

Australian Energy Market Commission

## FINAL REPORT

# RESIDENTIAL ELECTRICITY PRICE TRENDS 2019

9 DECEMBER 2019

REVIEW

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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 2019 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 2018-19 to 2021-22.

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 excludes the Northern Territory from 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 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 3 September 2019
- network cost information that was publicly available up until 11 November 2019. 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 tenth annual residential electricity price trends report prepared by the Australian Energy Market Commission (AEMC) at the request of the Council of Australian Governments' Energy Council (COAG or the Council).<sup>1</sup>

The 2019 residential electricity price trends report (2019 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 nationally, from 2018-19 to 2021-22 (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.

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.

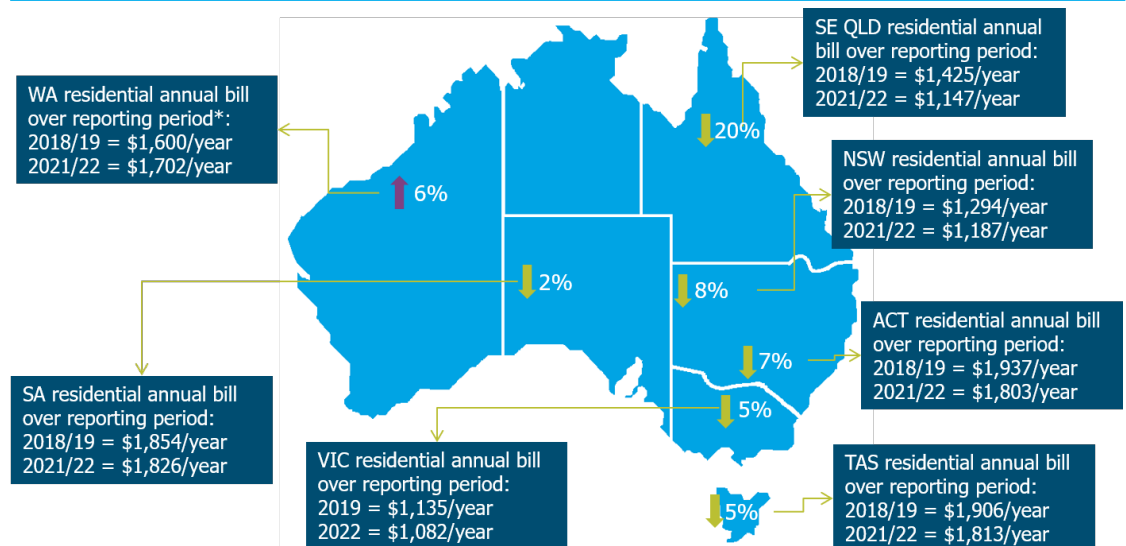
We also provide a comparison of expected trends from past reports with the actual historical trends, together with the major factors that caused them to diverge.

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<sup>1</sup> A copy of the terms of reference is available in the AEMC website.

<sup>2</sup> Northern Territory is excluded from 2019 report because of the lack of information provided by the jurisdiction – 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

Note: \* A different methodology has been used for WA allowing the AEMC to estimate both electricity cost of supply and residential price. Our results for WA should be treated with caution given the different methodology that has been used to establish these prices. Residential electricity prices are set by the WA Government.

## 2

## RESULTS

### 2.1

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

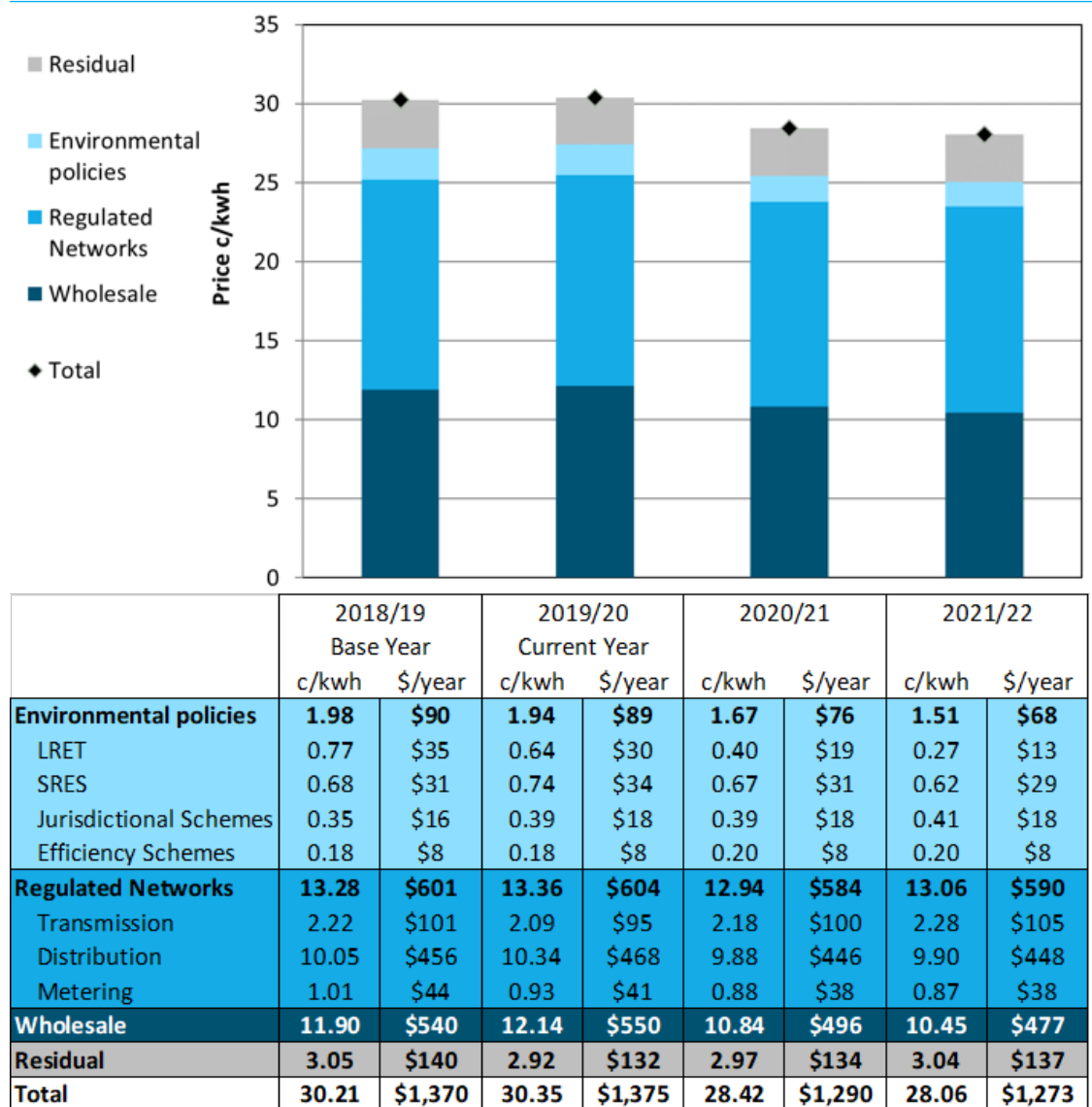
On a national basis, residential electricity prices and bills are expected to decrease in the period from 2018-19 to 2021-22. This trend is primarily driven by wholesale costs reducing in most of the states and territories (Figure 2.1). Prices fall markedly over the whole reporting period as new capacity enters the system. Total capacity of committed projects<sup>3</sup> includes 2,338 MW of solar, 2,566 MW of wind and 210 MW of OCGT. 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. Based on this modelling, total capacity of newly built projects includes 1,555 MW of battery storage, 1,553 MW of wind and 372 MW of solar.

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3 ESOO 2019



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



Source: AEMC analysis

Note: \* Note that the figure excludes Northern Territory due to the lack of information from the jurisdiction – See the notes at the start of the report for further details.

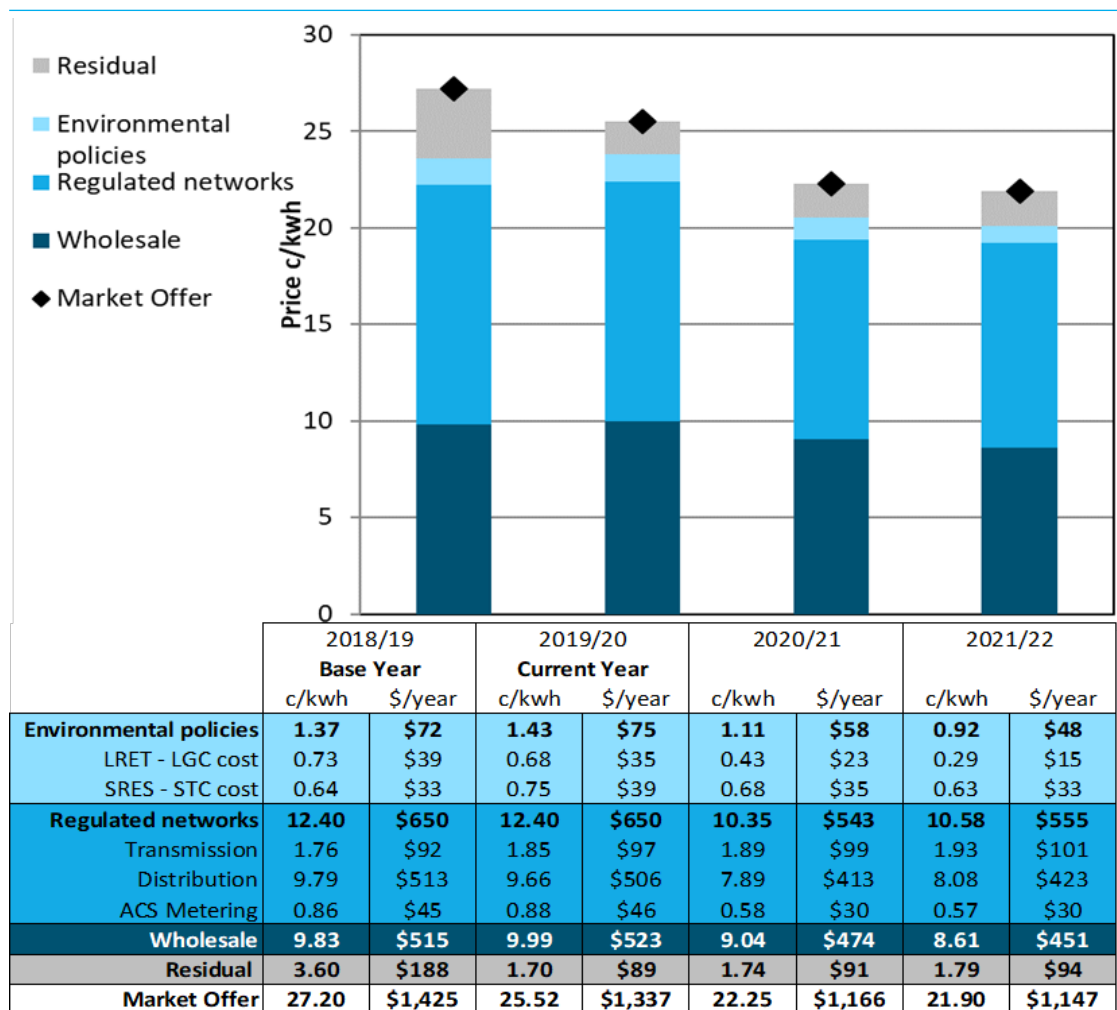
Annual residential bills (weighted by customer numbers) are expected to decrease by 7.1 per cent (or \$97) over the whole reporting period. The following supply chain components for national annual residential bills are observed in Figure 2.1:

