IPART Independent Pricing and Regulatory Tribunal | NSW

Solar feed-in tariff benchmark range methodology

Draft Report

February 2025

Energy »

Acknowledgment of Country

IPART acknowledges the Traditional Custodians of the lands where we work and live. We pay respect to Elders both past and present.

We recognise the unique cultural and spiritual relationship and celebrate the contributions of First Nations peoples.

Tribunal Members

The Tribunal members for this review are:

- Carmel Donnelly PSM, Chair
- Dr Darryl Biggar
- Jonathan Coppel
- Sharon Henrick

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Invitation for submissions

IPART invites comment on this document and encourages all interested parties to provide submissions addressing the matters discussed.

Submissions are due by Friday, 21 March 2025

We prefer to receive them electronically via our online submission form.

You can also send comments by mail to:

Solar feed-in tariff benchmark range review
Independent Pricing and Regulatory Tribunal
PO Box K35
Haymarket Post Shop, Sydney NSW 1240

If you require assistance to make a submission (for example, if you would like to make a verbal submission) please contact one of the staff members listed above.

Late submissions may not be accepted at the discretion of the Tribunal. Our normal practice is to make submissions publicly available on our website as soon as possible after the closing date for submissions. If you wish to view copies of submissions but do not have access to the website, you can make alternative arrangements by telephoning one of the staff members listed above.

We may decide not to publish a submission, for example, if we consider it contains offensive or potentially defamatory information. We generally do not publish sensitive information. If your submission contains information that you do not wish to be publicly disclosed, please let us know when you make the submission. However, it could be disclosed under the *Government Information (Public Access) Act 2009* (NSW) or the *Independent Pricing and Regulatory Tribunal Act 1992* (NSW), or where otherwise required by law.

If you would like further information on making a submission, IPART's submission policy is available on our website.

The Independent Pricing and Regulatory Tribunal

IPART's independence is underpinned by an Act of Parliament. Further information on IPART can be obtained from IPART's website.

Contents

1 Executive summary

Solar panels can provide significant savings to households. A typical household with a 5-kilowatt solar system could save up to $450 per year on their electricity bills by using the electricity they generate, instead of buying this electricity from their retailer (Box 1.1).[a]

As an added benefit, customers can also earn money from a feed-in tariff for any unused electricity they export to the grid - this is around $200 per year for a typical household.

Retailers in NSW are not required to pay customers for the electricity they export, but most do. If retailers offer feed-in tariffs, they set these tariffs themselves.

Since 2012, IPART has been setting benchmarks to guide customers about the value of feed-in tariffs they could expect to be paid by their retailers for their solar exports. These benchmarks provide information about how much their solar exports are worth and aim to help customers see if they are getting a reasonable feed-in tariff from their retailer and to compare offers.

This report outlines our draft decisions on our feed-in tariff benchmarks for 2025-26 and seeks feedback on our approach to setting our solar feed-in tariff benchmarks.

You can make a submission via our website by 21 March 2025, and/or register to attend our public workshop on the 11 March 2025.

Have your say

Your input is critical to our review process.

You can get involved by making a submission, and/or attending our online workshop event.

Submit feedback »

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Box 1.1 Benefits of solar panels

When customers use their solar-generated electricity rather than buying electricity from their retailer, they can make significant savings on their energy bill. By using the electricity they generate, customers do not have to pay the retail cost of electricity, which includes additional costs that retailers incur when they supply electricity to households (for example, network costs, overheads, and the costs of green energy schemes). This is usually the largest benefit of solar panels.

[a] A typical customer is assumed to have an annual electricity usage of 3,911 kWh, be in the Ausgrid network and have a 5-kW solar system. We also assume they consume 30% of the solar electricity they generate and have a time-of-use tariff, including a peak charge of 55 c/kWh and an off-peak charge of 25 c/kWh (which is the median consumption charge in the Ausgrid network as of January 2025).

Box 1.1 Benefits of solar panels

For most customers, the feed-in tariff revenue they receive provides a much smaller benefit. When customers do not use all the electricity generated by their solar panels, the excess electricity is exported to the grid. Customers may be paid a feed-in tariff for these solar exports by their retailer.

The total savings and feed-in tariff revenue a customer will receive depends on a number of factors, including the size (in kilowatts) and orientation of their solar panels, the amount of electricity the customer uses and when it is used, and their retail offer.

One way for a household to use more of the electricity they generate from their solar panels (and avoid purchasing it from their retailer) is to install a battery. As well as storing their excess electricity for later use, customers can also export this stored electricity. If they can export this electricity at peak times, they may receive a higher feed-in tariff.

The NSW Government offers rebates for eligible customers to help reduce the cost of installing batteries through the Peak Demand Reduction Scheme.

However, currently the upfront costs of batteries mean they may only have a positive financial payoff in some circumstances. The not-for-profit entity SunSPOT provides an online calculator that can help you estimate the costs and benefits of installing a battery.

1.1 IPART's draft feed-in tariff benchmarks for 2025-26

IPART's benchmarks are a forecast of the savings to retailers as a result of not buying the equivalent electricity from the wholesale market when their customers are supplied by solar exports instead. We consider this avoided cost represents a fair price that retailers should be willing to pay for solar exports.

Our draft decision for the all-day solar feed-in tariff benchmark range for 2025-26 is 4.9 to 7.4 c/kWh. We will use the most up-to-date data when we publish our final benchmarks in May.

Our draft benchmark is similar to the benchmark range we set for 2024-25 of 4.9 to 6.3 c/kWh. This reflects that the wholesale price of electricity at the times that solar is exporting to the grid is expected to be the same or higher in 2025-26.

Customers with batteries may also be offered higher feed-in tariffs if they are able to export their stored solar electricity during the evenings, when wholesale electricity prices are significantly higher, and distribution network service providers ("network providers") offer additional rebates.

To guide customers about the value of their exports at different times of the day, we have also set time-dependent feed-in tariffs benchmarks. Table 1.1 shows that in 2025-26, we expect exports in the late afternoon and evening to be worth significantly more than the all-day solar feed-in tariff benchmark – higher than 20 c/kWh in some cases.

Table 1.1 Draft time-dependent benchmark ranges for 2025-26

Network time window	2025-26 range (c/kWh)
Ausgrid	
10 am to 3 pm	4.9 to 5.5
3 pm to 4 pm	9.1 to 12.6
4 pm to 9 pm	14 to 19.3
9 pm to 10 am	5.1 to 6.2
Endeavour Energy	
10 am to 2 pm	3.3 to 5.4
2 pm to 4 pm	9.2 to 12.3
4 pm to 8 pm	20.9 to 26.6
8 pm to 10 am	4.8 to 6.4
Essential Energy	
10 am to 3 pm	5.1 to 5.3
3 pm to 5 pm	9.9 to 12.6
5 pm to 8 pm	26.5 to 36.7
8 pm to 10 am	6 to 6.1

1.2 Changes to our approach to forecasting the value of solar exports

To make our draft decisions on the solar feed-in tariff benchmarks for 2025-26, we have made changes to the approach we use to forecast the wholesale value of electricity.

Our draft decision is to use the last 3 years of solar export volume-weighted ("solar-weighted") average prices to set the range for estimating the wholesale value of solar in the benchmark year.[b]

This approach would replace our previous approach of using a forecast of the average price across the day, and applying a scaling factor (or "solar multiplier") based on the historical relationship between the average price across the day, and the wholesale prices when solar is exporting to the grid (or the solar-weighted prices).

Our proposed approach is simpler, and it provides a closer estimate of the actual wholesale price when solar is exporting when applied to previous time periods. This includes reducing volatility in the benchmark which is not representative of prices when solar is exporting to the grid. It also results in a forecast that is close to prices currently being observed in the market.

[b] This is the average half-hourly spot price across the year weighted by how much solar is exported during each half hour of the year. For a year, it is determined by multiplying the spot price of each of the 17,520 half-hour periods (48 half-hours per day over 365 days) by the proportion of solar exports that occurred in that half-hour. We then sum the results.

Our draft benchmarks for 2025-26 also include the impact of new network tariffs. These are charges and rebates applied by network providers and faced by retailers when their customers export solar to the grid. For Ausgrid customers, the average cost of these network tariffs is around $3.50 per year. When we divide the average financial impact by the average volume of exports per customer, the network tariffs have a very small impact on the average value of solar exports, reducing the bottom end of our solar feed-in tariff benchmark range by around 0.14 c/kWh. We have not adjusted the top end of the all-day range, reflecting that the new export tariffs will not apply to most customers in the Endeavour Energy and Essential Energy distribution networks in 2025-26 and will therefore not impact the value of solar exports for these customers.

Although the average impact of the solar export tariffs across the whole day is very small, they have a significant impact on the value of exports at certain times of the day. Because this impact is significant and varies depending on the network provider's tariff structure, we have set different time-dependent benchmarks for each distribution network.

1.3 Why the all-day benchmark is lower than the retail price of electricity

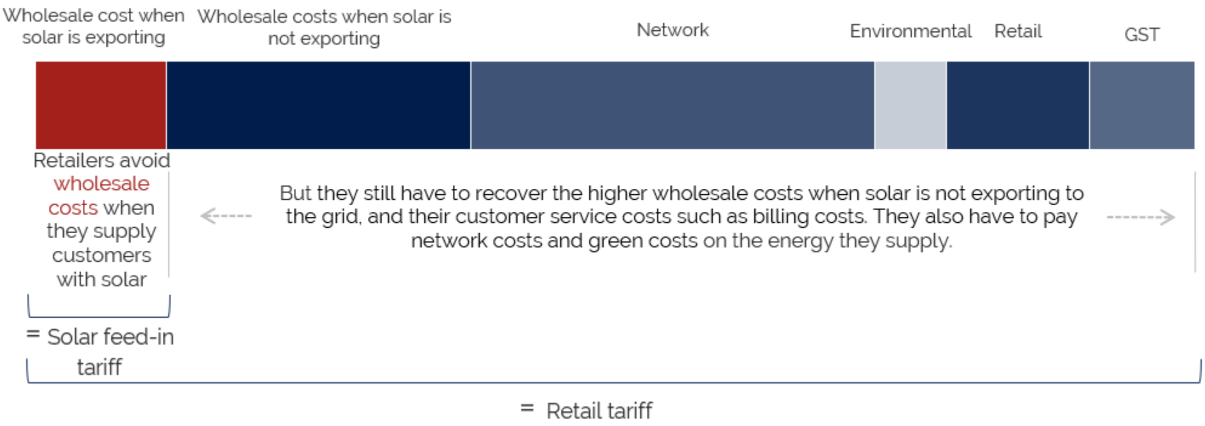
Households are paid by their retailer for the solar electricity they export to the grid. We set a solar feed-in tariff benchmark based on what retailers would have otherwise paid to purchase this wholesale electricity minus any additional network costs they would have incurred. We estimate this value to be 4.9 to 7.4 c/kWh in 2025-26.

When solar electricity is exported and supplied to other households, retailers must pay charges on each kilowatt hour of electricity they supply. The main charges are those paid to the network provider for using the energy grid. These can be more than 29 c/kWh.[1] Retailers also must recover other costs, including:

- the difference between wholesale costs when solar is exporting to the grid and their average wholesale costs, which are higher because solar exports drive down the wholesale price during the day, while prices when solar is not exporting (such as the evening) remain high
- their environmental obligations to purchase renewable energy, demand reduction certificates, and paying into the climate change fund
- their billing services, running their call centres, and other operations
- GST.

