-Budget-and-Fees-inc-ERA-final-determination.pdf

[23] Australian Energy Market Operator 2019, *Ancillary services payments and recovery*, accessed 5 November 2018, https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Data/Ancillary-Services/Ancillary-Services-Payments-and-Recovery.

[24] 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.

grid). During that transportation process, some portion of the electricity originally generated is lost as heat. These are known as 'line losses'.

Small scale renewable generation reduces line losses, since electricity does not need to travel as far from the point where it is generated to the point it is consumed. The extent of this saving varies depending on where the generation is located (and other factors). We have incorporated these cost savings into the FiT rates by applying a 'loss factor' as part of the avoided cost of purchasing energy on the wholesale market.

To do this, we have used the Australian Energy Market Operator's published estimates for distribution loss factors and marginal loss factors. Using these factors allows us to develop a loss factor for each distribution zone. Those are then combined into one single loss factor for Victoria by weighting each distribution zone's loss factor by the number of customers. The result is a customer weighted loss factor of 1.0486. We apply the inverse of the loss factor to the forecast solar weighted average pool price, including market fees and ancillary charges.

More discussion on the calculation of losses and market fees can be found in Appendix B – Technical Methodology.

Social cost of carbon remains at 2.5 c/kWh

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

In Victoria, emissions are reduced when energy is sourced from small scale renewable generators displacing coal generation.

The Victorian Government's Order in Council published on 21 February 2017 specifies the factors and methodologies for determining the avoided social cost of carbon which the commission must have regard when setting the FiT.[25]

As in 2019–20, the value generated by this approach and which is applied to both the single rate and the time-varying FiT for 2020–21, is 2.5 c/kWh of electricity exported by a small scale renewable generator. More detail can be found in Appendix B – Technical Methodology.

The Victorian Government's Order in Council did not specify a factor or method for determining avoided human health costs. They are therefore set at 0 c/kWh.

[25] 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).*

3. Our draft decision on the minimum feed-in tariff

This chapter sets out our draft decision on the feed-in tariff to apply from 1 July 2020. It follows the approach outlined in chapter 2. The draft decision is to set two minimum FiTs to apply from 1 July 2020, of which each retailer must offer both:

- a minimum single rate FiT
- a minimum time-varying FiT, with peak, shoulder and off peak rates.

Some owners of small scale renewable generator may prefer the simplicity of a single FiT while others may favour a more market reflective rate, such as the time-varying FiT. Under the latter, a customer is paid a price that better reflects the wholesale cost of electricity at the time they sell electricity into the grid.

We signalled in our previous two FiT decisions that the optional offering of a time-varying FiT in 2018–19 and 2019–20 was a transitional measure. Our draft decision now gives customers the ability to choose which minimum FiT best suits their circumstances, irrespective of which retailer they are contracted to.

Proposal to mandate a time-varying FiT

During our consultation with stakeholders, we heard strong views from retailers about additional administrative and billing systems costs likely to be incurred if a time-varying FiT is made mandatory in 2020–21. Some retailers indicated that it would take from 3 to 12 months to update their systems to accommodate a time-varying FiT. One retailer also suggested that we should extend the optional offering of time-varying FiT for two more years given ongoing reforms they are facing in relation to retail and distribution tariffs.

We recognise that our draft decision to mandate a time-varying FiT will have some implementation costs for retailers. We also recognise that the ability to offer a time-varying FiT from 1 July 2020 will differ among retailers depending on business size and capability of their current systems. Larger retailers may be better resourced than smaller retailers.

The commission is also aware that a range of new products relating to the export of small scale renewable energy have been introduced, either in Victoria, or elsewhere, in recent years. These can involve dynamic pricing of exports (such as through virtual power plants) and stakeholders may have evidence on how these changes have affected the costs and benefits of mandating time-varying FiTs.

To assist us in forming our final decision, we seek the following information from retailers and other stakeholders:

- costs and implementation issues associated with mandatory introduction of a time-varying FiT from 1 July 2020.
- costs and implementation issues that would support mandating a time-varying FiT from 1 July 2021.
- costs and benefits that support delaying mandating a time-varying FiT to an unspecified future date.

