AEMC

REVIEW

Australian Energy Market Commission

FINAL REPORT

2018 RESIDENTIAL ELECTRICITY PRICE TRENDS REVIEW

21 DECEMBER 2018

INQUIRIES

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Note on this year's report

The purpose of the 2018 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 2017-18 to 2020-21.

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 published by the Australian Energy Regulator (AER) or provided to the Australian Energy Market Commission (AEMC) by state and territory governments.

This report does not provide, and should not be regarded as providing,forecasts of future prices including those which are set by jurisdictional regulators or governments. The prices and trends in the report are based on:

- modelling of wholesale costs using available information up until 15 October 2018
- network cost information that was publicly available up until 8 November 2018.

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
- governmental policies, such as those related to jurisdictional environmental policy schemes
- jurisdictions reviewing their approaches to retail price deregulation for the setting of regulated prices.

SUMMARY

1 This is the ninth annual residential electricity prices 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).[1]

2 The 2018 residential electricity price trends report (2018 report) identifies changes in the energy supply chain cost components that are driving residential electricity prices and bills for each Australian state and territory, and nationally, from 2017-18 to 2020-21 (the reporting period). By focussing on trends in the cost drivers of prices and bills, the report helps to focus attention on key sectoral issues.

3 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 market 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.

4 Given this analysis method, 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.

Trends in national residential electricity prices and bills

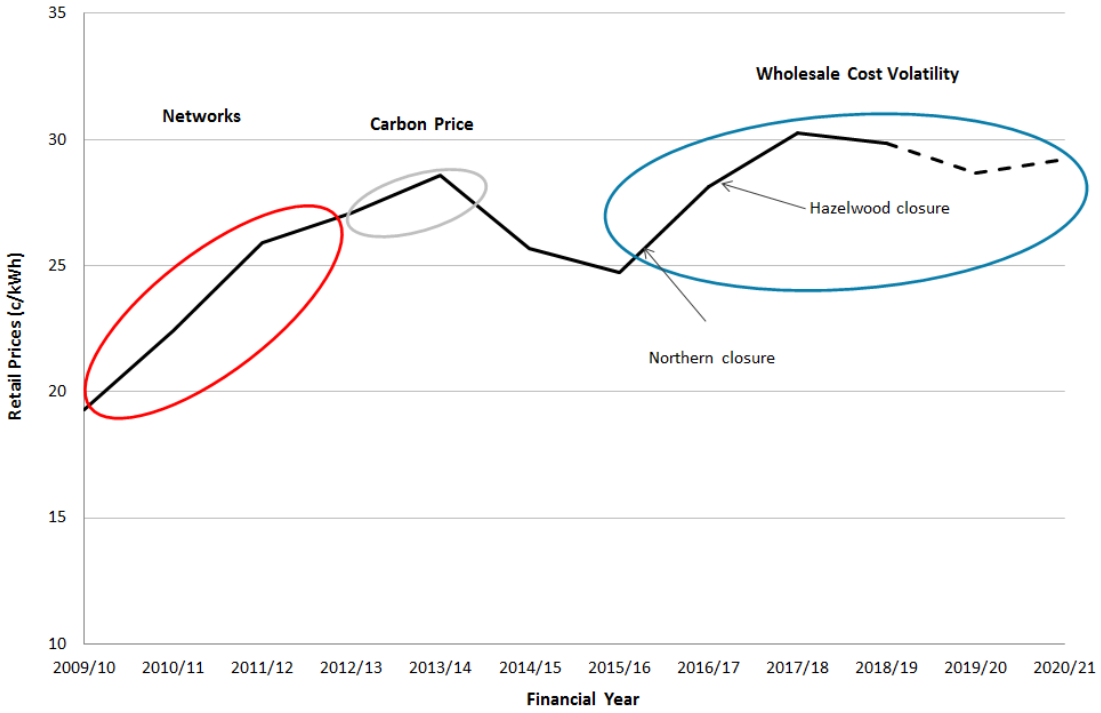
5 On a national basis, residential electricity prices and bills are expected to decrease in the period from 2017-18 to 2020-21. This trend is primarily driven by wholesale costs reducing in South East Queensland, Victoria, South Australia and Tasmania. The reduction is driven by the estimated entry of 9,732 MW of accredited, committed or expected new generation and battery storage. The downward pressure this generation creates on wholesale prices more than offsets expected increases in gas and coal fuel prices over the period. As this trend applies across most of the NEM, and a large proportion of Australian residential customers are in the NEM, it influences the national trend. The wholesale cost reductions are larger than the expected slight increase in network costs and higher environmental costs that are driven by increasing costs associated with the Small-scale Renewable Energy Scheme (SRES).

6 The results indicate the analysis period will have declining retail prices after a recent period of increased cost and volatility driven by the retirement of the Northern and Hazelwood generators in 2016 and 2017 respectively. This can be seen in the figure below, which provides recent historical context for this report. Figure 1 shows periods in which retail price

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

changes have been driven by network cost increases, the carbon price and wholesale cost increases. As noted above the main driver in this report's analysis period is the expected reduction in wholesale costs.

Figure 1: National average representative residential retail electricity prices over time



Source: AEMC analysis

Note: The national average retail prices in this chart are based on the national average consumption level for the representative consumer, as it applied in Residential Electricity Price Trends Reports that were published from 2009 to 2018. The national average consumption level has changed over time due to changes in the characteristics and consumption profile of the representative consumer in some jurisdictions.

Key drivers of trends in residential electricity supply chain cost components

Decreasing wholesale costs in most jurisdictions

7 Wholesale market costsaccount for 33 to 57 per cent of a consumer's annual bill in 2017-18, depending on the jurisdiction. Decreasing wholesale costs are the primary driver of retail prices and bills in most jurisdictions over the reporting period. The exceptions are Western Australia and the Northern Territory.

8 From 2017-18 to 2018-19, wholesale costs:

- decreased in South East Queensland, Victoria and Tasmania, due primarily to the 1,042 MW of generation and 30 MW of battery storage that entered the NEM in 2017-18 and the 3,663 MW of new generation and 75 MW battery storage that is entering in 2018-19.

The Queensland government direction to Stanwell corporation to moderate its bidding behaviour has also coincided with reduced wholesale prices

- were relatively flat in South Australia due to a combination of new generation supply and higher peak demand
- increased in New South Wales and the ACT due to a combination of:
  - higher fuel costs for some NSW generators from rising international coal prices
  - constrained coal supply for some NSW coal generators in mid 2018
  - an expectation that NSW would import more electricity from Queensland than from Victoria following the retirement of the Hazelwood power station in 2017, given generation from Queensland black coal is more expensive
- increased in Western Australia due to increases in gas fuel prices
- increased in the Northern Territory due to increased costs for the Darwin-Katherine power system.

9 In the period 2018-2019 to 2020-21, wholesale costs:

- are expected to decrease in all jurisdictions in the NEM. Forecast electricity demand is relatively flat, so the decreasing trend is driven by changes in the supply of electricity:
- in 2019-20 and 2020-21, 4,822 MW of large scale intermittent generation and 100 MW of battery storage is expected to enter the NEM
- gas and coal fuel prices are expected to increase in some locations, placing upwards pressure on wholesale costs. However this effect is less than the downwards pressure on wholesale costs from new generation
- are expected to increase in Western Australia due to increasing gas fuel prices and in the Northern Territory due to increased costs for the Darwin-Katherine power system.

10 The above trends in wholesale costs assumes no new exit of generation in the NEM, either through retirement or mothballing, that was not known about as of 15 October 2018.

11 The 9,732 MW of new generation and battery storage[2]that is expected to enter the NEM over the analysis period is comprised of:

- 8,961 MW of new large-scale intermittent generation.
- 566 MW of new thermal generation and upgraded capacity of existing generators
- 205 MW of battery storage, supported by jurisdictional programs.

Generally flat or increasing network costs

12 Network costs include transmission and distribution costs, and account for 30 to 50 per cent of a representative consumer's annual bill in 2017-18.

13 This report shows network costs are generally flat or increasing:

2 Based on AEMO 2018 Generation information and public announcements about capacity developments that are committed, accredited or expected.

- from 2017-18 to 2018-19, network costs increased in all jurisdictions with the exception of South East Queensland, Tasmania and Western Australia.
- from 2018-19 to 2020-21, network costs are expected to be flat or increasing in all jurisdictions. The expected increase is primarily due to an increase in transmission costs, which are expected to increase by 6% on a national basis.

Environmental policy costs are increasing

14 Environmental policy costs directly account for 3 to 14 per cent of a representative customer's annual bill, depending on the jurisdiction in 2017-18.

15 Environmental policy costs are increasing in most jurisdictions over the reporting period, primarily due to the continued growth in solar penetration and the consequent increase in costs for the Small Scale Renewable Energy Scheme (SRES).

16 In relation to specific jurisdictional schemes, the Victorian renewable energy target is incorporated into the analysis with effect in 2020-21, but the Queensland renewable energy target is still being developed and is therefore not included.

Residual costs

17 The residual component accounts for around 8 to 1 per cent of the representative consumer's annual bill in 2017-18. This component is the amount left over after deducting the wholesale, network and environmental costs from the total bill amount. As such it represents costs incurred by retailers, retail margins, and any errors in the estimated value of the other supply chain cost components. It does not, nor is it meant to, represent retail margins at either a gross or net margin level. The exception is Western Australia where the cost stack includes a retail cost component, which is equivalent to the regulated retail cost.

The energy sector continues to transform

18 The trends in prices and bills summarised above are occurring while the electricity market continues to transform to a lower emissions power sector, with an increasing quantity of wind and solar generation capacity entering the market. During the period from 2017-18 to 2020-21, while significant additional intermittent generation capacity will be connected to the electricity market, there are no expected retirements of large thermal generators, although the Liddell power station is scheduled to retire immediately after in 2022. There are also expected to be more customer-connected distributed energy resources like rooftop solar and storage, a more active market for demand response, and the growth of electric vehicles as a potential source of increased demand and behind-the-motor storage.

19 This transition creates a broad range of issues related to reliability, system security, participant bidding and contracting behaviour, and the economics of the electricity system. As such, these developments will impact on system costs and in turn on consumer prices and bills.

20 This report describes a range of the key factors that are, or are anticipated to, impact on consumer pricing and bills. Some of the factors are having an influence now, and the impact

on prices and bills is included where that can be quantified. The impact of other factors, that have only recently been implemented or are still being developed, is less clear and in general not quantified in this report.

Effect of the Large-scale Renewable Energy Target on the wholesale market

21 The direct costs of the large-scale renewable energy target (LRET) are included in the environmental component of the cost stack. However it is important to also recognise the indirect impact of this policy.

22 The LRET provides incentives for increased quantities of renewable generation to enter the market, even when demand is flat or falling. This is because the revenue that these intermittent generators receive from the scheme is additional to that available from the wholesale market and the LGC penalty price is higher than the expected long-run cost of investing in new intermittent generation.

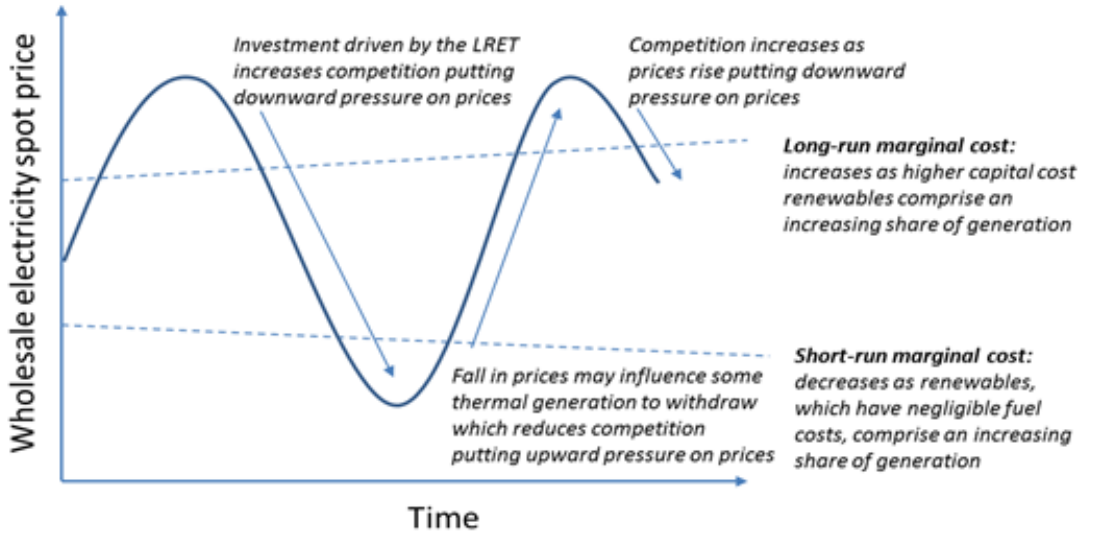
23 The technical characteristics of intermittent generation are also not suited to offering the type of hedging contracts that thermal generators can offer. In particular, intermittent generators without firming capabilities do not add to the supply of traditional swaps and caps. This affects the level of liquidity in contract markets and may undermine the ability of retailers to hedge their customer loads against the risk of volatile spot market prices.

24 The economic characteristics of intermittent generators are also different from thermal generators. Their initial capital costs are relatively high, although these continue to fall rapidly, and their marginal costs of operating are negligible. These economic characteristics let these generators displace thermal generators (which have higher marginal or operating costs, primarily due to fuel costs) at times when they are generating. Over time, to the extent to which the LRET contributes to the exit of thermal generation but does not incentivise investment in firming technologies, it may result in a tighter supply-demand balance and lead to higher wholesale prices. As the LRET target for 2020 is expected to be met through the large volume of new renewable investments in the coming years, and the price of large-scale generation certificates (LGC) is expected to fall significantly as a result, the LRET is not expected to drive additional investment in new renewable projects after 2020.

25 The overall impact of the LRET has therefore been to drive down wholesale prices in the short term but, in the absence of policies and incentives to encourage investment in replacement generation and firming technologies, it contributes to periods of more volatile and potentially higher wholesale prices.

26 Figure 2 shows the effect of the LRET on wholesale price dynamics over time.

Figure 2: Effect of LRET on medium term wholesale price dynamics over time

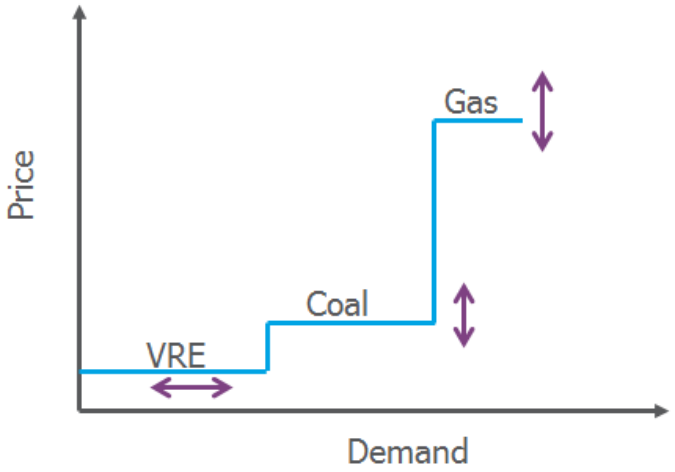


Source: Developed by the AEMC

27 As a further explanation of the effect of the LRET on wholesale price dynamics above, Figure 3 below shows that for a given level of demand, wholesale prices are driven by short short-run marginal costs (SRMC). SRMC are impacted by:

- the availability of variable renewable energy (VRE) - wind and solar generators - can shift the supply curve from left to right in real time, depending on changing wind and sun conditions
- changes in coal and gas prices (e.g. due to changes in export prices) shift the supply curve up or down.

Figure 3: Effect of variable renewable energy on wholesale price dynamics



Source: Developed by the AEMC

Recent and ongoing reviews in the energy sector

28 There were large electricity price rises in most jurisdictions of the National Electricity Market (NEM) in 2017-18. These were mainly driven by a tightening of the supply-demand balance and higher fuel costs for coal and gas generators. Queensland was an exception to this general trend, with its prices remaining relatively flat. However the broader NEM price rises led to concerns about the affordability of consumer energy services. A number of initiatives and inquiries have occurred or are underway to address these and other concerns about the sector. At the time of publication there was a lack of clarity about the specific impact of these programs, so they are generally not included in the analysis.

- The ACCC Retail Electricity Pricing Inquiry made 56 recommendations to boost competition in the generation and retail sectors, lower electricity costs and enhance consumer outcomes. Some of these are being progressed, but because the specific impacts on prices and bills are not known at this stage, the impact of the initiatives has not been factored into the analysis in this report.
- AEMO's Integrated System Plan (ISP) identifies potential transmission investments to support system reliability. It is a long term plan to 2040. The first stage projects are due for delivery in 2020, which is within the report period. However the impact of these projects on transmission revenues and costs, and wholesale energy prices, are not known at this point and so are not included in this analysis. The AEMC has also been asked to assess options for converting the ISP into an actionable strategic plan in its coordination of generation and transmission investment review.
- The ESB is developing a mechanism for market making in South Australia to address concerns about a lack of liquidity in the wholesale hedge market. The AEMC is also progressing a rule change to consider market making obligations across the NEM. Market

making obligations may apply to energy and financial market participants to make offers to buy and sell hedge contracts, to improve participants' ability to manage risks related to electricity wholesale spot price. Given these processes are in train but not finalised, they have not been factored into the analysis for this report.

- Changes to regulated network processes
  - in October 2017 limited merits review of network pricing decisions was abolished. While this is expected to put downward pressure on network costs over time, it is too early to factor this into the pricing and bill analysis in this report.
  - the rate of return guidelines are being revised. The draft rate of return decision indicated a reduction in the rate of return, but this will not be factored into analysis until the final rate of return decision has been made and is factored into future network revenue determinations.
- In addition to the issues listed above, the AEMC has completed or is undertaking a number of rule changes and reviews which have the potential to directly or indirectly impact consumer prices and bills, including:
  - to help consumers get better deals in the energy market (for example, requiring retailers to give advance notice of price changes, stopping retailers discounting from inflated rates)
  - market design changes (for example, market making obligations, impact of a retail default offer)
  - to review system security and reliability (for example, new technical performance standards for generators, establishing a register of distributed energy resources, requiring at least three year's notice of generator closure)
  - to foster the efficiency of network investment and operations (for example, via the coordination of generation and transmission investment review, introducing new transmission connection and planning arrangements, introducing competition in metering and establishing the value of customer reliability.

New methodology for calculating wholesale and environmental costs in the 2018 report

29

This year's report has changed the method used to calculate wholesale electricity purchase costs. Previous *Residential Electricity Price Trends* reports estimated retailers' wholesale electricity purchase costs by forecasting spot market outcomes and applying a contract premium for managing risk. This approach assumed that a retailer buys all its electricity and hedging contracts at a single point in time, so that its entire position is effectively purchased at the prevailing market price. However, it became apparent in the past two years, that with high volatility in forward prices after generator retirements, that short-term estimates made through this method were becoming inconsistent with market outcomes. For this reason, this 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

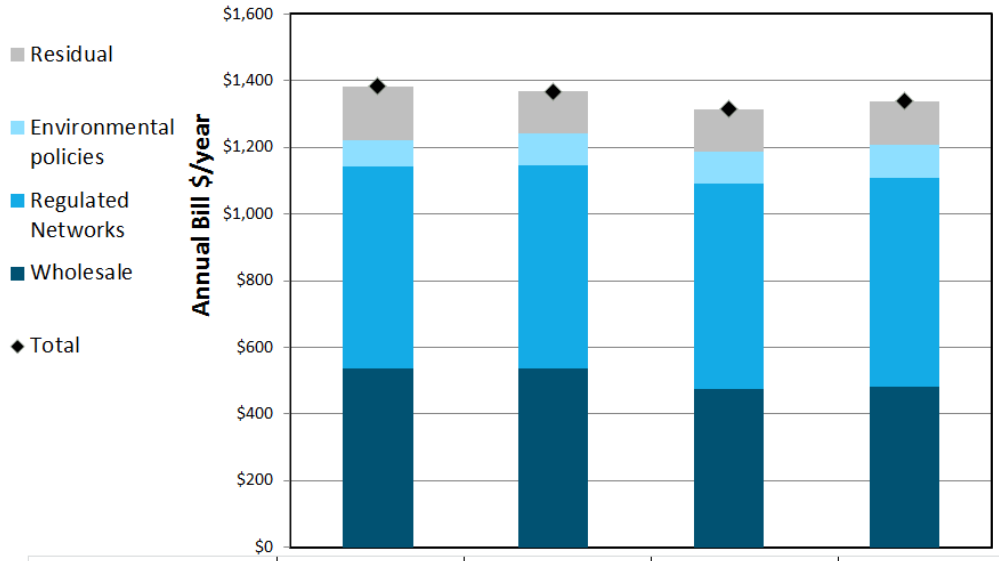
retailers actually hedge their loads, and is therefore considered a more realistic basis for estimating wholesale costs that retailers incur and can be passed through to customer's bills.

30 The approach to estimating environmental costs has also changed. The change relates to the way Ministerial calendar year determinations are translated into financial years for the LRET and SRES. The intention of the change is again to make this analysis more accurately reflect how retailers actually make pricing decisions.

Trends in national prices, bills and supply chain cost components

31 Figure 4 below shows the expected movements in the supply chain components nationally.

Figure 4: Trends in national prices, bills and supply chain cost components



	2017/18 Base Year		2018/19 Current Year		2019/20		2020/21	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**1.75**	**$79**	**2.08**	**$95**	**2.07**	**$96**	**2.14**	**$99**
LRET	0.82	$37	0.89	$41	0.78	$36	0.79	$37
SRES	0.43	$19	0.69	$32	0.74	$34	0.77	$36
Jurisdictional Schemes	0.36	$17	0.35	$16	0.37	$17	0.39	$18
Efficiency Schemes	0.14	$6	0.15	$7	0.18	$8	0.19	$8
Regulated Networks	**13.22**	**$605**	**13.33**	**$610**	**13.49**	**$617**	**13.65**	**$625**
Transmission	2.19	$100	2.22	$101	2.28	$104	2.35	$107
Distribution	10.04	$462	10.10	$464	10.24	$470	10.32	$475
Metering	0.99	$44	1.01	$45	0.97	$43	0.98	$43
Wholesale	**11.70**	**$536**	**11.72**	**$537**	**10.34**	**$474**	**10.55**	**$482**
Residual	**3.57**	**$162**	**2.72**	**$125**	**2.79**	**$128**	**2.87**	**$132**
Total	**30.24**	**$1,384**	**29.85**	**$1,367**	**28.69**	**$1,315**	**29.20**	**$1,338**

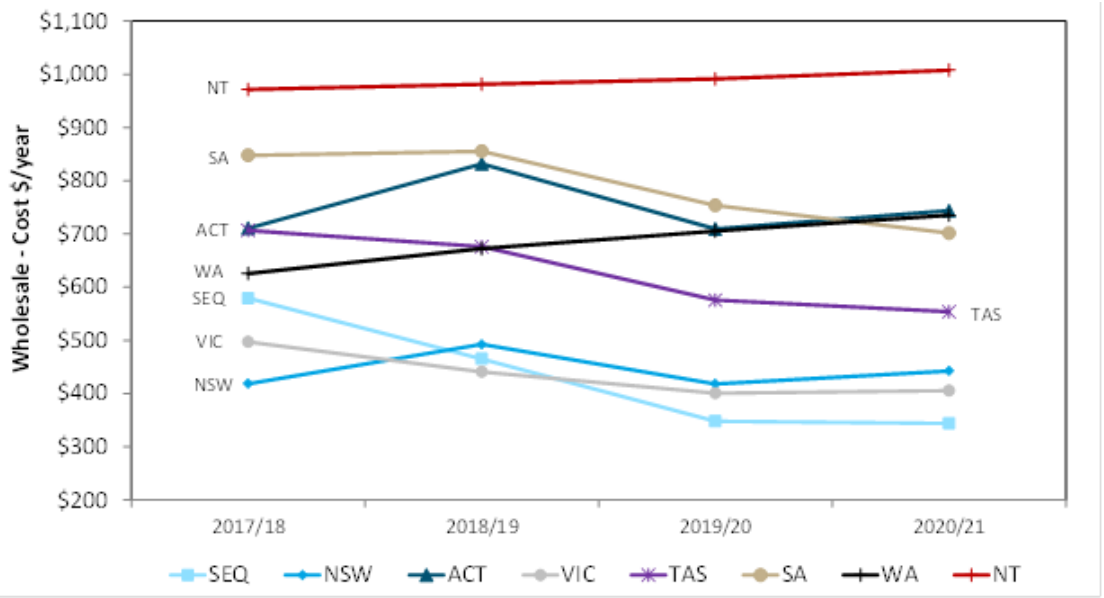
Source: AEMC

32 The national weighted average consumption level for residential consumers is 4,596 kWh per

year. At this consumption level, the national average annual residential bill in 2017-18 is $1,384 exclusive of good and services tax (GST). It is noted that all prices and bills in this report are exclusive of GST. However it is recognised that customers are required to pay GST, such that the retail electricity prices paid by representative customers would be 10 per cent higher than those presented in this report. The annual bill for the national average representative consumer in 2017-18 is $1,522 inclusive of GST.

33 As noted, the expected reduction in wholesale costs is the most significant factor driving the trend in prices and bills. Figure 5 below shows the trends in the wholesale component across jurisdictions over the period 2017-18 to 2020-21.

Figure 5: Trends in the wholesale cost component of representative residential electricity bill by jurisdiction



Source: EY and AEMC
Note: Victorian prices and bills are on a calendar year basis

Summary of key data by jurisdictions

34 Table 1 provides a summary of key data and results from this report.

35 This report is focused on electricity prices and bills for the most common type of retail offer in each jurisdiction, which is the market offer in most jurisdictions. More information on standing offer prices and bills is available in the supporting Databook, available on the *2018 Residential Electricity Price Trends Review* webpage on the AEMC's website.

36 The Databook sets out the AEMC's estimate of a 1.5 per cent decrease in Victorian standing offer prices between the 2018 and 2019 calendar years, based on wholesale modelling up t 15 October 2018 and network cost inputs to 8 November 2018. Subsequent to then, on 30 November 2018, the Big 3 retailers announced the price changes that will apply in Victoria

from January 2019. AGL has announced a 1.6 per cent price decrease, while Origin and EnergyAustralia have indicated a 0 per cent price change. While this report is more focussed on changes in market offers, and retailers have not indicated how these offers will change, the announced changes in standing offers indicates the report is directionally correct and identifies the key drivers of price and bill changes.

Table 1: **Summary of key data by jurisdiction**

	NATIONAL WEIGHTED AVERAGE	SOUTH EAST QLD	NSW	ACT	VIC* (CALENDAR YEARS)	SA	TAS	WA	NT^
Representative consumption (KWh p.a.)	4,596	5,240	4,215	7,151	3,865	5,000	7,908	5,198	6,613
% customers on offer type (as of March 2018)	-	81% on market offers (as of December 2017)	83% on market offers	68% on standing offers	94% on market offers	89% on market offers	Most consumers are on standing offers	N/A. Government set price	N/A. Government set price
Cost component proportion of retail electricity price in 2017/18									
Network cost	44%	45%	47%	30%	40%	38%	46%	49%	50%
Wholesale cost	39%	38%	32%	42%	44%	45%	38%	40%	57%
Environmental policies cost	6%	4%	5%	14%	7%	7%	6%	3%	4%
Changes in retail electricity prices over the reporting period									
Actual change from 2017-18 to 2018-19-	-1.3%	-6.8%	0.4%	1.4%	-3.2%	-1.9%	2.05%	7.0%	1.1%
Estimated annual average change from 2018-19 to 2020-21	-1.1%	-2.8%	-1.1%	2.5%	-1.2% (*2019 to 2021)	-3.3%	-1.0%	4.5%	1.3%

Source: AEMC

Note: All cost component figures are rounded to the nearest whole number. *In Victoria, retail prices generally change in January each year and, therefore, prices and bills are calculated on a calendar year basis. As such, the prices and bills are actual results in 2018 and estimated results in 2019. This differs from all other jurisdictions where retail prices generally change in July each year and prices and bills in 2017-18 and 2018-19 are both actual results. ^The Northern territory cost stack adds to more than 100% because the cost of supplying electricity is higher than the cost of electricity to residential consumers. *In SEQ, the % price change from 2018-19 to 2019-20 is based on the 2018-19 retail electricity bill minus the $50 rebate and 2019-0 retail electricity bill.

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1 INTRODUCTION

1.1 Purpose of the report

The Australian Energy Market Commission (the AEMC or Commission) prepares this annual Residential Electricity Price Trends report at the request of the Council of Australian Governments Energy Council (COAG Energy Council). Now in its ninth year, this report provides information for stakeholders on trends in the components of the electricity supply chain that impact residential electricity prices for each state and territory of Australia. This 2018 report covers the period from 2017-18 to 2020-21 (the reporting period).

The analysis of possible future price trends is based on assumptions and modelling of future costs. Importantly, the estimated future prices in this report do not seek to pre-empt the decisions of governments or jurisdictional regulators. Therefore the information contained in this report should not be considered forecasts of either regulated prices set by jurisdictional regulators, government-set prices, or of specific prices offered by retailers in the competitive market.

1.2 COAG Energy Council terms of reference

In accordance with the terms of reference set by the COAG Energy Council,[3] this report describes and analyses:

- the trends in residential retail electricity prices for each year from 2018-19 to 2020-21, using 2017-18 as the base year
- the breakdown of the supply chain components that contribute to residential retail electricity prices.

The analysis is presented separately for each state and territory, as well as in aggregate to create a national summary. The results are based on representative residential consumption levels for each state and territory.[4]

Where available both standing offer[5] and market offer[6] price trends are reported. Prices are expressed in cents per kilowatt (c/kWh) and as an annual bill amount for the representative consumer. Prices in c/kWh and annual bills are sensitive to the consumption level of the representative consumer, which differs between jurisdictions.[7] All prices are in nominal terms and are exclusive of goods and services tax (GST).

3 A copy of the terms of reference can be found on the project page for the 2018 Residential Electricity Price Trends Report on the AEMC website.

4 Consumption levels were either calculated from benchmark values published by the AER, or provided directly by state and territory governments. Consumption levels reflect the annual electricity consumption of a representative consumer for each jurisdiction.

5 Standing offer contracts are basic electricity contracts with terms and conditions regulated by law. For further information refer to the Methodology Report.

6 Market offer contracts are electricity contracts determined by retailers in the competitive market. They must contain a regulated set of minimum terms and conditions. For further information refer to the Methodology Report.

7 For more information, refer to the Methodology Report.

1.3 Structure of the report

This report is structured as follows:

- Chapter 2 provides a summary of trends and drivers of residential retail electricity prices and bills
- Chapter 3 summarises key changes in the energy sector which may affect residential electricity prices and bills
- Chapter 4 outlines changes in regulated network costs and the impact of these on consumer's bills
- Chapter 5 outlines changes in environmental policy costs and the impact of these on customer's bills
- Chapter 6 outlines the drivers that are likely to influence movements in wholesale electricity costs and the impact on customer's bills
- Chapter 7 outlines how the retail or residual component is derived. In this report, the residual component applies in all jurisdictions except Western Australia.

Appendices A to I provide detailed jurisdictional results for each state and territory and a national summary.

The *2018 Residential Electricity Price Trends Methodology Report*[8] provides more detailed descriptions of key factors influencing industry costs and consumer bills, including descriptions of the data and methods of calculation used in generating the results reported. The databook, which compiles the information provided in this report as well as other consumption levels and tariff data, is available on the project page for this report at aemc.gov.au.

8 Available on the AEMC's website.

2 RETAIL ELECTRICITY PRICE TRENDS AND DRIVERS

BOX 1: KEY FINDINGS

- Consumer's electricity bills are the product of retail prices and their consumption. The key cost components that determine retail prices are network, wholesale and environmental costs, and the residual or retail component.
- The retail electricity prices and bills in this report are specific to the 'representative consumer', which is a composite representing the most common consumer characteristics in each jurisdiction. As the common consumer characteristics change in each jurisdiction, prices and bills in this report should not be compared between jurisdictions.
- From 2017-18 to 2018-19, retail electricity prices and bills:
  - decreased in South East Queensland, Victoria, South Australia and Nationally
  - were flat or increased in New South Wales, the ACT, Tasmania, Western Australia and the Northern Territory.
- From 2018-19 to 2020-21, retail electricity prices and bills are estimated to:
  - decrease in South East Queensland, New South Wales, Victoria, Tasmania, South Australia and Nationally
  - increase in the ACT, Western Australia and the Northern Territory.
- The general decreasing trend in retail electricity prices and bills from 2017-18 to 2020-21 is driven by:
  - decreasing wholesale costs, due to the entry of 9,732 MW of new generation in the NEM from 2017-18 to 2020-21
  - network costs that are flat or increasing and environmental costs that are increasing, but these are outweighed by decreasing wholesale costs
- A number of changes have been made to this year's report compared to the 2017 *Residential Electricity Price Trends report* including changes in the:
  - methodology for calculating wholesale costs
  - methodology for calculating Renewable Energy Target (RET) costs
  - presentation of metering costs and related services.
- The comparison of expected and actual national results from 2014-15 to 2018-19 from recent AEMC *Residential Electricity Price Trends* reports shows that:
  - 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 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.

This chapter outlines:

- Trends in retail electricity prices and bills
- Drivers of retail electricity prices and bills
- Changes between the 2017 and 2018 *Residential Electricity Price Trends* reports.
- Comparison of expected and actual national results from recent AEMC *Residential Electricity Price Trends* reports.

2.1 Trends in retail electricity prices and bills

This section describes the key trends in retail residential electricity prices and bills for all jurisdictions from 2017-18 to 2020-21. The bills are for the representative consumer in each jurisdiction, and are the product of the representative consumer's consumption and the prices they pay for electricity.[9]

The representative consumption levels have not changed from those used in the *2017 Residential Electricity Price Trends report*. Table 2.1 below outlines the annual electricity consumption levels of the representative consumer used in this report.

