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Australian Energy Market Commission

**FINAL REPORT**

**RESIDENTIAL ELECTRICITY PRICE  
TRENDS 2021**

25 NOVEMBER 2021

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**REVIEW**

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## ABOUT THE AEMC

The AEMC reports to the Energy Ministers' Meeting (formerly the Council of Australian Governments Energy Council). We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the Energy Ministers' Meeting.

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## NOTE ON THIS YEAR'S REPORT

- 1 The purpose of the 2021 residential electricity price trends report is to provide governments and consumers with an understanding of:
  - the cost components of the electricity supply chain that contribute to the overall price paid by residential consumers
  - the expected trends in each of the cost components and overall prices over the period from 2020-21 to 2023-24.
- 2 This then indicates which components are expected to be the most important drivers of price changes. The prices presented in this report are specific to the “representative consumer” and do not reflect the pricing outcomes for all residential consumers. The representative consumer is different for each jurisdiction and is determined using a representative annual consumption level either calculated from benchmark values provided by the Australian Energy Regulator (AER) or provided to the Australian Energy Market Commission (AEMC) by state and territory governments or regulators.
- 3 This report does not include the Northern Territory in the analysis. In previous years, the AEMC used Territory Generation’s bundled wholesale load following price provided by the Department of Treasury and Finance (DTF) to perform the analysis. This price is no longer an accurate representation of wholesale costs in the DKIS due to the entry of independent generators to the Darwin-Katherine Interconnected System (DKIS). As such, publishing this price information would be misleading of wholesale electricity prices and could undermine the integrity of future data reporting and analysis. Currently all commercial transactions in the Northern Territory’s electricity market occur through bilateral contracts between generators and retailers, and information related to these contracts is commercial in confidence. The DTF has informed the AEMC that there does not appear to be any price that can be used for publication without the risk of providing misleading information around the movement of wholesale prices in the DKIS or revealing information that could be detrimental to competition.
- 4 This report does not include analysis on Western Australia’s electricity prices. Western Australian residential electricity prices are set by the State Government as part of the annual State Budget process. The Western Australian Minister for Energy has advised that the Western Australian Government considers a broad range of factors in determining household electricity prices, including the impacts on electricity consumers.
- 5 This report does not provide and should not be regarded as providing forecasts of future prices including those which are set by jurisdictional regulations or governments. The prices and trends in the report are based on:
  - modelling of wholesale costs using available information up until October 2021
  - network cost information that was publicly available up until October 2021. Regulated network costs may vary because of AER decisions on contingent project applications.
- 6 It is important to note that the results are limited by the data used and the underlying assumptions made in determining costs, prices and trends. Information on prices in future

years may differ from estimated outcomes as they are sensitive to uncertainties and changes in the factors that drive prices across the electricity supply chain. These include changes in:

- representative energy consumption by consumers across states and territories
- network costs following the finalisation of revenue determinations which remain the subject of ongoing regulatory or legal processes
- government policies, such as those related to jurisdictional environmental policy schemes
- jurisdictions reviewing their approaches to retail price deregulation for the setting of regulated prices
- wholesale cost drivers, including commodity prices and the timing of new build generation entering the market.

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# 1 INTRODUCTION

This is the twelfth annual residential electricity price trends report prepared by the Australian Energy Market Commission (AEMC) at the request of Energy Ministers.<sup>1</sup>

The 2021 residential electricity price trends report (2021 report) identifies changes in the energy supply chain cost components that are driving residential electricity prices and bills for each Australian state and territory (excluding the Northern Territory<sup>2</sup> and Western Australia<sup>3</sup>), and nationally, from 2020-21 to 2023-24 (the reporting period). By focusing on trends in the cost drivers of prices and bills, the report helps to focus attention on key sectoral issues.

Residential electricity bills are calculated by multiplying the consumption of the representative consumer in each jurisdiction by the price they pay for electricity. The representative consumer's consumption is either based on the most common consumption profile of consumers in each jurisdiction, or a quantity provided by the jurisdictional government. The prices used for each jurisdiction are the average of the lowest representative offer from each retailer, weighted by market share. National results are then determined by weighting the jurisdictional price and bill outcomes by the number of consumers in each state or territory. It is important to note that prices include both variable and fixed charges and are expressed in nominal terms.

Given this methodology, it is important to recognise that the pricing and billing outcomes do not constitute specific pricing and billing forecasts, and that the results may not reflect the actual prices and bills that consumers pay. Actual price movements will be influenced by how retailers compete, the dynamics of the wholesale spot and contract markets, the outcome of network regulatory decisions, and changes in policy and legislation. However, the results do reflect movements in the underlying costs of service provision and are a guide to pricing and bill directions based on current expectations, policy and legislation.

We also provide a comparison of expected trends from past reports with the actual historical trends, together with the major factors that caused them to diverge.

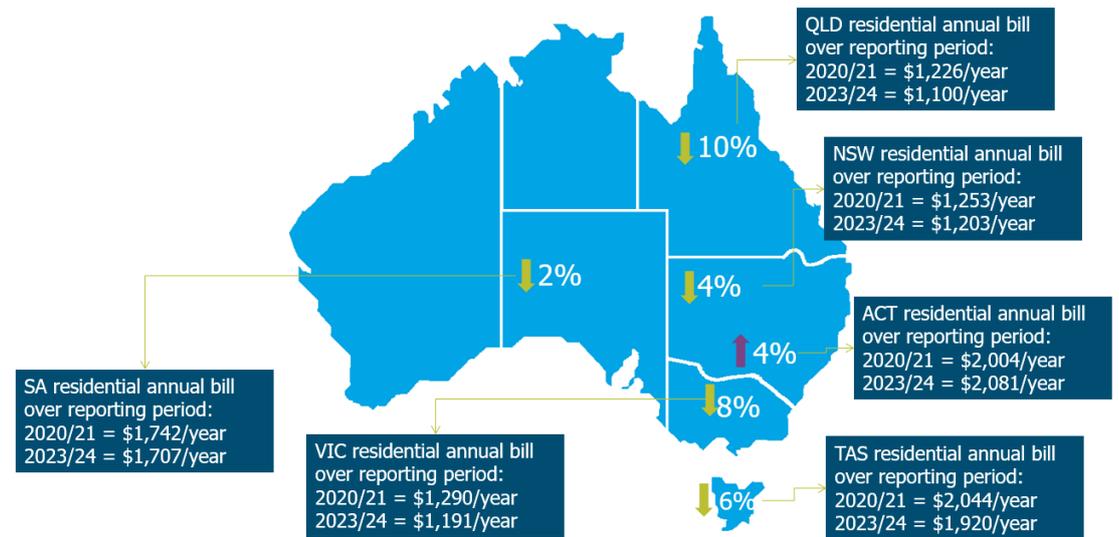
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1 A copy of the terms of reference is available in the AEMC website.

2 Northern Territory is not included in the 2021 report — See the notes at the start of the report for further details.

3 Western Australia is not included in the 2021 report — See the notes at the start of the report for further details.

**Figure 1.1: Trends in annual residential bills by jurisdiction over 3-year period**



Source: AEMC analysis

## 2 RESULTS

### 2.1 Trends in national electricity prices and bills over 3 year period

On a national basis, residential electricity prices and bills are expected to decrease over the forecast period to 2023-24. Overall prices fall despite increasing in 2022-23. This trend is primarily driven by wholesale costs reducing in most of the states and territories in the first year before increasing in the second reporting year following the closure of Liddell power station in New South Wales (Figure 2.1) and Torrens Island A1 and A3 and Osborne in South Australia.

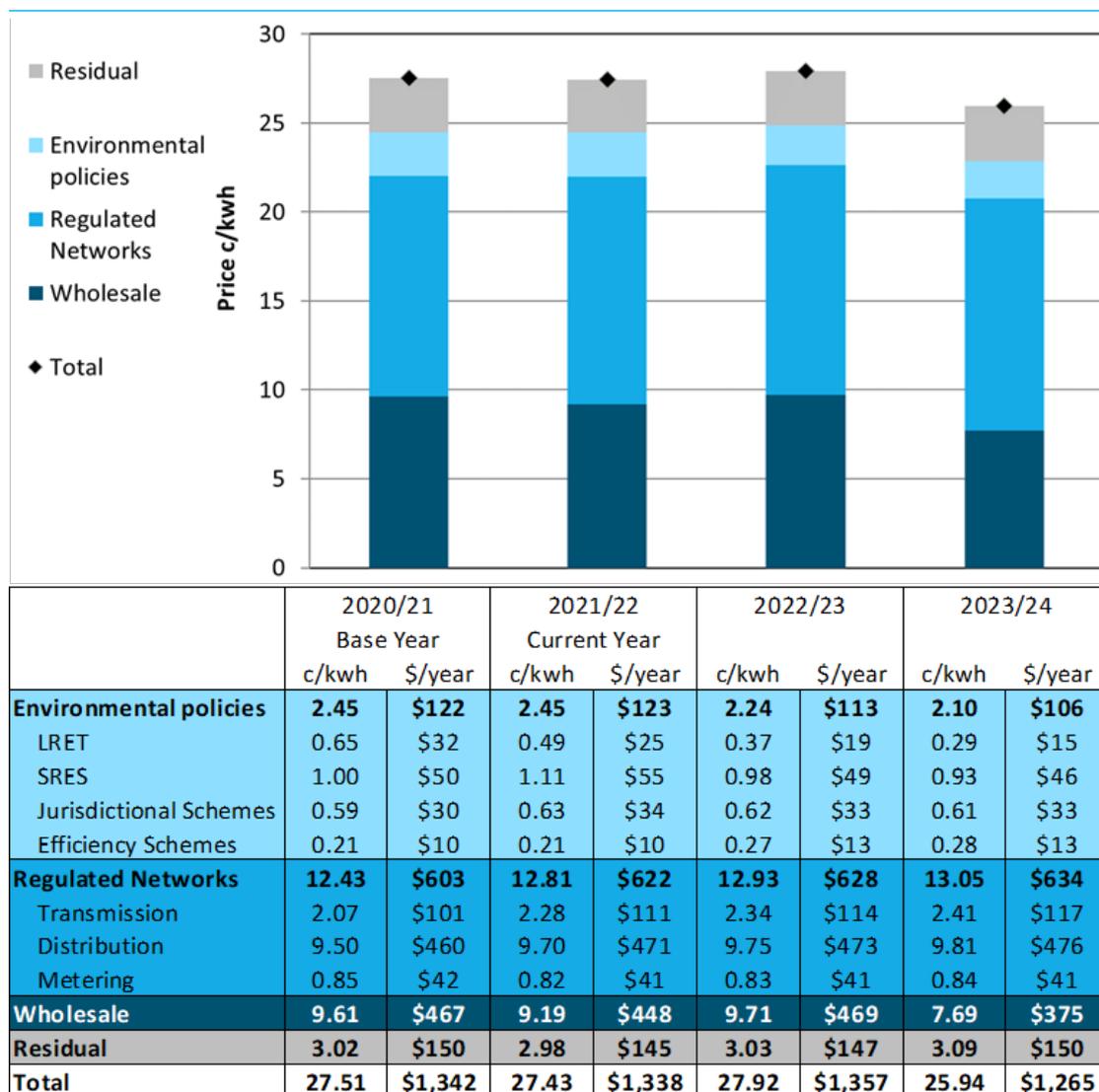
Prices fall over the whole reporting period as new capacity enters the system. This capacity comprises both renewable generation in the form of utility scale wind and solar and dispatchable power in the form of large scale batteries and gas fired generation. The Snowy 2.0 scheme is forecast to come online outside the timeframe for this year's price trends report.

Total capacity of committed projects includes 2,671 MW of solar and 1,393 MW of wind. In addition, 904 MW of gas fired capacity and 470 MW of large scale battery is committed across the NEM. This new capacity has a bearing on most jurisdictions with New South Wales adding 2,287 MW, Queensland adding 1,557 MW, Victoria adding 1,354 MW and South Australia adding 240 MW. The AEMC has modelled total capacity of new investments based on finding an optimal mix of generation which meets power system needs at lowest cost to consumers.

There are decreases in contract prices in 2020-21, with increases seen for 2021-22 and easing of prices once again in all states in 2022-23 and 2023-24. (Figure 2.2).

