

SUBMISSION TO THE

ESSENTIAL SERVICES COMMISSION: MINIMUM FEED-IN TARIFF TO APPLY FROM 1 JULY 2023. DRAFT DECISION. 20 DECEMBER 2022

FROM

**ANONYMOUS
BUNINYONG, VIC 3357**

DATED

25 JANUARY 2023

DATE DUE

30 JANUARY 2023

I provide this submission as a residential owner of a roof-top solar power system.

1.0 Summary

The ESC's Draft Decision reveals several key areas where their Draft Decision is incomplete or has not been updated. In some sections, out-of-date assumptions are simply repeated, without being retested against the changing market dynamics of the National Electricity Market.

Consistent with the ESC's desire to treat Victoria's 510,000 residential solar customers as 'generators' rather than 'citizens', this analysis is consistent with that framework – of evaluating what is in the individual's commercial interest rather than the collective social interest.

This analysis has revealed the following key findings:

- The Feed-in Tariff (FiT) component *Value of avoided costs of carbon* has not been updated for six years, inconsistent with the requirements of the *Electricity Act 2000*, and as specifically required by the Victorian State Government's Order in Council 2017, to ensure that the *Price factor* represents the *relevant period* (being 2023-24). When the State Government's current forecast Price Factor (VEEC forecast price) is correctly applied, the FiT rate is calculated to increase from 2.5c/kWh to 8.5 c/kWh for 2023-24. There is also the substantive issue of back payments due to the solar generators over the previous six years for this ongoing failure to apply the correct *Price factor* and calculate the correct FiT rate.
- The incomplete evaluation and consideration of *Avoided human health costs*. This has resulted in the ESC ignoring its own research in last year's Final Decision that showed the FiT rate for this component was between 0.0 and 5.1 c/kWh – with the majority of research showing a cluster at 1.3 c/kWh. Citing the lack of research to make a decision, the ESC then makes a decision to make the rate 0.0 c/kWh, which appears a text-book application of circular logic – to the detriment of solar customers. It is instructive of how dismissive the ESC is of this component that it is not even afforded a line item in the table of components of the Feed-in-Tariff (Table 1.3). Consequently, the rate for *Avoided human health costs* is recommended to be 1.4 c/kWh for 2023-24. This is 1.3 c/kWh adjusted for one year's CPI, and consistent with the ESC's prior year's research.

- The Draft Decision does not mention at all the issue of grid-scale battery storage, which has been a feature of the Victorian electricity network since 2018-19. Battery storage is planned to become Victoria’s second largest source of electricity within 10 years (behind on-shore wind). A proportion of electricity fed into the grid by solar customers is currently being stored in grid batteries which is released overnight at a wholesale rate higher than what solar customer receive under the current FiT, which accounts for only instantaneous demand – not stored battery capacity to meet future demand. The ESC needs to develop a model which takes account of these higher rates of return to solar customers, prior to the commencement of the 2023-24 financial year.

As a result of this analysis, the recommended changes to the FiT rates for 2023-24 are:

Feed-in tariff component	ESC Draft Decision Flat	Recommended change	Total Recommend Flat
Forecast solar-weighted average wholesale electricity price	2.1	-	2.1
Avoided market fees and ancillary service charges	0.1	-	0.1
Value of avoided distribution and transmission losses	0.1	-	0.1
Value of avoided social cost of carbon	2.5	+ 6.0	8.5
Avoided human health costs	0.0	+ 1.4	1.4
NEW Forecast grid battery wholesale electricity rate	-	TBA	TBA
Total feed-in tariff rate	4.8	+ 7.4	12.2 + NEW Forecast grid battery wholesale electricity rate

The ESC’s draft FiT rate of 4.8 c/kWh has been shown to be manifestly inadequate and should be increased to at least 12.2 c/kWh.

On reflection, it appears the ESC has taken a rather simplistic ‘copy n paste’ approach to the annual review of Feed-in Tariffs, to the detriment of solar customers.

In adopting this approach, those FiT components which exert downwards price pressure are examined rigorously by external consultants (e.g. *Forecast solar-weighted average wholesale electricity price*), yet those components that should rise in line with market dynamics are either not examined with the same vigour (e.g. *Avoided social cost of carbon, Avoided human health costs*) or are totally ignored as if they don’t exist (e.g. *NEW Forecast grid battery wholesale electricity rate*).

Victoria has more than 510,000 small-scale solar PV systems – all together they generate almost a third of the state’s total residential electricity demand.¹ These thousands of solar customers deserve a higher quality evaluation of all the components that contribute to the Feed-in Tariff, as is their expectation and right and under Victorian law.

¹ <https://www.solar.vic.gov.au/victorians-embracing-solar-record-levels> accessed 24 January 2023

2.0 Introduction

Several points stood out to me immediately as I read the ESC's Draft Decision:

2.1 The ESC's intention to treat solar customers as electricity generators (p.10)²

Being treated by the ESC more as a generator and less as a citizen investing their own capital to assist in society's transition to a cleaner greener future is an interesting concept in itself, and one that the majority of solar customers would probably be surprised to learn. But this statement from the ESC ensures that the level of scrutiny of the draft FiT rates must therefore be made from a "generator's" individual commercial perspective. This means that solar customers are entitled to demand what is rightfully accorded to them under law and according to normal commercial practices – no more and no less. Accordingly, a higher level of scrutiny is warranted on the ESC's fleeting evaluation of the avoided social cost of carbon and human health costs, as the ESC must lawfully consider under the Electricity Industry Act (p.5).

