Australian Energy Market Commission

REVIEW

FINAL REPORT

2015 Residential Electricity Price Trends

4 December 2015 (*Updated 23 February 2017)

*This report was updated on 23 February 2017, correcting errors that affected the New South Wales, Victoria, South East Queensland, ACT and national summary results in the 2015 Residential Electricity Price Trends report, published on 4 December 2015. The superseded report containing these errors is available on our website at: http://www.aemc.gov.au/Markets-Reviews-Advice/2015-Residential-Electricity-Price-Trends

This report includes updated electricity prices and bills for New South Wales, Victoria, South East Queensland, ACT and the national summary for the 2014/15 to 2017/18 period. This report has not been updated to reflect any developments in regulatory outcomes, legal processes or energy market conditions that have occurred since the report was originally published on 4 December 2015. If you have any further queries regarding this updated report, please contact Kris Funston on (02) 8296 7811 or Owen Pascoe on (02) 8296 7856.

For the AEMC's more recent report covering 2015/16 to 2018/19 see the 2016 Residential Electricity Price Trends report at: http://www.aemc.gov.au/Markets-Reviews-Advice/2016-Residential-Electricity-Price-Trends

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About the AEMC

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

Box 1 Note on this year's report

The 2015 Residential Electricity Price Trends report provides information on the electricity supply chain cost components expected to affect the trends in residential electricity prices for each state and territory of Australia over the next three years.

The purpose of the report is to provide an understanding of:

- the cost components of the electricity supply chain that contribute to the overall price paid by residential consumers; and
- the expected trends in each of these components.

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 or provided to us by state and territory government officials.

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 information on prices and trends in the report has been based on information from the jurisdictions and the Australian Energy Regulator up to 19 November 2015, and modelling undertaken for the Australian Energy Market Commission.

It is important to recognise that our results are limited by the data used and the underlying assumptions made in determining average prices and trends. Information on prices in future years may differ from actual outcomes as they are sensitive to uncertainties and changes in the factors that drive prices across the electricity supply chain. These include changes in:

- energy consumption by consumers across the states and territories;
- government policies, such as those relating to jurisdictional environmental schemes;
- network costs following the finalisation of new revenue determinations (including any determinations re-made for the outcomes of merit reviews) for individual network businesses; and
- retail price deregulation, as jurisdictions may review their existing approaches for setting regulated prices.

Executive summary

This is the sixth annual residential electricity price trends report prepared by the Australian Energy Market Commission (AEMC) at the request of the Council of Australian Governments' (COAG) Energy Council.

The report provides information on the electricity supply chain cost components expected to affect the trends in residential electricity prices for each state and territory of Australia from 2014/15 to 2017/18. These components are network costs, competitive market costs and environmental and other policy costs. Different factors drive movements in each of these components. Since residential electricity prices are a function of movements in all three components, this report examines each in turn to identify the overall price trends.

Over the next three years, residential electricity prices are expected to be slightly increasing for most jurisdictions and slightly decreasing for some jurisdictions. However in the first year a number of jurisdictions are likely to see price decreases. This trend is being driven by the opposing influences of decreasing network costs and increasing wholesale electricity costs.

Network costs are currently expected to fall in response to revenue determinations by the Australian Energy Regulator (AER) which implement new economic regulation rules. These determinations can be subject to merits reviews by the Australian Competition Tribunal, which can result in the network costs used in this report changing from what was in the AER determination. To the extent merits reviews occur, the pricing outcomes identified in this report may therefore change.

Merits reviews are currently underway in respect of AER revenue determinations in New South Wales and the Australian Capital Territory (ACT). Applications for merits review have been lodged in respect of the AER revenue determination for the South Australian distribution network business. No applications have been lodged in respect of the Queensland network distribution businesses' determinations. Network costs represent around half of a typical residential bill and in many jurisdictions are currently expected to fall by around 5 per cent over the next three years.

Wholesale electricity costs are expected to rise from historically low levels. This expected increase is mainly as a result of increasing consumption as forecast by the Australian Energy Market Operator (AEMO), but also as a result of generator retirements, both of which tighten the supply-demand balance in the short-term. This has the effect of putting upward pressure on wholesale electricity costs in the NEM. Rising wholesale gas prices also drive increases in the cost of electricity supplied by gas-fired generators. Competitive market costs (including wholesale electricity costs) represent around 35 to 60 per cent of a typical residential bill and are expected to rise by 2.5 to 9.5 per cent in most jurisdictions over the next three years.

We note that the trends in the underlying supply chain cost components and drivers of those trends will vary across jurisdictions and over time. This reflects differences in population, climate, consumption patterns, government policy and other factors across the states and territories. The way these trends affect an individual consumer will

depend on how that consumer uses electricity. This is particularly relevant as the consumption profiles of consumers become increasingly diverse.

Key trends in electricity prices and cost components

Price trends identified in this report are not a forecast of actual prices, but rather a guide as to what may influence prices based on current expectations, assumptions and government legislation. Actual price movements will be influenced by how retailers compete in the retail market and changes in government legislation.

For this reporting period, we have identified three primary drivers of residential electricity price trends. These are falling regulated network costs, rising wholesale electricity costs and rising wholesale gas costs. Each of these key price drivers is discussed below.

Falling network costs in NEM jurisdictions

Regulated network costs refer to the costs of the transmission and distribution networks. The regulated services largely relate to the provision of electricity networks, connecting electricity generators to end users. Network costs comprise approximately 50 per cent of a residential electricity bill and are expected to decrease in National Electricity Market (NEM) jurisdictions over the reporting period.