Increases in gas prices since last year's report are a contributor to higher wholesale prices in the 2022-23 period (Figure 2.3).

**Figure 2.1: Trends in national supply chain components**



Source: AEMC analysis

Note: The figure does not include Northern Territory and Western Australia — See the notes at the start of the report for further details. All figures are exclusive of GST.

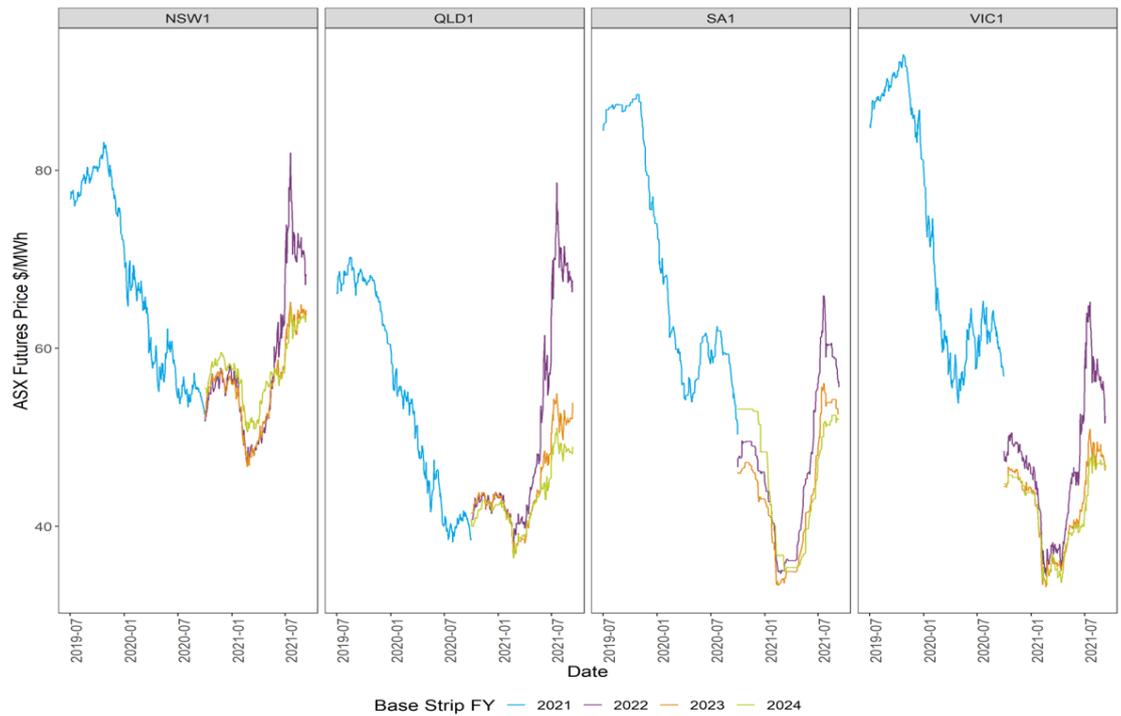
Annual residential bills (weighted by customer numbers) are expected to decrease by 5.7 percent (or \$77) over the whole reporting period. The following supply chain components for national annual residential bills are observed in Figure 2.1:

- Wholesale costs are expected to go down by 19.7 per cent (or \$92) over the reporting period, contributing -6.9 percentage points. Over the full price trends timeframe this is driven by the influx of new generation (Figure 2.3). Increases in the 2022-23 year over the 2021-2022 year are driven in part by increases in gas prices and the retirement of Liddell in New South Wales, TIPS A1 and A3 and Osborne in South Australia. The

increase in wholesale prices in 2022 is also observed in ASX contract price trends in Figure 2.2,

- In relation to gas prices, it should be noted that LNG netback prices have been trading at record levels in recent periods, as shown in Figure 2.3. The gas price assumption used by the AEMC in the preparation of the price trends report, shown in Table 2.1, is taken from the 2021 AEMO ESOO. This annual gas price assumption is at a level below the current levels of the ACCC LNG netback benchmark published for the east coast of Australia for 2022. Domestic spot gas prices on the east coast have not yet approached the recent levels seen in the ACCC LNG netback series. Furthermore, the contract market forward curve, utilised in the preparation of the price trends report, does not appear to reflect these high prices being translated into domestic spot gas markets over the longer term. However, actual gas prices over the price trends reporting period may differ to those assumed in the modelling.
- Regulated network costs are expected to increase by 5.2 per cent (or \$31) over the reporting period contributing 2.3 percentage points. This is driven by increases in distribution and transmission costs.
- Environmental costs are expected to go down by 13.2 per cent (or \$16) over the reporting period contributing -1.2 percentage points. This is driven by a decrease in Large-scale Renewable Energy Target (LRET) costs stemming from a reduction in the cost of large scale generation certificates (LGCs).
- The residual cost component, which explains remaining variations in annual residential bills is unchanged.

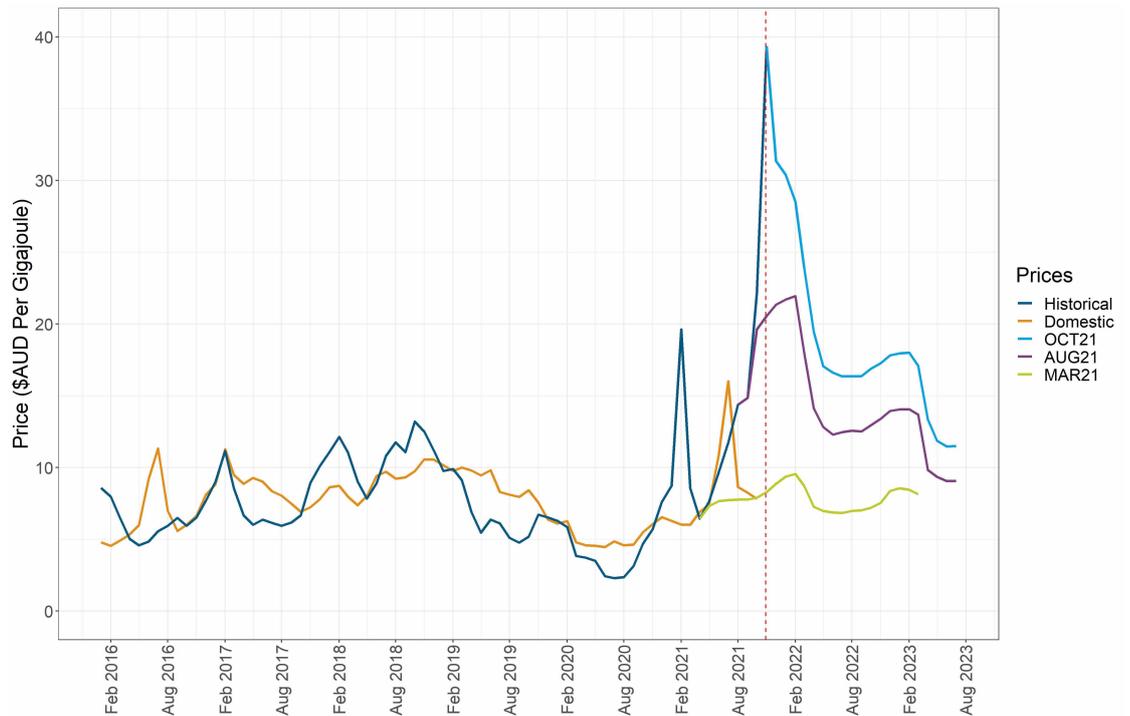
**Figure 2.2: Contract prices are increasing in 2022**



Source: AEMC analysis of ASX data

Note: The contracts for 2023 and 2024 have relatively low liquidity, i.e. there are few trades on which these prices are based.

**Figure 2.3: ACCC LNG netback benchmark and domestic gas spot prices**



Source: AEMC analysis of ACCC data

Note: Domestic gas prices are STTM unweighted average prices from Sydney, Brisbane and Adelaide. The forward netback prices are latest as at 29th October 2021.

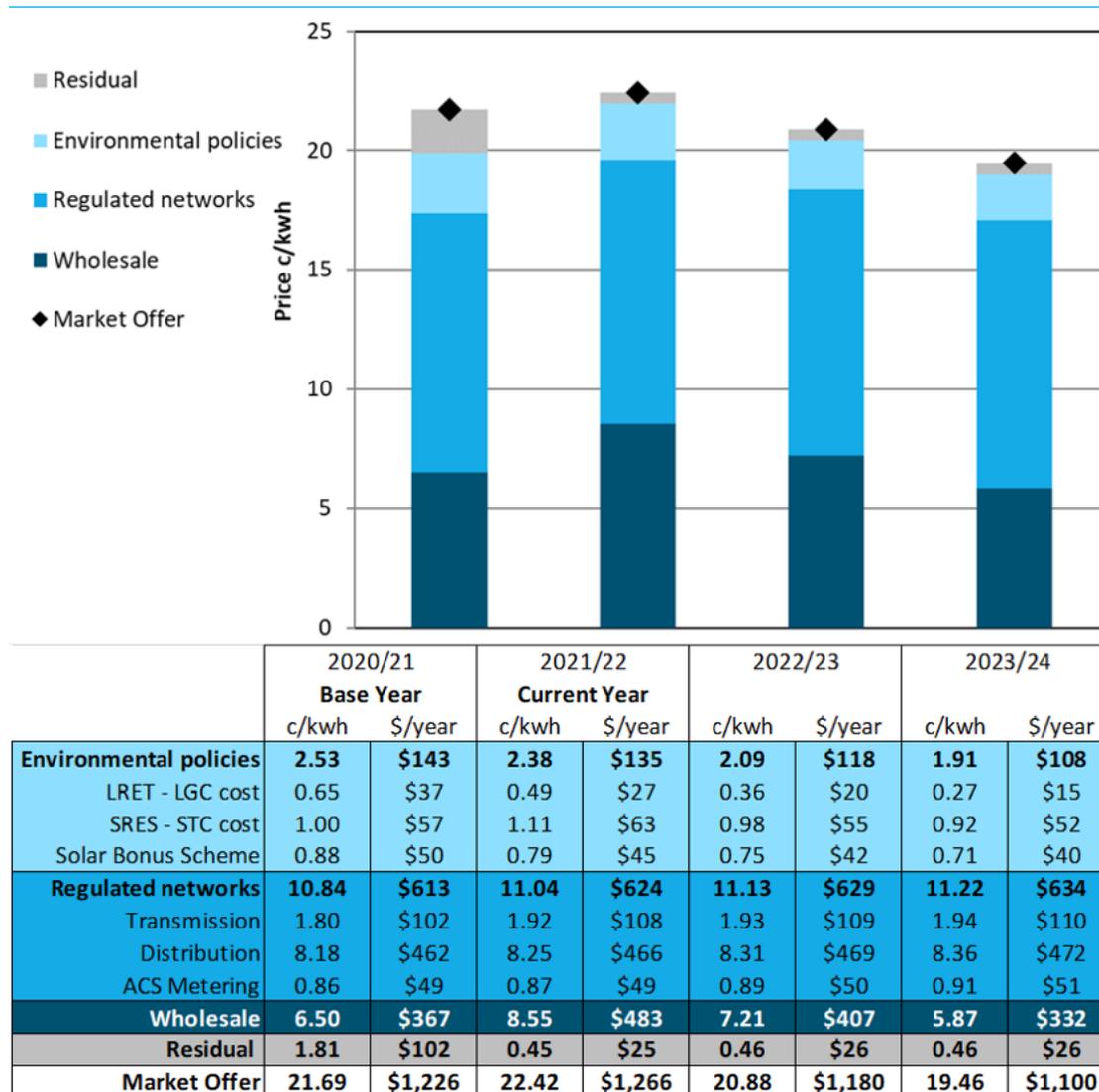
**Table 2.1: Annual gas price assumptions utilised in modelling**

	<b>GAS PRICES (\$/GJ) — ESOO 2020</b>	<b>GAS PRICES (\$/GJ) — ESOO 2021</b>
2020-21	9.52	10.23
2021-22	9.05 (5.0% decrease)	10.91 (6.7% increase)
2022-23	9.56 (5.7% increase)	10.99 (0.7% increase)
2023-24	9.70 (1.4% increase)	11.09 (0.8% increase)