2.2 The ESC's desire to utilise forecasts of future wholesale electricity prices (p.18)

Table B.1 (p.33) is interesting in this regard because it shows two of the four FiT components changing value significantly over the 7-year period, as would be expected with forecasts in such a dynamic marketplace. However, one component, the *Value of avoided costs of carbon* stands out as an outlier. The rate was set at 2.5 c/kWh in 2017-18 and has been unchanged since. A deeper evaluation is obviously needed as to understand why one key component of the FiT would remain unchanged in such a dynamic marketplace.

2.3 The incomplete evaluation and consideration of avoided human health costs.

This is especially troubling as the ESC identified in last year's Final Decision (p.20)³ that the avoided human health costs could indeed be forecast from somewhere between 0.0 and 5.0 c/kWh. However, in this year's Draft Decision the ESC return to their previous stance that essentially it is all essentially too hard to evaluate (p.22) and adopted a 0.0 c/kWh rate. Being treated as a commercial generator, solar customers are being denied a FiT component that they are lawfully entitled to receive. The ESC needs to explain why have they ignored their own forecasts from just one year ago, completely inconsistent with their principle of embracing price forecasts, and also institute this FiT component for 2023-24.

2.4 The complete absence of any discussion at all on the emerging impact that large scale grid battery storage will have as a discrete FiT component.

The ESC argues that the *Forecast solar-weighted average wholesale electricity price* FiT component should reduce in line with daytime wholesale prices. As generators, solar customers can accept this principle as the accompanying Frontier Economics research is a

² Page numbers in this section refer to the ESC's 2022-24 Draft Decision as per: Essential Services Commission 2022, *Minimum Feed-in Tariff to apply from 1 July 2023: Draft Decision*, 20 December.

³ Essential Services Commission 2022, *Minimum Feed-in Tariff to apply from 1 July 2022: Final Decision*, 24 February.

high-quality and thorough analysis.⁴ But in doing so, the ESC must accept that the opposite is also true – that solar customers should benefit from higher evening wholesale prices when their solar electricity generated during the day and stored in large-scale grid batteries is released and used during the night time. This is a rapidly growing feature of the Victorian electricity network and its complete absence from the ESC’s Draft Decision is quite astonishing. As a generator, solar customers expect a full and thorough examination of all the commercial returns they are entitled to for the generation they provide to the entire network under all operating conditions.

This paper will now discuss these identified FiT components in greater detail to evaluate if any changes to the proposed FiT rates are warranted.

3.0 Detailed examination

3.1 Value of avoided social cost of carbon

The *Value of avoided social cost of carbon* stands out as an outlier in the following table (p.33). The rate was set at 2.5 c/kWh in 2017-18 and has been unchanged since as is shown below.

So where does the figure of 2.5 c/kWh actually come from and why doesn’t it change?

Table B.1: Minimum flat feed-in tariff from past years and proposed for 2023-24 (c/kWh)

Feed-in tariff component	2016	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24
Forecast solar-weighted average wholesale electricity price	4.6	8.1	6.8	8.9	7.3	3.9	2.5	2.1
Avoided market fees and ancillary service charges	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Value of avoided distribution and transmission losses ⁴²	0.3	0.6	0.5	0.5	0.3	0.2	0.2	0.1
Value of avoided social cost of carbon	n/a	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Feed-in tariff rate	5	11.3	9.9	12.0	10.2	6.7	5.2	4.8

According to the ESC paper, the value is ‘set at rate of 2.5 cents per kWh’ (p.31):

The Essential Services Commission updates the minimum feed-in tariffs each year to update for changes in the factors that determine the feed-in tariff. From 2017–18, legislation required that we also consider the social cost of carbon (set at a rate of 2.5 cents per kWh). This has caused the forecast wholesale electricity price and the minimum feed-in tariff to diverge. Figure A.4 shows the difference coincides with the introduction of the social cost of carbon in 2017.

⁴ Frontier Economics 2022. *Wholesale Price Forecasts for Calculating Minimum Feed-In Tariff*, 1 December.

This has the appearance that the ESC has either actively updated the 'changes in factors that determine the feed-in-tariff', or that the legislation 'sets' the rate at 2.5 cents. On closer examination, neither are true.

The ESC paper does explain that this rate is derived from a Victorian Government Order in Council dated 2017, and included as Appendix E in the paper. The methodology within that Order is explained on p.42 as follows:

In February 2017, the Victorian Government issued an Order in Council ('Order') specifying a methodology for determining the social cost of carbon and the factors we must consider when applying this methodology.⁵³

It defines the avoided social cost of carbon as the avoided 'cost per kilowatt-hour (kWh) of small renewable energy generation electricity purchased by a relevant licensee' (e.g., retailer), determined in accordance with the following methodology and factors:

Avoided social cost of carbon = Volume factor × Price factor

The volume factor, in the Order is an emissions intensity coefficient factor of 1.27 kilograms (kg) of carbon dioxide equivalent (CO₂e) per kWh of electricity exported by a small renewable energy generator. This means that 1.27 kg (or 0.00127 tonne) of CO₂e is assumed to be avoided for each kWh of electricity exported by a small renewable energy generator.