When these costs are added up, the retail price of electricity is higher than just the cost of the wholesale electricity (minus the impact of any network export tariffs) supplied into the grid by households (Figure 1.1).

Figure 1.1 Wholesale costs are a small proportion of the average retail consumption charge (2024)



Source: IPART calculations, based on data from the ACCC, *Inquiry into the National Electricity Market report – December 2024 Appendix C*.

Draft decisions

1. The NSW draft all-day feed-in tariff benchmark range for 2025-26 is 4.9 to 7.4 c/kWh. 17
2. The draft time-dependent feed-in tariff benchmark ranges for 2025-26 are set out in Table 3.3. These vary by network area to reflect the differences in export tariffs, and charging and rebate times in each network. 17
3. Our benchmarks for 2025-26 will continue to be based on an avoided cost methodology, minus the average net network charge that retailers are required to pay to networks for these exports. 17
4. For the 2025-26 benchmark range, we will forecast the wholesale value of solar using historical solar export-weighted prices. 28
5. Our all-day benchmark range for 2025-26 will incorporate network export tariffs by reducing the minimum of the benchmark range by the estimated net impact on Ausgrid customers. The maximum of the range will not be adjusted to account for network export tariffs because there will be no impact for many customers (particularly in the Endeavour and Essential networks). 32

2 What we have been asked to do

2.1 The NSW Government has asked IPART to set feed-in tariff benchmarks

The NSW Government has asked IPART to provide advice on the value of solar exports since 2012. In September 2023, the NSW Government provided IPART with a Terms of Reference to continue this role for the next 3 financial years (2024-25 to 2026-27). See Appendix A.

The Terms of Reference require us to set annual benchmark ranges for an all-day solar feed-in tariff and feed-in tariffs for different times across the day. In doing so, we are required to consider the following key parameters:

- there should be no resulting increase in retail electricity prices
- the voluntary benchmark range should operate in such a way as to support a competitive retail electricity market in NSW
- the voluntary benchmark range should be fit-for-purpose and consider network charges for solar exports and demand charges, and how retailers reflect these in their tariffs.

We consider the first parameter means we cannot set the solar feed-in tariff benchmark higher than the price a retailer would pay to purchase that electricity from the National Energy Market (NEM). If we did, this would likely result in electricity retailers passing on this increase in costs, which would result in higher retail electricity prices. Similarly, in relation to the second parameter, a higher feed-in tariff would increase the cost of supplying solar customers relative to non-solar customers, which could:

- disproportionately impact retailers with more solar customers, reducing their ability to compete in the market, and/or
- create an incentive for retailers to opt out of suppling solar customers and reduce competition for these customers.

The third parameter reflects that the tariff structures used by network providers and retailers are changing. We outline our approach to considering these new tariffs in Chapter 3, and provide further detail in Chapter 5.

In addition to setting the solar feed-in tariff benchmark ranges, we are also required to:

- Publish consumer Fact Sheets on the all-day solar feed-in tariff benchmark range and time-of day solar feed-in tariff benchmark ranges. These Fact Sheets will be made available on the IPART website when we publish our final benchmarks in May.
- Report on the feed-in tariffs currently being offered by each retailer and note whether they are within the benchmark range. We will have published an interactive dashboard on the IPART website that shows the solar feed-in tariffs on offer and whether they are within our benchmark range. We will update the dashboard for 2024-25 when we publish our final benchmarks.

2.2 Timeline for our review

As outlined above, this annual review is part of a 3-year Terms of Reference from 2024-25 to 2026-27. In early 2024, we released an Information Paper inviting feedback on whether our existing methodology remained appropriate to set the 2024-25 feed-in tariff benchmarks. A summary of the submissions received to our 2024 information paper and our responses can be found in Appendix B.

This year, we are undertaking a more comprehensive review of our methodology. One of the key reasons for the expanded review this year is that new network export charges will apply more widely in NSW from 1 July 2025, impacting the value of solar exports.

In undertaking this comprehensive review, we have conducted analysis and have also engaged Endgame Analytics[c] (Endgame) to consider our approach to forecasting the wholesale cost of electricity for the feed-in tariff benchmark range. Endgame's report can be found on our website.

As a result of the work to date, we are proposing some changes to our methodology for setting the solar feed-in tariff benchmarks as set out in this Draft Report. We are seeking your feedback via submissions through our website by **21 March 2025**, and at a public workshop to be held on **11 March 2025**.

After considering feedback on our draft methodology, we will publish our final solar feed-in tariff benchmarks for 2025-26 by 31 May 2025. We will set our benchmarks for 2026-27 by 31 May 2026.

We note that the Terms of Reference requires that we publish our benchmark ranges by 30 April 2025. However, the Australian Energy Regulator approves network export tariffs that will be incorporated into our benchmarks at the end of April 2025. Therefore, the NSW Government has agreed to an amended date for the publication of the final benchmarks to 31 May 2024.

A detailed summary of the submissions received to our 2024 information paper and our responses can be found in Appendix A.

c Formerly Endgame Economics.

3 Draft solar feed-in tariff benchmarks for 2025-26

3.1 Overview of draft decision on the all-day benchmark

Our draft solar benchmarks are based on our forecast of the value of solar exports to retailers.

When households export their excess solar electricity into the grid, retailers can use that electricity to supply other customers. This means that they can avoid purchasing this electricity from the National Electricity Market (NEM).

As well as the wholesale spot price that the retailer would have paid for that energy,[d] retailers make additional savings because they would have had to buy more electricity if they had supplied those customers from the NEM. This is because some electricity is lost when it travels over large distances. When electricity is supplied by solar, it can be used by neighbouring properties and so minimal losses are incurred.

In addition, when retailers supply electricity to their customers that is generated from a neighbouring solar system, they avoid paying NEM fees and ancillary service charges on this electricity. These are costs payable on each kWh of electricity purchased from the NEM.

Our benchmark is based on these avoided costs, minus the average net network charge that the retailer is required to pay to network provider for these exports (see Table 3.1). More detail on our approach to calculating the wholesales value of electricity at the times solar is exporting and the impact of the network export charges is included in the following chapters.

Using this methodology, we estimate that this value of solar exports will be 4.9 to 7.4 c/kWh in 2025-26 (see Table 3.2). We will update our draft benchmarks to incorporate the most up to date data for our final report.

Table 3.1 Draft methodology for setting the solar feed-in tariff benchmark ranges

Step	Draft methodology
Step 1. Forecast the average solar-weighted wholesale price in NSW for the next financial year	• Generally, wholesale prices in the NEM are lowest in the middle of the day when solar generation is high as this meets a large proportion of demand, and highest in the evening when demand is high and there is little solar energy exported to the grid. • The solar-weighted average price is the average price across the year weighted by how much solar is exported at the time. For a year, it is determined by multiplying the spot price of each of the 17,520 half-hour periods (48 half-hours per day over 365 days) by the proportion of solar exports that occurred in that half-hour. We then sum the results. • We take a solar-weighted average of the most recent 12 months of wholesale spot prices to establish one end of the range, plus an error margin determined by the Tribunal each year • We also take a solar-weighted average of 3 years of historical wholesale spot prices to establish the other end of the range, plus an error margin determined by the Tribunal each year.

[d] When solar is exported back into the grid, retailers receive the wholesale spot price at the time the electricity was exported, which is netted off through an AEMO settlement process. This occurs through a netting process during settlement. The solar electricity exported to the grid is the value of these exports and is netted off from the total value of electricity that the retailer must purchase from the wholesale market.

Step	Draft methodology
Step 2. Increase the value by an avoided loss factor	• We increase the value of the range by multiplying it with an avoided loss factor. • When electricity is purchased from the NEM and flows through the transmission and distribution networks some of it will be lost. However, given that solar exports are located closer to where electricity will be used by other customers, less needs to be purchased by retailers to meet the same level of demand.
Step 3. Add back the value of NEM fees and charges	• We add back the value of the NEM fees and ancillary service charges that retailers avoid paying when they supply customers with other customers' solar exports because these charges are levied on retailers' net purchases.
Step 4. Subtract or add the net value of network export charges	• We adjust the range to account for the net value of solar network export charges and rebates. • Network charges for solar exports are a new tariff structure which aims to send price signals to customers about when it is beneficial (or not beneficial) to export excess energy to the grid. • Customers are charged a network fee for exporting electricity during specific daylight hours and rewarded a rebate for exporting during specific evening hours. Over the year, this typically results in a small net loss for solar customers, which decreases the value of solar exports.

Table 3.2 Draft all-day benchmark range for 2025-26

Benchmark component	Draft
Forecast solar-weighted wholesale electricity price range	4.8 to 7.0 c/kWh
Average solar-weighted wholesale price for the most recent 12-month period (without margin)	*5.6 c/kWh*
Average solar-weighted wholesale price for the most recent 3-year period (without margin)	*6.1 c/kWh*
Error margin	+/-15%
Network loss factor	1.05
NEM fees and ancillary charges	0.06 c/kWh
Network export charges range	-0.14 to 0 c/kWh
Average net network charges for customers with network solar export tariffs (Ausgrid)	-0.14 c/kWh
Net network charges for solar customers not on network solar export tariffs (most solar customers in the Endeavour and Essential networks will not face solar network charges)	0 c/kWh
Solar feed-in tariff benchmark range	4.9 to 7.4 c/kWh

Note: We have not used the 3-year solar-weighted average for Endeavour Energy due to data quality issues for 2021-22.

We also considered whether we should include Reliability and Emergency Reserve Trader (RERT) costs in the solar feed-in tariff benchmark range. We propose not to include these costs because they are difficult to forecast ahead of time given their infrequent nature and unknown scale (usually small scale).[2] Box 3.1 explains RERT costs, and more detail is included in Endgame's report.

Box 3.1 Reliability and Emergency Reserve Trader scheme costs

The Reliability and Emergency Reserve Trader scheme allows the Australian Energy Market Operator (AEMO) to contract emergency reserves (generation or demand response) when there is an expected shortfall in reserves. When AEMO activates this scheme, it provides compensation to the scheme's participants.

AEMO recovers the associated costs from market customers, which includes retailers. After a Reliability and Emergency Reserve Trade event occurs, market customers are charged based on the cost of the scheme's activation, divided by the total energy requirement in the affected region. Retailers are allocated a portion of these costs depending on how many MWh their customers used in the relevant region.

Retailers pass on these costs to customers who consumed electricity in the affected region (e.g. NSW) during the event period. Depending on usage, this is allocated between commercial and industrial customers and residential and small business customers.

Source: AEMO, *Reliability and Emergency Reserve Trader (RERT)*, November 2022

In previous reviews, stakeholders considered that IPART's benchmarks should be set for a longer period, as solar panels are a long-term investment. We set annual benchmarks because the price of electricity can fluctuate significantly from year to year, and it can be difficult to predict several years in advance. Further, most retailers change their retail prices (including their solar feed-in tariffs) at least once a year, rather than locking them in over the longer term.

3.2 Overview of our draft decisions on the time-dependent benchmarks

In addition to setting an all-day solar feed-in tariff benchmark range, our Terms of Reference also require us to set benchmark ranges that vary across different times of the day ("time-dependent" benchmark ranges) (Appendix A).

Our time-dependent benchmarks are intended to assist customers with batteries who have greater control over when they export their excess electricity to the grid. These customers could earn more revenue from feed-in tariffs by being on a time-dependent network and retail tariff.

Our draft time-of-day benchmarks are set using the same approach as the all-day benchmark, except we forecast separate solar-weighted prices for each individual time block instead of the whole day.