We also welcome stakeholders' feedback on other matters which you think the commission should consider in our future FiT reviews.

Customer notification

To better understand retailers' customer notification process in relation to changes to FiT we seek from retailers the following information:

- method and timing of notifying customers regarding changes to FiT
- whether the FiT rates credited and the charges payable by a customer are covered under the customer retail contract, or separate agreements.

Proposed FiT rates to apply from 1 July 2020

The tariff structures and rates for the proposed minimum single rate FiT are set out in table 3.1 and for the proposed minimum time-varying FiT are set out in table 3.2.

Single rate minimum FiT is lower

The proposed single rate FiT of 10.0 c/kWh represents a 2.0 c/kWh decrease from the FiT that we set for 2019–20. This reduction is driven primarily by the reduction in the wholesale electricity price component of the FiT during the middle of the day when most electricity is exported to the grid by solar home systems. As discussed in Frontier Economics' report[26], this change in the wholesale electricity price component of the FiT is driven by a number of factors:

- Market expectations of wholesale electricity in 2020–21 compared to 2019–20 are generally lower.[27]

[26] Frontier Economics, Wholesale price forecasts for calculating minimum feed-in tariff, a draft report for the Essential Services Commission, November 2019, section 5.1.

[27] Data on the average ASXEnergy prices used to scale historical prices for this draft decision are lower in every quarter except for quarter 1 (January-March 2019) compared to the ASXEnergy prices that informed our 2019–20 minimum FiT determination (Source: Frontier Economics, Wholesale price forecasts for calculating minimum feed-in tariff, a draft report for the Essential Services Commission, November 2019, section 5.1.)

- The average price is calculated based on a 12-month average of contract prices rather than a 40-day average, which is lower as market participants have anticipated a higher price over 2020–21 over the past 40 days relative to their expectations over the last 12-month period. Given the projected average price levels are lower, we would expect a lower FiT, all else equal.
- The relationship between solar exports and wholesale electricity prices that is used to set the single rate FiT is based on more recent data from 2018–19. This data reveals a weaker relationship between times of solar exports and times of high prices than the data previously used. This means that the single rate FiT is lower than it would be if the correlation were stronger.

See section 5 of Frontier Economics' report for details. Appendix D explains the differences between the wholesale electricity price forecasts for FiT 2020–21 and the Victorian Default Offer 2020.

Table 3.1 – Single rate minimum feed-in tariff – 2020–21 draft rate (c/kWh)

	Single rate to apply at all times
Minimum feed-in tariff	10.0

Retailers who choose to offer the minimum single rate FiT must offer customers at least 10.0 c/kWh for all exports, regardless of what time of day export occurs. Retailers can, and do, offer rates above the minimum we set.

Currently, there are five Victorian retailers which offer a single rate FiT that exceeds the minimum FiT – these ranged between 13 and 20 cents per kilowatt hour.[28] These higher feed-in tariffs tend to only be available under special terms and conditions, for example you must also buy solar panels from the retailer. We encourage solar customers to shop around and find an offer that best suits them.

Time-varying minimum FiT rates are lower

Table 3.2 sets out the proposed time-varying FiT rates for 2020–21. This means retailers must offer the minimum rate that applies in each time block. As with the single rate FiT, retailers can offer rates above the minimum we set in one or all of the time blocks. So long as retailers meet the minimum rate at each point in time, there is significant flexibility for designing their own time-

[28] Essential Services Commission, Victorian Energy Market Report, September 2019, section 4.

varying FiT profiles. We encourage customers who consider they will benefit more from a time-varying FiT to shop around and find an offer that best suits them.

Table 3.2 – Time-varying minimum FiT – 2020–21 draft rates (c/kWh) (solar-weighted)

Time blocks	Off peak	Shoulder	Peak
Minimum feed-in tariff	9.0	9.7	12.3

The time-varying rates for FiT are lower than was estimated in 2019–20 for the same reasons that cause the single rate FiT to be lower. The other factor which has contributed to lower time-varying rates for FiT is our draft approach to use solar-weighted instead of time-weighted wholesale electricity prices.