Source: AEMO ES00 2020 and AEMO ES00 2021

## 2.2 Trends in SE QLD supply chain components

**Figure 2.4:** Trends in SE QLD supply chain components



Source: AEMC analysis

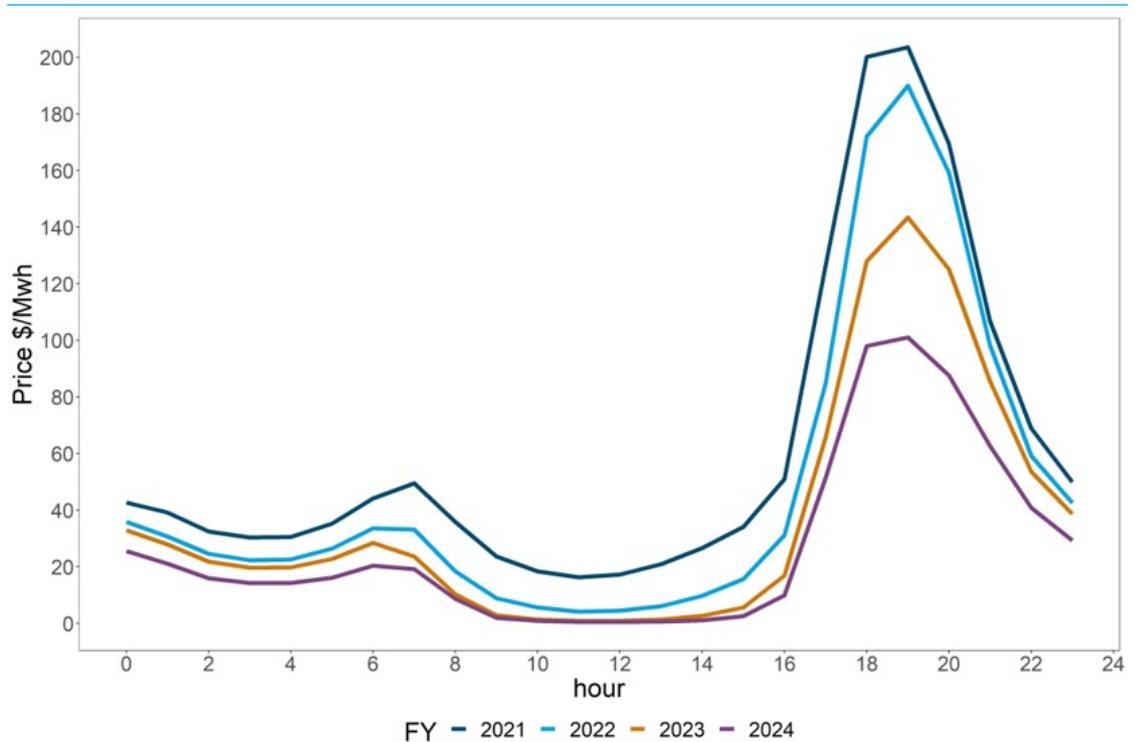
Note: All figures are exclusive of GST

Annual residential bills for South East Queensland are expected to decrease by 10.3 per cent (or \$126) over the whole reporting period. The following supply chain components for South East Queensland’s annual residential bill are observed in Figure 2.4:

- Wholesale costs are expected to go down by 9.7 per cent (or \$36) over the reporting period contributing -2.9 percentage points.

- Regulated network costs are expected to increase by 3.4 per cent (or \$21) over the reporting period contributing 1.7 percentage points. This is driven by increases in transmission and distribution costs.
- Environmental costs are expected to decrease by 24.7 per cent (or \$35) over the reporting period contributing -2.9 percentage points.
- The residual cost component explains the remaining variations in the annual residential bill, contributing -6.2 percentage points.

**Figure 2.5: Average wholesale electricity prices by hour of the day in QLD**

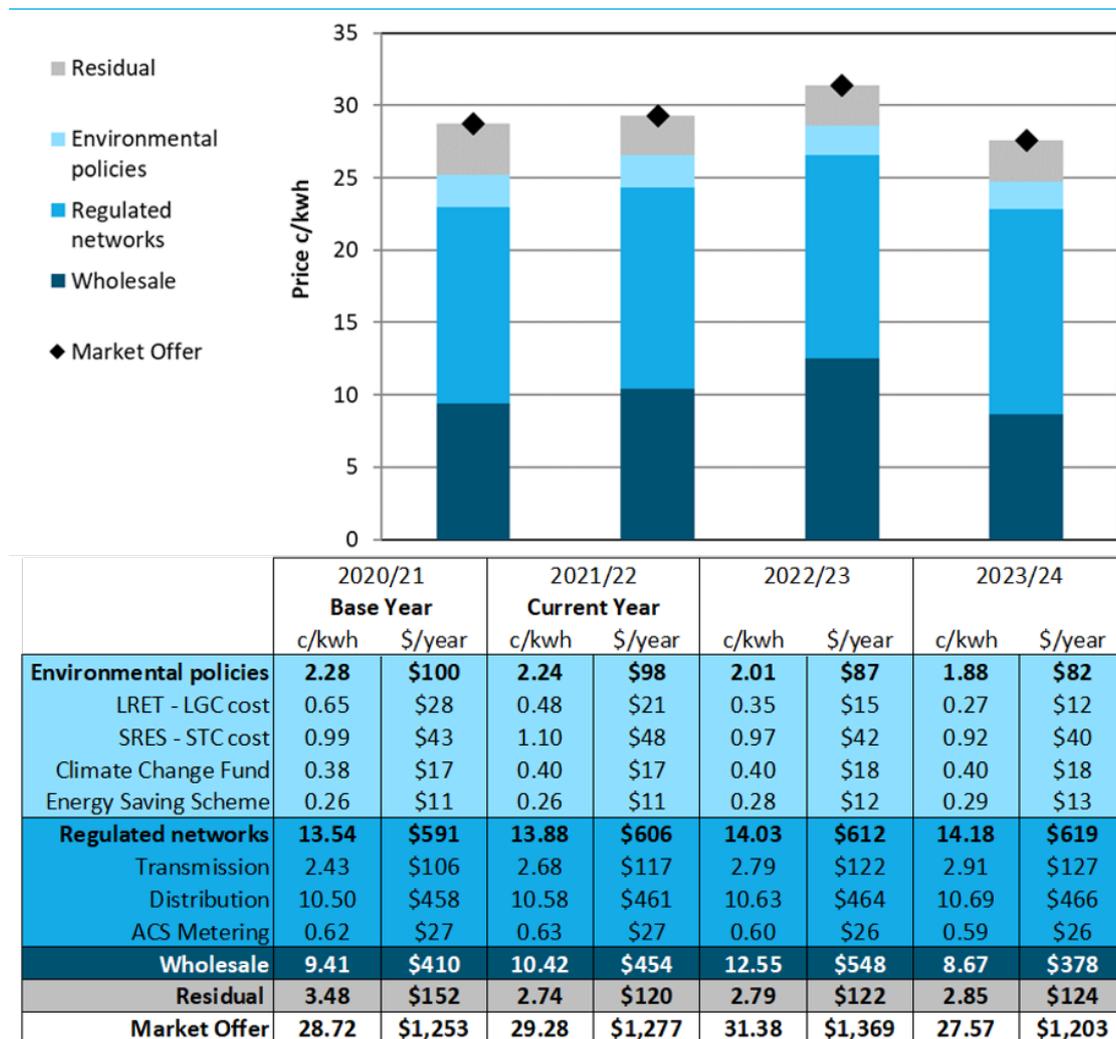


Source: AEMC analysis

Note: Total committed generation is only that category of generation sourced from AEMO that has reached financial close before the modelling was undertaken. Other new capacity may have been included as new generation within the modelling period. Since the modelling was undertaken, additional projects have been committed to across the NEM which would impact these results.

## 2.3 Trends in NSW supply chain components

**Figure 2.6:** Trends in NSW supply chain components



Source: AEMC analysis

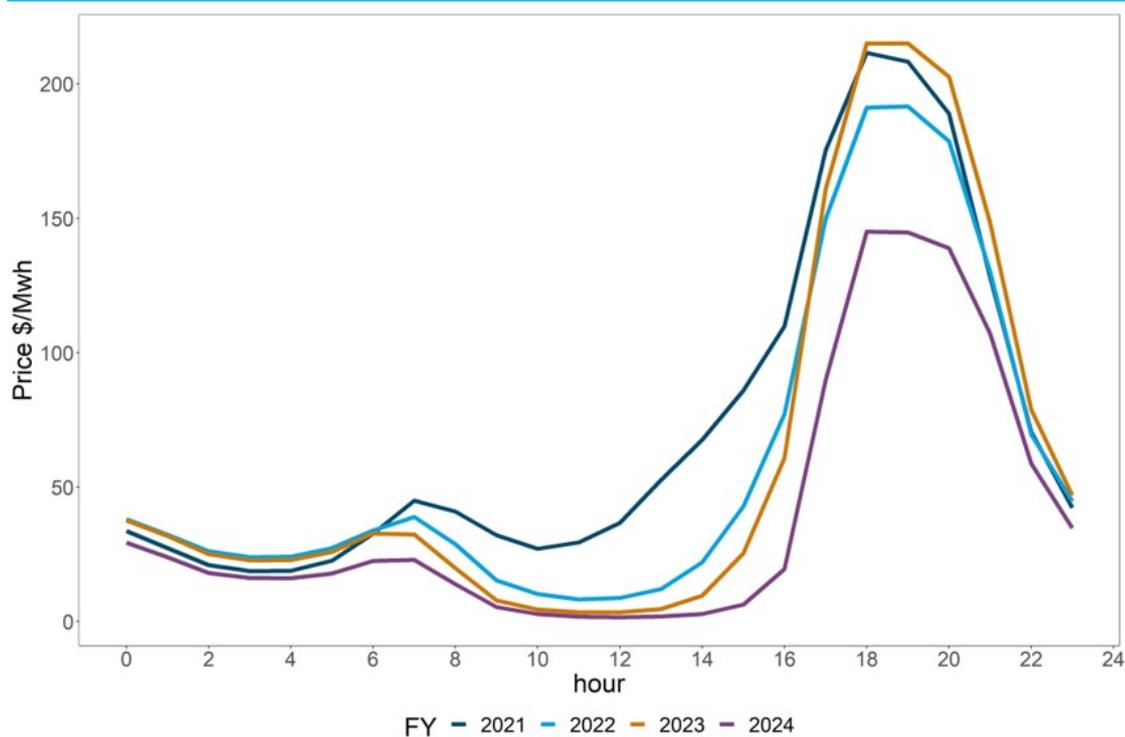
Note: All figures are exclusive of GST

Annual residential bills in New South Wales are expected to decrease by 4.0 per cent (or \$50) over the whole reporting period. The following supply chain components for New South Wales' annual residential bill are observed in Figure 2.6:

- Wholesale costs are expected to go down by 7.9 per cent (or \$32) over the reporting period contributing -2.6 percentage points. This is driven by the addition of new wind and solar capacity as well as gas fired capacity in 2024 (Figure 2.7).
- Regulated network costs are expected to increase by 4.7 per cent (or \$28) over the reporting period contributing 2.2 percentage points. This is driven by an increase in transmission cost.

- Environmental costs are expected to go down by 17.8 per cent (or \$18) over the reporting period contributing -1.4 percentage points. This is driven by a decrease in LRET costs stemming from a reduction in the cost of LGCs.
- The residual cost component explains the remaining variations in the annual residential bill, contributing -2.2 percentage points.