- Wholesale costs are expected to go down by 11.6 per cent (or \$62) over the reporting period contributing -4.6 percentage points. This is driven by the influx of new generation of 8,594 MW. Committed projects make up 60 per cent of the total new generation and the rest of this is modelled by the AEMC.

- Regulated network costs are expected to decrease by 1.8 per cent (or \$11) over the reporting period contributing -0.8 percentage points. This is driven by a reduction in distribution costs and metering costs, mainly in South East Queensland.
- Environmental costs are expected to go down by 23.9 per cent (or \$21) over the reporting period contributing -1.6 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 -0.1 percentage points.

## 2.2 Trends in QLD supply chain components

**Figure 2.2:** Trends in SE QLD supply chain components

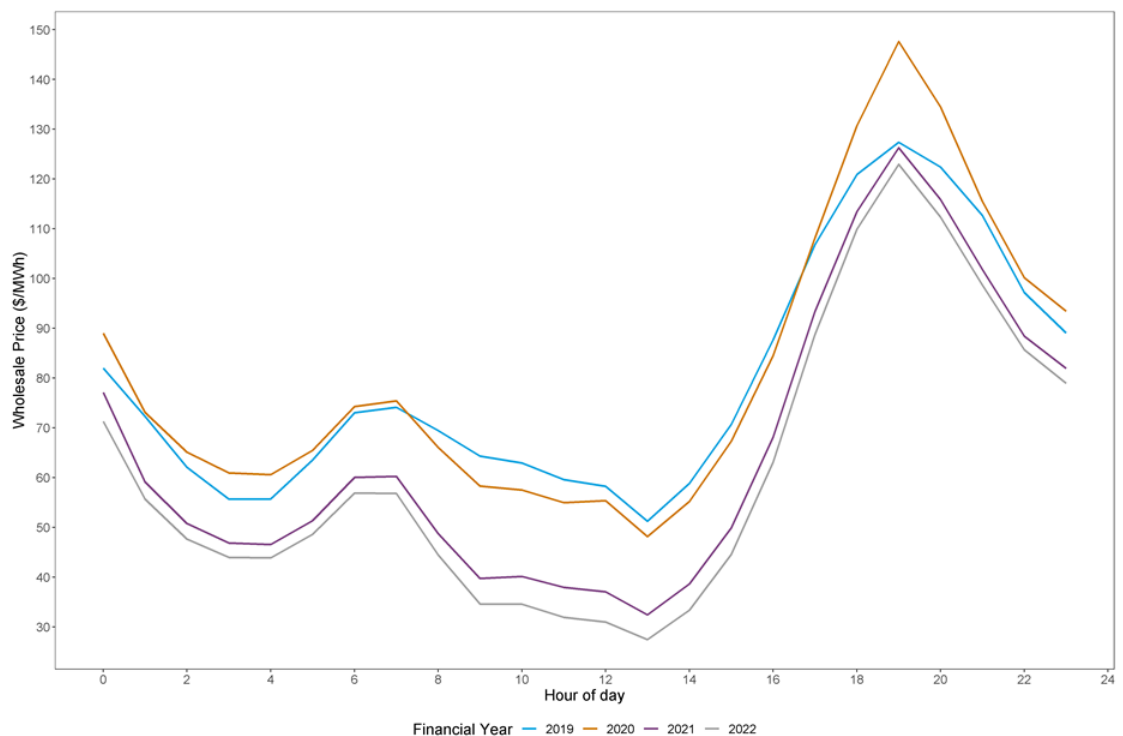


Source: AEMC analysis

Annual residential bills for South East Queensland are expected to decrease by 19.5 per cent (or \$278) over the whole reporting period. The following supply chain components for South East Queensland's annual residential bill are observed in Figure 2.2:

- Wholesale costs are expected to go down by 12.4 per cent (or \$64) over the reporting period contributing -4.5 percentage points. This is driven by the influx of committed renewable generation including 595 MW of solar and 496 MW of wind. New renewable generation mean that prices of electricity are lower during peak renewable production periods, which may lead to lower wholesale electricity purchase costs depending on the hedging profiles of retailers (Figure 2.3).
- Regulated network costs are expected to decrease by 14.7 per cent (or \$95) over the reporting period contributing -6.7 percentage points. This is driven by reduction in distribution costs, mainly declines in Energex's revenue allowance.
- Environmental costs are expected to go down by 33.1 per cent (or \$24) over the reporting period contributing -1.7 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 -6.6 percentage points.

**Figure 2.3: Average wholesale electricity prices by hour of day in QLD**

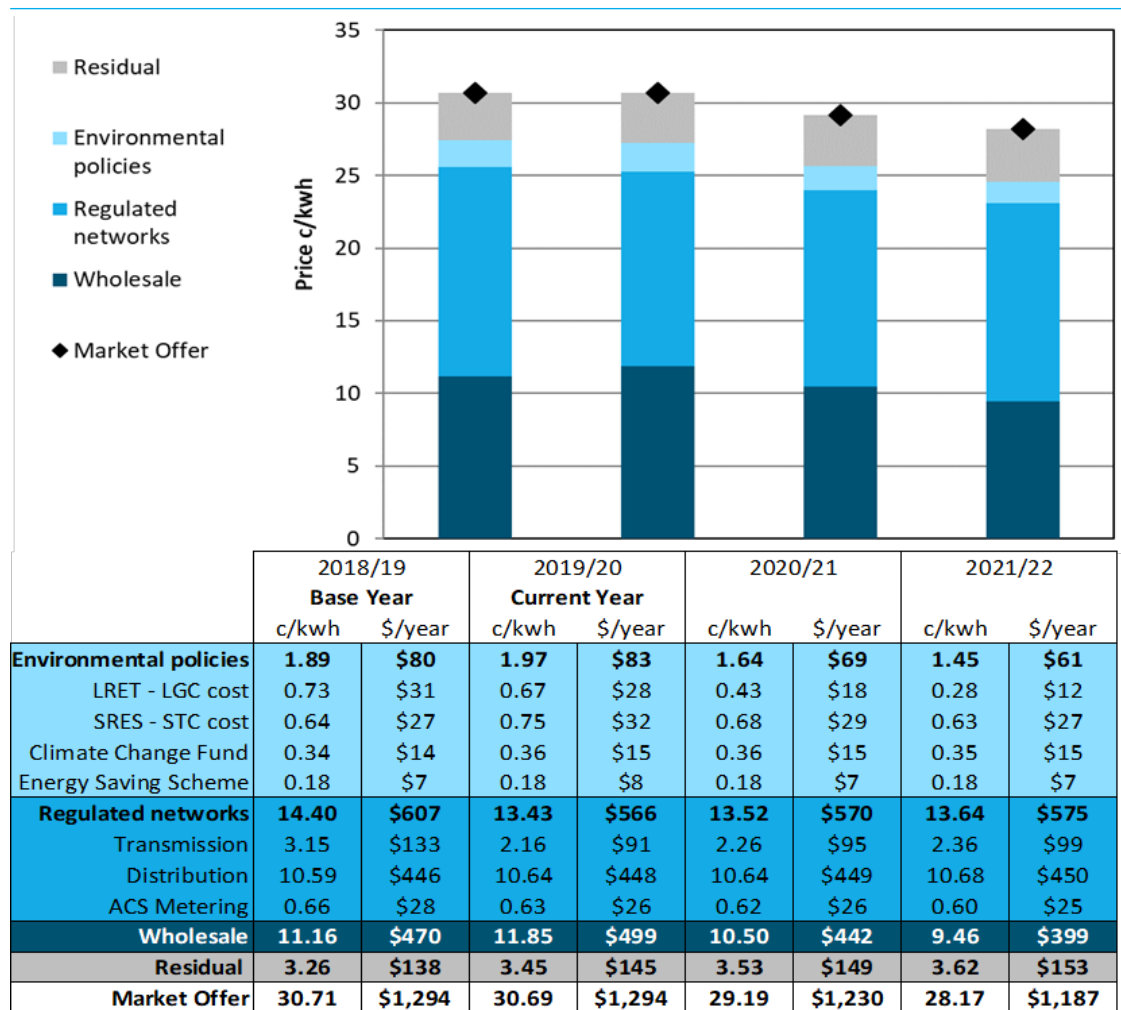


Source: AEMC analysis

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.