Table 2.1: Annual electricity consumption level of representative consumers by jurisdiction in 2018

JURISDICTION	ANNUAL CONSUMPTION
South East Queensland	5,240
New South Wales	4,215
Australian Capital Territory	7,151
Victoria	3,865
Tasmania	7,908
Northern Territory	6,613
South Australia	5,000
Western Australia	5,198

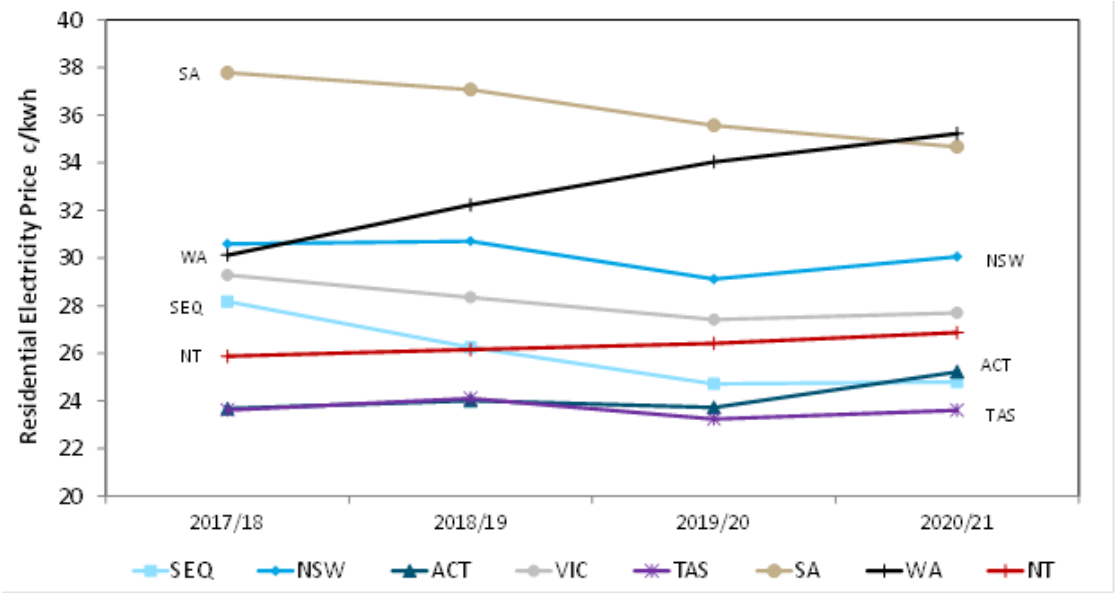
Figure 2.1 and Figure 2.2 below show estimated retail electricity prices and bills:

- from 2017-18 to 2018-19 are:
  - decreasing in South East Queensland, Victoria, South Australia and Nationally
  - flat or increasing in New South Wales, the Australian Capital Territory, Tasmania, Western Australia and the Northern Territory.
- from 2018-19 to 2020-21 are:

9 The representative consumer is defined in each jurisdiction by the electricity consumption characteristics of a typical consumer, based either on benchmark data published by the AER, or information provided by state and territory governments. Consumption levels are different for each jurisdiction and are impacted by numerous factors including weather, the availability and use of gas, and penetration of air conditioning. Therefore, there can be significant variation in consumption levels between jurisdictions. In NSW and Victoria, where the representative consumer is a dual fuel consumer, the total annual energy costs paid by the consumer would be higher than represented here as it includes both electricity and gas costs. For more information on the representative consumer, refer to AEMC, *2018 Residential Price Trends Methodology report*, December 2018.

- decreasing in South East Queensland, New South Wales, the Australian Capital Territory, Victoria, Tasmania, South Australia and Nationally
- increasing in Western Australia and the Northern Territory.

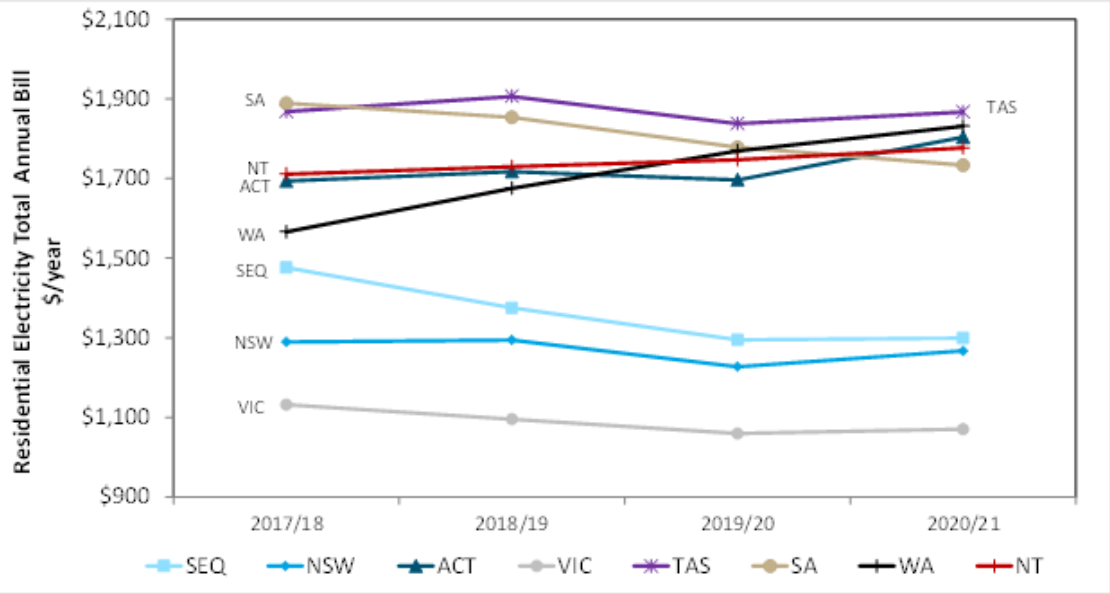
Figure 2.1: Trends in representative residential electricity prices across jurisdictions



Source: AEMC

Note: The weighted average of retailer's lowest market offers for the representative consumer was used in South East Queensland, New South Wales, Victoria and South Australia. The weighted average of retailer's lowest standing offers for the representative consumer was used in the ACT and Tasmania. The regulated price set by the state or territory government was used for Western Australia and the Northern Territory. Also note that Victorian prices are set on a calendar year basis.

Figure 2.2: Trends in representative residential retail electricity bills across jurisdictions



Source: AEMC

Note: The weighted average of retailer's lowest market offers for the representative consumer was used in South East Queensland, New South Wales, Victoria and South Australia. The weighted average of retailer's lowest standing offers for the representative consumer was used in the ACT and Tasmania. The regulated price set by the state or territory government was used for Western Australia and the Northern Territory. Also note that Victorian prices are set on a calendar year basis.

Importantly, jurisdictional bills should be read in conjunction with pricing and consumption data, as bills are the product of prices multiplied by consumption. Viewing either prices or bills in isolation can be misleading. For example, the Tasmanian representative consumers' consumption is more than double that of the representative consumer in Victoria (who is a dual fuel consumer). Therefore, even though the price in cents per kilowatt hour (c/kWh) in Tasmania is lower than in Victoria, the annual bill is higher given the higher consumption level. Accordingly, the jurisdiction tables are more useful as indicators of trends than as comparison or ranking assessments.

It is noted that these expected trends in electricity prices and bills may be affected by changes in wholesale market conditions, network regulatory decisions and government policies which were not known or confirmed at the time of writing this report. The prices and bills in this report are based on:

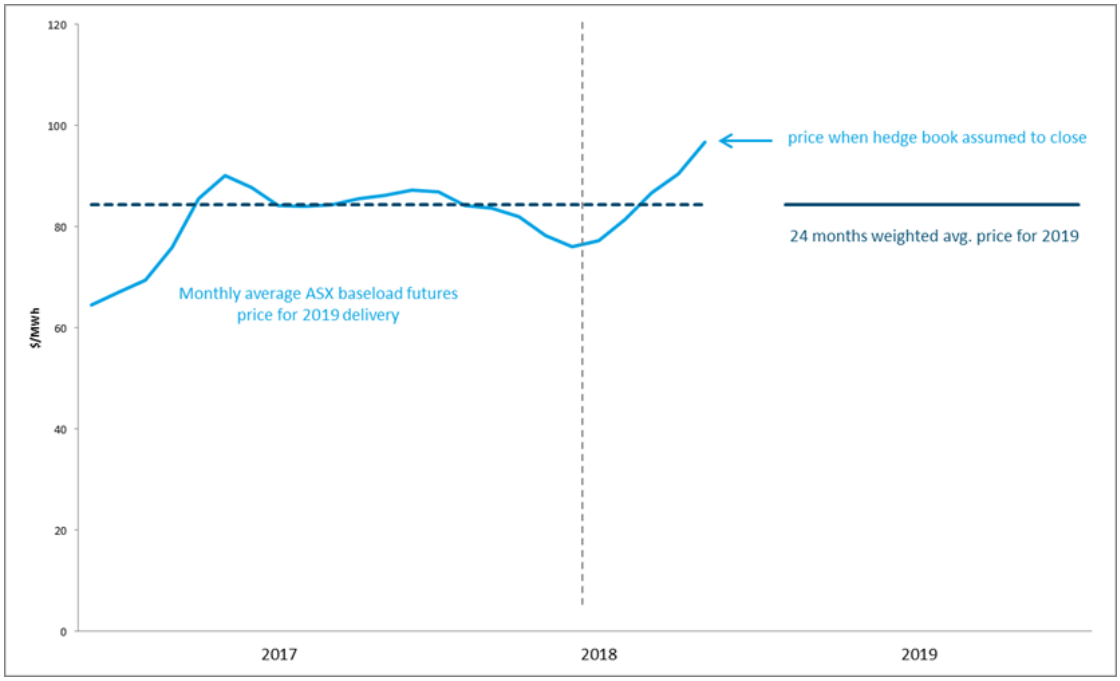
- modelling of wholesale and environmental costs undertaken for the AEMC using available market information up until 15 October 2018
- network cost information that was publicly available up until 8 November 2018.

Importantly, material market change can occur between the time this report's data inputs are finalised 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. Even though Victoria operates on different timeframes, and retailers generally adjust their pricing in

January, recent Victorian forward contract prices provide a useful example of how changes can have a material impact on prices.

Figure 2.3 below shows the price of Victorian baseload swaps for delivery in the first quarter of 2019. Baseload swaps are important because they are the main hedging instrument used by retailers to manage the risk of spot market price volatility. The figure shows that prices were at a low point on 1 June 2018 at $74/MWh, but then rose by approximately 31 percent in the next four and a half months to 15 October, when the price was $97/MWh. Given retailers are assumed to contract approximately 42% of their hedging target during this period of time, such changes can have a material effect on wholesale costs that retailer's can pass through to customer's retail bills.

Figure 2.3: Victorian baseload swap futures prices (for delivery 1st quarter 2019)



Source: ASX data

The Victorian wholesale costs in this report incorporate the recent increase in Victorian futures prices up until 15 October 2018. However, as wholesale costs in this report are estimated based on the average of futures contract prices, that are purchased exponentially over a period of 12 to 24 months, prior to the delivery period,[10] the recent increase in Victorian futures prices from June to October 2018 does not result in an increase in Victorian wholesale costs from the 2018 to 2019 calendar years. Instead, Victorian wholesale costs are expected to decrease from the 2018 to 2019 calendar years.

10 It is assumed that small retailers build up their hedge book over a period of 12 months and large retailers build up their hedge book over a period of 24 months, prior to the delivery period. For more information on the wholesale cost methodology, refer to the AEMC *2018 Residential Electricity Price Trends Methodology Report*.

2.2 Drivers of retail electricity prices and bills

Pricing and billing outcomes are being driven by changes in the underlying supply chain cost components, including:

- wholesale costs are generally decreasing and are the primary driver of retail prices and bills
- network costs are generally flat or increasing
- environmental policy costs are increasing.

Detail on each of these key drivers is outlined below.

Decreasing wholesale costs are the primary driver of retail prices and bills

From 2017-18 to 2018-19, wholesale costs:

- decreased in South East Queensland, Victoria and Tasmania primarily due to new generation (3,663 MW generation and 75 MW battery) that entered the NEM in 2018-19.[11]
- were relatively flat in South Australia due to a combination of new generation supply and higher peak demand
- increased in New South Wales and the ACT due to a combination of:
  - higher fuel costs for some NSW generators from rising coal prices
  - constrained supply issues for some NSW coal generators in mid 2017
  - an expectation that NSW would import more electricity from Queensland compared to Victoria following the retirement of Hazelwood in 2017, noting that Queensland black coal generation is more expensive than Victorian brown coal generation.
- increased in Western Australia due to increases in gas fuel prices
- increased in Northern Territory due to increased costs for the Darwin-Katherine power system.

From 2018-19 to 2020-21, wholesale costs:

- are expected to decrease in all jurisdictions in the NEM. Forecast electricity demand is relatively flat, so the decreasing trend is driven by changes in the supply of electricity:
  - only in 2019-20 and 2020-21, 4,532 MW of large scale renewable new generation is accredited, committed or expected to enter the NEM as is 100 MW of battery storage.
  - gas and coal fuel prices are expected to increase in some locations, placing upwards pressure on wholesale costs. However, this effect is less than the downwards pressure on wholesale costs from new generation.

11 For clarity, new generation and battery storage that is accredited, committed or expected to enter the NEM, in each year from 2017-18 to 2020-21, is as follows:
2017/18: 1,042 MW of new generation and 30 MW of battery storage
2018/19: 3,663 MW of generation and 75 MW of battery storage
2019/20: 3,396 MW of generation and 100 MW of battery storage
2020/21: 1,426 MW of generation
These are not cumulative numbers. They represent the new capacity added to the NEM in each individual year.

- are expected to increase in Western Australia due to expected increases in gas fuel prices
- are expected to increase in the Northern Territory due to increased costs for the Darwin-Katherine power system.

Generally flat or increasing network costs

Network costs are generally flat or increasing over the reporting period:

- from 2017-18 to 2018-19, network costs increased in all jurisdictions, with the exception of South East Queensland, Tasmania and Western Australia.
- from 2018-19 to 2020-21, network costs are expected to be flat or increasing marginally in all jurisdictions, except South East Queensland where they are expected to decrease marginally. The expected increase is primarily due to an increase in transmission costs.

Transmission costs represent a relatively small proportion of network costs, but they are increasing over the reporting period.

In the 2016 and 2017 reports, the trend in the regulated network component was uncertain in a number of jurisdictions due to ongoing legal and regulatory processes. The level of uncertainty in this year's report has reduced compared to previous reports, due to:

- the completion of legal processes in New South Wales and the ACT, and
- the inclusion of proposed, draft or final remade 2014-19 distribution decisions into the AER's 2019-24 draft determinations for the NSW and ACT DNSPs.[12]

Increasing environmental policy costs

Environmental policy costs are increasing in most jurisdictions over the reporting period, primarily due to increasing costs of the Small Scale Renewable Energy Scheme (SRES). SRES cost are estimated to increase in all jurisdictions from 2017-18 to 2020-21 due to:

- a large increase in the adoption of solar systems and an accompanying increase in the Small-Scale Technology Percentage (STP) from 2017 to 2018, and
- further expected increases in the STP from 2018-19 to 2020-21.

In the ACT, the cost of the feed-in-tariff scheme is also expected to increase.

2.3 Changes between 2017 and *2018 Residential Electricity Price Trends* reports

The main changes between the 2017 and *2018 Residential Electricity Price Trends* report relate to methodology. In particular changes have been made to the methods for calculating wholesale costs and the Renewable Energy Target (RET) costs, and to the presentation of metering costs.

2.3.1 Change in method for calculating wholesale costs

There has been a significant change in the methodology used to calculate wholesale costs in this year's report. Previous price trends reports used a modelling approach to estimate

12 For more information, refer to Chapter 4 - Regulated Network Cost Trends and Drivers.

retailers' wholesale electricity purchase costs. However, it became apparent in the past two years, that with high volatility in forward prices after generator retirements, short-term estimates made through the modelling approach were largely inconsistent with market behaviours.

For this reason, and to better reflect how retailers actually manage their wholesale costs, this report combines an approach that:

- where possible, assumes retailers build up a hedge contract book over time
- where there is limited forward contract data, uses a mark-to-market estimate.

For more detail on the approach for estimating wholesale costs as a component of the bill, refer to the *2018 Residential electricity price trends methodology report*.

2.3.2 Change in method for calculating the renewable energy target costs

This year's report has also made changes to the way the costs of the Renewable Energy Target (RET) are calculated. The RET includes both the large-scale renewable energy scheme (LRET) and the small-scale renewable energy scheme (SRES). The cost of the:

- LRET is calculated by multiplying the price of large-scale generation certificates (LGCs) by the Renewable Power Percentage (RRP)
- SRES is calculated by multiplying the price of small-scale technology certificates (STCs) by the Small-scale technology percentage (STP).

The RRP and STP are set by the Minister on a calendar year basis. However this report's terms of reference require financial year reports. Therefore, the RRP and STP need to be converted from calendar to financial years, for the purposes of this report. In previous *Residential Electricity Price Trends* reports, the RRP and STP were estimated using a 50%/50% split between calendar years. However, because the RRP and STP is set by the Minister in March each year, and applies for the calendar year that has nine months still to be completed, our understanding is that retailers generally use the RRP and STP as the basis for the majority (i.e. 9 months or around 75%) of their RET cost estimates. This report has therefore changed to a 75%/25% split.

This year's report has also changed the way LGC and STC prices are estimated. LGC prices are estimated separately for large and small retailers, which reflects the different options available to retailers of obtaining LGCs through Power Purchase Agreements or through the spot market.

Similarly, for STC prices, rather than just using the clearing house penalty price of $40, this report estimated STC prices by reflecting general differences in the way in which large and small retailers meet their SRES obligations. Retailers have the option of either purchasing STCs on the market at a value of around $35/STC or from the clearing house at $40/STC.[13]

13 A detailed explanation of these assumptions is provided in EY's accompanying methdology report.

2.3.3 Change in presentation of metering costs and related services

A competitive market for electricity metering and related services commenced on 1 December 2017 in all jurisdictions other than Victoria, Western Australia and the Northern Territory.[14] This means metering services are contestable and over time, will progressively move from being part of regulated network costs to retail costs[15]. In this report, metering costs:

- remain under the broader 'network cost' component[16] as the representative consumer in each jurisdiction still has a meter that is maintained by a regulated distribution business[17]
- have been separated out from other network costs to increase transparency over metering costs as the transition towards a competitive metering market occurs.

2.4 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 2.4, shows that from 2014-15 to 2018-19:

- 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.[18] However, actual competitive market costs decreased, due to:
    - a major reduction in AEMO's forecast of electricity demand,[19] and
    - lower forecast gas prices driven by forecasts of lower global fuel prices.[20]
  - 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.

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14 The AER changed the classification of metering services in NEM jurisdictions (other than Victoria) through the most recent set of DNSP determinations. For more information see the discussion papers Classification of metering services for each jurisdiction and determinations for each DNSP.

15 Retail costs are part of the residual component in the AEMC's annual Residential Electricity Price Trends reports.

16 These are provided by DNSPs as an Alternative Control Service (ACS). An ACS is a type of service provided by a DNSP that is regulated by the AER. The service is provided on a cost basis and is only paid for by consumers when they use it.

17 In most jurisdictions, consumers still have a Type 6 accumulation meter. The exception is in Victoria where a mandatory rollout of smart meters has occurred.

18 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.

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

20 Ibid, p4.

  - 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.
- 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.

As noted above in section 2.1, material market change 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 of time from the finalisation of inputs in October and when retailers generally adjust their pricing in January the next year.

Figure 2.4: 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
Source of estimated prices and costs	2013 report	2014 report	2015 report	2016 report	2016 report	2017 report
Source of actual prices and costs	2014 report	2015 report	2016 report	2017 report	2018 report	2018 report
Total retail price						
Estimated price	27.95	26.83	25.21	25.8	26.49	29.58
Estimated price change		-1.12	-1.62	0.59	0.69	3.09
Estimated direction of trend		Decrease	Decrease	Increase	Increase	Increase
Actual price	28.57	25.68	24.71	28.16	30.24	29.85
Actual price change		-2.89	-0.97	3.45	2.08	-0.39
Actual direction of trend		Decrease	Decrease	Increase	Increase	Decrease
Accuracy of expected vs actual trend		Correct	Correct	Correct	Correct	Within 1%
Network costs						
Estimated price	14.4	14.23	11.93	12.07	12.2	13.57
Estimated price change		-0.17	-2.3	0.14	0.13	1.37
Estimated direction of trend		Decrease	Decrease	Increase	Increase	Increase
Actual price	13.87	13.37	12.24	13.63	13.22	13.33
Actual price change		-0.5	-1.13	1.39	-0.41	0.11
Actual direction of trend		Decrease	Decrease	Increase	Decrease	Increase
Accuracy of expected vs actual trend		Correct	Correct	Correct	Incorrect	Correct
Wholesale costs*						
Estimated price	5.26	10.49	11.18	7.39	8.14	11.28
Estimated price change		5.23	0.69	-3.8	0.75	3.14
Estimated direction of trend		Increase	Increase	Decrease	Increase	Increase
Actual price	10.3	10.52	10.38	10.01	11.7	11.72
Actual price change		0.22	-0.14	-0.37	1.69	0.02
Actual direction of trend		Increase	Decrease	Decrease	Increase	Increase
Accuracy of expected vs actual trend		Correct	Incorrect	Correct	Correct	Correct
Environmental costs						
Estimated price	4.49	2.11	2.1	2.18	1.87	1.78
Estimated price change		-2.38	-0.01	0.08	-0.31	-0.09
Estimated direction of trend		Decrease	Decrease	Increase	Decrease	Decrease
Actual price	4.39	1.79	2.08	2.01	1.75	2.08
Actual price change		-2.6	0.29	-0.07	-0.26	0.33
Actual direction of trend		Decrease	Increase	Decrease	Decrease	Increase
Accuracy of expected vs actual trend		Correct	Within 1%	Incorrect	Correct	Incorrect

Source: AEMC 2013, 2014, 2015, 2016, 2017 and 2018 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 and 2018-19 the comparison of actual and expected results are for wholesale costs only.

3 CHANGES IN THE ENERGY SECTOR

BOX 2: KEY FINDINGS

- The electricity market is transforming, with an increasing quantity of wind and solar generation capacity entering the market, and older synchronous generators expected to retire. During this report's timeframe from 2017-18 to 2020-21, there is 9,732 MW of new generation capacity expected to enter the NEM. This new capacity is primarily wind and solar generation, incentivised through the LRET and state based schemes such as the Victorian Renewable Energy Target (VRET).
- The transition from large centralised synchronous generators to smaller decentralised non-synchronous generation resources creates a broad range of issues related to reliability, system security, participant bidding and contracting behaviour, and the economics of the electricity system. As such, these developments will impact on system costs and in turn on consumer prices and bills.
- Where possible the impact of these developments has been included in the analysis. However, if the developments are not finalised, if the impact is unclear, or if the impact is beyond the analysis period to 2020-21, then the impacts have not been included. Notably, if actual market developments diverge from the assumptions underpinning the analysis in this report, the pricing and bill impacts will need revision.
- Some of the key market, policy and legislative developments are listed below.
    - The AEMC is progressing a large number of rule change and review processes to protect consumers, address market design issues, deliver system security and reliability, and promote the efficient investment in and operation of electricity networks. These may have direct and indirect impacts on consumer pricing and bill outcomes.
    - The ACCC's retail electricity price inquiry (REPI) made 56 recommendations to boost competition, lower industry costs, and improve customer experiences and business outcomes. Two specific recommendations that are being progressed relate to the introduction of a default market offer and a mechanism to underwrite investment in new dispatchable generation. Both of these could have material impact on consumer prices and bills but, because the impact is not yet clear, have not been factored into the pricing and bill estimates. The AEMC is providing advice on both of these initiatives.
    - AEMO's Integrated System Plan (ISP) identified potential transmission investments to support system reliability. It is a long term plan for 2040. The first stage projects are due for delivery in 2020, which is within the reporting period. However no projects are finalised at this point and so are not included in this analysis. The AEMC has also been asked to assess options for converting the ISP into an actionable strategic plan in the Coordination of generation and transmission investment review (COGATI).

- The recent change to remove limited merits review and the progressing review of the rate of return guidelines may lower network prices in future years, but are yet to have an effect on actual price and bill outcomes.
- Government initiatives to expand the capacity of the Snowy Hydro generation assets, and the Tasmanian hydro scheme may also materially impact market supply and pricing. As yet, these projects are not included in the modelled results.

This chapter describes a number of key factors that may have an influence on pricing and consumer bills. The particular factors considered are:

- changes in the generation mix in the electricity market, in particular the increasing penetration of wind and solar generators
- AEMC changes to the market design
- AEMO's *Integrated System Plan*
- the ACCC's recommendations from its *Retail Electricity Pricing Inquiry*
- other regulatory and policy changes.

While all the factors described are potentially influential on consumer prices and bills, some described changes have just been introduced and others are still being considered. In modelling future pricing outcomes, specific assumptions have been made about the influence of these factors. It is therefore important to note that if actual events diverge from the assumptions, then the estimated consumer prices and bills will need revision.

3.1 The energy market is transforming

The electricity market is transforming, with an increasing quantity of wind and solar generation capacity entering the market, and older synchronous generators expected to retire. There are also expected to be more customer-connected distributed energy resources like rooftop solar and storage, a more active market for demand response, and the growth of electric vehicles as a potential source of increased demand and behind-the-motor storage. While these broad directions are generally accepted, there are varying views as to the timing of such developments and the specific impacts they will have on the energy market and consumers. For this report, even when longer term trends are described, the specific focus is on factors that will impact consumer prices and bills in the period to 2020-21.

During this report's timeframe from 2017-18 to 2020-21, there is 9,732 MW of new generation capacity and battery storage expected to enter the NEM. This new capacity is primarily wind and solar generation, incentivised through the LRET and state based schemes such as the Victorian Renewable Energy Target (VRET). In 2020-21, this new capacity is estimated to represent approximately 13.6 per cent of total generation capacity (MW) and 12.3 per cent of energy output (MWh) in the NEM. This additional capacity is expected to put downward pressure on wholesale prices in the reporting period.[21]

21 Note, the expectation of downward pressure on wholesale prices assumes no unexpected exit of thermal generation will occur.

The transition from large centralised synchronous generators to smaller decentralised non-synchronous generation resources creates a broad range of issues related to reliability, system security, participant bidding and contracting behaviour, and the economics of the electricity system. As such, these developments will impact on system costs and in turn on consumer prices and bills.

The following sections of this chapter describe key factors and how they may affect consumer prices and bills.

3.2 AEMC changes to market design

There are a range of regulatory processes underway that are addressing issues associated with the technology and market transition that is occurring in the electricity markets.

Relevant elements of the AEMC's work program follow.

- A number of consumer protection measures to help consumers get better deals in the market have been progressed. While these do not directly reduce retailers' costs, they can reduce some consumer bills. Specific initiatives include:
  - stopping electricity discounting from inflated rates[22]
  - requiring retailers to give advance notice of price changes[23]
  - the *2018 Retail Competition Review* highlighted a number of problematic retailer pricing practices, identified potential solutions to those practices, and described how consumers can take matters into their own hands by adopting new technologies such as solar and storage.
- The AEMC has changed or been tasked to consider a number of key market design issues, including:
  - considering a rule change on market making obligations[24]
  - considering the impact of a default offer on retail competition, innovation, and specific consumers
  - consideration of a mechanism for underwriting new investment
  - monitoring industry preparations for implementation of the five minute settlement rule.
- The system security and reliability work program is focused on developing market frameworks which allow continued take-up of new generating technologies while keeping the lights on at least cost to consumers. In 2018, this work program included:

22 AEMC, Final Determination, *National Energy Retail Amendment (Preventing discount on inflated energy rates) Rule 2018*, 15 May 2018

23 AEMC, Final determination, *National Energy Retail Amendment (Advance notice of price changes) Rule*, 27 September 2018.

24 Market making obligations are being considered to address concerns about a lack of liquidity in wholesale electricity hedge markets. Market making obligations may apply to energy and financial market participants to make offers to buy and sell hedge contracts, to improve participants' ability to manage risks related to electricity wholesale spot price.

  - changing the technical performance standards for generators seeking to connect to the national electricity grid[25]
  - establishing a register of distributed energy resources (DER) to provide AEMO with visibility of DER to assist in planning and operating the system[26]
  - requiring generators to provide at least three year notice of generator closure to avoid unexpected price increases such as those that followed the closures of the Northern and Hazelwood generators.[27]
- Networks costs are the largest component of a customer's bill, so work to promote the efficient investment in and operation of the network is key to managing network costs. The recent work program has included:
  - the coordination of generation and transmission investment (COGATI) review is assessing how AEMO's integrated system plan can be turned into an actionable strategic plan
  - the Annual Electricity Network Economic Regulatory Framework Review which assessed whether network businesses had the right tools and sufficient flexibility to manage changes such as increased rooftop solar.[28]
  - the introduction of new transmission connection and planning arrangements[29]
  - establishing the value of customer reliability to inform the development of reliability standards in network and wholesale markets[30]
  - the introduction of competition in metering.[31]

3.3 ACCC Retail Electricity Price Inquiry

On 11 July 2018 the ACCC released the final report of its *Retail Electricity Pricing Inquiry (REPI)*.[32] The report made 56 recommendations which fall into four main areas:

- boosting competition in the generation and retail sectors (9 recommendations)
- lowering costs in networks, retail and environmental schemes (19 recommendations)
- enhancing consumer experiences and outcomes (20 recommendations)
- improving business outcomes (8 recommendations).

25 AEMC, Final determination, *National Electricity Amendment (Generator Technical Performance Standards) Rule 2018*, 27 September 2018

26 AEMC, Final determination, *National Electricity Amendment (Register of Distributed Energy Resources) Rule 2018*, 13 September 2018.

27 AEMC, Final determination, *National Electricity Amendment (Generator three year notice of closure) Rule*, 8 November 2018.

28 AEMC, *Economic Regulatory Framework Review - Promoting efficient investment in the grid of the future*, 26 July 2018.

29 AEMC, Final determination, *National Electricity Amendment (Transmission Connection and Planning Arrangements) Rule 201*, 23 May 2017.

30 AEMC, Final determination, *National Electricity Amendment (Establishing Values of Customer Reliability) Rule 2018*, 5 July 2018.

31 This rule change came into effect in all NEM jurisdictions except Victoria on 1 December 2017.

32 For more information see: https://www.accc.gov.au/system/files/Retail%20Electricity%20Pricing%20Inquiry%E2%80%94Final%20Report%20June%202018_0.pdf.

The responsibility for assessing and implementing these recommendations lies variously with the COAG Energy Council, Commonwealth Government, State and Territory Governments, and market bodies — namely the ESB, AEMC, AEMO, AER and ACCC.

Some of these recommendations are in the process of being developed. However, as it is unclear how these recommendations are to be given effect, this *2018 Residential Price Trends report* has not accounted for the potential impact on electricity prices bills over the reporting period from 2017-18 to 2020-21.

One recommendation which could affect retail electricity prices in the reporting period is the introduction of a default offer. This would replace standing offers in non-price regulated jurisdictions[33] and set a consistent benchmark from which market offers could be referenced. While a default offer may help consumers to compare the offers and discount claims from retailers, the level of the default offer needs to be set carefully to avoid negatively impacting on retail competition, innovation and customers who are currently enjoying the benefits of competitive offers. As the development of the default offer is still being progressed, and is not yet finalised, it has not been incorporated into the modelling of electricity prices and bills for this 2018 report.

Another recommendation that is being progressed is the proposal for the Commonwealth to underwrite new investment to ensure sufficient dispatchable generation will be available.

3.4 AEMO's integrated system plan

On 17 July 2018 AEMO released its inaugural *Integrated System Plan* (ISP) for the NEM[34] to address one of the Finkel review recommendations for improved system planning.[35] The ISP is an engineering plan that forecasts the overall transmission system requirements for the NEM over the next 20 years. The report identified that the coal-fired generation that supplies around 70 TWh of energy (i.e. approximately one-third of total NEM consumption) is expected to retire by 2040. The ISP identifies a potential plan of transmission investments to support the development of renewable energy zones and the reliable supply of electricity.

The ISP groups transmission projects into three phases, based on when the investments will be required:

- Group 1: near-term construction to maximise use of existing resources (now to 2020).
- Group 2: medium-term developments to enhance trade between regions, provide access to storage, and support developments of renewable energy zones (REZs) (2020-2030).
- Group 3: long-term developments of REZs, system reliability and security (2030-2040).

The most relevant investments for this report are those in Group 1 given AEMO's an indicative timing is delivery in 2020 with a total cost of $450-$650 million. However, all projects identified in this first group are currently subject to RIT-T or alternate regulatory processes or have been identified as contingent projects by TNSPs but are yet to be

33 That is, South East Queensland, New South Wales and South Australia. It is not intended to apply in Victoria.

34 AEMO, *Integrated System Plan - For the National Electricity Market*, July 2018.

35 AEMO, *Integrated System Plan,* June 2018, accessed 30 October 2018, https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Integrated-System-Plan.

triggered. Therefore, the cost of these projects has not been included by the AER in any TNSP revenue determinations. Accordingly, these projects are not included in this report. If the investments go ahead they will likely put upwards pressure on transmission network costs within the reporting period. The proposed investments in Group 2 and Group 3 will result in further changed network and other costs, but these will occur beyond the reporting period. In total, the projects are estimated to cost in the order of $6.2 billion.[36]

3.5 Other regulatory and policy changes

There are a range of other regulatory and policy changes underway or being considered.

- The Energy Security Board (ESB) is developing the retailer reliability obligation[37] which is intended to ensure sufficient resources are available to meet demand in the NEM, particularly in regions with limited access to dispatchable generation. If the right investment does not come forward to address forecast supply shortfalls, this would trigger an obligation on electricity retailers to demonstrate they can meet their share of peak demand. There are insufficient details available to include any impact in this report.
- The AER is updating the rate of return guidelines. The final decision is due in December 2018, and the guidelines will be binding on network service providers.[38] The draft decision was to decrease the rate of return by around 0.6 per cent. As this would affect approximately 50 per cent of regulated network revenues, it would place downwards pressure on network costs that are included in customer's bills.
- There are also specific changes to network costs in New South Wales and the ACT, following appeals of the AER's final determinations for the 2014-2019 regulatory control period. The AER has recently released the draft and final remittal decisions for some distribution network businesses, and Ausgrid has released a proposed remittal.[39] The latest remittal decision or proposal has been incorporated into the estimate of network costs in this report.
- The AER has also updated the retail pricing information guidelines to improve the way pricing information is provided to consumers, and to help them compare offers from different retailers.[40] This may have indirect benefits to consumer billing outcomes, but no explicit benefit has been modelled.

There are an additional range of Commonwealth government initiatives that have recently been implemented or are being developed.

- In October 2017, the Commonwealth Government passed legislation that removed the ability of energy networks to appeal AER pricing decisions.[41] Since 2008, network

36 The 2017, the Regulatory Asset Base (RAB) for all transmission network businesses was approximately $20 billion.

37 COAG Energy Council, *20th Meeting Communique*, 26 October 2018.

38 Following COAG Energy Council legislatation in April 2017. See AER, *Consultation paper –process for reviewing the rate of return guidelines*, July 2017, p. 7 and for more information see: https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-rate-of-return-guideline/draft-decision.

39 On 21 November 2018, the AER published its draft remittal decision for Ausgrid. This decision was not incorporated into the estimate of network costs in this report as it occurred after the cut-off date for new information for this report.

40 For more information see: www.aer.gov.au/retail-markets/retail-guidelines-reviews/retail-pricing-information-guidelines-2018.

41 For more information see: www.environment.gov.au/minister/frydenberg/media-releases/mr20171016.html.

businesses succeeded in 31 appeals, which put upwards pressure on network costs. The abolition of limited merits review is expected to put downwards pressure on network costs over time, however as it was only recently abolished, it is too early to determine the extent of this effect.