**Figure 2.7: Average wholesale electricity prices by hour of the day in NSW**

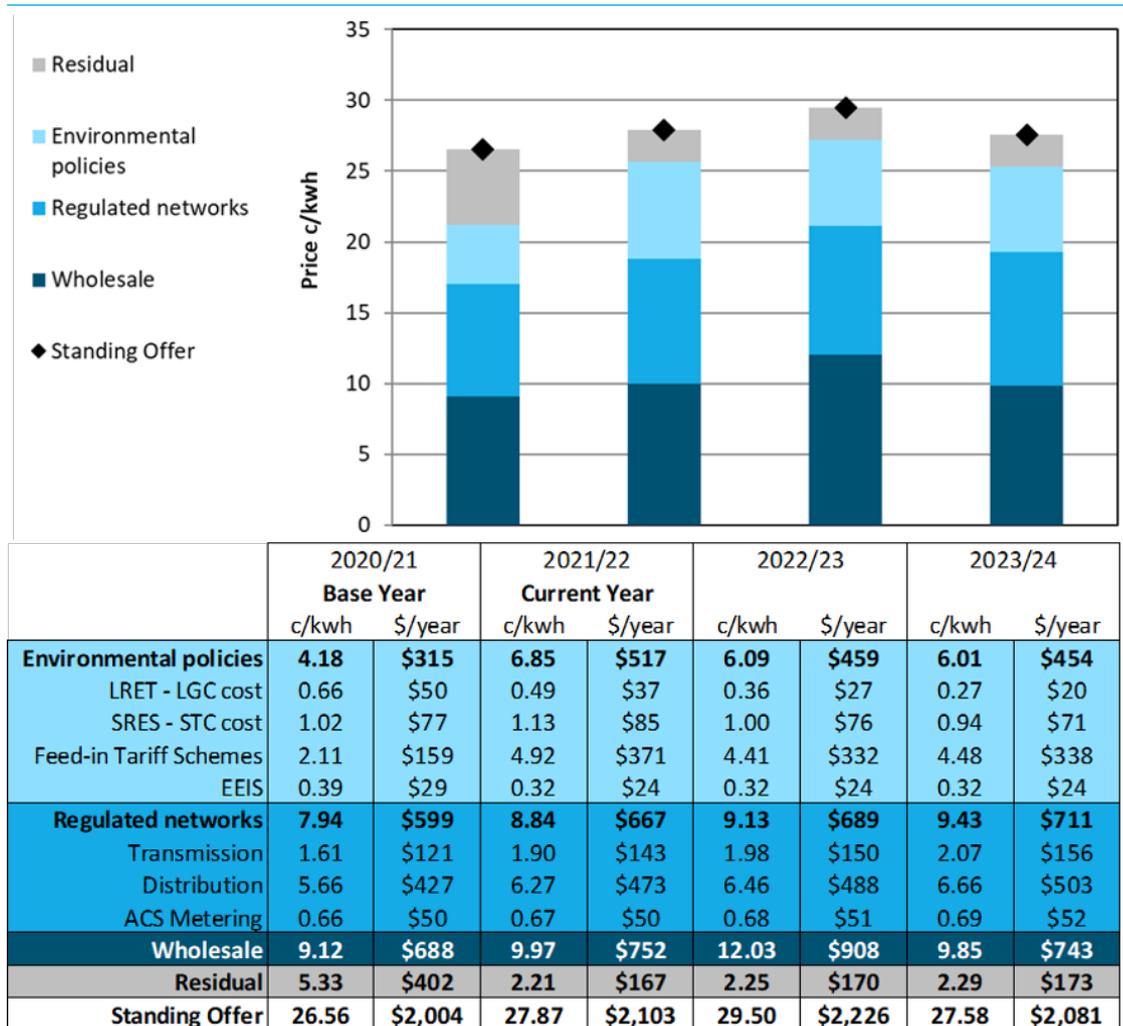


Source: AEMC analysis

Note: Total committed generation is only that category of generation sourced from AEMO that has reached financial close before the modelling was undertaken. Other new capacity may have been included as new generation within the modelling period. Since the modelling was undertaken, additional projects have been committed to across the NEM which would impact these results.

## 2.4 Trends in ACT supply chain components

**Figure 2.8:** Trends in ACT supply chain components



Source: AEMC Analysis

Note: All figures are exclusive of GST. FIT schemes' forecasts are provided by the ACT government.

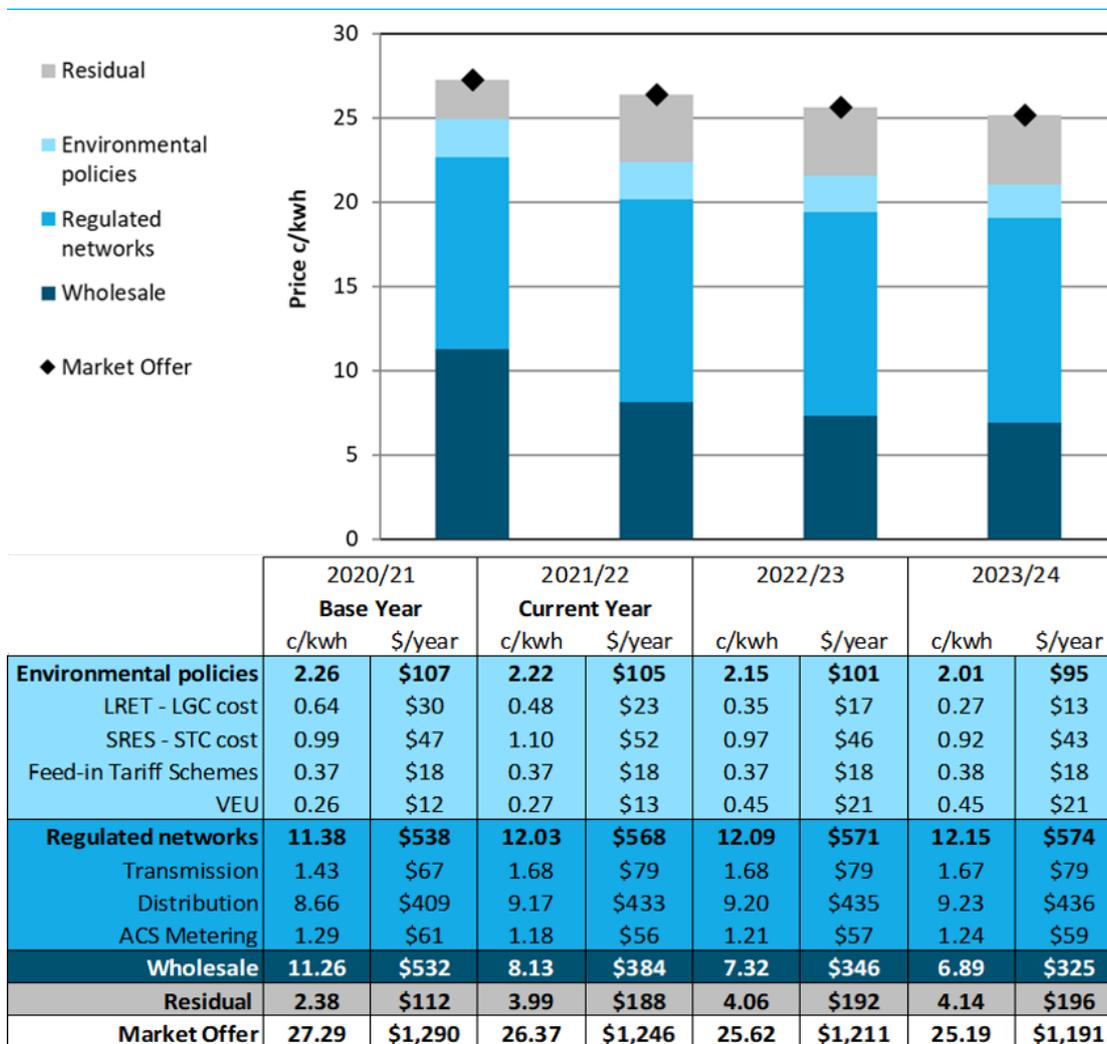
Annual residential bills in the Australian Capital Territory are expected to increase by 3.8 percent (or \$77) over the whole reporting period. The following supply chain components for the Australian Capital Territory's annual residential bill are observed in Figure 2.8:

- Wholesale costs are expected to increase by 8.0 per cent (or \$55) over the reporting period contributing 2.8 percentage points.
- Regulated network costs are expected to increase by 18.8 per cent (or \$112) over the reporting period contributing 5.6 percentage points. This is driven by increases in distribution and transmission costs.

- Environmental costs are expected to increase by 43.9 per cent (or \$138) over the reporting period contributing -6.9 percentage points. This is driven by increases in the cost of large scale Feed-in Tariff Schemes.
- The residual cost component explains the remaining variations in the annual residential bill, contributing -11.4 percentage points.

## 2.5 Trends in VIC supply chain components

Figure 2.9: Trends in VIC supply chain components



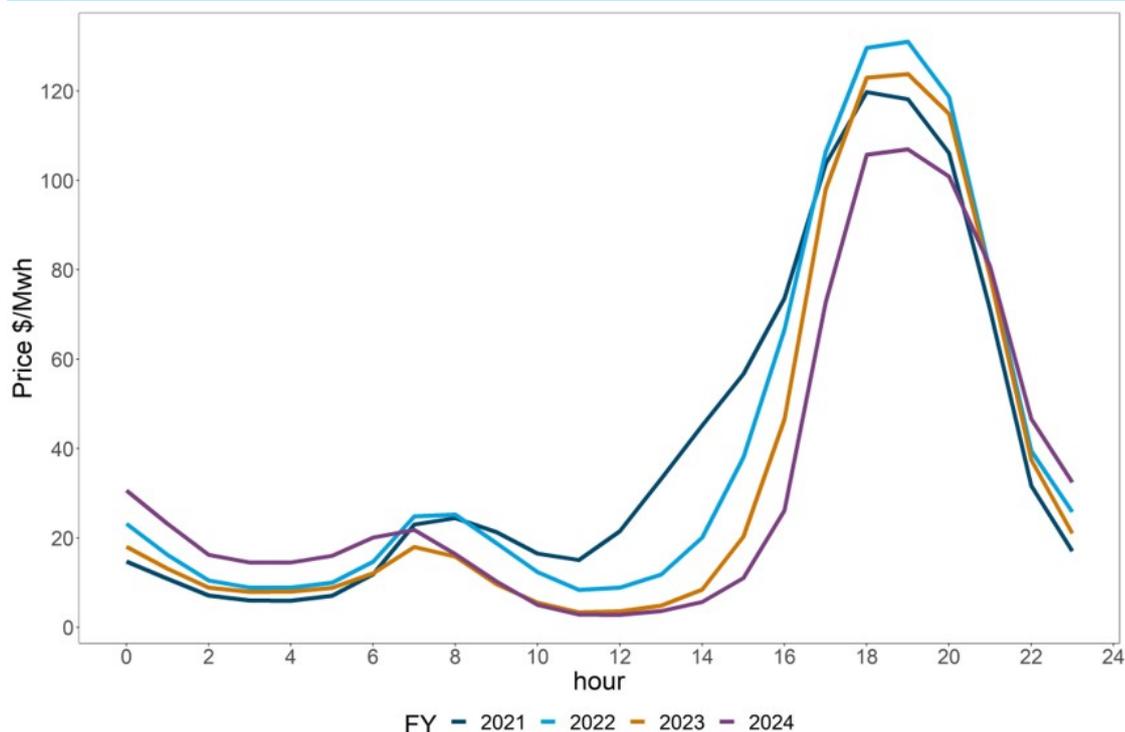
Source: AEMC analysis

Note: All figures are exclusive of GST

Annual residential bills in Victoria are expected to decrease by 7.7 per cent (or \$99) over the whole reporting period. The following supply chain components for Victoria's annual residential bill are observed in Figure 2.9:

- Wholesale costs are expected to go down by 38.9 per cent (or \$207) over the reporting period contributing -16 percentage points. This is driven by increases in generation capacity, particularly wind farms (Figure 2.11).
- Regulated network costs are expected to increase by 6.8 per cent (or \$36) over the reporting period contributing 2.8 percentage points. This is driven by increases in transmission and distribution costs.
- Environmental costs are expected to go down by 11.3 per cent (or \$12) over the reporting period contributing -0.9 percentage points. This is driven by a decrease in LRET costs stemming from a reduction in the cost of LGCs.
- The residual cost component explains the remaining variations in the annual residential bill, contributing 6.5 percentage points.

