
Australian Energy Market Commission

FINAL REPORT

RESIDENTIAL ELECTRICITY PRICE TRENDS 2020

21 DECEMBER 2020

REVIEW

INQUIRIES

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ABOUT THE AEMC

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

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NOTE ON THIS YEAR'S REPORT

The purpose of the 2020 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 2019-20 to 2022-23.

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.

This report does not include the Northern Territory in the analysis. In previous years, the AEMC used the 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.

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. Given the impacts of COVID-19, the Western Australian Government has put a freeze on price changes in 2020-21 and provided additional financial support to these electricity consumers throughout 2020. As these policy decisions cannot be accounted for in preparation of the Residential Electricity Price Trends

report, the Western Australian Government has requested that Western Australia not be included in this report.

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 2 November 2020
- network cost information that was publicly available up until 17 November 2020. Regulated network costs may vary because of AER decisions on contingent project applications.

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.

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1 INTRODUCTION

This is the eleventh annual residential electricity price trends report prepared by the Australian Energy Market Commission (AEMC) at the request of the ministerial forum of Energy Ministers (formerly COAG Energy Council)^{1,2}.

The 2020 residential electricity price trends report (2020 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 Territory³ and Western Australia⁴), and nationally, from 2019-20 to 2022-23 (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.

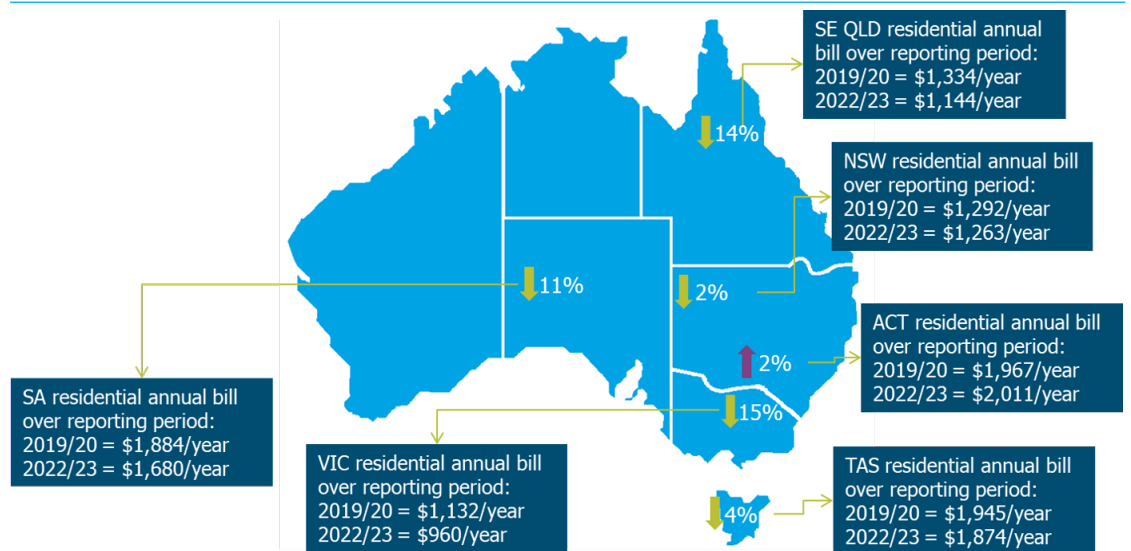
Residential electricity bills are calculated by multiplying the consumption of the representative consumer in each jurisdiction by the price they pay for electricity. The representative consumer's consumption is either based on the most common consumption profile of consumers in each jurisdiction, or 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. The 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.

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.

-
- 1 On 29 May 2020, the Prime Minister announced the establishment of the National Federation Reform Council and the disbanding of the COAG. New arrangements for the former COAG Energy Council will be finalised following the National Cabinet Review of COAG Councils and Ministerial Forums which provided recommendations to National Cabinet which were agreed in October 2020. The Prime Minister has advised that, while this change is being implemented, former councils may continue meeting as a Ministerial Forum to progress critical and/or well-developed work.
 - 2 A copy of the terms of reference is available in the AEMC website.
 - 3 Northern Territory is not included in the 2020 report because of the lack of information provided by the jurisdiction — See the notes at the start of the report for further details.
 - 4 Western Australia is not included in the 2020 report due to a request from the Minister for Mines and Petroleum; Energy; Industrial Relations — 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

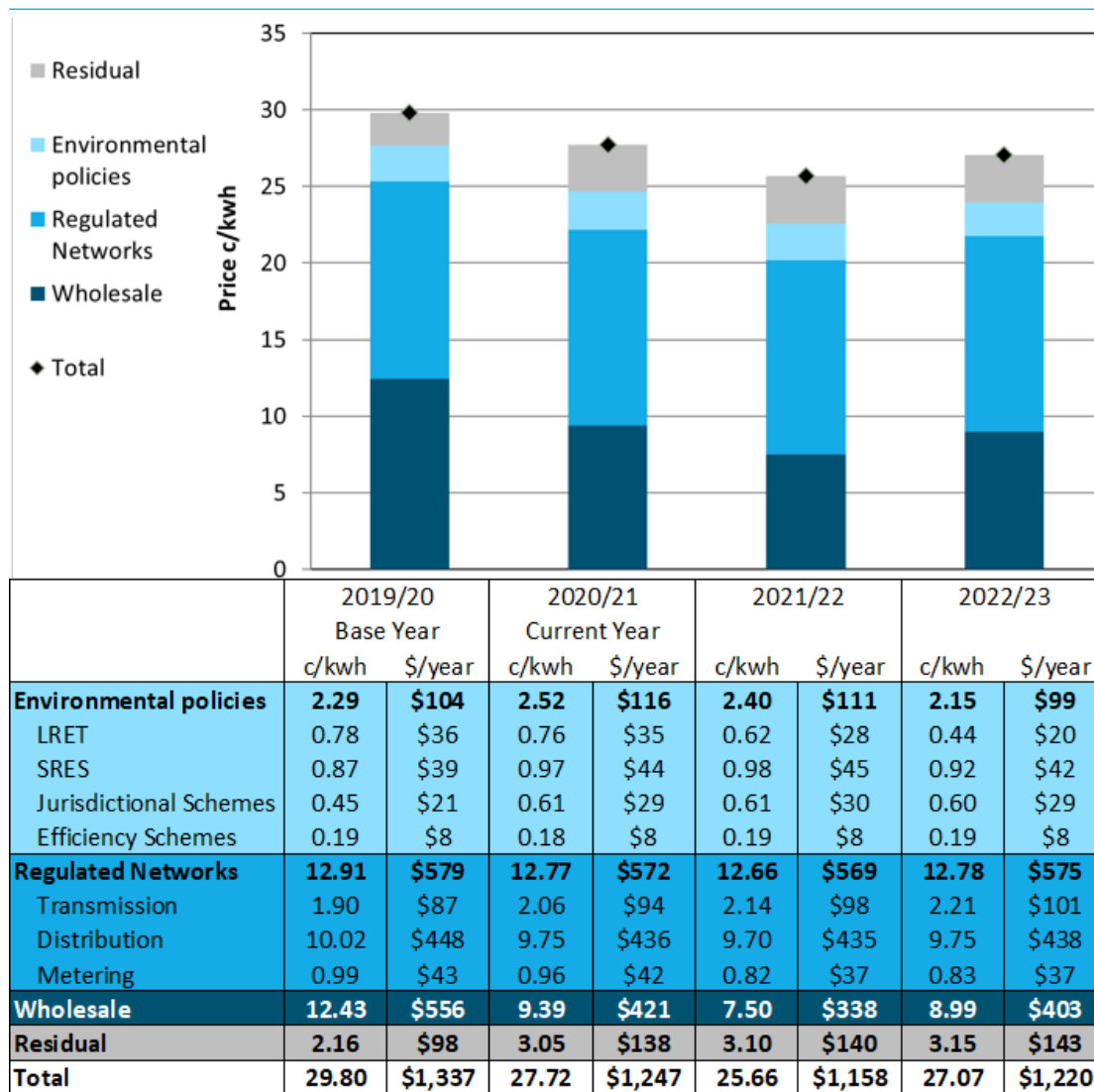
2.1

Trends in national electricity prices and bills over 3-year period

On a national basis, residential electricity prices and bills are expected to decrease until 2021-22 and increase in 2022-23. Overall prices fall despite increase in 2022-23. This trend is primarily driven by wholesale costs reducing in most of the states and territories in the first two years before increasing in the last reporting year following the closure of Liddell power station (Figure 2.1). Notably this tightening of supply and demand balance occurs at the end of the reporting period and may be affected by the recent announcement from the NSW government about the Electricity Infrastructure Roadmap. Prices fall markedly over the whole reporting period as new capacity enters the system. There are significant drops in contract prices (Figure 2.2). Total capacity of committed projects⁵ includes 1,667 MW of solar and 2,580 MW of wind. The AEMC has modelled total capacity of new investments based on finding an optimal mix of generation investment which meets power system needs at lowest cost to consumers. Decrease in gas prices is also a contributor to lower wholesale prices (Figure 2.3).

5 ESOO 2020

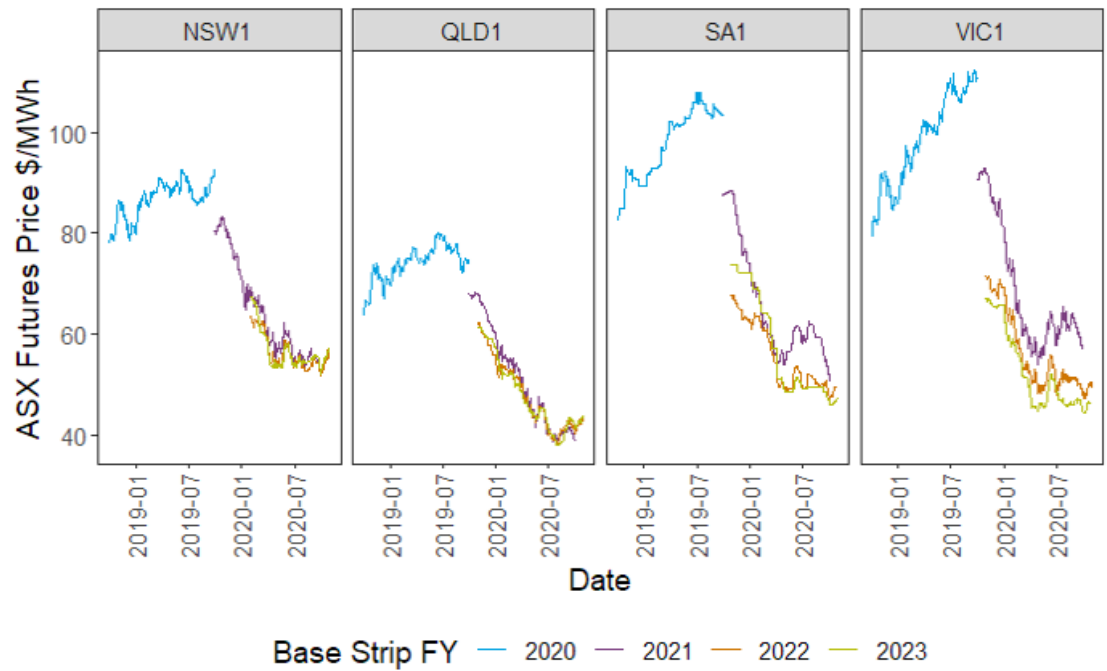
Figure 2.1: Trends in national supply chain components



Source: AEMC analysis

Note: The figure does not include Northern Territory due to the lack of information from the jurisdiction — See the notes at the start of the report for further details. The figure does not include Western Australia due to a request from the Minister for Mines and Petroleum; Energy; Industrial Relations. All figures are exclusive of GST.