## 2.3 Trends in NSW supply chain components

**Figure 2.4:** Trends in NSW supply chain components



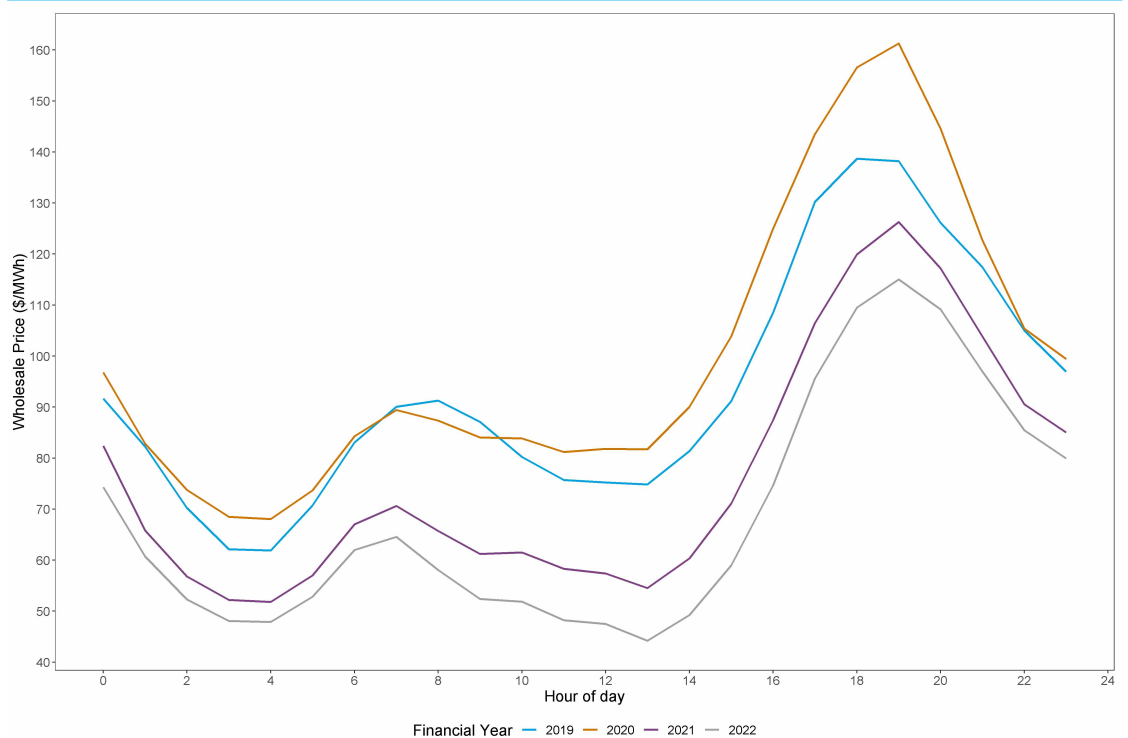
Source: AEMC analysis

Annual residential bills in New South Wales are expected to decrease by 8.3 per cent (or \$107) over the whole reporting period. The following supply chain components for New South Wales' annual residential bill are observed in Figure 2.4:

- Wholesale costs are expected to go down by 15.3 per cent (or \$72) over the reporting period contributing -5.5 percentage points. This is driven by the influx of new committed generation, in particular 1,171 MW of solar.
- Regulated network costs are expected to decrease by 5.2 per cent (or \$32) over the reporting period contributing -2.4 percentage points. This is driven by reduction in transmission costs, mainly from TransGrid.

- Environmental costs are expected to go down by 23.3 per cent (or \$19) 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 1 percentage points.

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

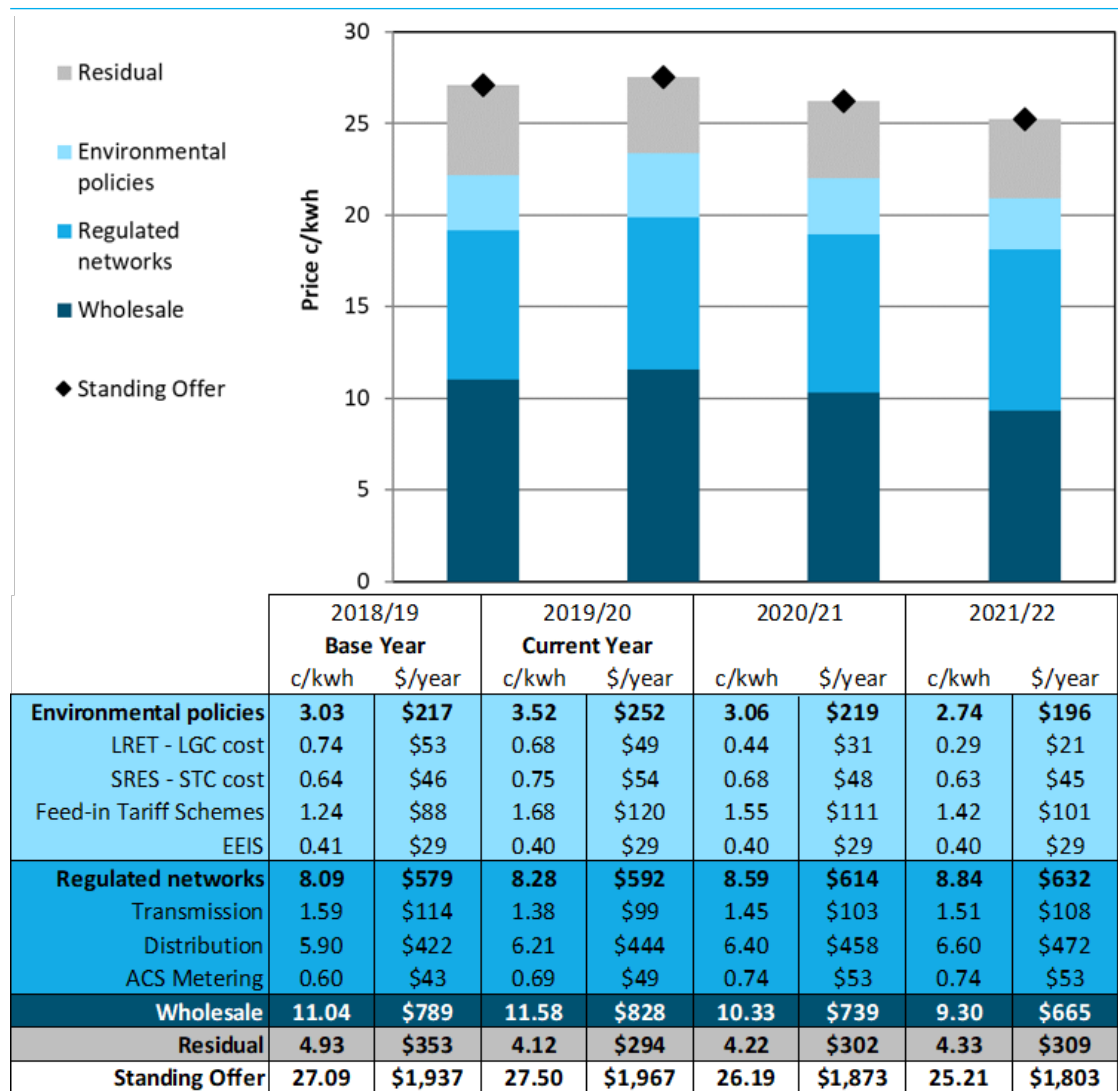


Source: AEMC analysis

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.

## 2.4 Trends in ACT supply chain components

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



Source: AEMC analysis

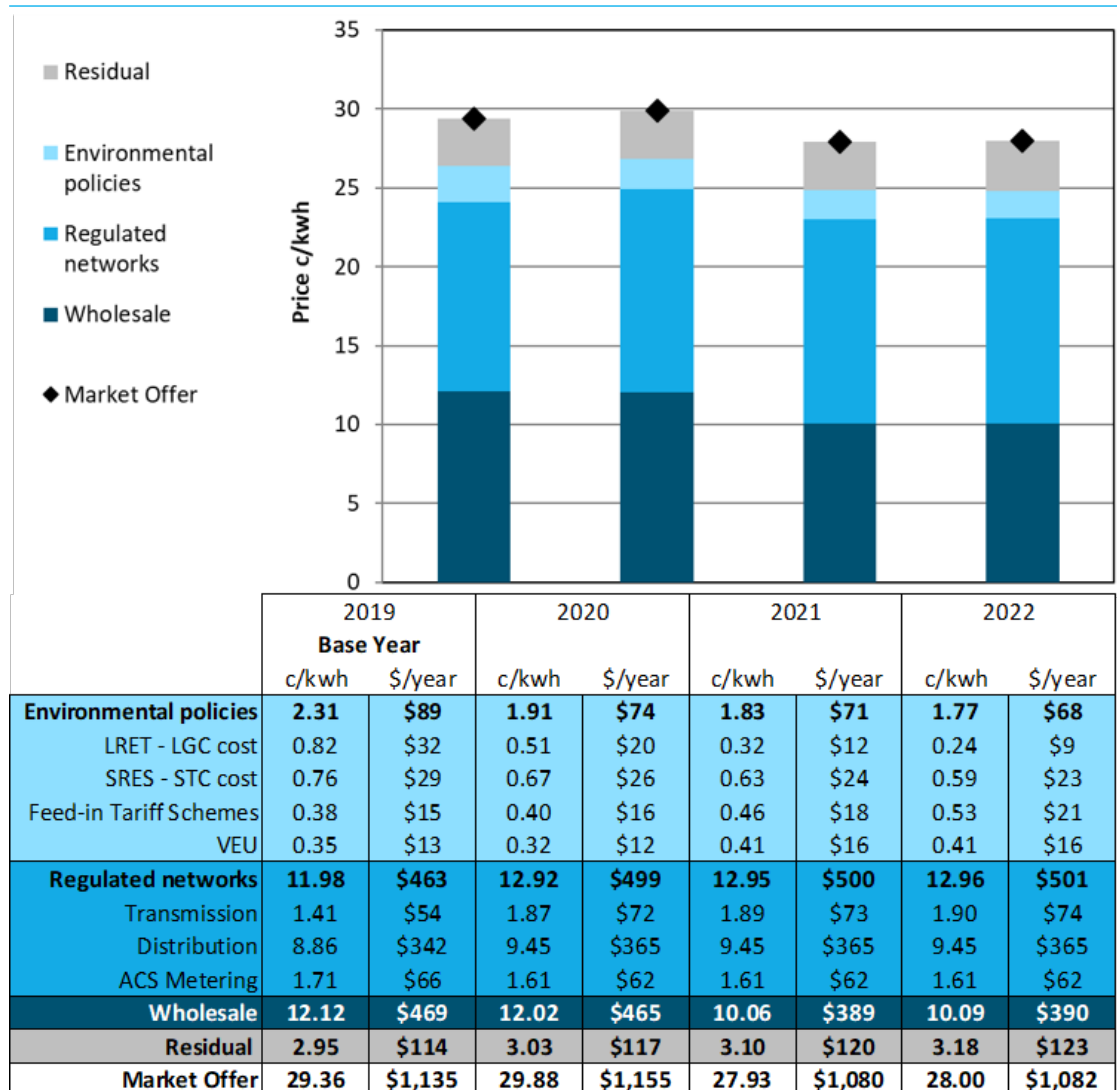
Annual residential bills in the Australian Capital Territory are expected to decrease by 6.9 per cent (or \$134) over the whole reporting period. The following supply chain components for the Australian Capital Territory's annual residential bill are observed in Figure 2.6:

- Wholesale costs are expected to go down by 15.7 per cent (or \$124) over the reporting period contributing -6.4 percentage points.