For 2025-26 we have set separate time-dependent benchmarks for Ausgrid, Endeavour Energy and Essential Energy to align with each network provider's export charging and rebate periods. Each network provider has established its own set of charges and rebates for solar exports, as well as different time bands for when these apply.

Our time-dependent benchmark ranges are provided in Table 3.3.

Table 3.3 Draft time-dependent benchmark ranges for 2025-26

Network time window	2025-26 range (c/kWh)
Ausgrid	
10 am to 3 pm	4.9 to 5.5
3 pm to 4 pm	9.1 to 12.6
4 pm to 9 pm	14 to 19.3
9 pm to 10 am	5.1 to 6.2
Endeavour Energy	
10 am to 2 pm	3.3 to 5.4
2 pm to 4 pm	9.2 to 12.3
4 pm to 8 pm	20.9 to 26.6
8 pm to 10 am	4.8 to 6.4
Essential Energy	
10 am to 3 pm	5.1 to 5.3
3 pm to 5 pm	9.9 to 12.6
5 pm to 8 pm	26.5 to 36.7
8 pm to 10 am	6 to 6.1

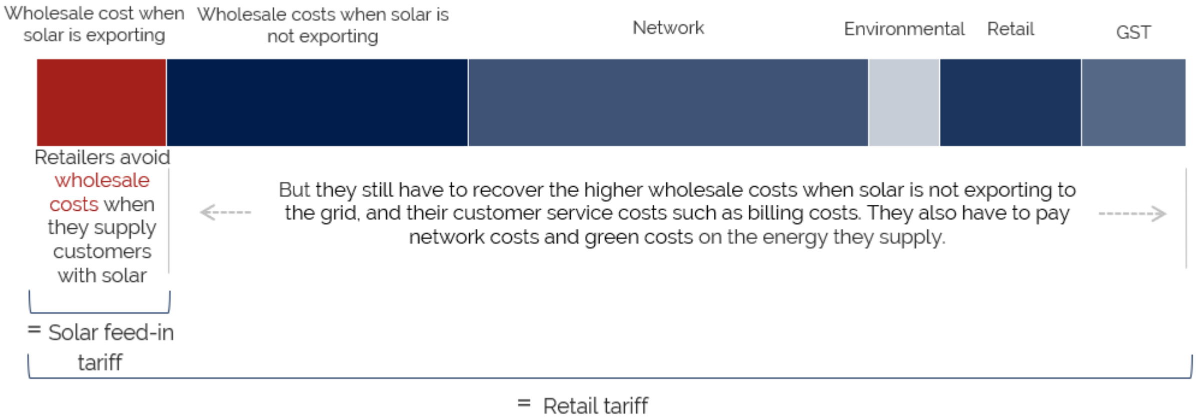
Although we have set separate time-dependent benchmark ranges for each network, we have set a single all-day benchmark range. While there are large differences between the charges and rebates offered in different networks, these only apply for short periods of time (such as between 4 pm and 9 pm). When each network's charges and rebates are averaged over the day (and an entire year), the annual net impact is very similar between the networks. This is discussed further in Chapter 5.

3.3 The feed-in tariff benchmarks are lower than retail electricity prices

Households are paid by their retailer for the solar electricity they export to the grid. Our estimated value of these exports (4.9 to 7.4 c/kWh) are substantially lower than retail electricity prices (variable costs of around 25 to 40 c/kWh for all-day consumption tariffs).[3]

However, when solar exports are used to supply electricity to other households, retailers must pay charges on each kilowatt hour they supply. The main charges are those paid to the network operator for using the energy grid. These can be more than 29 c/kWh.[4] Retailers also must recover other costs, including their operating overheads, funding for green energy programs and GST (see Figure 3.1).

Figure 3.1 Wholesale costs are a small proportion of the average retail consumption charge (2024)



Source: IPART calculations, based on data from the ACCC, *Inquiry into the National Electricity Market report – December 2024 Appendix C*.

3.4 The benchmarks reflect the value of solar exports to retailers

In previous reviews, stakeholders submitted that our benchmarks should be higher to reflect:

- the value of solar energy in displacing high-cost generation[5]
- avoided network costs as less of the power system is used if solar exports are used by customers nearby[6]
- the environmental benefits that solar generated electricity provides compared to other forms of generation.[7]

Retailers are not required to offer feed-in tariffs, and if they do, they are free to set their own tariffs. They are also not required to follow our feed-in tariff benchmarks. This means that if IPART sets a higher benchmark, it would not mean that retailers would have to pay customers more for their solar energy, because offering a feed-in tariff is voluntary.

To be useful to customers, we consider that our benchmarks should reflect what retailers are likely to pay their customers, based on how much the solar electricity is worth to retailers. This means that we have not included 'external benefits' – benefits to the wider community, such as avoided health and environmental costs in our benchmark.

But if IPART did set a higher benchmark, and all retailers paid a higher feed-in tariff, this would result in higher costs to retailers, which would mean that they would have to increase their prices. Households without solar panels should not have to pay more to reduce the bills of customers with solar panels. This would disadvantage the households who are unable to install a solar system themselves, for example, because they rent or they cannot afford the upfront costs.

The feed-in tariff benchmark reflects the market price of wholesale electricity

Stakeholders have previously submitted that solar electricity displaces high-cost generation (including the need to build alternative generating capacity) and reduces the chances of high wholesale electricity prices occurring in the first place.[8]

However, we consider that solar customers should be treated consistently with other electricity generators and so should not get a higher or lower tariff to reflect their impact on wholesale prices.

In its review of our methodology, Endgame agreed with this approach. It assessed our methodology for forecasting the wholesale value of electricity and concluded that "the avoided cost method is sound since it reflects the value of solar - what retailers would pay if they instead bought the electricity from the market. In this way, solar PV is treated as a price-taking generator, that is the retailer gets paid or netted off the wholesale value of solar from AEMO in its settlement process."[9]

Retailers have to pay network tariffs when solar exports are supplied to other customers

Stakeholders have submitted that avoided network costs should be included in our benchmarks as less of the network is used if exported solar energy is used by other consumers nearby.[10]

Our benchmarks do not make an allowance for this. This is because retailers still incur the full network usage costs when they sell solar exports to other consumers and so do not avoid these network costs.

Solar customers receive upfront subsidies to reflect avoided carbon emissions

Stakeholders have also previously submitted that our benchmark should include the environmental benefits that solar generated electricity provides compared to other forms of generation.[11]

Retailers do not capture avoided externalities from supplying solar generated electricity. This means that if we included a value for environmental benefits in the feed-in tariffs that was paid by retailers, retailers would need to recoup this amount from their customers (including those without solar panels) through higher retail prices.

We note that solar customers currently receive an upfront subsidy for installing their panels under the Small-Scale Renewable Energy Scheme (SRES) to reflect the avoided costs of carbon emissions. For a 5-kW solar system installed in Sydney, the subsidy is currently worth around $1,600.[12]

All electricity customers pay to subsidise customers with solar panels and other 'green costs' (including subsidies for the Renewable Energy Target, the Climate Change Fund, and the Energy Saving Scheme). The Australian Energy Market Commission (AEMC) projects these cost to fall over coming years.[13]

Demand charges do not impact the value of solar to retailers

Our Terms of Reference states that when setting the benchmark ranges, we should consider demand charges (see Box 3.2) and how retailers reflect these in their tariffs.

We have considered the impact of demand tariffs and consider there is no impact on the value of solar to retailers. Therefore, we have not made an adjustment to our methodology to account for these charges.

We note that there is little overlap between the times when solar exports occur and when demand peaks drive demand charges. Solar exports primarily occur during the day when solar panels generate excess electricity. Peak demand, which influences demand charges, typically occurs in the late afternoon or evening when solar generation is lower or non-existent.

Box 3.2 Demand charges

Demand charges are a tariff structure that are intended to reflect the network costs of using electricity during peak periods. It involves a retailer measuring a customer's consumption over a 30-minute window and charging a monthly fee based on the highest demand during peak periods in each month. A demand charge can only be applied if a customer has a smart meter that records energy consumption in at least 30-minute intervals.

The 3 distribution network providers in NSW (Ausgrid, Essential Energy and Endeavour Energy) charge demand tariffs to retailers.[14] Retailers can decide how they pass demand charges onto customers. For instance, a retailer may choose not to pass on the demand charge and instead recover this cost from its supply and usage charges. Or retailers may pass it through as a demand charge in addition to the supply and usage charges.

Draft decisions

1. The NSW draft all-day feed-in tariff benchmark range for 2025-26 is 4.9 to 7.4 c/kWh.
2. The draft time-dependent feed-in tariff benchmark ranges for 2025-26 are set out in Table 3.3. These vary by network area to reflect the differences in export tariffs, and charging and rebate times in each network.
3. Our benchmarks for 2025-26 will continue to be based on an avoided cost methodology, minus the average net network charge that retailers are required to pay to networks for these exports.

4 Wholesale value of solar exports

4.1 Draft decision on the wholesale value of solar

The largest component of our benchmark range is our estimate of the wholesale value of electricity at the times when solar electricity is exported.

When solar generated electricity is exported back into the grid, retailers receive the wholesale spot price at the time the electricity was exported, which is netted off the total cost of wholesale electricity the retailer has purchased. This occurs through the AEMO settlement process.[e] This reduces the wholesale electricity costs faced by the retailer. Therefore, our methodology forecasts the wholesale spot prices at the times that solar is exporting to the grid.

To ensure our benchmark range continues to be relevant, it is important that we regularly review the performance of our forecasting methodology and consider whether adjustments to the methodology would improve its performance.

For the 2025-26 benchmark range, our draft decision is to forecast the wholesale value of solar using historical solar export-weighted prices. This represents a change to the approach used in previous years. Using this methodology, we forecast the wholesale value of solar in NSW to be between 4.8 and 7.0 c/kWh in 2025-26.

We also considered other options which maintained our previous approach of using a forecast of average wholesale prices, adjusted for the relationship between average prices and solar-weighted prices ("the solar-multiplier"), with updates to the approach used in previous years. This includes:

- only looking at the most recent forward contract prices to forecast the average spot price for the benchmark year
- using only 1 year of historical data to calculate the solar multiplier (instead of 3 years)
- forecasting a forward-looking solar multiplier.

Our proposed methodology uses a simpler approach and provides a closer estimate of the benchmark to the actual wholesale prices when applied to previous years.

4.2 The solar export-weighted average wholesale price is significantly lower than the average price across the day

Retailers face costs when purchasing wholesale electricity from the NEM to supply their customers. By sourcing electricity from solar exports, retailers can reduce these wholesale electricity costs. Our benchmark feed-in tariff range reflects these avoided costs.