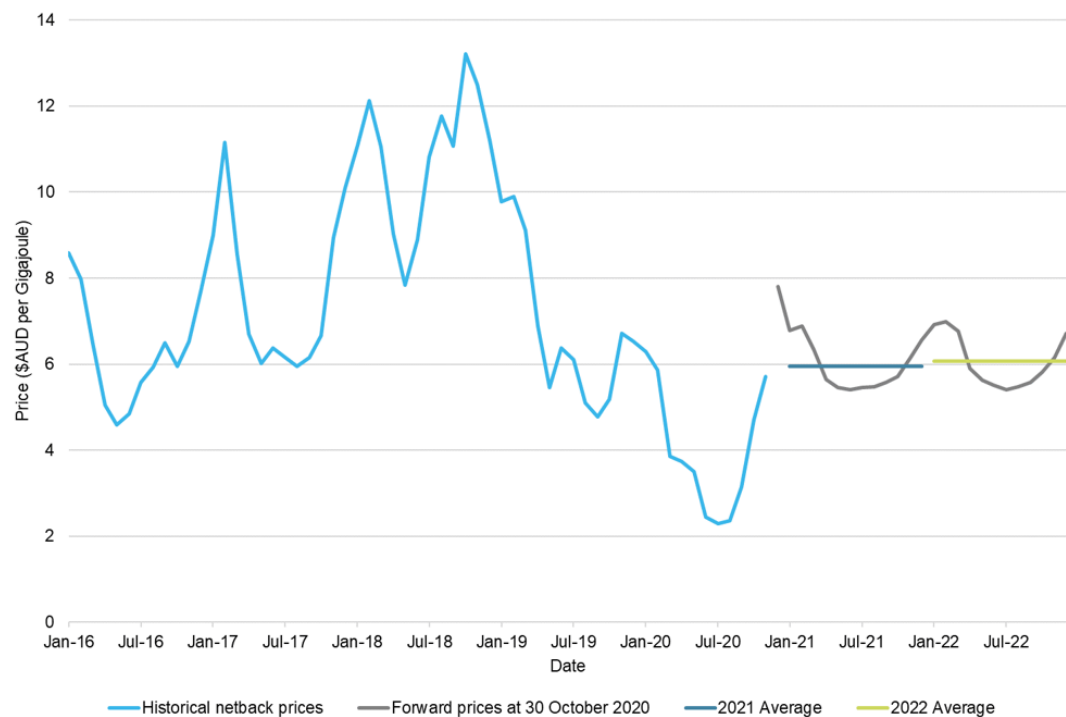
Figure 2.2: Contract prices are decreasing



Source: AEMC Analysis of ASX data

Note: The contracts for 2022 and 2023 have relatively low liquidity, i.e. there are few trades on which these prices are based.

Figure 2.3: Decrease in gas prices is also a contributor to lower wholesale prices



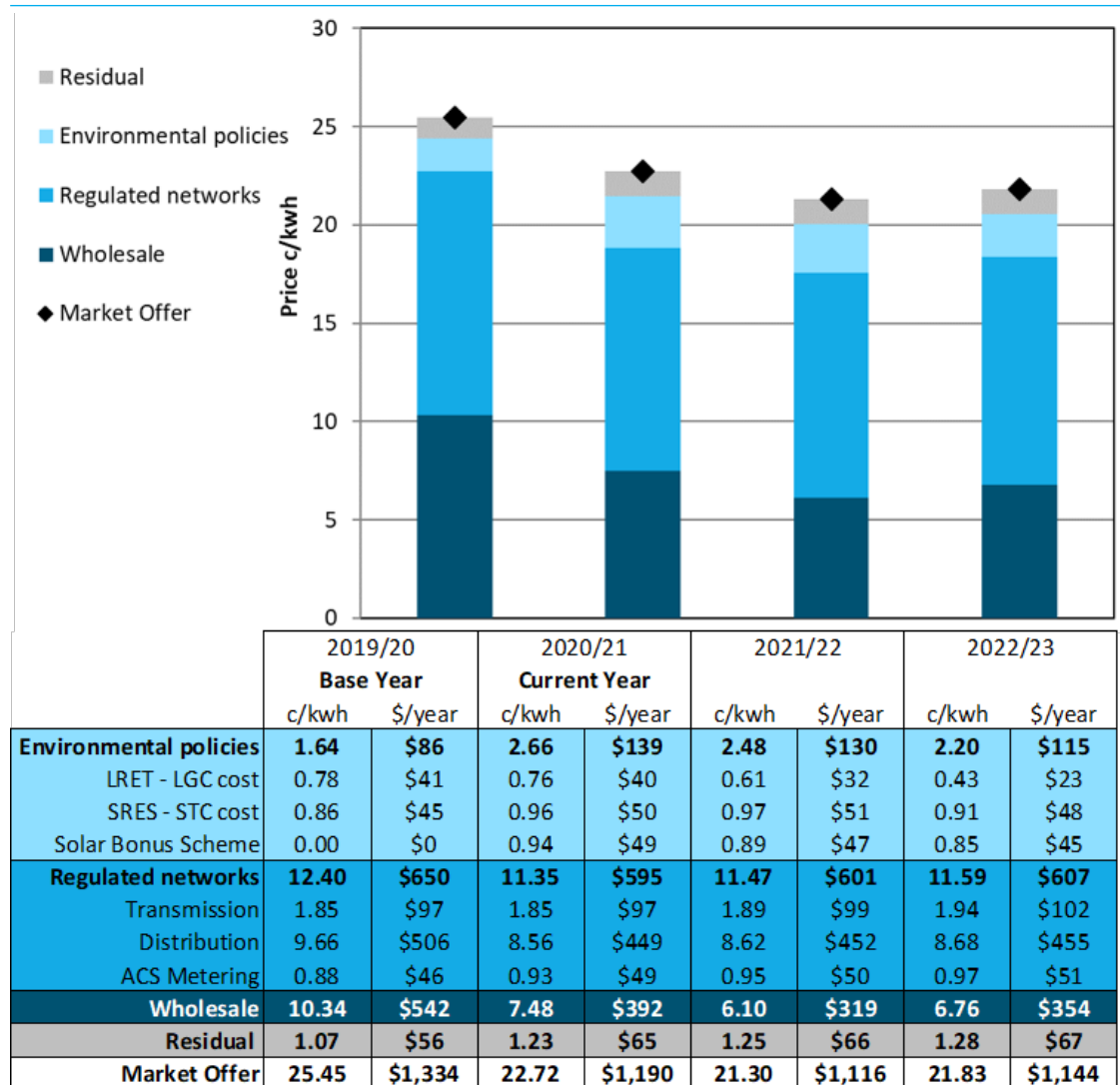
Source: AEMC analysis of ACCC data

Annual residential bills (weighted by customer numbers) are expected to decrease by 8.7 per cent (or \$117) 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 27.4 per cent (or \$152) over the reporting period contributing -11.4 percentage points. This is driven by the influx of new generation and lower gas prices (Figure 2.3).
- Regulated network costs are expected to decrease by 0.6 per cent (or \$4) over the reporting period contributing -0.3 percentage points. This is driven by decrease in distribution and metering costs.
- Environmental costs are expected to go down by 5.2 per cent (or \$5) over the reporting period contributing -0.4 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 explains remaining variations in annual residential bills, contributing 3.3 percentage points.

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.

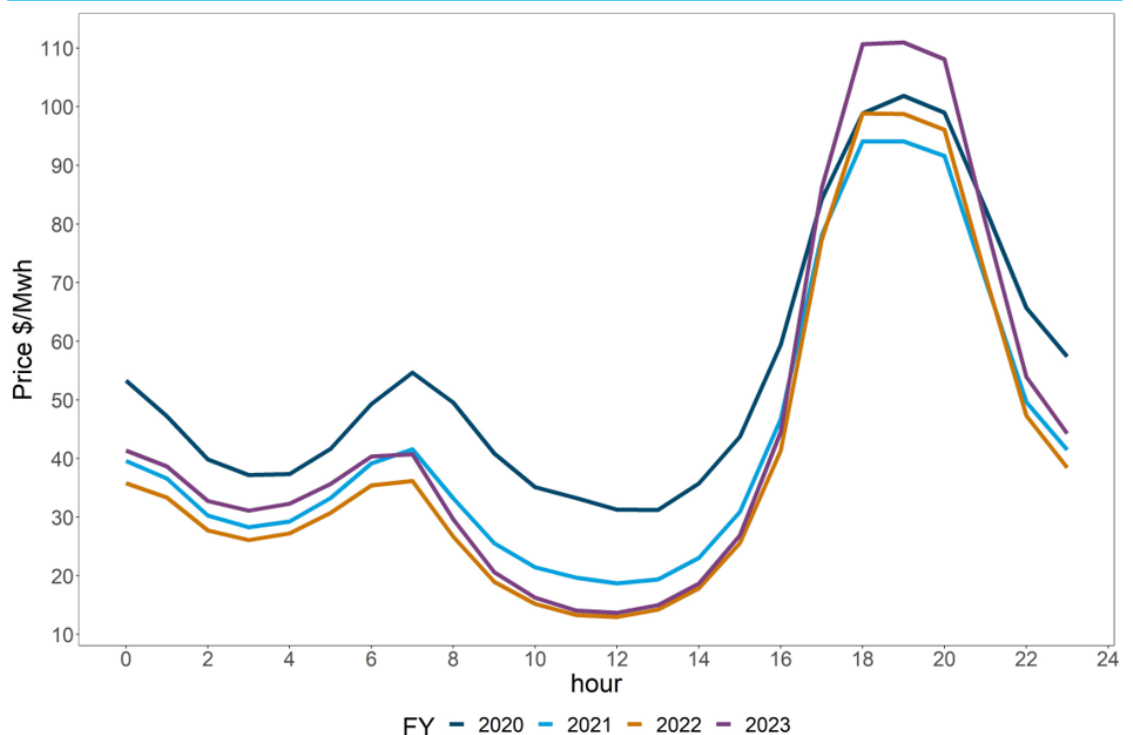
Annual residential bills for South East Queensland are expected to decrease by 14.2 per cent (or \$190) over the whole reporting period. The following supply chain components for South East Queensland's annual residential bill are observed in Figure 2.4:

- Wholesale costs are expected to go down by 34.6 per cent (or \$188) over the reporting period contributing -14.1 percentage points.
- Regulated network costs are expected to decrease by 6.5 per cent (or \$42) over the reporting period contributing -3.2 percentage points. This is driven by reduction in

distribution cost, partly stemming from DUOS over recovery in 2018-19 to be returned to customers in 2020-21.

- Environmental costs are expected to go up by 33.6 per cent (or \$29) over the reporting period contributing 2.2 percentage points. This is driven by the re-introduction of Solar Bonus Scheme⁶ from 1 July 2020.
- The residual cost component explains the remaining variations in the annual residential bill, contributing 0.8 percentage points.