For the price factor, we have used the method specified in the Order to determine the value of a tonne of CO₂e. It results in a value of \$19.63 per tonne of CO₂e. The resulting avoided social cost of carbon is 2.5 cents per kWh.

The first key point to notice is that the ESC is aware of their responsibility re factors they must consider (outlined in red above). The following evaluation will demonstrate they have not in fact, actively considered or reviewed any of the factors.

Looking at the calculation in the box above, there are two factors. The Volume factor is a fixed constant at 1.27 but the Price factor of \$19.63 per tonne of CO₂e is derived from the attached calculation from Order in Council as follows:

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.

Here are two very important definitions to note:

- The **Price factor** **must** be calculated in accordance with the formula – there is no option not to use the formula

- In recognising this mandatory requirement, the **Price factor** relates to the value of one tonne of CO2e for the **relevant** financial year, expressed in dollars, and
- The VEET average market spot price for one tonne of CO2 for the **relevant** period is used.

We will return to the relevant period shortly, as it is, very relevant indeed.

But where does the figure of \$19.63 per tonne come from that is used in this calculation? As it turns out, it is the arithmetic average of all the historic data in Column 2 in the table from the Order in Council as follows:

(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

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

So, this realisation raises some serious questions about the ESC's reliance on this document alone as its source for the **Price factor** which in turn results in the 2.5 c/kWh rate for the avoided social cost of carbon, such as:

- The ESC has not updated the change in factors that determine the *Avoided social cost of carbon* rate as it is obligated to do
- The most recent VEET value in the Order in Council document is December 2016, some *six years prior* to the period (2023-24) under consideration
- Why did the ESC not seek to obtain up to date data on the VEET average market spot price, from either market information or the Government? Is it not available?
- If it is not available, then why did the ESC not seek to forecast the VEET average market spot price?
- If, deciding to do neither of these things, did the ESC not seek to apply at least annual CPI increases to the feed-in tariff rate of 2.5 c/kWh? This would have at least been in line with normal commercial practice.

All of these are very puzzling observations.

The ESC may have considered it did not have jurisdiction over the 'Order in Council' to update the VEET and subsequently the Price factor component. Certainly an 'Order in Council' certainly sounds quite grandiose and has an air of authority about it. Perhaps the ESC unconsciously thought this was an 'untouchable' component of the FiT and have neglected to examine it closely. However, the legislation the ESC must refer to in setting Feed-in tariffs states the following in this regard (included as Appendix D in the ESC paper):

s. 40FBB(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. 40FBB(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.

The wording in the legislation clearly provides the ESC with a choice – to use '*the methodology OR factor specified in the Order for the relevant avoided costs*'.

So in fact, the 'Order in Council's' authority only extends to providing the methodology, not the ongoing factors that comprise the equation in the methodology.

It is clear that the ESC has an obligation under the legislation, to use an updated factor, as the existing factor is clearly outdated (by six years). The ESC must consider the methodology for the

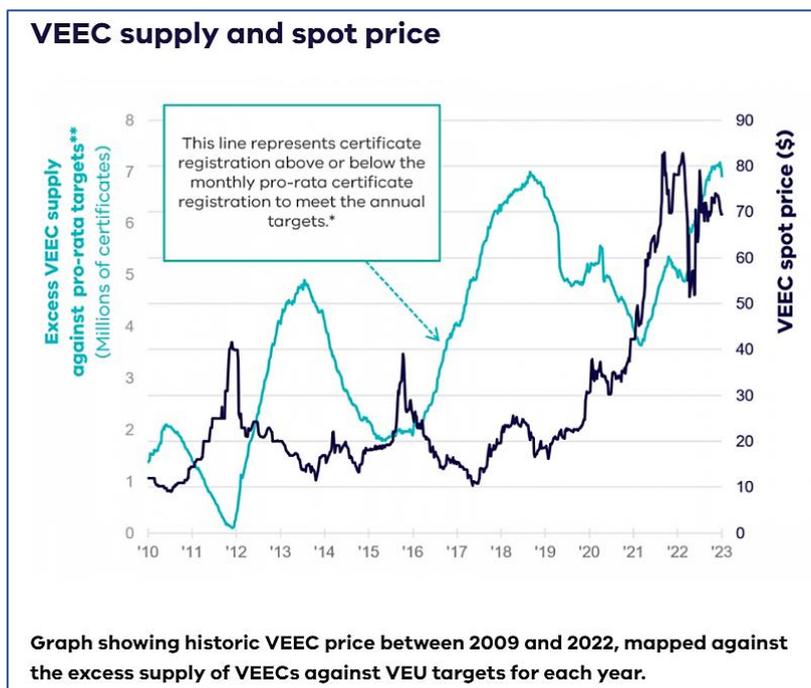
Price factor as prescribed by the Order which clearly states, on several occasions: “for the relevant period”.

In staying silent on the Price factor ‘for the relevant period’ (being some six years out of date) the ESC is not meeting its obligations according to the legislation. The ‘relevant period’ under question is clearly 2023-24, which means a forecast of the VEET will be required – now known as the VEEC.⁵

The ESC should be comfortable with this approach, as using forecasts is one of their stated principles in regards to setting the elements of the FiT. In this regard it is surprising that the ESC did not include this forecast component in their brief to Frontier Economics for their paper ‘*Wholesale Price Forecasts for Calculating Minimum Feed-In Tariff*’. This appears to be another major and puzzling omission of this ESC process.