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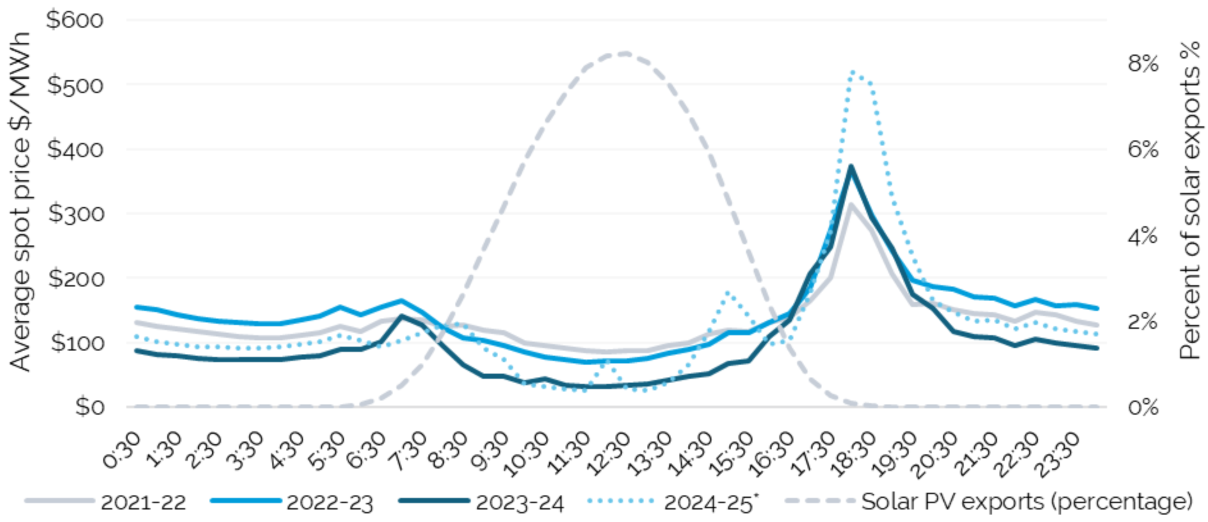
[e] This occurs through a netting process during settlement. The solar electricity exported to the grid is the value of these exports and is netted off from the total value of electricity that the retailer must purchase from the wholesale market. Further detail on the AEMO settlement process is available on pages 16 to 18 of the Endgame report, Review of the wholesale value of solar exports. This report is available on the IPART website.

As shown in Figure 4.1, most solar exports occur between 8 am and 4 pm, when wholesale prices are lowest. Our benchmark aims to forecast prices at these times – that is, the average wholesale prices when weighted by solar exports.

Figure 4.1 Average wholesale price by time of day ($/MWh), with solar exports by time of day for comparison



Notes: * Price data for 2024-25 is year-to-date from 1 July 2024 to February 2025.
The percent of solar exports is of all solar export by hour. This figure uses solar exports from 2023-24.
Source: IPART analysis of NEM wholesale spot prices for NSW and sample Ausgrid solar exports for 2023-24.

To date, we have forecast the average solar-weighted price by:

1. forecasting the average wholesale spot price across the whole day, using ASX Energy forward contract prices (base swaps)[f]
2. adjusting this average price for the whole day by a 'solar multiplier', which used the historical relationship between the average wholesale price across the whole day, and the average prices when solar is exporting to the grid (weighted by solar exports).

However, as solar generation has expanded, daytime prices have become more independent of all-day prices. Daytime prices are increasingly being set by large-scale and distributed solar,[15] putting steady downward pressure on daytime prices.

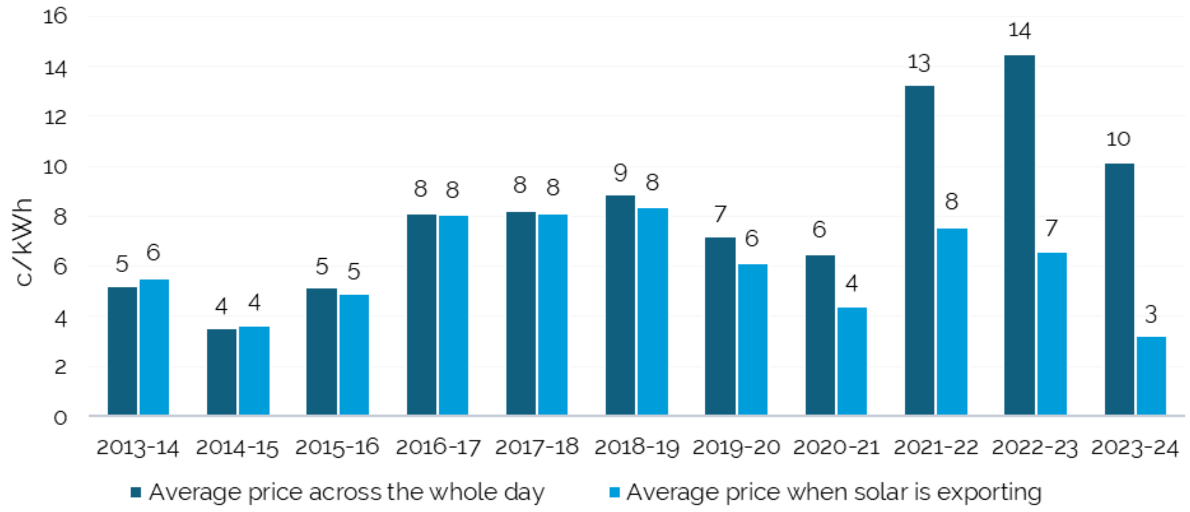
While the relationship between solar output and price has been strengthening,[g] the relationship between the average wholesale price across the day and average wholesale prices when solar is exporting to the grid has weakened (see Figure 4.2). This is primarily because evening and nighttime prices continue to be set primarily by coal, gas and hydro generation rather than solar.[16] This means that movements in the average price across the day (such as spikes related to coal or gas) are now less evident in movements in the average daytime price.

[f] One end of the range is set using a 40-day average of trades as a proxy for the spot prices for the forecast period. We apply a 5% downward adjustment to this value to account for the fact that contracts typically trade at a premium to the underlying spot price.

[g] The correlation between solar output and daytime wholesale prices has risen from a weak correlation of approximately -16% in 2018-19 to a more moderate -44% in 2022-23. This means that as solar export increases, the wholesale price of electricity during the day decreases.

As a result, we have observed less price volatility in the average solar export-weighted daytime price compared to the average all-day price. Particularly during price spikes, daytime prices have remained more subdued than the average all-day price, moving less in terms of raw-dollar price change as well as percentage change.

Figure 4.2 Average yearly wholesale price when solar is exporting to the grid, compared to the average price across the day (c/kWh)



Source: AEMO wholesale price data, sample solar export data for Ausgrid customers.

4.3 Simplified approach to estimating the solar-weighted price

Given the large changes in the relationship between the average price across the day and the solar-export weighted price, we are proposing to change our approach to forecasting the wholesale value of solar.

For the 2025-26 and 2026-27 benchmarks, our draft decision is to use historical solar-weighted prices, combined with a reasonable error margin.

This approach provides a more straightforward and transparent way to forecast daytime prices and it provides a forecast that is closer to the actual wholesale price of electricity when solar is exporting compared to other methods that seek to adjust forecasts of the average price across the entire day.

This approach also avoids the risks posed by including more volatile price events, which typically occur during peak times when demand is high, and which are less likely to reflect the more stable prices that prevail during daylight hours when solar is exporting to the grid.

To establish the forecast range for the upcoming financial year, we propose to calculate the average wholesale spot price throughout the year, weighted by the amount of solar exported during each half-hour period for 2 historical periods:

1. **Recent 12-month solar-weighted average:** Calculate the solar-weighted average of the most recent 12 months of wholesale spot prices to establish one end of the forecast range
2. **3-year solar-weighted average:** Calculate the solar-weighted average of the past 3 financial years of wholesale spot prices to establish the other end of the forecast range.

As discussed in section 4.6 below, there has not been a consistent trend in the solar-weighted wholesale prices in recent years – rather, these prices have continued to fluctuate. Therefore, using both the 12-month and 3-year solar-weighted averages allows us to balance responsiveness to recent market conditions with a more stable long-term perspective. When we apply this 3-year approach, we have found that it provides a better forecast of the prices for the benchmark period compared to using alternative time periods.

The solar-weighted average price for a year is determined by multiplying the spot price of each of the 17,520 half-hour periods (48 half-hours per day over 365 days) by the proportion of solar exports that occurred in that half-hour. We sum the results across the year to obtain the 12-month solar-weighted average price, and across 3 years to obtain the 3-year solar-weighted average price.

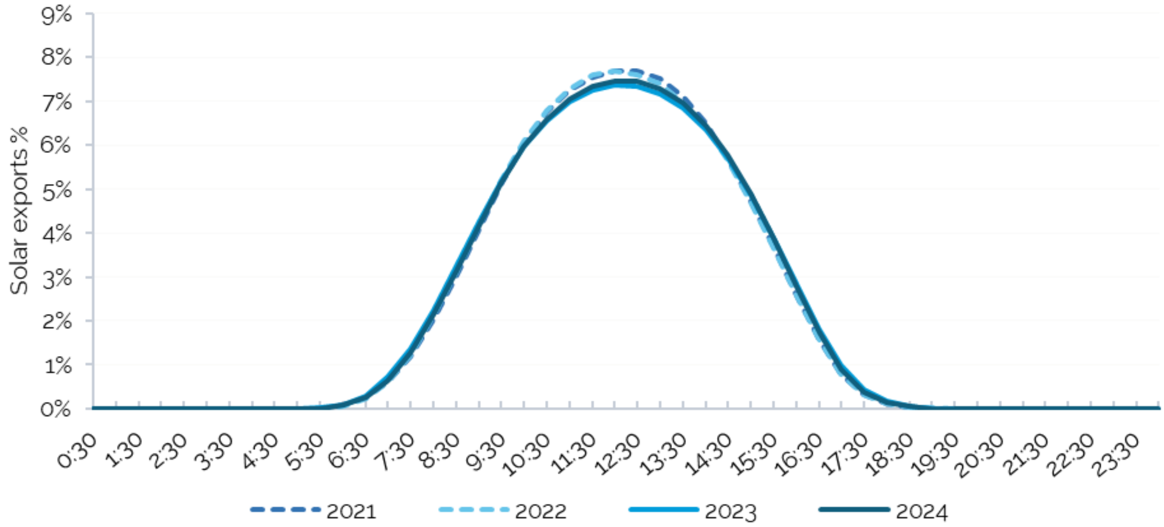
While up-to-date wholesale price data is available, there is a one-year lag in receiving detailed solar export data from the network providers.[h] Therefore, to calculate the solar-weighted average price for the most recent 12 months, we use the latest available price data combined with solar export data from the same 12-month period in the year prior. For example, if we used price data from April 2024 to April 2025, we would cross-multiply these prices with normalised solar export data from April 2023 to April 2024.

We consider this is a reasonable approach because the solar export profiles we receive each year from the network providers do not to change materially from year to year.

In addition, we normalise the data so that the export profile shape is not impacted by the total volume of solar exports each year or the number of customers in our sample. We have observed that weighting wholesale prices against normalised solar exports for the same year or the previous year produce very similar average solar-weighted prices. For example, Figure 4.3 shows the normalised average solar export profile for customers in our Essential Energy sample dataset since 2020-21.

[h] This data is sent to IPART once per year by the network providers.

Figure 4.3 Percent of solar exports by time of day from a sample of Essential Energy solar customers, by year



Source: IPART analysis of AEMO wholesale prices since 2020-21 and sample solar export profiles from Essential Energy.

For the 3-year solar-weighted average, we use the most recent 3 financial years of pricing and export data. For the 2025-26 benchmark we use data from 2021-22 to 2023-24.

Section 4.5 below discusses the performance of this draft methodology compared to alternative approaches, including the approach we used in 2024-25. It shows that when our draft methodology is applied to previous time periods, it produces the most reliable forecasts of the actual solar-weighted prices, compared to alternative approaches. However, on average, the actual solar-weighted average price that prevailed was 12% higher or lower than our forecast ranges.[i]

As a result, we are proposing to include an error margin to account for the uncertainties in the forecast, so that the actual prices would be more likely to fall within our benchmark ranges. The error margin would vary each year based on a qualitative assessment that considers factors such as current price volatility and the width of our forecast range. For instance, if the range is too narrow or prices are notably more volatile than usual, we would apply a wider error margin than 12%. Conversely, if the range was already wider than usual, we would consider applying a smaller error margin.