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



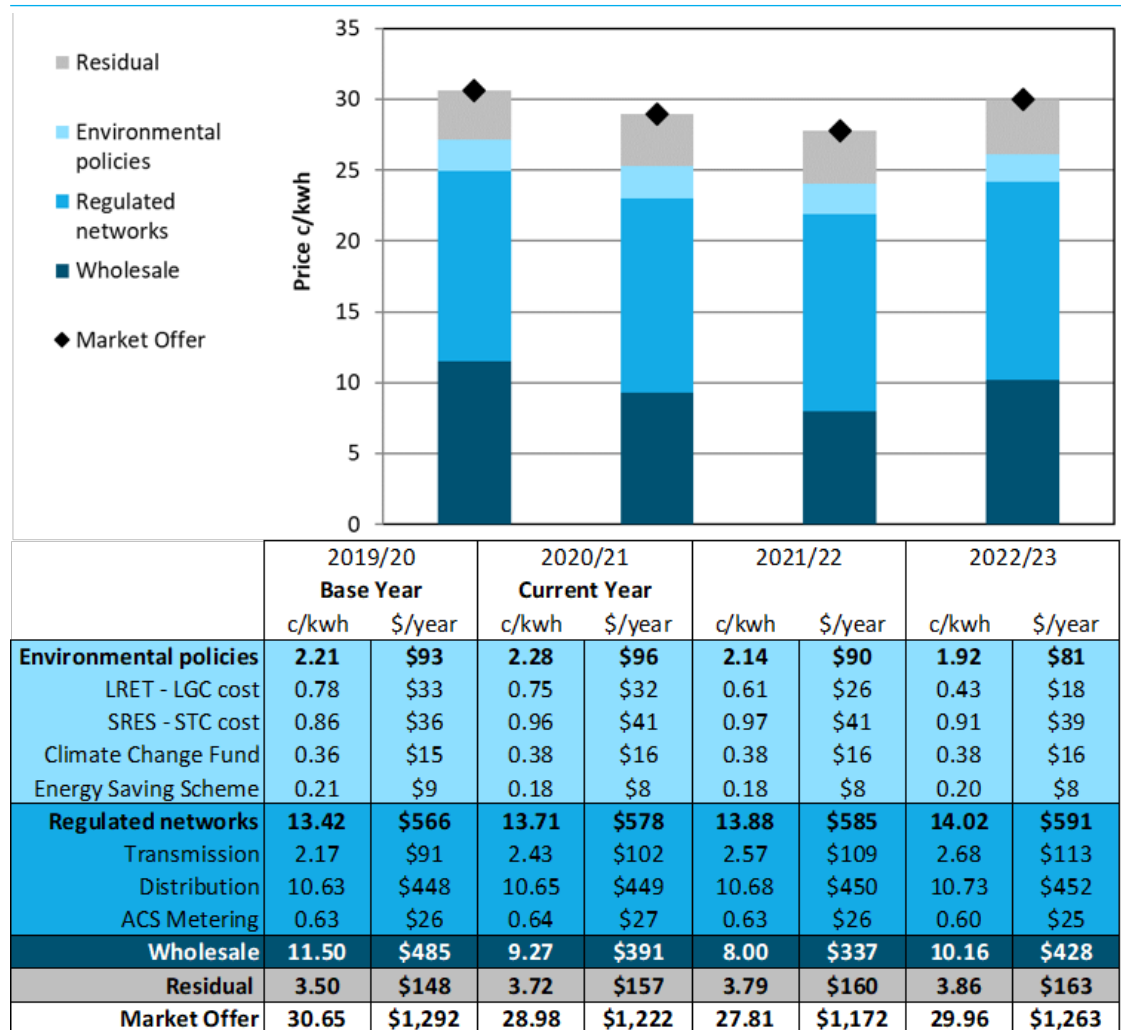
Source: AEMC analysis

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.

6 The Queensland Government funded the Solar Bonus Scheme (SBS) from 1 July 2017 to 1 July 2020.

2.3 Trends in NSW supply chain components

Figure 2.6: Trends in NSW supply chain components



Source: AEMC analysis

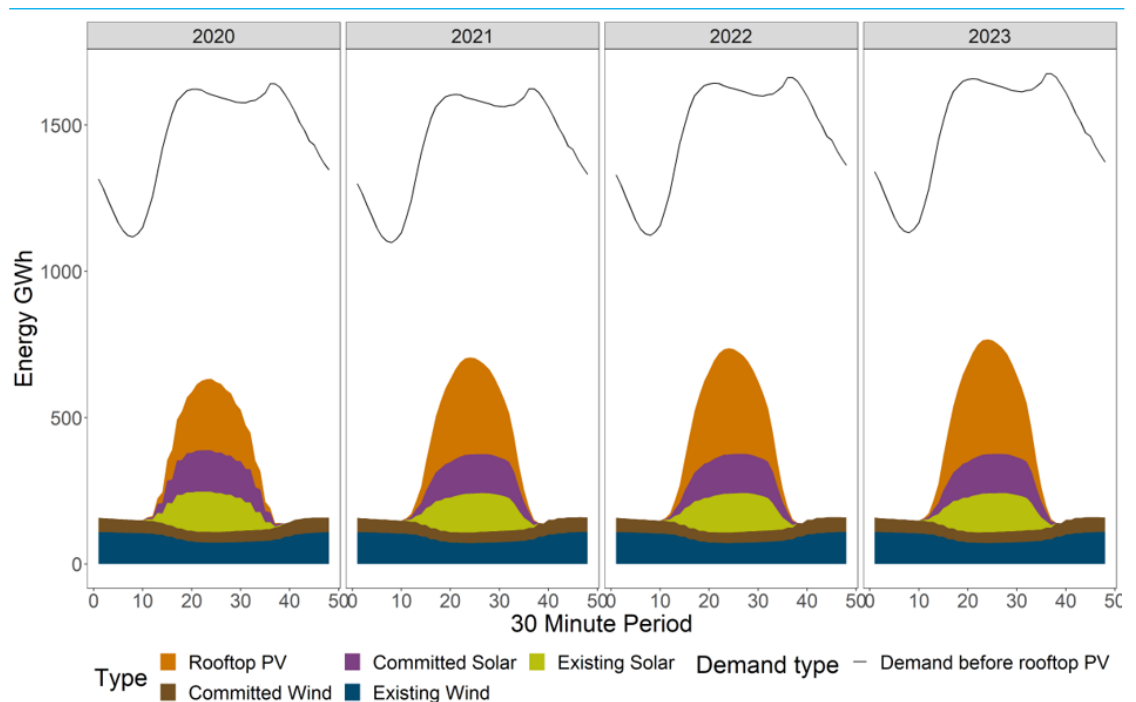
Note: All figures are exclusive of GST.

Annual residential bills in New South Wales are expected to decrease by 2.2 per cent (or \$29) 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 11.7 per cent (or \$57) over the reporting period contributing -4.4 percentage points. This is driven by increasing solar PV penetration (Figure 2.7).
- Regulated network costs are expected to increase by 4.4 per cent (or \$25) over the reporting period contributing 1.9 percentage points. This is driven by an increase in transmission cost.

- Environmental costs are expected to go down by 13.2 per cent (or \$12) over the reporting period contributing -1.0 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 1.1 percentage points.

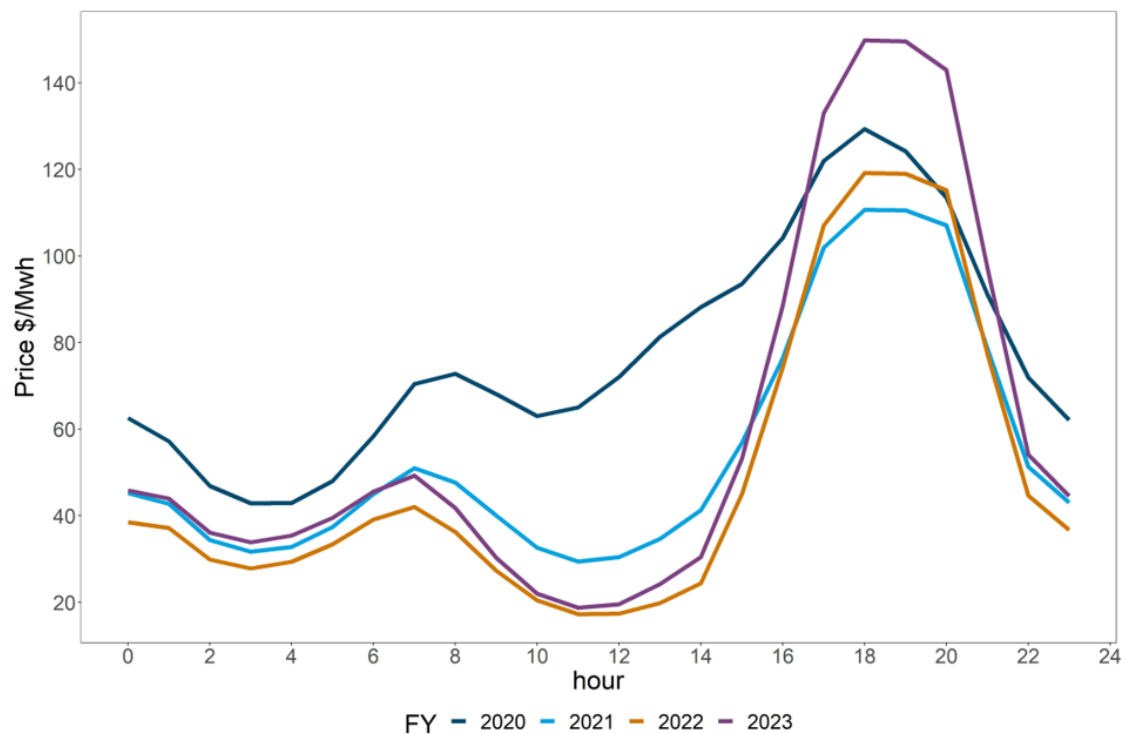
Figure 2.7: Average daily energy profile in NSW



Source: AEMC Analysis

Note: Total committed generation is only that category of generation sourced from AEMO that had 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. Importantly, our modelling does not incorporate the recently announced NSW Roadmap, which seeks to underwrite the addition of 12 GW of renewable energy by 2030. Our modelling also does not incorporate the recent decision of the Federal Government in setting a target for electricity sector to deliver 1000 MW of new dispatchable energy to replace the Liddell power station before it closes down in 2023.