Time-varying rate for FiT is based on solar-weighted wholesale electricity prices

During the 2015 distributed generation inquiry, the commission recommended that time-varying FiT should be time-weighted and not solar-weighted to ensure that it is technology neutral. We have used this approach in our most recent two FiT determinations. Table 3.3 shows the forecast time-varying FiT for 2020–21 if we continue to adopt the technology neutral time-weighting approach.

Table 3.3 – Time-varying minimum FiT – 2020–21 draft rates (c/kWh) (time-weighted)

Time blocks	Off peak	Shoulder	Peak
Minimum feed-in tariff	8.9	10.7	15.5

Because the single rate FiT is based on a solar export-weighted average prices, while time-varying rates for the FiT are based on time-weighted average prices, the relationship between the single rate FiT and the time-varying rates for FiT does not necessarily correspond with the relationship between wholesale electricity prices during those periods.

For 2020–21, there is a negative correlation between wholesale electricity prices and solar exports, which results in a lower single rate FiT and indeed a single rate FiT that is lower than the shoulder rate for the time-varying FiT. See section 5.1 of Frontier Economics' report for details.

If we continue to adopt the technology neutral approach for FiT 2020–21 solar customers are likely to receive higher payments under the time-varying FiT than the single rate FiT. If all customers with solar panels switch to time-varying FiT, this would entail additional FiT payments from retailers to

said solar customers of about $12 million (this is an upper bound estimate).[29] A proportion of the cost of these higher payments are likely to be borne by retail customers.

However, since 2015 the take-up of rooftop solar generating units has continued to increase and remained the dominant small scale renewable generating unit in Victoria. This means that under the technology neutral time-weighting approach, solar customers currently on a time-varying FiT or new customers who will switch to a time-varying FiT in the future may get paid more than the true value of their export to the grid.[30]

Given the current high share of rooftop solar in Victoria and our draft decision to mandate the offering of a time-varying FiT, we are proposing that the wholesale electricity price used for setting the time-varying rates for FiT should now be solar-weighted. We will continue to monitor changes to the composition of Victoria's small scale generating mix when making future FiT decisions.

We seek stakeholders' views on our draft decision on whether the time-varying FiT be based on solar weighting of exports within each time period.

Table 3.4 sets out the relevant periods, or time blocks, in which the time-varying FiT applies.

Table 3.4 – Time block structure for 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

Components of the feed-in tariff

Table 3.5 below sets out how each component contributes to the overall FiT for both the single rate and time-varying options. Annual changes in the level of FiT is affected primarily by the changes in the forecast wholesale electricity price, which accounts for 71 per cent of the FiT, on average.

[29] Difference between single FiT (10 c/kWh) and average of time-weighted time-varying FiT (11.4 c/kWh) multiplied by the assumed solar export for 2020-21 of 950 GWh.

[30] During our consultation with stakeholders in September 2019, some retailers and consumer groups have also expressed concerns about customers with no solar panels subsidising customers with solar panels.

Table 3.5 – Detailed breakdown of the components for the 2020–21 minimum FiT (c/kWh)[31]