- There is a joint proposal, with the Tasmanian government, to expand the storage capacity of the Tasmanian hydro scheme by 2,500 MW and expanding the Tarraleah and Gordon power stations.[42] The aim is for this project to operate in tandem with a second Tasmanian interconnector. This project has not been approved and as such has not been included in the modelling for this report.
- The federal government purchased the Snowy Hydro Limited generation assets from the New South Wales and Victorian governments in March 2018, and a feasibility study has found that adding 2,000 MW of pumped hydro energy storage was technically and financially feasible.[43] As the proposal has not been finalised, no additional generation has been included in this report.
- The Commonwealth is investigating how to initiate a mechanism to underwrite investment in new dispatchable generation capacity. This was one of the ACCC REPI recommendations. Consultation of the mechanism is underway, and it is expected that the first mechanism could commence from 1 July 2019. As the design of the mechanism is in the process of being developed, and the potential outcomes of the mechanism are uncertain, it has not been incorporated into the modelling for this 2018 report.

42 Prime Minister of Australia, *The Honourable Malcolm Turnbull, New Tasmanian Pumped Hydro,* Media release, 20 April 2017.

43 For more information see: www.pm.gov.au/media/green-light-snowy-hydro-20.

4 REGULATED NETWORK COST TRENDS AND DRIVERS

BOX 3: KEY POINTS

Network charges in 2017-18 represented approximately 30 to 51 per cent of a typical residential electricity bill for a consumer nationally. Of this, the transmission cost represented five to 12 per cent, the distribution cost represented 23 to 40 per cent and metering costs represented two to six per cent.

- On average from 2017-18 to 2018-19, the regulated network cost of a representative consumer's annual electricity bill:
  - increased in New South Wales, the ACT, Victoria, South Australia and the Northern Territory
  - decreased in South East Queensland, Tasmania
  - remain stable in Western Australia.
- On average from 2018-19 to 2020-21, the regulated network cost of a representative consumer's annual electricity bill is expected to:
  - increase in New South Wales, the ACT, Victoria, South Australia, Tasmania and Western Australia
  - decrease in South East Queensland
  - remain stable in the Northern Territory.
- From 2018-19 to 2020-21, the trend in the regulated network cost components are:
  - Transmission network charges are flat or increasing in all jurisdictions, except for Tasmania where the charges are decreasing.
  - Distribution network charges are increasing in all jurisdictions, except for South East Queensland where the charges are decreasing.
  - Metering charges are relatively flat in all jurisdictions, except for the ACT and Western Australia where the charges are increasing, and for Victoria where the charges are decreasing.
- The network charges used in this report are based on regulatory decisions made by the AER and the ERA. The decisions are made at different times because network service provider businesses' (NSP) regulatory control periods are not aligned.
  - For 2017-18 and 2018-19, network costs are based on approved actual tariffs in distribution NSP's annual pricing proposals, that have been set by regulators.
  - For 2019-20 and 2020-21, networks costs are:
    - based on the latest draft or final decision made by a regulator for those years, or

  - — are held constant in nominal terms from the previous year's tariff, if a draft or final decision is not available for one or both of those years.
- As the review of the rate of return guidelines has not yet been finalised, the potential impact has not been accounted for in the estimate of network costs in this 2018 report.

Regulated network costs are the largest component of residential customers' bills, reflecting the fact that distribution and transmission networks involve large capital investments. As networks are natural monopolies, there is no competition for network services, so network service providers (NSPs) are economically regulated. In NEM jurisdictions and the Northern Territory, NSPs are regulated by the Australian Energy Regulator (AER), and in Western Australia they are regulated by the Economic Regulation Authority (ERA). The AER and the ERA use incentive-based regulation frameworks to encourage efficient investment in and operation of the electricity network by NSPs.

Network tariffs are the prices that electricity distribution network businesses charge retailers for their customers' use of the electricity network. These tariffs include:

- a transmission network cost, which is passed through to Distribution Network Service Providers (DNSPs) by Transmission Network Service Providers (TNSPs)
- a distribution network cost, which allows DNSPs to recover their operating and capital costs as well as their gross margin
- a metering cost, which is the cost of measuring consumers' electricity usage and maintaining the meter.

This chapter outlines:

- trends in network costs by jurisdiction
- the break down of network costs into transmission, distribution and metering components
- potential future costs not accounted for in this report which may affect regulated network costs in the period of 2018-19 to 2020-21.

The approach used to estimate the transmission and distribution network cost component and a brief description of the regulatory frameworks used is outlined in the *2018 Residential Electricity Price Trends Methodology Report*.

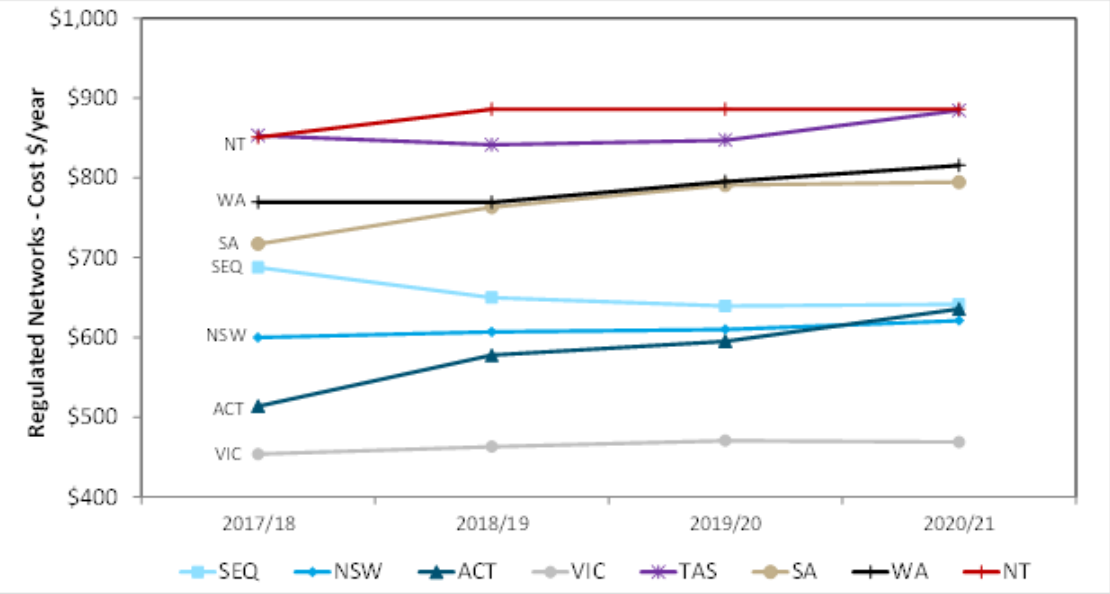
4.1 Trends in network costs by jurisdiction

Regulated network charges in 2017-18 represented approximately 30 to 50 per cent of a typical residential electricity bill for a consumer across jurisdictions. Of this, the transmission cost represented approximately four to 12 per cent, the distribution cost represented 23 to 40 per cent and metering costs represented two to six per cent. The network costs as a component of the bill has slightly decreased as a proportion of a typical residential consumers' annual electricity bill from 2016-17.[44]

44 The network costs and electricity bills for 2016-17 were presented in the *2017 Residential Electricity Price Trends Report.*

Figure 4.1 below shows the network component of representative electricity prices from 2017-18 to 2020-21.

Figure 4.1: Network cost component of annual electricity bills for representative consumer in each jurisdiction



Source: AEMC

Note: In all jurisdiction network prices change on a financial year basis. The exception is Victoria, where network prices change on a calendar year basis.

From 2017-18 to 2018-19, the regulated network cost of a representative consumer's annual electricity bill:

- increased in New South Wales, the ACT, Victoria, South Australia and the Northern Territory
- decreased in South East Queensland, Tasmania
- remain flat in Western Australia.

On average from 2018-19 to 2020-21, the regulated network cost of a representative consumer's annual electricity bill is expected to:

- increase in New South Wales, the ACT, Victoria, South Australia, Tasmania and Western Australia
- decrease in South East Queensland
- remain flat in the Northern Territory.

However, on average from 2018-19 to 2020-21, as a proportion of the total representative consumer's annual bill, the regulated network cost component is expected to:

- increase in South East Queensland, New South Wales, ACT, Victoria, South Australia and Tasmania

- decrease in Western Australia and the Northern Territory.

Basis of network tariffs

The expected trends in regulated network costs, as shown in Figure 4.1, are based on actual regulatory decisions made by the AER and ERA - where such decisions are available - and on projections for years where no decisions have been finalised. Given different Network Service Providers (NSP) have different regulatory control periods, the mix between network costs based on regulatory decisions and projections differs by jurisdiction.

In this report actual DNSP tariffs are used for 2017-18 and 2018-19. For 2019-20 and 2020-21,

- Where a final or draft decision has been made, the tariffs from the previous year's tariff are escalated by the percentage difference between the allowed (smoothed) revenue from the previous year to the next year.
- Where a final or draft decision has not been made, the previous year's tariff is held constant in nominal terms.

The AER's upcoming final network expenditure determinations, which were not finalised at the time of writing this report and therefore have not been accounted for in the estimated network costs in this report, are:

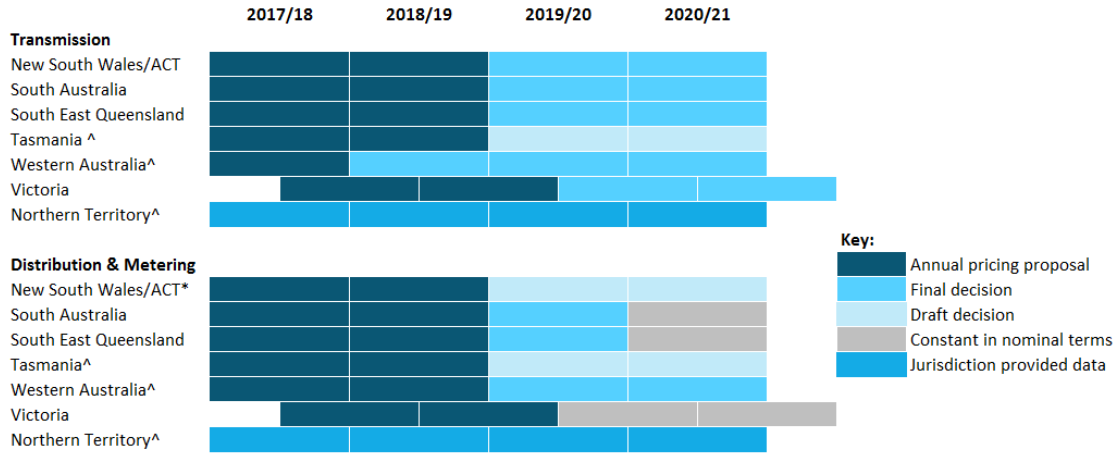
- In New South Wales, ACT, Northern Territory and Tasmania — EvoEnergy, Ausgrid, Endeavour Energy, Essential Energy, Power and Water Corporation and TasNetworks' next regulatory period begins 1 July 2019. The AER's final decision is expected to be released around March-April 2019. The AER's draft decisions for these jurisdictions have been used in this report.
- In South East Queensland and South Australia — Energex, Ergon and SA Power Networks' next regulatory period begins 1 July 2020. The AER's Final Decision is expected to be released around March-April 2020.
- In Victoria — CitiPower, Powercor, Jemena, AusNet Services and United Energy's next regulatory period begins 1 January 2021. The AER's Final Decision is expected to be released around November-December 2020.

The Economic Regulation Authority of Western Australia's final decision on the 2017-2022 access arrangement has been used for this report.[45]

Figure 4.2 below shows the basis on which each jurisdiction's network tariffs were determined.

45 For more information on Western Power's Access Arrangement 2017-2022 see: https://www.erawa.com.au/electricity/electricity-access/western-power-network/access-arrangement/access-arrangement-period-2017-2022

Figure 4.2: Summary of approaches for estimating network costs



Note: Network costs are set on a financial year in all jurisdictions except Victoria, where network costs are set on a calendar year. ^In Tasmania, Western Australia (SWIS) and the Northern Territory, both transmission and distribution network services are provided by the same business. *In NSW and the ACT, the latest available AER remittal decision or business' proposed remittal, that was available up until 8 November 2018, has been incorporated into the estimate of network costs. *ACS metering costs are determined from the respective distribution network service provider's annual pricing proposal or the AER's draft or final determination.

Further detail on jurisdictional specific tariffs and assumptions used in this report are available in the *2018 Residential Electricity Price Trends Methodology Report*.

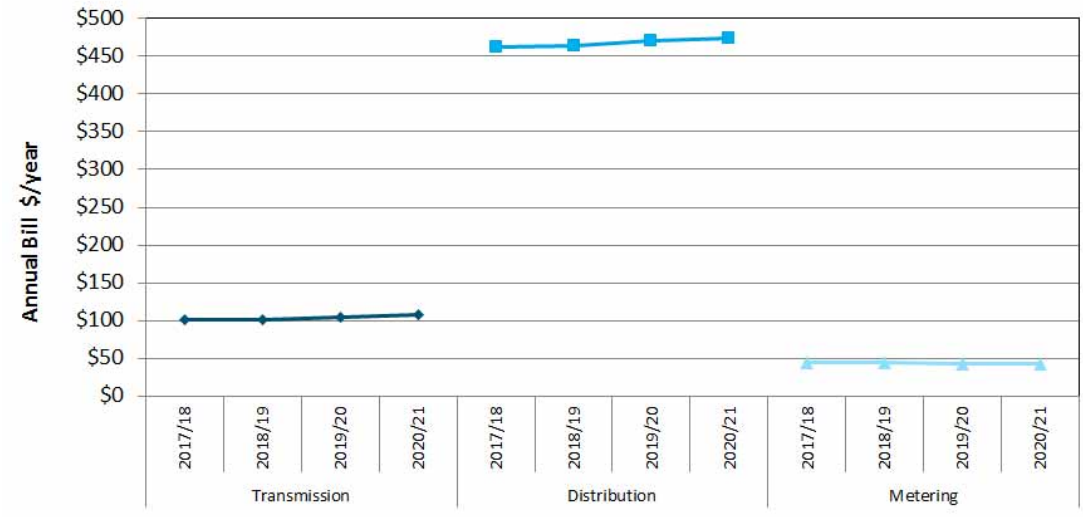
4.2 Breakdown of network cost components

From 2018-19 to 2020-21, the trend in the network cost components are:

- Transmission network costs are increasing in all jurisdictions, except for Tasmania where these costs are decreasing.
- Distribution network costs are increasing in all jurisdictions, except for South East Queensland where these costs are decreasing.
- Metering costs are relatively flat in all jurisdictions, except for the ACT and Western Australia where these costs are increasing, and Victoria where these costs are decreasing.

Figure 4.3 below shows the network cost components on a national average basis over the reporting period.

Figure 4.3: Nationally averaged network cost component trends



Note: This figure shows the trend of each network cost component using the nationally averaged bill. For more information on how this bill was calculated see the 2018 Residential Electricity Price Trends Methodology Report.

4.2.1 Transmission charge trends

From 2017-18 to 2020-21, national average transmission costs are expected to increase. These findings are observable in the left-hand graph of Figure 4.3 above.

The increasing trend in transmission network costs are primarily due to increasing transmission costs in New South Wales, ACT, South Australia and Western Australia. The trend is for an annual average increase of 3.0 per cent in transmission costs from 2018-19 to 2020-21 in the national average residential bill.

There are some factors that will potentially impact transmission network costs both within the reporting period and beyond. Box 4 discusses some of these potential future factors to impact transmission costs.

BOX 4: POTENTIAL FUTURE FACTORS TO IMPACT TRANSMISSION NETWORK COSTS

There are also a number of reports that may impact network costs, in particular the trend in future transmission cost, beyond the analysis period of this report 2017-18 to 2020-21. The key reports are summarised below.

Integrated System Plan (ISP) Report

On 17 July 2018 AEMO released its inaugural Integrated System Plan (ISP) for the NEM. The ISP aims to be a strategic infrastructure development plan to facilitate an orderly energy

system transition under a range of scenarios.

The report identified that coal-fired generation that supplies around 70 TWh of energy is expected to retire by 2040. This represents approximately one-third of total NEM consumption. AEMO's neutral scenario suggests a portfolio of geographically and technologically diverse generation assets totalling 90 TWh of energy output per annum will be required by 2040.

The portfolio of new resources is likely to involve substantial amounts of geographically dispersed renewable generation. Increased transmission investment may be needed to connect these resources.

If the ISP is implemented, it will put upwards pressure on network expenditure. However, if transmission investments lead to greater competition in the wholesale market, or provides system security or reliability benefits that reduce the need for other interventions, it may put downward pressure on wholesale costs.

The ISP groups projects into three categories, based on the expected timing of the investments:

- Group 1: near-term construction to maximise economic use of existing resources (now to 2020)
- Group 2: developments in the medium term to enhance trade between regions, provide access to storage, and support developments of renewable energy zones (REZs) (2020 to 2030)
- Group 3: longer-term developments to support REZs and system reliability and security (2030 to 2040).

The most relevant investments for this report are those in Group 1 given AEMO's an indicative timing is delivery in 2020 with a total cost of $450-$650 million. However, all projects identified in this first group are currently subject to RIT-T or alternate regulatory processes or have been identified as contingent projects by TNSPs but are yet to be triggered.

Therefore, the cost of these projects has not been included by the AER in any TNSP determination's total allowed revenue. Hence, these projects are not accounted for in this report. If the investments go ahead they will likely put upwards pressure on transmission network costs within the reporting period. The proposed investments in Group 2 and Group 3 will result in further changed network and other costs, but these will occur beyond the reporting period.

An actionable Integrated Strategic Plan

Ministers asked that the ESB identify a work program (including possible changes to the RIT-T) and convert the ISP into an actionable strategic plan.

The options for converting the ISP into an actionable strategic plan are currently being investigated through the AEMC's *Coordination of Generation and Transmission Investment* (COGATI) review. On 21 September 2018, the Commission released an options paper for

consultation as part of the review, and submissions closed on 19 October 2018. In the options paper, the AEMC articulated five potential ways in which AEMO's role as national transmission planner could be linked more strongly to the individual investments undertaken by TNSPs, consistent with the COAG Energy Council request to make the ISP "actionable".

The five options are indicative of a potential range of investment decision paths, and are described in terms of who is responsible for undertaking the various stages in a transmission investment process. The options range on a spectrum from an enhanced status quo where transmission network business keep responsibility for the majority of steps in the transmission network planning and investment decision making process, to an option where AEMO would take on the responsibility for all of the steps as part of the ISP.

The ESB held a number of public forums in October 2018 to canvass these options and what they would mean for the current regulatory framework with stakeholders, as well as how the Group 1 and Group 2 projects in the ISP can be progressed. The final report in the AEMC's COGATI review is due to be published in December, and along with the feedback received at the stakeholder forums, will be an input into the ESB's reporting to the COAG Energy Council in December 2018.

Note: For more information see: AEMO, *Integrated System Plan*, AEMO, viewed 18 July 2017. http:—www.aemo.com.au-Electricity-National-Electricity-Market-NEM-Planning-and-forecasting-Integrated-System-Plan and AEMC, *Coordination of generation and transmission investment, AEMC, viewed 8 November 2018, https:—www.aemc.gov.au-markets-reviews-advice-reporting-on-drivers-of-change-that-impact-transmi.*

4.2.2 Distribution charge trends

Over the reporting period, national average distribution charges are expected to increase. These findings are observable in the middle graph of Figure 4.3 above.

The increasing trend in distribution network costs are primarily due to increasing distribution costs in the ACT, South Australia and Tasmania. The trends are for an annual average increase of 1.1 per cent in distribution costs from 2018-19 to 2020-21 in the national average residential bill.

4.2.3 Metering charge trends

National average metering charges are expected to be relatively flat over the reporting period. These findings are observable in the right-hand graph of Figure 4.3 above.

The result on the national average residential bill is an annual average decrease of 1.8 per cent from 2018-19 to 2020-21.

Competition in metering

Competition in metering began in all NEM jurisdictions other than Victorian on 1 December 2017.[46] This change means metering and related services are now provided under a competitive framework,[47] whereas previously metering costs were all regulated.[48] Over time this change will affect how consumers pay for their metering services and therefore how they are accounted for by these annual reports.

Shifting metering costs from regulated networks to a competitive market

Historically metering has been a regulated service provided by a DNSP, with type 6 accumulation meters being the standard meter for residential installations. Metering services will continue to be provided by DNSPs for the type 6 accumulation meters as an alternative control service (ACS)[49] until a consumer's meter needs to be replaced. Replacement can occur for a range of reasons, including breakage or the installation of solar panels. Replacement meters will be competitively supplied by retailers or metering coordinators and must be a type 4 meter.[50]

How is this accounted for in this report

The costs described in this report are for a representative consumer in each jurisdiction. Even though the process of transitioning to competitively supplied metering services has commenced in all jurisdictions other than Victoria, the representative consumer (in all regions other than Victoria) still has a meter owned by a DNSP. For this reason metering charges will still be part of network costs in this year's report.

Importantly, metering costs have been identified as a specific component within network costs in the cost stack (along with transmission network costs and distribution network costs). In future years, if the representative consumer has a smart meter rather than an accumulation meter, metering costs will be included in the residual component of the cost stack, as opposed to the network cost component.

4.3 Potential changes in future costs not accounted for in 2019-20 and 2020-21

Future regulatory decisions have the potential to change the estimate of network costs for 2019-20 and 2020-21. The network costs in this report are based on current information and do not account for potential future decisions relating to:

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46 Victoria and Northern Territory have not adopted Chapter 7 (Metering) of the National Electricity Rules (NER). These new rules do not apply in Western Australia. Therefore, these jurisdictions do not have competitive metering service frameworks and all metering related services are provided by the DNSP.

47 As established by the AEMC through the *Expanding competition in metering and related services rule change.* For more information please see: https://www.aemc.gov.au/rule-changes/expanding-competition-in-metering-and-related-serv.

48 The AER changed the classification of the metering services in the NEM jurisdictions (other than Victoria) through the most recent set of DNSP determinations. For more information see the discussion papers *Classification of metering services* for each jurisidiction and final determinations for each DNSP.

49 An ACS is a type of service provided by a DNSP and is regulated by the AER. The service is provided on a cost basis and is only paid for by the consumers when they use it.

50 If a customer's current meter is working properly and a competitive supplier wants to replace it with a smart meter, the customer can opt out of the smart meter installation.

- the AER's rate of return guidelines
- 2014-19 remittal decisions for Ausgrid and EvoEnergy which have not yet been finalised. These could affect network costs in New South Wales and ACT in the future.

These are explained in more detail below.

4.3.1 Review of the rate of return guideline

The Rate of return guidelines are currently being updated by the AER. The draft guidelines were released in July 2018 with the final decision due in December 2018. These guidelines will be binding on network service providers.[51]

The AER's draft decision is for a decrease in the rate of return of around 0.6 per cent as the return on capital comprises approximately 50 per cent of regulated revenues that can be earned by a network business. If the draft decision were implemented, it would place downwards pressure on network costs that are included in customer's bills.

4.3.2 Remittals for NSW and ACT distribution network businesses

New South Wales and ACT distribution network businesses appealed their Final Determinations for the 2014-19 regulatory control period. The appeals were successful on some counts and the 2014-19 determinations were remitted to the AER for re-making. The AER has now finalised or is in the process of finalising its 2014-19 remittal decisions for these businesses. The latest AER remittal decision and business' proposed remittal have have been incorporated into the estimate of network costs in this report. In future, changes between the latest remittal information and the final remittal decisions could change network costs in New South Wales and the ACT.

The distribution network costs for NSW and the ACT in this report are based on:

- the AER's final remittal decisions for Essential Energy and Endeavour Energy's 2014-19 regulatory control period, which the AER incorporated into its 2019-24 draft determinations for Essential Energy and Endeavour Energy
- the AER's draft remittal decision for EvoEnergy 2014-19 regulatory control period, which the AER used as a placeholder in EvoEnergy's 2019-24 draft determination.
- Ausgrid's remittal proposal for the 2014-19 regulatory control period, which the AER used as a placeholder in Ausgrid's 2019-24 draft determination.

As the final remittal decisions may differ from EvoEnergy's draft remittal decision and Ausgrid's proposed remittal, future distribution costs may differ from those presented in this report for New South Wales and the ACT.

51 Following COAG Energy Council legislatation in April 2017. See AER, *Consultation paper –process for reviewing the rate of return guidelines*, July 2017, p. 7 and for more information see: https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-rate-of-return-guideline/draft-decision.

5 ENVIRONMENTAL POLICY COST TRENDS AND DRIVERS

BOX 5: KEY FINDINGS

- The Commonwealth and jurisdictional governments have introduced a number of schemes that affect residential electricity prices. These include the renewable energy target (RET), feed-in-tariff (FiT) schemes and energy efficiency schemes.
- Environmental costs in 2017-18 represented approximately three to 14 per cent of a typical residential electricity bill depending on the jurisdiction. They were 14 per cent in the ACT due to the cost of the ACT FiT schemes.
- From 2018-19 to 2020-21, environmental policy costs are:
  - increasing in the ACT, New South Wales, Tasmania, Western Australia and the Northern Territory,
  - relatively flat in Victoria and South Australia, and
  - decreasing in South East Queensland.

Environmental schemes have been introduced by Commonwealth and jurisdictional governments to encourage investment in renewable generation and improve energy efficiency. Throughout this report, these schemes are collectively referred to as environmental policies.

This chapter provides an overview of environmental policies, and the trends in these costs over the reporting period. Additional information on these policies and costs is provided in the jurisdictional appendices and the *2018 Residential electricity price trends methodology report*.

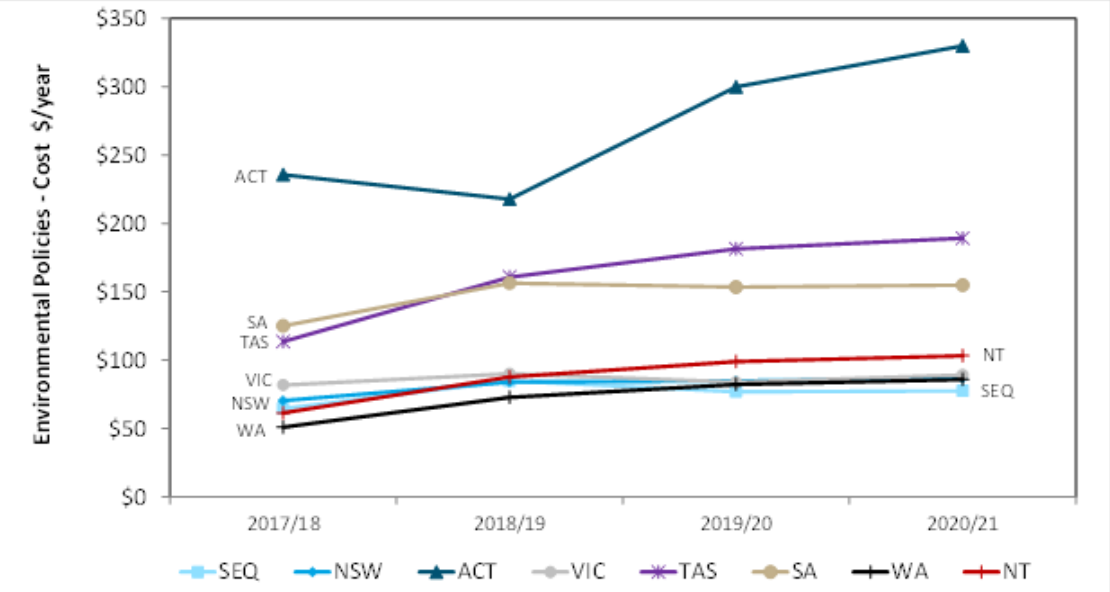
An important environmental policy is the large-scale renewable energy target (LRET). The direct costs associated with the LRET are included in environmental costs for this report. However, it has additional effects on the wholesale electricity market. These effects are detailed in the *2018 Residential electricity price trends methodology report* and Chapter 6 (Wholesale costs and drivers) of this report.

5.1 Trends in environmental policy costs

Environmental policy costs in 2017-18 represented approximately three to 14 per cent of a typical residential electricity bill across all jurisdictions. They are higher in the ACT at 14 per cent due to the higher costs of the ACT feed-in-tariff (FiT) schemes.

Figure 5.1 shows the trends in environmental policy costs across jurisdictions over the reporting period.

Figure 5.1: Environmental cost component of annual electricity bills for representative consumer in each jurisdiction



Source: AEMC
Note: Victorian prices and bills are on a calendar year basis.

The key trends in environmental costs are described below.

Large-scale renewable energy target

The LRET supports the installation of large-scale renewable generators, such as wind and solar farms and is part of the national renewable energy target (RET). As noted above, the LRET has direct and indirect costs. The direct costs are described in this chapter. The indirect costs relate to the distorting effect the LRET has on the operation of the wholesale electricity market, where additional generation is incentivised to enter the market even when demand is flat or falling. These indirect costs are not quantified in the report.

LRET costs:

- increased from 2017-18 to 2018-19 in all jurisdictions
- from 2018-19 to 2020-21 are expected to:
  - increase in the ACT, Tasmania, Western Australia and the Northern Territory.
  - decrease in south east Queensland, New South Wales, Victoria and South Australia.

The different trends in LRET costs between jurisdictions are driven by a combination of:

- The renewable power percentage (RRP) which is expected to increase every year across the 2017-18 to 2020-21 reporting period.[52]

52 For more information refer to Chapter 5 of EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

- The estimated average cost of large scale generation certificates (LGCs) which retailers are required to purchase to meet their LRET obligations. Estimated LGC costs vary between those contracted through power purchase agreements (PPAs) and those purchased through LGC futures contract markets. As large retailers tend to manage their risk over a longer period of time than smaller retailers, it is assumed that large retailers will meet their LRET obligation more through contracted PPAs. As smaller retailers tend to manage risk over a shorter period of time, it is assumed that they will meet their LRET obligation more through purchases from the LGC futures contract markets. LGC futures prices are decreasing significantly from 2017-18 to 2020-21.
- The market share of large and small retailers, which differ by jurisdiction. For more information refer to the *2018 Residential electricity price trends methodology report* and EY's report.

Small-scale renewable energy scheme

Under the small-scale renewable energy scheme (SRES), consumers are able to sell renewable energy certificates that are generated by small scale renewable systems. Liable entities (usually retailers) are required to buy and surrender the certificates, and these costs are passed on to consumers in their bills.[53]

SRES costs are estimated to increase in all jurisdictions from 2017-18 to 2020-21. This is driven by:

- A large increase in the small-scale technology percentage (STP) from 2017 to 2018 to account for the additional small-scale technology certificates (STCs) that were generated in 2017 beyond that which was forecasted. This is reflected in a large increase in SRES costs from 2017-18 to 2018-19
- Increases in the STP from 2018-19 to 2020-21 due to expected further increases in the take-up of solar PV systems and other small scale technologies (e.g. solar hot water, small scale wind systems, air source heat pumps). For more information refer to the *2018 residential electricity price trends methodology report* and EY's report.[54]

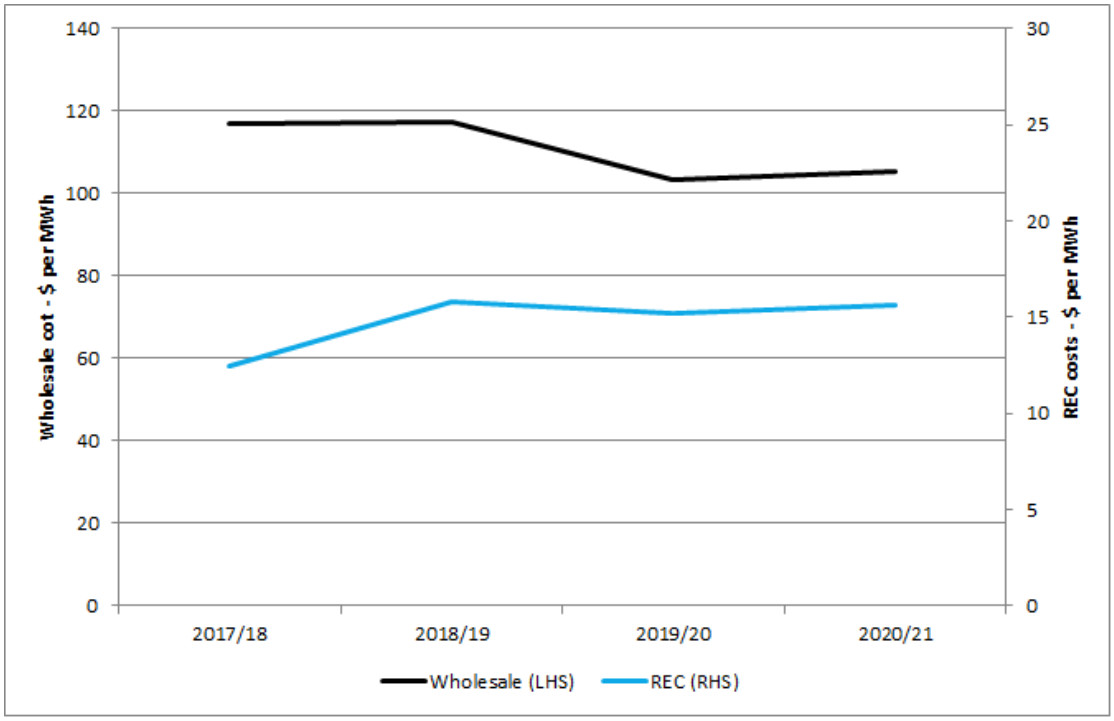
Figure 5.2 below shows the estimated Renewable Energy Certificate (REC) costs[55] and estimated national average wholesale costs over the reporting period. This shows that, from 2017-18 to 2020-21, wholesale costs are estimated to decrease and REC costs estimated to increase, which is related to the large volume of new renewable generation in these years.

53 For more information, see Clean Energy Regulator - The small-scale technology percentage: http://www.cleanenergyregulator.gov.au/RET/Scheme-participants-and-industry/the-small-scale-technology-percentage

54 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

55 In this figure, REC's are the national weighted average sum of LGC and STC costs.

Figure 5.2: Estimated REC and national average wholesale costs over the reporting period



Source: AEMC results in this report.

ACT feed-in-tariffs scheme

The cost of the ACT feed-in-tariffs (FiT) scheme are expected to increase from 2018-19 to 2020-21 due to the expected increase[56] in FiT payments for large-scale generators.[57] These support payments are based on a reverse auction process, as explained in Appendix C.

The indirect effect of these FiT schemes on the wholesale market structure may have a greater impact on customer bills than the direct effects estimated in this section. The ACT FiT schemes result in new renewable generation that is likely to have similar effects on wholesale electricity prices and the wholesale electricity contract market as the LRET.[58] For discussion on the effect of the LRET on the wholesale electricity prices and wholesale contract market refer to the *2018 Residential Electricity Price Trends Methodology Report*.