- Regulated network costs are expected to increase by 9.3 per cent (or \$54) over the reporting period contributing 2.8 percentage points. This is driven by increase in distribution costs.
- Environmental costs are expected to go down by 9.5 per cent (or \$21) over the reporting period contributing -1.1 percentage points. This is driven mainly by an increase in the cost of feed-in tariff schemes, which is offset by decreases in LRET costs.
- The residual cost component explains the remaining variations in the annual residential bill, contributing -2.2 percentage points.

## 2.5 Trends in VIC supply chain components

**Figure 2.7:** Trends in VIC supply chain components

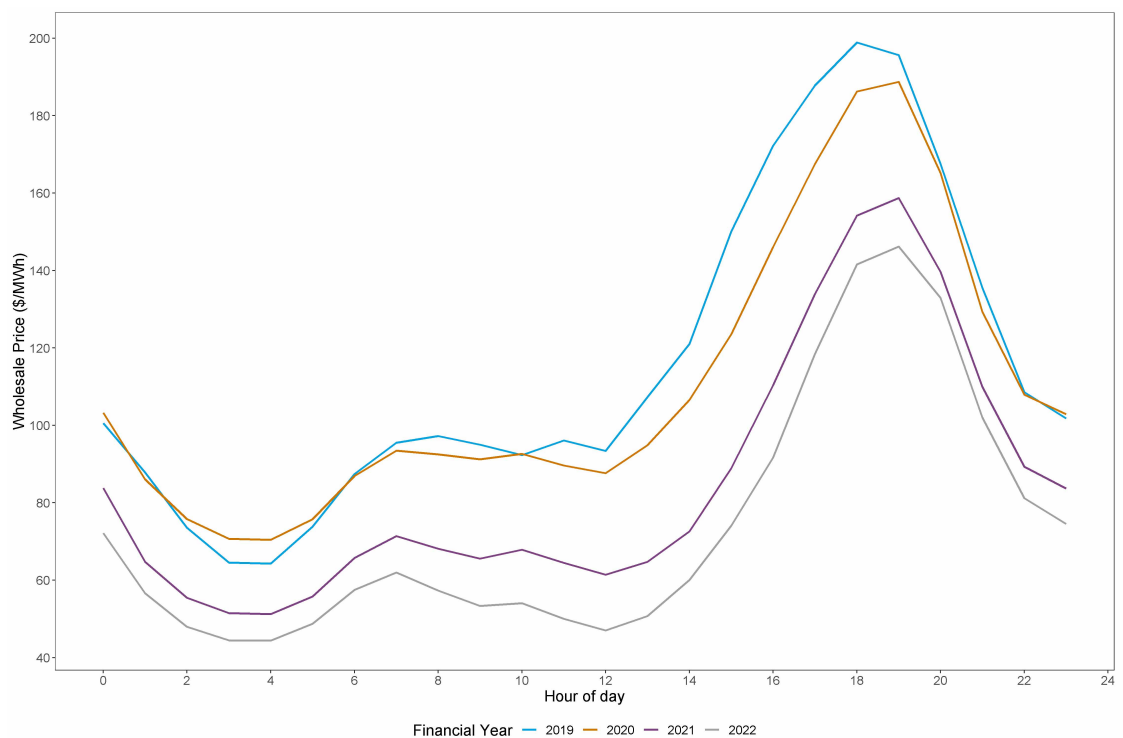


Source: AEMC analysis

Annual residential bills in Victoria are expected to decrease by 4.6 per cent (or \$53) over the whole reporting period. The following supply chain components for Victoria's annual residential bill are observed in Figure 2.7:

- Wholesale costs are expected to go down by 16.8 per cent (or \$79) over the reporting period contributing -6.9 percentage points. This is driven by the influx of new renewable generation including 2,421 MW of committed projects and 945 MW of new projects (modelled). This additional supply places downward pressure on wholesale pricing (Figure 2.8).
- Regulated network costs are expected to increase by 8.2 per cent (or \$38) over the reporting period contributing 3.3 percentage points. This is driven by an increase in distribution costs.
- Environmental costs are expected to go down by 23.4 per cent (or \$21) over the reporting period contributing -1.8 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 0.8 percentage points.

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



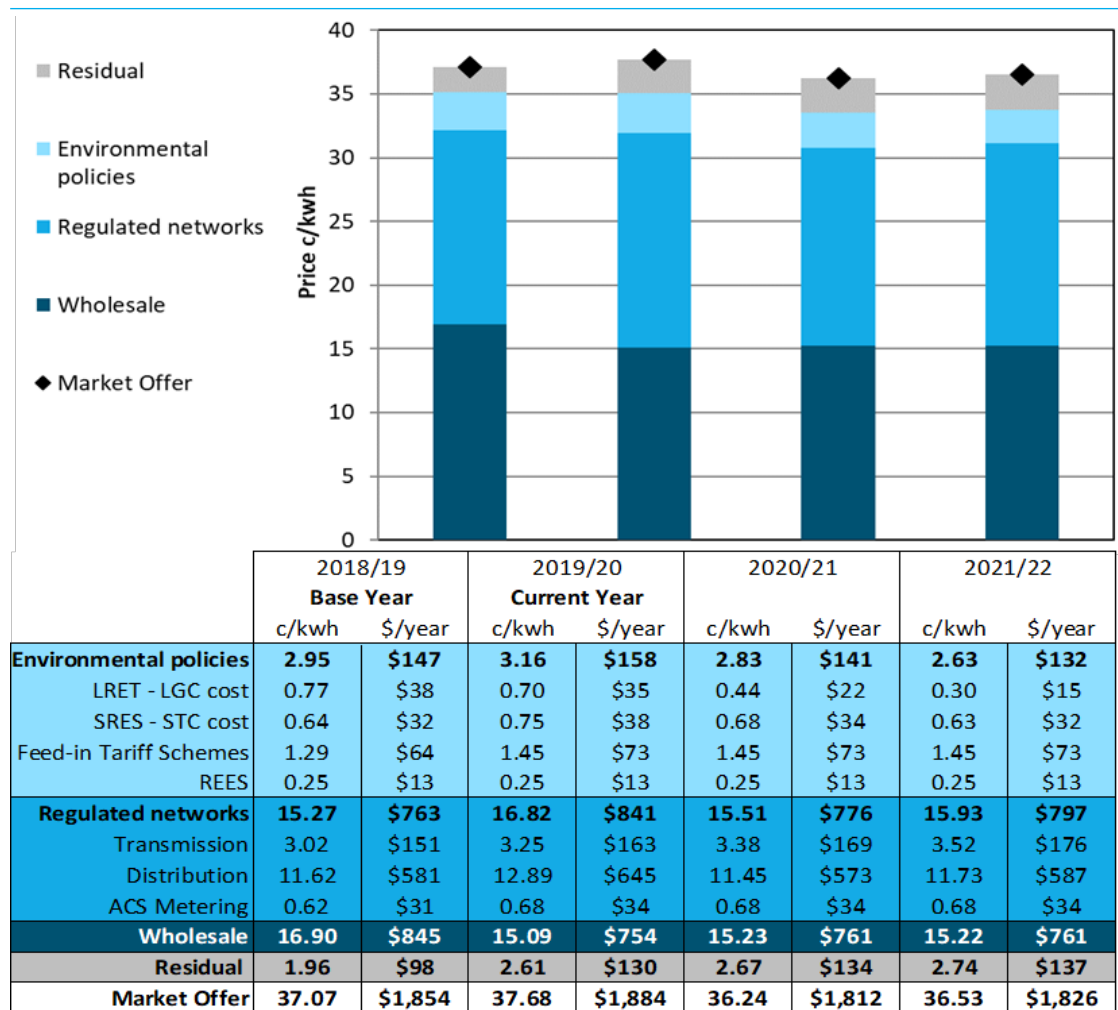
Source: AEMC analysis

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 2.9:** Trends in SA supply chain components



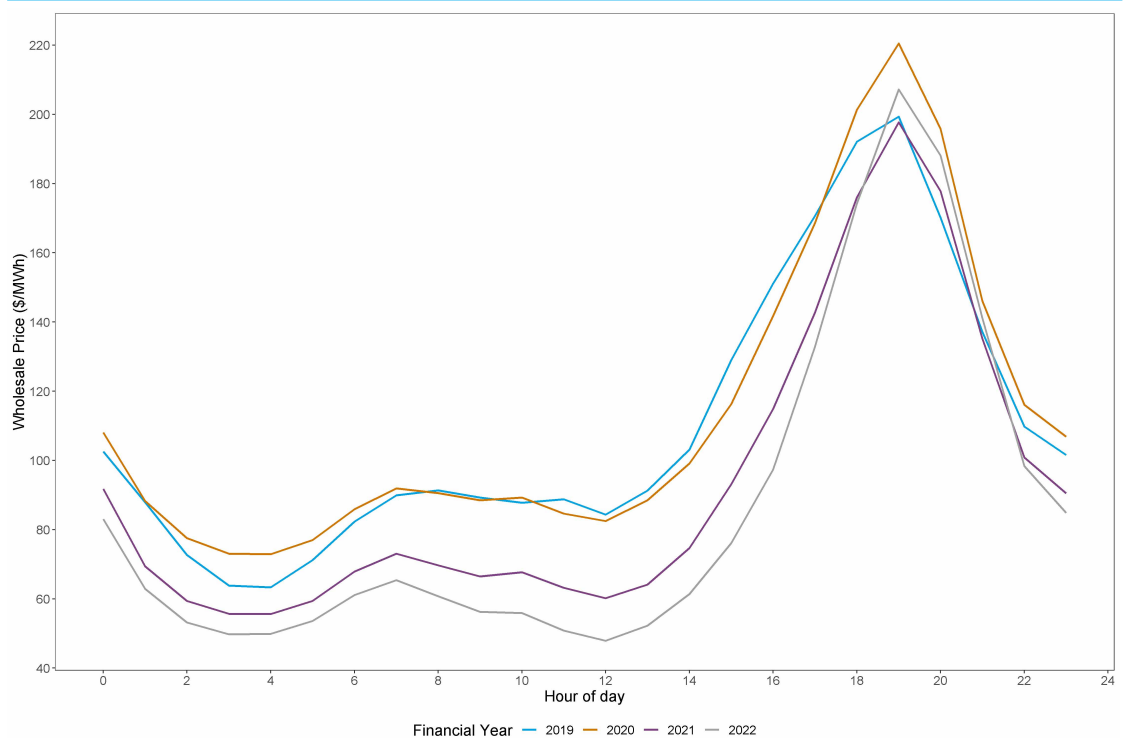
Source: AEMC analysis

Annual residential bills in South Australia are expected to decrease by 1.5 per cent (or \$27) over the whole reporting period. The following supply chain components for South Australia's annual residential bill are observed in Figure 2.9:

- Wholesale costs are expected to go down by 10.0 per cent (or \$84) over the reporting period contributing -4.5 percentage points.
- Regulated network costs are expected to increase by 4.4 per cent (or \$33) over the reporting period contributing 1.8 percentage points. This is driven by increase in transmission costs.

- Environmental costs are expected to go down by 10.6 per cent (or \$16) 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 2 percentage points.

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

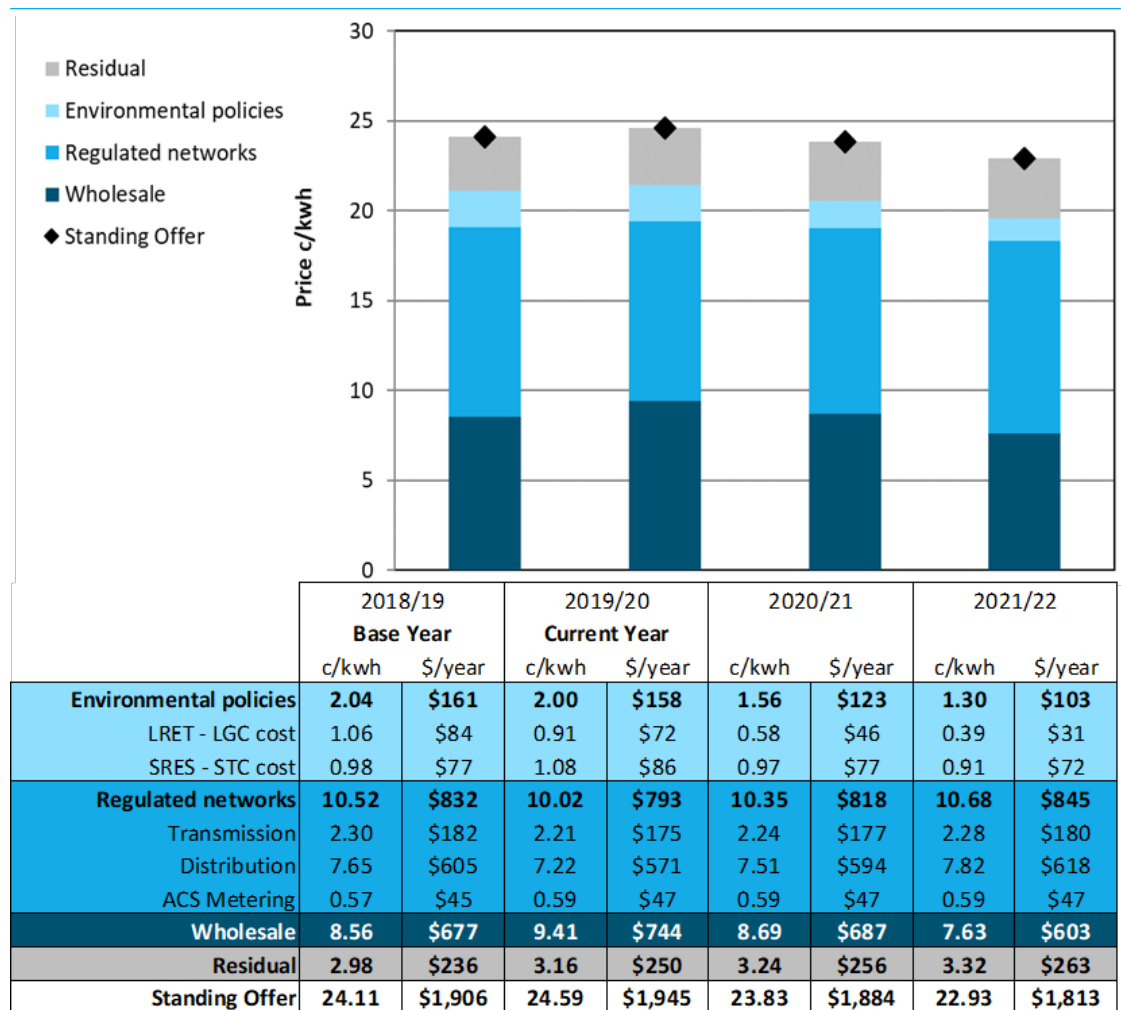


Source: AEMC analysis

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 2.11:** Trends in TAS supply chain components



Source: AEMC analysis

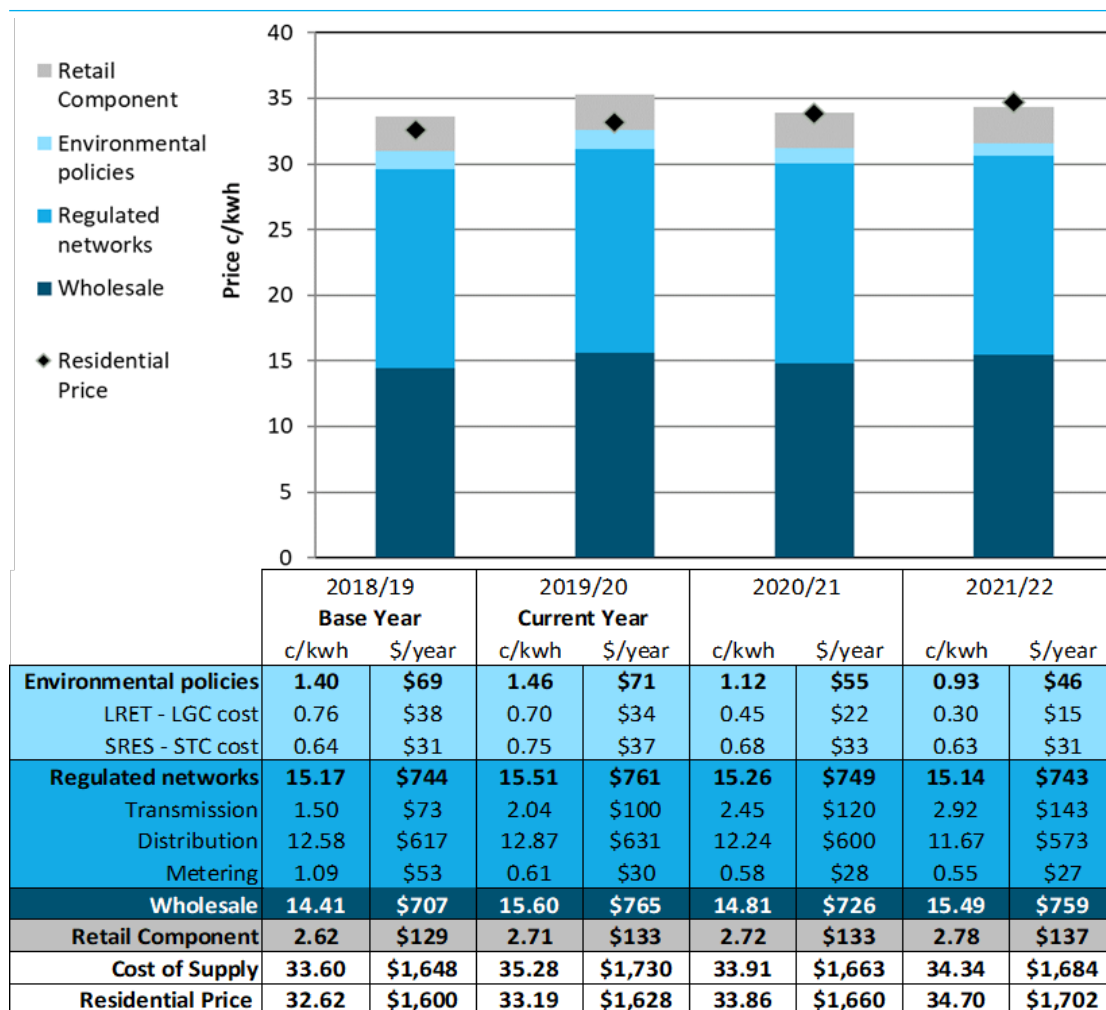
Annual residential bills in Tasmania are expected to decrease by 4.9 per cent (or \$93) over the whole reporting period. The following supply chain components for Tasmania's annual residential bill are observed in Figure 2.11:

- Wholesale costs are expected to go down by 10.9 per cent (or \$74) over the reporting period contributing -3.9 percentage points. Wholesale costs in 2018-19 and 2019-20 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 and hedge products adjusted for losses on Basslink.

- Regulated network costs are expected to increase by 1.5 per cent (or \$13) over the reporting period contributing 0.7 percentage points. This is driven by an increase in distribution costs.
- Environmental costs are expected to go down by 36.2 per cent (or \$58) over the reporting period contributing -3.1 percentage points. LRET and SRES costs in 2018-19 and 2019-20 are based on the Aurora Energy Standing Offer Tariff Schedule.
- The residual cost component explains the remaining variations in the annual residential bill, contributing 1.2 percentage points.