Figure 2.8: Average wholesale electricity prices by hour of day in NSW

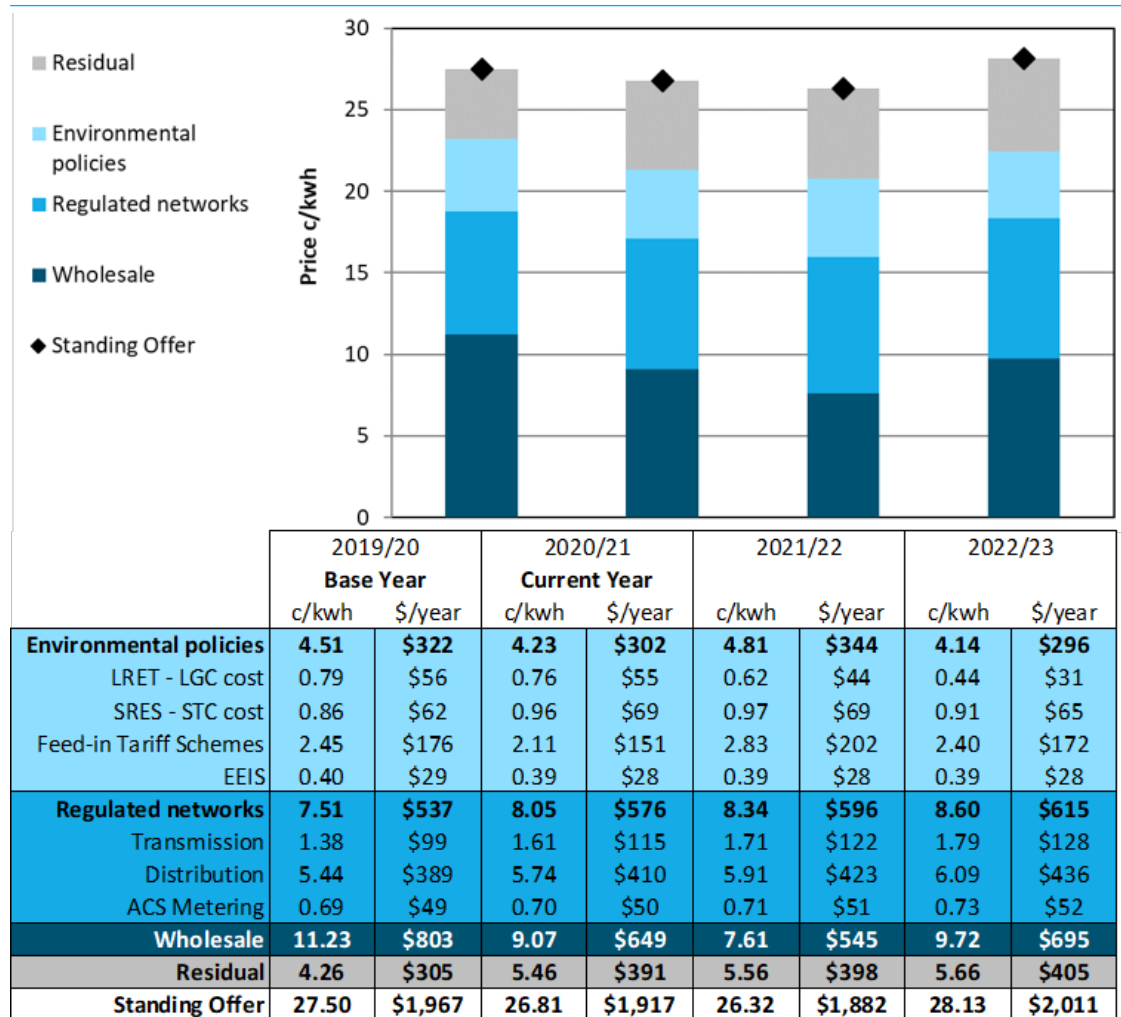


Source: AEMC analysis

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. Importantly, our modelling does not incorporate the recently announced NSW Roadmap, which seeks to underwrite the addition of 12 GW of renewable energy by 2030. Our modelling also does not incorporate the recent decision of the Federal Government in setting a target for electricity sector to deliver 1000 MW of new dispatchable energy to replace the Liddell power station before it closes down in 2023.

2.4 Trends in ACT supply chain components

Figure 2.9: 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.

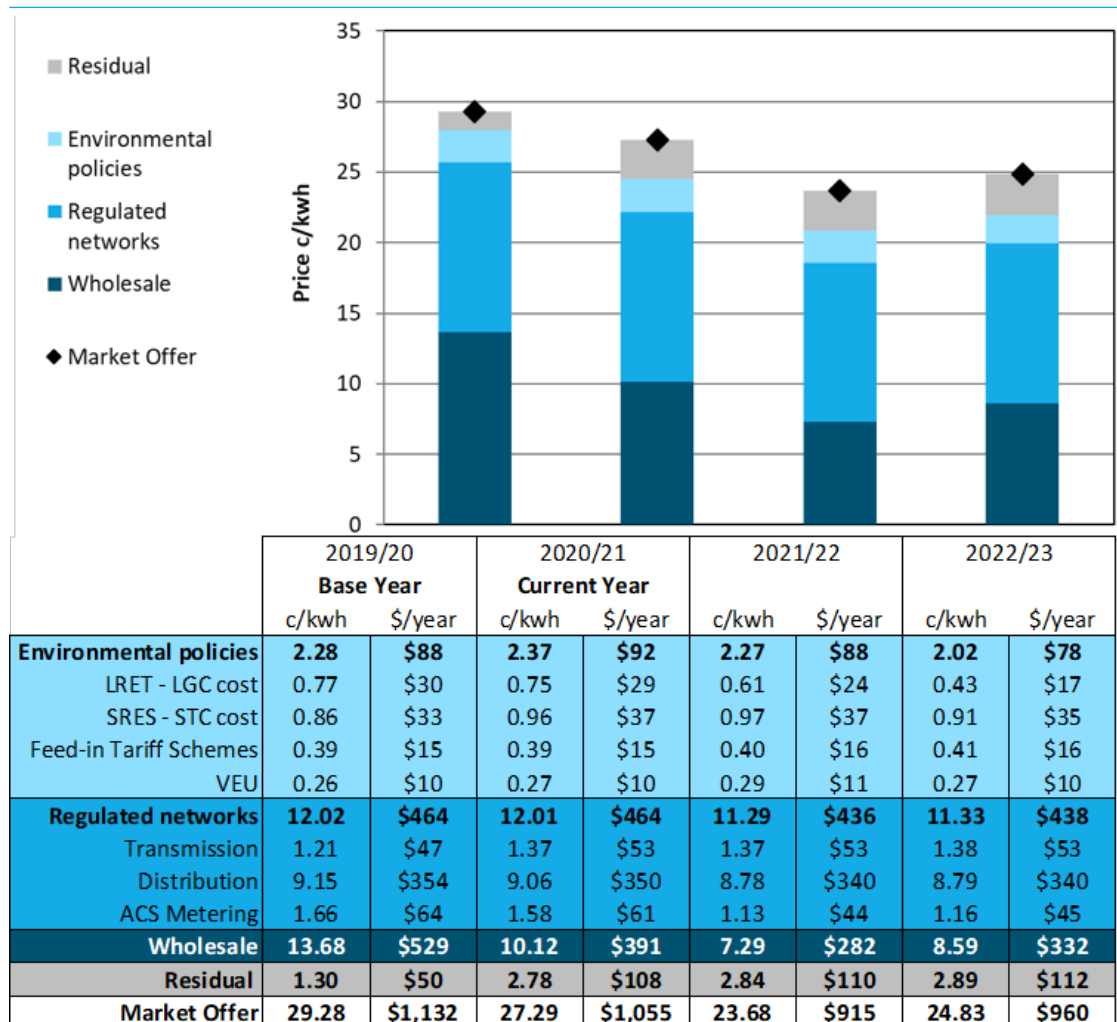
Annual residential bills in the Australian Capital Territory are expected to increase by 2.3 per cent (or \$45) over the whole reporting period. The following supply chain components for the Australian Capital Territory's annual residential bill are observed in Figure 2.9:

- Wholesale costs are expected to go down by 13.4 per cent (or \$108) over the reporting period contributing -5.5 percentage points.
- Regulated network costs are expected to increase by 14.6 per cent (or \$78) over the reporting period contributing 4.0 percentage points. This is driven by increase in distribution and transmission costs; partly due to previous under-recoveries and higher operating expenditure.

- Environmental costs are expected to go down by 8.1 per cent (or \$26) over the reporting period contributing -1.3 percentage points. This is driven mainly by a decrease in the LRET costs.
- The residual cost component explains the remaining variations in the annual residential bill, contributing 5.1 percentage points.

2.5 Trends in VIC supply chain components

Figure 2.10: Trends in VIC supply chain components



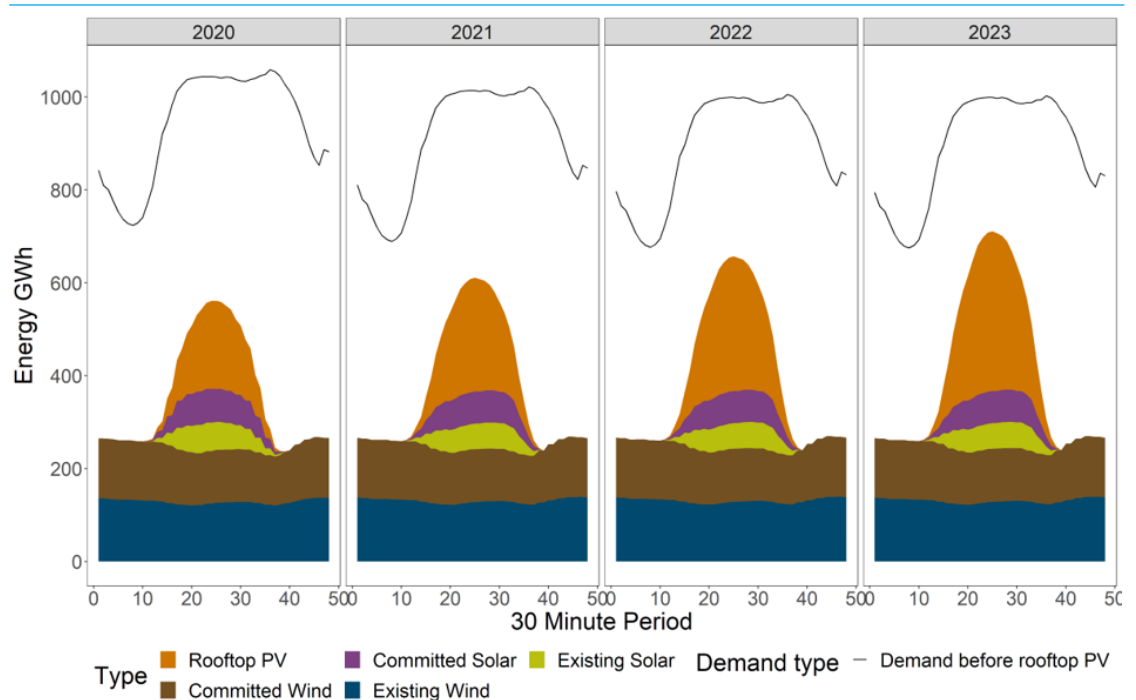
Source: AEMC analysis

Note: All figures are exclusive of GST.

Annual residential bills in Victoria are expected to decrease by 15.2 per cent (or \$172) over the whole reporting period. The following supply chain components for Victoria's annual residential bill are observed in Figure 2.10:

- Wholesale costs are expected to go down by 37.2 per cent (or \$197) over the reporting period contributing -17.4 percentage points. This is driven by increases in generation capacity, particularly wind farms (Figure 2.11).
- Regulated network costs are expected to decrease by 5.7 per cent (or \$27) over the reporting period contributing -2.4 percentage points. This is driven by decrease in distribution and metering costs; partly due to lower return on capital.
- Environmental costs are expected to go down by 11.4 per cent (or \$10) 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 5.4 percentage points.

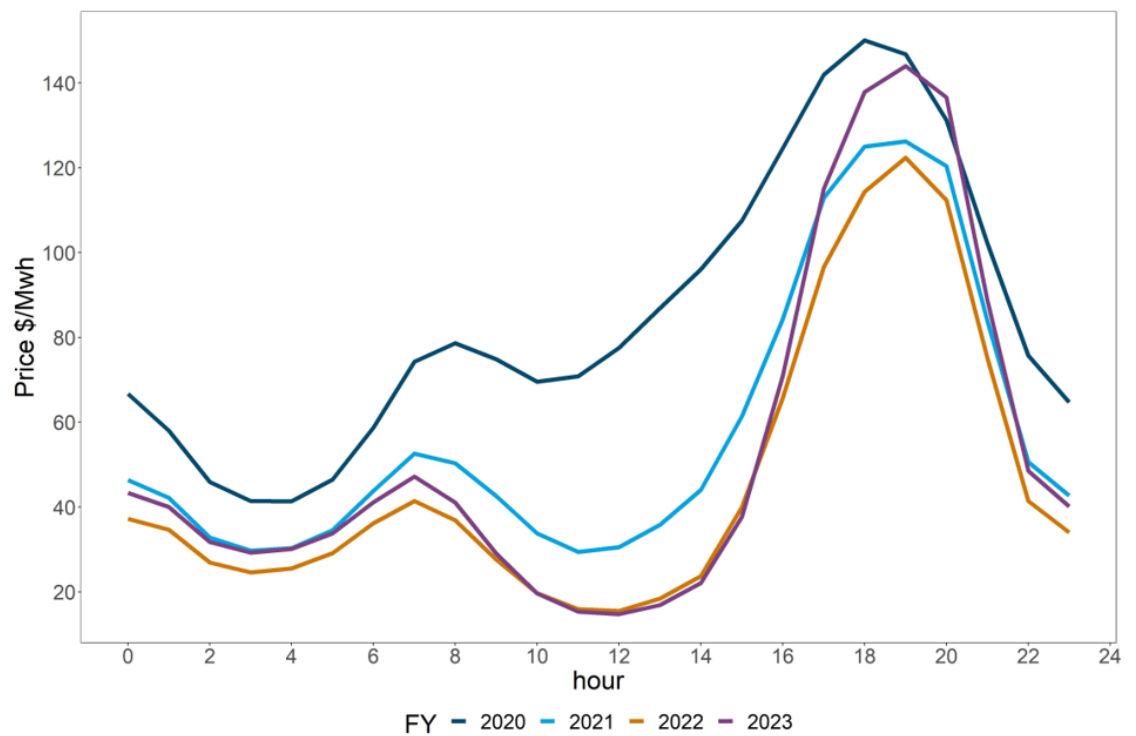
Figure 2.11: Average daily energy profile in VIC



Source: AEMC Analysis

Note: Total committed generation is only that category of generation sourced from AEMO that had 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.