Feed-in-tariff schemes

Victoria and South Australia also have jurisdictionally specific FiT schemes which have a direct impact on residential electricity bills in this report. In 2017-18, these schemes comprise

56 The ACT Government informed the AEMC that costs associated with ACT FiT schemes are increasing as the ACT approaches its target of 100% renewable energy by around 2020.

57 ACT Government, *How do the ACT's renewable energy reverse auctions work?* Viewed 16 July 2018. https://www.environment.act.gov.au/energy/cleaner-energy/how-do-the-acts-renewable-energy-reverse-auctions-work

58 As the FiT scheme are a through a separate mechanism from the wholesale contract market.

between 1.2 and 2.8 per cent of a representative residential consumer's electricity bill. These FiT schemes, other than the ACT scheme, are expected to be generally flat over the reporting period and therefore do not have a significant effect on trends in customers' annual bills.

Energy efficiency schemes

New South Wales, the ACT, Victoria and South Australia have jurisdictionally specific energy efficiency schemes which have a direct impact on residential electricity bills. Energy efficiency schemes comprise between 0.6 and 1.8 per cent of a representative residential consumer's electricity bill. These schemes are expected to be generally flat over the reporting period and therefore do not have a significant effect on trends in customers' annual bills.

5.2 Drivers of environmental policy costs

The sections below outline the key drivers of environmental policy costs.

5.2.1 Renewable energy target

The RET[59] applies on a national basis, and consists of the LRET and SRES.

The LRET supports the installation of large-scale renewable generators, such as wind and solar farms by providing financial benefits that incentivise investments in renewable generation.

The SRES supports the installation of small-scale renewable energy technologies, such as household solar and solar hot water systems, by paying for renewable energy certificates that such devices create. The number of certificates created depends on the location of the device, when it was installed, and the amount of electricity in megawatt hours that it produces or displaces. Payment for the certificates is often up-front at the time of system purchase, and so is often used to reduce the cost of the system to consumers.[60]

Further information on the LRET and the SRES is available in the *2018 residential electricity price trends methodology report.* This report also expands on the additional effects that the LRET has on the wholesale electricity costs previously discussed in Chapter 6 (Wholesale electricity cost trends and drivers) of this report.

LRET and SRES costs were estimated for the AEMC by EY. For information on the methodology for estimating these costs, refer to the EY report.[61]

5.2.2 Feed in tariff schemes

FiTs can be defined as either net or gross electricity generation. A gross FiT is where a consumer receives a payment for all electricity generated by the renewable generator. A net FiT is where the consumer is only paid for the excess electricity that is exported to the grid. FiTs can either be mandated through government schemes or offered voluntarily by retailers.

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59 The RET is based on a legislated annual target of 33,000 GWh of generation from renewables by 2020.

60 For more information, see Clean Energy Regulator - The small-scale technology percentage: http://www.cleanenergyregulator.gov.au/RET/Scheme-participants-and-industry/the-small-scale-technology-percentage

61 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

A number of mandatory government schemes have now been phased out and replaced with voluntary retailer FiT payments.

This report only covers government FiT schemes which were mandatory during the reporting period and are therefore a direct environmental cost.[62] These are outlined below:

- ACT small, medium and large-scale FiT schemes[63]
- Victoria's FiT schemes[64]
- South Australia's Solar FiT scheme.[65]

For information on the nature and costs associated with these solar FiT schemes, refer to the relevant jurisdictional appendix.

5.2.3 Energy efficiency schemes

The following jurisdictional schemes are designed to assist consumers in reducing their energy consumption through energy efficiency measures:

- New South Wales Energy Savings Scheme (ESS)
- ACT Energy Efficiency Improvement Scheme (EEIS)
- Victorian Energy Upgrades (VEU)
- South Australia Retailer Energy Efficiency Scheme (REES)

The cost of these schemes either have a direct impact on residential prices or are government funded. For information on the nature and costs associated with these energy efficiency schemes, refer to the jurisdictional appendices.

62 No direct environmental costs relate to the Queensland Solar Bonus Scheme (SBS) from 2017/18 to 2019/20, as the Queensland Government has moved funding of the SBS from DNSP charges to the Queensland Government budget. For the purposes of this report it has been assumed that this funding arrangement will remain in place in 2020/21.

63 The small and medium-scale FiT schemes are closed for new entrants, however consumers on the scheme continue to receive FiT payments for 20 years from after their system was connected to the distribution network. ACT Government, *2016-17 Annual Feed-in-tariff Report*, December 2017, p5.

64 Victorian Government, Current feed-in-tariff, website viewed 28 July 2018. https://www.energy.vic.gov.au/renewable-energy/victorian-feed-in-tariff/current-feed-in-tariff

65 Distributor feed-in tariffs are closed to new entrants, but the 44 cents/kWh tariff will continue to be paid out to eligible customers until 2028.

In addition, South Australia also has a voluntary Retailer Feed-in-tariff (R-FiT) scheme. From 1 January 2017, ESCoSA determined that it would not set a minimum amount for R-FiT. ESCoSA, Solar feed-in-tariff scheme, https://www.escosa.sa.gov.au/consumers/energy/solar-feed-in-tariff-scheme, website viewed 18 July 2018.

6 WHOLESALE COST TRENDS AND DRIVERS

BOX 6: KEY FINDINGS

- This year's report has changed the method used to calculate wholesale costs. Previous AEMC *Residential Electricity Price Trends* reports estimated retailer's wholesale electricity purchase costs by forecasting spot market outcomes and applying a contract premium for managing risk. This approach assumed that a retailer buys all of its electricity and hedging contracts at a single point in time, so that its entire position is effectively purchased at the prevailing market price.
- However, it became apparent in the past two years, that with high volatility in forward prices after generator retirements, short-term estimates made through this method were largely inconsistent with market outcomes. For this reason, this report estimates wholesale costs using a blended method. Where possible, the analysis uses observable forward contract prices that retailers use to build up their hedge book over time. Where limited forward contract data is available in later years of the reporting period, 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.
- Wholesale electricity market costs in 2017-18 represented approximately 33 to 45 per cent of a typical residential electricity bill for a consumer in the NEM, and 40 per cent in Western Australia's Wholesale Electricity Market (WEM).
- From 2017-18 to 2018-19, the wholesale cost component of a representative consumer's electricity bill:
  - increased in New South Wales and the ACT due to a combination of:
    - — higher fuel costs for NSW generators from rising international fuel prices
    - — supply issues for NSW coal generators in mid 2017
    - — expectation that NSW would import from Queensland, which has more expensive black coal, due to the retirement of Hazelwood power station in 2017.
  - increased in Western Australia due to increasing fuel prices
  - decreased in South East Queensland, Victoria and Tasmania primarily due to new generation entering the NEM . In South East Queensland, the decreasing trend is also related to the state government's direction to Stanwell Corporation to undertake strategies to place downwards pressure on wholesale prices.
  - remained relatively flat in South Australia due to a combination of new generation supply and higher peak demand
  - remained relatively flat in the Northern Territory

- From 2018-19 to 2020-21, wholesale costs are expected to decrease in all NEM jurisdictions and the Northern Territory. In NEM jurisdictions, forecast electricity demand is relatively flat, so the decreasing trend is driven by changes in the supply of electricity:
  - In 2019-20 and 2020-21, 4,532 MW of large scale renewable new generation is accredited, committed or expected to enter the NEM and 100 MW of battery storage. This includes new generation entering in Victoria under the VRET in 2020-21.
  - Gas and coal fuel prices are expected to increase in some locations, placing upwards pressure on wholesale costs. However this effect is less than the downwards pressure on wholesale costs from new generation.
  - in Queensland, the state government's direction to Stanwell Corporation to undertake strategies to place downwards pressure on wholesale prices.
- In the WEM in Western Australia, wholesale costs are estimated to increase throughout the reporting period. This is due to increasing gas and coal prices. Changes in the residential demand shape related to increased penetration of rooftop PV also contribute to an increase in wholesale costs.
- Wholesale costs, wholesale price volatility and the wholesale contract market continue to be affected by environmental policy, with increased levels of intermittent generation, incentivised by the large-scale renewable energy target (LRET). As the LRET target for 2020 is expected to be met through the large volume of new renewable investments in the coming years, and the price of large-scale generation certificates (LGC) is expected to fall significantly as a result, the LRET is not expected to drive additional investment in new renewable projects after 2020.

This chapter outlines:

- the estimated trend in wholesale market costs
- the drivers of wholesale market costs.

For information on the methodology for estimating wholesale electricity market costs refer to the 2018 Residential Electricity Price Trends Methodology Report and EY's report.[66]

6.1 Methodology for calculating wholesale costs

There has been a significant change in the methodology used to calculate wholesale costs in this year's report. Previous *Residential Electricity Price Trends* reports estimated retailers' wholesale purchase costs by forecasting spot market outcomes and applying a contract premium for managing risk. This approach assumed that a retailer buys all its electricity and hedging contracts at a single point in time, so that its entire position is effectively purchased at the prevailing market price.

66 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

However, it became apparent in the past two years, that with high volatility in forward prices after generator retirements, that short-term estimates of retail prices made through this method , were largely inconsistent with market outcomes.

For this reason, and to more closely resemble how retailers manage their wholesale costs and hedge their load, this report uses a blended method that:

- where possible, the analysis uses observable market contract prices that retailers use to build up a hedge contract book over time
- where limited forward contracts data is available, then uses 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.

Most firms have well defined approaches to risk management. This determines the period of time over which they construct their hedging positions, and the levels of flexibility they have in the quantities of hedging they acquire over time:

- Larger retailers are assumed to have larger and more distributed customer bases, which gives them more stable customer types and load profiles. This allows them to build their hedge contract book over a longer period. For these retailers a two-year book build is assumed.
- Smaller retailers are assumed to have a smaller customer base with a less certain load profile. These retailers typically build up their hedge book over a shorter period. For these retailers a one-year book build is assumed.

For more detail on the approach for estimating wholesale costs as a component of the bill, refer to the 2018 Residential Electricity Price Trends Methodology Report.

6.2 Trends in wholesale market costs

Wholesale electricity purchase costs in 2017-18 represented approximately 33 to 45 per cent of the representative residential electricity bill for a consumer in the NEM, and 40 per cent in Western Australia's WEM.

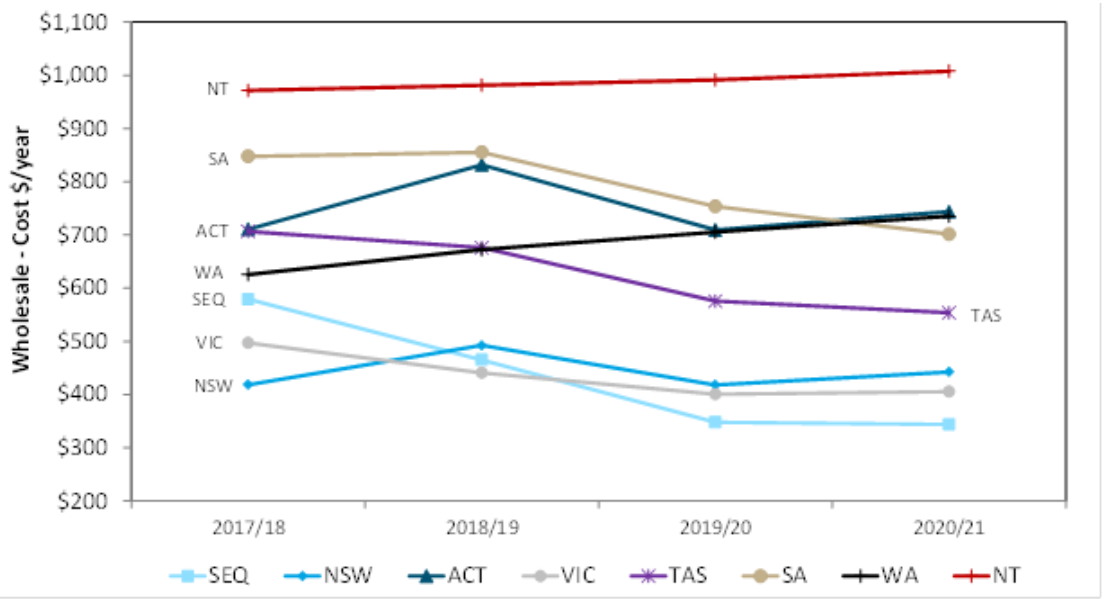
Figure 6.1 shows the trend in the wholesale market component of the representative electricity bill across jurisdictions from 2017-18 to 2020-21. These estimates are all based on the methodology outlined in section 6.1.

From 2017-18 to 2018-19, the wholesale cost component of a representative consumer's electricity bill:

- increased in Western Australia, New South Wales and the ACT
- decreased in South East Queensland, Victoria and Tasmania
- remained relatively flat in South Australia and Northern Territory.

These wholesale costs trends are described below in section 6.2.1 and section 6.2.2.

Figure 6.1: Wholesale component of annual electricity bill for a representative consumer in each jurisdiction



Source: AEMC
Note: Victorian prices and bills are on a calendar year basis.

6.2.1 NEM

From 2017-18 to 2018-19, the wholesale cost component of a representative consumer's electricity bill:

- **increased in New South Wales and the ACT** due to a combination of the following factors which increased ASX wholesale futures prices for contracts purchased in 2017-18 for delivery in 2018-19:
  - higher fuel costs for some NSW generators from rising international fuel prices
  - supply issues for some NSW coal generators in mid 2017. NSW coal generators (for example Mt Piper) faced various supply issues in 2017. The Hazelwood closure and unexpectedly high summer demand in 2016-17 caused some generators to have higher output and consume more coal than expected. Attempts to replenish stockpiles through short term contracts were stymied by rail network constraints, technical issues at mines and industrial action.[67]

67 AER, *Electricity wholesale performance monitoring NSW market advice*, 6 December 2017.

- after the closure of Hazelwood in March 2017, the expectation that NSW would import less from Victoria and more from Queensland which has more expensive black coal as the primary generation source.[68]
- the price of ASX wholesale futures contracts purchased between May 2015 and April 2017, for delivery in 2017-18 were increasing in a close to exponential manner, but for a considerably long time in the first half of the purchasing period, remained below $60/MWh. The price of the same type of contracts purchased between May 2016 and April 2018, for delivery in 2018-19, however, started from an already elevated level due to speculations about Hazelwood's closure (reaching above $60/MWh already in September 2016) and rose sharply after the announcement of Hazelwood's closure in November 2016. Retailers' two year hedge-books relating to 2017-18 would have contained a higher percentage of contracts that were purchased at lower prices for an extended period of time before the announcement of Hazelwood's closure was made. Two year hedge-books relating to 2018-19 had limited "access" to those lower prices.

- **decreased in South East Queensland, Victoria, and Tasmania** primarily due to new generation (3,663 MW and a 75 MW battery) entering the NEM in 2018-19 only[69]
- **remained relatively flat in South Australia** due to a combination of new generation supply and higher peak demand.

Figure 6.2 shows the expectation of elevated NSW wholesale prices in 2018-19 was built into the price of baseload strips traded on the ASX. The Victorian and the Queensland ASX futures prices also increased, but to a lesser extent, compared with New South Wales. The shaded area shows the increase in NSW ASX futures prices during mid 2017 when there were concerns around supply for NSW generators.

68 In the second calendar quarter of 2017, generator bidding behaviour in changed in New South Wales. Following the closure of the Hazelwood power station in March 2017 closure, imports to New South Wales from Victoria were effectively replaced with imports from Queensland. The primary source of electricity supply in Queensland (black coal) has higher cost than the primary source of electricity supply in Victoria (brown coal). As a result of these changing market dynamics, generators in New South Wales became less constrained in their dispatch offer prices.

69 The breakdown of the 9,732 MW of new generation and battery storage that is accredited, committed or expected to enter the NEM from 2017/18 to 2020/21, is as follows for each individual year:

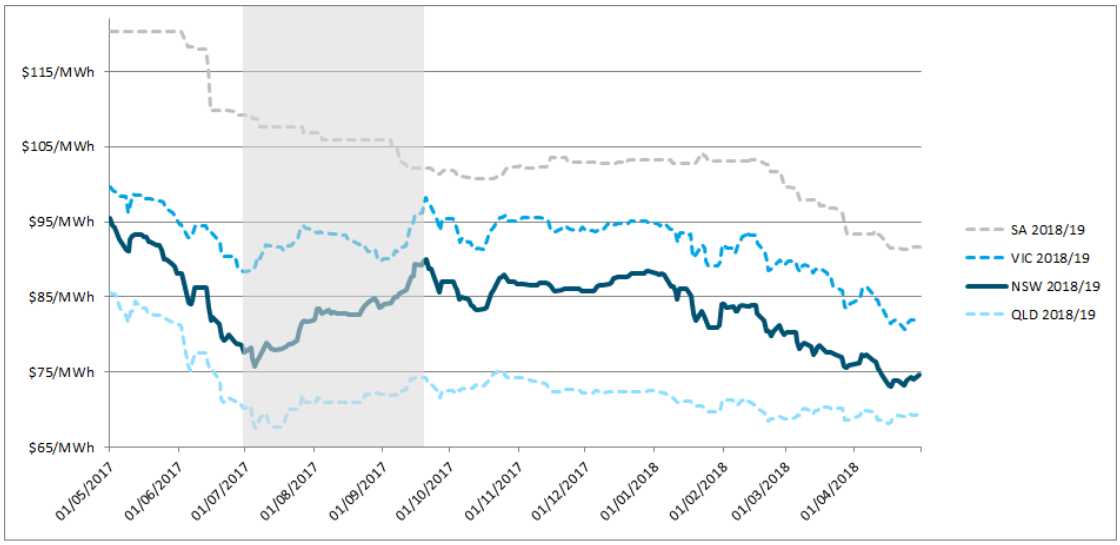
2017/18: 1,042 MW of new generation and 30 MW of battery storage

2018/19: 3,663 MW of generation and 75 MW of battery storage

2019/20: 3,396 MW of generation and 100 MW of battery storage

2020/21: 1,426 MW of generation

Figure 6.2: ASX futures prices of 2018-19 financial yearly baseload strips for NSW, QLD, VIC and SA



Source: ASX data

From 2018-19 to 2020-21, wholesale costs are expected to decrease in all mainland NEM jurisdictions. Forecast electricity demand is relatively flat, so the decreasing trend is driven by changes in the supply of electricity. Over these three years, around 8,500 MW of new generation is accredited, committed or expected to enter the NEM and 175 MW of battery storage[70], placing downwards pressure on wholesale costs.

A significant portion of this trend is driven by new renewable generation, incentivised through the LRET. While this suppresses wholesale prices in the short-term, in the medium-term lower wholesale prices can contribute to earlier retirement of large-scale synchronous generators, decreasing competition and increasing wholesale prices. The effect of the LRET on the wholesale electricity market is discussed further in *2018 Residential Electricity Price Trends Methodology Report*.

Table 6.1 below is a summary of wholesale cost drivers in the NEM.[71] More detail on the effects of these drivers on trends in wholesale electricity prices over the reporting period are outlined in section 6.4 below.

70 The total of 75 MW of battery storage in Ballarat and Gannawarra is expected to come online by December 2018. 100 MW of battery storage is tendered by the Queensland government and expected to come online in 2019/20.

71 In addition to the cost drivers in Table 6.1, generator entry (new or return to service) results in a decrease in wholesale costs, all else constant.

Table 6.1: **Summary of wholesale cost drivers in the NEM**

WHOLESALE COST DRIVER	FOR WHOLESALE COSTS TO INCREASE, THIS DRIVER NEEDS TO CHANGE AS FOLLOWS (IF ALL ELSE CONSTANT)
Demand	
Forecast electricity demand	Increase
Supply	
Generator exit (retirements and mothballing)	Generator retirement or mothballing occurs
Gas fuel prices	Increase
Coal fuel prices	Increase

6.2.2 Western Australia and the Northern Territory

In Western Australia, wholesale costs are expected increase throughout the reporting period due to:

- a slight increase in peak demand and a change in residential demand shape related to the increased penetration of rooftop PV systems
- increasing coal and gas prices.

In the Northern Territory, wholesale costs are expected to increase and account for an increasing proportion of the representative consumer's electricity bill across the 2017-18 to 2020-21 period. Wholesale electricity costs for the reporting period were provided to the AEMC by the Northern Territory Government.

6.3 The LRET and wholesale electricity costs

Wholesale market outcomes are increasingly interconnected with environmental policies.

The direct costs of the large-scale renewable energy target (LRET) are a direct cost to consumers that is included in the environmental policy component of the cost stack. However it is important to also recognise the indirect impact of this policy.

The LRET provides incentives for increased quantities of renewable generation to enter the market, even when demand is flat or falling. This is because the revenue that these intermittent generators receive is additional to that available from the wholesale spot market.

The technical characteristics of intermittent generation are also not suited to offering the type of hedging contracts that thermal generators can offer. In particular, intermittent generators without firming capabilities cannot offer traditional swaps and caps. This affects the level of liquidity in contract markets and may undermine the ability of retailers to hedge their customer loads against the risk of volatile spot market prices.

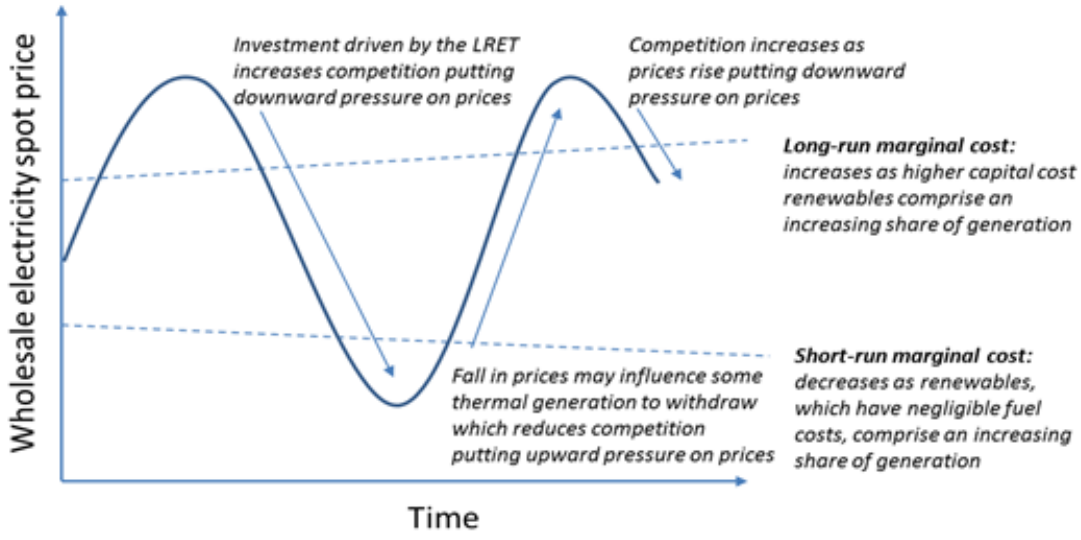
The economic characteristics of intermittent generators are also different from thermal generators. Their initial capital costs are relatively high, although these continue to fall rapidly, and their marginal costs of operating are negligible. These economic characteristics

let these generators displace thermal generators (which have higher marginal or operating costs, primarily due to fuel costs) at times when they are generating. Over time, to the extent to which the LRET contributes to the exit of thermal generation but does not incentivise investment in firming technologies, it may result in a tighter supply-demand balance and lead to higher wholesale prices. As the LRET target for 2020 is expected to be met through the large volume of new renewable investments in the coming years, and the price of large-scale generation certificates (LGC's) is expected to fall significantly as a result, the LRET is not expected to drive additional investment in new renewable projects after 2020.

The overall impact of the LRET has therefore been to drive down wholesale prices in the short-term but, in the absence of policies and incentives to encourage investment in replacement generation and firming technologies, it contributes to periods of more volatile and potential higher wholesale prices.

Figure 6.3 illustrates the effect of the LRET on wholesale price dynamics over time.

Figure 6.3: Effect of the LRET on medium term wholesale electricity price dynamics

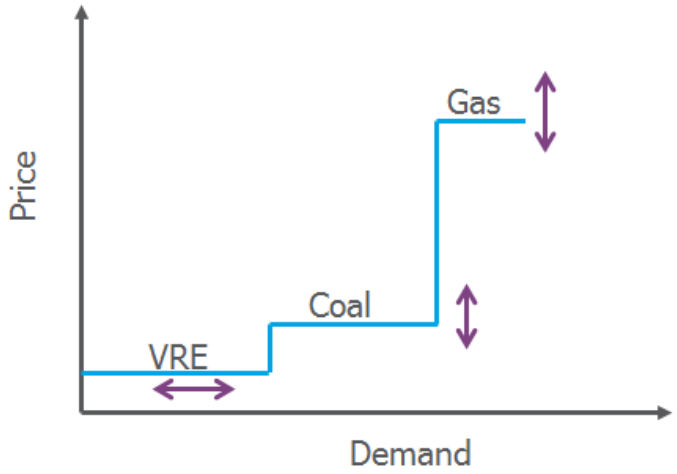


Source: Developed by the AEMC.

As a further explanation of the effect of the LRET on wholesale price dynamics above, Figure 6.4 below shows that for a given level of demand, wholesale prices are driven by short short-run marginal costs (SRMC). SRMC are impacted by:

- the availability of variable renewable energy (VRE) - wind and solar generators - can shift the supply curve from left to right in real time, depending on changing wind and sun conditions
- changes in coal and gas prices (e.g. due to changes in export prices) shift the supply curve up or down.

Figure 6.4: Effect of variable renewable energy on wholesale price dynamics over time



Source: Developed by the AEMC.

For more information on the interaction between the LRET and market is provided in the 2018 Residential Electricity Price Trends Methodology Report.

6.4 Drivers of trends in wholesale electricity costs

This section outlines the key factors affecting wholesale electricity costs from 2017-18 to 2020-21. These are:

- demand factors:
  - forecast electricity demand
- supply factors:
  - generator entry and exit
  - fuel costs
  - the effect of interconnectors on the electricity market
- other factors:
  - the effect of the LRET and other government policies and plans on the wholesale electricity market.

6.4.1 Forecast electricity demand

Increasing demand for electricity will in the absence of any supply change, place upward pressure on wholesale electricity costs. In general, electricity demand in the NEM though is expected to be relatively flat over the reporting period. Figure 6.5 shows that electricity demand is forecast to fall slightly in New South Wales and Victoria, and remain flat in South Australia, Queensland and in Tasmania, so demand is not expected to be a driver of higher prices.

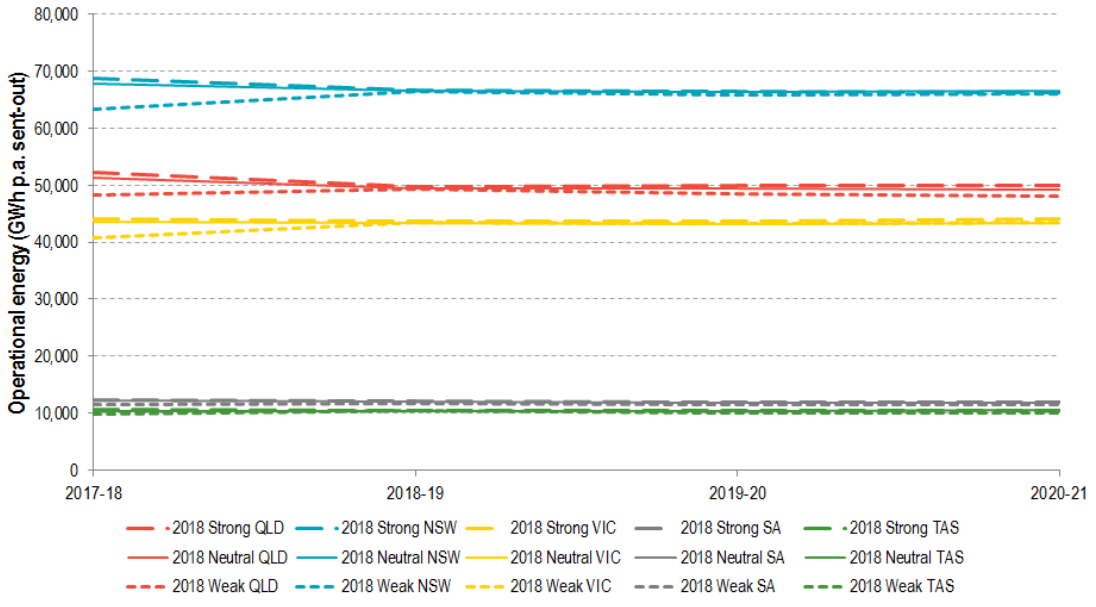
Peak demand, however, appears to follow a different pattern. Figure 6.6 shows that peak demand from 2017-18 to 2018-19 is forecast to:

- slightly increase in South Australia and New South Wales (including the ACT)
- slightly decrease in Queensland, Victoria and Tasmania.

Wholesale prices were relatively flat in South Australia from 2017-18 to 2018-19 due to a combination of new generation supply and higher peak demand. Increased peak demand in South Australia off-set the downward pressure of over 600 MW of new renewable generation added to the system in 2018-19. This lead to wholesale costs remaining relatively flat between 2017-18 and 2018-19.

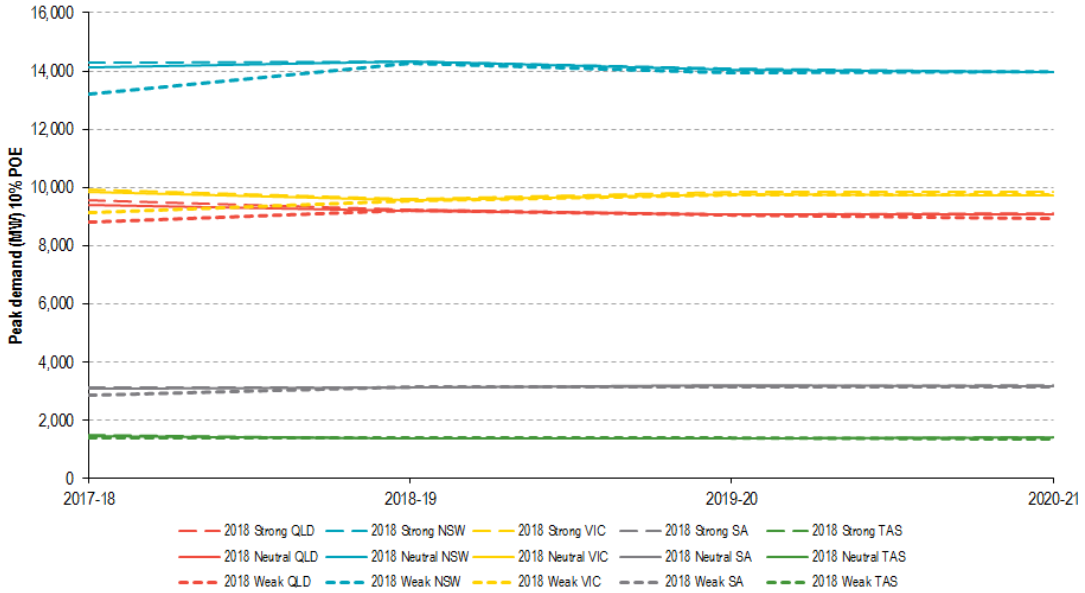
The wholesale cost estimates in this report are based on the neutral demand forecast scenario by AEMO. If the strong or weak demand scenarios eventuate, there would be upwards or downwards pressure on wholesale prices respectively.

Figure 6.5: Electricity demand forecast in the NEM over the reporting period



Source: EY, based on AEMO, Electricity Statement of Opportunities (ESOO) 2017 March 2018 Update for 2017-18 and ESOO 2018 for 2018-19 and forward.

Figure 6.6: Electricity peak demand forecast in the NEM over the reporting period



Source: EY, based on AEMO, Electricity Statement of Opportunities (ESOO) 2017 March 2018 Update for 2017-18 and ESOO 2018 for 2018-19 and forward

6.4.2 Generator entry and exit

Generator retirement

Generator retirements can place upwards pressure on wholesale prices by:

- tightening the supply-demand balance
- reducing competition in the wholesale electricity spot market
- increasing electricity spot price volatility particularly if the proportion of intermittent generation increase
- reducing the availability of contracts, where retirements are non-intermittent generators.

The only generator retirement that has occurred or is expected to affect wholesale cost in the NEM over the reporting period is the Hazelwood coal power station (1,600 MW) in Victoria, which closed in March 2017.[72] No other generators are planned to be retired over the reporting period from 2017-18 to 2020-21.

Generator mothballing and return to service

Mothballing is where there is the withdrawal of a generation facility such that it is not available to supply electricity, but the generator is kept in working order. This means if a decision is made to return it to service, it could be made available to supply electricity. These

72 This will have an effect of wholesale costs that retailer can pass through to customers in 2017/18 and 2018/19.

decisions can be made for commercial reasons or engineering considerations. The following decisions to either mothball or return generators to service are expected to affect wholesale costs over the reporting period:

- Torrens Island A Power Station (480 MW) will be progressively mothballed between 2019 and 2021. Two units (240 MW) will be mothballed after the winter of 2019 and one unit (120 MW) after the winter of 2020.[73] However a new 210 MW gas-fired power station is planned to be built alongside the Torrens Island facility and commence operation in early 2019.
- the Smithfield gas-fired power station (171 MW) in New South Wales was closed in July 2017, but was brought back to service in late 2017.[74]
- Swanbank E (385 MW) in Queensland was mothballed, but returned to service in January 2018.[75]
- Tamar Valley CCGT (208 MW) was to be withdrawn after May 2017, but was to be made available for operation with less than 3 months' notice.[76]

For more information on generator retirements, mothballing and returning to service refer to the EY report.[77]

New generation investment

Figure 6.7 shows approximately 9,732 MW of new generation is expected to be installed across the NEM over the period from 2017-18 to 2020-21.[78] This is comprised of:

- **renewable generation:** around 8,961 MW of expected generation in the four years period of 2017-18 to 2020-21. In 2020-21, this 8,961 MW of new large scale renewable generation is expected to represent around 13.6 per cent of generation capacity (MW) and 12.3 per cent of energy output (MWh) in the NEM.[79] This includes 928 MW of new generation entering in Victoria under the VRET in 2020-21.[80]
- **non-renewable generation:** around 566 MW of expected thermal generation. This includes diesel 276 MW of generation installed in SA in December 2017, AGL's 210 MW Barker Inlet Power Station to be built in 2019-20 and Alinta's gradual upgrade of Loy Yang B by 80 MW through 2019-20 and 2020-21.

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73 AEMO, Generation_Information_SA_March_2018, 16 March 2018. Available at: https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Generation-information.

74 AEMO, Generation_Information_NSW_March_2018, 16 March 2018. Available at: https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Generation-information.

75 Stanwell, *Swanbank E Power Station Factsheet*, February 2018, http://www.stanwell.com/wp-content/uploads/FactSheet-swanbank-February-2018.pdf
Accessed: 17 July 2018.

76 AEMO, *Generation_Information_TAS_March_2018*, 16 March 2018. Available at: https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Generation-information.

77 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

78 On 2 November 2018 Snowy Hydro announced that it will add the total of 888 MW of solar and wind capacity to is portfolio at NWS and VIC locations. This announcement was made after the cut-off date of EY's modelling and it also did not specify when these capacities would be built. Therefore this generation capacity has not been taken into account in this report.