In November 2012, the AEMC made changes to the National Electricity Rules (NER) related to the economic regulation of network businesses. These new arrangements improve the way economic regulation is applied to network businesses through three broad changes:

- allowing greater use of incentives by the AER to encourage network businesses to invest capital efficiently;
- improving the AER's ability to determine the regulated rate of return; and
- clarifying the AER's ability to use efficiency benchmarks when determining revenue allowances.

Final network revenue determinations have been made for transmission and distribution network businesses in New South Wales and ACT and the Tasmanian transmission business. Final determinations were also made for distribution businesses in Queensland and South Australia, as well as draft determinations for distribution businesses in Victoria. These determinations set the maximum revenues these businesses can recover from consumers but do not directly control expenditure by these businesses. Most of these decisions have resulted in a lower maximum allowed revenue compared with the previous regulatory period. Reduced revenue leads to expected reductions in network costs, which in turn leads to lower prices for customers. Network costs based on the new rules will take effect no later than 2017 in all NEM jurisdictions.

The limited merits review regime was introduced into the National Electricity Law on 1 January 2008, with the Australian Competition Tribunal (the Tribunal) the nominated body to conduct the reviews. In 2013 changes to key parts of this regime were introduced. The limited merits review regime allows parties affected by the regulatory determinations of the AER recourse to have those decisions reviewed by the Tribunal.

The Tribunal has the power to affirm the AER's determination, vary the AER's determination or set aside the AER determination and request the AER to remake it in a certain way.

In response to the AER's final revenue decisions in 2015, the New South Wales and ACT distribution businesses and the Public Interest Advocacy Centre have made applications to the Tribunal for merits review of the AER's recent distribution determinations. Hearings were held in September 2015.

SA Power Networks and the South Australian Council of Social Services have lodged merits review applications in respect of the AER final determination for SA Power Networks. No applications have been lodged regarding the AER determinations in respect of the Queensland distribution businesses.

Merits reviews of other current and future AER determinations are possible. The trend in regulated network costs for the reporting period will depend on the outcomes of merits reviews.

In summary, the actual trend in regulated network costs over the reporting period depends on when the new rules start to apply for specific network businesses and the results of merit reviews underway for some distribution businesses. Based on the recent AER decisions, it is expected that in most NEM jurisdictions overall network costs will fall over the reporting period.

Increasing wholesale electricity costs

Competitive market costs refer to the costs of the wholesale and retail components of a consumer's bill. They represent around 35 to 60 per cent of a typical residential bill and are expected to rise across the reporting period. This is mainly in response to expected increases in electricity consumption to 2017/18, however the Large-scale Renewable Energy Target, generator retirements and wholesale electricity market price volatility also influence wholesale electricity costs. Each of these drivers is discussed below.

Effect of projections of increasing electricity consumption

AEMO produces the National Electricity Forecast Report (NEFR) each year. This report provides electricity consumption and maximum demand forecasts for the NEM and the five NEM regions over a twenty year outlook period. The NEFR consumption and maximum demand forecasts are a major input into the wholesale electricity market modelling underpinning this report. This is because greater consumption and demand necessarily translates to greater modelled generation output requirements, which in turn affects costs in the wholesale electricity market.

Electricity consumption trends set out in the 2015 NEFR vary between the states and territories but are generally expected to increase across the reporting period (2014/15 to 2017/18). AEMO attributes increasing consumption to:

- population increases,
- consumer responses to expected income growth,
- consumer responses to recent decreases in electricity retail prices, and

- development of the liquefied natural gas (LNG) industry in Queensland (significant amounts of electricity will be required to compress and then transport natural gas to the LNG processing and export facilities).

Effect of the Large-scale Renewable Energy Target

The LRET mandates that retailers source a proportion of their electricity from renewable sources to meet a target for large-scale generation of 33,000 GWh in 2020.

Where the LRET leads to a greater supply of generation than would otherwise be the case it puts downward pressure on wholesale costs in the short term, particularly when demand is flat or falling. The LRET has impacts on both wholesale costs and retail prices:

- **Wholesale costs:** The LRET can encourage a greater supply of generation than would otherwise be the case. This effect is more pronounced where demand growth is flat or falling. By encouraging greater supply, and in the absence of generator retirements, the LRET would put downward pressure on wholesale costs. The LRET also results in a greater proportion of the generation mix coming from renewable sources, which at present is typically wind generation. Wind generation has lower operating costs compared with thermal generation. Due to these lower operating costs, wind generation displaces higher cost thermal plant in the merit order of generators and effectively shifts the supply curve to the right. For a given level of demand this should place downward pressure on wholesale costs.
- **Retail prices:** The costs of the LRET are recovered through retail prices. The LRET therefore places upwards pressure on retail prices. A separation (or wedge) between retail prices and wholesale costs can be created. This is because the increasing costs of the policy are recovered through retail prices, and these retail prices may not reflect underlying movements in the retailer's wholesale electricity costs.

Effect of generator retirement

There are many reasons why a generator may be retired, including when the plant is at or near the end of its life, the expectation that the generator's revenue from the wholesale market will no longer cover its operating costs, or changes in policy or expectation of policy changes.

In recent years the NEM has had an oversupply of generation capacity and low wholesale electricity prices. If low wholesale prices mean some generators are not recovering their operating costs, this may encourage them to exit the market. Retirements reduce the amount of generating capacity available to meet demand, and therefore almost always increase wholesale electricity prices.