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

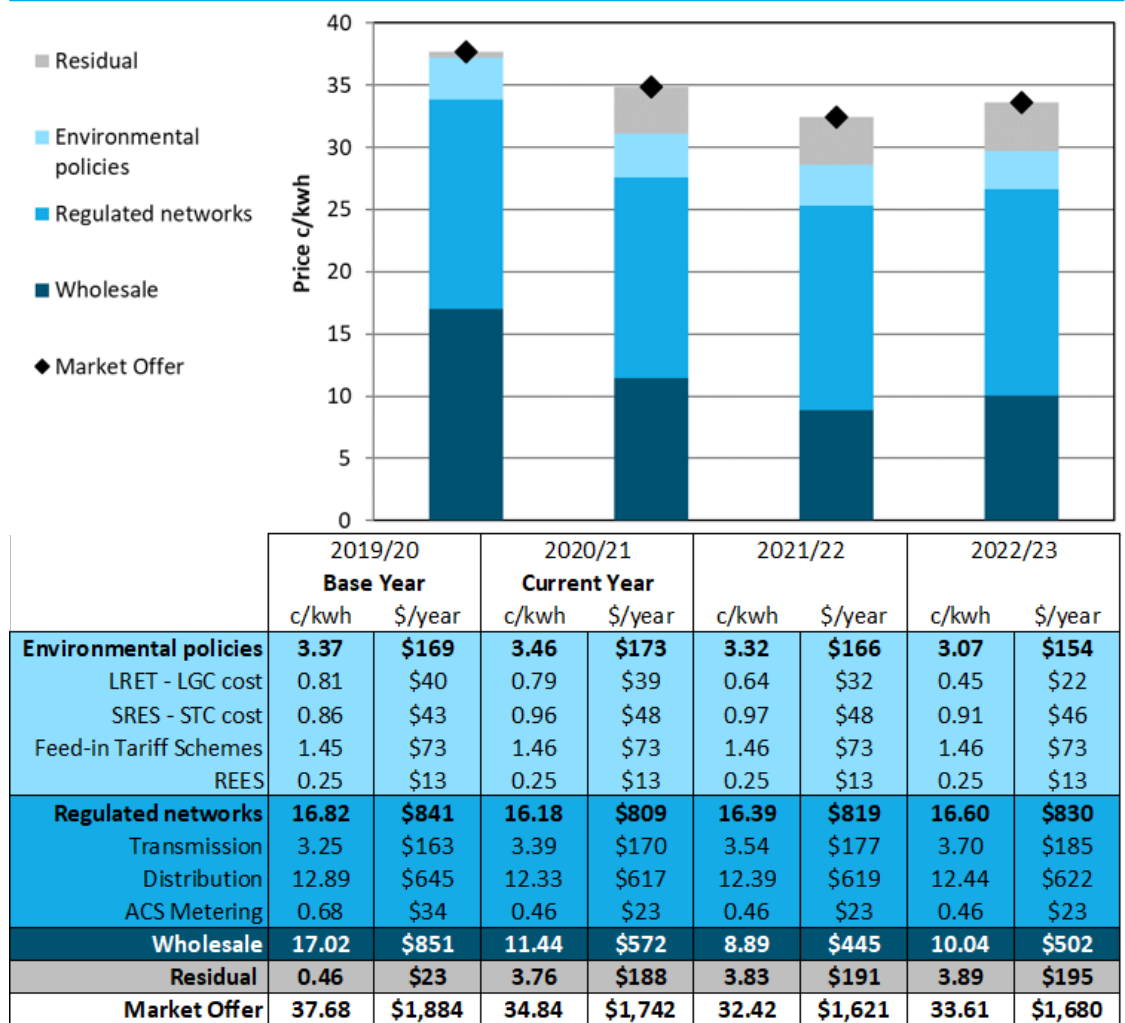


Source: AEMC analysis

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 2.13: Trends in SA supply chain components



Source: AEMC analysis

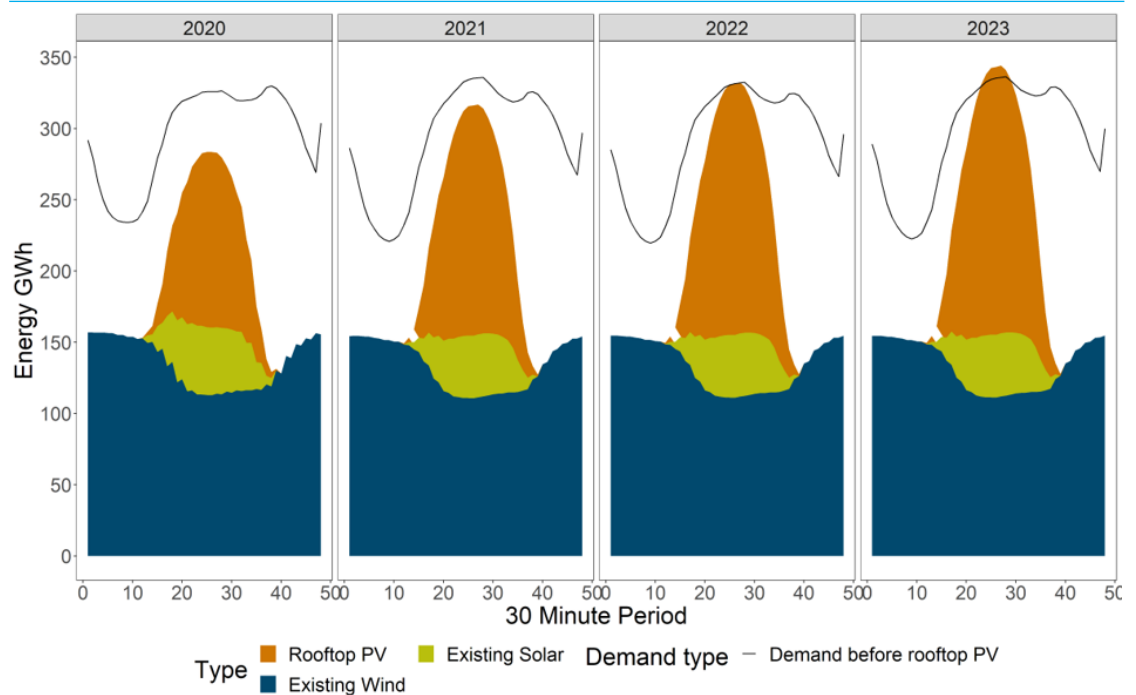
Note: All figures are exclusive of GST.

Annual residential bills in South Australia are expected to decrease by 10.8 per cent (or \$203) over the whole reporting period. The following supply chain components for South Australia's annual residential bill are observed in Figure 2.13:

- Wholesale costs are expected to go down by 41.0 per cent (or \$349) over the reporting period contributing -18.5 percentage points. This is driven by increasing solar PV penetration (Figure 2.14), which is evident in an increase of negative prices in South Australia (Figure 2.15).

- Regulated network costs are expected to decrease by 1.3 per cent (or \$11) over the reporting period contributing -0.6 percentage points. This is driven by decrease in distribution and metering costs; partly due to lower return on capital.
- Environmental costs are expected to go down by 8.9 per cent (or \$15) over the reporting period contributing -0.8 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 9.1 percentage points.

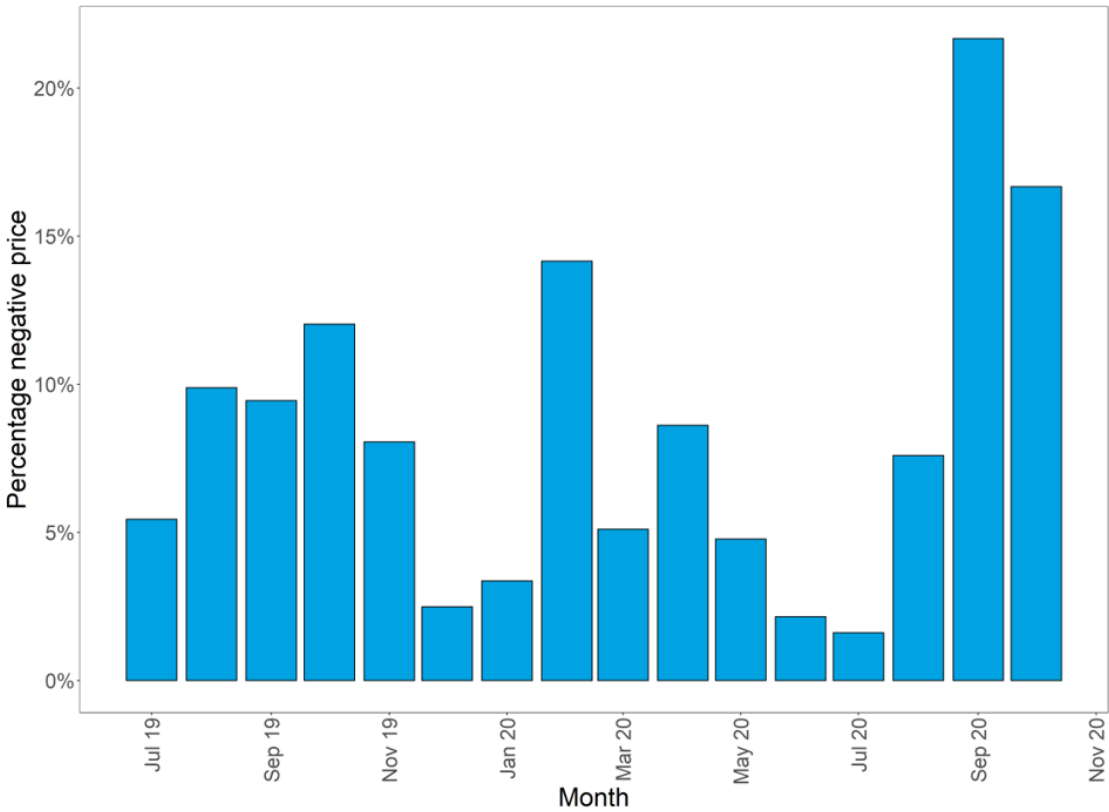
Figure 2.14: Average daily energy profile in SA