For the 2025-26 benchmark, we have selected an error margin of 15%, because prices have been slightly more volatile across 2024 compared to the long-term average.

[i] This is based on a trimmed mean of retroactively calculated forecasts between 2017-18 and 2024-25. This is an improvement to the previous methodology, which produced an average difference of 19%.

4.4 Other approaches we considered

In forecasting the wholesale value of solar, we also considered maintaining our previous approach, with several adjustments. These are outlined below.

In addition, as part of its review of our methodology, we asked Endgame to consider whether methodologies used in other Australian jurisdictions could be used to set a NSW solar feed-in tariff benchmark.

It is important to note that each jurisdiction has unique market circumstances that may support different approaches, and therefore a methodology used in another State may not be the most relevant methodology to apply in NSW (and vice versa).

Overall, Endgame found that our avoided cost methodology was similar to some methodologies being applied in other jurisdictions. However, some jurisdictions had different objectives to IPART in setting solar feed-in tariffs, which led to different factors being considered and different feed-in tariffs.[17]

Updating our forecast of the average price across the day

We considered changing how we forecast the average price of solar across the whole day. We have previously used the ASX baseload swaps as the best publicly available information on wholesale prices in the next financial year. ASX baseload swaps are a type of commonly traded energy derivative contract, under which a buyer and seller agree to trade a given volume of electricity during a fixed future period and at a specified price.[18] Retailers use baseload swaps to help secure their wholesale costs for future periods. This forecast of the average time-weighted wholesale price captures the market's views on expected wholesale costs for the following year.

Most recently we have used the forward prices across the entire trading period for a particular baseload swap, and also the most recent 40 days. For 2025-26, we considered using only the most recent 40 days of forward prices to capture the most up to date information in the market without capturing outdated information.

Endgame reviewed our methodology in 2024 and noted that in a competitive market, the value of solar feed-in tariffs should tend towards the long-run marginal cost of new entry, which is better represented by more recent baseload swap prices than the cost of historical trades.[19]

Using a more up-to-date solar multiplier

Under our previous methodology, the ASX forward prices are adjusted by a "solar multiplier" which captured the historical relationship between the average price across the whole day, and the average price when solar is exported to the grid (weighted by solar exports). We also considered different ways of capturing this relationship.

In recent years, we have captured this relationship using 3 years of historical data, placing more weight on the most recent year. In its submission to our 2024 information paper, Origin considered that we should forecast this relationship, or only the latest year of data because it identified that our solar multiplier had consistently been overstated as a result of using lagged market data.[20] Similar to Origin, Endgame recommended updating our solar multiplier, which it considered was likely not accounting for new levels of solar capacity.[21]

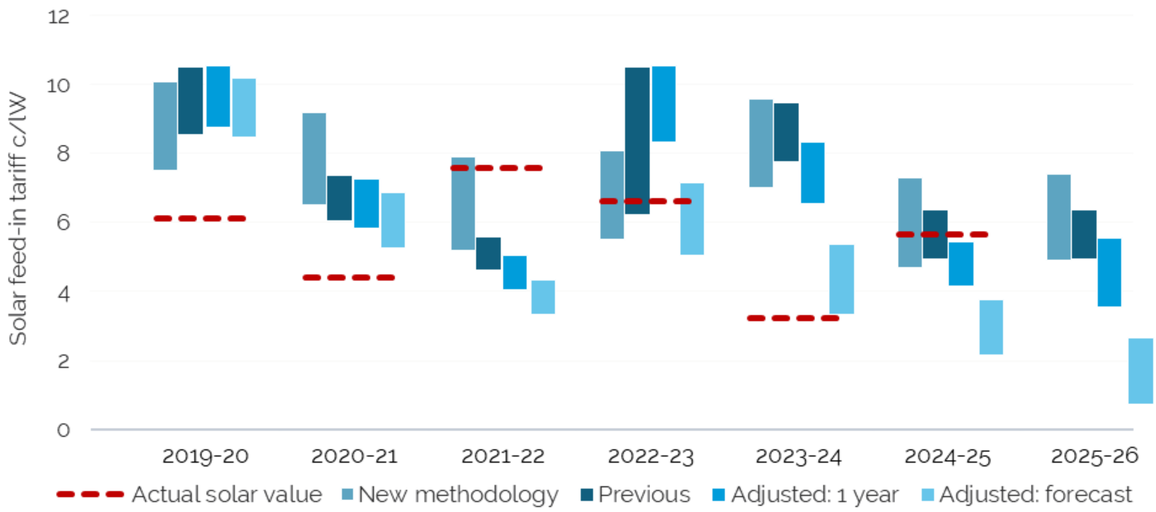
4.5 Comparing the performance of the different forecast methodologies

In weighing up the options, we have considered how well each forecasting methodology has predicted the actual solar-weighted price that prevailed in relevant year.

Figure 4.4 shows that our draft methodology produces forecast ranges that were closer to the actual solar-weighted price compared to the forecasts from other approaches, including the methodology used in 2024-25.

The alternative methodologies we considered produced forecast ranges of varying results. For example, the adjusted methodology that forecasts the solar multiplier would have produced the most accurate benchmark range in years such as 2023-24, when actual solar prices continued a 3-year downward trend. However, there were years such as 2021-22 and 2024-25 in which a forecast-based solar multiplier would have produced a benchmark range that was materially lower than the actual outturn price (in these years, average solar prices changed direction).

Figure 4.4 Estimated solar feed-in tariff benchmark by methodology compared to actual solar-weighted average price each year (c/kWh)



Note: 'Actual solar value' is the actual solar-weighted price of wholesale electricity each year. 2025-26 is based on year-to-date information.
'New methodology' is our draft methodology that uses historical solar-weighted values.
'Previous' is our previous methodology that applied a solar multiplier to an ASX forecast of the time-weighted average price.
'Adjusted 1 year' is uses only one year of historical data for the solar multiplier and uses the most recent forward contract prices to forecast the average price.
'Adjusted: forecast' uses the most recent forward contract prices and a forecast solar multiplier extending the 3-year historical trend.
Source: IPART methodologies since 2019-20.
'New methodology' includes an error margin each year that maintains a minimum width for the benchmark range each year.

One of the issues with our previous methodology is that the while ASX baseload swap prices are the best publicly available estimate of the average spot price for the coming year, they often do not often reflect the actual prices that prevail. For example, the actual time-weighted average price each year has not fallen within our estimated range derived from ASX baseload swaps in 7 of the last 8 years.

This means that even if the solar multiplier accurately reflects the actual relationship between the average price and the solar-weighted prices, it may be applied to an incorrect starting point. This can have varying impacts. For example, in 2022-23 and 2024-25, our previous methodology predicted the solar weighted price, however this was because our forecasts of the average wholesale price was too low, but this was balanced out by a forecast solar multiplier that was too high.[j]

As discussed above, there is a strengthening relationship between solar exports and daytime (solar-weighted) prices. As a result, we consider that we can estimate the solar-export weighted price directly using recent price data and export profiles. This allows us to remove use of ASX swap prices from our forecasting process, and more accurately and transparently estimate wholesale prices when solar is exporting.

4.6 How recent trends in prices compares to our forecast benchmark

Table 4.1 summarises the differences in the forecast of the wholesale value of solar for the 4 different forecasting methods. It shows that for 2025-26, there is overlap between the benchmark output from our previous approach (in which we forecast the average price and scale it down using a historical solar multiplier) and our updated draft approach. While this is not uncommon (as shown in Figure 4.4 above), it is important to note these estimates are driven by different inputs and could therefore diverge between our draft benchmarks (February 2025) and our final benchmarks (May 2025).[k]

In contrast, the adjusted methodology that incorporates a forecast solar multiplier estimates the value of solar exports will decrease materially in 2025-26 (0.7 to 2.6 c/kWh).

Table 4.1 Indicative wholesale value of solar under different methodologies, 2025-26

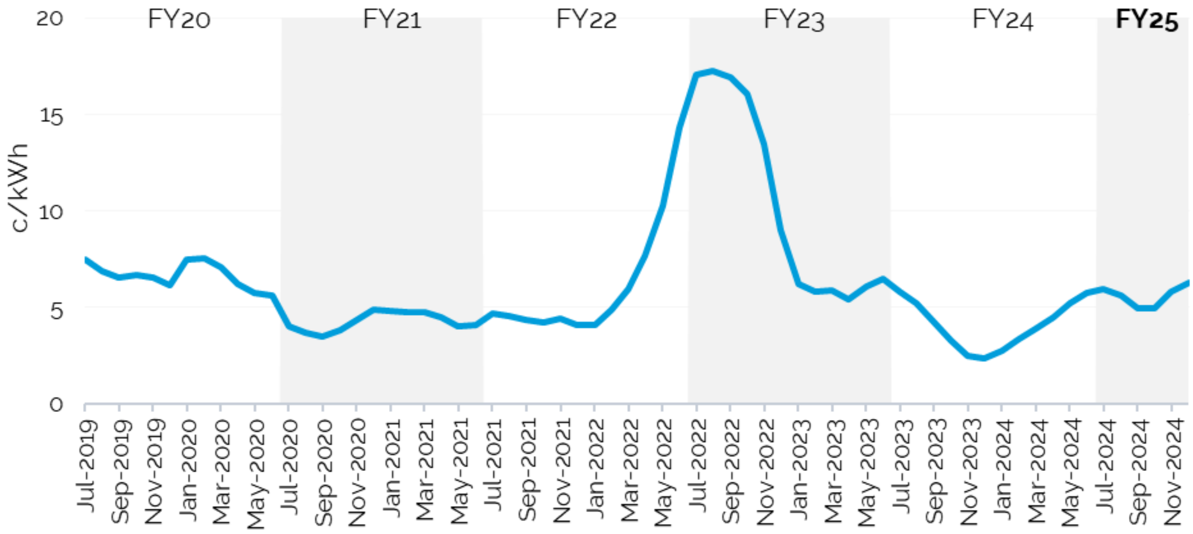
Approach	Wholesale value of solar
Draft approach: Using historical solar-weighted price with 15% error margin.	4.8 to 7 c/kWh
Previous approach: Forecast average price and scale using historical solar multiplier.	4.6 to 5.9 c/kWh
Adjusted previous approach: • Use only the most recent forward contract prices to forecast the average price • Use only 1 year of historical data for the solar multiplier • Apply 10% error margin.	3.4 to 5.2 c/kWh
Adjusted previous approach: • Use only the most recent forward contract prices to forecast the average price • Use a forecast solar multiplier extending the 3-year historical trend • Apply 10% error margin.	0.7 to 2.5 c/kWh

[j] When we refer to 'too low' or 'too high' in this section, we are referring to the forecast or estimated values compared to the actual values that then prevailed in the forecast period.

[k] Our previous approach and adjusted approaches are dependent on the most recent 40 days of ASX baseload swap prices, which can change by several cents over a period of a few months and affect the benchmarks accordingly.

In considering the options, we have also assessed how closely the forecasts for 2025-26 produced by each methodology reflect current prices. Figure 4.5 shows that the current 6-month rolling average solar-weighted wholesale price is around 6 c/kWh, which falls within our draft benchmark, and is significantly higher than the resulting benchmark where a forecast solar multiplier is used.

Figure 4.5 Six-month rolling average of the solar-weighted wholesale price, NSW



Note: This is a 6-month rolling average of the solar-weighted price in NSW. For instance, the point at July 2024 shows the solar-weighted average price between February 2024 and July 2024.