Examples of recent retirements include the announcement that Northern Power Station in South Australia would not operate beyond March 2016 and the temporary retirement of Swanbank E in Queensland.

Price volatility in the NEM

As discussed above, a high proportion of renewable generation installed recently is wind generation. As an intermittent form of generation, the output from wind

generators is less constant than for thermal generators. Therefore as wind generation capacity increases as a proportion of the overall generation mix, a greater proportion of the overall electricity supply from generators will be intermittent.

Increasing intermittency of generation output leads to more volatile wholesale electricity spot prices. This effect has been observed in South Australia recently.

Increased volatility in spot prices increases the overall level of risk that retailers must manage. One means by which retailers manage the risk of volatile electricity spot prices is by purchasing hedge contracts. Where there is greater volatility in the spot market, the cost of these contracts can be expected to be higher. These increased contract costs are then passed on by retailers to consumers through higher retail prices.

Summary

There is a complex interaction of influences on wholesale electricity costs. Increasing consumption puts upward pressure on costs but the LRET encourages investment in renewable generation and can act to suppress wholesale costs when renewable generators are operating. However lower wholesale costs over time may lead to generator retirements which then places upward pressure on wholesale electricity costs. Intermittent forms of generation can also contribute to higher spot market volatility, as well as the risks and costs to retailers. These impacts are summarised in the table below.

Theoretical effect of the LRET and generator retirements on wholesale electricity markets

	Effect on wholesale electricity costs	Effect on retail electricity prices	Effect on wholesale spot price volatility
Introduce more renewable generation	decrease	increase	increase
Thermal generator retirements	increase	increase	increase

Rising wholesale gas costs leading to higher wholesale electricity costs

Wholesale electricity costs are impacted by movements in underlying fuel costs. Higher fuel costs will result in higher input costs for generators and therefore higher costs in the wholesale electricity market.

The ramp-up of the LNG facilities in Queensland is expected to result in higher wholesale gas prices across all east coast jurisdictions over the reporting period. This is mainly due to the gas supply-demand balance tightening and the domestic gas market becoming exposed to international LNG prices.

Increasing wholesale gas prices create rising costs for gas-fired generators and therefore contribute to rising wholesale electricity costs. Increasing gas prices may also contribute to decisions to temporarily or permanently retire gas-fired generators. This would have the effect of reducing supply into the wholesale electricity market, which in turn would also place upward pressure on wholesale electricity costs.

Retail costs

While retail costs can be the subject of debate, this report does not separately report a retail component of residential electricity prices. This is because of the difficulty in quantifying retail costs, and in particular, the return on investment for retailers. To assess this in a meaningful way would require a detailed assessment of the capital, risks, revenue and costs of energy retailers by jurisdiction. This would be very challenging, especially in the absence of information gathering powers, and would be highly sensitive to assumptions made.

Instead, the retail component is determined through a residual method, which involves subtracting non-retail cost components from the representative market or standing offer price in 2014/15. This means it is less precise, and for this reason is not reported separately.

Summary of jurisdictional results

Prices in this report are based on representative consumption levels that are specific to each jurisdiction. Representative consumption levels in this report were either calculated from benchmark values published by the Australian Energy Regulator or provided to us by state and territory government officials. The consumption level for the representative consumer has a significant impact on the level of prices reported and, to a lesser degree, the expected price movements.

Information on expected trends in *standing offers* and, where possible, *market offers* for the representative consumer is provided in this report. As required by the Terms of Reference, results are expressed as nominal cents per kilowatt hour (c/kWh) values and are exclusive of GST.

A summary of the trends and drivers of residential electricity prices over the reporting period 2014/15 to 2017/18 follows for each state and territory. Where possible, potential savings available to the representative consumer from switching from the *standing offer* to a *market offer* have been identified.

The *market offer* value presented in this report is unlikely to be the cheapest price available to residential consumers. There is a range of different products available in the market and the actual savings for consumers will depend on their own individual circumstances. The way these trends affect an individual consumer will depend on how that consumer uses electricity. This is particularly relevant as the consumption profiles of consumers become increasingly diverse.

Queensland

- Residential *market offer* electricity prices in South East Queensland are expected to decrease by 2.5 per cent in 2015/16, be flat in 2016/17 and increase by 5.0 per cent in 2017/18. This is equivalent to an average annual increase of 0.8 per cent for the representative consumer over the reporting period.
- The analysis of residential electricity prices and cost components applies to a representative consumer in South East Queensland connected to the Energex distribution network. Customers in regional Queensland are eligible for the same *standing offer* price as in South East Queensland under the Queensland Government's uniform tariff policy.
- Increases during the reporting period are mostly due to increasing competitive market costs and Queensland Solar Bonus Scheme costs.
- In 2014/15, a representative consumer on the regulated *standing offer* using 5,173 kWh per year had a total annual bill of $1,510 exclusive of GST. This consumer may have saved around $111, or 7.3 per cent, by switching from the regulated *standing offer* to the representative *market offer*.
- The deregulation of retail electricity prices for residential and small business customers in South East Queensland has been delayed by the Queensland Government by 12 months to July 2016. This will allow the Queensland Productivity Commission time to undertake an inquiry into electricity prices.