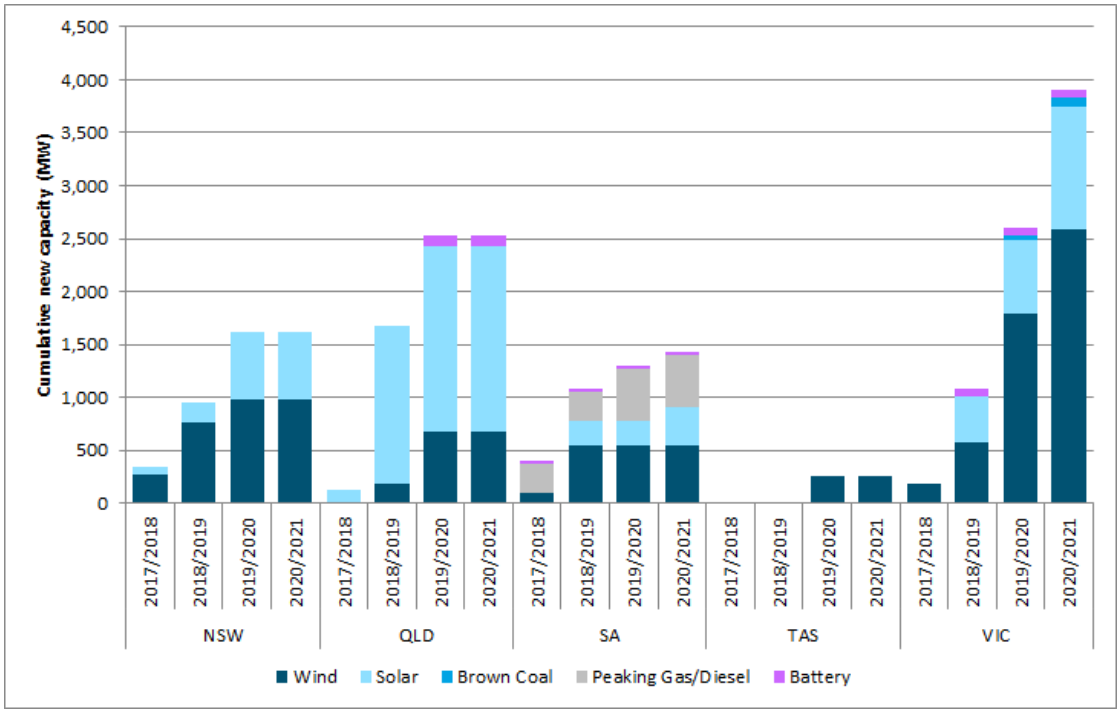
79 These percentages are based on the total generation capacity expected to be present in the NEM in 2020/21, including the estimated aggregate capacity of rooftop PV.

80 Victoria State Government, Department of Environment, Land, Water and Planning, *VRET auction benefits*, September 2018.

- **battery storage:** around 205 MW of battery storage. This includes:
  - the 30MW capacity that is available for the wholesale market of the 100 MW Hornsdale battery in South Australia that started operations in December 2017
  - 100 MW of battery storage tendered by the Queensland government and expected to come online in 2019-20
  - the 20 MW Neoen Bulgana, the 25 MW Gannawarra and the 30 MW Ballarat batteries in Victoria, expected to come online in 2018-19.

The 4,822 MW of new generation and 100 MW of battery storage that is commencing operation in 2019-20 and 2020-21 is a key driver of the decrease in wholesale costs in these years.

Figure 6.7: New generation in the NEM from 2017-18 to 2020-21



Source: EY, based on information from AEMO and the CER.

Change in generation mix, residential demand shape and increasing fuel costs in the WEM

In the WEM, wholesale costs were estimated based on a Long Run Marginal Costs (LRMC) approach for the electricity system.[81]

The LRMC approach estimated that wholesale costs are expected to increase in the WEM from 2017-18 to 2020-21 due to:

81 In addition, EY also estimated WEM wholesale costs using a market modelling approach. The market modelling approach was conducted as a comparator for the Western Australian government so that any insights could be considered from an alternative methodology.

- a slight increase in peak demand and a change in residential demand shape related to the increased penetration of rooftop PV systems. This reduces the energy demand met per fixed capital cost of generation, such that the long-run marginal costs of generation increase.
- increasing gas and coal prices.

6.4.3 Fuel costs

The costs of gas-fired and coal-fired generators are influenced by fuel costs. For example, large increases in coal or gas fuel prices will flow through into higher costs of generating electricity, and ultimately higher wholesale electricity costs. The respective markets for gas and coal will determine the availability and prices of the fuel for electricity generation.

Gas prices

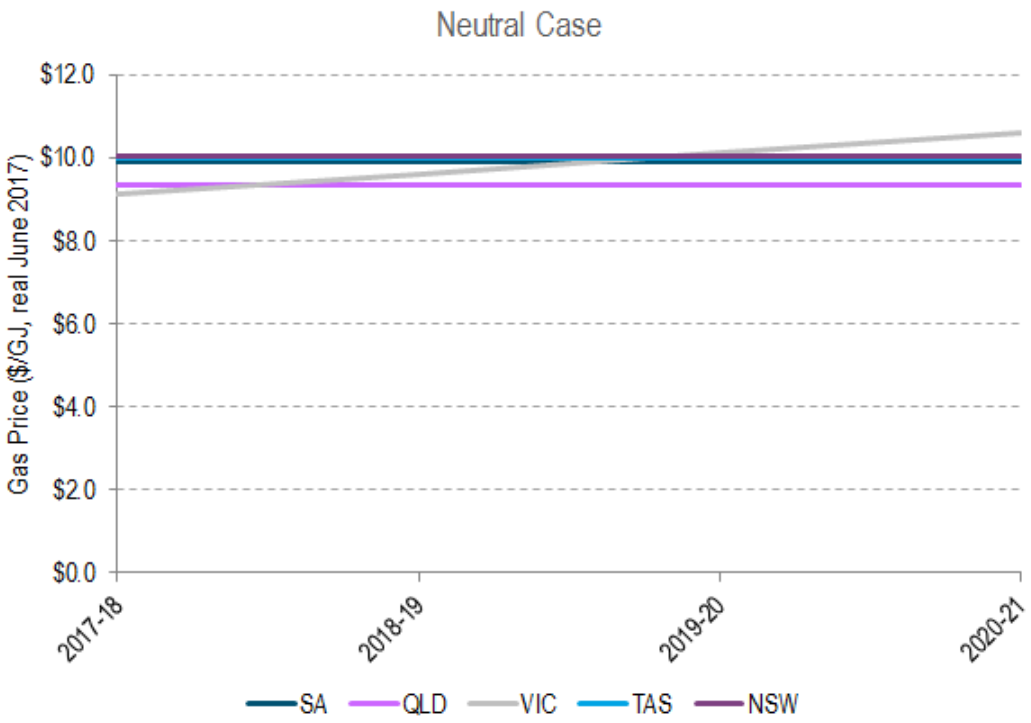
The increase in demand for east coast gas, driven by liquefied natural gas (LNG) exports from Queensland, has increased gas prices. Higher gas fuel costs result in higher input costs for gas-fired generators. This results in higher wholesale electricity market costs as gas-fired generators often set the dispatch price in the wholesale electricity spot market. This also impacts on investment decisions, not only in relation to gas-fired generators but also other generator types.

Figure 6.8 shows that gas prices are expected to remain high relative to recent history,[82] but flat throughout the reporting period with the exception of Victoria. The increase in Victorian gas prices is expected to place upwards pressure on wholesale electricity costs.[83]

82 ACCC, *Gas inquiry 2017-2020*, Interim report, July 2018, p. 42
Accessed on 20 September 2018:
https://www.accc.gov.au/system/files/Gas%20inquiry%20July%202018%20interim%20report.pdf

83 The differences in gas prices at different points in eastern Australia reflect differences in transport costs.

Figure 6.8: Forecast gas prices over the reporting period



Source: AEMO's 2018 Integrated System Plan (ISP) - Gas Price Assessment

Even though gas prices in most jurisdictions are forecast to be relatively flat, they are high by historical standards. High forecast gas prices reflect the tight supply-demand balance and the LNG net-back price,[84] which reflects the opportunity cost of supplying gas to the domestic market.

A different trend is expected in Victoria where gas prices are forecast to increase across the period from 2017-18 and 2020-21. The expected increase in Victoria is due to a combination of tight supply and demand conditions, retailers transitioning from legacy contracts to higher-priced new Gas Supply Agreements (GSAs) for wholesale gas, and a higher gas demand forecast in Victoria compared with slightly lower forecasts in other regions.[85] Victorian gas prices are expected to stabilise after the reporting period for this report, which ends in 2021.[86]

84 The net-back price is the price of liquefied natural gas sold internationally, minus the cost of liquefaction and transport.

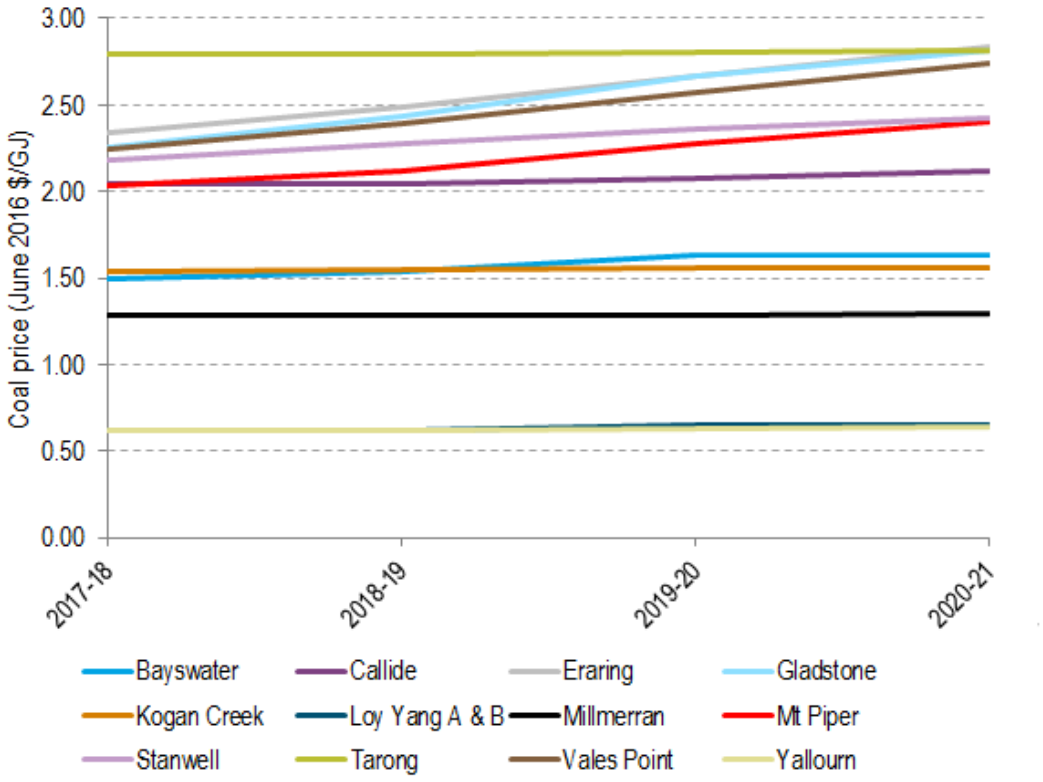
85 AEMO, *2018 Gas Statement of Opportunities (GSOO)*, June 2018, p16.

86 Ibid.

Coal prices

Figure 6.9 shows that coal prices are expected to be high in 2017-18 and remain flat or further increase from 2018-19 to 2020-21. This will place upwards pressure on wholesale electricity costs.

Figure 6.9: Forecast coal prices over the reporting period



Source: EY, based on AEMO's 2018 Integrated System Plan (ISP) - Coal Price Assessment

The increase in coal prices is expected for coal power plants that are located in coal mining regions which are exposed to international coal prices. For example Mt Piper in New South Wales and Gladstone in Queensland.

6.4.4 The effect of interconnectors on the wholesale electricity market

Transmission networks that transport electricity between regions are referred to as interconnectors.[87] Over the period from 2017-18 to 2020-21 no further interconnectors are assumed to be built.

Interconnectors allow electricity in lower priced regions to flow to higher priced regions, which reduces the overall cost of meeting demand in the NEM. Interconnectors allow retailers to access cheaper sources of generation. They also contribute to the reliability of supply

87 There are currently six interconnectors in the NEM.

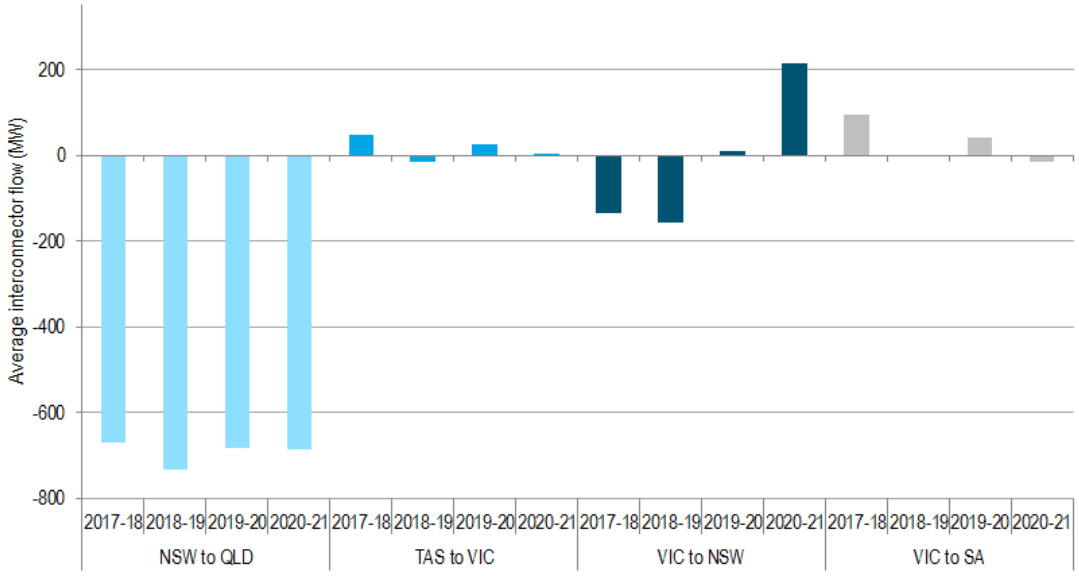
across the NEM as regions can draw upon a wider pool of generation resources. Interconnectors are often viewed as a substitute for building additional generation, however they do not increase the supply of firm hedging contracts.

Interconnector flows are influenced by capacity developments and demand forecasts for each region.

Figure 6.10 below shows that, over the 2017-18 to 2020-21 reporting period, interconnector flows:

- between VIC-NSW are expected to move from net flows changing from NSW to VIC in 2017-18 and 2018-19 to a close to zero net flow in 2019-20 and a significant net flow from VIC to NSW in 2020-21
- net flows are from QLD to NSW across the period from 2017-18 to 2020-21. However, energy exports from QLD to NSW are expected to decrease in 2019-20 and 2020-21 due to consumption growth in QLD, which outpaces the development of new generation.[88]

Figure 6.10: Annual average interconnector flow between NEM regions (MW)



Source: EY

6.5 Effect of the LRET and other government policies and plans on the wholesale electricity market

A number of governments have introduced their own energy policies aimed at increasing renewable generation or putting downwards pressure on wholesale spot prices. Some of these policies are funded by government, and to the extent these policies impose a direct

88 For more information, refer to EY's report. EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

cost to electricity consumers they are included in the environmental cost component dealt with in Chapter 5. These policies, like the LRET, have the potential to additionally affect supply-demand dynamics and wholesale electricity costs.

Table 6.2 provides a summary of the direct costs and additional effects of the LRET and government energy policies and plans on wholesale and environmental cost components. More detail on the Commonwealth Government energy policies and plans is provided in the 2018 Residential Electricity Price Trends Methodology Report and more detail on jurisdictional government energy policies and plans is provided in the Jurisdictional Appendices of this report.

Table 6.2: Assumed effects of government energy policies and plans on wholesale and environmental costs in the NEM

GOVERNMENT POLICY OR PLAN	ASSUMED EFFECT ON ELECTRICITY COST COMPONENTS	
	Direct effect on environmental costs	**Additional effects on wholesale costs in period 2017-18 to 2020-21**
Commonwealth government		
LRET	Yes (upwards pressure)	Yes (upwards or downwards pressure, depending on the supply-demand balance. See 2018 Residential Electricity Price Trends Methodology Report for more detail.)
Proposals to increase wholesale supply (expansion of Snowy Hydro and Tasmanian Hydro schemes and ADGSM)	Not incorporated into modelling as either still to be finalised, occur outside the reporting period or effect remains relatively uncertain.	
ACT government		
FiT scheme	Yes (upward pressure)	Yes (downwards pressure; also see the effects of LRET)
South Australian government		
Government contracted load	No (government funded)	Yes (downwards pressure)
Emergency backup generator	No (government funded)	No
Utility scale battery storage	No (government funded)	Yes (downward pressure on ancillary service costs in SA)
Victorian government		
Victorian renewable energy	No (government funded)	Yes (downwards pressure in

GOVERNMENT POLICY OR PLAN	ASSUMED EFFECT ON ELECTRICITY COST COMPONENTS	
target (VRET)		2020-21; also see the effects of the LRET)
Victorian energy storage initiative	No (government funded)	Yes (downwards pressure)
Queensland government		
Renewable generation reverse auction	No (outside reporting period)	No (outside reporting period)
Solar 150 program	No (government and ARENA funded)	Yes (downwards pressure; also see the effects of LRET)
Direction to Stanwell on bid pricing	No	Yes (downwards pressure)
Tasmania		
Wholesale price order 2017-18 to 2018-19	No (not an environmental cost)	Yes (wholesale price set at $83.79 in 2017-18 and at $79.68/MWh in 2018-19).

7 RESIDUAL COMPONENT

The last part of the electricity cost stack included in this report is the residual component or retail cost. Either the 'residual component' or 'retail cost' terminology is used, depending on the jurisdiction.

As retailers' operating costs and margins are not usually observable for the representative consumer, a residual component is calculated instead. The residual component is estimated based on the difference between the bill outcome (based on retailer prices multiplied by representative consumer's electricity consumption levels) and the sum of the other components in the electricity cost stack. This is a top-down methodology, starting with a known billing outcome, removing known costs, and deriving the unknown (residual) component. This is shown in Figure 7.1 below.

Figure 7.1: Representation of residual component of an electricity bill

Source: AEMC

The residual component was derived for 2017-18 and 2018-19 by subtracting the wholesale, network and environmental cost components from the retail bill. This residual component was then escalated by an assumed inflation rate of 2.5 per cent for future years in the reporting period. Exceptions to this are:

- in Victoria the residual component is derived for the 2018 calendar year and escalated forward by inflation[89]
- in Western Australia the cost stack includes a retail cost component[90]
- in the Northern Territory there is a cost differential.[91]

In aggregate, the residual component consists of the retailer's operating costs (opex), customer acquisition and retention costs (CARC), return for investing in the business (ROI), and any errors in estimating the other supply chain cost components, as shown in the Figure 7.2 below.

89 A different approach is applied in Victoria as residential bills are based on actual bills for 2017/18 and estimated bills for 2018/19. For more information refer to Appendix D.

90 The retail component is provided by the Western Australian Public Utilities Office for Synergy's efficient retailer operating costs and margin.

91 The cost differential refers to the difference between the residential price set by the Northern Territory Government and the cost of supply (which includes the cost of wholesale, network and environmental policies).

Figure 7.2: Representation of the residual component

Source: AEMC

As the residual component is derived in aggregate, it is not possible to report on the individual sub-components that are shown in Figure 7.2. Importantly, this means that the reported residual component is not equivalent to the gross margin on profit earned by retailers. Further, the residual component is only estimated for a single point in time. Retail markets are dynamic and retailers will respond to changes in costs and competitive dynamics over time.

As noted in Chapter 3 of this report, the ACCC reported on electricity retail costs and margins in its recent *Retail Electricity Pricing Inquiry Final Report*,[92] and is to report on these at least every 6 months.[93] This creates an opportunity to move away from the top-down methodology described above, and undertake a bottom-up analysis of billing outcomes. With this method, the cost stack elements (networks, wholesale, environmental and retail) would be added together to calculate a consumer billing outcome, and then unitised by consumer consumption to calculate consumer prices.

At this stage, the Commission has retained the top-down methodology. Therefore, it is important to note that the residual component in this report does not reflect nor is it meant to represent retail margins (either gross or net). The purpose of this *Residential Electricity Price Trends* report is to provide an indication of trends in retail bills and the drivers of those trends. This report does not forecast the actual costs that customers will pay for any of the supply chain components.

Although this report does not examine retail operating costs or margins, the Commission did consider these issues as part of AEMC's *2018 Retail Energy Competition Review*.[94] The ACCC's *Retail Electricity Pricing Inquiry Final Report* also considered these issues of retail costs.[95] Both reports look at the current and past state of retail competition across the NEM. Therefore, it is these reviews, rather than the Residential Electricity Price Trends Report, which should be referenced in relation to retailer's operating costs and margins.

92 ACCC, *Restoring electricity affordability and Australia's competitive advantage, Retail Electricity Pricing Inquiry - Final report*, June 2018.

93 ACCC, *ACCC to monitor and report on electricity prices,* 21 August 2018. *2018. https://www.accc.gov.au/media-release/accc-to-monitor-and-report-on-electricity-prices*

94 See: AEMC, *2018 Retail Energy Competition Review*, Final Report, 15 June 2018, chapter 10, www.aemc.gov.au/markets-reviews-advice/2018-retail-energy-competition-review

95 See: ACCC, *Retail Electricity Pricing Inquiry*, ACCC, 30 June 2018, Chapter 10: Retail costs, https://www.accc.gov.au/system/files/Retail%20Electricity%20Pricing%20Inquiry%E2%80%94Final%20Report%20June%202018_0.pdf.

A NATIONAL

A.1 The national representative consumer

The terms of reference for the review require the calculation of indicative national prices and cost components.

As the national numbers are an average of jurisdictional results that are, in some cases, already averages of multiple different network regions, the prices and costs are indicative only and may not reflect the actual costs faced by residential consumers.

In order to calculate the national weighted average consumption level and national weighted average prices, the representative consumption level and the estimate of prices used for each jurisdiction has been weighted by the number of residential connections in each jurisdiction. The national weighted average consumption is 4,596 kWh of electricity per year.

As a result, the trends in the national summary most closely reflect the cost trends in the most populous jurisdictions. This also means that the national summary is more representative of trends in the National Electricity Market (NEM) that covers the eastern states.

A detailed explanation of the pricing methodology is set out in the *2018 Residential Electricity Price Trends Methodology Report.*

A.2 Trends in residential electricity prices and bills

In 2017-18, the national weighted average electricity bill for the representative consumer was approximately $1,384 exclusive of GST. This was made up of a:

- 44 per cent regulated network component
- 39 per cent wholesale market component
- 6 per cent environmental policy component
- 12 per cent residual component.

National weighted average residential electricity bill:

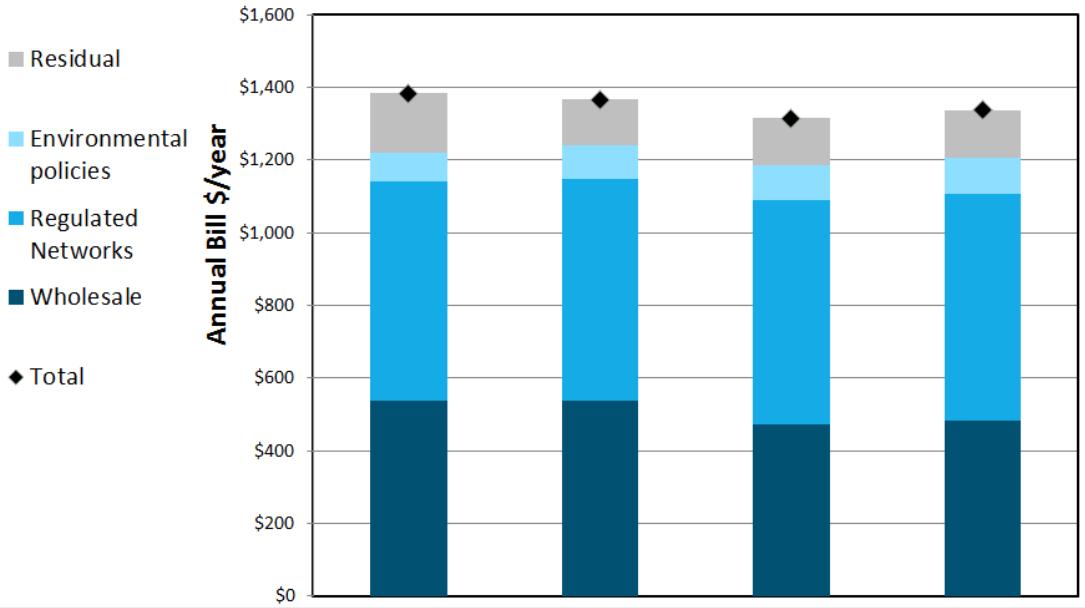
- decreased 1.3 per cent from 2017-18 to 2018-19
- are expected to decrease by an annual average of 1.1 per cent from 2018-19 to 2020-21. This is based on a:
  - decrease of 3.9 per cent in 2019-20
  - increase of 1.8 per cent in 2020-21.

The expected decrease in residential electricity prices from 2018-19 to 2020-21 are largely attributable to decreases in the wholesale cost component.

A.3 Trends in electricity supply chain components

Figure A.1n shows the expected movements in the supply chain cost components nationally.

Figure A.1: National summary of supply chain cost components

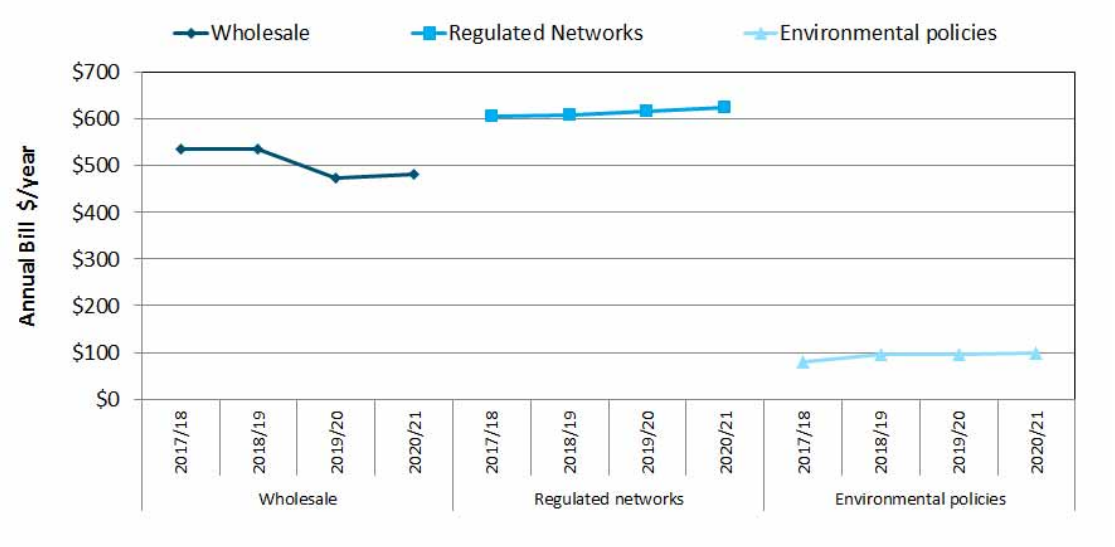


	2017/18 Base Year		2018/19 Current Year		2019/20		2020/21	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**1.75**	**$79**	**2.08**	**$95**	**2.07**	**$96**	**2.14**	**$99**
LRET	0.82	$37	0.89	$41	0.78	$36	0.79	$37
SRES	0.43	$19	0.69	$32	0.74	$34	0.77	$36
Network JS	0.36	$17	0.35	$16	0.37	$17	0.39	$18
Efficiency Schemes	0.14	$6	0.15	$7	0.18	$8	0.19	$8
Regulated Networks	**13.22**	**$605**	**13.33**	**$610**	**13.49**	**$617**	**13.65**	**$625**
Transmission	2.19	$100	2.22	$101	2.28	$104	2.35	$107
Distribution	10.04	$462	10.10	$464	10.24	$470	10.32	$475
Metering	0.99	$44	1.01	$45	0.97	$43	0.98	$43
Wholesale	**11.70**	**$536**	**11.72**	**$537**	**10.34**	**$474**	**10.55**	**$482**
Residual	**3.57**	**$162**	**2.72**	**$125**	**2.79**	**$128**	**2.87**	**$132**
Total	**30.24**	**$1,384**	**29.85**	**$1,367**	**28.69**	**$1,315**	**29.20**	**$1,338**

Note: The weighted average of retailer's lowest market offers for the representative consumer was used in South East Queensland, New South Wales, Victoria and South Australia. The weighted average of retailer's lowest standing offers for the representative consumer was used in the ACT and Tasmania. The electricity price set by the state or territory government was used for Western Australia and the Northern Territory. Also, note that Victorian prices are set on a calendar year basis.

Figure A.2 shows the expected trends in national supply chain components from 2017-18 to 2020-21.

Figure A.2: Trends in national supply chain components



The expected trends of national electricity supply chain components (wholesale, regulated networks and environmental policies) are further explored in the sections below.

A.3.1 Wholesale electricity costs

Wholesale electricity costs comprised approximately 39 per cent of the representative national average electricity bill in 2017-18, and are expected to account for a decreasing proportion of a residential consumer's bill from 2017-18 to 2020-21.

On a national basis, wholesale electricity costs:

- increased 0.1 per cent from 2017-18 to 2018-19
- are expected to decrease by an annual average of 5.1 per cent from 2018-19 to 2020-21. This is based on a:
  - decrease of 11.8 per cent in 2019-20
  - increase of 2.0 per cent in 2020-21.

Refer to Chapter 6 (Wholesale market trends and drivers) for more information on the drivers of the trends above.

A.3.2 Regulated network costs

Regulated network costs comprised approximately 44 per cent of the representative national average electricity bill in 2017-18, and are expected to account for an increasing proportion of a residential electricity consumer's bill from 2017-18 to 2020-21.

On a national basis, regulated network costs:

- increased 0.9 per cent from 2017-18 to 2018-19

- are expected to increase by an annual average of 1.2 per cent from 2018-19 to 2020-21. This is based on a:
  - increase of 1.2 per cent in 2019-20
  - increase of 1.2 per cent in 2020-21.

The increase in network costs is driven by increasing distribution and transmission costs.

A.3.3 Environmental policy costs

The environmental policy costs that are relevant for the national summary from 2017-18 to 2020-21 are environmental schemes which have a direct cost that can be included on a customer's retail bill. This includes costs associated with the Commonwealth Government's Renewable Energy Target (RET), jurisdictional feed-in-tariff (FiT) schemes and jurisdictional energy efficiency schemes. For more detail on these schemes refer to Chapter 5 and the jurisdictional appendices.

Environmental policy costs comprised approximately 6 per cent of the representative national average electricity bill in 2017-18, and are expected to account for an increasing proportion of a residential electricity consumer's bill from 2017-18 to 2020-21.

On a national basis, environmental policy costs:

- increased 19.0 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 1.4 per cent from 2018-19 to 2020-21. This is based on a:
  - decrease of 0.7 per cent in 2019-20
  - increase of 3.5 per cent in 2020-21.

The increase in environmental policy costs is primarily due to increasing SRES costs.

A.4 Note on the methodology used

The national average annual bill is the product of the weighted average consumption level and the weighted average price. It is calculated by:

- taking the consumption level of the representative consumer in each jurisdiction and the average price paid by the representative consumer, as set out in Appendices A to I.
- weighting by the number of residential connections in each jurisdiction.

In order to calculate the consumption level of the representative consumer in each jurisdiction, the AEMC:

- used data provided by the AER in their 2017 bill benchmarking survey, with the exception of South Australia, Western Australia and Northern Territory where the respective government provided the consumption level
- accounted for "controlled load" tariffs, where particular appliances (typically electric hot water systems and pool pumps) are charged at a lower rate as they are used outside of the peak periods. In Queensland the majority of residential consumers have part of their consumption on an off-peak tariff

- accounted for other region specific tariff structures. In Tasmania the majority of residential consumers have part of their consumption on a heating and hot water tariff which is charged at a lower rate.

There are other differences to note in the estimation of jurisdictional costs and prices. Where there were market offers available in a jurisdiction, representative market offers were used. In other jurisdictions, the regulated standing offer or government set tariffs were used. The specific data sources and methods used for estimating market and standing offers for each jurisdiction are described in the *2018 Residential Electricity Price Trends Methodology Report.*

B SOUTH EAST QUEENSLAND

B.1 The representative consumer in South East Queensland

This report uses the most common type of residential electricity consumer (the representative consumer) to analyse residential electricity prices, annual bills and the cost components of a bill. In South East Queensland the representative consumer:[96]

- is a two-person household that consumes 5,240 kWh of electricity per year, of which 806 kWh is attributed to a controlled-load tariff[97]
- is on a "controlled load" tariff
- has no gas connection
- is on a market offer.

As at December 2017, 81 per cent of small customers in South East Queensland were on a market offer and therefore the South East Queensland representative consumer is on a market offer.[98] A detailed explanation of the pricing methodology is set out in the *2018 Residential Electricity Price Trends Methodology report*.

B.2 Trends in residential electricity prices and bills

In 2017-18, a residential electricity market offer[99] bill in South East Queensland was approximately $1,526 exclusive of GST, which equates to a revised customer bill of $1,476 exclusive of GST after removal of the Queensland government rebate of $50.[100] The market offer[101] was made up of the following components:

- 38 per cent wholesale market costs
- 45 per cent regulated network costs
- 4.2 per cent environmental policy costs
- 12.8 per cent residual component.

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96 This analysis does not include regional Queensland. In regional Queensland, standing offer prices remain regulated, reflecting the Queensland Government's Uniform Tariff Policy, which sets prices on par with lower-cost electricity prices in South East Queensland. See Queensland Competition Authority, *Regulated Retail Electricity Price for Regional Queensland in 2018-19*, Media Release, 31 May 2018. http://www.qca.org.au/Media-Centre/Media-Releases/Media-Releases/2018/May/Regulated-Retail-Electricity-Prices-for-Regional-Q

97 Energex customer connection data was used to establish that the most typical South East Queensland consumer is on Tariff 33. Controlled load is also sourced from this tariff class.

98 Small customers include both residential and small business customers. Taken from: ACCC, *Retail Electricity Pricing Inquiry - Final Report*, July 2018, figure 12.4, p. 244.

99 This is the weighted average of retailer's lowest electricity market offers for the representative consumer in South East Queensland.