Source: IPART analysis of AEMO wholesale prices and solar export data from the network providers.

This does not necessarily mean that NSW daytime prices will remain at this level in 2025-26. However, unlike in other states, Figure 4.5 shows that NSW solar-weighted prices continue to fluctuate, and do not show a consistent downward trend (see Box 4.1). Average solar-weighted prices in NSW rose in 2024 and have remained high during the first half of 2024-25, sitting around 3 cents higher compared to the first half of 2023-24. These prices could remain high in the second half of 2024-25, as wholesale prices typically spike towards the end of the financial year (in May to June) as a result of high demand and lower solar supply generated electricity in winter.[l]

Further, changing market dynamics in the next few years could see daytime prices increase and the solar multiplier change direction. Even in 2024, market dynamics have begun visibly changing. For example, AEMO found that energy arbitrage from batteries rose by 97% between Q2 2023 and Q2 2024, driven by a doubling in battery capacity and availably across the NEM.[22] In addition, several major battery facilities in NSW entered full operations in 2023, including the Riverina Energy Storage System (ESS) 1, Riverina ESS 2 and Darlington Point ESS.[23] Small-scale batteries have also become more common, as the percent of small-customer solar installations in NSW that are accompanied by batteries has grown from around 1% in 2021 to 9% in 2024.[24] One potential impact of more battery storage is that less solar is exported during the day as it is stored for usage in higher priced, peak periods, and wholesale prices during daylight hours increase.

l Price spikes have occurred in winter since 2020-21, owing to less supply from solar exports. This is indicated in Box 4.1, where almost 0% of wholesale prices in NSW are negative during early Winter.

In light of different cost drivers and uncertain price movements in the coming years, we consider that using a variation of our previous approach with a forecast (or forward looking) solar multiplier would create a risk of undervaluing the solar exports over the coming years.

Box 4.1 The NSW wholesale value of solar exports is higher than in Victoria

The Essential Services Commission (ESC) in Victoria has released a draft minimum feed-in tariff of 0.04 c/kWh for 2025-26, which is significantly lower than our draft benchmark range for NSW. The Victorian benchmark is lower compared to previous years, reflecting a prolonged period of falling daytime prices in Victoria that commenced in 2019-20.

The difference in the benchmark prices in Victoria reflects the different market conditions in Victoria compared to NSW. The wholesale price is typically higher in NSW, where the average annual wholesale price has been between 40% and 75% more expensive than Victoria since 2020-21.

In addition, Victoria experiences more frequent negative wholesale prices during the day (8 am to 4 pm) compared to NSW. Figure 4.6 shows the average percent of daytime spot prices that were negative each month in either Victoria of NSW. Over 2023-24, Victoria had 7 months in which at least 50% of daytime spot prices were negative, compared to a single month of frequent negative prices in NSW (October, with 49%).

Figure 4.6 Percent of daytime (8 am to 4 pm) wholesale prices that were negative each month, NSW and Victoria.

Note: This graph shows how many half-hour daytime price blocks (between 8 am and 4 pm) are negative each month in NSW and Victoria. From 2021, AEMO prices operated in 5-minute intervals. Before this, prices were in 30-minute blocks. We have combined all 5-minute interval data into 30-minute intervals so we can compare prices from before and after 2021.

Source: IPART analysis of AEMO wholesale price data for Victoria and NSW.

Box 4.1 The NSW wholesale value of solar exports is higher than in Victoria

Note: The Victorian benchmark of 0.04 c/kWh comprises a forecast solar-weighted price of -2.4 c/kWh (a 3 c/kWh drop since last year), 'other' energy costs of -0.08 c/kWh, and a +2.49 c/kWh value of avoided carbon. As explained in Chapter 2, our methodology does not include a value for avoided carbon, because this does not represent a cost to retailers.

Source: ESC, Minimum Electricity Feed-in Tariffs from 1 July 2025 – *Draft Decision*, January 2025, pp 10, 12-13.

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4. For the 2025-26 benchmark range, we will forecast the wholesale value of solar using historical solar export-weighted prices.

5 Network charges for solar exports

Under our Terms of Reference, we have been asked to consider how new network export charges for solar exports in NSW might affect solar customers and the value of feed-in tariffs they receive from retailers.

Since 1 July 2024, network providers have been able to charge or provide rebates to retailers when their customers export electricity to grid. Retailers are able to determine whether and how they pass these export network tariffs onto their customers.

The new network export tariffs aim to encourage solar customers to use more of their electricity onsite when the grid does not need it and export more when it does. They do this by:

- charging when customers export large amounts of electricity into the network at times when it is not needed (typically during the day)
- providing a rebate when customers export electricity when the network would benefit from receiving solar exports the most (typically in the evening).

Over 2024-25, network export tariffs could only be applied if customers opted in. From 1 July 2025, network providers are able to apply these tariffs to all exporting customers.

Because export charges impact the cost of solar exports to retailers, our draft decision is to adjust our 2025-26 feed-in tariff benchmarks to reflect these charges and rebates. However, we expect these export charges to have a very small impact on the all-day benchmark ranges for 2025-26, reducing the bottom end of the range by 0.14 c/kWh.

This chapter explains the export charges in each network region, the impact of the export tariffs, and how we propose to incorporate these export charges and rebates into our all-day and time-of-day benchmark ranges.

5.1 Export network tariffs in NSW

Each network provider sets their own network tariffs, which approval by the Australian Energy Regulator (AER). Table 5.1 shows the draft network export tariffs for 2025-26 proposed by the network providers in NSW for the AER's approval by 30 April 2025.

It is important to note that each network has a 'basic export level' which is a threshold up to which customers can export to the network with no charge.

Table 5.1 Indicative 2025-26 network charges and rebates for solar tariffs for each network in NSW (in 2023-24 dollars)

Network	Tariff name	Export charge (c/kWh)	Export charge time	Export rebate (c/kWh)	Export rebate time	Basic export level
Ausgrid	Small customer export tariff	1.23	10 am to 3 pm	2.46	4 pm to 9 pm	6.85 kWh per day
Endeavour Energy	Prosumer	1.80	10 am to 2 pm	11.33 – high season 3.36 – low season	4 pm to 8 pm	8 kWh per day
Essential Energy	Residential ToU Sun Soaker	0.74	10 am to 3 pm	11.09	5 pm to 8 pm	7.5 kWh per day

Notes: Export charges and rebates have been rounded to 2 decimal places.
Indicative charges and rebates are in 2023-24 real dollars. Final prices must be submitted by the network providers to the AER by 31 March, which we will include in our Final Report in May 2025.
The basic export level has been converted to kWh per day, whereas the network providers may report this as a threshold per month or per quarter.
Endeavour Energy reports an export rebate for the high season peak period which covers November, December, January, February, March and June, July and August. The remaining months (September, October, April and May) are in the low season peak period and have a lower rebate.
Source: Ausgrid, *Ausgrid Indicative Network prices 2026-29*, p 1; Endeavour Energy, *Endeavour Energy; Indicative Price Schedule*, p 1; Essential Energy, *Essential Energy – 904 Indicative NUOS including Metering Price Schedule – Nov 2023 – Public*.

The network providers also have different assignment policies for moving NSW customers onto export tariffs. As set out in Table 5.2 below, Ausgrid will apply export tariffs to all exporting customers with smart meters from 1 July 2025, and customers are not able to opt-out.[25] Almost all of its exporting customers (323,474 customers) are expected to be assigned a network export tariff in the 2025-26 financial year.[26]

The network export tariffs will apply to a much smaller proportion of solar customers in the Endeavour Energy and Essential Energy networks. This is because in 2025-26, these network providers will only apply export tariffs to new and upgrading solar customers, and existing solar customers that opt in. In addition, customers can opt out of this network tariff.

Essential Energy has estimated that around 16% of exporting customers will be on its solar export tariff in 2025-26.[27] Endeavour Energy has not provided a forecast of uptake in 2025-26, but it forecasts that 14,443 small low voltage customers (which we estimate is less than 5% of solar customers) are on its export tariff in 2024-25.

Table 5.2 Assignment policies for export tariffs for each network in NSW

Network provider	Network tariff assignment policy for export tariffs
Ausgrid	• From 1 July 2025, all small customers with export capability will be assigned to the small customer export tariff (as a secondary tariff). They will not be able to opt out of this tariff.
Essential Energy	• From 1 July 2025 export pricing begins for new Essential Energy solar customers, and existing customers who have opted in to export charges. • Between From 1 July 2026 and 1 July 2028, all small customers who can export to the grid will be moved to an export tariff. • All customers can opt-out of the network charges until 1 July 2028.
Endeavour Energy	• From 1 July 2025, new and upgrading Endeavour Energy customers will be moved onto the export tariff but are able to opt-out if they choose. Existing customers can opt in. • Opt-out provision to be removed in 2029-2034 period.

Source: Ausgrid, *Revised proposal – Att. 8.1 Tariff Structure Statement Compliance Document*, November 2024, p 15; Endeavour Energy, *Tariff Structure Explanatory Statement 2024-29 regulatory control period*, November 2023, p 5; Essential Energy, *Electricity pricing and network tariffs*, accessed 30 January 2025.

5.2 Draft decisions on incorporating network charges for solar exports into our all-day benchmark range

If a retailer has an exporting customer that is subject to the network export tariffs, then the retailer is required to pay the network charges, and they will receive rebates for that customer.

For the all-day benchmark range, our draft methodology calculates the net impact of the network tariffs for each network. This is based on our random sample of 2,000 customers' 30-minute solar export profiles across the previous financial year.[m]

To calculate the average cents-per-kWh impact of export tariffs across all export tariff customers, we first calculate the net impact (in dollars) for each customer in our sample. This is the customer's total rebates minus their total charges over the year. We then sum the combined net impact (in dollars) for all customers in our sample. Likewise, we add up the combined total exports (kWh) for all customers in our sample. To produce a c/kWh estimate of the net impact for all export tariff customers, we divide the total net impact ($) by the total exports (kWh) and multiply the result by 100 (to convert from dollars to cents).

Based on our sample export data from 2023-24 (which is the latest year of data we have available), and Ausgrid's forward estimates of export charges and rebates for 2025-26, we have calculated the average impact per customer in our sample would be around $3.50 over the year for Ausgrid customers in 2025-26, or **negative 0.14 c/kWh.** As discussed above, almost all solar customers in the Ausgrid network will be on an export tariff in 2025-26 and won't be able to opt out. In Appendix C we have calculated the annual expected impact by solar panel size.

For solar customers in the Endeavour Energy and Essential Energy distribution networks, the net impact of the network tariffs for most customers will be **0 c/kWh**. This is because most solar customers in the Endeavour Energy and Essential Energy networks will not be on an export tariff, and customers can opt out.

Because the differences in these average impacts between networks are very minor, our draft decision is to set a single all-day benchmark range for all NSW customers (that is, a single range that applies to all 3 networks). To ensure our benchmark accounts for the different impact of export tariffs in Ausgrid's network compared to Endeavour Energy and Essential Energy's networks, we will:

1. adjust the minimum of the range downwards by Ausgrid's net impact of -0.14 c/kWh
2. leave the maximum of the range unadjusted (or effectively adjust it by 0 c/kWh).

Table 5.3 below shows the impact on the draft benchmark range for 2025-26.

m We assume these samples are representative of all small solar customers in the network provider.