New South Wales

- Residential electricity *market offer* prices in New South Wales are expected to decrease by 5.3 per cent in 2015/16, before increasing by 1.4 per cent in 2016/17 and 2.6 per cent in 2017/18. This is equivalent to an average annual decrease of 0.5 per cent for the representative consumer over the reporting period.
- The decrease in 2015/16 is mostly due to lower distribution network prices, which fall across the reporting period following the AER's final decisions for the distribution network businesses for the 2015-18 regulatory period. Increases in 2016/17 and 2017/18 are mainly due to rising competitive market costs outweighing reductions in network costs.
- In 2014/15, a representative consumer on a *standing offer* using 5,936 kWh each year, had a total annual bill of $1,438 exclusive of GST. This consumer may have saved around $127 or 8.8 per cent, by switching from a *standing offer* to the representative *market offer*.
- The New South Wales distribution businesses have made applications to the Australian Competition Tribunal for a review of the AER's recent distribution determinations. The trend in regulated network prices will depend on the outcomes of these merits reviews and the operation of the electricity price guarantee that forms part of the network business transaction legislation.

Australian Capital Territory

- Residential *standing offer* electricity prices in the Australian Capital Territory (ACT) are expected to decrease by 4.7 per cent in 2015/16, before increasing by 1.7 per cent in 2016/17 and 4.5 per cent in 2017/18. This is equivalent to an average annual increase of 0.4 per cent for the representative consumer over the reporting period.
- The decrease in 2015/16 is mostly due to lower distribution network costs and competitive market costs. Falling network costs across the reporting period are based on the AER's final decisions for both the transmission and distribution network businesses in their regulatory periods.
- Expected price rises in the last two years of the reporting period are mainly due to increases in wholesale electricity and environmental policy costs, which outweigh the reductions in regulated network costs.
- In 2014/15, a representative consumer on the regulated *standing offer* using 7,312 kWh each year, had a total annual bill of $1,468 exclusive of GST. This consumer may have saved around $52, or 3.6 per cent, by switching from a regulated *standing offer* to the representative *market offer*.
- ActewAGL has made an application to the Australian Competition Tribunal for a review of the ActewAGL distribution determination made by the AER. The trend in regulated network costs for ActewAGL will depend on the outcomes of this merits review.

Victoria

- Residential *market offer* electricity prices in Victoria are expected to increase by 1.4 per cent in 2015/16, decrease by 3.2 per cent in 2016/17 and then increase by 1.0 per cent in 2017/18. This is equivalent to a 0.3 per cent decrease on an annual average basis for the representative consumer over the reporting period.
- The increase in 2015/16 is due to higher competitive market costs. In 2016/17, further increases in competitive market costs are more than offset by lower regulated network costs. The increase in 2017/18 reflects increases in competitive market costs outweighing a decrease in network costs
- The trend in regulated network costs is subject to the AER's final revenue determinations for the Victorian network businesses due to be released in April 2016.
- In 2014/15, a representative consumer on a *standing offer* using 4,026 kWh each year, had a total annual bill of $1,452 exclusive of GST. This consumer may have saved around $306, or 21 per cent, by switching from a *standing offer* to the representative *market offer*.
- Competitive market costs are expected to increase by an average of 4.9 per cent per year over the reporting period. These increases are due to changes in the supply/demand balance due to rising electricity consumption and from generator retirements.

South Australia

- Residential *market offer* electricity prices in South Australia are expected to decrease by 7.2 per cent in 2015/16, followed by increases in the final two years of the reporting period of 6.8 per cent in 2016/17 and 3.4 per cent in 2017/18. This is equivalent to an average annual increase of 0.8 per cent for the representative consumer over the reporting period.
- Prices decreases in 2015/16 are driven by reductions in distribution network costs and the cost of the South Australian Solar Feed-in Scheme. The expected increases in the final two years of the reporting period are reflective of increased network costs and competitive market costs.
- In 2014/15, a representative consumer on the representative *standing offer* using 5,000 kWh per year had a total annual bill of $1,811 exclusive of GST. This consumer may have saved around $222, or 12 per cent, by switching from the *standing offer* to the representative *market offer*.
- Competitive market costs are expected to increase by an average of 5.9 per cent per year over the reporting period. These increases are due to changes in the supply/demand balance from generator retirements, increases in wind generation and rising electricity consumption.
- Applications have been made to the Australian Competition Tribunal for merits reviews of the AER's recent final revenue determination for the South Australian distribution network business. The trend in regulated network costs will depend on the outcomes of these merits reviews.

Tasmania

- Residential electricity prices in Tasmania are driven by determinations of the Office of the Tasmanian Economic Regulator (OTTER). While OTTER determinations have been made for the period to 30 June 2016, in subsequent years prices in this report are based on projected movements of costs. These prices are therefore subject to future OTTER determinations.
- Residential electricity prices in Tasmania are expected to increase by 2 per cent in 2015/16, 2.7 per cent in 2016/17 and 1.1 per cent in 2017/18, subject to future pricing determinations made by the Office of the Tasmanian Economic Regulator. This is equivalent to an average annual increase of 1.9 per cent for the representative consumer over the reporting period.
- This trend reflects expected increases in competitive market costs and environmental policy costs.
- In 2014/15, a representative consumer on the regulated *standing offer* using 8,550 kWh per year had a total annual bill of $1,821 exclusive of GST.
- The Tasmanian retail electricity market is undergoing a period of change with the introduction of full retail competition from 1 July 2014. No new retailer has entered the electricity market yet and Aurora Energy continues to be the sole supplier of electricity to residential consumers.