Source: AEMC Analysis

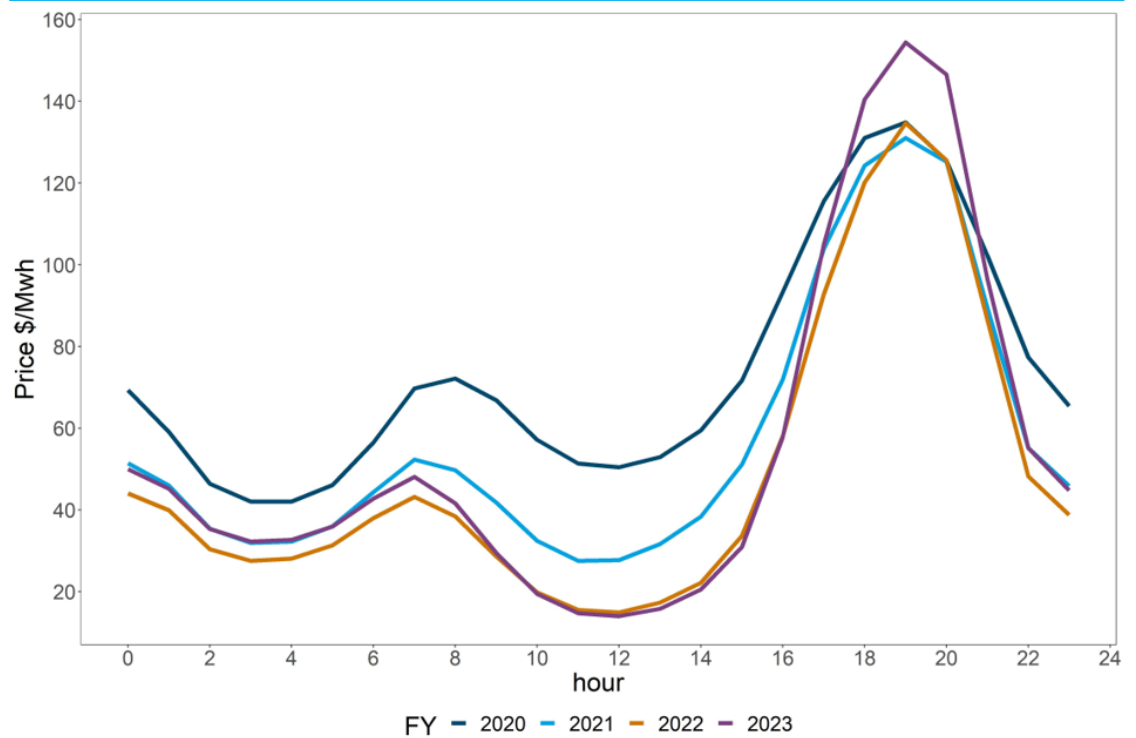
Note: Total committed generation is only that category of generation sourced from AEMO that had reached financial close before the modelling was undertaken. Other new capacity may have been included as new generation within the modelling period. Since the modelling was undertaken, additional projects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

Figure 2.15: Percentage of negative prices in SA



Source: AEMC Analysis

Figure 2.16: Average wholesale electricity prices by hour of day in SA

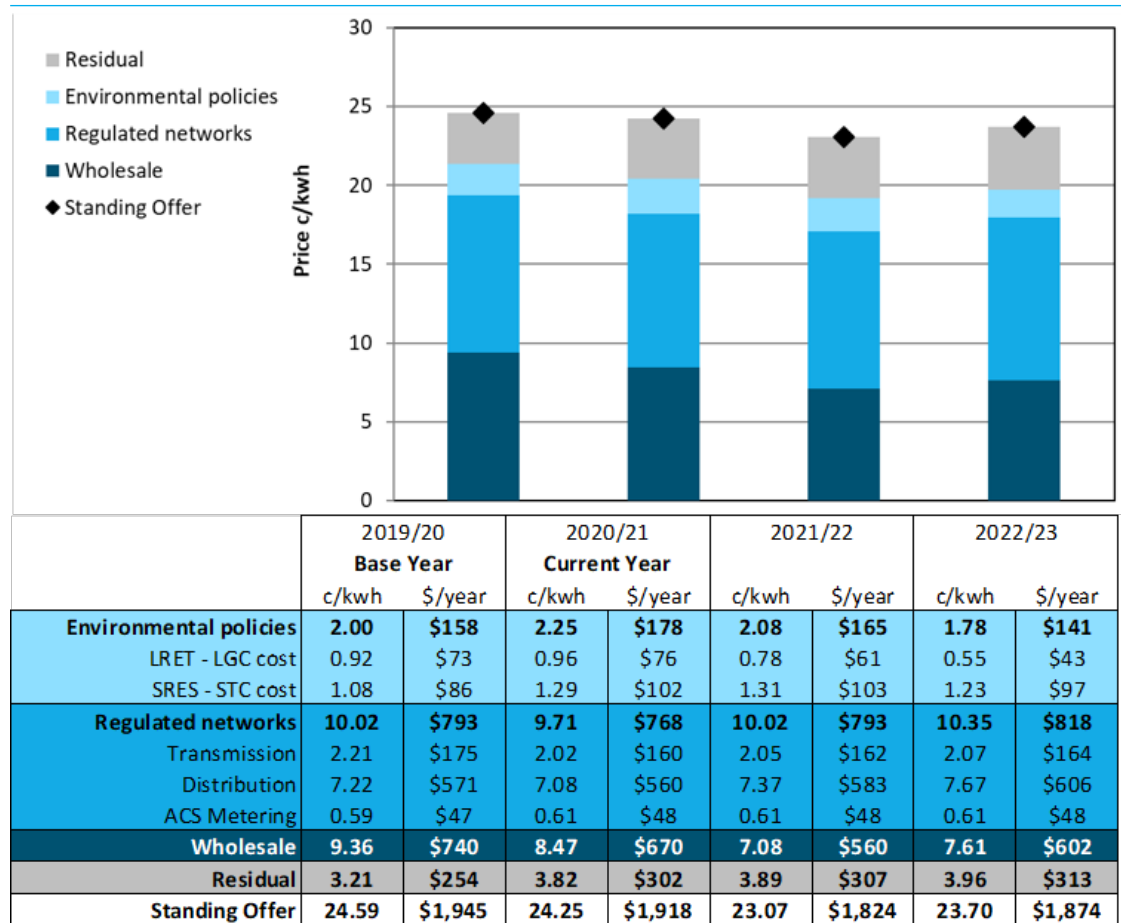


Source: AEMC analysis

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 2.17: Trends in TAS supply chain components



Source: AEMC analysis

Note: All figures are exclusive of GST. The Tasmania Economic Regulator put a cap on the annual growth of the standing offer prices according to the CPI for Hobart (2016 Standing Offer Determination). Annual average growth rate up to March 2020 is calculated to be 2.7 per cent.

Annual residential bills in Tasmania are expected to decrease by 3.6 per cent (or \$70) over the whole reporting period. The following supply chain components for Tasmania's annual residential bill are observed in Figure 2.17:

- Wholesale costs are expected to go down by 18.6 per cent (or \$138) over the reporting period contributing -7.1 percentage points. Wholesale costs in 2019-20 and 2020-21 are based on the Aurora Energy Standing Offer Tariff Schedule. Wholesale electricity purchase costs in 2020-21 and 2021-22 are based on hedging Tasmanian load shape at Victorian spot.
- Regulated network costs are expected to increase by 3.2 per cent (or \$26) over the reporting period contributing 1.3 percentage points. This is driven by an increase in distribution costs.

- Environmental costs are expected to go down by 11.1 per cent (or \$18) over the reporting period contributing -0.9 percentage points. LRET and SRES costs in 2019-20 and 2020-21 are based on the Aurora Energy Standing Offer Tariff Schedule.
- The residual cost component explains the remaining variations in the annual residential bill, contributing 3.1 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.
- The NSW Government's Electricity Infrastructure Roadmap has not been taken into account.

Network costs

- Our analysis considers relevant information from the latest available network revenue determinations.⁷ 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 2020 retail offers and the sum of the other cost components, remains constant in real terms.
- 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 Residential 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 2.18, shows that from 2014-15 to 2019-20:

- the expected direction of the trend in total retail prices and cost components was generally accurate in the majority of cases.

⁷ Note that the latest PTRMs used in the analysis also include ElectraNet's Eyre Peninsula contingent project and QNI minor contingent project. The cost of the Integrated System Plan 2020 projects are only included when it is considered by the AER through the determination process and/or contingency project. VNI Minor has been included in our wholesale market modelling but this has not been reflected in the transmission costs because it does not appear in the PTRM. In our opinion, this makes little to no difference to the overall results because of the relative size of VNI minor.

- 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.⁸ However, actual competitive market costs decreased, due to:
 - a major reduction in AEMO's forecast of electricity demand,⁹ and
 - lower forecast gas prices driven by forecasts of lower global fuel prices.¹⁰
 - 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 based on the outcome of our recent wholesale cost modelling. 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.
- 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.

⁸ 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.

⁹ AEMC, 2016 Residential Electricity Price Trends, Final Report, 14 December 2016, p4.

¹⁰ Ibid, p4.

Figure 2.18: 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
Source of estimated prices and costs	2013 report	2014 report	2015 report	2016 report	2016 report	2017 report	2018 report	2019 report
Source of actual prices and costs	2014 report	2015 report	2016 report	2017 report	2018 report	2018 report	2019 report**	2020 report^
Total retail price								
Estimated price	28	27	25	26	26	30	29	28
Estimated price change		-1	-2	1	1	3	-1	0
Estimated direction of trend		Decrease	Decrease	Increase	Increase	Increase	Decrease	Decrease
Actual price	29	26	25	28	30	30	30	28
Actual price change		-3	-1	3	2	0	1	-3
Actual direction of trend		Decrease	Decrease	Increase	Increase	Decrease	Increase	Decrease
Network costs								
Estimated price	14	14	12	12	12	14	13	13
Estimated price change		0	-2	0	0	1	0	-1
Estimated direction of trend		Decrease	Decrease	Increase	Increase	Increase	Decrease	Decrease
Actual price	14	13	12	14	13	13	13	13
Actual price change		-1	-1	1	0	0	0	-1
Actual direction of trend		Decrease	Decrease	Increase	Decrease	Increase	Decrease	Decrease
Wholesale costs*								
Estimated price	5	10	11	7	8	11	10	11
Estimated price change		5	1	-4	1	3	-1	1
Estimated direction of trend		Increase	Increase	Decrease	Increase	Increase	Decrease	Increase
Actual price	10	11	10	10	12	12	12	9
Actual price change		0	0	0	2	0	0	-3
Actual direction of trend		Increase	Decrease	Decrease	Increase	Increase	Increase	Decrease
Environmental costs								
Estimated price	4	2	2	2	2	2	2	2
Estimated price change		-2	0	0	0	0	0	0
Estimated direction of trend		Decrease	Decrease	Increase	Decrease	Decrease	Increase	Decrease
Actual price	4	2	2	2	2	2	2	3
Actual price change		-3	0	0	0	0	0	1
Actual direction of trend		Decrease	Increase	Decrease	Decrease	Increase	Decrease	Increase

Source: AEMC 2013, 2014, 2015, 2016, 2017, 2018, 2019, 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 and 2019-20 the comparison of actual and expected results are for wholesale costs only. ** For 2019 report, the figures are estimated by not including Northern Territory. ^ For 2020 report, the figures are estimated by not including Northern Territory and Western Australia.

3

MAIN ASSUMPTIONS

3.1

Representative customer approach

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 have been used for the whole reporting period. Annual consumption of a representative consumer based on AER benchmark values and provided by jurisdictional governments are provided in Table 3.1 and Table 3.2 respectively.

This report uses data provided by the AER from their 2017 Electricity Bill Benchmarks¹¹ to estimate the annual consumption value and quarterly breakdown for most jurisdictions. Equivalent values to the AER are provided by jurisdictions in South Australia and Western Australia. 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.