## 2.8 Trends in WA supply chain components

**Figure 2.12:** Trends in WA supply chain components<sup>4</sup>



Source: AEMC analysis

It is important to note that Western Australian electricity prices are established by government using a different methodology. As such, the results presented for Western Australia should be interpreted as providing some potential guidance on drivers of cost, but actual prices may be different.

Based upon our modelling, annual residential bills in Western Australia are expected to increase by 6.4 per cent (or \$102) over the whole reporting period. The following supply chain components for Western Australia's annual cost of supply are observed in Figure 2.12:

<sup>4</sup> Since the method used to calculate WA supply chain components is different to the other jurisdictions, provision of percentage contribution values have been excluded in this section.

- Wholesale costs are expected to go up by 7.5 per cent (or \$53) over the reporting period. This is mainly driven by increase in gas prices in 2019-20 leading to reductions in generation from CCGT. These results have been modelled using our internal market modelling and the details are provided in the main assumptions section.
- Regulated network costs are expected to be flat over the reporting period.
- Environmental costs are expected to go down by 33.7 per cent (or \$23) over the reporting period. This is driven by a decrease in LRET costs stemming from a reduction in the cost of LGCs.
- Retail margins are expected to increase by 6.2 per cent (or \$8) over the reporting period.

It is important to note that the estimated annual residential bill is between 2.9 and 5.9 per cent below the cost of supplying electricity in WA.

## 2.9 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. 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 2019 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.

## 2.10 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 2.13, 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.

- 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>5</sup> However, actual competitive market costs decreased, due to:
    - a major reduction in AEMO's forecast of electricity demand,<sup>6</sup> and
    - lower forecast gas prices driven by forecasts of lower global fuel prices.<sup>7</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 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.
- 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.

<sup>5</sup> 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.

<sup>6</sup> AEMC, 2016 Residential Electricity Price Trends, Final Report, 14 December 2016, p4.

<sup>7</sup> Ibid, p4.

**Figure 2.13:** 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
Source of estimated prices and costs	2013 report	2014 report	2015 report	2016 report	2016 report	2017 report	2018 report
Source of actual prices and costs	2014 report	2015 report	2016 report	2017 report	2018 report	2018 report	2019 report**
<b>Total retail price</b>							
Estimated price	27.95	26.83	25.21	25.8	26.49	29.58	28.69
Estimated price change		-1.12	-1.62	0.59	0.69	3.09	-0.89
Estimated direction of trend		Decrease	Decrease	Increase	Increase	Increase	Decrease
Actual price	28.57	25.68	24.71	28.16	30.24	29.85	30.35
Actual price change		-2.89	-0.97	3.45	2.08	-0.39	0.5
Actual direction of trend		Decrease	Decrease	Increase	Increase	Decrease	Increase
Accuracy of expected vs actual trend		Correct	Correct	Correct	Correct	Within 1%	Within 5%
<b>Network costs</b>							
Estimated price	14.4	14.23	11.93	12.07	12.2	13.57	13.49
Estimated price change		-0.17	-2.3	0.14	0.13	1.37	-0.08
Estimated direction of trend		Decrease	Decrease	Increase	Increase	Increase	Decrease
Actual price	13.87	13.37	12.24	13.63	13.22	13.33	13.36
Actual price change		-0.5	-1.13	1.39	-0.41	0.11	0.03
Actual direction of trend		Decrease	Decrease	Increase	Decrease	Increase	Decrease
Accuracy of expected vs actual trend		Correct	Correct	Correct	Incorrect	Correct	Within 1%
<b>Wholesale costs*</b>							
Estimated price	5.26	10.49	11.18	7.39	8.14	11.28	10.34
Estimated price change		5.23	0.69	-3.8	0.75	3.14	-0.94
Estimated direction of trend		Increase	Increase	Decrease	Increase	Increase	Decrease
Actual price	10.3	10.52	10.38	10.01	11.7	11.72	12.14
Actual price change		0.22	-0.14	-0.37	1.69	0.02	0.42
Actual direction of trend		Increase	Decrease	Decrease	Increase	Increase	Increase
Accuracy of expected vs actual trend		Correct	Incorrect	Correct	Correct	Correct	Incorrect
<b>Environmental costs</b>							
Estimated price	4.49	2.11	2.1	2.18	1.87	1.78	2.07
Estimated price change		-2.38	-0.01	0.08	-0.31	-0.09	0.29
Estimated direction of trend		Decrease	Decrease	Increase	Decrease	Decrease	Increase
Actual price	4.39	1.79	2.08	2.01	1.75	2.08	1.94
Actual price change		-2.6	0.29	-0.07	-0.26	0.33	-0.14
Actual direction of trend		Decrease	Increase	Decrease	Decrease	Increase	Decrease
Accuracy of expected vs actual trend		Correct	Within 1%	Incorrect	Correct	Incorrect	Incorrect

Source: AEMC 2013, 2014, 2015, 2016, 2017, 2018, 2019 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 excluding Northern Territory.



## 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 Benchmarks 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**

<b>JURISDICTION</b>	<b>MOST COMMON HOUSEHOLD TYPES</b>	<b>CONSUMPTION BY TYPE (KWH)</b>	<b>TOTAL ANNUAL CONSUMPTION (KWH)</b>
Queensland	2-person household, no mains gas, air conditioning, off-peak hot water and on a market offer	Tariff 41: 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

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

JURISDICTION	MOST COMMON HOUSEHOLD 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
Western Australia	2-person household, no mains gas, electricity water heating and on the regulated standing offer	4,904	4,904

Source: South Australia Government and Western 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	2018-19	2019-20
NSW, ACT, SA	Standing	Retailer offers obtained from Energy Made Easy in July 2018	Retailer offers obtained from Energy Made Easy in September 2019
	Market		
South East Queensland	Standing	Retailer offers obtained from Energy Made Easy in July 2018	Retailer offers obtained from Energy Made Easy in September 2019
	Market		
Tasmania	Standing	Aurora Energy approved standing offer prices from 1 July 2018	Aurora Energy approved standing offers prices from 1 July 2019
	Market	None	None
Victoria	Standing	None	None
	Market		
Western Australia	Government set prices	2018-19 Electricity Price Order	2019-20 Electricity Price Order

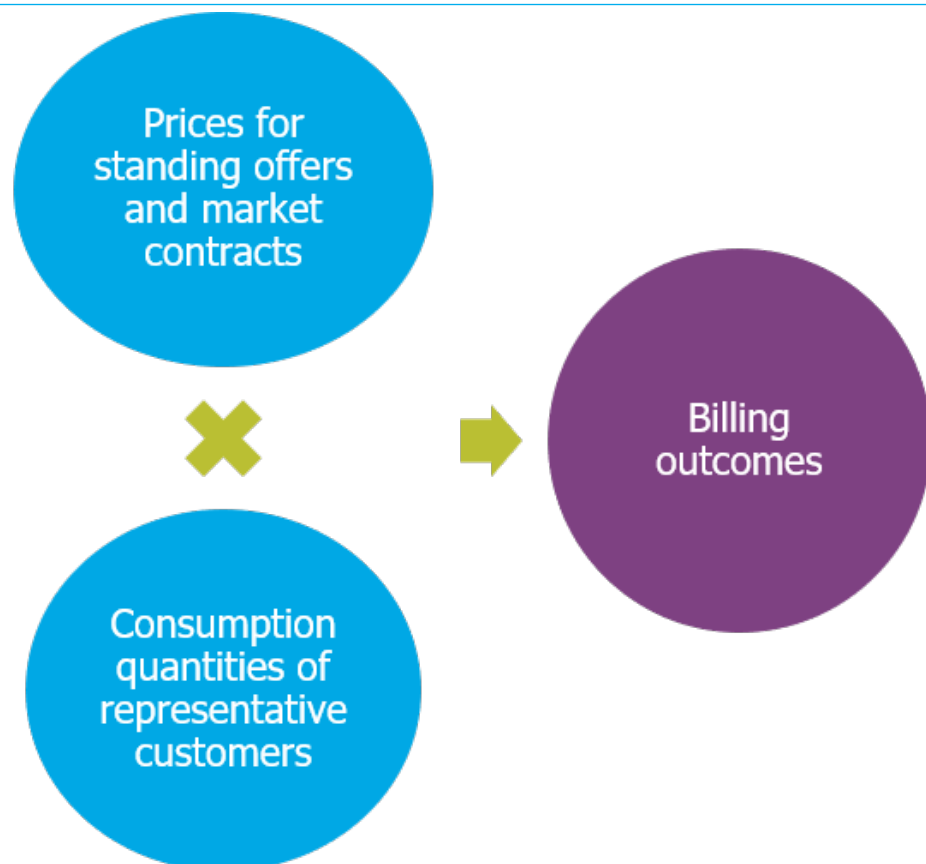
JURISDICTION	OFFER	2018-19	2019-20
	Market	None	None

Source: AEMC and cited sources

Note: Victorian price changes occur on a calendar year basis, unlike all other jurisdictions where price changes occur on a financial year basis. Data used for estimating Victorian offer price in 2019 come from Victorian Energy Compare in August 2019.