100 This rebate applies to all Queensland residential customers that are separately charged for their electricity. Customer's who don't receive a separate electricity bill (i.e. where electricity is included as part of the rent) are not eligible to receive the rebate. Queensland Government, Electricity asset ownership dividend, April 2018, https://www.qld.gov.au/community/cost-of-living-support/asset-ownership-dividend, Accessed: 18 July 2018

101 Of $1,526 excluding GST

In 2017-18, a representative consumer on a standing offer[102] had an annual bill of $1,699 exclusive of GST, which equates to a revised customer bill of $1,649 exclusive of GST after removal of the Queensland Government rebate of $50.

Residential electricity market offer bills for the representative consumer in South East Queensland (after removal of the $50 rebate from the customer bill):

- decreased by 6.8 per cent from 2017-18 to 2018-19
- are expected to decrease by an annual average of 2.8 per cent from 2018-19 to 2020-21. This is based on:
  - a decrease of 5.8 per cent in 2019-20
  - an increase of 0.3 per cent in 2020-21.

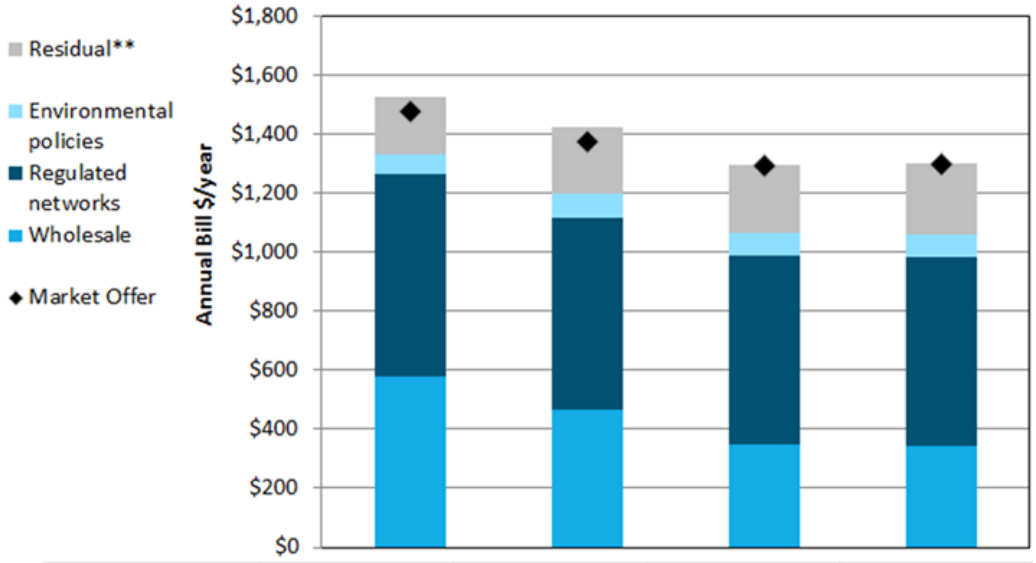
The expected decrease in residential market offer electricity prices in 2019-20 is largely attributable to decreases in the wholesale component.

B.3 Trends in electricity supply chain components

Figure B.1 below shows the expected movements in the supply chain components for South East Queensland. Electricity supply chain components include wholesale market costs, regulated networks costs, environmental policy costs and the residual component. In addition, residential customers in Queensland received a $50 rebate in 2017-18 and 2018-19.

102 This is the weighted average of retailer's lowest electricity standing offers for the representative consumer in South East Queensland.

Figure B.1: Trends in South East Queensland supply chain components

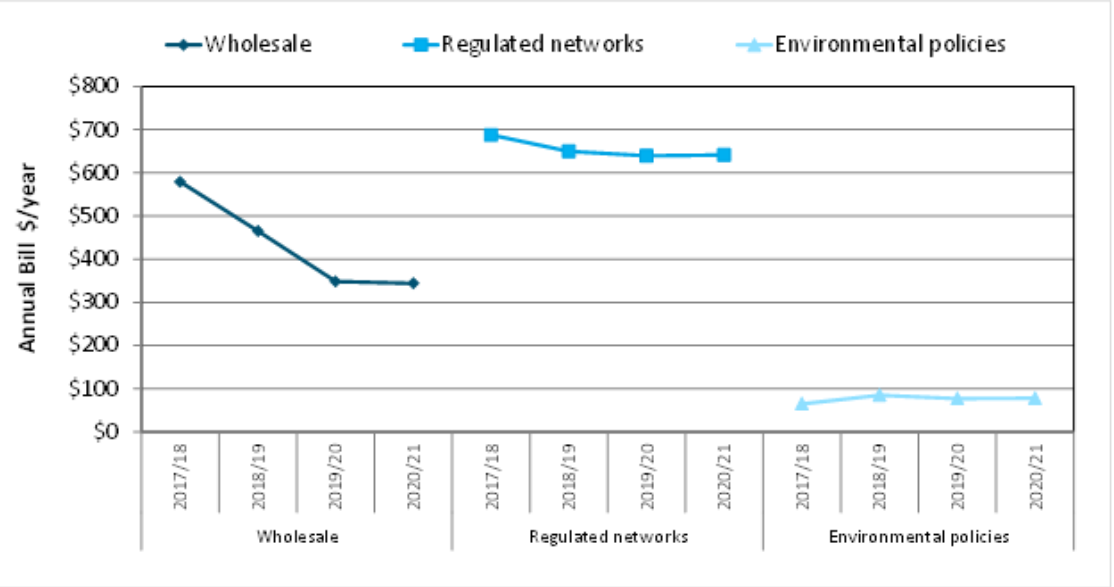


	2017/18 Base Year		2018/19 Current Year		2019/20		2020/21	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**1.23**	**$65**	**1.62**	**$85**	**1.47**	**$77**	**1.48**	**$78**
LRET - LGC cost	0.88	$46	0.95	$50	0.72	$38	0.72	$38
SRES - STC cost	0.35	$18	0.67	$35	0.75	$39	0.76	$40
Regulated networks	**13.12**	**$688**	**12.40**	**$650**	**12.20**	**$639**	**12.24**	**$641**
Transmission	1.85	$97	1.76	$92	1.78	$93	1.82	$95
Distribution	10.44	$547	9.79	$513	9.52	$499	9.52	$499
ACS Metering	0.83	$44	0.86	$45	0.89	$47	0.89	$47
Wholesale	**11.05**	**$579**	**8.88**	**$465**	**6.64**	**$348**	**6.56**	**$344**
Residual	**3.72**	**$195**	**4.30**	**$225**	**4.40**	**$231**	**4.51**	**$237**
Market Offer	**29.13**	**$1,526**	**27.20**	**$1,425**	**24.71**	**$1,295**	**24.80**	**$1,299**
Market Offer less Government Rebate	**28.17**	**$1,476**	**26.24**	**$1,375**				

Note: The electricity prices and bills are based on a weighted average of retailer's lowest market offers for the representative consumer in South East Queensland.

Figure B.2 below shows the expected trends in supply chain components in South East Queensland from 2017-18 to 2020-21.

Figure B.2: Trends in South East Queensland supply chain components



The expected trends of South East Queensland electricity supply chain components (wholesale, regulated networks and environmental policies) are further explored in the sections below.

B.3.1 Wholesale electricity costs

Wholesale electricity costs for the reporting period were provided to the AEMC by our consultants EY. For more details refer to their report.[103]

Wholesale electricity costs comprised approximately 38 per cent of the representative market electricity offer in 2017-18, and is expected to account for a decreasing proportion of a residential electricity consumer's bill from 2017-18 to 2020-21.

Wholesale electricity costs are expected to:

- decreased by 19.7 per cent from 2017-18 to 2018-19
- are expected to decrease by an annual average of 14.0 per cent from 2018-19 to 2020-21. This is based on:
  - a decrease of 25.2 per cent in 2019-20
  - a increase of 1.2 per cent in 2020-21.

Refer to Chapter 6 (Wholesale market trends and drivers) for more details on the drivers of this trend.

103 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

B.3.2 Regulated network costs

In South East Queensland, transmission network services are provided by Powerlink and distribution network services are provided by Energex.

Regulated network costs comprised approximately 45 per cent of the representative market electricity offer in 2017-18, and are expected to account for an increasing proportion of a residential electricity consumer's bill from 2017-18 to 2020-21.

Regulated network costs:

- decreased by 5.5 per cent from 2017-18 to 2018-19
- are expected to decrease by an annual average of 0.7 per cent from 2018-19 to 2020-21. This is based on:
  - a decrease of 1.7 per cent in 2019-20
  - a increase of 0.3 per cent in 2020-21.

The main driver of this trend is the decrease in distribution network charges.

B.3.3 Environmental policy costs

The environmental policy cost that is relevant in South East Queensland during the reporting period is the Commonwealth Government's Renewable Energy Target (RET).[104] The RET applies on a national basis and consists of the LRET and SRES.[105]

The drivers of direct costs associated with the LRET and SRES are detailed in the EY report.[106] Additional effects of the LRET on the wholesale electricity market are discussed in the *2018 Residential Electricity Price Trends Methodology Report*.

In 2017-18, the RET comprised 4.2 per cent of the representative market offer in South East Queensland and is expected to comprise an increasing proportion of the representative consumers' electricity bill from 2017-18 to 2020-21.

Environmental policy costs:

- increased by 31.3 per cent from 2017-18 to 2018-19
- are expected to decrease by an annual average of 4.5 per cent from 2018-19 to 2020-21. This is based on:
  - a decrease of 9.4 per cent in 2019-20
  - a increase of 0.8 per cent in 2020-21.

The main driver of this trend is the increase in the Commonwealth government's SRES policy.

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104 The costs associated with the RET are passed through to retailers who may recover them from customers. Until 2016/17, the costs associated with the Queensland Government's Solar Bonus Scheme (SBS) were recovered through distribution network prices and could be passed through to customers. In 2017/18, 2018/19 and 2019/20, the costs of the SBS are funded through the Queensland Government budget. In 2020/21, in the absence of alternative information, it is assumed that SBS costs will remain in the Queensland Government budget.

105 For more information refer to Chapter 5.

106 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

B.4 Developments that could affect residential electricity price trends in South East Queensland

This section identifies future developments that have been announced which could affect the future trend in residential retail prices in South East Queensland.

B.4.1 Affordable Energy Plan

The Queensland Government's Affordable Energy Plan is aimed at making electricity more affordable for residential and business customers. The plan features a range of initiatives which have been split into three categories: 'Help for households', 'Extra assistance for regional Queensland customers', and 'Business support'.

The '**Help for households'** category included:

- From 30 April 2018, residential Queensland customers are provided with a $50 per year rebate for each of the two years of 2018 and 2019.[107] The rebate is automatically applied to a customer's electricity account.[108]
- Since mid-2018, the Government provides interest free loans to Queensland households to purchase solar PV systems.[109]
- The Solar Bonus Scheme was moved from customer's bill to the Queensland Government budget for 2017-18, 2018-19 and 2019-20.[110]

B.4.2 Solar Future Program

The Queensland government has implemented the Solar Future Program to support the growth of solar PV in Queensland. The aim of the program is to have 1 million rooftops or 3,000 megawatts of solar PV in Queensland by 2020. The program's initiatives include reforming feed-in tariffs, statutory voltage limits and Solar 150 (large-scale solar investment).[111] The estimate of wholesale costs in this report takes into account new generation projects that were successful under the Queensland Government's Solar 150 program and are expected to be operational in the 2017-18 to 2020-21 reporting period.

B.4.3 Queensland renewable generation reverse auction (Renewables 400)

Under the Powering Queensland Plan, the Queensland Government conducted a reverse auction for up to 400 MW of renewable energy capacity, including 100 MW of energy storage. The auction process will consider standalone renewable energy projects, standalone energy storage projects, and integrated renewable and energy storage projects. Expressions of

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107 This $50 rebate has been factored into the net electricity bill paid by the representatie customer in 2017/18 and 2018/19 in this report.

108 Queensland Government, *Electricity asset ownership dividend*, April 2018, https://www.qld.gov.au/community/cost-of-living-support/asset-ownership-dividend, Accessed: 18 July 2018

109 Queensland Government, *Interest-free loans for solar and storage*, June 2018, https://www.qld.gov.au/community/cost-of-living-support/about-solar-program, Accessed: 18 July 2018

110 For the purposes of this report, it has been assumed that the SBS is to be funded via the Queensland Government budget until 1 July 2021.

111 Queensland Government, Department of Natural Resources, Mines and Energy, *Affordable Energy Plan: making electricity more affordable*, viewed 18 July 2018. https://www.dnrme.qld.gov.au/energy/initiatives/solar-future

interest closed on 25 September 2017. A shortlist is being compiled with binding bids through a request for proposal process occurring in 2018.[112]

B.4.4 Queensland Energy Security

The Queensland Energy Security Taskforce is an initiative of the Powering Queensland Plan and has been commissioned to develop an energy security plan for Queensland. The taskforce will provide advice to the government on short-term and long-term strategies to maintain energy system security, affordability and reliability for households and businesses while encouraging and transitioning to a higher level of renewable energy.

112 Queensland Government, Department of Natural Resources, Mines and Energy, *Renewables 400*, viewed 18 July 2018. https://www.business.qld.gov.au/industries/mining-energy-water/energy/renewable/projects-queensland/renewables-400

C NEW SOUTH WALES

C.1 The representative consumer in New South Wales

This report uses the most common type of residential electricity consumer (the representative consumer) to analyse residential electricity prices, annual bills and the cost components of a bill. In New South Wales the representative consumer:

- is a two-person household that consumes 4,215 kWh of electricity per year
- is not on a "controlled load" tariff
- has a mains gas connection, and therefore is a dual fuel customer[113]
- is on a market offer.

As at March 2018, 83 per cent of small customers in New South Wales are on a market offer and therefore the representative consumer is on a market offer.[114] A detailed explanation of the pricing methodology is set out in the *2018 Residential Electricity Price Trends Methodology report*.

C.2 Trends in residential electricity prices and bills

In 2017-18, a residential electricity market offer[115] bill in New South Wales was approximately $1,290 exclusive of GST. This is made up of a:

- 32.4 per cent wholesale market cost component
- 46.5 per cent regulated network cost component
- 5.5 per cent environmental policy cost component
- 15.6 per cent residual component.

In 2017-18, a representative consumer on a residential standing offer[116] using 4,215 kWh each year had an annual bill of $1,578 exclusive of GST.

Residential electricity market offer bills for the representative consumer in New South Wales:

- increased by 0.4 per cent from 2017-18 to 2018-19
- are expected to decrease by an annual average of 1.1 per cent from 2018-19 to 2020-21. This is based on:
  - a decrease of 5.2 per cent in 2019-20
  - an increase of 3.2 per cent in 2020-21.

The expected decrease in residential market offer electricity prices from 2018-19 and 2020-21 is largely attributable to a decrease in the wholesale cost component.

113 This analysis does not account for the cost of gas for the representative consumers and therefore should not be taken as their total annual energy costs.

114 Small customers includes both residential and small business customers.

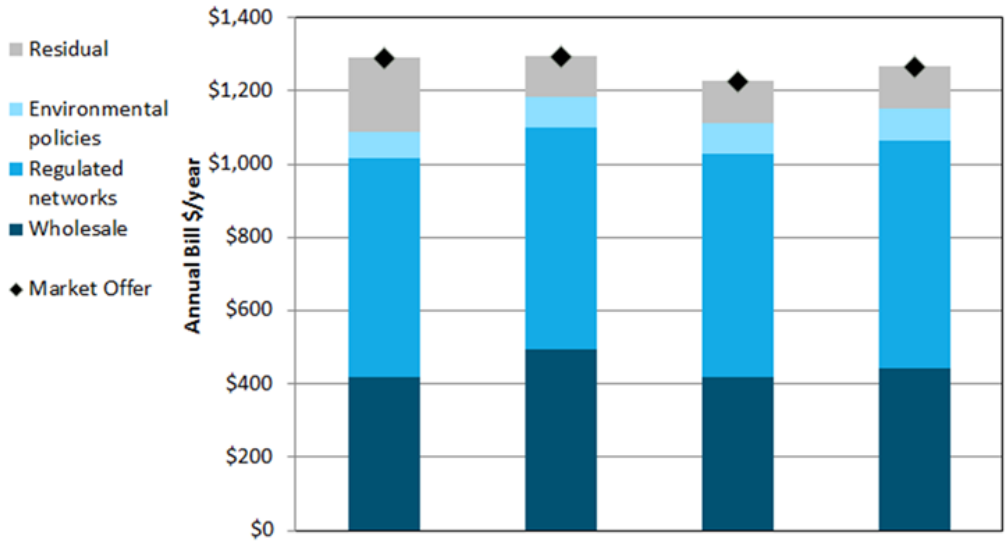
115 This is the weighted average of retailer's electricity lowest market offers for the representative consumer in New South Wales.

116 This is the weighted average of retailer's electricity lowest standing offers for the representative consumer in New South Wales.

C.3 Trends in electricity supply chain components

Figure C.1 shows the expected movements in the supply chain cost components for New South Wales. Electricity supply chain components include wholesale market costs, regulated networks costs, environmental policy costs and the residual component.

Figure C.1: Trends in New South Wales supply chain components

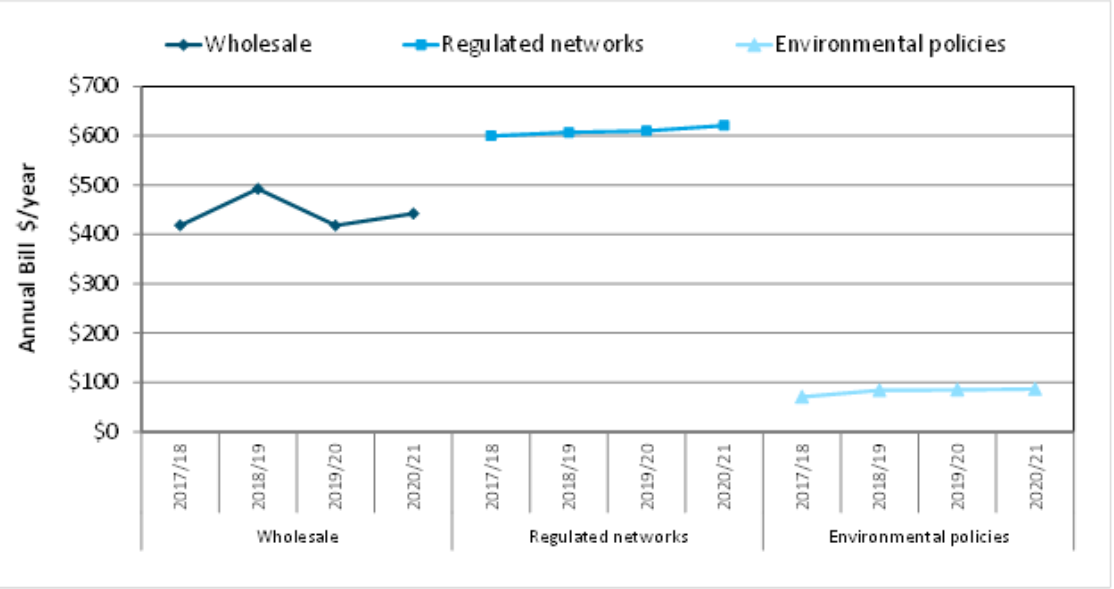


	2017/18 Base Year		2018/19 Current Year		2019/20		2020/21	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**1.67**	**$70**	**1.99**	**$84**	**2.02**	**$85**	**2.05**	**$87**
LRET - LGC cost	0.74	$31	0.83	$35	0.78	$33	0.82	$34
SRES - STC cost	0.34	$14	0.65	$27	0.73	$31	0.74	$31
Climate Change Fund	0.41	$17	0.34	$14	0.33	$14	0.32	$14
Energy Saving Scheme	0.17	$7	0.17	$7	0.18	$7	0.18	$7
Regulated networks	**14.23**	**$600**	**14.40**	**$607**	**14.47**	**$610**	**14.73**	**$621**
Transmission	3.03	$128	3.15	$133	3.27	$138	3.42	$144
Distribution	10.54	$444	10.59	$446	10.59	$446	10.71	$451
ACS Metering	0.65	$27	0.66	$28	0.61	$26	0.61	$26
Wholesale	**9.93**	**$418**	**11.68**	**$492**	**9.92**	**$418**	**10.50**	**$442**
Residual	**4.77**	**$201**	**2.64**	**$111**	**2.71**	**$114**	**2.78**	**$117**
Market Offer	**30.59**	**$1,290**	**30.71**	**$1,294**	**29.12**	**$1,227**	**30.06**	**$1,267**

Note: The electricity prices and bills are based on a weighted average of retailer's lowest market offers for the representative consumer in New South Wales.

Figure C.2 below shows the expected trends in supply chain components in New South Wales from 2017-18 to 2020-21.

Figure C.2: Trends in New South Wales supply chain components



The expected trends of New South Wales electricity supply chain components (wholesale, regulated networks and environmental policies) are further explored in the sections below.

C.3.1 Wholesale electricity costs

Wholesale electricity costs for the 2017-18 to 2020-21 were provided to the AEMC by our consultants EY. For more details refer to their report.[117]

Wholesale electricity costs comprised approximately 32.4 per cent of the representative market electricity offer in 2017-18, and are expected to account for a decreasing proportion of a residential electricity consumer's bill from 2018-19 to 2020-21.

Wholesale electricity costs:

- increased by 17.7 per cent from 2017-18 to 2018-19
- are expected to decrease by an annual average of 5.2 per cent from 2018-19 to 2020-21. This is based on:
  - a decrease of 15.1 per cent in 2019-20
  - a increase of 5.8 per cent in 2020-21.

Refer to Chapter 6 (Wholesale market trends and drivers) for details on the drivers of this trend.

117 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

C.3.2 Regulated network costs

In New South Wales, transmission network services are provided by Transgrid and distribution network services are provided Ausgrid, Endeavour Energy and Essential Energy.

Regulated network costs comprised approximately 46.5 per cent of the representative market electricity offer in 2017-18, and are expected to account for an increasing proportion of a residential electricity consumer's bill from 2018-19 to 2020-21.

Regulated network costs:

- increased by 1.2 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 1.2 per cent from 2018-19 to 2020-21. This is based on:
  - a increase of 0.5 per cent in 2019-20
  - a increase of 1.8 per cent in 2020-21.

The main driver of this cost trend is the increase in transmission network charges.

C.3.3 Environmental policy costs

The environmental policy costs that are relevant in New South Wales during the 2017-18 to 2020-21 are the Commonwealth Government's Renewable Energy Target (RET), and the New South Wales Government's Climate Change Fund (CCF) and Energy Savings Scheme (ESS).

In 2017-18, environmental schemes comprised 5.5 per cent of the representative market offer and are expected to represent an increasing proportion of a representative consumer's electricity bill from 2018-19 to 2020-21.

Environmental policy costs:

- increased by 19.2 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 1.6 per cent from 2018-19 to 2020-21. This is based on:
  - a increase of 1.3 per cent in 2019-20
  - a increase of 1.9 per cent in 2020-21.

The main drivers of these trends is the significant increase in the cost of the Commonwealth government's SRES.

Renewable Energy Target

The RET applies on a national basis and consists of the LRET and SRES.[118]

The drivers of direct costs associated with the LRET and SRES are detailed in the EY report.[119] Additional effects of the LRET on the wholesale electricity market are discussed in the *2018 Key concepts and calculation methodology report*.

Climate Change Fund

118 For more information refer to Chapter 5.

119 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

The CCF was established by the New South Wales Government to support energy and water saving initiatives.[120] It is funded through New South Wales distribution network charges which retailers can pass through to consumers.[121]

The CCF supports energy management initiatives through the Energy Efficiency Action Plan (EEAP) and the Government Resource Efficiency Policy (GREP). It also supports the development of renewable energy through the Regional Clean Energy Program (RCEP), and climate change adaptation through the Enhanced Bushfire Management Program.[122]

Energy Savings Scheme

The ESS is a New South Wales Government program to assist households and businesses reduce their energy consumption. It is a certificate trading scheme in which retailers are required to fund energy efficiency through the purchase of certificates.[123]

C.4 Developments that could affect residential electricity prices in New South Wales

This section identifies future developments that have been announced and could affect the future trend in residential retail prices in New South Wales.

C.4.1 Clean energy initiatives to reduce power bills

The NSW Government is delivering a range of new programs to provide clean and affordable energy for the people of NSW. These programs will assist households and businesses to save money on their energy bills. The programs include:[124]

- Regional Community Energy
- Solar for Low Income Households
- appliance replacement offers
- air conditioner upgrades.

120 For more information, see NSW Office of Environment and Heritage, *Climate Change Fund*, viewed, 18 July 2018. http://www.environment.nsw.gov.au/grants/ccfund.htm

121 NSW Office of Environment and Heritage, *Climate Change Fund Annual Report 2016-17*, November 2017, p.4.

122 For more information see: https://www.environment.nsw.gov.au/grants/ccfund.htm.

123 For more information, see IPART, Energy Savings Scheme http://www.ess.nsw.gov.au/How_the_scheme_works

124 For more information regarding these programs, their funding arrangements and their indirect impact on prices see: https://energy.nsw.gov.au/renewables/emerging-energy/clean-energy-initiatives.

D AUSTRALIAN CAPITAL TERRITORY

D.1 The representative consumer in the ACT

This report uses the most common type of residential electricity consumer (the representative consumer) to analyse residential electricity prices, annual bills and the cost components of a bill. In the ACT the representative consumer:

- is a two-person household that consumes 7,151 kWh of electricity per year[125]
- is not on a "controlled load" tariff
- has no mains gas connection
- is on a regulated standing offer.

As at March 2018, 68 per cent of ACT small customers are on a standing offer and therefore the representative consumer is on a standing offer.[126] A detailed explanation of the pricing methodology is set out in the *2018 Residential Electricity Price Trends Methodology report*.

D.2 Trends in residential electricity prices and bills

In 2017-18, the residential electricity standing offer[127] bill in the ACT was approximately $1,693 excluding GST. This is made up of a:

- 42 per cent wholesale market cost component
- 30.3 per cent regulated network cost component
- 13.9 per cent environmental policy cost component
- 13.8 per cent residual component.

In 2017-18, the representative consumer on a market offer[128] had an annual bill of $1,548 exclusive of GST.

Residential electricity standing offer prices for the representative consumer in the ACT:

- increased by 1.4 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 2.5 per cent from 2018-19 to 2020-21. This is based on:
  - a decrease of 1.2 per cent in 2019-20
  - an increase of 6.3 per cent in 2020-21.

The expected increase in residential standing offer electricity bills from 2018-19 to 2020-21 is driven by increasing network costs and environmental costs.

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125 Compared to other jurisdictions, the representative consumer in the ACT has the highest annual consumption of electricity. This creates a disconnect between the annual electricity bill and the costs of electricity on a c/kWh basis because while the annual bill may be high, the price (c/kWh) may not be high relative to other jurisdictions.

126 Small customers includes both residential and small business customers.

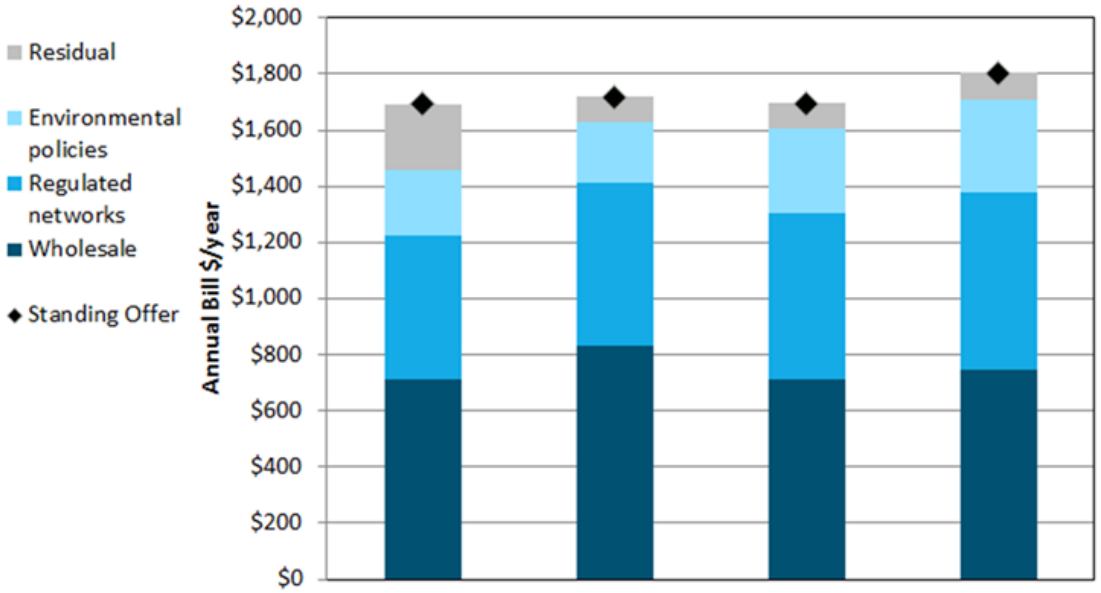
127 This is the weighted average of retailer's electricity lowest standing offers for the representative consumer in the ACT.

128 This is the weighted average of retailer's electricity lowest market offers for the representative consumer in the ACT.

D.3 Trends in electricity supply chain components

Figure D.1 shows the expected movements in supply chain cost components for the ACT. Electricity supply chain components include wholesale market costs, regulated networks costs, environmental policy costs and the residual component.

Figure D.1: Trends in the ACT supply chain components

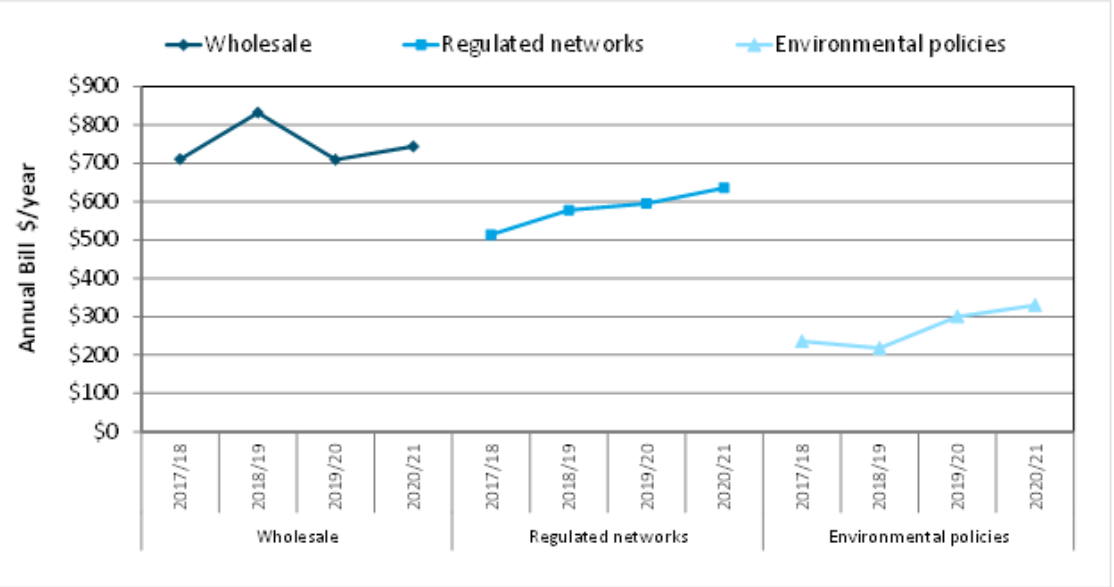


	2017/18 Base Year		2018/19 Current Year		2019/20		2020/21	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**3.29**	**$236**	**3.05**	**$218**	**4.19**	**$300**	**4.61**	**$330**
LRET - LGC cost	0.65	$46	0.75	$53	0.85	$61	0.90	$65
SRES - STC cost	0.33	$24	0.64	$45	0.71	$51	0.72	$52
Feed-in Tariff Schemes	1.90	$136	1.25	$89	2.22	$159	2.57	$184
EEIS	0.42	$30	0.41	$29	0.41	$29	0.41	$29
Regulated networks	**7.18**	**$514**	**8.08**	**$578**	**8.32**	**$595**	**8.89**	**$636**
Transmission	1.06	$76	1.59	$114	1.69	$121	1.82	$130
Distribution	5.53	$395	5.88	$421	5.99	$428	6.37	$456
ACS Metering	0.59	$42	0.60	$43	0.64	$46	0.69	$49
Wholesale	**9.94**	**$711**	**11.63**	**$832**	**9.92**	**$709**	**10.40**	**$744**
Residual	**3.26**	**$233**	**1.26**	**$90**	**1.29**	**$92**	**1.32**	**$95**
Standing Offer	**23.68**	**$1,693**	**24.01**	**$1,717**	**23.72**	**$1,697**	**25.22**	**$1,804**

Note: The residual component is derived for 2017-18 and 2018-19 by subtracting wholesale, environmental and network costs from the standing offer price. The residual cost is assumed to increase at an inflation rate of 2.5 per cent for future years from 2018-19 to 2020-21. The residual component is derived specifically for the representative consumer using the methodology in this report and may differ from the regulated retail cost in the ACT. Also, the electricity prices and bills are based on a weighted average of retailer's lowest standing offers for the representative consumer in the ACT.

Figure D.2 below shows the expected trends in supply chain components in the ACT from 2017-18 to 2020-21.

Figure D.2: Trends in the ACT supply chain components



The expected trends of ACT electricity supply chain components (wholesale, regulated networks and environmental policies) are further explored in the sections below.

D.3.1 Wholesale electricity costs

Wholesale electricity costs for 2017-18 to 2020-21 were provided to the AEMC by our consultants EY.[129] For more details refer to their report.[130]

Wholesale electricity costs comprised approximately 42 per cent of the representative standing electricity offer in 2017-18, and is expected to account for a decreasing proportion of a residential electricity consumer's bill from 2018-19 to 2020-21.

Wholesale electricity costs:

- increased by 17 per cent from 2017-18 to 2018-19
- are expected to decrease by an annual average of 5.4 per cent from 2018-19 to 2020-21. This is based on:
  - a decrease of 14.7 per cent in 2019-20
  - an increase of 4.9 per cent in 2020-21.

Refer to Chapter 6 (Wholesale market trends and drivers) for information regarding the drivers of this trend.

129 The wholesale cost methodology used in this report is based on a average of wholesale futures prices, weighted over a period of 24 months (large retailer) and 12 months (small retailers), as explained in the *2018 Residential Electricity Price Trends Methodology Report*. This is different from the wholesale cost methodology applied by the ACT's Independent Competition and Regulatory Commission (ICRC), which uses a 23 month arithmetic average of wholesale futures prices.

130 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

D.3.2 Regulated network costs

In the ACT, transmission network services are provided by Transgrid and distribution network services are provided EvoEnergy.

Regulated network costs comprised approximately 30.3 per cent of the representative standing electricity offer in 2017-18, and is expected to account for an increasing proportion of a residential electricity consumer's bill from 2018-19 to 2020-21.

Regulated network costs:

- increased by 12.5 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 4.9 per cent from 2018-19 to 2020-21. This is based on:
  - an increase of 3.0 per cent in 2019-20
  - an increase of 3.8 per cent in 2020-21.