Table 3.1: Annual consumption of representative consumer – based on AER benchmark values

JURISDICTION	MOST COMMON HOUSEHOLD TYPES	CONSUMPTION BY TYPE (KWH)	TOTAL ANNUAL CONSUMPTION (KWH)
Queensland	2-person household, no mains gas, air conditioning, off-peak hot water and on a market offer	Tariff 11: 4,434 Tariff 33 (Controlled Load 2): 806	5,240
New South Wales	2-person household; mains gas and on a market offer	4,215	4,215
Australian Capital Territory	2-person household, no mains gas, electricity water heating and on the regulated standing offer	7,151	7,151
Victoria	2-person household, mains gas and on market offer	3,865	3,865
Tasmania	2-person household, no mains gas, electric water heading and on the regulated standing offer	Tariff 31 (Lighting): 3,559 Tariff 41 (Heating): 4,349	7,908

Source: AER

¹¹ At the time of writing, the AER Electricity and Gas Consumption Benchmarks for Residential Customers 2020 has not been published and scheduled to be released in December 2020.

Table 3.2: Annual consumption of representative consumer - provided by jurisdictional government

JURISDICTION	MOST COMMON HOUSE-HOLD TYPES	CONSUMPTION BY TYPE (KWH)	TOTAL ANNUAL CONSUMPTION (KWH)
South Australia	2-person household; mains gas and on a market offer	5,000	5,000

Source: South Australia Government

3.2

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) and for Western Australia come from the Electricity Price Order. Table 3.3 provides detailed information on the sources of electricity pricing data.

Table 3.3: Sources of electricity pricing data

JURISDICTION	OFFER	2019-20	2020-21
NSW, ACT, SA	Standing	Retailer offers obtained from Energy Made Easy in September 2019	Retailer offers obtained from Energy Made Easy in September 2020
	Market		
South East Queensland	Standing	Retailer offers obtained from Energy Made Easy in September 2019	Retailer offers obtained from Energy Made Easy in September 2020
	Market		
Tasmania	Standing	Aurora Energy approved standing offer prices from 1 July 2019	Aurora Energy approved standing offers prices from 1 July 2020
	Market	None	None
Victoria	Standing	Retail offers obtained from Victorian Energy Compare in August 2019	Retail offers obtained from Victorian Energy Compare in August 2019 and October 2020
	Market		

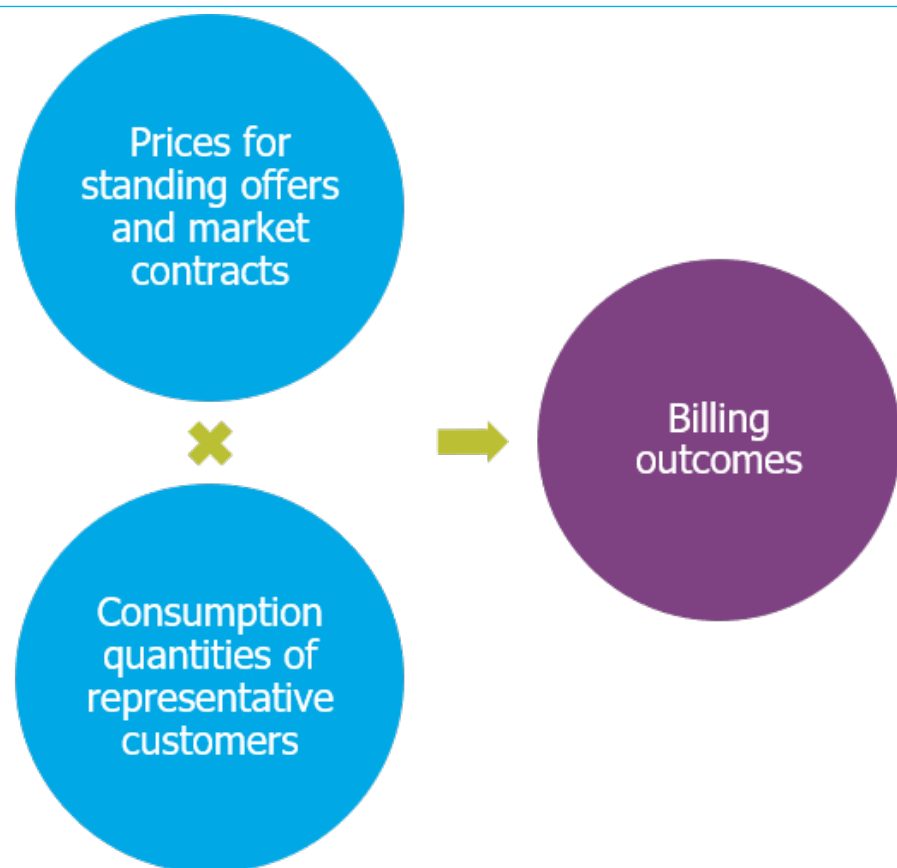
Source: AEMC and cited sources

Note: 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 will occur on a financial year basis instead as approved by the Victorian government. Data used for estimating Victorian offer price in 2019-20 come from Victorian Energy Compare on 1 August 2019.

Using above assumptions of representative consumer and the lowest retail offers for 2019-20 and 2020-21 in each jurisdiction based on the electricity pricing data stated in Table 3.3, the

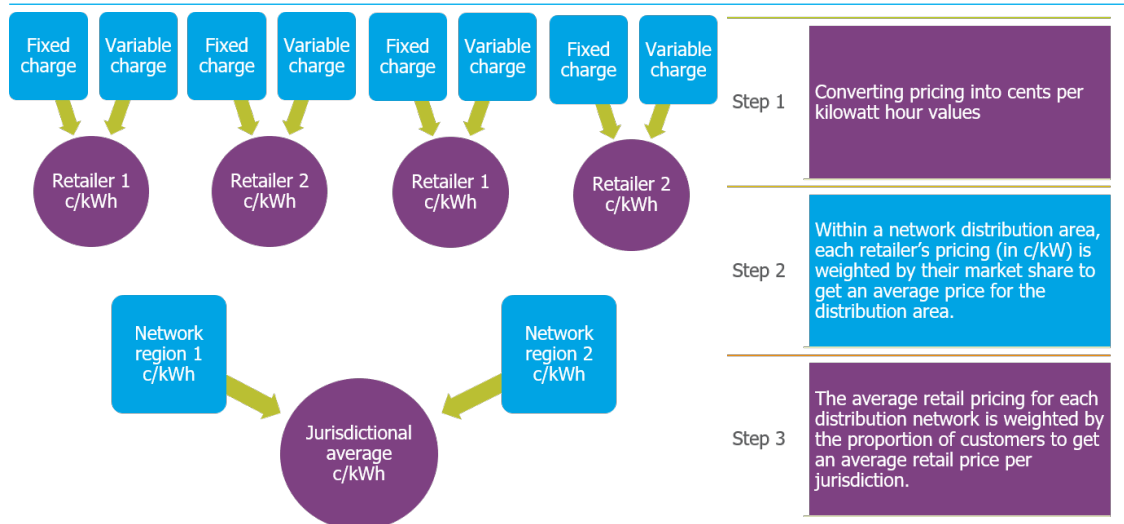
representative retail electricity price by each retailer can be calculated as shown in Figure 3.1. The average retail price per jurisdiction is explained in Figure 3.2. Firstly, the representative retail electricity price by each retailer is converted into cents per kilowatt hour values. Secondly, within 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 3.1: Calculation of representative retail electricity prices



Source: AEMC analysis

Figure 3.2: Process of calculating a jurisdictional average price



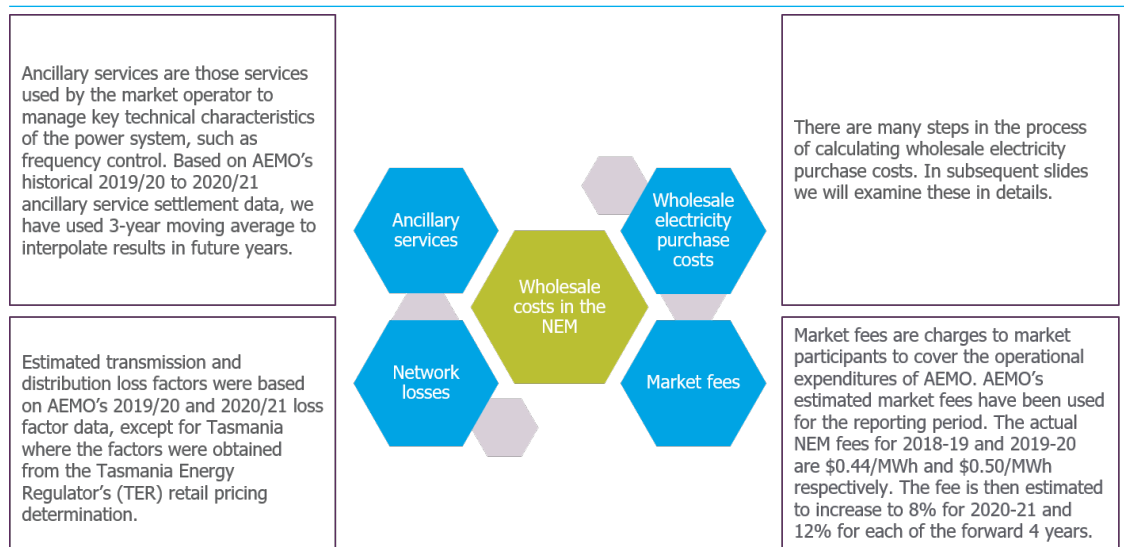
Source: AEMC analysis

3.3

Wholesale costs

Wholesale electricity costs are estimated based on the calculations of four cost components (Figure 3.3), which are wholesale electricity purchase costs, network losses, ancillary services and market fees.

Figure 3.3: Four components of wholesale electricity costs in the NEM



Source: AEMC analysis

Wholesale electricity purchase costs

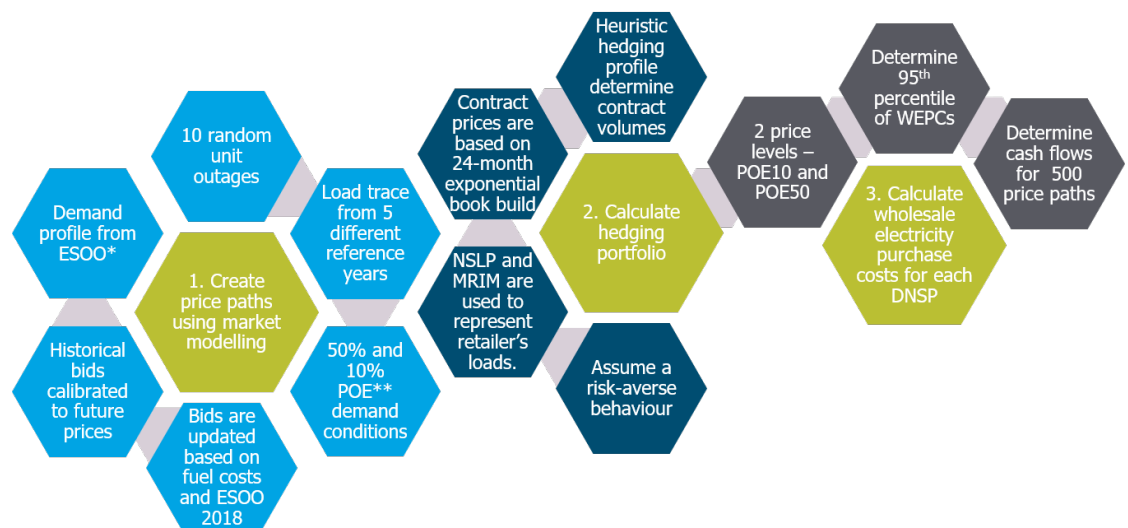
There are 3 main steps in the process of calculating wholesale electricity purchase costs. These steps are illustrated below in Figure 3.4. The main assumptions for each of these steps are presented in Figure 3.5. Figure 3.6, Figure 3.7 and Figure 3.8 explain steps 1-3 respectively.