Western Australia

- Residential electricity prices in Western Australia are set by the Western Australian Government, which subsidises electricity prices such that the prices paid by consumers are less than the cost of supply.
- Residential electricity prices in Western Australia are expected to increase on average by 6.2 per cent per year over the reporting period. Based on the methodology and the modelling assumptions adopted, in 2014/15 the residential price would have needed to increase by 11 per cent to reflect the total estimated cost of supply. As prices are set by the Western Australian Government, the retail price paid by consumers does not necessarily reflect underlying costs of supplying electricity, nor follow cost trends.
- Estimated residential electricity supply cost increases are mainly driven by increases in distribution network costs and wholesale energy costs during the reporting period.
- In 2014/15, a representative consumer using 5,229 kWh per year paid the government-set price and had an annual bill of $1,319 exclusive of GST.
- The Western Australian Government is currently undertaking a wide-ranging review of the electricity market. The following reforms have been announced: retail price deregulation for households and businesses, and the transfer of regulatory oversight of Western Power from the Economic Regulation Authority to the Australian Energy Regulator. Decisions on additional reforms are expected to occur progressively over 2015/16 and 2016/17.

Northern Territory

- Residential electricity prices in the Northern Territory are set by the Northern Territory Government, which subsidises electricity prices such that the prices paid by consumers are less than the cost of supply.
- Residential electricity prices in the Northern Territory are expected to increase on average by 2.5 per cent per year over the reporting period, based on an assumed rate of inflation. As prices are set by the Northern Territory Government, the retail prices paid by consumers do not necessarily reflect underlying costs, nor follow cost trends.
- The key drivers of supply costs in the Northern Territory are increases in regulated network costs and a decrease in wholesale electricity costs. Increases in regulated network costs are due to higher operational expenditure and regulatory depreciation allowance. The decrease in wholesale electricity costs reflects a revision of Territory Generation's wholesale prices.
- In 2014/15, a representative consumer using 6,790 kWh per year paid the government-set price and had a total annual bill of $1,997 exclusive of GST.

Time of use and solar offers

Two ways in which consumers are becoming more engaged in the electricity market are via the uptake of retail time of use offers and installation of solar photo-voltaic (PV) systems. Time of use offers provide consumers with the opportunity to save on their electricity bills by consuming electricity during cheaper 'off-peak' periods. By having solar PV, consumers generate their own electricity and either offset their household consumption or export electricity to the distribution network. Consumers are expected to experience changes in their annual electricity bills through these choices. These bill impacts depend on both on a consumers' retail offer and how they use electricity.

This report provides an overview of the number and structure of retail time of use and solar offers available to residential consumers in order to better understand the nature and diversity of these offerings. These are two ways in which electricity offers available to consumers are becoming increasingly diverse as retail markets mature.

The uptake of retail time of use offers and solar PV is being facilitated by technological change. Historically, residential electricity meters have not kept track of how electricity usage varies throughout the day. Newer interval meters (also known as "smart meters") sample electricity consumption much more frequently, thereby allowing for more dynamic pricing structures, such as time of use. Solar uptake has been driven by significant cost reductions in solar technology costs, coupled with rising residential electricity prices and generous government incentives.

Observed electricity consumption and generation data from a sample of households has been used to estimate the potential impacts on consumers' electricity bills from switching from a representative flat offer to a time of use offer. Analysis shows that most consumers stand to benefit from shifting to retail time of use offers, even without any change to their existing consumption patterns. Furthermore, the benefits of switching to time of use and installing a PV system compound each other, as time of use consumers stand to benefit more from installing solar systems than consumers on flat offers. Conversely, consumers who have already installed solar stand to benefit more by switching from flat to time of use offers than those who have not installed solar.

Contents

1 Introduction

1.1 Purpose of this report

This is the sixth annual residential electricity price trends report prepared by the Australian Energy Market Commission (AEMC) at the request of the Council of Australian Governments' (COAG) Energy Council (formerly called the Standing Council on Energy and Resources).

This year's report provides information on electricity supply chain cost components expected to affect the trends in residential electricity prices for each state and territory of Australia from 2015/16 to 2017/18. Trends in the electricity supply chain cost components that are expected to contribute to the overall prices paid by households over the next three years are identified and discussed.

The purpose of the report is to provide an understanding of:

- the cost components of the electricity supply chain that contribute to the overall price paid by residential consumers; and
- the expected trends in each of these components.

Importantly, our analysis of possible future price trends is based on assumptions and modelling of future costs. Therefore information provided in the report should not be considered forecasts of either regulated prices set by jurisdictional regulators and governments, or of prices offered by retailers in the competitive market.

1.2 COAG Energy Council Terms of Reference

In accordance with the COAG Energy Council Terms of Reference, this report provides:

- trends in both *standing offer* and *market offer* prices, expressed as a single nominal cents per kilowatt hour (c/kWh) value. This is based on a representative residential consumption level for each state and territory;[1] and
- a breakdown of the supply chain cost components that contribute to residential retail electricity prices. These are again expressed as a c/kWh value for each state and territory.[2]
- possible trends in residential retail electricity prices for each year to 2017/18, using 2014/15 as the base year. Our analysis is presented separately for each state and territory, as well as in an aggregated form for the national summary. All prices are exclusive of GST.

1 Consumption levels were either calculated from benchmark values published by the Australian Energy Regulator, or provided by state and territory jurisdictions. Consumption levels reflect the annual electricity consumption of a representative consumer for each jurisdiction.

2 The COAG Energy Council has not made any changes to the Terms of Reference since the 2014 report. A copy of the Terms of Reference for the 2014 Electricity Price Trends report can be found on the AEMC website.