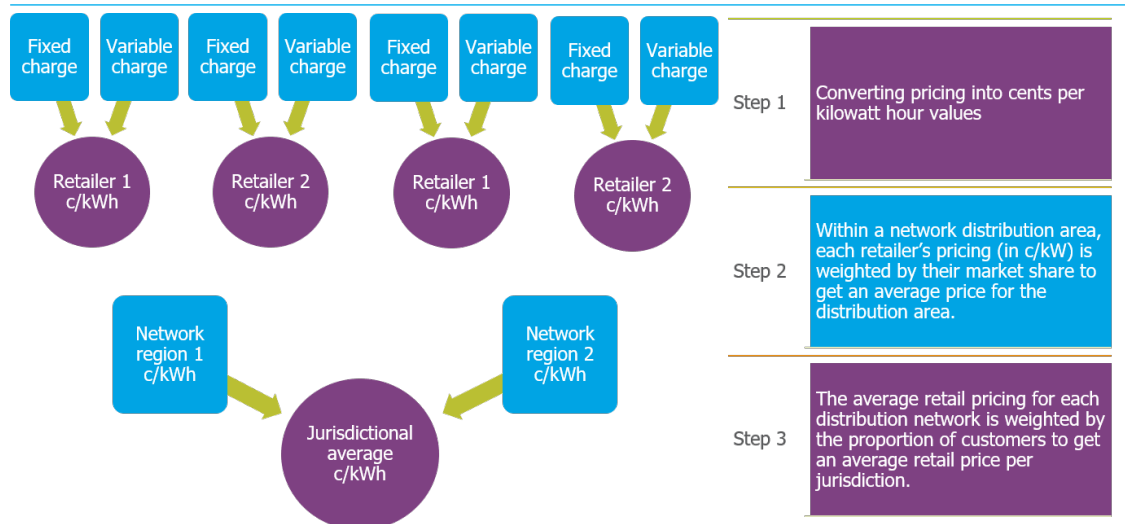
Using above assumptions of representative consumer and the lowest retail offers for 2018-19 and 2019-20 in each jurisdiction based on the electricity pricing data stated in Table 3.3, the representative retail electricity price by each retailer can be calculated as shown in Figure 3.1. The average retail 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**



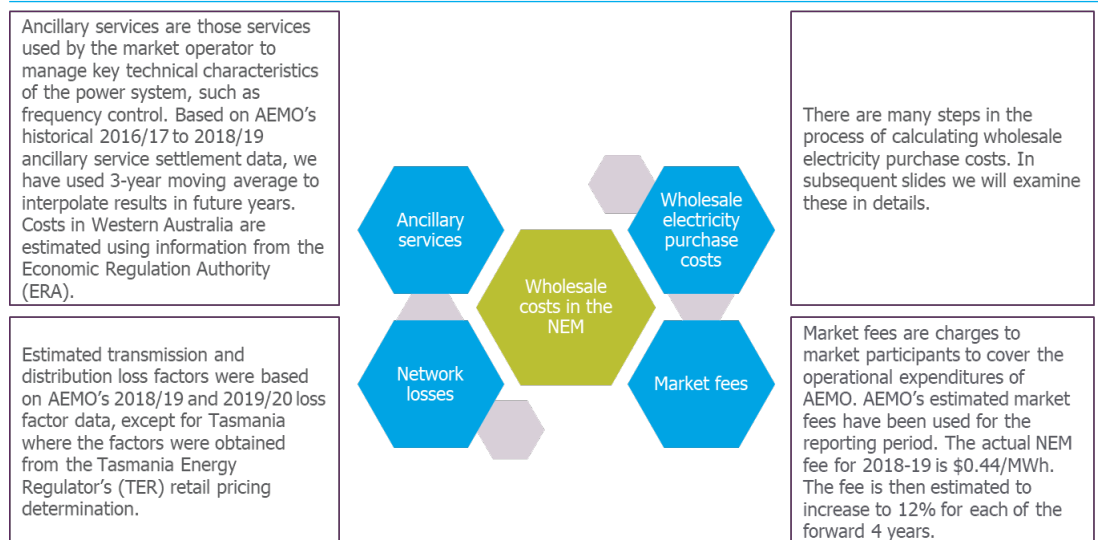
Source: AEMC analysis

### 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. A different method has been used in order to calculate the wholesale costs in Western Australia, which are based on the standalone long run marginal cost (LRMC) calculations.

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



Source: AEMC analysis

### Wholesale electricity purchase costs

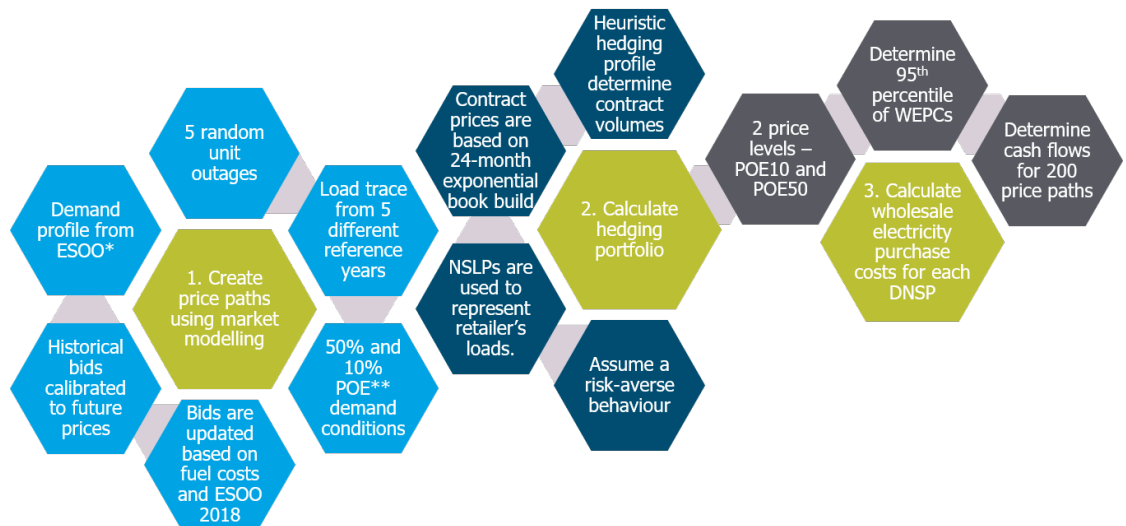
There are 3 main steps in the process of calculating wholesale electricity purchase costs. These steps are illustrated below in Figure 3.4. The main assumptions for each of these steps are presented in Figure 3.5. Figure 3.6, Figure 3.7 and Figure 3.8 explain steps 1-3 respectively.