So, what has the VEEC spot price been since 2016? Has it been different than the seemingly immovable \$19.63? This is a highly relevant question, which is easily answered by reference to the State Government’s own *Victorian Energy Upgrades* website which conveniently graphs historic VEEC data from 2010 to late 2022.⁶ The historic spot price in the graph below is shown by the dark blue line with the price shown on the right-hand side axis. A simple cross check will reveal that this is certainly the same data referred to in the Order in Council (up to December 2016 of course).⁷

A review of the graph shows that the VEEC spot price has been rising steadily since an inflection point in early 2017. This makes the ESC reliance on the ‘old’ data in the Order in Council even more obviously completely redundant.



⁵ NOTE: On 10 December 2018 the Victorian State Government renamed the Victorian Energy Efficiency Target (VEET) scheme to the Victorian Energy Upgrades (VEU) program. In doing so, it changed the name of the VEET certificate (in reference to the cost of one tonne of CO₂e in the Order in Council) to VEEC (Victorian Energy Efficiency Certificate).

⁶ <https://www.energy.vic.gov.au/for-industry/victorian-energy-upgrades-for-industry/industry-market-update-work-program>

⁷ The graph shows a price peak in late 2016 of approximately \$40 which is not evident in the Order in Council table, but it is not known what time interval the graph’s data is representing. Other data is consistent.

The estimated VEEC spot price from the graph for each financial year since 2016 is used to recalculate an updated and more accurate *Avoided social cost of carbon* (c/kWh), as shown by the following table:

	2017-18	2018-19	2019-20	2020-21	2021-22
Volume factor	1.27	1.27	1.27	1.27	1.27
Price factor: Average VEEC spot price for the <i>relevant period</i> (estimate) (\$)	22.00	21.00	28.00	40.00	60.00
<i>Avoided social cost of carbon</i> (c/kWh) ⁸	2.8	2.7	3.6	5.1	7.6
ESC <i>Avoided social cost of carbon</i> (c/kWh)	2.5	2.5	2.5	2.5	2.5
Difference in ESC <i>Avoided social cost of carbon</i> (c/kWh)	-0.3	-0.2	-1.1	-2.6	-5.1

This table reveals that solar customers have received lower than expected feed-in tariff for *Avoided social cost of carbon* for a full six years (including 2022-23). The failure by the ESC to update the VEEC spot price for the *relevant period* (as permitted and required by the legislation) has potentially cost many thousands of solar customers collectively millions of dollars, as the VEEC spot price has indeed risen quite steadily since January 2017.

The question of back payments to solar customers should also be considered by the ESC as this analysis shows the generators (solar customers) have been found to be short-changed by the ESC's failure to properly apply the prescribed Order in Council methodology. There is no doubt large scale generators would seek legal redress for such an oversight. Unfortunately, solar customers are somewhat outsized by the other participants in this decision and have virtually no negotiation power of any weight and must rely only upon the ESC's charter and sense of responsibility to do right.⁹

This brings us to the question of the forecast VEEC spot price for the *relevant period* (being 2023-24), which is the main purpose of the ESC's Draft Decision paper.

Again, fortunately the forecast VEEC spot price is easily accessible as the Victorian State Government has already made this forecast as part of its consultation for the *Victorian Energy Upgrades Targets and Lighting (2019)*.¹⁰

As part of their consultation material in relation to the Regulatory Impact Statement (RIS), the Victorian State Government provided FAQs. Question 14 is reproduced in full below.¹¹

Question 14 – What changes to the VEEC price are expected under the proposed target?

Modelling undertaken by the Department estimates average VEEC prices of \$67 over the 2021 to 2025 target years. This is likely to be a conservative assumption (i.e. likely to be on the high side), given models often underestimate the pace of technological progress and the ability of the market to deliver cost effective solutions. VEU targets have generally been delivered at a lower cost than estimated.

However, VEEC prices are expected to increase over the 2021 to 2025 target period. This is partly due to each certificate needing to deliver more energy savings. Increased prices will support some activities that haven't had uptake historically and can deliver much needed improvements for consumers (such as space heating upgrades).

For the avoidance of doubt, the question heading refers to the '*...under the proposed target*'. The proposed target (Option #4 in the RIS), was fully accepted by the Hon. Lily D'Ambrosio MP, Minister

⁸ Avoided social cost of carbon = 1.27 x Average VEEC spot price (\$) as per Order in Council methodology

⁹ Other avenues of appeal may exist, for example Victoria's Auditor General or Department of Treasury and Finance

¹⁰ <https://engage.vic.gov.au/project/victorian-energy-upgrades/page/targets> accessed 22 January 2023

¹¹ DELWP 2019, Frequently Asked Questions – VEU Target Setting and Lighting Consultations

for Energy, Environment and Climate Change on 8 December 2020.¹² This provides explicit government support for this forecast VEEC price of \$67 in the relevant period and ‘locks it in’.

There is now no impediment for the ESC to adopt this forecast VEEC spot price as the Price factor as follows:

	2023-24
Price factor: Average VEEC spot price for the <i>relevant period</i> (\$)	67.00
Avoided social cost of carbon (c/kWh) for the <i>relevant period</i> ¹³	8.5
ESC Draft Decision - Avoided social cost of carbon (c/kWh)	2.5
Difference in ESC Draft Decision - Avoided social cost of carbon (c/kWh)	-6.0

The calculation of the Price factor now satisfies the Order in Council methodology requirements which were completely missing from the ESC’s apparent and puzzling ‘hands-off’ approach.