1.2.1 Definition of supply chain cost components

In our report, the supply chain cost components have been grouped into the following segments:

- The competitive market sector for the purchase of wholesale electricity and the retail sale of electricity. Wholesale electricity costs include purchases from the spot market and financial hedging contracts, ancillary services, market fees and energy losses from transmission and distribution networks. The retail component captures all of the costs that arise from retailing electricity and marketing to consumers, as well as any return to the owners of the retailer for investing in the business.
- The regulated network sector connects power stations to the end users who consume electricity. Regulated network costs refer to the costs associated with building and operating transmission and distribution networks, including a return on capital and metering costs. These costs are regulated by the AER in the National Electricity Market (NEM), the Economic Regulation Authority (ERA) in Western Australia, and the Utilities Commission in the Northern Territory.
- Environmental policies, introduced by Commonwealth and/or state and territory governments. There are a number of environmental policies or programs that directly impact or integrate with the electricity market. These include the Renewable Energy Target [3] and the various state and territory feed-in tariff and energy efficiency schemes.

1.3 Structure of the report

This report is structured as follows:

- Chapter 2 provides a summary of the factors and developments that are likely to influence movements in each of the supply chain cost components and residential electricity prices between 2014/15 to 2017/18.
- Chapter 3 is a summary of the jurisdictional results, including forecast changes in each supply chain cost component and the national and jurisdictional factors that are contributing to these changes. A national summary is also provided in this chapter.
- Chapter 4 analyses available time of use and solar offers, and their impact on consumer bills compared to representative 'flat' tariff offers.

Appendices

- Appendix A to I: Detailed jurisdictional results for each state and territory.
- Appendix J: Methodology for the 2015 report.
- Appendix K: Methodology used to establish the potential outcomes of the merits reviews.
- Appendix L: Abbreviations for the 2015 report.

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3 The Renewable Energy Target comprises the Large-scale Renewable Energy Target and the Small-scale Renewable Energy Scheme.

Consultant report

- Frontier Economics, *2015 Residential Electricity Price Trends*, Final Report, November 2015.

2 Key trends in prices and cost components

Chapter 2 provides a summary of the factors that are likely to influence movements in residential electricity prices between 2014/15 and 2017/18. For this reporting period, we have identified three primary drivers of residential electricity price trends. These are falling regulated network costs, rising wholesale electricity prices and rising wholesale gas costs. Each of these is discussed below in sections 2.1 to 2.3. Section 2.4 sets out other factors that may also have an impact on residential electricity price trends during this time.

2.1 Key driver - Falling network costs in NEM jurisdictions

Background

Transmission and distribution network businesses recover regulated network costs relating to the provision of electricity networks. Generally, transmission lines connect electricity generators to major load centres and the distribution network delivers energy at lower voltages to residential and other consumers. Network costs comprise approximately 50 per cent of a residential electricity bill and are expected to decrease in NEM jurisdictions over the reporting period.

In November 2012, the AEMC made changes to the National Electricity Rules (NER) related to the economic regulation of network businesses. The Economic Regulation of Network Service Providers rule change gave the Australian Energy Regulator (AER) more tools to determine efficient costs for each regulated business, including requirements for the AER to benchmark network businesses and publish reports on their performance. These rules apply in NEM jurisdictions and do not currently apply to Western Australia or the Northern Territory.

These new arrangements improve the way economic regulation is applied to network businesses through three broad changes:

- allowing greater use of incentives by the AER to encourage network businesses to invest capital efficiently;
- improving the AER's ability to determine the rate of return; and
- clarifying the AER's ability to use efficiency benchmarks when determining revenue allowances.

Timing

Figure 2.1 shows the timing of when the full application of the new rules will apply to transmission and distribution network determinations. Network costs based on the new rules will take effect no later than 2017 in all NEM jurisdictions.