**Figure 2.10: Average wholesale electricity prices by hour of day in VIC**

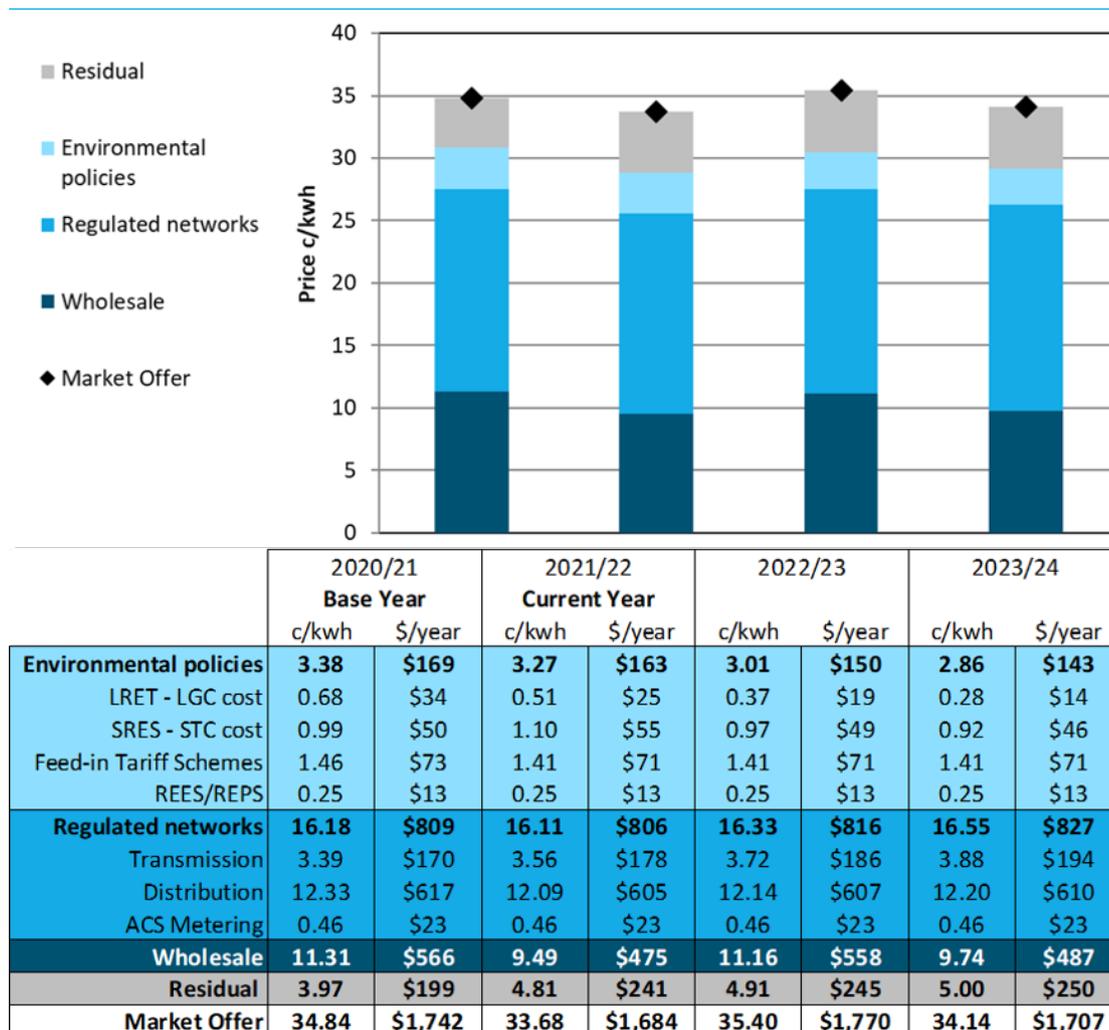


Source: AEMC analysis

Note: Total committed generation is only that category of generation sourced from AEMO that has reached financial close before the modelling was undertaken. Other new capacity may have been included as new generation within the modelling period. Since the modelling was undertaken, additional projects have been committed to across the NEM which would impact these results.

## 2.6 Trends in SA supply chain components

**Figure 2.11:** Trends in SA supply chain components



Source: AEMC analysis

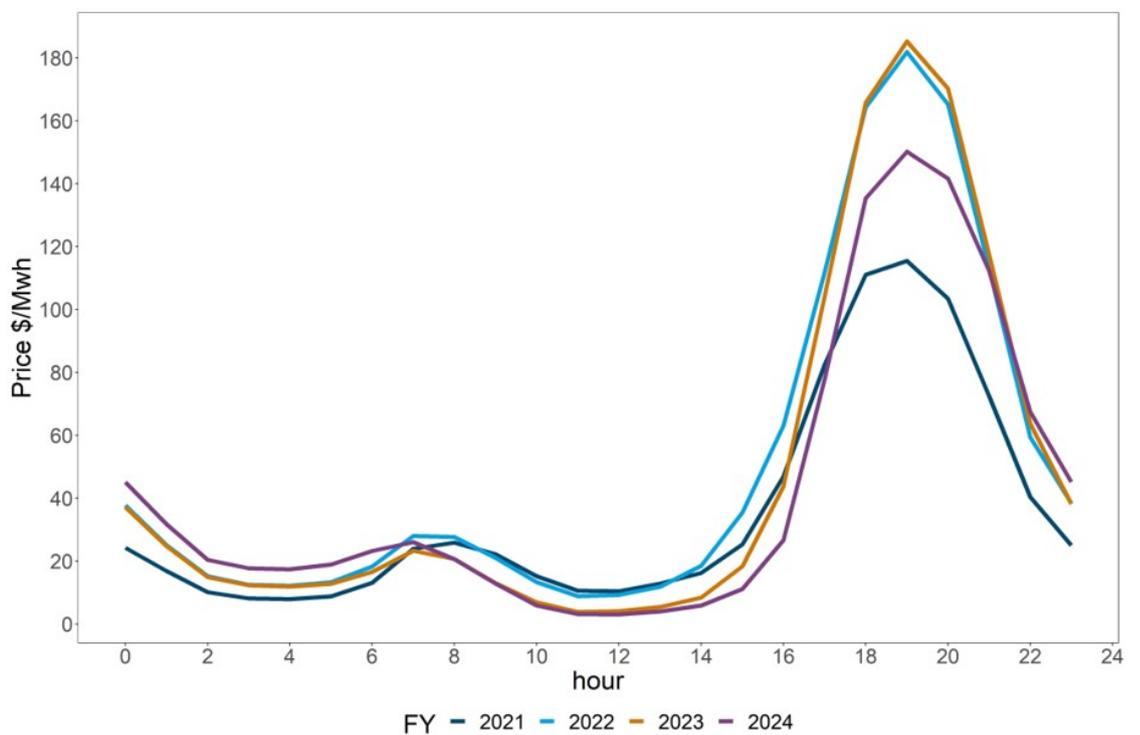
Note: All figures are exclusive of GST

Annual residential bills in South Australia are expected to decrease by 2.0 per cent (or \$35) over the whole reporting period. The following supply chain components for South Australia's annual residential bill are observed in Figure 2.11:

- Wholesale costs are expected to go down by 13.9 per cent (or \$79) over the reporting period contributing -4.5 percentage points. This is driven by increasing solar PV penetration, which is evident in an increase of negative prices in South Australia.
- Regulated network costs are expected to increase by 2.3 per cent (or \$18) over the reporting period contributing 1.1 percentage points. This is driven by increases in transmission and distribution costs.

- Environmental costs are expected to go down by 15.4 per cent (or \$26) over the reporting period contributing -1.5 percentage points. This is driven by a decrease in LRET costs stemming from a reduction in the cost of LGCs.
- The residual cost component explains the remaining variations in the annual residential bill, contributing 2.0 percentage points.

**Figure 2.12:** Average wholesale electricity prices by hour of day in SA

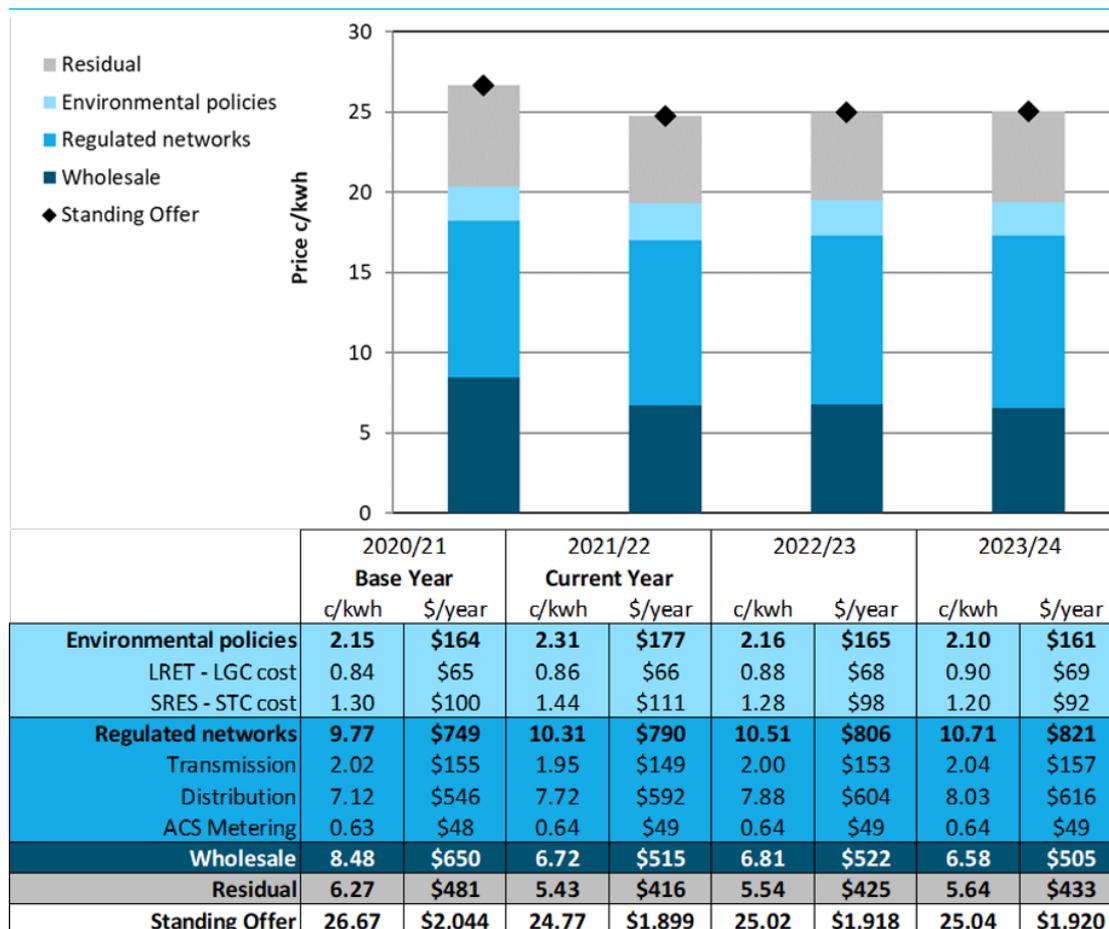


Source: AEMC analysis

Note: Total committed generation is only that category of generation sourced from AEMO that has reached financial close before the modelling was undertaken. Other new capacity may have been included as new generation within the modelling period. Since the modelling was undertaken, additional projects have been committed to across the NEM which would impact these results.

## 2.7 Trends in TAS supply chain components

**Figure 2.13:** Trends in TAS supply chain components



Source: AEMC analysis

Note: All figures are exclusive of GST.

Annual residential bills in Tasmania are expected to decrease by 6.1 per cent (or \$125) over the whole reporting period. The following supply chain components for Tasmania's annual residential bill are observed in Figure 2.13:

- Wholesale costs are expected to go down by 22.4 per cent (or \$146) over the reporting period contributing -7.1 percentage points. Wholesale costs in 2020-21 and 2021-22 are based on the Aurora Energy Standing Offer Tariff Schedule. Wholesale electricity purchase costs in 2022-23 are based on advice received on recent regulated wholesale prices for under the Wholesale Contract Regulatory Instrument. For 2023-24, prices are based on hedging Tasmanian load shape at Victorian spot.
- Regulated network costs are expected to increase by 9.7 per cent (or \$72) over the reporting period contributing 3.5 percentage points. This is driven by an increase in distribution costs.

- Environmental costs are expected to go down by 2.1 per cent (or \$3) over the reporting period contributing -0.2 percentage points. LRET and SRES costs in 2020-21 and 2021-22 are based on the Aurora Energy Standing Offer Tariff Schedule. The LRET cost component includes PPA costs from cattle hill wind farm.
- The residual cost component explains the remaining variations in the annual residential bill, contributing -2.4 percentage points.