Figure 3.4: Steps in the process of calculating wholesale electricity purchase costs



Source: AEMC analysis

Figure 3.5: Wholesale electricity purchase costs – main assumptions

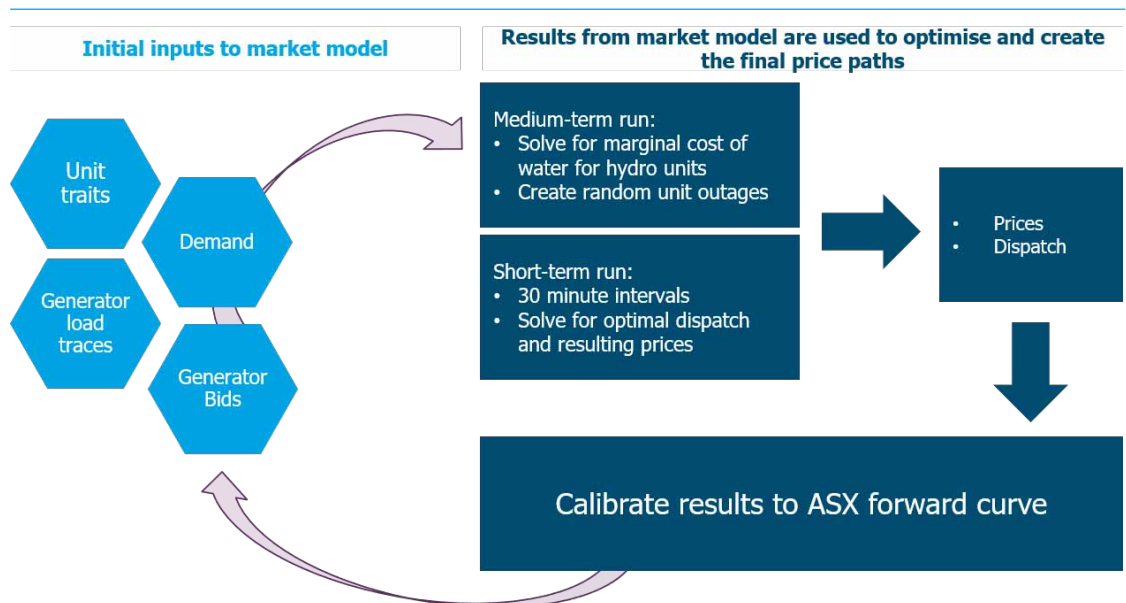


*Electricity Statement of Opportunities

**Probability of Exceedance

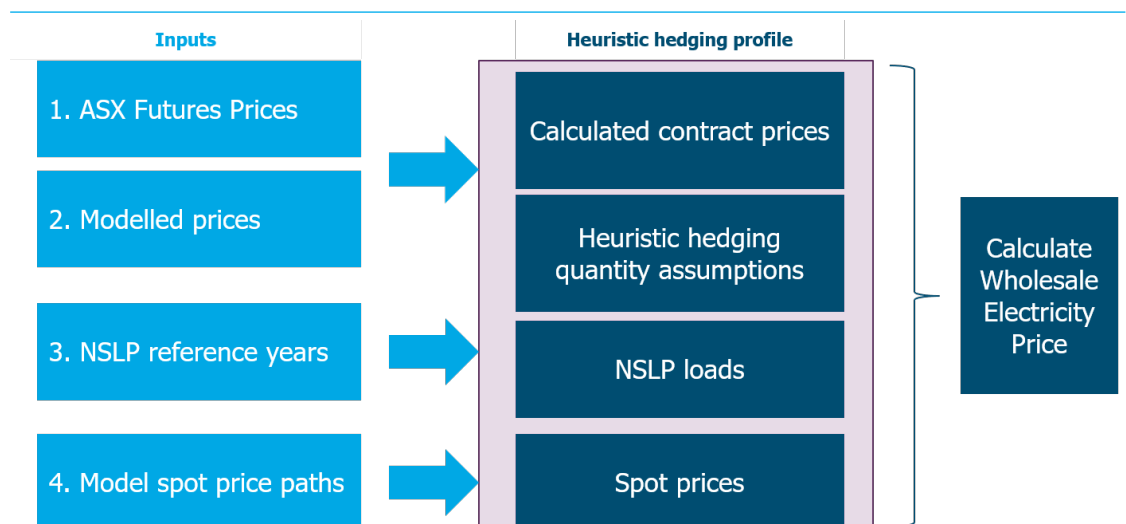
Source: AEMC analysis

Figure 3.6: Create price paths using market modelling



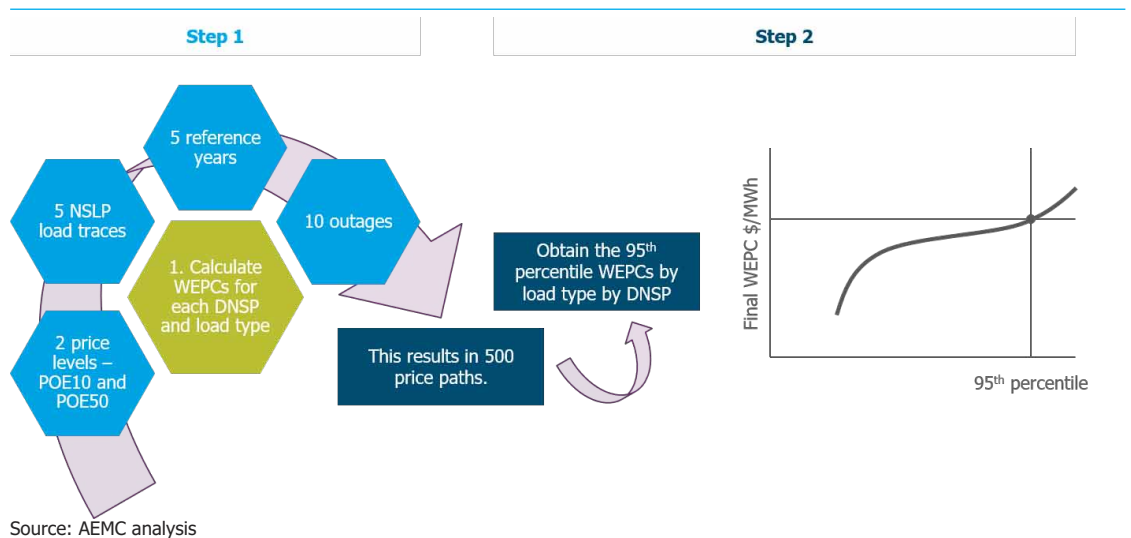
Source: AEMC analysis

Figure 3.7: Calculate optimal hedging portfolio



Source: AEMC analysis

Figure 3.8: Calculate wholesale electricity purchase costs for each DNSP



3.4

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 3.9 shows the calculation methods for these two schemes and Figure 3.10 shows the calculation method for the volume of the small-scale technology certificates (STCs).

Figure 3.9: Environmental cost calculations - LRET and SRES

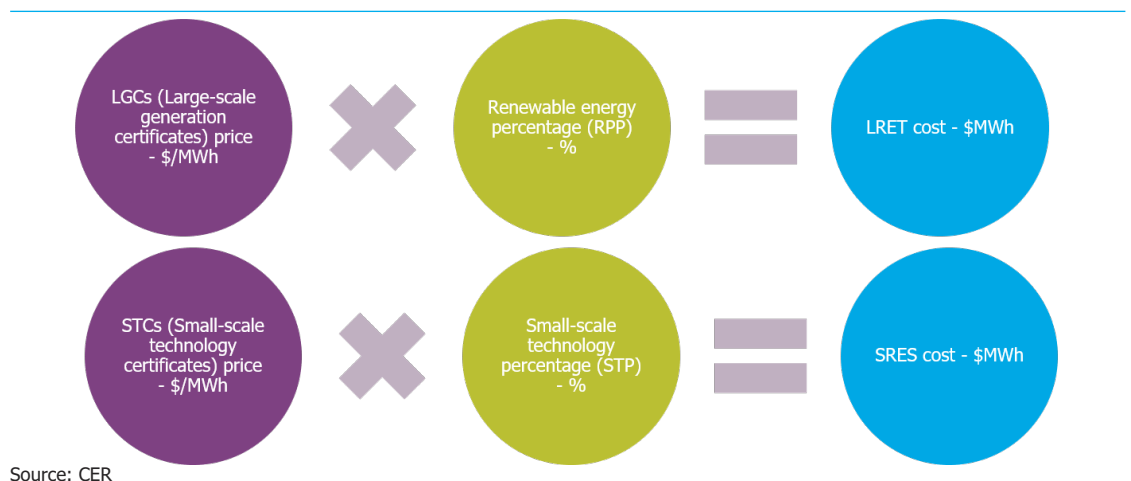
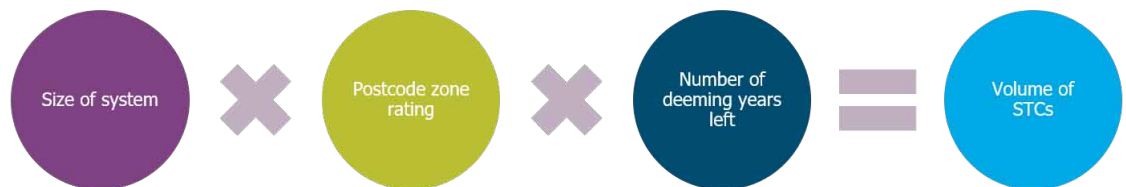


Figure 3.10: Calculation method for the volume of STCs



Source: CER

3.5 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 3.11.

Figure 3.11: Regulated network costs - Network tariff sources and regulatory periods

Summary of approaches for estimating network costs

	2019/20		2020/21		2021/22	2022/23
Transmission						
New South Wales/ACT						
South Australia						
South East Queensland						
Tasmania ^						
Victoria	CY 2019	CY2020	CY 2020	CY2021		
Distribution & Metering						
New South Wales/ACT						
South Australia						
South East Queensland						
Tasmania^						
Victoria	CY 2019	CY2020	CY 2020	CY2021		
Source: AEMC analysis						

Key:

- Annual pricing proposal
- Final decision
- Constant in real terms
- Draft decision

Key:

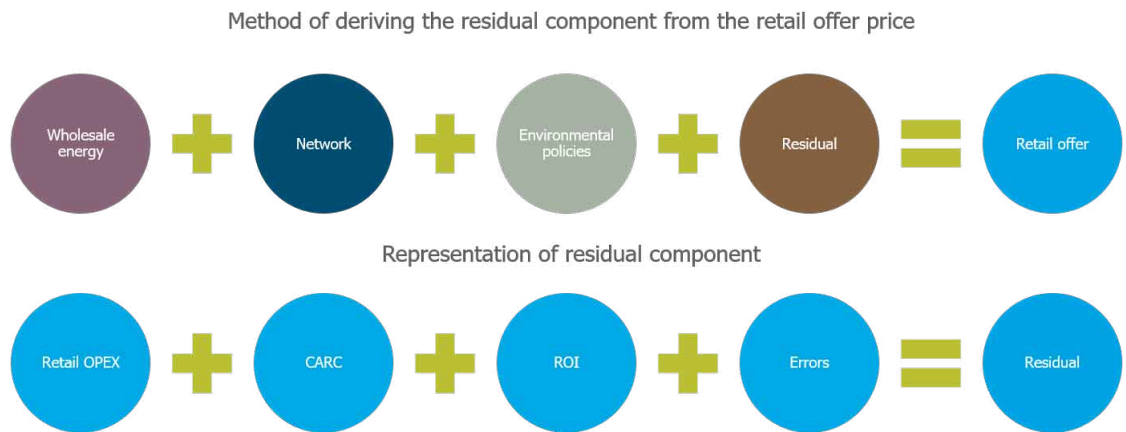
- Annual pricing proposal
- Final decision
- Constant in real terms
- Draft decision

Source: AEMC analysis

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

3.6 Residual component or retail cost

Figure 3.12: 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.