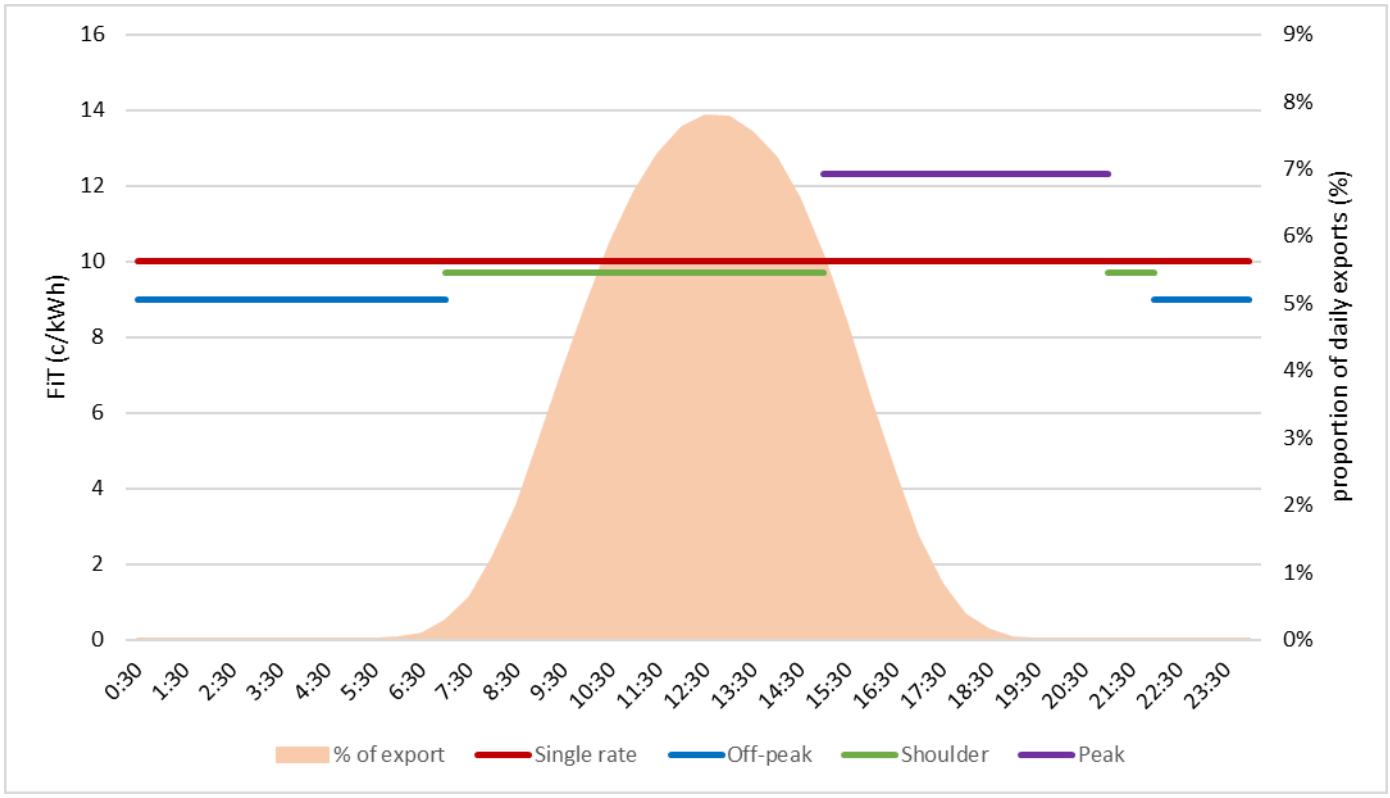
Component	Single rate	Off-peak	Shoulder	Peak
Wholesale electricity prices	7.12	6.08	6.78	9.29
Avoided market fees and ancillary service charges	0.098	0.098	0.098	0.098
Sub-total	7.22	6.18	6.88	9.39
Loss adjustment (multiply)	4.63%	4.63%	4.63%	4.63%
Value of avoided distribution and transmission losses	0.33	0.29	0.32	0.44
Sub-total	7.55	6.46	7.20	9.82
Value of avoided social cost of carbon	2.50	2.50	2.50	2.50
Value of avoided human health costs	0.00	0.00	0.00	0.00
Total (rounded to one decimal place)	10.0	9.0	9.7	12.3

Figure 3.1 provides an indication of how the minimum FiT varies throughout the day and how it compares with an average export profile. As the export profile is different for each individual customer, the best combination of FiTs and usage tariffs varies across customers.

Moreover, it is important not to just focus on the FiTs when deciding on an electricity plan. Some plans which offer higher FiTs have less competitive prices for the electricity that you consume from the grid, and this may more than offset any benefit from the higher FiT. You should think of your whole energy bill which includes what you will pay for the electricity you use as well as export.

[31] Table may not add due to rounding.