If the ESC believes it can only act on the advice of an Order in Council (a notion which is not supported by the legislation), then it should seek to have the Order updated urgently prior to the commencement of the *relevant period* i.e. 2023-24 utilising the new Price factor now that it is aware of a deficiency in their application of the methodology.

Recommendations:

- (i) The *Value of avoided costs of carbon* should be increased from 2.5 c/kWh to 8.5 c/kWh for 2023-24
- (ii) Solar customers should receive back payments for the years 2017-18 to 2022-23 due to the incorrect application of the methodology
- (iii) The ESC should forecast the appropriate factors consistent with the prescribed methodology every year

3.2 Value of Avoided human health costs

Last year the ESC identified in their Final Decision that the *Avoided human health costs* could indeed be forecast from somewhere between 0.0 and 5.0 c/kWh. (p.20)¹⁴

From the current information, these approaches return health costs ranging from 0.0 to 5.0 cents per kWh (noting most results are clustered at the lower end of this range between 0 and 1.3 cents).³¹

However, in this year’s Draft Decision the ESC return to their previous argument that this component is all too hard to evaluate and adopted a 0.0 c/kWh rate (p.22).

¹² <https://engage.vic.gov.au/project/victorian-energy-upgrades/page/targets>

¹³ Avoided social cost of carbon = 1.27 x Average VEEC spot price (\$) as per Order in Council methodology = 1.27 x \$67.00 = 8.5 cents per kWh

¹⁴ Essential Services Commission 2022, *Minimum electricity feed-in tariff to apply from 1 July 2022: Final decision*, 24 February

The ESC needs to explain why they have ignored their own forecasts from just one year ago, which is completely inconsistent with their principle in having faith in forecasts. There is no detailed research or empirical information provided in the Draft Decision to support their somewhat spurious conclusion. One would think they may have commissioned independent research into the matter, as per the very thorough and competent Frontier Economics research, but all we can do is accept the ESC's word on their conclusion – in the complete absence of any supporting economic analysis or evidence.

Consider the following extract on p.22:

After considering the cost estimates available, the potential overlap of the benefits of avoiding carbon emissions and other pollutants harmful to human health, and subsidies available for solar panel installation, our draft decision is to set the standalone avoided human health costs at 0 cents per kWh.

Apart from no data being provided to support these assertions, this approach is completely at odds with the statement on p.23 where the ESC recognises that indeed, research is required to fully understand the costs as stated (p.23).

To calculate the damages costs, it would be necessary to establish the unit health costs of fossil fuel generation and then assess how solar exports displaces fossil fuel generation to find the total avoided human health costs.

So, on the one hand the ESC dismisses any FiT rate (but in doing so actually has adopted a rate of zero) on the absence of research, yet on the other hand say research is needed to establish the rate – which they just established as zero.

I think this is called having it both ways, and this type of simplistic circular logic is simply not good enough for Victoria's independent economic regulator and should not be accepted by the solar generators or indeed the State Government or the body regulating the ESC.

The ESC has had one full year to commission such independent research to reach a well-informed conclusion. Solar customers can reach only one conclusion by this ongoing non-action – the ESC is determined not to provide any positive FiT rate for *Avoided human health costs*.

In addition, it is difficult to accept their simplistic place-based argument of pollution (p.23):

according to where the generation, and therefore pollution, occurs.²⁴ The dispersion of pollutants depends heavily on local conditions.

If the generators are in a densely populated area, the pollution will affect more people and the human health costs will be higher. In contrast, if the generation occurs in a low population area, there will be lower health costs.

There is no detailed research on the dispersion of pollutants in Victoria. Victoria's coal generation is in the Latrobe Valley. This is a relatively long distance from Victoria's larger population centres. In many other parts of the world, the distance between generation and consumption is not as large. While there is some gas generation within Melbourne, it accounts for only a small share of total generation.

All 510,000 Victorian solar customers (i.e. generators) have contributed to a cleaner electricity generating system in this state (as encouraged by the State Government) by any measure and they deserve to share in the benefits (i.e. the value) they have created for all residents across the state through improved health outcomes as stipulated in the Act.

Their collective actions have collectively reduced both CO₂e emissions and other harmful gasses (which are decidedly not place-based as suggested by the ESC, otherwise the whole basis for the IPCC's quest for reducing emissions world-wide would collapse) and particulate matter pollution (a component which may have elements of being somewhat place-based). This is recognised in the reduced carbon intensity of generated electricity in Victoria as reported by the Clean Energy Regulator.¹⁵

But consider that this outcome directly benefits the transport sector, as more electric vehicles (EV) are continually being registered in Victoria¹⁶, and when they recharge their electric battery from the grid, they are recharging with lower overall carbon emission intensity electricity from the network, made possible by the contribution of Victoria's solar customers (generators).

The transport sector produces 25% of Victoria's greenhouse gas emissions¹⁷, so the action of solar customers generating clean, green energy will help this sector produce less pollution as the shift to EV continues. As metropolitan Melbourne contains the vast majority of the transport sector, this place-based region is set to be the recipient of using in cleaner electricity, as less particulate matter is then generated from the cleaner vehicle fleet.