## 2.8 Limitations of the results

### Spot price modelling

- Our spot price modelling assumes bidding behaviour mirrors historical bid profiles. We have calibrated bids so that our modelled spot prices align with current futures prices.
- Nevertheless, the shape of our modelled prices — i.e. when high prices occur — is driven by historical bid profiles. Bidding behaviour may of course change, and this would affect our results.

### Network costs

- Our analysis considers relevant information from the latest available network revenue determinations including determinations on contingent project applications published by the AER, which include the latest decisions on ElectraNet and TransGrid's contingent project applications for Project EnergyConnect. Final determinations may differ from the assumptions we have included in this modelling.

### Retail offers

- We have assumed that the residual component of the bill, which is derived from the difference between September 2021 retail offers and the sum of the other cost components, remains constant in real terms. Note that retail offers for Tasmania for 2021-22 are based on the Aurora Energy's approved standing offers prices from 1 July 2021.
- In reality, the retail margin and retail costs may change over time, and this would affect our results.

## 2.9 Comparison of expected and actual national results in recent Electricity Price Trends reports

This section provides a comparison of expected and actual national average representative retail prices and cost components in recent AEMC Residential Electricity Price Trends reports.

The comparisons in Figure 2.13, shows that from 2014-15 to 2021-22:

- the expected direction of the trend in total retail prices and cost components was generally accurate in the majority of cases.
- in some cases where the expected direction of the trend did not reflect the actual direction of the trend, it is explained by changes in conditions in the energy sector or new information that was not known at the time of estimating prices and costs:

- from 2014-15 to 2015-16 competitive market costs were expected to increase, primarily due to AEMO's forecast of increasing electricity demand.<sup>4</sup> However, actual competitive market costs decreased, due to:
  - a major reduction in AEMO's forecast of electricity demand,<sup>5</sup> — and
  - lower forecast gas prices driven by forecasts of lower global fuel prices.<sup>6</sup>
- from 2015-16 to 2016-17 environmental costs were expected to increase slightly, but actually decreased slightly, primarily due to lower than expected costs associated with large-scale renewable generation under the LRET.
- from 2017-18 to 2018-19 environmental costs were expected to decrease slightly, but actually increased, due to higher than expected uptake of rooftop solar in 2017 which resulted in higher than expected SRES costs.
- from 2018-19 to 2019-20 environmental costs were expected to increase slightly, but actually decreased, due to revisions in the LGC costs which resulted in lower than expected LRET costs. From 2018-19 to 2019-20 wholesale costs were expected to decrease, but actually increased slightly. Both of these mean that the expected result for total retail price was within 5% of the actual result.
- from 2019-20 to 2020-21 environmental costs were expected to decrease slightly, but actually increased, due to revisions in the LGC costs which resulted in higher than expected LRET. From 2019-20 to 2020-21 wholesale costs were expected to increase, but actually decreased due to lower gas prices.
- from 2020-21 to 2021-22 network costs were expected to decrease slightly, but actually increased slightly.
- in some cases, while the expected direction of the trend in total retail prices or cost components did not reflect the actual trend, the expected result was within 1% of the actual result. This was the case:
  - from 2014-15 to 2015-16 for environmental costs, and
  - from 2017-18 to 2018-19 for total retail prices, and
  - from 2018-19 to 2019-20 for network costs. It is important to note that material market changes can occur between the time inputs are finalised for this and every annual Residential Electricity Price Trends report, and when retailers actually change their pricing. In most jurisdictions, this period is approximately eight months, from the end of October to July the next year. In Victoria there is a shorter period from the finalisation of inputs in October and when retailers generally adjust their pricing in January the next year.

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4 Based on the electricity demand forecast in AEMO's 2015 National Electricity Forecasting report (NEFR), which varied by state and territory but was generally expected to increase. AEMC, 2015 Residential Electricity Price Trends, Final Report, 4 December 2015, version updated 23 February 2017, p32.

5 AEMC, 2016 Residential Electricity Price Trends, Final Report, 14 December 2016, p.4.

6 Ibid. p.4.

**Figure 2.14: Comparison of expected and actual trends in national average prices and cost components in recent AEMC Residential Electricity Price Trends reports**

National average prices and costs	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Source of estimated prices and costs	2013 report	2014 report	2015 report	2016 report	2016 report	2017 report	2018 report	2019 report	2020 report
Source of actual prices and costs	2014 report	2015 report	2016 report	2017 report	2018 report	2018 report	2019 report**	2020 report^	2021 report^
<b>Total retail price</b>									
Estimated price	28	27	25	26	26	30	29	28	26
Estimated price change		-1	-2	1	1	3	-1	0	-2
Estimated direction of trend		Decrease	Decrease	Increase	Increase	Increase	Decrease	Decrease	Decrease
Actual price	29	26	25	28	30	30	30	28	27
Actual price change		-3	-1	3	2	0	1	-3	0
Actual direction of trend		Decrease	Decrease	Increase	Increase	Decrease	Increase	Decrease	Decrease
<b>Network costs</b>									
Estimated price	14	14	12	12	12	14	13	13	13
Estimated price change		0	-2	0	0	1	0	-1	0
Estimated direction of trend		Decrease	Decrease	Increase	Increase	Increase	Decrease	Decrease	Decrease
Actual price	14	13	12	14	13	13	13	13	13
Actual price change		-1	-1	1	0	0	0	-1	0
Actual direction of trend		Decrease	Decrease	Increase	Decrease	Increase	Decrease	Decrease	Increase
<b>Wholesale costs*</b>									
Estimated price	5	10	11	7	8	11	10	11	8
Estimated price change		5	1	-4	1	3	-1	1	-3
Estimated direction of trend		Increase	Increase	Decrease	Increase	Increase	Decrease	Increase	Decrease
Actual price	10	11	10	10	12	12	12	9	9
Actual price change		0	0	0	2	0	0	-3	0
Actual direction of trend		Increase	Decrease	Decrease	Increase	Increase	Increase	Decrease	Decrease
<b>Environmental costs</b>									
Estimated price	4	2	2	2	2	2	2	2	2
Estimated price change		-2	0	0	0	0	0	0	1
Estimated direction of trend		Decrease	Decrease	Increase	Decrease	Decrease	Increase	Decrease	Increase
Actual price	4	2	2	2	2	2	2	2	2
Actual price change		-3	0	0	0	0	0	0	0
Actual direction of trend		Decrease	Increase	Decrease	Decrease	Increase	Decrease	Increase	Increase

Source: AEMC 2013, 2014, 2015, 2016, 2017, 2018, 2019 and 2020 Residential Electricity Price Trends reports.

Note: \*For 2014-15 and 2015-16, expected and actual wholesale and retail costs were combined and presented as 'competitive market costs'. For 2016-17, 2017-18, 2018-19, 2019-20 and 2020-21 the comparison of actual and expected results are for wholesale costs only. For the final prices the numbers include the residual component and are subject to rounding. \*\*For the 2019 report, the figures are estimated by excluding Northern Territory. ^For the 2020 and 2021 report, the figures are estimated by excluding Northern Territory and Western Australia.

## 3 METHODOLOGY

The terms of reference for this report require the AEMC to estimate future:

- retail electricity prices and bill outcomes for representative residential consumers in each Australian state and territory
- national prices and bills based on a weighted average of the jurisdictional results.

Representative consumers are those households with the most common electricity consumption profiles in each jurisdiction. The AER identifies the annual and quarterly consumption of these consumers in most jurisdictions. However jurisdictional governments provide the representative consumption levels in South Australia and the Tasmanian Economic Regulator provides this information for Tasmania.

In order to estimate billing outcomes, a consumer's consumption must be multiplied by the price of electricity. The prices used in the analysis are determined in the following way.

- From each retailer, a tariff that charges the same rate for all or blocks (specific quantities) of consumption is chosen, as these are more common than time-of-use or other tariffs.
- Controlled loads are included in the analysis.
- All discounts are assumed to be achieved, but no value is ascribed to other incentive offerings (for example pay-on-time percentage discounts are included in the bill analysis but the value of free movie tickets or other incentive offerings are not included).

The retailers' tariffs are then weighted by retail market shares to determine an average price in each distribution area, each jurisdiction and nationally. The same process is undertaken for customers on standing offers and market contracts. Consistent with previous reports, the analysis of standing and market offers has used the lowest offer from each retailer.

As the described process can only inform historic and current pricing periods, an alternative method is used to estimate future prices and bills. To do this the changes in the supply chain cost components are assessed, and the retail or residual component escalated from the current year. Specifically, pricing and bill outcomes are estimated by examining network services costs, wholesale costs, and environmental and other policy costs, and then adding the residual or retail component to achieve a total cost, or bill outcome. Consumer prices are calculated by unitising the bill outcome by the consumer's consumption.

The report estimates wholesale costs using a blended method. Where possible, the analysis uses observable market contract prices that retailers use to build up their hedge contract book over time. Where there is limited forward contract data available, then a forecast of spot market outcomes and a contract premium is used. This method more closely resembles how retailers actually hedge their loads, and is therefore considered a more realistic basis for estimating wholesale costs that retailers may incur and pass through to customer's bills.

### 3.1 Jurisdiction key assumptions and methodology summary

The method by which costs are built up for each jurisdiction can change depending on arrangements specific to an individual region. Table 3.1 below summarises the similarities and differences in the methodology employed for estimating retail costs in each region.

**Table 3.1: Key Jurisdiction Methodologies and Assumptions**

	<b>SE QLD</b>	<b>NSW</b>	<b>ACT</b>	<b>VIC</b>	<b>SA</b>	<b>TAS</b>
Representative Consumer	2-3 person household, no mains gas, no solar PV, no swimming pool, controlled load and on a market offer	2-3 person household, mains gas, air conditioning, no controlled load, no swimming pool and on a market offer	2-3 person household, mains gas, electricity water heating, electric water heating and on the regulated standing offer	2-3 person household, mainsgas, no controlled load, no swimming pool, electric space heating and on market offer	2 person household; mains gas and on a market offer	2 person household, no mains gas, electric space, electric water heating and on the regulated standing offer
LRET	Clean Energy Regulator	Clean Energy Regulator	Clean Energy Regulator	Clean Energy Regulator	Clean Energy Regulator	Based on Aurora standing offer and Tasmanian Economic regulator
SRES	Clean Energy Regulator	Clean Energy Regulator	Clean Energy Regulator	Clean Energy Regulator	Clean Energy Regulator	Based on Aurora standing offer and Tasmanian Economic regulator
Efficiency Schemes	Data from Jurisdiction	Data from Jurisdiction	Data from Jurisdiction	Data from Jurisdiction	Data from Jurisdiction	N/A
Transmission	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-	2020-21 and 2021-22 are based on AER pricing proposals and	2020-21 and 2021-22 are based on AER pricing proposals and	2020-21 and 2021-22 are based on AER pricing proposals and	2020-21 and 2021-22 are based on AER pricing proposals and

	<b>SE QLD</b>	<b>NSW</b>	<b>ACT</b>	<b>VIC</b>	<b>SA</b>	<b>TAS</b>
	24 are based on AER determinations	24 are based on AER determinations	2022-23 and 2023-24 are based on AER determinations	2022-23 and 2023-24 are based on AER determinations	2022-23 and 2023-24 are based on AER determinations	2022-23 and 2023-24 are based on projected growth expectations
Distribution	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-24 are based on AER determinations	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-24 are based on AER determinations	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-24 are based on AER determinations	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-24 are based on AER determinations	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-24 are based on AER determinations	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-24 are based on projected growth expectations
ACS Metering	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-24 are based on AER determinations	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-24 are based on AER determinations	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-24 are based on AER determinations	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-24 are based on AER determinations	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-24 are based on AER determinations	2020-21 and 2021-22 are based on AER pricing proposals and 2022-23 and 2023-24 are based on projected growth expectations
Wholesale	QLD wholesale costs as applied to QLD consumption profile	NSW wholesale costs as applied to NSW consumption profile	NSW wholesale costs as applied to ACT consumption profile	VIC wholesale costs as applied to VIC consumption profile	SA wholesale costs as applied to SA consumption profile	FY21/FY22 Wholesale Electricity Price Instrument, FY23 estimate based on advice received on

	SE QLD	NSW	ACT	VIC	SA	TAS
						recent regulated wholesale prices for FY23 under the Wholesale Contract Regulatory Instrument, FY24 VIC wholesale costs as applied to TAS consumption profile
Residual	FY22 - Difference between market offer and all other cost components	FY22 - Difference between market offer and all other cost components	FY22 - Difference between market offer and all other cost components	FY22 - Difference between market offer and all other cost components	FY22 - Difference between market offer and all other cost components	FY22 - Difference between Aurora Standing Offer and all other cost components
Retail offers (Base and Current Year)	Energy Made Easy	Energy Made Easy	Energy Made Easy	Victorian Energy Compare	Energy Made Easy	Aurora Standing Offer as approved by Tasmanian Economic Regulator

Source: AEMC

## 4 KEY ASSUMPTIONS

### 4.1 Representative consumer approach

As per the terms of reference, the AEMC are required to use a representative electricity customer's consumption to estimate the makeup of the retail bill. Representative customers are defined by their electricity consumption characteristics, which are their total annual electricity consumption measured in KWh and how this consumption varies through the year, on a quarterly basis. In this analysis, the same consumption levels will be used for the whole reporting period.