Table 5.3 Draft impact of export tariffs on the all-day benchmark range (c/kWh)

	Benchmark range excluding network costs (c/kWh)	Net impact of solar export tariffs (c/kWh)	Benchmark range including network costs (c/kWh)
Minimum	5.089	-0.14 c/kWh	4.949
Maximum	7.378	0 c/kWh	7.378

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5. Our all-day benchmark range for 2025-26 will incorporate network export tariffs by reducing the minimum of the benchmark range by the estimated net impact on Ausgrid customers. The maximum of the range will not be adjusted to account for network export tariffs because there will be no impact for many customers (particularly in the Endeavour and Essential networks).

5.3 Draft decisions on incorporating network charges for solar exports into our time-dependent benchmark ranges

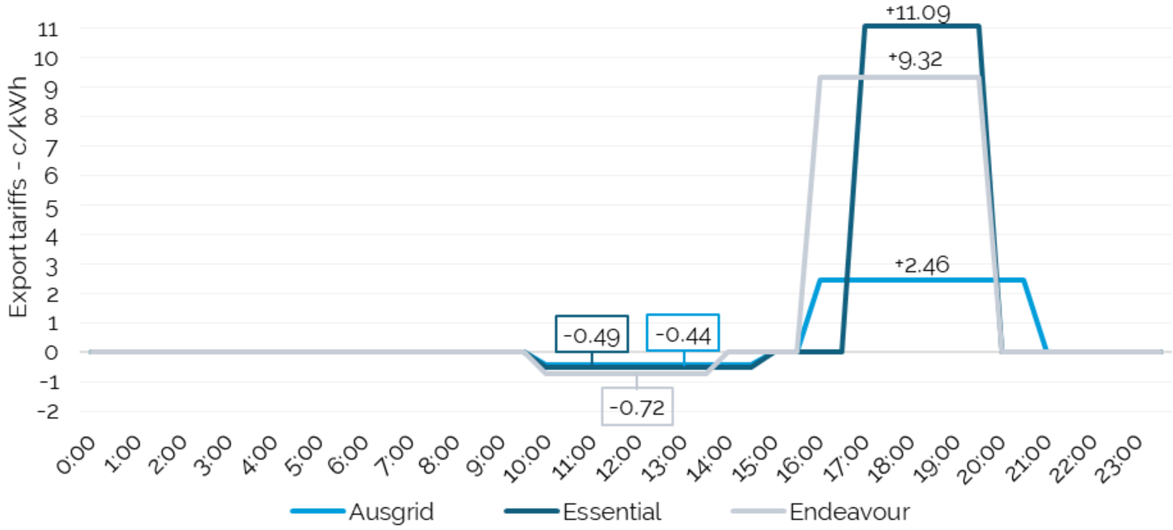
As shown in Figure 5.1, there are large differences in the unit value of the rebates being offered in each distribution network in NSW. For example, rebates that customers can receive in the evening vary widely, ranging from 2.46 to 11.09 c/kWh.

Because only a very small proportion of exports occur during evening hours, the difference in the overall net impact of the tariffs when averaged across all exports is very similar between networks. However, these impacts are not averaged out when we focus on certain times across the day. As a result, our draft decision is to set different time-dependent benchmark ranges for each network to ensure that each benchmark range reflects the rebates of that network.

For each network, our draft decision is to set time-dependent benchmark ranges that align with the network's solar export charge and rebate times.[n]

[n] For previous benchmarks, the time blocks we used were based on the level of wholesale price variation observed throughout the day, aiming to minimise price variation within each block. Typically, very little price variation occurs overnight and during the early hours. As a result, we set a single price from 8 pm to 6 am and another between 6 am and 3 pm. On the other hand, we set more dynamic prices hourly from 3 pm to 8 pm because wholesale prices vary a lot during the evening.

Figure 5.1 Average network tariffs for solar exports by time of day for solar exporting customers, 2025-26 (c/kWh)



Note: The average export charges during the day are based on all exports that occur during these hours, including exports that are below each network's free threshold. As a result, these reported average export charges are less than each network's reported charge rates (in c/kWh).
Source: Ausgrid, *Ausgrid Indicative Network prices 2026-29*, p 1; Endeavour Energy, *Endeavour Energy: Indicative Price Schedule*, p 1; Essential Energy, *Essential Energy – 904 Indicative NUOS including Metering Price Schedule – Nov 2023 – Public*.

Under our proposed approach, we would adjust the time-dependent benchmark ranges as shown in the table below. This increases the evening benchmark by the average rebate (in c/kWh) and decreases the daytime benchmark by the average charge (in c/kWh). There is no impact on benchmark ranges during other time blocks.

Table 5.4 Impact of export tariffs on the time-of-use benchmark ranges

Network	Time window	Benchmark range (c/kWh)	Net impact of export tariff/rebate (c/kWh)	New benchmark range (c/kWh)
Ausgrid	10 am to 3 pm	5.3 to 5.9	-0.44	4.9 to 5.5
	3 to 4 pm	9.1 to 12.6	-	9.1 to 12.6
	4 to 9 pm	11.5 to 16.8	+2.46	14 to 19.3
	9 pm to 10 am	5.1 to 6.2	-	5.1 to 6.2
Endeavour	10 am to 2 pm	4 to 6.1	-0.72	3.3 to 5.4
	2 to 4 pm	9.2 to 12.3	-	9.2 to 12.3
	4 to 8 pm	11.6 to 17.3	+9.32	20.9 to 26.6
	8 pm to 10 am	4.8 to 6.4	-	4.8 to 6.4
Essential	10 am to 3 pm	5.6 to 5.8	-0.49	5.1 to 5.3
	3 to 5 pm	9.9 to 12.6	-	9.9 to 12.6
	5 to 8 pm	15.4 to 25.7	+11.09	26.5 to 36.7
	8 pm to 10 am	6 to 6.1	-	6 to 6.1

Source: IPART analysis of sample solar export data provided by the network providers, 2023-24; Indicative export charges and rebates for 2026-27.

A Terms of Reference

The investigation and determination by IPART of an annual benchmark range for feed-in tariffs for financial years 2024-25, 2025-26 and 2026-27

Reference to IPART under section 9 of the *Independent Pricing and Regulatory Tribunal Act 1992*

With the approval of the Hon. Christopher Minns MP, Premier of NSW and Minister administering the *Independent Pricing and Regulatory Tribunal Act 1992* (IPART Act), pursuant to section 9(2) of the IPART Act, the Independent Pricing and Regulatory Tribunal (IPART) will enter into arrangements with the Office of Energy and Climate Change (OECC) to investigate and determine:

- the voluntary benchmark range for solar feed-in tariffs paid by retailers for electricity produced by complying generators and supplied to the distribution network
- time dependent benchmark ranges paid by retailers for electricity produced by complying generators and supplied to the distribution network during different times of the day.

Conduct of investigation
In conducting this investigation, IPART is to consider the following key parameters:

- There should be no resulting increase in retail electricity prices.
- The benchmark range should operate in such a way as to support a competitive retail electricity market in NSW.
- The benchmark range should be fit-for-purpose and consider network charges for solar exports and demand charges, and how retailers reflect these in their tariffs.

In conducting this investigation, IPART may incorporate:

- half-hourly solar export data reflecting customers in all three network areas
- forecast electricity wholesale prices for the financial year of the determination
- any other matter IPART considers relevant.

Reporting
IPART is to:

- report on the standard and time-of-use feed-in tariffs offered by each retailer at the time of writing its report
- note whether that tariff was within the benchmark for the preceding financial year
- provide factsheets that assist consumers to understand feed-in tariffs.

Consultation
In preparing its report on the voluntary benchmark range, IPART may consult on any matter that it regards as material.

Timing
The dates below are set to allow electricity retailers enough time to update their solar feed-in tariff pricing by 1 July each year.

- IPART is to provide its benchmark range determination by 30 June 2024 for financial year 2024-25 and by 30 April in 2025 and 2026 unless the Minister advises IPART of a change to the Terms of Reference by the October prior to the commencement of the next determination.

Signed:

Penny Sharpe ~~MP~~ MLC
Minister for Climate Change, Minister for Energy, Minister for the Environment, Minister for Heritage

Date: 22/9/23

B Stakeholder submissions

In 2024, we released an Information Paper inviting feedback on whether our existing methodology remained appropriate for the 2024-25 feed-in tariff benchmarks. We received 4 submissions: one from Origin Energy (an energy retailer) and 3 from individual stakeholders.

Table B.1 Issues raised in stakeholder submissions and our response

Issues raised in the stakeholder submission	Our response
Origin submitted that our existing methodology was appropriate for determining the 2024-25 benchmarks. However, Origin considered that, the methodology to calculate the solar multiplier could be adjusted.[28] Origin proposed 2 alternate methods for calculating the solar multiplier more accurately. These were: 1. using only the most recent year of data to capture up-to-date market conditions 2. adopting a forward-looking approach and extrapolate the current trend in solar PV penetration for the coming year. The submission noted disadvantages with each approach.[29]	Our draft decision is to remove the solar multiplier from our methodology. We discuss this in Chapter 4.
One submission considered that for each year the solar feed-in tariff benchmark is lowered, it will drive the calculation of the solar multiplier lower the following year. This would result in a feedback loop that is undesirable for renewable generators. This submission also proposed that IPART should consider introducing 2 solar feed-in-tariffs; one tariff for solar exports consumed in the local subnet and another for solar exports feeding into the wider grid. The submission proposed the local feed-in tariff should be set mildly above the cost of generation, while a lower feed-in tariff could be available to consumers who export to the grid.	The reason that the value of solar feed-in tariffs has tended to fall over time is because each year more households install solar panels and export their excess electricity, increasing electricity supply during the day and reducing prices. However, there are still fluctuations in the value of solar exports from year to year. Our benchmark assumes that all solar exports are consumed locally. We increase the value of solar exports to account for this assumption by approximately 5%. As explained in Chapter 3, retailers still incur the full network costs when solar electricity is exported from one house, and consumed by another.
One submission raised the concern that retailers are reducing their solar feed-in tariffs due to excess solar energy being exported during the day, while also charging business customers demand charges when their energy consumption is higher than a certain level during the day.	We note that many retailers have reduced their solar feed-in tariffs due to increasing supply of solar exports during the day. However, solar exports have not necessarily decreased peak demand (which generally occurs in the evenings). Demand charges aim to address this strain by charging customers for their highest level of electricity usage during certain hours – including during the day and evening.
Another submission raised the concern that energy bills are not transparent and higher solar feed-in tariffs may be associated with higher supply service charges. This submission also raised the concern there is a potential exaggeration of the costs associated with the export of solar energy back into the grid.	We analysed whether higher solar feed-in tariffs are associated with higher supply service charges and energy bills for typical customers,[o] and found no reasonable relationship between these factors. The rule change for network export charges came into effect from 1 July 2024. We are incorporating network export charges into our benchmark for 2025-26. We have considered how we can amend our methodology to account for these charges in Chapter 5.

Source: Origin, *Submission to IPART Information Paper*, March 2024, pp 1-2; Name suppressed, *Submission to IPART Information Paper*, March 2024, p 1; Name suppressed, *Submission to IPART Information Paper*, March 2024, p 1; M. Scott, *Submission to IPART Information Paper*, March 2024, p 1.

o See IPART, Solar feed-in benchmark ranges for 2024-25 Final Report, May 2024, pp 19-20.

C Annual impact of the network solar export charges by solar panel size

Using the network providers' 2023-24 sample solar data, we grouped customers by their solar panel capacity (kW) and network to estimate the net impact of these charges.