The increase in network costs are primarily driven by increasing distribution and transmission costs.

D.3.3 Environmental policy costs

The environmental policy costs relevant in the ACT during 2017-18 to 2020-21 are the Commonwealth Government's Renewable Energy Target (RET) and the ACT Government's feed-in-tariffs (FiT) schemes and the Energy Efficiency Improvement Scheme (EEIS).[131]

In 2017-18, environmental schemes comprised 13.9 per cent of the representative standing offer and are expected to comprise an increasing proportion of a representative consumer's electricity bill from 2018-19 to 2020-21.

Environmental policy costs:

- decreased by 7.6 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 23.1 per cent from 2018-19 to 2020-21. This is based on:
  - an increase of 37.7 per cent in 2019-20
  - an increase of 10 per cent in 2020-21.

The increase in environmental costs is primarily driven by increasing ACT FiT scheme costs,[132] and to a lesser extent by the Commonwealth RET schemes.

Renewable Energy Target

The RET applies on a national basis and consists of the LRET and SRES.[133]

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131 The costs associated with the RET and EEIS are borne by retailers and can be recovered by retailers through customer's retail bills. The costs associated with the FiT are recovered through distribution network costs that are passed through to retailers and can be recovered through customer's retail bills.

132 The ACT department informed the AEMC that ACT FiT scheme costs are increasing as the ACT is approaching its 100% renewable energy target.

133 The costs associated with the RET are passed through to retailers who may recover them from customers. For more information refer to Chapter 4.

The drivers of direct costs associated with the LRET and SRES are detailed in the EY report.[134] Additional effects of the LRET on the wholesale electricity market are discussed in the *2018 Residential Electricity Price Trends Methodology report*.

Feed-in-tariff schemes

A number of FiT schemes have been introduced in the ACT to encourage the installation of renewable energy systems. These schemes, which are now closed to new entrants, include the following:

- **Micro (Household) FiT scheme** - was designed to subsidise renewable generation for small-scale solar generators of 30 kW or less. From 1 March 2009 to 30 June 2010, registered systems of up to 10 kW received a 50.05 c/kWh rate, while systems between 10 kW and 30 kW received a 40.04 c/ kWh FiT rate. From 1 July 2010 to 31 May 2011, the FiT was 45.7 c/kWh for all systems up to 30 kW. There is no longer a regulated FiT available for new residential consumers, although consumers receiving the FiT will continue to do so for 20 years after their system was connected to the distribution network.
- **Medium FiT scheme** - was designed for generators between 30 kW and 200 kW. The scheme opened for applications on 7 March 2011 and originally offered a 34.27 c/kWh rate. In July 2011, the scheme was modified so that it would be open to generators that would have qualified for the micro FiT scheme. After re-opening, the rate was reduced to 30.1 c/kWh for all systems up to 200kW; the scheme closed on 14 July 2011, however payments remain from 2017-18 to 2020-21.
- **Large-scale solar FiT scheme** - involves reverse auctions for the right to receive a large-scale FiT for generators that have installed capacity of greater than 200 kW. The successful proposals receive a payment from the distribution network business equal to the difference between wholesale spot price income from the NEM and the auction FiT price. When the wholesale spot price income exceeds the auction FiT price, the generators pay the difference back to the distribution network business.

Energy Efficiency Improvement Scheme

The EEIS requires retailers in the ACT to meet energy savings targets by undertaking energy savings measures in ACT households or small to medium businesses. Retailers pass a portion of their compliance costs to ACT electricity consumers. The Independent Competition and Regulatory Commission determines the allowable costs that retailers can pass through to consumers. The scheme commenced on 1 January 2013 and is legislated to run until 2020.[135]

134 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

135 ACT Government, Environment, Planning and Sustainable Development Directorate - Environment, Canberra, *Energy Efficiency Improvement Scheme*, viewed 18 July 2018, https://www.environment.act.gov.au/energy/smarter-use-of-energy/energy_efficiency_improvement_scheme_eeis

E VICTORIA

E.1 The representative consumer in Victoria

This report uses the most common type of residential electricity consumer (the representative consumer) to analyse residential electricity prices, annual bills and the cost components of a bill. In Victoria the representative consumer:

- is a two-person household that consumes 3,865 kWh of electricity per year
- has no off peak hot water
- has a mains gas connection, and therefore is a dual fuel customer[136]
- is on a market offer.

As at March 2018, 94 per cent of Victorian small customers are on a market offer.[137] A detailed explanation of the pricing methodology is set out in the *2018 Residential Electricity Price Trends Methodology Report*.

E.2 Trends in residential electricity prices and bills

In all jurisdictions except Victoria, the residential electricity bills are based on actual bills for 2017-18 and 2018-19 and estimated bills for 2019-20 and 2020-21. For Victoria, the residential electricity bills are based on actual bills for 2018, and estimated bills for 2019, 2020, and 2021.

A different approach is applied in Victoria as retailers typically release new market offer prices in January each year to coincide with annual updates to network charges for the Victorian network providers, which occur on a calendar year basis in January each year. This is six months different from the timing of new retail prices in all other jurisdictions, which typically occur on a financial year basis in July each year.

In 2018, the residential electricity market offer[138] annual bill in Victoria was approximately $1,132 exclusive of GST. This is made up of a:

- 43.9 per cent wholesale market cost component
- 40.1 per cent regulated network cost component
- 7.2 per cent environmental policy cost component
- 8.8 per cent residual component.

In 2018, a representative consumer on a standing offer[139] had an annual bill of $1,597 exclusive of GST.

Residential electricity market offer prices for the representative consumer in Victoria are expected to:

136 This analysis does not account for the cost of gas for the representative consumers and therefore should not be taken as their annual total energy costs.

137 Small customers includes both residential and small business customers.

138 This is the weighted average of retailer's lowest electricity market offers for the representative consumer in Victoria.

139 This is the weighted average of retailer's lowest standing offers for the representative consumer in Victoria

- decrease 3.2 per cent from 2018 to 2019
- are expected to decrease by an annual average of 1.2 per cent from 2019 to 2021. This is based on a:
  - decrease of 3.3 per cent in 2020
  - increase of 1.0 per cent in 2021.

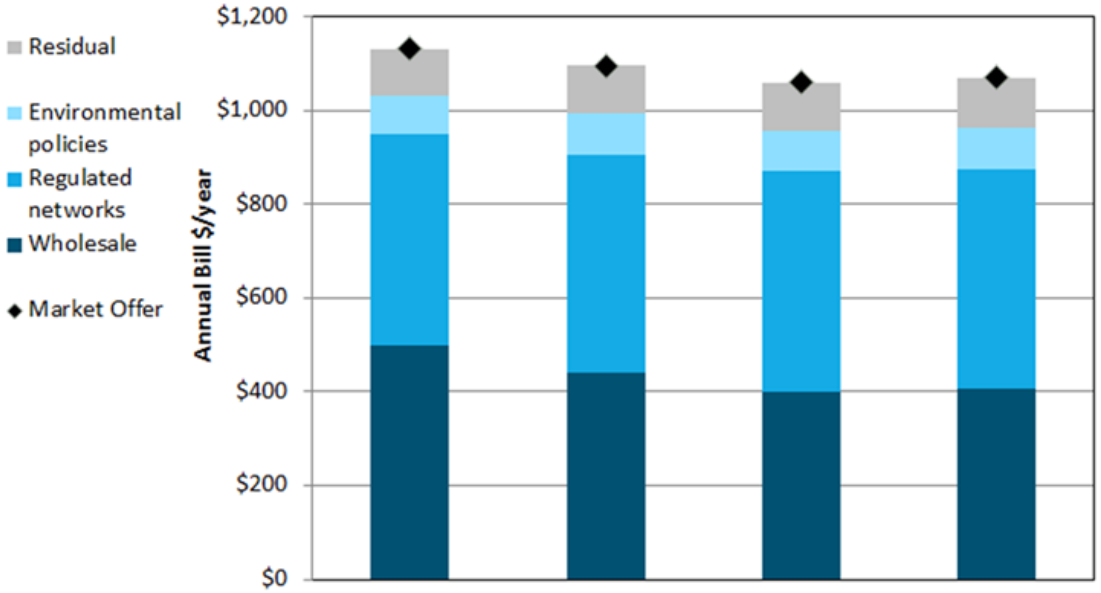
The expected decrease in residential electricity market offer prices from 2018-19 to 2020-21 is largely attributable to a decrease in the wholesale cost component.

E.3 Trends in electricity supply chain components

Figure E.1 shows the expected movements in the supply chain cost components for Victoria.[140] Electricity supply chain components include wholesale market costs, regulated networks costs, environmental policy costs and the residual component.

140 In Victoria, the residual component in 2017/18 and 2018/19 is based on the actual market offer minus wholesale, network and environmental costs. In 2019/20 and 2020/21, the residual component is escalated by 2.5 per cent per annum from the 2017/18 residual component.

Figure E.1: Trends in Victorian supply chain components

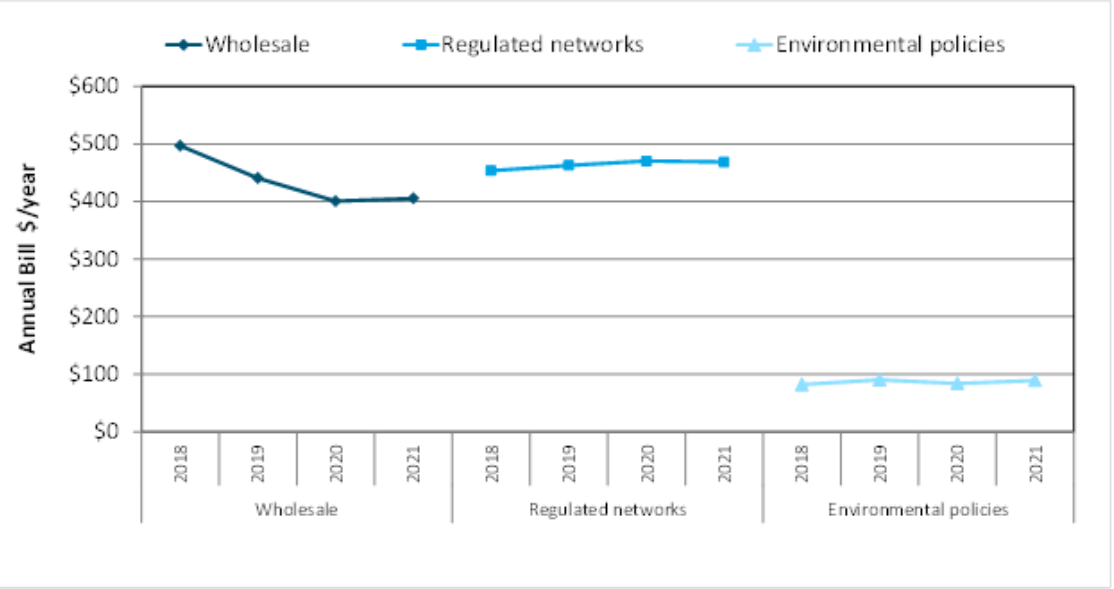


	2018 Base Year		2019 Current Year		2020		2021	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**2.12**	**$82**	**2.33**	**$90**	**2.17**	**$84**	**2.31**	**$89**
LRET - LGC cost	0.95	$37	0.97	$37	0.71	$28	0.69	$27
SRES - STC cost	0.63	$25	0.75	$29	0.73	$28	0.82	$32
Feed-in Tariff Schemes	0.34	$13	0.38	$15	0.41	$16	0.43	$17
VEU	0.19	$7	0.23	$9	0.32	$12	0.37	$14
Regulated networks	**11.74**	**$454**	**11.98**	**$463**	**12.18**	**$471**	**12.13**	**$469**
Transmission	1.45	$56	1.41	$54	1.42	$55	1.43	$55
Distribution	8.62	$333	8.86	$342	9.15	$354	9.09	$351
ACS Metering	1.67	$65	1.71	$66	1.61	$62	1.61	$62
Wholesale	**12.86**	**$497**	**11.41**	**$441**	**10.37**	**$401**	**10.49**	**$406**
Residual	**2.57**	**$99**	**2.64**	**$102**	**2.70**	**$104**	**2.77**	**$107**
Market Offer	**29.29**	**$1,132**	**28.35**	**$1,096**	**27.42**	**$1,060**	**27.70**	**$1,071**

Note: These electricity prices and bills are based on a weighted average of retailer's lowest market offers for the representative consumer in Victoria.

Figure E.2 below shows the expected trends in supply chain components in Victoria from 2017-18 to 2020-21.

Figure E.2: Trends in Victorian supply chain components



The expected trends of Victorian electricity supply chain components (wholesale, regulated networks and environmental policies) are further explored in the sections below.

E.3.1 Wholesale electricity costs

Wholesale electricity costs for the reporting period were provided to the AEMC by our consultants EY. For more details refer to their report.[141]

Wholesale electricity costs comprised approximately 43.9 per cent of the representative electricity market offer in 2018, and are expected to account for a decreasing proportion of a residential electricity consumer's bill from 2019 to 2021.

Wholesale electricity costs:

- decreased 11.3 per cent from 2018 to 2019
- are expected to decrease by an annual average of 4.1 per cent from 2019 to 2021. This is based on a:
  - decrease of 9.1 per cent in 2020
  - increase of 1.2 per cent in 2021.

Refer to Chapter 6 (Wholesale market trends and drivers) for more information regarding the drivers of these trends.

141 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

E.3.2 Regulated network costs

In Victoria, transmission network services are provided by AusNet Services, and distribution network services are provided AusNet Services, Jemena, United Energy, CitiPower, Powercor.

Regulated network costs comprised approximately 40.1 per cent of the representative electricity market offer in 2018, and are expected to account for an increasing proportion of a residential electricity consumer's bill from 2019 to 2021.

Regulated network costs:

- increased 2.0 per cent from 2018 to 2019
- are expected to increase by an annual average of 0.6 per cent from 2019 to 2021. This is based on a:
  - increase of 1.7 per cent in 2020
  - decrease of 0.4 per cent in 2021.

The increase in regulated network costs is driven by increasing distribution costs.

E.3.3 Environmental policy costs

The environmental policy costs that are relevant in Victoria during the reporting period are the Commonwealth Government's Renewable Energy Target (RET) and the Victorian Government's feed-in-tariff (FiT) schemes and Victorian Energy Upgrades (VEU) scheme.[142]

In 2018, environmental schemes represented 7.2 per cent of the representative market offer and are expected to account for an increasing proportion of a representative consumer's electricity bill from 2019 to 2021.

Environmental policy costs:

- increased 10.1 per cent from 2018 to 2019
- are expected to decrease by an annual average of 0.5 per cent from 2019 to 2021. This is based on a:
  - decrease of 6.8 per cent in 2020
  - increase of 6.2 per cent in 2021.

The increase in environmental policy costs is primarily driven by increasing costs associated with the SRES and Victorian Energy Upgrades (VEU).

Renewable Energy Target

The RET applies on a national basis and consists of the LRET and SRES.[143]

142 The costs associated with the RET are borne by retailers who may recover them through customer's retail bills. The costs associated with the FiT are recovered through distribution network charges or at the discretion of the retailer and the VEU is recovered through retail prices.

143 The costs associated with the RET are passed through to retailers who may recover them from customers. For more information refer to Chapter 4.

The drivers of direct costs associated with the LRET and SRES are detailed in the EY report.[144] Additional effects of the LRET on the wholesale electricity market are discussed in the *2018 Residential Electricity Price Trends Methodology Report.*

Feed-in-tariffs

A number of FiT schemes have been introduced in Victoria in recent years. The Transitional FiT (TFiT) and Standard FiT (SFiT) are now closed to new entrants and payments to customers under these schemes ended in December 2016.[145]

The FiT schemes for which payments still remain are:

- **Premium FiT (PFIT)** - this scheme is closed to new entrants. Consumers who took part in the PFIT remain eligible to claim the 60 c/kWh tariff, with payments continuing until 2024.[146]
- **Minimum FiT-** the current (retailer funded) minimum feed-in-tariff commenced on 1 January 2013. Since 1 July 2018, retailers could offer a single rate FiT or time varying minimum FiT to eligible Victorian residential customers. The minimum single rate tariff is 9.9 c/kWh.[147] Under the time varying minimum tariff rate, customers would be credited between 7.1 cents and 29.0 c/kWh for electricity exported to the grid, depending on the time of day.[148]

A key difference between the PFiT[149] scheme and the minimum FiT scheme is the way in which the costs of the schemes are recovered:

- The costs of the PFiT are recovered from residential consumers through distribution network prices. These costs are included in the environmental policy cost component in this report.
- The minimum FiT[150] are costs faced by the retailer and individual retailers will determine whether and/or how the costs of these schemes are to be recovered from consumers. This means that these costs are effectively part of the residual component.

Victorian Energy Upgrades (VEU)

VEU is a Victorian Government program that is designed to help reduce greenhouse gas emissions and electricity bills by giving households and businesses access to discounted energy-efficient products and services.[151]

144 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

145 Therefore, there are no direct costs associated with the TFIT and SFIT in the 2017/18 to 2020/21 reporting period.

146 Victorian Government, Premium feed-in tariff, viewed 17 September 2018, https://www.energy.vic.gov.au/renewable-energy/victorian-feed-in-tariff/premium-feed-in-tariff

147 The minimum FiT was 5 c/kWh in 2016/17 and 11.3 c/kWh in 2017/18.

148 Victorian Essential Services Comisssion, *Minimum feed-in tariff*, 2018, https://www.esc.vic.gov.au/electricity-and-gas/electricity-and-gas-tariffs-and-benchmarks/minimum-feed-tariff, accessed: 18 July 2018

149 The now closed TFIT scheme applied a similar approach with regards to its cost recovery methods.

150 The now closed SFIT scheme applied a similar approach with regards to its cost recovery methods.

151 Victorian Government, *Victorian Energy Upgrades - About the program*, viewed 18 July 2018. https://www.energy.vic.gov.au/energy-efficiency/victorian-energy-upgrades/about-the-program

E.4 Developments that could affect residential electricity prices in Victoria

This section identifies future developments that have been announced and which could affect the future trend in residential retail prices in Victoria.

E.4.1 Independent review of Victoria's electricity and gas network safety framework

On 19 January 2017, the Minister for Energy, Environment and Climate Change announced an independent review of Victoria's electricity network safety framework. The review had regard to the relationship between the safety regime and the economic regulatory regime with the aim of balancing safety objectives and economic impacts, including the cost impact on consumers.[152]

The final report was released on 1 August 2018 and included 43 recommendations.[153] The Victorian Government supports in full 21 recommendations and has taken steps to progress them. This includes strengthening Energy Save Victoria's capability to take strong regulatory action and ensuring that the framework is able to manage new sources of network safety risk.[154]

E.4.2 Review of electricity and gas retail markets in Victoria

In November 2016, the Victorian Government announced an independent bi-partisan review of Victoria's electricity and gas retail markets, to examine the operation of these markets and provide options to improve outcomes for consumers.[155] In August 2017, the final report made 11 recommendations to the Minister for Energy, Environment and Climate Change.[156]

The final response of the Victorian Government was released in October 2018 and outlined its response to all recommendations. It supported all 11 main recommendations including recommendation 1 to introduce a default offer to be called the "Victorian default offer" and the abolition of standing offer contracts. The Victorian Government also supported recommendation 4 to make contracts clearer and fairer for customers.[157]

As part of its response to this review, the Victorian Government requested the Essential Services Commission to review its codes for the purpose of giving effect to selected recommendations from the review. On 30 October 2018, the Essential Services Commission made a final decision which created new entitlements, including a requirement that retailers

152 Ibid.

153 Victorian Government, *Review of Victoria's Electricity and Gas Networks Safety Framework*, 1 August 2018, website viewed 18 September 2018. https://engage.vic.gov.au/electricity-network-safety-review

154 Ibid.

155 Department of Environment, Land, Water and Planning, Policy and strategy, Melbourne, 2017, viewed 17 July 2018, https://www.energy.vic.gov.au/about-energy/policy-and-strategy.

156 ibid.

157 The State Government of Victoria Department of Environment, Land, Water and Planning, Victorian Government Final Response to the independent review of the electricity and gas retail markets in Victoria, October 2018.

regularly display their 'best offer' on customer's bills and provide prior notice of any price changes that could affect customer's bill.[158]

E.4.3 Victorian Renewable Energy Target

The aim of the VRET is for Victoria to generate 25 per cent of its electricity from renewable generation in 2020 and 40 per cent in 2025.

The Victorian Government established the 2017 Victorian renewable energy auction to support achievement of the VRET. Under this process, the request for proposal process opened in November 2017 and six successful renewable generation projects were announced in September 2018. The successful projects were three wind farms in Mortlake South (157.5 MW), Dundonnell (336 MW) and Berrybank (180 MW), and three solar PV farms at Carwarp (121.6 MW), Cohuna (34.2 MW) and Winton (98.8 MW).[159] These six projects amount to a total new renewable generation capacity of 928 MW.[160]

The first generation under the VRET is expected to commence operation in September 2020.[161] Any costs associated with the 2017 VRET auction are funded by the Victorian Government.

158 Essential Services Commission, *Building trust through new customer entitlements in the retail energy market*, Final decision, 30 October 2018, p1 and p3.

159 For more information see: https://www.energy.vic.gov.au/renewable-energy/victorian-renewable-energy-auction-scheme.

160 669MW is contracted under the VRET auction through guaranteed output prices via 15 year contracts. Due to this commitment projects have agreed to build an additional 259 MW. This brings the total VRET auction capacity to 928 MW. Victorian Government, VRET Auction Benefits, September 2018. https://www.energy.vic.gov.au/__data/assets/pdf_file/0028/391159/VRET-Auction-fact-sheet.pdf

161 Victorian Department of Environment, Land, Water and Planning, *2017 VRET Reverse Auction – Industry Information Session*, 28 November 2017. https://www.energy.vic.gov.au/__data/assets/word_doc/0024/90924/VRET-Information-Session-Q-and-A-28-November-2017.docx

Website viewed 16 July 2018.

F SOUTH AUSTRALIA

F.1 The representative consumer in South Australia

This report uses the most common type of residential electricity consumer (the representative consumer) to analyse residential electricity prices, annual bills and the cost components of a bill. In South Australia the representative consumer:

- consumes 5,000 kWh of electricity per year
- has no "controlled load" tariff
- is on a market offer.

As at March 2018, 89 per cent of South Australian small customers are on a market offer and therefore the representative consumer is on a market offer.[162] A detailed explanation of the pricing methodology is set out in the *2018 Residential Electricity Price Trends Methodology Report.*

F.2 Trends in residential electricity prices and bills

In 2017-18, the representative residential electricity market offer bill[163] in South Australia was approximately $1,889 exclusive of GST. This is made up of a:

- 44.9 per cent wholesale market cost component
- 38.0 per cent regulated network cost component
- 6.6 per cent environmental policy cost component
- 10.5 per cent residual component.

In 2017-18, the representative consumer on the residential electricity standing offer[164] had an annual bill of $2,194 exclusive of GST.

Residential electricity market offer bills for the representative consumer in South Australia:

- decreased by 1.9 per cent from 2017-18 to 2018-19
- are expected to decrease by an annual average of 3.3 per cent from 2018-19 to 2020-21. This is based on:
  - a decrease of 4.1 per cent in 2019-20
  - a decrease of 2.5 per cent in 2020-21.

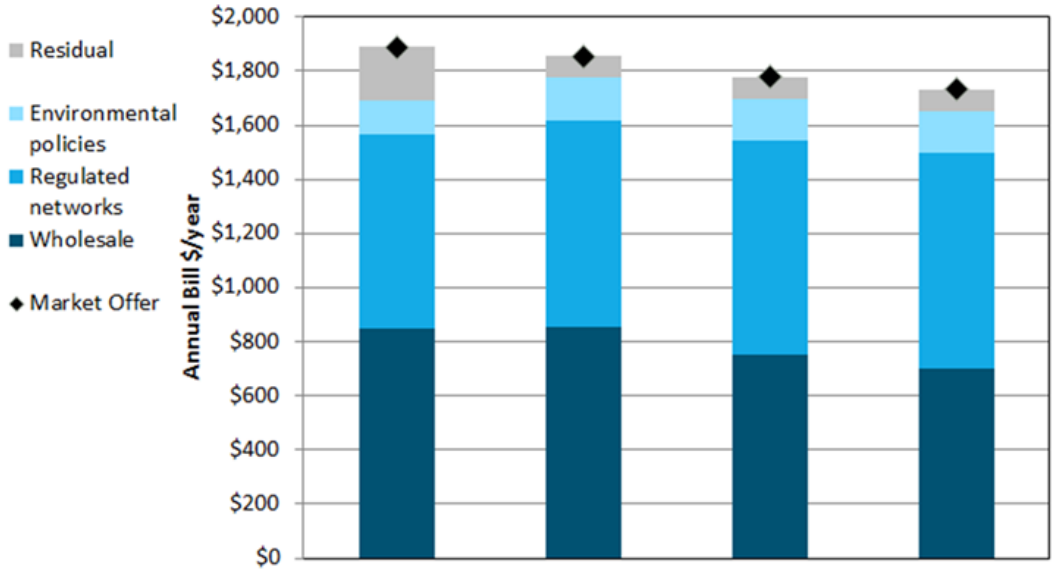
The expected decreases in residential market offer electricity prices from 2018-19 and 2020-21 are largely attributable to decreases in the wholesale cost component.

162 Small customers includes both residential and small business customers.
163 This is the weighted average of retailer's lowest electricity market offers for the representative consumer in South Australia.
164 This is the weighted average of retailer's electricity lowest standing offers for the representative consumer in South Australia.

F.3 Trends in electricity supply chain components

Figure F.1 shows the expected movements in the supply chain cost components for South Australia. Electricity supply chain components include wholesale market costs, regulated networks costs, environmental policy costs and the residual component.

Figure F.1: Trends in South Australian supply chain components*

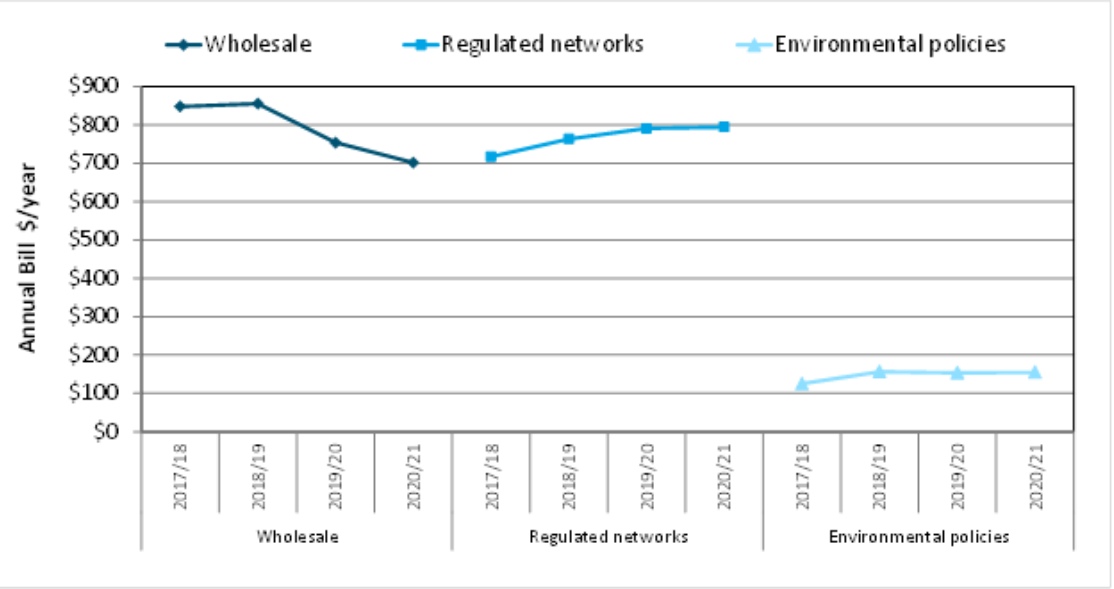


	2017/18 Base Year		2018/19 Current Year		2019/20		2020/21	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**2.50**	**$125**	**3.13**	**$156**	**3.07**	**$153**	**3.10**	**$155**
LRET - LGC cost	0.84	$42	0.93	$46	0.79	$40	0.81	$40
SRES - STC cost	0.35	$17	0.66	$33	0.74	$37	0.75	$37
Feed-in Tariff Schemes	1.06	$53	1.29	$64	1.29	$64	1.29	$64
REES	0.25	$13	0.25	$13	0.25	$13	0.25	$13
Regulated networks	**14.34**	**$717**	**15.27**	**$763**	**15.82**	**$791**	**15.89**	**$795**
Transmission	2.89	$145	3.02	$151	3.11	$155	3.18	$159
Distribution	10.88	$544	11.62	$581	12.10	$605	12.10	$605
ACS Metering	0.57	$29	0.62	$31	0.61	$30	0.61	$30
Wholesale	**16.96**	**$848**	**17.11**	**$855**	**15.07**	**$754**	**14.03**	**$701**
Residual	**3.98**	**$199**	**1.57**	**$79**	**1.61**	**$81**	**1.65**	**$83**
Market Offer	**37.78**	**$1,889**	**37.07**	**$1,854**	**35.57**	**$1,779**	**34.67**	**$1,734**

Note: The electricity prices and bills are based on a weighted average of retailer's lowest market offers for the representative consumer in South Australia.

Figure F.2 below shows the expected trends in supply chain cost components in South Australia from 2017-18 to 2020-21.

Figure F.2: Trends in South Australia supply chain components



The expected trends of South Australian electricity supply chain components (wholesale, regulated networks and environmental policies) are further explored in the sections below.

F.3.1 Wholesale electricity costs

Wholesale electricity costs for 2017-18 to 2020-21 were provided to the AEMC by our consultants EY. For more details refer to their report.[165]

Wholesale electricity costs comprised approximately 45 per cent of the representative electricity market offer in 2017-18, and is expected to account for a decreasing proportion of a residential electricity consumer's bill from 2018-19 to 2020-21.

Wholesale electricity costs:

- increased by 0.9 per cent from 2017-18 to 2018-19
- are expected to decrease by an annual average of 9.4 per cent from 2018-19 to 2020-21. This is based on:
  - a decrease of 11.9 per cent in 2019-20
  - a decrease of 6.9 per cent in 2020-21.

Refer to Chapter 6 (Wholesale market trends and drivers) for information regarding the drivers of this trend.

165 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

F.3.2 Regulated network costs

In South Australia, transmission network services are provided by ElectraNet and distribution network services are provided by SA Power Network.

Regulated network costs comprised approximately 38 per cent of the representative electricity market offer in 2017-18, and are expected to account for an increasing proportion of a residential electricity consumer's bill from 2018-19 to 2020-21.

Regulated network costs:

- increased by 6.4 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 2.0 per cent from 2018-19 to 2020-21. This is based on:
  - an increase of 3.6 per cent in 2019-20
  - an increase of 0.5 per cent in 2020-21.

The increase in network costs is driven by increases in both transmission and distribution network costs.

F.3.3 Environmental policy costs

The environmental policy costs that are relevant for South Australia during 2017-18 to 2020-21 are the Commonwealth Government's Renewable Energy Target (RET) and the South Australian Government's solar feed-in-tariff (FiT) schemes and the Retailer Energy Efficiency Scheme (REES).[166]

In 2017-18, environmental schemes represented 6.6 per cent of the representative market offer and are expected to account for an increasing proportion of a representative consumer's electricity bill from 2018-19 to 2020-21.

Environmental policy costs:

- increased by 25 per cent from 2017-18 to 2018-19
- are expected to decrease by an annual average of 0.5 per cent from 2018-19 to 2020-21. This is based on:
  - a decrease of 1.9 per cent in 2019-20
  - a increase of 1.0 per cent in 2020-21.

The 25 per cent increase in environmental costs from 2017-18 to 2018-19 is driven by increasing costs associated with the Commonwealth Government's SRES and South Australian FiT schemes.

Renewable Energy Target

The RET applies on a national basis and consists of the LRET and SRES.[167]

166 The costs associated with the RET and REES are recovered through increases in retail prices and are estimated by Ernst & Young. The FiT schemes comprise of two tariffs; one is recovered through distribution network charges, and the other is recovered through retail prices.

167 The costs associated with the RET are passed through to retailers who may recover them from customers. For more information refer to Chapter 5.

The drivers of direct costs associated with the LRET and SRES are detailed in the EY report.[168] Additional effects of the LRET on the wholesale electricity market are discussed in the *2018 Residential Electricity Price Trends Methodology report.*

Feed-in-tariff schemes

Costs associated with South Australian FiT schemes are as follows:

- **Solar feed-in scheme -** this scheme is now closed to new entrants. However, consumers who took part are still eligible to claim the FiT, which is recovered through distribution network charges. The applicable tariff from 2017-18 to 2020-21 is 44 c/kWh tariff for electricity exported to the grid, with payments continuing until 30 June 2028.[169]
- **Retailer FiT (R-FiT) -** this scheme was applied until 31 December 2016 and set a minimum amount that was paid to customers for supplying renewable energy into the distribution network. From 1 January 2017, the Essential Services Commission of South Australia (ESCoSA) stopped setting a minimum price for the R-FiT. Instead, each retailer now determines the R-FiT amount and mechanisms for recovery of costs. As a result, the costs of the R-FiT across the 2017-18 to 2020-21 period for this report are effectively part of the residual component.[170]

Retailer Energy Efficiency Scheme

The REES is a South Australian Government energy efficiency scheme that provides incentives for South Australian households and businesses to save energy. The REES require large energy retailers to assist households and businesses by offering energy audits and undertaking energy efficiency activities. The scheme set a target for the number of energy saving activities each retailer must carry out.[171]

REES costs are expected to remain unchanged from 2017-18 to 2020-21.

F.4 Developments that could affect residential electricity prices in South Australia

This section identifies future developments that have been announced and which could affect the future trend in residential retail prices in South Australia.

F.4.1 Review of the Retail Energy Efficiency Scheme code

On 11 May 2017, ESCoSA commenced a review of the REES Code to:

- improve the administration of REES
- ensure it aligns with the SA Government's updated annual targets and activity minimum specifications.

168 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

169 SA Power Networks, Pricing Proposal 2018/19, April 2018. https://www.aer.gov.au/system/files/SA%20Power%20Networks%20Pricing%20Proposal%202018%20v2.2F.pdf

170 ESCoSA, *Solar feed-in-tariff scheme*, accessed 18 July 2018, http://www.escosa.sa.gov.au/consumers/energy/solar-feed-in-tariff-scheme

171 ESCoSA, *ESCoSA - REES overview, ESCoSA*, viewed 18 July 2018, http://www.escosa.sa.gov.au/industry/rees/overview.

The amended code is expected to apply from 1 January 2019.

As REES is recovered through retail prices, changes to retailer obligations under the REES could potentially impact residential electricity prices.