In 2020, the AER released its new residential electricity benchmarking figures, thus the figure used in previous price trends reports required updating to be consistent with the new figures reported by the AER. The AER benchmark values are based on the survey of around 8,000 households where participants are asked about their homes and the way in which they use electricity. Separate data was provided by the AER to estimate the new values. Equivalent values to the AER are provided by the jurisdiction in South Australia and the economic regulator in Tasmania.

**Table 4.1: Annual consumption of representative consumer - based on AER benchmark values**

<b>JURISDICTION</b>	<b>MOST COMMON HOUSEHOLD TYPES</b>	<b>TOTAL ANNUAL CONSUMPTION (KWH) PT2020</b>	<b>TOTAL ANNUAL CONSUMPTION (KWH) PT2021</b>
Queensland	2-3 person household, no mains gas, no solar PV, no swimming pool, controlled load and on a market offer	5,240	5,650
New South Wales	2-3 person household, mains gas, air conditioning, no controlled load, no swimming pool and on a market offer	4,215	4,362
Australian Capital Territory	2-3 person household, mains gas, electricity water heating, electric water heating and on the regulated standing offer	7,151	7,545
Victoria	2-3 person household, mains	3,865	4,727

<b>JURISDICTION</b>	<b>MOST COMMON HOUSEHOLD TYPES</b>	<b>TOTAL ANNUAL CONSUMPTION (KWH) PT2020</b>	<b>TOTAL ANNUAL CONSUMPTION (KWH) PT2021</b>
	gas, no controlled load, no swimming pool, electric space heating and on market offer		

Source: AER

**Table 4.2: Annual consumption of representative consumer - provided by jurisdictional government**

<b>JURISDICTION</b>	<b>MOST COMMON HOUSEHOLD TYPES</b>	<b>TOTAL ANNUAL CONSUMPTION (KWH) PT2020</b>	<b>TOTAL ANNUAL CONSUMPTION (KWH) PT2021</b>
South Australia	2 person household, mains gas and on a market offer	5,000	5,000

Source: South Australian Government

**Table 4.3: Annual consumption of representative consumer - provided by Tasmanian Economic Regulator**

<b>JURISDICTION</b>	<b>MOST COMMON HOUSEHOLD TYPES</b>	<b>TOTAL ANNUAL CONSUMPTION (KWH) PT2020</b>	<b>TOTAL ANNUAL CONSUMPTION (KWH) PT2021</b>
Tasmania	2 person household, no mains gas, electric space, electric water heating and on the regulated standing offer	7,908	7,666

Source: Tasmanian Economic Regulator

The household types only apply to the 2021 figures. The reason for the increase in the general consumption figures for QLD, NSW, ACT and VIC is due to the change of the assumption from a 2-person household to a 2–3-person household. From ABS data, the average household makeup within these regions ranges from 2.4 – 2.6, thus, to be consistent with the household makeup, the assumption was changed. Furthermore, Victoria’s larger increase is consistent with the inclusion of electric space heating as a representative consumer within Victoria does have electric space heating. ACT now includes mains gas

within their profile as 80% of households within ACT currently have access to mains gas. The Tasmanian Economic Regulator requested the figure calculated by them be used instead of the figures in the AER's report. This is also the case with South Australia, whose figure is provided by the jurisdiction.

The energy consumption of the representative consumer in each region should be considered in the context of continued increasing penetration of rooftop solar PV, both over recent timeframes and over the future timeframe of the price trends horizon. Currently, within Australia a typical representative consumer does not have solar PV. However, this is changing with households continuing to install new systems and some states such as Queensland on track to reach 50% rooftop solar penetration in the next 5-10 years.

As trends for solar PV penetration growth by state vary, this effect will vary across the NEM. But across the NEM as a whole, and in some regions to a greater extent than others, consumers will on average be paying less for their energy even assuming the unit cost of energy is unchanged.

## 4.2 Retail offers

This report uses retail offers obtained from Energy Made Easy and Victorian Energy Compare to estimate the jurisdictional average bill, weighted by retailer customer numbers. Retail offers for Tasmania come from Aurora Energy standing offer prices as approved by the Tasmanian Economic Regulator (OTTER). Table 4.4 provides detailed information on the sources of electricity pricing data.

**Table 4.4: Sources of electricity pricing data**

<b>JURISDICTION</b>	<b>OFFER</b>	<b>2020-21</b>	<b>2021-22</b>
NSW, ACT, SA	Standing	Retailer offers obtained from Energy Made Easy on 11 September 2020	Retailer offers obtained from Energy Made Easy on 17 September 2021
	Market		
South East Queensland	Standing	Retailer offers obtained from Energy Made Easy on 11 September 2020	Retailer offers obtained from Energy Made Easy on 17 September 2021
	Market		
Tasmania	Standing	Aurora Energy approved standing offers prices from 1 July 2020	Aurora Energy approved standing offers prices from 1 July 2021
	Market	None	None
Victoria	Standing	Retail offers obtained from Victorian Energy Compare on 15 October 2020	Retail offers obtained from Victorian Energy Compare on 17 September 2021
	Market		

Source: AEMC and cited sources

Note: These offer prices include both variable and fixed charges. In previous years, Victorian price changes occur on a calendar year basis, unlike all other jurisdictions where price changes occur on a financial year basis. From 30 June 2021 onwards, Victorian price changes occur on a financial year basis instead as approved by the Victorian government.

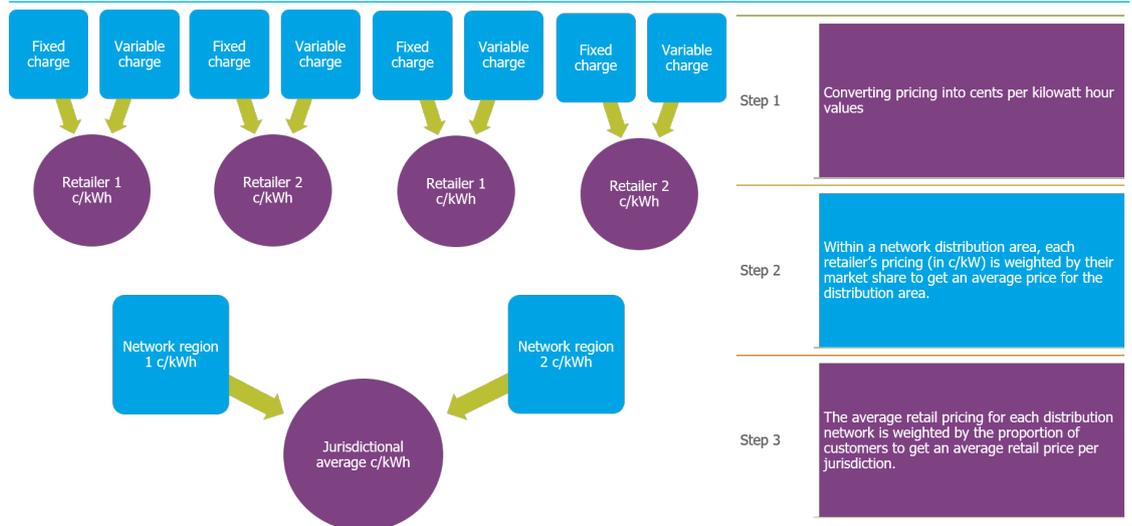
Using above assumptions of representative consumer and the lowest retail offers for 2020-21 and 2021-22 in each jurisdiction based on the electricity pricing data stated in Table 4.4, the representative retail electricity price by each retailer can be calculated as shown in Figure 4.1. The average retail price per jurisdiction is explained in Figure 4.2. Firstly, the representative retail electricity price by each retailer is converted into cents per kilowatt hour values. Secondly, within a distribution area each retailer’s pricing (in c/KW) is weighted by their market share to get an average price for the distribution area. Lastly, the average retail pricing for each distribution network is weighted by the proportion of customers to get an average retail price per jurisdiction.

**Figure 4.1:** Calculation of representative retail electricity prices



Source: AEMC analysis

**Figure 4.2: Process of calculating a jurisdictional average price**



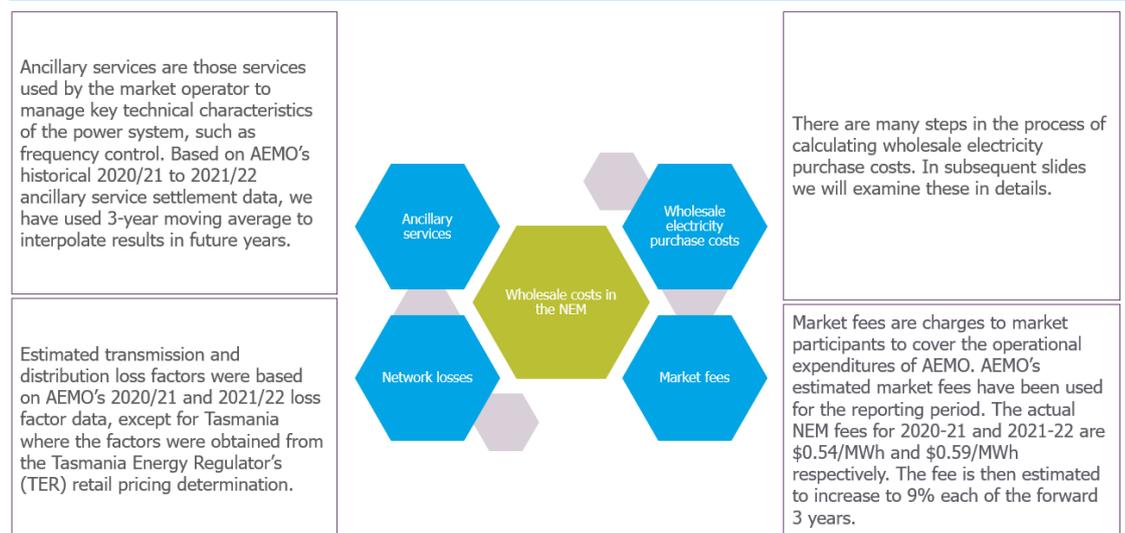
Source: AEMC analysis

## 4.3

### Wholesale costs

Wholesale electricity costs are estimated based on the calculations of four cost components (Figure 4.3), which are wholesale electricity purchase costs, network losses, ancillary services and market fees. The AEMC have decided to not include directions costs.