This is but one example of where the ESC's simplistic approach to 'place-based' health benefits being solely restricted to the Latrobe Valley do not hold up to a similarly relatively simple counter argument.

The unavoidable conclusion is that the ESC need to introduce a temporary FiT rate for avoided human health costs to indicate they accept that there is some quantifiable value to this element, as indicated by last year's Final Decision and to show they are willing to act in good faith. They have an obligation to do so have been avoiding this responsibility for many years, in contravention of their responsibilities under the *Electricity Industry Act 2000*.

The rate that should be introduced is 1.3 c/kWh, as identified as being in the lower end of last year's Final Decision (p.20).

Consistent with standard commercial practice, the rate should be indexed by the current annual CPI of 7.8%, as provided by the ABS.¹⁸

¹⁵ In 2021-22 Victoria's Scope 2 electricity emission factor (kg CO₂-e/kWh) reduced to 0.96 from 0.98 in 2020-21. Ref: Clean Energy Regulator <https://www.cleanenergyregulator.gov.au/OSR/EERS/eers-current-release> Victorian Greenhouse Gas Emissions Report 2020 p.8

¹⁶ As of 2021, there were 10,311 registered electric vehicles in Victoria - up from 3,398 EVs in June 2018. Ref: <https://www.carsguide.com.au/ev/advice/how-many-electric-cars-are-there-in-australia-83262>

¹⁷ The State of Victoria Department of Environment, Land, Water and Planning 2022, *Victorian Greenhouse Gas Emissions Report 2020* p.8 https://www.climatechange.vic.gov.au/_data/assets/pdf_file/0036/598257/Victorian-Greenhouse-Gas-Emissions-Report-2020.pdf

¹⁸ <https://www.abs.gov.au/statistics/economy/price-indexes-and-inflation/monthly-consumer-price-index-indicator/latest-release> Accessed 25 January 2023

Reference period December Quarter 2022

Released 25/01/2023 ▼ Future releases ▼ Previous releases

Key statistics

- The Consumer Price Index (CPI) rose 1.9% this quarter.
- Over the twelve months to the December 2022 quarter, the CPI rose 7.8%.
- The most significant price rises were Domestic holiday travel and accommodation (+13.3%), Electricity (+8.6%), International holiday travel and accommodation (+7.6%) and New dwelling purchase by owner occupiers (+1.7%).

This would make the rate equivalent to $1.3 \text{ c/kWh} \times 1.078 = 1.4 \text{ c/kWh}$

The absence of an Order in Council for this element does not preclude the ESC from making a decision as clearly shown by the Act (below) in section 3. As there is no Order in effect (subsection 3A) then the ESC is able to make its own determination – which effectively it has done already at 0.0 c/kWh.

s. 40FBB(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. 40FBB(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.

Recommendations:

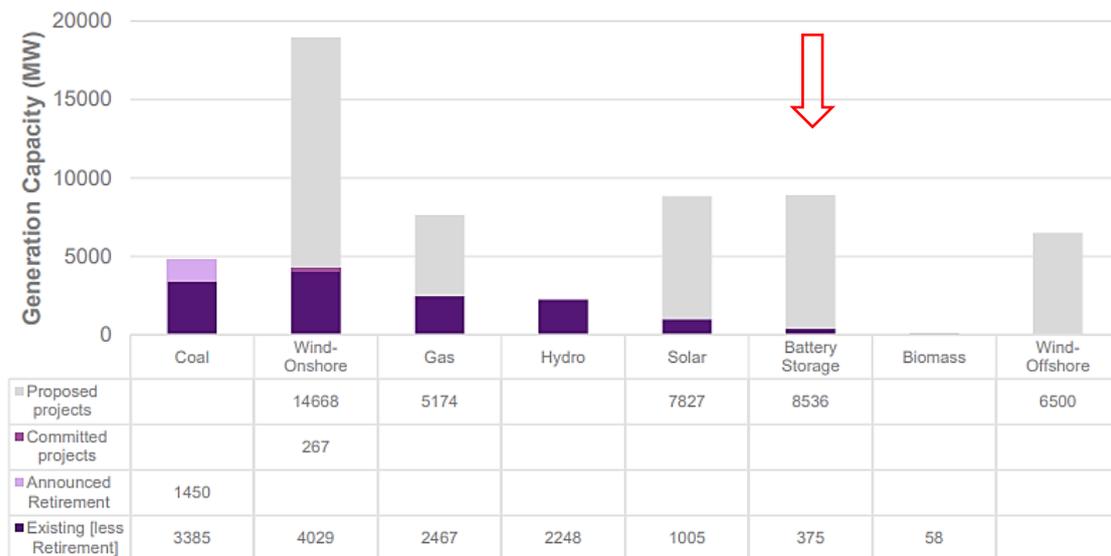
- (i) As an indication of good practice and to respect previous ESC research, the *Value of avoided human health costs* should be increased from 0.0 c/kWh to 1.4 c/kWh for 2023-24.
- (ii) The ESC should commission independent high-quality research to establish the methodology and the rate for 2024-25 onwards

3.3 The emerging impact that large scale grid battery storage will have as a discrete Feed-in Tariff component.

The ESC argues that the *Forecast solar-weighted average wholesale electricity price* FIT component should reduce in line with daytime wholesale prices. As generators, solar customers can accept this finding as it supported by high quality independent research by Frontier Economics. But in doing so, the ESC must accept that the opposite is also true – that solar customers should benefit from higher evening wholesale prices when their solar electricity generated during the day is stored in large-scale grid batteries and is released and used during the night time. This is a rapidly growing feature of the Victorian electricity network and its complete absence from this paper is quite astonishing. As a generator, solar customers expect a full and thorough examination of all the commercial returns they are entitled to for the generation they provide to the entire network under all operating conditions.