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



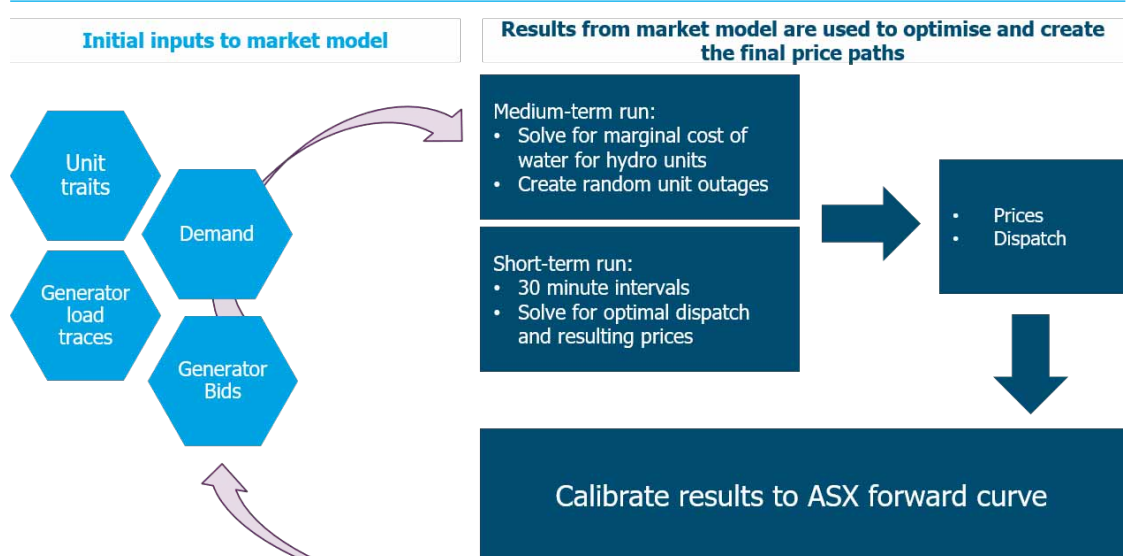
Source: AEMC analysis

**Figure 3.5: Wholesale electricity purchase costs - main assumptions**



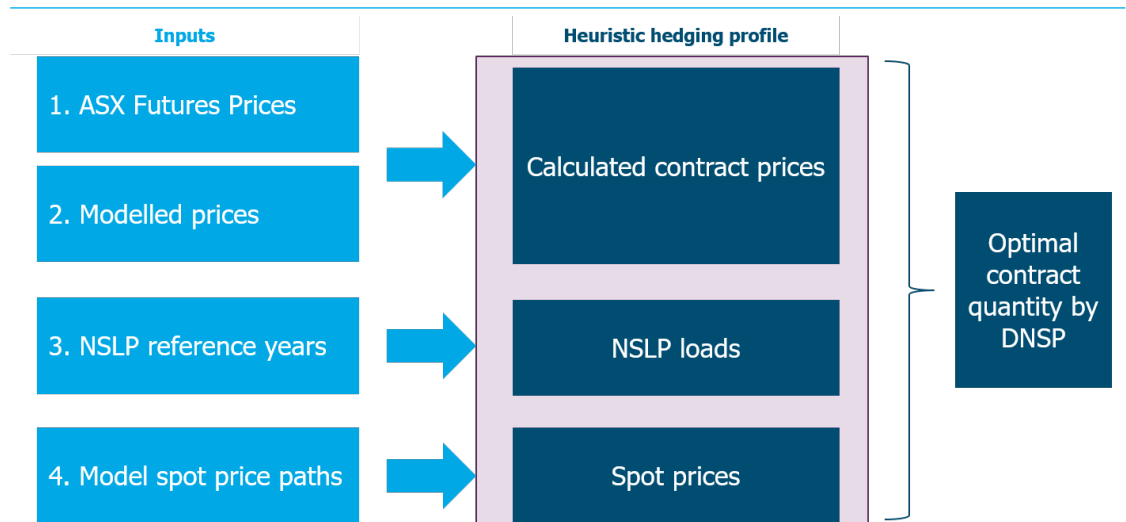
Source: AEMC analysis

**Figure 3.6: Create price paths using market modelling**



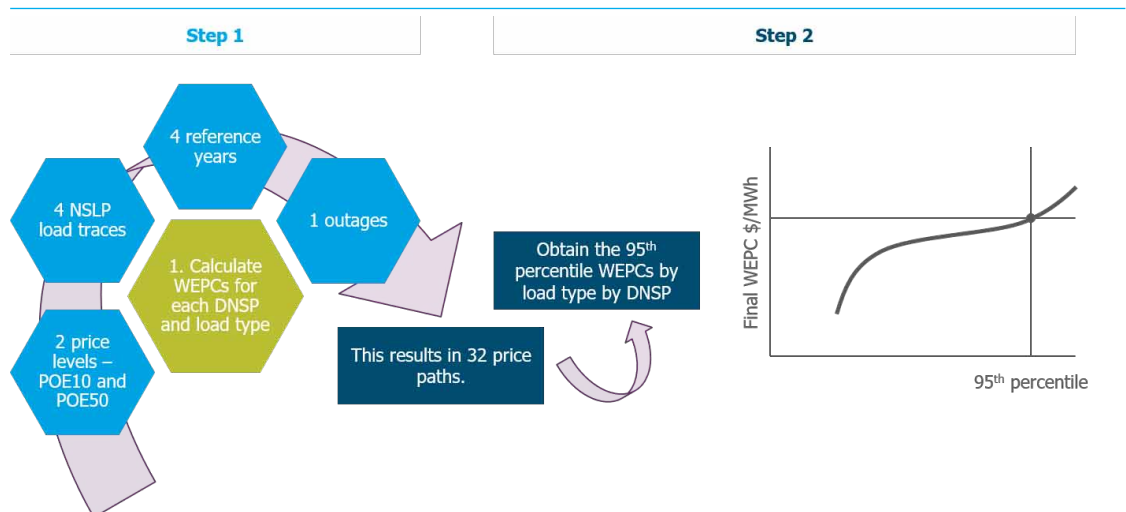
Source: AEMC analysis

**Figure 3.7: Calculate optimal hedging portfolio**



Source: AEMC analysis

**Figure 3.8: Calculate wholesale electricity purchase costs for each DNSP**



Source: AEMC analysis

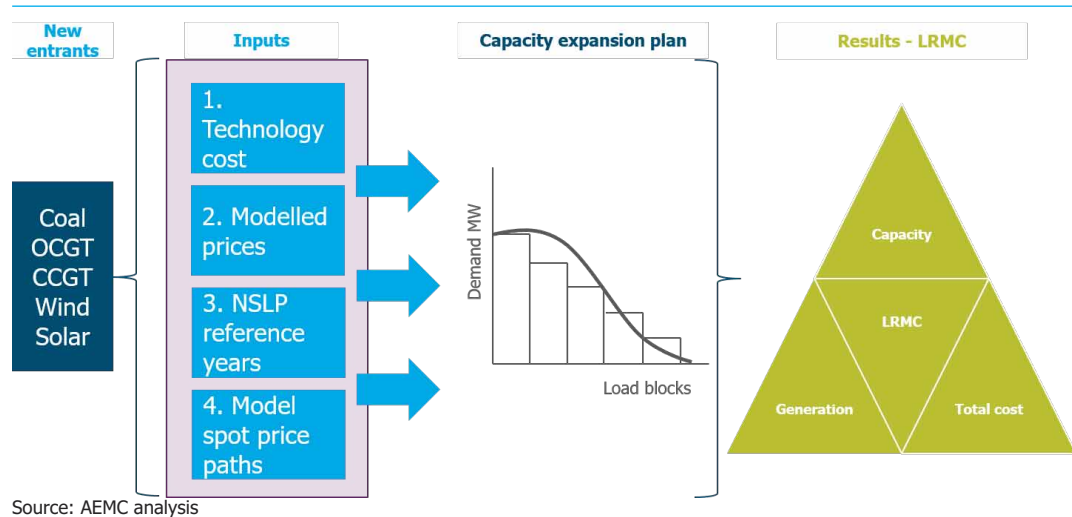
### Standalone LRMC calculations for Western Australia

A stand-alone LRMC is modelled for financial years 2020 to 2022. The LRMC model starts each year with no existing generation and builds the least cost generation required to meet a representative load shape. Half-hour load data was provided by the Western Australia Public Utilities Office (PUO). A reserve margin of approximately 19% was applied to the yearly max demand.

The LRM model has the option to build black coal, open cycle gas turbines (OCGT), combined cycle gas turbines (CCGT), wind, single axis solar PV and utility scale batteries. Technical and cost parameters for each generation technology uses assumptions from the AEMO 2019 Input and Assumptions workbook, regionally adjusted for WA. Coal cost is taken from AEMO 2019 Input and Assumptions workbook. Gas cost is based on the LNG netback price from the 2018 WA Gas Statement of Opportunities (GSOO).

Calculation of standalone long run marginal cost (LRMC) for Western Australia is represented in Figure 3.9.

**Figure 3.9: Calculate standalone long run marginal cost (LRMC) for Western Australia**

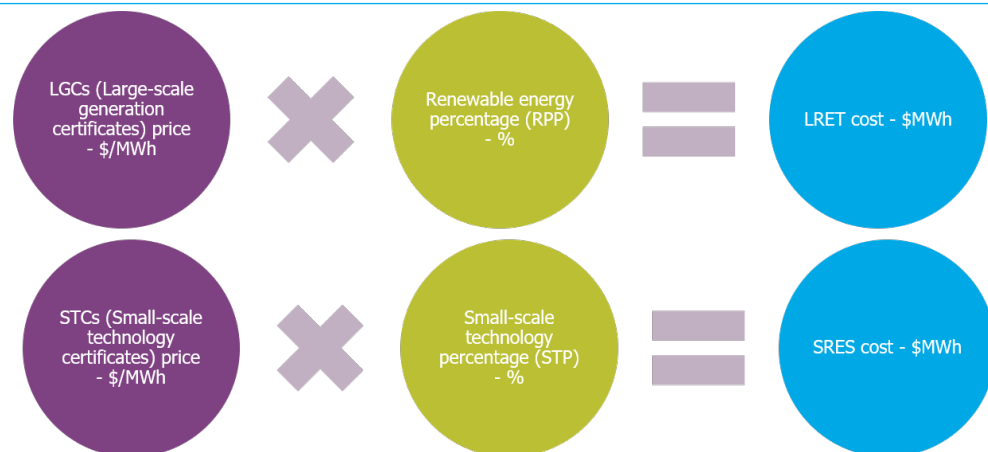


## 3.4 Environmental costs

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 3.10 shows the calculation methods for these two schemes and Figure 3.11 shows the calculation method for the volume of the small-scale technology certificates (STCs).

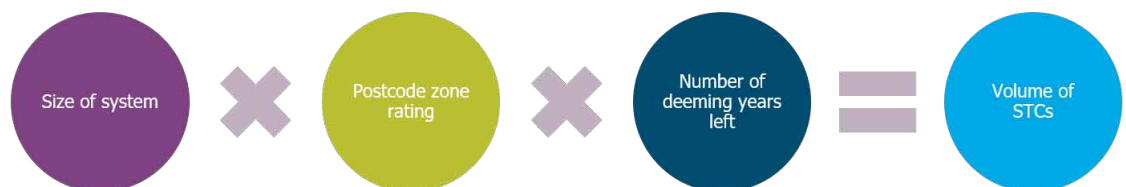


**Figure 3.10:** Environmental cost calculations - LRET and SRES



Source: CER

**Figure 3.11:** Calculation method for the volume of STCs



Source: CER

## 3.5

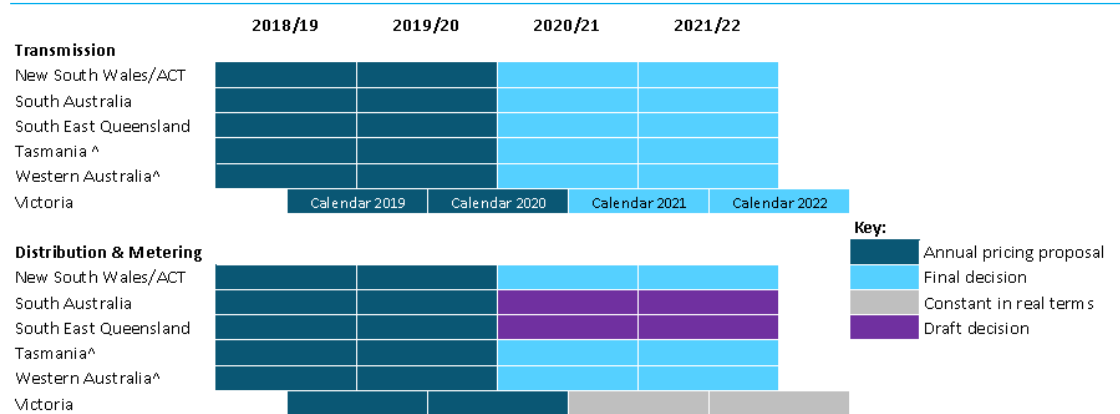
### Regulated network costs

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 3.12.

**Figure 3.12: Regulated network costs - Network tariff sources and regulatory periods**

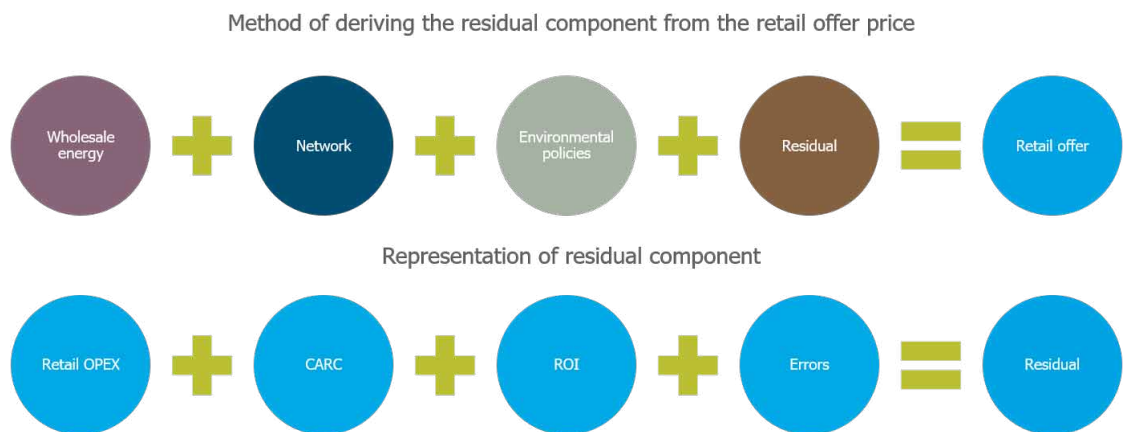


Source: AEMC analysis

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

## 3.6 Residual component or retail cost

**Figure 3.13: Calculation of residual component or retail cost**



Source: AEMC analysis