Figure 3.1 – Comparison of 2020–21 minimum FiT rates and export profile throughout the day



4. We invite feedback on our draft decision

We invite feedback from all interested parties, including consumers, energy licence holders and other stakeholders to make a submission to us by midnight 17 January 2020. Our final decision will be made by 28 February 2020 as per the Act.

Making a submission

To make a submission on this draft decision please go to Engage Victoria's website: https://engage.vic.gov.au/ and search for minimum electricity feed-in tariff to apply from 1 July 2020.

Submissions can also be sent by mail to:

Minimum feed-in tariff review 2020–21

Essential Services Commission

Level 37, 2 Lonsdale Street

Melbourne, Victoria 3000

Submissions will be made available on the commission's website, except for any information that is commercially sensitive or confidential. Submissions should clearly identify which information is sensitive or confidential and provide the reasons why they should not be made publicly available.

Appendix A – Legal context

The Essential Services Commission is required under the Electricity Industry Act 2000[32] 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. This rate or rates is referred to as the minimum feed-in tariff (FiT).

The FiT is a credit paid by a relevant retailer[33] to each customer per kilowatt hour (kWh) of electricity exported. It applies to 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.[34]

Each year, the commission determines the minimum FiT for the following year.[35] The new FiT described in this document will apply from 1 July 2020.

By law, [36] the commission must take into account certain factors in determining the minimum FiT. These factors include:

- the prices of electricity in the wholesale electricity market
- any distribution and transmission losses avoided in Victoria as a result of small renewable energy generation.

The commission must also have regard to 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.[37] The Act allows the Governor in Council to issue an order specifying a methodology or

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[32] See section 40FBB of the *Electricity Industry Act 2000* (the Act).

[33] A person that holds a licence to sell electricity and sells to more than 5,000 customers.

[34] An important exception is that a 'small renewable energy generation facility' does not include a generating facility that is under the premium solar feed-in tariff scheme (*Electricity Industry Act* section 40F(1)). Further, the Governor in Council, by order published in the Government Gazette, can specify a facility or class of facility that generates electricity in any way as a small renewable energy generation facility (*Electricity Industry Act* section 40F(2)).

[35] While this has previously been done on a calendar year basis, following recent amendments to the Act the commission is now required to set one or more rates (section 40FBB(2)) by 28 February in the financial year preceding the financial year in which it is to apply (section 40FBB(1). See *Energy Legislation Amendment (Feed-in Tariffs and Improving Safety and Markets) Act 2017* (Vic), assent date 14 February 2017.

[36] The factors that the commission must have regard to in determining the FiT that applies from 1 July 2018 are set out in section 40FBB(3) of the Act.

[37] Following recent amendments to section 40FBB(3) of the Act.

factors for determining these avoided costs.[38] An order made in 2017[39] sets out factors and methodologies including the following:

- methodologies for determining the number of units of carbon dioxide equivalent (CO_2e) reduced per unit of electricity exported from a small renewable energy generator
- the monetary value for each unit of CO_2e 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.

[38] Section 40FBB(3B).

[39] Victorian Government 2017, *Victoria Government Gazette No. S 36,* Tuesday 21 February 2017.

Appendix B – Technical methodology

The commission has set two FiT rate options to apply from 1 July 2020. The approach we have used to determine the FiT options is the same as the approach used to set the minimum FiT for 2019–20.

The methodology comprises the following components:

- the value of electricity produced by small scale renewable generators, based on the avoided cost of purchasing the same amount of electricity from the wholesale market, accounting for price changes throughout the day and seasonally. This includes:
  - wholesale electricity price forecast, both a single rate and time-varying rate
  - avoided distribution and transmission losses
  - avoided ancillary service charges and market fees
- avoided social cost of carbon and avoided human health costs.

Forecasting wholesale electricity prices

Approaches to forecasting wholesale electricity prices

As set out in our draft decision, we have used a futures market approach to estimate the wholesale electricity price in 2020–21. This is based on feedback that we have received from stakeholders in establishing an approach for setting a reference retail price, a desire to align all our pricing approaches, and advice from Frontier Economics as to the best practice approaches used by other regulators in completing similar work.