G TASMANIA

G.1 The representative consumer in Tasmania

This report uses the most common type of residential electricity consumer (the representative consumer) to analyse residential electricity prices, annual bills and the cost components of a bill. In Tasmania the representative consumer:

- is a two-person household that consumes 7,908 kWh of electricity per year, of which 4,349 kWh is attributed to tariff 41 (heating and hot water).[172]
- has no mains gas connection
- has electric water heating
- is on a regulated standing offer.

As at March 2018, most residential customers in Tasmania are on a standing offer and therefore the representative consumer is on a standing offer. A detailed explanation of the pricing methodology is set out in the *2018 Key concepts and calculation methodology report*.

G.2 Trends in residential electricity prices and bills

Residential electricity prices in Tasmania are set by the determinations of the Tasmanian Economic Regulator (TER).[173] The Tasmanian Government capped standing offer electricity price changes to no more than an increase of the Hobart Consumer Price Index (CPI), each year from 2017-18 to 2020-21.[174]

In 2017-18, a representative consumer on the regulated standing offer using 7,908 kWh each year had an annual bill of $1,868 exclusive of GST. This is made up of a:

- 37.8 per cent wholesale market cost component
- 45.7 per cent regulated network cost component
- 6.1 per cent environmental policy cost component
- 10.4 per cent residual component.

Residential electricity standing offer bills for the representative consumer in Tasmania:

- increased by 2.05 per cent from 2017-18 to 2018-19[175]
- are expected to decrease by an annual average of 1.0 per cent from 2018-19 to 2020-21. This is based on an:
  - decrease of 3.6 per cent in 2019-20
  - increase of 1.6 per cent in 2020-21.

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172 Aurora Energy, *Standard electricity rates and charges,* Aurora Energy, Hobart, viewed 17 July 2018, https://www.auroraenergy.com.au/your-home/electricity/rates-and-charges/standard-electricity-rates-and-charges.

173 For more information see: https://www.economicregulator.tas.gov.au/electricity/pricing/retail/electricity-pricing-explained#HowareTasmanianelectricitypricesdetermined?.

174 In 2018/19 the retail electricity price increased by 2.05 per cent. For more information see: http://www.premier.tas.gov.au/releases/electricity_price_cap. Or the price cap legislation for 2018/19 to 2020/21 here: http://www.premier.tas.gov.au/releases/electricity_price_cap

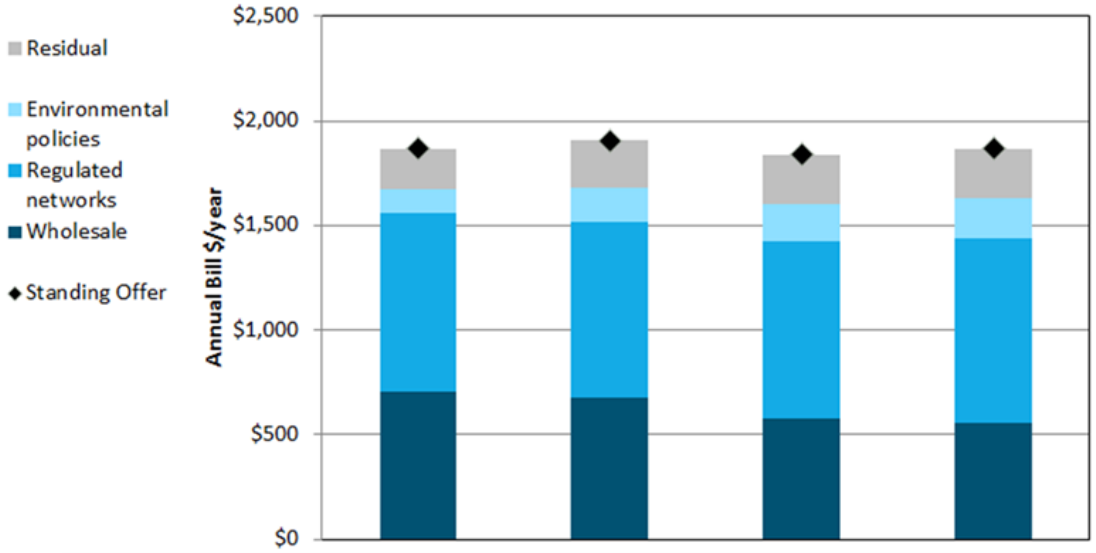
175 Aurora Energy, *Pricing proposal for period 3 of the 2016 Standing offer price determination, 1 July 2018 - 30 June 2019*, 31 May 2018, p2.

The expected decrease in residential standing offer electricity prices from 2018-19 to 2020-21 is largely attributable to a decrease in the wholesale cost component.

G.3 Trends in electricity supply chain components

Figure G.1 shows the expected movements in the supply chain components for Tasmania. Electricity supply chain components include wholesale market costs, regulated networks costs, environmental policy costs and the residual component.

Figure G.1: Trends in Tasmanian supply chain components

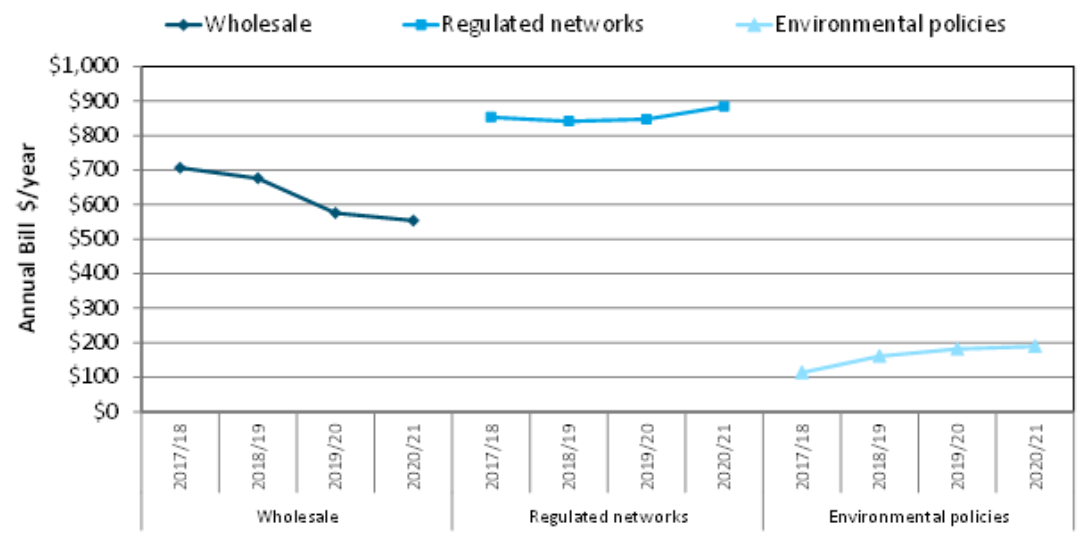


	2017/18 Base Year		2018/19 Current Year		2019/20		2020/21	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**1.44**	**$114**	**2.03**	**$161**	**2.29**	**$181**	**2.39**	**$189**
LRET - LGC cost	0.91	$72	1.06	$84	1.20	$95	1.29	$102
SRES - STC cost	0.52	$41	0.97	$77	1.09	$86	1.11	$88
Regulated networks	**10.79**	**$853**	**10.64**	**$841**	**10.71**	**$847**	**11.19**	**$885**
Transmission	2.76	$218	2.41	$190	2.21	$174	2.29	$181
Distribution	7.47	$591	7.66	$606	7.95	$629	8.33	$659
ACS Metering	0.56	$44	0.57	$45	0.56	$44	0.57	$45
Wholesale	**8.94**	**$707**	**8.55**	**$676**	**7.28**	**$576**	**7.00**	**$554**
Residual	**2.46**	**$195**	**2.88**	**$228**	**2.96**	**$234**	**3.03**	**$240**
Standing Offer	**23.62**	**$1,868**	**24.11**	**$1,906**	**23.24**	**$1,838**	**23.61**	**$1,867**

Note: The residual component is derived for 2017-18 and 2018-19 by subtracting wholesale, environmental and network costs from the standing offer price. The residual component is assumed to increase at an inflation rate of 2.5 per cent for future years in the reporting period. The residual component is derived specifically for the representative consumer using the methodology in this report and is not equivalent to the regulated retail margin set by the TER in Tasmania.

Figure G.2 below shows the expected trends in supply chain cost components in Tasmania from 2017-18 to 2020-21.

Figure G.2: Trends in Tasmanian supply chain components



The expected trends of Tasmanian electricity supply chain components (wholesale, regulated networks and environmental policies) are further explored in the sections below. The different method for estimating wholesale costs in Tasmania is outlined below.

G.3.1 Wholesale market costs

In Tasmania, wholesale market costs comprised approximately 37.8 per cent of the representative standing offer in 2017-18, and are expected to comprise a decreasing proportion of a residential electricity consumer's bill from 2018-19 to 2020-21.

For 2017-18 and 2018-19, wholesale market costs are based on the Wholesale Electricity Price Order[176] which set the wholesale price at:

- $83.79/MWh for 2017-18[177]
- $79.68/MWh for 2018-19.[178]

For 2019-20 and 2020-21, wholesale costs are estimated based on EY's modelling of Tasmanian wholesale electricity prices for this report. Refer to EY's report for more detail.[179]

176 A review of the Tasmanian wholesale electricity market regulatory pricing framework was announced in the 2017-18 State Budget. Tasmanian Department of Treasury and Finance. https://www.treasury.tas.gov.au/government-businesses/strategic-reviews/review-of-the-tasmanian-wholesale-electricity-market-regulatory-pricing-framework

177 Electricity Supply Industry Act 1995, *Wholesale Electricity Price Order,* 2017 http://www.economicregulator.tas.gov.au/Documents/WEP-Order-for-2017-18-Standing-Offer-prices.PDF.

178 For more information see: https://www.economicregulator.tas.gov.au/Documents/18%201149%20%2020180514%20Special%20Gazette.pdf.

179 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

Refer to Chapter 6 (Wholesale electricity market costs and drivers) for more information on the trend in wholesale market costs in Tasmania from 2017-18 to 2020-21.

G.3.2 Regulated network costs

In Tasmania, transmission and distribution network services are provided by TasNetworks.

Regulated network costs comprised approximately 45.7 per cent of the representative regulated electricity offer in 2017-18, and are expected to account for an increasing proportion of a residential electricity consumer's bill from 2018-19 to 2020-21.

Regulated network costs :

- decreased by 1.4 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 2.5 per cent from 2018-19 to 2020-21. This is based on an:
  - increase of 0.7 per cent in 2019-20
  - increase of 4.4 per cent in 2020-21.

This increase in network costs is primarily driven by increasing distribution costs.

G.3.3 Environmental policy costs

The environmental policy cost that is relevant in Tasmania during the reporting period is the Commonwealth Government's Renewable Energy Target (RET)[180].

In 2017-18, the RET represented 6.1 per cent of the representative standing offer and are expected to account for an increasing proportion of a representative consumer's electricity bill from 2018-19 to 2020-21.

Environmental policy costs:

- increased by 41.6 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 8.5 per cent from 2018-19 to 2020-21. This is based on an:
  - increase of 12.9 per cent in 2019-20
  - increase of 4.3 per cent in 2020-21.

The main drivers of these trends is the significant increase in the cost of the Commonwealth government's SRES policy.

Aurora Energy offers a number of feed-in-tariffs for small-scale renewable energy generators. However, the costs of these schemes have not been estimated as they do not directly affect residential prices.

Renewable Energy Target

The RET applies on a national basis and consists of the LRET and SRES.[181]

180 The costs associated with the RET are passed through to retailers who may recover them from customers.

181 For more information refer to Chapter 4.

The drivers of direct costs associated with the LRET and SRES are detailed in the EY report. Additional effects of the LRET on the wholesale electricity market are discussed in the *2018 Residential Electricity Price Trends Methodology report*.

H WESTERN AUSTRALIA

H.1 The representative consumer in Western Australia

This report uses the most common type of residential electricity consumer (the representative consumer) to analyse residential electricity prices, annual bills and the cost components of a bill. In Western Australia the representative consumer:

- a four-person household that consumes 5,198 kWh of electricity per year
- has no mains gas connection
- on the electricity price set by the Western Australian Government.[182]

A detailed explanation of the pricing methodology is set out in the *2018 Residential Electricity Price Trends Methodology report.*

H.2 Trends in residential electricity prices and bills

In 2017-18, the residential electricity cost of supply in the South-West Interconnected System (SWIS) for the representative consumer was approximately $1,573 exclusive of GST. This is made up of a:

- 39.8 per cent wholesale market cost component
- 48.9 per cent regulated network cost component
- 3.2 per cent environmental policy cost component
- 8.1 per cent retail component.

In 2017-18, the representative consumer on the electricity price set by the Western Australian Government had an annual bill of $1,566 exclusive of GST.

Residential electricity prices for the representative consumer in the SWIS:

- increased by 7.0 per cent from 2017-18 to 2018-19.
- are expected to increase by an annual average of 4.5 per cent from 2018-19 to 2020-21. This is based on:
  - an increase of 5.6 per cent in 2019-20
  - an increase of 3.5 per cent in 2020-21.

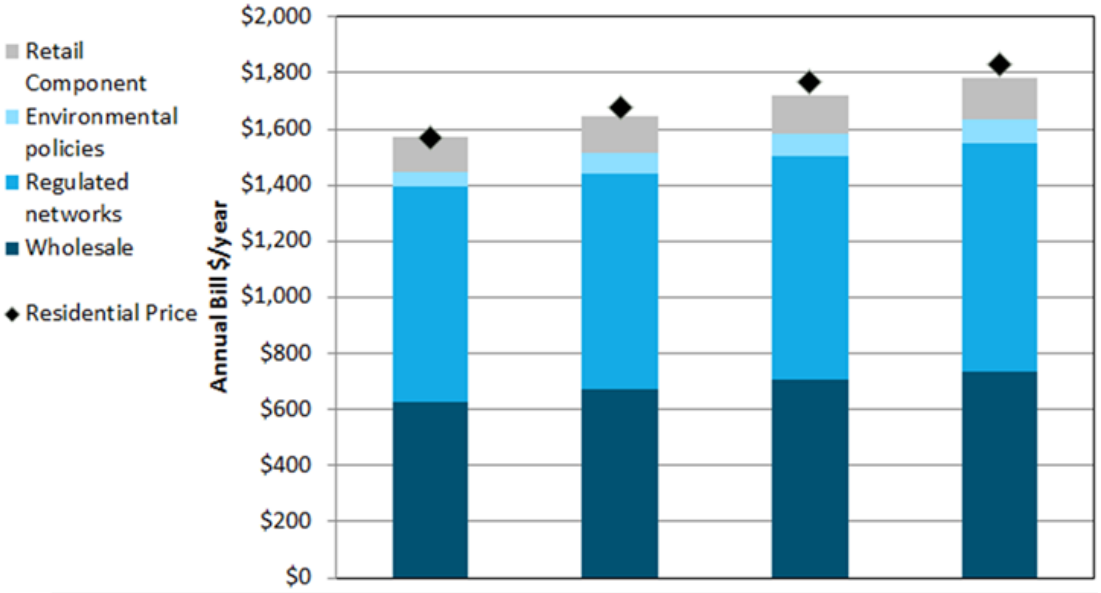
The expected increases in residential electricity prices in 2019-20 and 2020-21 are attributable to the annual increase set by the Western Australia Government. Residential electricity prices are set by the Western Australian Government and may not reflect the underlying cost of supplying electricity.

H.3 Trends in electricity supply chain components

Figure H.1 shows the expected movements in the supply chain cost components for Western Australia. For Western Australia, the residual component is referred to as the retail component.

182 Government of Western Australia, *2017-18 Budget: Budget Paper No. 3*, Government of Western Australia, Perth, 2017.

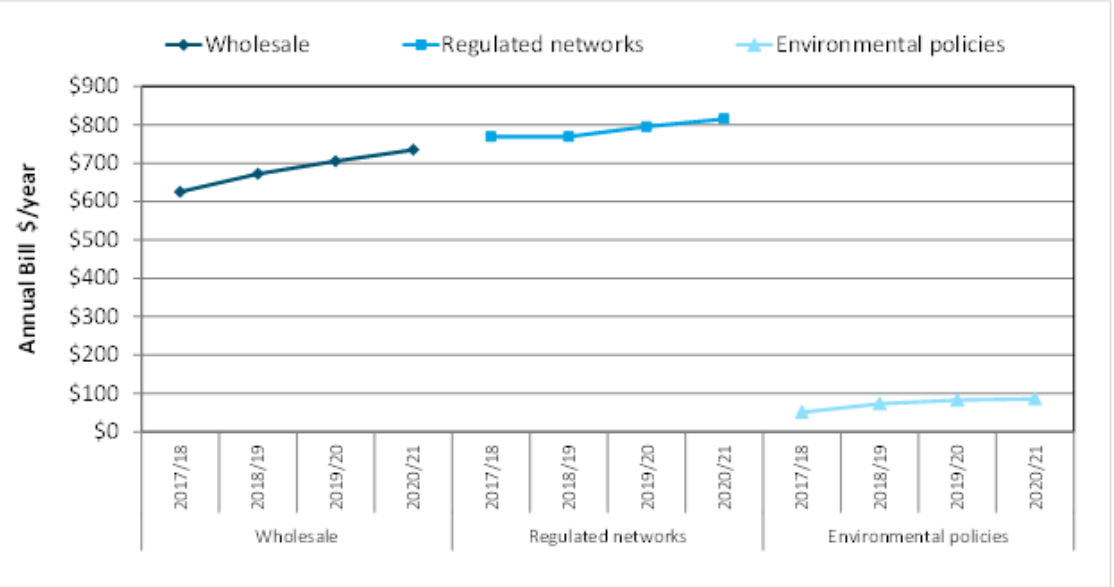
Figure H.1: Trends in Western Australian supply chain components



	2017/18 Base Year		2018/19 Current Year		2019/20		2020/21	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**0.98**	**$51**	**1.40**	**$73**	**1.58**	**$82**	**1.65**	**$86**
LRET - LGC cost	0.65	$34	0.77	$40	0.87	$45	0.93	$48
SRES - STC cost	0.33	$17	0.64	$33	0.71	$37	0.72	$38
Regulated networks	**14.80**	**$769**	**14.80**	**$769**	**15.30**	**$795**	**15.69**	**$816**
Transmission	1.50	$78	1.50	$78	1.55	$80	1.59	$82
Distribution	12.24	$636	12.24	$636	12.65	$657	12.97	$674
Metering	1.07	$56	1.07	$56	1.11	$57	1.13	$59
Wholesale	**12.03**	**$626**	**12.94**	**$672**	**13.57**	**$705**	**14.14**	**$735**
Retail Component	**2.45**	**$128**	**2.56**	**$133**	**2.66**	**$139**	**2.77**	**$144**
Cost of Supply	**30.27**	**$1,573**	**31.70**	**$1,648**	**33.12**	**$1,721**	**34.25**	**$1,781**
Residential Price	**30.13**	**$1,566**	**32.23**	**$1,676**	**34.04**	**$1,769**	**35.23**	**$1,831**

Figure H.2 below shows the expected trends in supply chain components in Western Australia from 2017-18 to 2020-21.

Figure H.2: Trends in Western Australian supply chain components



The expected trends of Western Australian electricity supply chain components (wholesale, regulated networks and environmental policies) are further explored in the sections below. Note that there are differences between the way the residential electricity price is set by the Western Australian Government and the methodology used in this report to estimate the supply chain cost components.

H.3.1 Wholesale market costs

In Western Australia, wholesale market costs comprised approximately 39.8 per cent of the cost of supply in 2017-18, and are expected to comprise an increasing proportion of the cost of supply from 2018-19 until the end of 2020-21.

Wholesale electricity costs:

- increased by 7.5 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 4.6 per cent from 2018-19 to 2020-21. This is based on:
  - an increase of 4.9 per cent in 2019-20
  - an increase of 4.2 per cent in 2020-21.

In this report, wholesale costs in Western Australia were estimated using a Long Run Marginal Cost (LRMC) approach. The drivers of the expected trend in wholesale electricity costs in Western Australia from 2017-18 to 2020-21 are detailed in Chapter 6 (Wholesale market trends and drivers) of this report.

While the method of estimating wholesale costs is similar across most NEM jurisdictions, the approach used in Western Australia is different. The method for estimating wholesale costs is in the *2018 Residential Electricity Price Trends Methodology Report* and EY's report.[183]

BOX 7: THE WHOLESALE ELECTRICITY MARKET (WA)

The Wholesale Electricity Market (WEM) (WA) operates in the South Western Interconnected System (SWIS). The WEM has two components, an energy market (for the buying and selling of electricity) and a capacity mechanism.

Most energy in the WEM is traded outside the market via bilateral contracts between market participants. These bilateral contract positions can be modified through trading on the daily Short Term Energy Market and a Balancing Market.

Activity in the capacity market is driven by the Reserve Capacity Mechanism (RCM). The RCM involves the acquisition of an amount of capacity credits by AEMO annually (from generators, net any bilateral trades), two years in advance. Retailers must acquire a set amount of capacity credits each year either from generators or through AEMO to ensure the market has enough generation to meet peak demand.

Retailers must purchase their allocated share of the capacity credits through bilateral contacts from generators or from AEMO.

The key governance bodies and energy providers in the WEM are:

- the Australian Energy Market Operator (AEMO), which operates the wholesale market and maintains the Market Rules
- Western Power, the network owner and operator
- Government-owned (Synergy) and privately owned retailers and generators. Synergy is the only retailer for customers using less than 50,000 kWh of electricity per year in the SWIS.
- Synergy, which retails and generates electricity
- the Economic Regulation Authority which is responsible for economic regulation of Western Power's transmission and distribution network and market monitoring.

The transmission and distribution networks, and the retailer are owned by the Western Australia Government.

H.3.2 Regulated network costs

In Western Australia, transmission and distribution network services are provided by Western Power.

183 EY, Residential Electricity Price Trends - Wholesale Market Cost Modelling 2018, November 2018.

Regulated network costs comprised approximately 48.9 per cent of the representative residential electricity bill in 2017-18, and are expected to account for a increasing proportion of the representative residential electricity bill from 2018-19 to 2020-21.

Regulated network costs:

- remain stable from 2017-18 to 2018-19
- are expected to increase by an annual average of 3.0 per cent from 2018-19 to 2020-21. This is based on:
  - an increase of 3.4 per cent in 2019-20
  - an increase of 2.6 per cent in 2020-21.

H.3.3 Environmental policy costs

The environmental policy cost that is relevant in Western Australia during 2017-18 to 2020-21 is the Commonwealth Government's Renewable Energy Target (RET).[184]

In 2017-18, the RET comprised 3.2 per cent of the representative residential electricity bill and are expected to comprise an increasing proportion of the representative residential electricity bill from 2018-19 to 2020-21.

Environmental policy costs:

- increased by 42.9 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 8.6 per cent from 2018-19 to 2020-21. This is based on:
  - an increase of 12.9 per cent in 2019-20
  - an increase of 4.4 per cent in 2020-21.

H.3.4 Retail costs

In Western Australia, retail costs comprised approximately 8.1 per cent of the cost of supply in 2017-18, and are expected to account for a relatively flat proportion of the cost of supply from 2017-18 to 2020-21.[185]

The retail component is provided by the Western Australian Public Utilities Office for new entrants' efficient retailer operating costs and retail margin. The approach for estimating the retail cost in Western Australia is different to how the residual component is derived for other jurisdictions.[186]

184 The costs associated with the RET are passed through to retailers who may recover them from customers.

185 The slight increase is due to increasing retail operating costs across the reporting period from 2017/18 to 2020/21

186 In other jurisdictions, the 'residual component' is derived by subtracting the wholesale, environmental policy and network cost components from the representative standing offer price or market offer price in each jurisdiction. There are two reasons for a different methodology for WA. As prices are set by the government rather than an independent regulator, it is unclear what assumptions have been made in regard to the retail component. Also, because the government-set price is different than the cost of supply, calculation of the retail component via the residual method used in other jurisdictions would not provide any indication of the retail costs and would underestimate or overestimate the total cost of supply.

H.4 Developments that could affect residential electricity prices in Western Australia

This section identifies future developments that have been announced and which could affect the future trend of residential retail prices in Western Australia.

The Public Utilities Office is currently developing a work program to progress multiple electricity sector reform initiatives. The proposed reforms include:[187]

- Improving access to Western Power's electricity network — implementing a constrained network access model for Western Power's electricity network in the SWIS. This project is currently in the consultation phase after releasing Consultation Papers in February 2018 and October 2018.
- Improved network regulation — a broad review of Western Power's network regulatory framework to ensure that it continues to support the effective delivery of network services at the lowest possible cost. This project is still in the planning phase.
- Improving the power system security and reliability framework - broad review of the power system security and reliability framework for the SWIS. The purpose of the review is to ensure that the security and reliability of the power system can accommodate changes in the generation mix, increases in distributed energy resources and changes in consumer preferences. This project forms part of both the Electricity Network Reform work program — Western Power Network and the Wholesale Electricity Market reform program, and is currently in the planning phase.

187 Government of Western Australia, Department of Treasury, *Electricity network reform work program - Western Power network,* Perth, viewed 17 July 2018, http://www.treasury.wa.gov.au/Public-Utilities-Office/Industry-reform/Electricity-network-reform-work-program-Western-Power-network/

I NORTHERN TERRITORY

I.1 The representative consumer in the Northern Territory

This report uses the most common type of residential electricity consumer (the representative consumer) to analyse residential electricity prices, annual bills and the cost components of a bill. In the Northern Territory the representative consumer:

- is a two-person household that consumes 6,613 kWh of electricity per year
- has no mains gas connection
- has air conditioning
- is on the electricity price set by the Northern Territory Government.

The analysis in this report relates to the Darwin-Katherine power system. A detailed explanation of the pricing methodology is set out in the *2018 Residential Electricity Price Trends Methodology Report.*

I.2 Trends in residential electricity prices and bills

Residential electricity prices in the Northern Territory are set by the Northern Territory Government, which subsidises electricity prices so that the prices paid by consumers are less than the cost of supply.

In 2017-18, the representative consumer had an annual bill of $1,711 exclusive of GST. This is made up of (excluding residual-retail component):

- 56.8 per cent wholesale electricity cost component
- 49.7 per cent regulated network cost component
- 3.6 per cent environmental policy cost component.[188]

Residential electricity prices for the representative consumer in the Northern Territory:

- increased by 1.1 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 1.3 per cent from 2018-19 to 2020-21. This is based on an:
  - increase of 1.0 per cent in 2019-20
  - increase of 1.7 per cent in 2020-21.

The expected increases in residential electricity prices in 2019-20 and 2020-21 are attributable to the annual increase projected by the Northern Territory Government.[189]

I.3 Trends in electricity supply chain components

Figure I.1 shows the expected movements in the supply chain cost components for the Northern Territory. The AEMC is able to estimate wholesale electricity costs, regulated

188 It is noted that the sum of the supply chain cost components in the Northern Territory add up to more than 100 per cent due to the negative cost differential (that is, the residential electricity price is being subsidised].

189 The outer years of the residential price for the Northern Territory have been increased by the Darwin consumer price index (CPI) as set out in the Northern Territory 2018 budget.

network costs and environmental policy costs in the Northern Territory. The full cost of supply cannot be determined for the Northern Territory as the AEMC does not have visibility of the retail cost of residential electricity bills. However, as the residential tariff is set by the government, the trend in residential electricity prices can be determined.

Figure I.1: Trends in Northern Territory supply chain components

	2017/18 Base Year		2018/19 Current Year		2019/20		2020/21	
	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year	c/kwh	$/year
Environmental policies	**0.93**	**$61**	**1.33**	**$88**	**1.50**	**$99**	**1.56**	**$103**
LRET - LGC cost	0.59	$39	0.69	$46	0.79	$52	0.84	$55
SRES - STC cost	0.33	$22	0.64	$42	0.71	$47	0.72	$48
Regulated networks	**12.87**	**$851**	**13.40**	**$886**	**13.40**	**$886**	**13.40**	**$886**
Wholesale	**14.69**	**$971**	**14.84**	**$981**	**14.99**	**$991**	**15.24**	**$1,008**
Residential Price	**25.88**	**$1,711**	**26.16**	**$1,730**	**26.42**	**$1,747**	**26.87**	**$1,777**
Cost Differential*	**-2.61**	**-$173**	**-3.41**	**-$225**	**-3.47**	**-$229**	**-3.33**	**-$220**

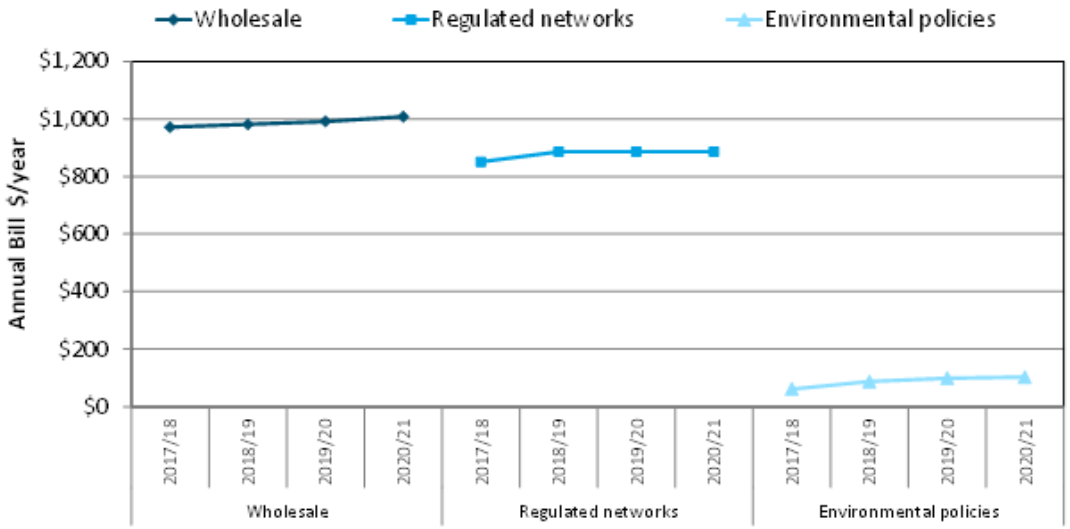
Note: *The cost differential refers to the difference between the residential price set by the Northern Territory government and the cost of supply (which includes the cost of environmental policies, regulated networks and wholesale electricity).

The cost stack shown in the table underestimates total costs. The aggregate of the supply chain costs excludes the retail component. These costs are higher than the residential price. There is an unknown retail cost component to these bills which is not shown in Figure I.1. This retail cost component includes a range of different costs, including retailer operating costs, consumer acquisition and retention, and return on investment for investing capital in the business.

Residential tariffs are set by the Northern Territory Government. The Northern Territory Government moved to updating prices on a financial year basis from 2017-18. It is assumed that residential tariffs for 2018-19, 2019-20 and 2020-21 will increase at Darwin CPI as set out in the Northern Territory budget for 2018.

Figure I.2 shows the expected trends in supply chain cost components in the Northern Territory from 2017-18 to 2020-21.

Figure I.2: Trends in Northern Territory supply chain components



The expected trends of the Northern Territory electricity supply chain components (wholesale, regulated networks and environmental policies) are further explored in the sections below.

I.3.1 Wholesale electricity costs

Wholesale electricity costs for 2017-18 to 2020-21 were provided to the AEMC by the Northern Territory Government.

Wholesale electricity costs comprised approximately 56.8 per cent of the representative residential electricity bill in 2017-18, and are expected to account for a stable proportion of the representative residential electricity bill from 2018-19 to 2020-21.

Wholesale electricity costs:

- increased by 1.0 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 1.3 per cent from 2018-19 to 2020-21. This is based on an:
  - increase of 1.0 per cent in 2019-20
  - increase of 1.7 per cent in 2020-21.

Refer to Chapter 6 (Wholesale market trends and drivers) for more information regarding the drivers of this trend.

I.3.2 Regulated networks costs

In the Northern Territory, transmission and distribution network services are provided by the government-owned Power and Water Corporation. There is also no distinction between transmission and distribution prices when network prices are recovered from consumers, which is different from other jurisdictions.

Regulated network costs comprised approximately 49.8 per cent of the representative residential electricity bill in 2017-18, and are expected to account for an increasing proportion of the representative residential electricity bill from 2018-19 to 2020-21.

Regulated network costs:

- increased by 4.1 per cent from 2017-18 to 2018-19
- are not expected to change from 2018-19 to 2020-21.

I.3.3 Environmental policy costs

The environmental policy cost that is relevant in the Northern Territory during 2017-18 to 2020-21 is the Commonwealth Government's Renewable Energy Target (RET).[190]

In 2017-18, RET costs comprised four per cent of the representative residential electricity bill and are expected to comprise an increasing proportion of the representative residential electricity bill from 2018-19 to 2020-21.

Environmental policy costs:

- increased by 42.9 per cent from 2017-18 to 2018-19
- are expected to increase by an annual average of 8.5 per cent from 2018-19 to 2020-21. This is based on an:
  - increase of 12.9 per cent in 2019-20
  - increase of 4.3 per cent in 2020-21.

The increase in environmental policy costs is driven by increasing costs associated with the SRES. For more information, refer to Chapter 5 (Environmental policy cost trends and drivers) of this report.

I.4 Developments that could affect residential electricity prices in the Northern Territory

This section identifies future developments that have been announced and which could affect the future trend in residential retail prices in the Northern Territory.

Network regulation

On 1 July 2015, the Northern Territory Government transferred network access and price regulation from the Northern Territory Utilities Commission to the AER.[191] The AER will initially

190 The costs associated with the RET are passed through to retailers who may recover them from customers.

191 Utilities Commission, Transfer of network price regulation to the AER, media release, Darwin, 1 July 2015, viewed 17 July 2018, http://www.utilicom.nt.gov.au/Newsroom/Lists/Posts/Post.aspx?ID=200.

regulate according to the Northern Territory regulatory framework for the duration of the 2014–19 network determination. The National Electricity Law and the National Electricity Rules have been adopted and will apply for the subsequent regulatory period commencing 1 July 2019.

Wholesale energy sector

The Northern Territory government recently announced:[192]

- a 50 per cent renewable energy target by 2030 for electricity consumption
- that it planned to implement the Northern Territory Electricity Market (NTEM) in the Darwin-Katherine power system, progressing from interim arrangements.

Retail competition

The Northern Territory Government undertook a review of options for retail price regulation for electricity consumers and the following measures have been implemented:[193]

- Retail price regulation has ceased for consumers in Darwin-Katherine, Alice Springs and Tennant Creek markets, using between 750 MWh and 2 GWh per annum. These consumers are now able to contract with any electricity retailer.
- For consumers up to 750 MWh per year, the uniform tariff subsidy was made contestable and now available to all licensed electricity retailers. This commenced on 1 January 2016.

The introduction of some competition for electricity retailers should provide consumers with more choice of offers. The extent to which this development will affect prices will become clearer over time.

192 Northern Territory Government, *Roadmap to Renewables - Implementation*, website viewed 7 November 2018. https://roadmaptorenewables.nt.gov.au/

193 Department of Treasury and Finance, Strategy for Northern Territory Utilities, Department of Treasury and Finance, Darwin, 2016, p. 8.