Figure 2.1 Stages of network regulation reform

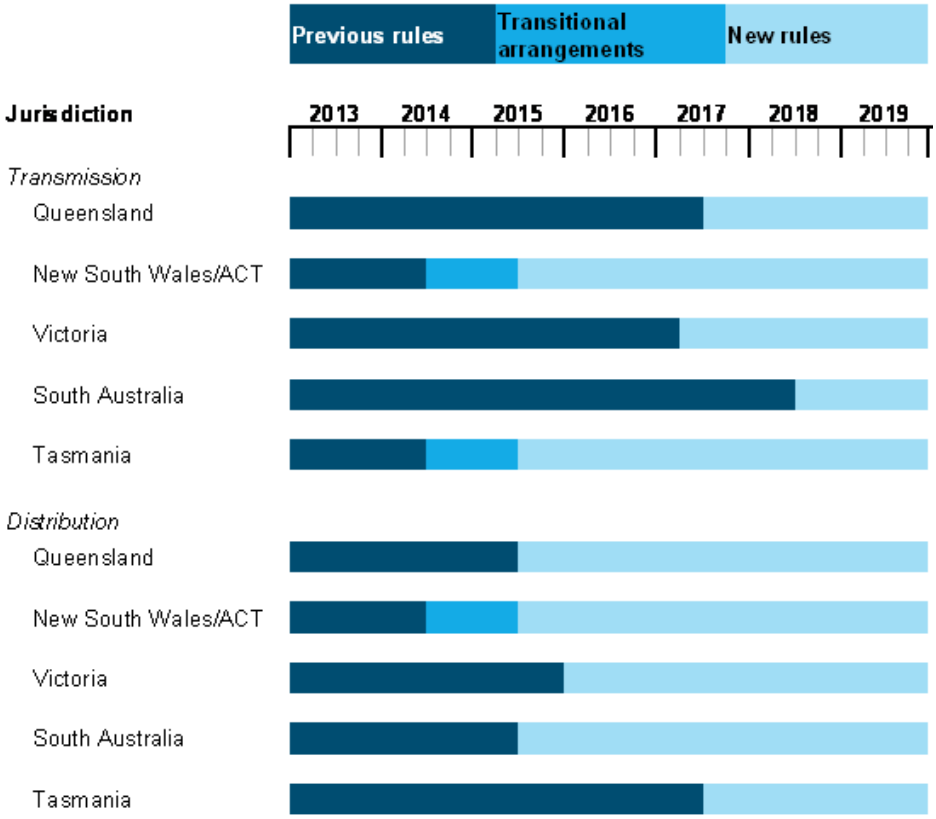

Figure 2.1 shows that the new rules for network regulation come into effect in 2015 for transmission and distribution network businesses in several jurisdictions. These new rules have been applied in all final and draft network revenue determinations made by the AER in 2015. Final network determinations have been made for transmission and distribution network businesses in New South Wales and ACT. Final determinations were also made for the Queensland and South Australian distribution businesses and the Tasmanian transmission business. Most of these decisions have specified a lower maximum allowed revenue and applied a lower rate of return compared with the previous regulatory control period ('regulatory period').[4] Outcomes of the AER decisions for each network business are set out in the "regulated network" section of the relevant jurisdictional appendices to this report.

Maximum allowed revenue

Most of the recent AER decisions made under the new rules for network regulation have provided for reductions in the maximum allowed revenue compared to the prior regulatory period (Table 2.1). The impact of lower revenue allowances will be passed through to consumers in the form of reduced network costs.

4 'Regulatory control period' is a defined term in the National Electricity Rules, meaning the period of time (usually five years) that a determination applies to a network business. In this report we have used the shortened term 'regulatory period' in lieu of the defined term.

Table 2.1 Network business revenue determinations, current and prior regulatory period

Network business	Region	Current regulatory period, total maximum allowed revenue for 2014-19[5]	Prior regulatory period, total maximum allowed revenue for 2009-14[6]	
FINAL DECISIONS		**$ million, $2015**	**$ million, $2015**	**$ million, $2009**
ActewAGL	ACT	$591	$927	$800
Ausgrid	New South Wales	$8,785	$9,875	$8,515
Endeavour Energy	New South Wales	$4,132	$5,554	$4,790
Essential Energy	New South Wales	$5,118	$7,021	$6,054
TransGrid	New South Wales	$3,036	$4,636	$3,997
TasNetworks	Tasmania	$881	$1,209	$1,042
		Current regulatory period, total maximum allowed revenue for 2015-20[7]	**Prior regulatory period, total maximum allowed revenue for 2010-15[8]**	
		$ million, $2015	**$ million, $2015**	**$ million, $2010**
SA Power Networks	South Australia	$3,838	$4,322	$3,820
Energex	Queensland	$8,257	$8,254	$7,295
Ergon	Queensland	$7,400	$7,682	$6,790

5 AER, Final decision ActewAGL distribution determination 2015−16 to 2018−19, Table 2, p23; AER, Final decision Ausgrid distribution determination 2015−16 to 2018−19, Table 2, p22; AER, Final decision Endeavour Energy distribution determination 2015−16 to 2018−19, Table 2, p21; AER, Final decision Essential Energy distribution determination 2015−16 to 2018−19, Table 2, p22; AER, Final decision TransGrid transmission determination 2015−16 to 2018−19, Table 3, p18; AER, Final decision TasNetworks transmission determination 2015−16 to 2018−19, Table 2, p1.

6 AER Statement on updates for NSW DNSPs distribution determination, p13, Table 29; AER decision - revocation and substitution of 2009-14 ActewAGL Distribution Determination, April 2012; AER Statement on updates for TransGrid transmission determination, p6, Table 10; AER Statement on updates for Transend's final transmission determination, p4, Table 4.

7 AER, Final decision SA Power Networks distribution determination 2015−16 to 2018−19, Table 2, p18; AER, Final decision Energex determination 2015−16 to 2019−20, Table 2, p20; AER, Final decision Ergon distribution determination 2015−16 to 2019−20, Table 2, p20; AER, Final decision SA Power Networks distribution 2015-16 to 2019−20, Table 2, p18.

8 Australian Competition Tribunal order, File No 4 of 2010 Determination (ETSA), 19 May 2011, p8, Table 9; Australian Competition Tribunal order, File No 2 of 2010 Determination (Energex), 19 May 2011, p12, Table 16.10 & 21; Australian Competition Tribunal order, File No 3 of 2010 Determination (Ergon), 19 May 2011, p12, Table 16.12 & 23, AER Final distribution determination 2011−2015, Table 18.27, p832; ESC, Electricity Distribution Price Review 2006-10 Final Decision, Table D.35, p640, Table D.55, p660, Table D.75, p680, Table D.95, p698.

DRAFT DECISIONS		DRAFT total maximum allowed revenue for 2016-20[9]	Prior regulatory period, total maximum allowed revenue for 2010-15[10]	
		$ million, $2015	$ million, $2015	$ million, $2010
CitiPower	Victoria	$1,413	$1,346	$1,190
Jemena	Victoria	$1,163	$1,125	$994
Powercor	Victoria	$3,086	$2,842	$2,512
United Energy	Victoria	$1,832	$1,895	$1,675
AusNet Services (SP AusNet)	Victoria	$2,878	$2,769	$2,447

Source: Australian Energy Regulator current and historic AER determinations and Australian Competition Tribunal rulings (www.aer.gov.au).