Both market modelling and futures market approaches are well established techniques that both have their relative advantages, but the commission has determined that the factors above mean that it is appropriate for us to use a futures market approach.

Prior to 2018, we used a market modelling approach that essentially modelled the process that occurs in the National Electricity Market. Doing so requires detailed assumptions on bidding strategies from generators, fluctuations in demand and intermittent wind and solar generation, unplanned plant outages, and transmission constraints. These models can also incorporate the impact of new generation assets, structural changes in the market and longer range forecasts. Based on these assumptions, the model then generates wholesale price forecasts at half-hourly level.

By their nature, these models are complex, which limits the level of transparency that can be provided to stakeholders about how we have reached a decision. In preparing this draft decision we reviewed the feedback we have received from stakeholders on approaches to forecasting wholesale electricity prices over the time we have been setting the minimum FiT. We have also examined the approaches taken to forecast wholesale electricity prices in other jurisdictions and the response from stakeholders in their most recent decisions.

Using a futures market approach is consistent with the approach used in our 2019–20 FiT decision and our Victorian Default Offer (VDO) decisions.[40] We believe that there are benefits from using a futures market approach by providing more transparency to stakeholders, and ensuring our decision matches the view of 'the market' as represented by contract prices. Increased transparency over the inputs for analysis provides stakeholders with greater opportunity to provide meaningful feedback on our draft decision.

Wholesale price forecasts for 2020–21

We engaged Frontier Economics to forecast wholesale electricity prices for 2020–21 using a futures market approach. The following section outlines the approach.

Wholesale price forecast for the single rate

Forecasting the relevant wholesale price for the single rate minimum FiT involves four steps.

1. **Calculating the price level for 2020–21.** Using the average price of 2020–21 quarterly baseload future swaps from the ASX (after adjusting for an assumed contract premium of five per cent) weighted by traded volume across the most recent 12 months up to a particular date (for this draft decision this was 25 October 2019).

   The use of a 12-month average price is new for this FiT review. Last year, we used the 40-day average price to forecast wholesale electricity prices for 2019–20. The 12-month average price is more reflective of retailers' approach to buying contracts over a longer period hence would likely result in prices that are more reflective of retailer's actual costs. While it does not reflect the market's most current view of electricity prices in the future it would provide more stable prices over time. We also used the 12-month average price in forecasting wholesale electricity

[40] 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 2020.

price for the VDO.[41] All stakeholders we have met with support consistency in the commission's approach for setting the FiT and the VDO. Retailers we have met with also prefer the 12-month average price because it is more consistent with their approach to buying contracts.

2. **Selecting the appropriate historical prices and export profile.** The commission received half-hourly actual export data from each of the five distribution business for the period 1 July 2018 to 30 June 2019. The most recent data is likely to be the best indicator of solar export profiles in 2020–21. Similarly, corresponding spot price data is available from the Australian Energy Market Operator.
3. **Scaling historical prices to 2020–21 levels.** After averaging prices for each quarter for the relevant historical base year, they are compared to the quarterly futures prices in step 1 to determine a scaling factor for each quarter.
4. **Apply 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 2020–21.
5. **Calculate the single rate FiT.** The wholesale electricity component of the single rate FiT is calculated by averaging the half-hourly prices from step 4, weighted according to the time of solar exports from step 2.

Wholesale price forecast for the time-varying rate

Like the single rate approach, the commission has set the time-varying rate using weighting based on solar export profiles.

The time blocks used for the time-varying FiT are those established by the Victorian Government for the standard flexible pricing tariff.

Estimate of market charges and ancillary services

When retailers buy energy from the wholesale market, they must pay market fees and ancillary service charges to the Australian Energy Market Operator. They pay these fees based on the amount of electricity they purchase from the wholesale market and avoid them to the extent that they source electricity from small renewable generators. We have included these fees when calculating avoided wholesale costs.

[41] 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 2020.

The market fees levied by the Australian Energy Market Operator are set in advance, through its budgeting process. The Australian Energy Market Operator has estimated its relevant 2020–21 market fees to be $0.60 /MWh. Our estimate of market fees does not include fees associated with full retail competition as these fees are recovered on a per customer basis.