Victoria is leading Australia in implementing grid-scale battery storage which also requires the regulator keeps up. The following chart from AEMO indicates that battery storage is planned to become the second largest source of grid electricity in Victoria over the coming decade.¹⁹

Figure 1 Currently existing, committed, and proposed large-scale generation and storage capacity in Victoria



Note: Committed includes projects that are currently undergoing the commissioning process, 'large-scale generation' means individually greater than 20 MW, and retirements are those that owners/operators have announced will occur in the next decade.

The State Government has publicly announced its intentions in this regard:²⁰

The Victorian State Government announced Australia's largest energy storage targets on 27 September 2022, with a target of 6.3 GW of storage by 2035. That's enough renewable energy to power around half of Victoria's home at their energy peak.

Victoria is already the battery capital of Australia and home to the largest battery in the Southern Hemisphere – the Victorian Big Battery – a 300 MW battery just outside Geelong.

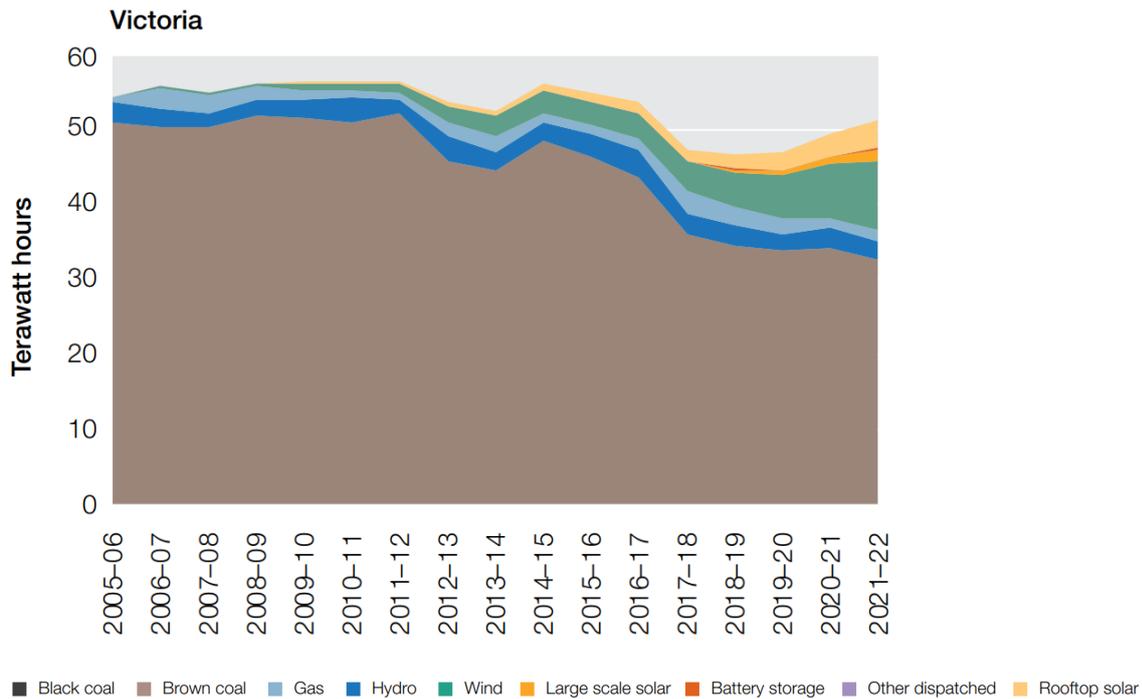
¹⁹ AEMO (2022). *Victorian Annual Planning Report*. October 2022 p.6

²⁰ Victoria State Government (2022). Media release: *Australia's biggest renewable energy storage targets*. 27 September 2022

The energy storage targets will include both short and long-duration energy storage systems, allowing energy to be moved around during the day and also to be supplied through longer duration imbalances.²¹

The following chart from the Australian Energy Regulator (AER) shows the increasing influence that large-scale grid battery storage is having in Victoria’s supply network system with its impact definitely discernible as older sources of generation are retired or reduced due to lower demand:²²