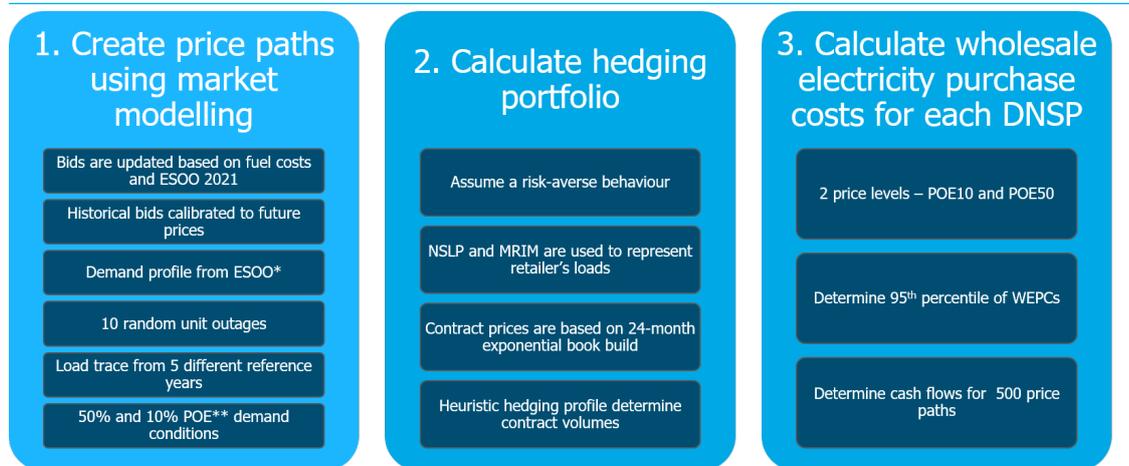
**Figure 4.3: Four components of wholesale electricity costs in the NEM**



Source: AEMC analysis

There are 3 main steps in the process of calculating wholesale electricity purchase costs. These steps are illustrated below in Figure 4.4. The main assumptions for each of these steps are presented in Figure 4.5. Figure 4.6, Figure 4.7 explain steps 1-3 respectively.

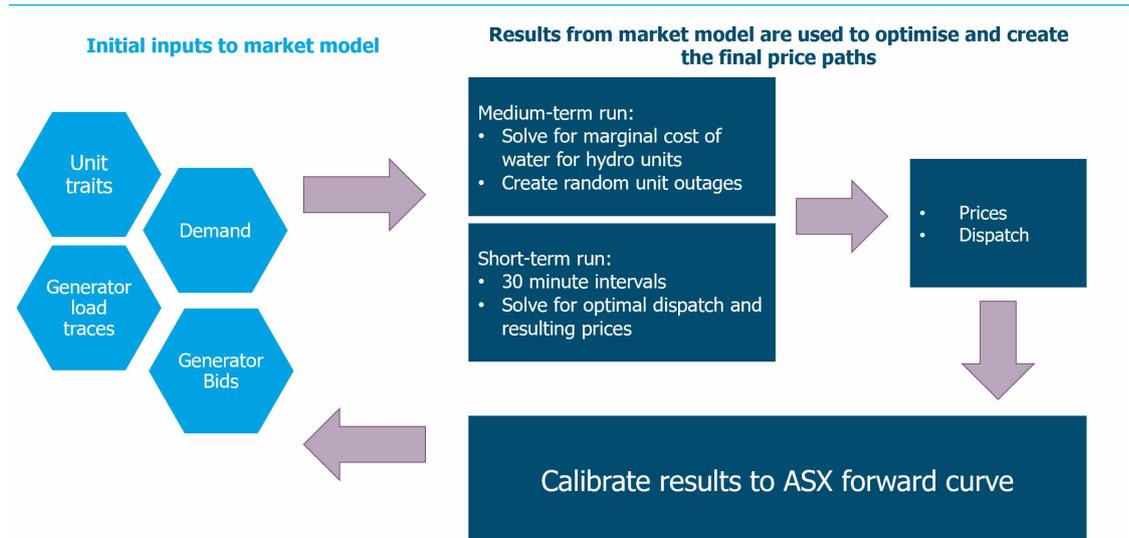
**Figure 4.4: Steps in the process of calculating wholesale electricity purchase costs and main assumptions**



Source: AEMC analysis

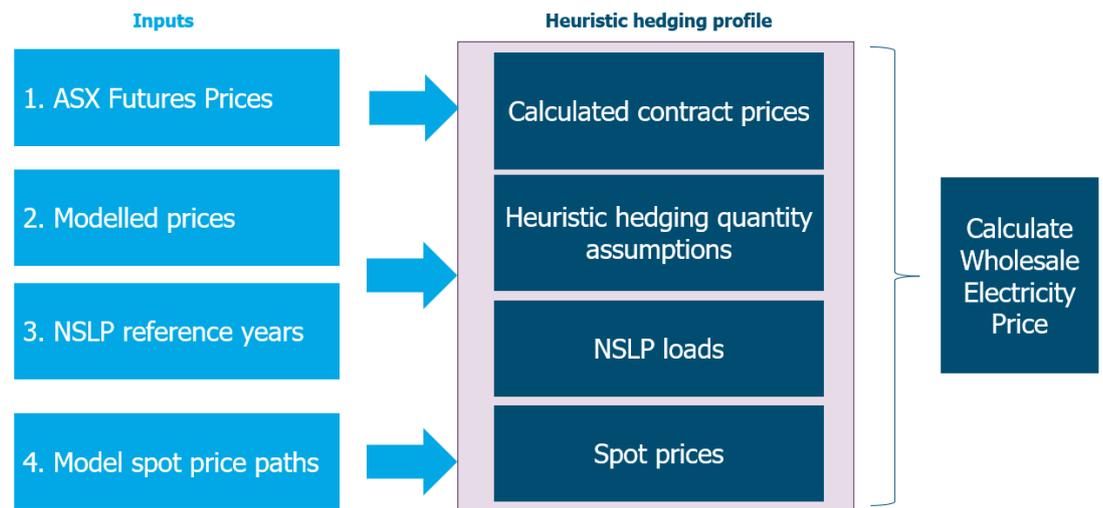
Note: \*Electricity statement of opportunities \*\*Probability of exceedance

**Figure 4.5: Create price paths using market modelling**



Source: AEMC analysis

**Figure 4.6: Calculate optimal hedging portfolio**



Source: AEMC analysis

**Figure 4.7: Calculate wholesale electricity purchase costs for each DNSP**



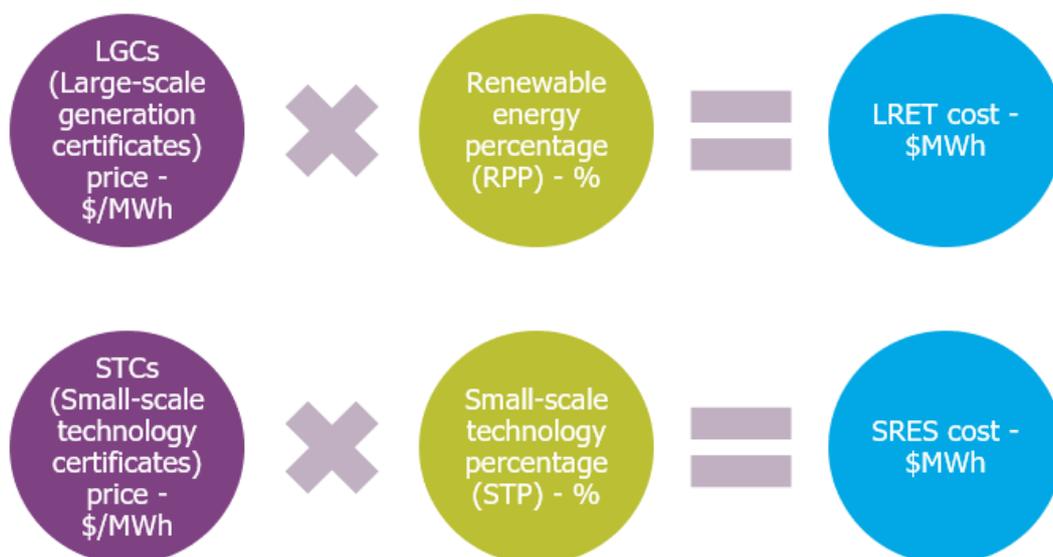
Source: AEMC analysis

## 4.4 Environmental costs

Environmental costs are calculated using information provided by the Clean Energy Regulator (CER) and jurisdictional data. There are two types of environmental schemes, which are the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). Figure 4.8 shows the calculation methods for these two schemes and Figure 4.9

shows the calculation method for the volume of the small-scale technology certificates (STCs).

**Figure 4.8: Environmental cost calculations - LRET and SRES**



Source: Clean Energy Regulator

**Figure 4.9: Calculation method for the volume of STCs**



Source: Clean Energy Regulator

## 4.5 Regulated network costs

Regulated network costs are estimated using Annual Pricing Proposals produced by the distribution network service providers (DNSPs) before each new financial year (or calendar year for Victorian network businesses). These proposals are to be approved by the AER and set out the overall network use of service (NUOS) charge for each tariff class. This can be broken down into the:

- transmission use of service charge (TUOS);
- distribution use of service charge (DUOS);
- metering charges (capital and non-capital);

- jurisdictional scheme costs (if applicable). We assume the representative consumer in each jurisdiction still has a Type 6 accumulation meter owned by a DNSP. Network tariff sources and regulatory periods have been presented in Figure 4.10.

**Figure 4.10: Network tariff sources and regulatory periods**

Summary of approaches for estimating network costs

	2020/21	2021/22	2022/23	2023/24
<b>Transmission</b>				
New South Wales/ACT	Annual pricing proposal	Annual pricing proposal	Final decision	Final decision
South Australia	Annual pricing proposal	Annual pricing proposal	Final decision	Final decision
South East Queensland	Annual pricing proposal	Annual pricing proposal	Final decision	Final decision
Tasmania ^	Annual pricing proposal	Annual pricing proposal	Final decision	Final decision
Victoria	Annual pricing proposal	Annual pricing proposal	Final decision	Final decision
<b>Distribution &amp; Metering</b>				
New South Wales/ACT	Annual pricing proposal	Annual pricing proposal	Final decision	Final decision
South Australia	Annual pricing proposal	Annual pricing proposal	Final decision	Final decision
South East Queensland	Annual pricing proposal	Annual pricing proposal	Final decision	Final decision
Tasmania^	Annual pricing proposal	Annual pricing proposal	Final decision	Final decision
Victoria	Annual pricing proposal	Annual pricing proposal	Final decision	Final decision

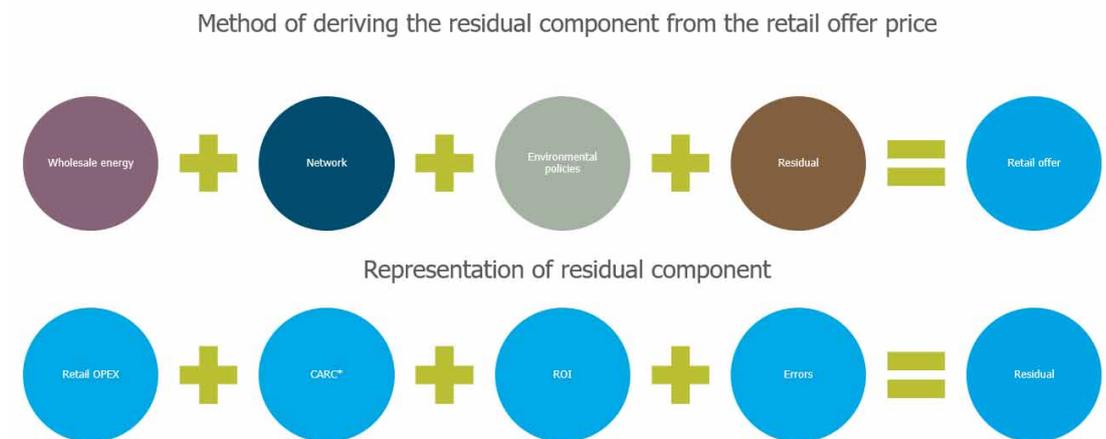
**Key:**  
 Annual pricing proposal  
 Final decision  
 Constant in real terms  
 Draft decision

Source: AEMC analysis

Note: ^ These network service providers are both transmission and distribution businesses

## 4.6 Residual component or retail cost

**Figure 4.11: Calculation of residual component or retail cost**



Source: AEMC analysis

Note: CARC refers to customer acquisition and retention cost. ROI refers to return on investment. OPEX refers to operating expenses.

## ABBREVIATIONS

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CARC	Customer Acquisition and Retention Cost
CER	Clean Energy Regulator
Commission	See AEMC
EME	Energy Made Easy
LRET	Large-scale Renewable Energy Target
MCE	Ministerial Council on Energy
NEL	National Electricity Law
NEO	National electricity objective
NERL	National Energy Retail Law
NERO	National energy retail objective
NGL	National Gas Law
NGO	National gas objective
ROI	Return on Investment
SRES	Small-scale Renewable Energy Scheme
STC	Small-scale Technology Certificates
TER	Tasmanian Economic Regulator
VEC	Victorian Energy Compare