The cost of ancillary services is recovered from market participants. On a weekly basis, the Australian Energy Market Operator publishes data showing the cost recovery rate for ancillary services. For the purpose of determining a FiT that applies from 1 July 2020, we assume that the average cost of ancillary services in 2020–21 will be consistent with the average over the last 12 months. When this is added to the relevant market fees, the value of ancillary service charges and market fees avoided when a retailer obtains electricity from a small scale renewable generator is 0.098 c/kWh. Table B.1 provides a breakdown of this calculation.

In maintaining consistency with previous years, the cents per kilowatt hour has been rounded to the nearest 0.1 cent amount, meaning the value applied for market fees and ancillary services in the 2020–21 feed-in tariff is 0.1 c/kWh.

Table B.1 – Market and ancillary service fees

Item	Fee ($/MWh)
NEM general fees	0.56
National transmission planner	0.04
Ancillary services	0.38
TOTAL	0.98

Source: AEMO, Electricity Budget and Fees report 2019–20 and Ancillary service payments and recovery

Estimate of the avoided transmission and distribution losses

Electricity purchased from the wholesale market is often supplied by large generators located away from the point where it is consumed. Electricity is transported to households and other users via the transmission and distribution network (also known as the grid). During that transportation process, a small portion of the electricity originally generated is lost as heat. This is often referred to as ‘line losses’.

Small-scale renewable generation is typically generated and consumed close together. The extent of this saving varies depending on where the generation is located (and other factors). We have incorporated this cost saving into the feed-in tariff by applying a ‘loss factor’ as part of the avoided cost of purchasing energy on the wholesale market.

Using data obtained from the Australian Energy Market Operator, the commission estimates a customer weighted line loss factor of 1.0486. The inverse of the loss factor is applied to estimate the value of losses in the calculation. Table B.2 sets out the inputs to this calculation. Consistent with previous decisions, we have taken the short sub-transmission 'E' distribution loss factors[42] and calculated the average marginal loss factors (MLF) by taking a simple average of the loss factors published by the Australian Energy Market Operator across each distribution area.[43] We have not published the MLFs, but they can be sourced from the Australian Energy Market Operator website. Both sets of loss factors use the 2019–20 factors published by Australian Energy Market Operator. The loss factors are then weighted by the number of low voltage residential and non-residential customers in each distribution zone to calculate a Victoria wide loss factor.[44]

Table B.2 – Inputs for calculating loss factors

Distribution area	Distribution loss factor	Average marginal loss factors	Total loss factor	Customers
AusNet Services	1.0583	0.9950	1.0530	732,805
Citipower	1.0474	0.9975	1.0448	337,953
Jemena	1.0418	0.9984	1.0401	339,021
Powercor	1.0682	0.9795	1.0463	827,074
United Energy	1.0570	0.9959	1.0526	675,999
Customer weighted			1.0486	
Inverse			4.63%	

Estimate of the avoided social cost of carbon

In February 2017, the Victorian Government issued an Order in Council specifying a method for determining the social cost of carbon.[45]

[42] https://aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Loss_Factors_and_Regional_Boundaries/2019/Distribution-Loss-Factors-for-the-2019–20-Financial-Year.pdf

[43] https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Loss_Factors_and_Regional_Boundaries/2019/Marginal-Loss-Factors-for-the-2019–20-Financial-year.pdf

[44]://www.aer.gov.au/networks-pipelines/network-performance

[45] See 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).

The avoided social cost of carbon for a relevant financial year is the cost per kilowatt-hour of small renewable energy generation electricity purchased by a relevant licensee (retailer), determined in accordance with the following methodology and factors:

$$Avoided\ social\ cost\ of\ carbon = Volume\ factor\ X\ Price\ factor$$

The order specifies the factors the commission must use when applying this methodology.

With regard to the volume factor, the commission must use an emissions intensity coefficient factor of 1.27 kilograms (kg) of carbon dioxide equivalent (CO_2e) per kWh of electricity exported by a small renewable energy generator. This means that 1.27 kg of CO_2e is assumed to be avoided for each kWh exported by a small renewable energy generator (or 0.00127 tonne of CO_2e avoided per kWh exported).