Figure 2.3 Generation output by fuel type



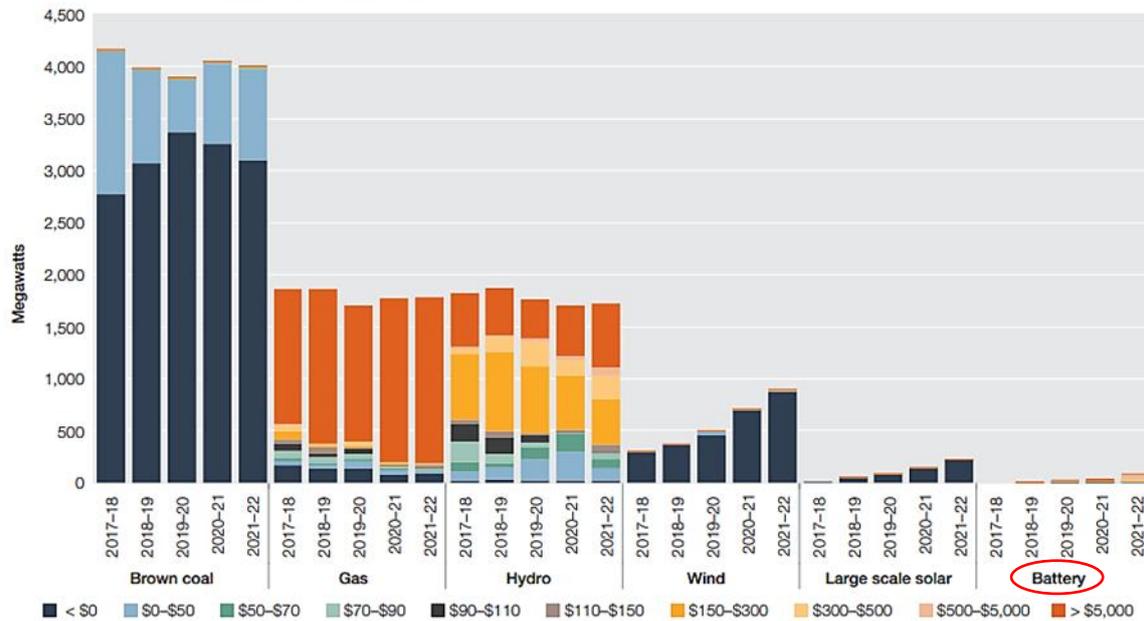
Most importantly, electricity sourced from grid scale batteries is being charged at a higher price relative to other sources as the following chart from AER clearly demonstrates:²³

²¹ AEMO (2022). *Victorian Annual Planning Report*. October 2022 p.17

²² Australian Energy Regulator (2022) *Wholesale electricity market performance report 2022*. December 2022, p.12

²³ Australian Energy Regulator (2022) *Wholesale electricity market performance report 2022*. December 2022, p.63

Figure 5.6 Victorian offers, by fuel type



Note: Financial year average offered capacity by Victorian generators within price bands.
 Source: AER analysis using NEM data.

This chart clearly indicates that electricity from stored batteries is priced higher (typically \$500 - \$5,000 per MW) than traditional sources such as brown coal (typically \$0 - \$50 per MW) and other renewable sources, such as wind and large scale solar (both typically \$90- \$110 per MW). This chart also shows that the amount of electricity sourced from batteries is also increasing year-on-year,

This has significant implications for solar customers (i.e. ‘generators’) as their fed-in solar energy will increasingly become stored in batteries during the day (along with other electricity generated from other sources) and released at night time when the price is higher.

The ESC recognise that higher prices apply at night time (p.7 of the Draft Decision):

On the other hand, night-time wholesale electricity prices have increased significantly.

Consistent with being treated under this Draft Decision as a generator, and not as a benevolent citizen, solar customers rightly demand an increased rate of return for the use of their generated solar energy in this way.

This means that the ESC’s overall thesis of increasing solar production and decreasing demand during the day forever driving down the *Forecast solar-weighted average wholesale electricity price* needs to be re-thought.

In fact, the thinking needed to commence in 2018-19 as clearly shown by the graph above, but again, the ESC has been too slow to recognise a fundamental change in the market, to the detriment of solar customers (once again).

I’m not able to estimate a Feed-in Tariff rate for the solar energy stored and released from grid batteries component, but the approach as to how the components relate to each other would be something like this:

Proportion of roof top solar electricity stored in grid batteries (%)

X

Amount of electricity released from batteries when required at night time (kWh)

X

Night-time rate of electricity (c/kWh)

Recommendations

- (i) The ESC has a responsibility to properly develop this model and estimate costs for inclusion in the 2023-24 Final Decision to ensure that solar customers are receiving the full value of their exported solar energy that they are fully entitled to.

This component could be called: *Forecast grid battery wholesale electricity rate*

- (ii) If the FiT rate is found to be significant (i.e. above zero), the ESC should apply back-payment from 2018-19 to relevant solar generators

4.0 Conclusions

This paper has identified a number of serious omissions in the Draft Decision that will require time for the ESC to properly evaluate, particularly those components regarding back payments to eligible solar customers.

The legislation requires the ESC required to determine the final Feed-in tariffs '*no later than 28 February in the financial year preceding the financial year it is to apply*'.²⁴

This appears an excessive timeframe, being a full four months before the new Feed-in tariff needs to take effect.

Recommendation

- (i) The final recommendation of this paper is for the ESC to apply to the State Government for an extension to the date when the Final Decision is required in order for it to properly consider the changes and updates it needs to make to a number of the FiT components as demonstrated in this analysis, namely:
- *The avoided social cost of carbon*, including the calculation of back payments rightfully owed to solar customers over the six-year period from 2017-18 to 2022-23
 - *The avoided human health costs attributable to a reduction in air pollution*, and
 - Commission research to develop a new component provisionally called: *Forecast grid battery wholesale electricity rate* and calculate any back payments owed to solar customers over the five-year period from 2018-19 to 2022-23

²⁴ Electricity Industry Act 2000. s.40FBB(2)