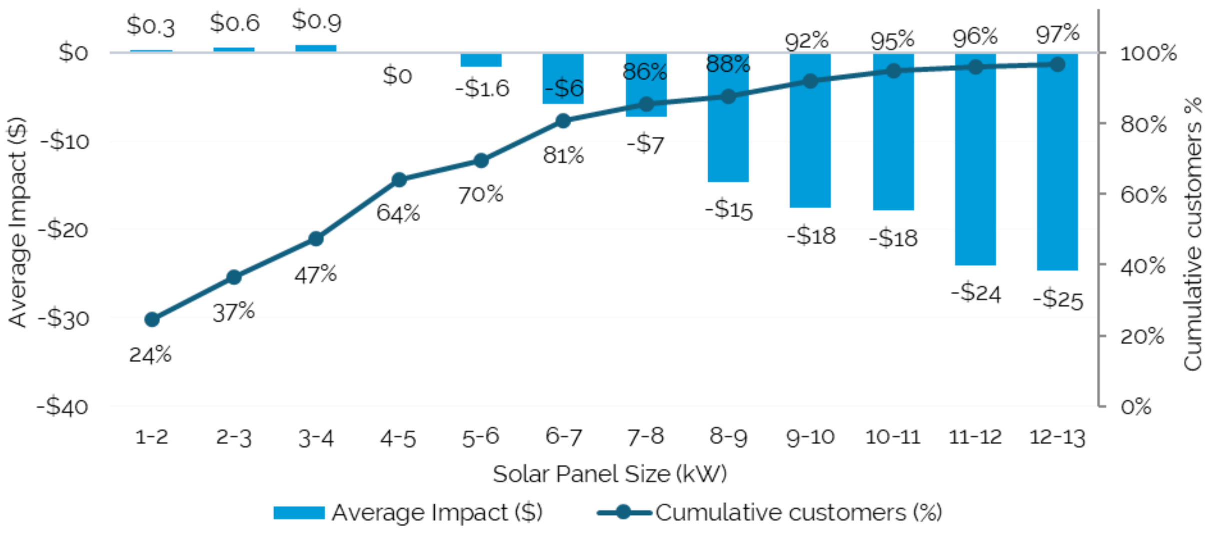
Across all networks, customers with larger solar panels typically have more daytime exports, often exceeding the free export threshold and leading to higher export charges. As a result, their net annual impact tends to be more negative than customers with smaller solar panel systems.

In the Endeavour Energy network, residential customers with solar panels with less than 10 kW capacity can end up with a net positive benefit (see Figure C.3). This is in part due to Endeavour Energy's quarterly-based export threshold. This quarterly mechanism allows customers to balance out high-export months with low-export months, so that even if customers export above the threshold in one month, they can avoid being charged by exporting less in other months. In contrast, Ausgrid and Essential Energy operate monthly export thresholds, so any excess exports in a single month cannot be offset by lower exports in prior or subsequent months.

Consequently, smaller solar customers in the Ausgrid and Essential Energy networks are expected to have a near-neutral net impact over the year. In the Ausgrid network, the average impact for customers with panels smaller than 5 kW (64% of customers) is between $0 and $1 (see Figure C.1), or between -$1.5 and -$26 for Essential Energy customers (see Figure C.2).

In addition, the network providers have estimated that network charges for solar exports could result in minor increases to annual electricity bills for many small exporting customers. However, the exact impact of the export tariff will depend on each individual customer's solar export profile.[p] [30, 31, 32]

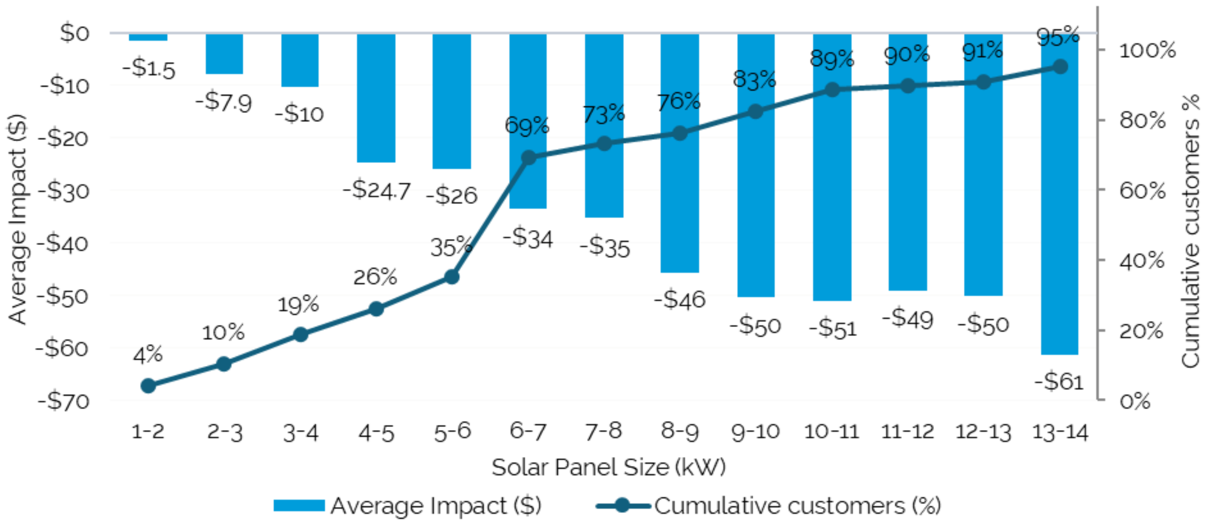
Figure C.1 Ausgrid, average impact of export tariffs on residential customers by solar panel size with cumulative sum of customers (2025-26)



p Depending on the retailer and their billing system this could occur as a result of reduced solar feed-in tariffs (or slightly higher solar feed-in tariffs depending on the time of the export) or through a separate network charge.

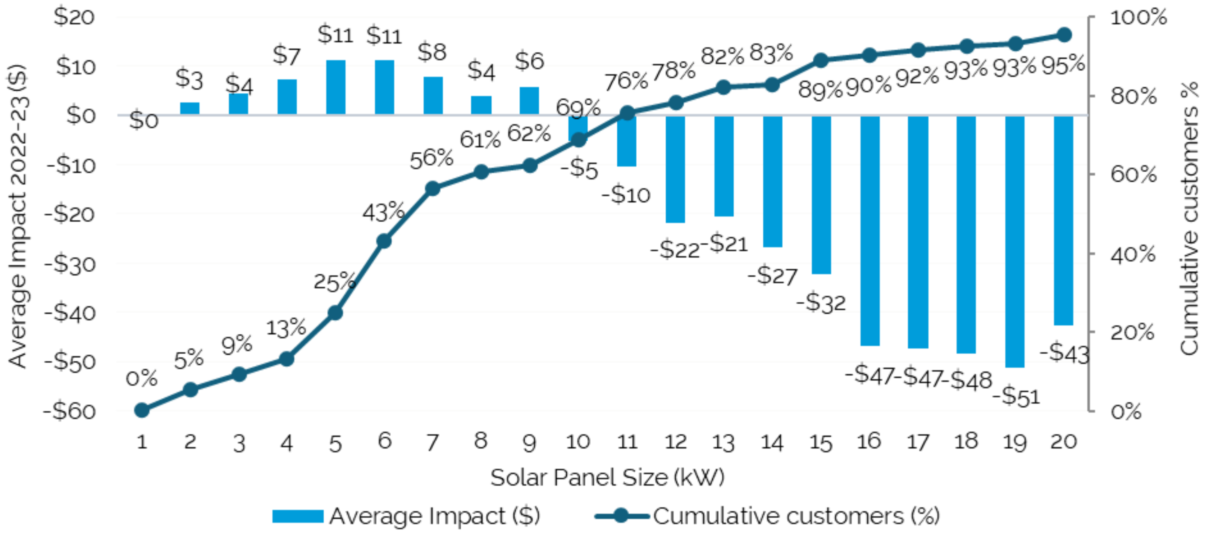
Source: Ausgrid sample dataset for customers in 2023-24. Ausgrid forward-estimates of tariffs for 2025-26.

Figure C.2 Essential Energy, average impact of export tariffs on residential customers by solar panel size with cumulative sum of customers (2025-26)



Source: Essential Energy sample dataset for customers in 2023-24. Essential Energy forward-estimates of tariffs for 2025-26.

Figure C.3 Endeavour Energy, average impact of export tariffs on residential customers by solar panel size with cumulative sum of customers (2025-26)



Source: Endeavour Energy sample dataset for customers in 2022-23. Endeavour Energy forward-estimates of tariffs for 2025-26.

[1] Ausgrid, *Network Price List 2024-25*, 2024, p 2.
[2] Endgame Economics, *Review of the wholesale value of solar exports*, July 2024, p 36.
[3] Canstar Blue, *NSW energy rates explained*, accessed 16 January 2025.
[4] Ausgrid, *Network Price List 2024-25*, 2024, p 2.
[5] G Harris, *G.Harris Submission to IPART Issues Paper*, March 2021.
[6] Name Withheld, *Anonymous Submission to IPART Issues Paper*, March 2021.
[7] D Curtis, *Submission to IPART Issues Paper*, March 2021.
[8] G Harris, *Submission to IPART Issues Paper*, March 2021
[9] Endgame Economics, *Review of the wholesale value of solar exports*, July 2024, p 18.
[10] Name Withheld, *Anonymous submission to IPART Issues Paper*, March 2021
[11] Name Withheld, *Anonymous Submission to IPART Draft Report*, May 2021.
[12] IPART calculation based on: Australian Government Clean Energy Regulator Rec Registry, *Small generation unit STC calculator*, accessed 31 January 2025; and Demand Manager, *Spot Trade Prices*, accessed 31 January 2025.
[13] AEMC, *Residential electricity prices trends 2024*, November 2024, p 37.
[14] Ausgrid, *Understanding Network Tariffs*, accessed 4 November 2024.
[15] AER, *Wholesale electricity market performance report 2024*, December 2024, p 25.
[16] AER, *Wholesale electricity market performance report 2024*, December 2024, p 24.
[17] Endgame Economics, *Review of the wholesale value of solar exports,* July 2024, pp 37, 39.
[18] AEMC, *Spot and contract markets*, accessed 30 January 2025.
[19] Endgame Economics, Review of the wholesale value of solar exports, July 2024, pp 18-19.
[20] Origin Energy, *Origin Submission to IPART Information Paper*, March 2024, pp 1-2.
[21] Endgame Economics, *Review of the wholesale value of solar exports,* July 2024, pp 5, 23.
[22] AEMO, *Quarterly Energy Dynamics Q2 2024*, 2024, p 37.
[23] AEMO, *Quarterly Energy Dynamics Q2 2024*, 2024, p 38.
[24] IPART, *Energy Market Monitoring Report 2023-24*, p 146.
[25] Ausgrid, *Tariff Structure Statement Compliance Document*, November 2023, pp 32, 40.
[26] Ausgrid, *Attachment 8.9: Demand, consumption and customer number forecasts*, November 2023, p 2.
[27] Essential Energy, *Essential Energy 2024-29 Revised Tariff Structure Statement*, November 2023, p 33.
[28] Origin Energy, *Origin Submission to IPART Information Paper*, March 2024, pp 1-2.
[29] Origin Energy, *Origin Submission to IPART Information Paper*, March 2024, p 1.
[30] Ausgrid, *Two-way pricing for grid exports*, p 2.
[31] Endeavour Energy, *Tariff Structure Statement 2024-29 Regulatory Control Period*, January 2023, p 43.
[32] Essential Energy, *TSS Explanatory Statement*, April 2024, pp 53-54.

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