With regard to the price factor, the order specifies a method for determining the value, which the commission has applied to determine a value per tonne of CO_2e of $19.63.

The resulting avoided social cost of carbon is $0.025/kWh of electricity exported by a small renewable energy generator.

Structuring time-varying tariffs

We have also set a time-varying FiT with peak, shoulder and off peak periods. Consistent with the findings of our inquiry into the true value of distributed generation, these time blocks are identical to those used for flexible pricing in Victoria. The time periods – or 'time blocks structure' – for the time-varying FiT are set out in table B.3.

Table B.3 – Time block structure for 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

Appendix C – Comparison with previous years

Table C.1 – Minimum single rate FiT from previous years (c/kWh)

FiT component	2015	2016	2017–18	2018–19	2019–20	2020–21 (proposed)
Forecast solar-weighted average wholesale electricity price	5.7	4.6	8.1	6.8	8.9	7.1
Avoided market fees and ancillary service charges	0.05	0.1	0.1	0.1	0.1	0.1
Value of avoided distribution and transmission losses	0.4	0.3	0.6	0.5	0.5	0.3
Value of avoided social cost of carbon	n/a	n/a	2.5	2.5	2.5	2.5
FiT rate	**6.2**	**5**	**11.3**	**9.9**	**12.0**	**10.0**

Table C.2 – Minimum time-varying FiT from previous years (c/kWh)[46]

	2018–19	2019–20	2020–21 (proposed)
Peak	29.0	14.6	12.3
Shoulder	10.3	11.6	9.7
Off peak	7.1	9.9	9.0

See chapter 5 of Frontier Economics' report for details about comparison of wholesale electricity price forecasts for FiT 2019–20 and for this draft decision.

[46] The time-varying FiT for 2018–19 and 2019–20 are time-weighted while 2020-21 is solar-weighted.

Appendix D – Comparison between FiT and the VDO

While our estimate of the wholesale electricity price component of the single rate FiT has fallen in this draft decision for 2020–21 compared with our previous final decision for FiT 2019–20, our estimate of the wholesale electricity cost component of the Victorian Default Offer 2020 has increased relative to our previous estimate of the VDO for 2019–20.

While there are similarities in the approach to estimating the wholesale electricity components of the FiT 2020–21 and the Victorian Default Offer 2020, there are important differences that account for these different trends:

- We estimated the FiT for 2020–21 and the Victorian Default Offer for 2020. This means that the high contract prices for Q1 2020 affect our estimate of the Victorian Default Offer but not our estimate of the FiT.
- The FiT rates are determined, in part, by the correlation between solar exports and prices while the Victorian Default Offer is determined, in part, by the correlation between retail load and prices. The same changes in pricing patterns that have resulted in a reduced correlation between solar exports and prices in 2019–20 have a very different impact on the correlation between retail load and prices in 2019–20.
- Our use of a 12-month trade weighted average price for determining the FiT for 2020–21 instead of the 40-day average we used for FiT 2019–20 has the effect of lowering the FiT for 2020–21. The trend for the Victorian Default Offer has not been affected by a similar change in approach, since the Victorian Default Offer for both 2019–20 and 2020 made use of a 12-month trade weighted average price.

See section 5 of Frontier Economics' report for details.

Appendix E – Abbreviations

Term	Definition
AEMO	Australian Energy Market Operator
c/kWh	cents per kilowatt hour
DLF	Distribution loss factor
FiT	Feed-in tariff
IPART	Independent Pricing and Regulatory Tribunal in New South Wales
kW	Kilowatts
kWh	Kilowatt hour
MLF	Marginal loss factor
MWh	Megawatt hour
MW	Megawatts

Appendix F – Glossary

Term	Definition
the Act	*Electricity Industry Act 2000* (Vic)
commission	Essential Services Commission (Victoria)
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.
Relevant retailer	A person that holds a licence to sell electricity and sells to more than 5,000 customers.