Rate of Return

The rate of return is a component of revenue determinations. It is a significant contributor to revenue allowances, comprising between approximately 35% and 60% of a network business' revenue. It is therefore a primary driver of future trends in residential electricity prices. Importantly, though, the rate of return used by the AER to determine revenue allowances does not determine how a business obtains finance or what rate of return it will be able to achieve in practice; these are commercial decisions.

In its recent decisions, both draft and final, the AER has lowered the overall rate of return used to determine revenue allowances for individual network businesses compared with the previous regulatory period (Table 2.2). A key element of these decisions is that interest rates are falling and easing financial markets mean that the cost of debt and the returns required to attract equity have reduced. A reduced rate of return compared to the previous regulatory period leads to expected reductions in network costs, which in turn leads to lower costs for customers.

9 AER, Preliminary decision Citipower distribution 2016−20, Table 3, p25; AER, Preliminary decision Jemena distribution 2016−20, Table 3, p25; AER, Preliminary decision Powercor distribution 2016−20, Table 3, p26; AER, Preliminary decision United Energy distribution 2016−20, Table 3, p25; AER, Preliminary decision AusNet distribution 2016−20, Table 3, p25.

10 CitiPower Pty, Distribution determination 2011–2015 Pursuant to Orders of the Australian Competition Tribunal in Application by United Energy Distribution Pty Limited (No 2) [2012] ACompT 8, September 2012, Table 6, p17; Jemena Electricity Networks (Victoria) Ltd Pursuant to Orders of the Australian Competition Tribunal in Application by United Energy Distribution Pty Limited (No 2) [2012] ACompT 8, September 2012, Table 6, p22; Powercor Australia Ltd, Distribution determination 2011–2015 Pursuant to Orders of the Australian Competition Tribunal in Application by United Energy Distribution Pty Limited (No 2) [2012] ACompT 8, October 2012, Table 6, p20; United Energy Distribution, Distribution determination 2011–2015 Pursuant to Orders of the Australian Competition Tribunal in Application by United Energy Distribution Pty Limited (No 2) [2012] ACompT 8, September 2012, Table 5, p19; and SPI Electricity Pty Ltd, Distribution determination 2011–2015 Pursuant to Orders of the Federal Court of Australia in SPI Electricity Pty Ltd v Australian Competition Tribunal, [2012] FCAC 186, August 2013, Table 6, p27.

Table 2.2 Network business rate of return, current and prior regulatory period[11]

Network business	Region	Current regulatory period rate of return for 2014-19 (%)	Prior regulatory period rate of return for 2009-14 (%)
FINAL DECISIONS			
ActewAGL	ACT	6.38	8.79
AusGrid, Endeavour Energy and Essential Energy	New South Wales	6.68	10.02
TransGrid	New South Wales	6.75	10.05
TasNetworks (Transmission)	Tasmania	6.37	10.00
		Current regulatory period rate of return for 2015-20 (%)	**Prior regulatory period rate of return for 2010-15 (%)**
SA Power Networks	South Australia	6.17	9.76
Ergon and Energex	Queensland	6.01	9.72
DRAFT DECISIONS		**Current regulatory period rate of return for 2016-20 (%)**	**Prior regulatory period rate of return for 2011-15 (%)**
CitiPower	Victoria	6.02	9.49
Jemena	Victoria	6.02	10.33
Powercor	Victoria	6.02	9.49
United Energy	Victoria	6.12	9.49
AusNet Services (SP AusNet)	Victoria	6.10	9.75

Source: Australian Energy Regulator current and historic determinations and statements (www.aer.gov.au)

Limited merits review regime

Background to merits reviews

As discussed elsewhere in this report, network costs in most jurisdictions are determined by the AER. In 2008, a limited merits reviews regime for AER network determinations was introduced into the National Electricity Law. This allows persons affected by AER network determinations to apply to the Australian Competition Tribunal (the Tribunal) for a review of the AER's determination.

11 The overall difference in the rates of return between jurisdictions is due to differences in the timing of the risk free rate averaging period.

In these reviews the Tribunal has the power to affirm the AER's determination, vary the AER's determination or set aside the AER determination and request the AER to remake it in a certain way.

Historically, applications for merits review have resulted in changes to network costs for a majority of AER electricity revenue determinations made since the merits review regime was introduced. If this trend were to continue, network costs in some of the recent and upcoming AER determinations could be expected to change. Since we have based our projections of residential prices on the actual revenues determined by the AER, this means, in effect, that some of the network costs used in this report could change.

The COAG Energy Council introduced changes to the limited merits review regime in 2013. The most significant of these changes requires that the Tribunal only make a decision to vary or set aside the AER's determination (and request the AER to remake it) if it is satisfied that there is a materially preferable decision (in comparison with the decision under review) consistent with the National Electricity Objective. Other changes made it easier for consumer groups to participate in and bring merits review applications.

Current merits reviews for New South Wales and ACT distribution businesses

In response to recent AER determinations, the New South Wales and ACT distribution businesses (Ausgrid, Endeavour, Essential, ActewAGL) and the Public Interest Advocacy Centre have made applications to the Tribunal for merits review. Hearings were held in September 2015, with other network businesses participating as interveners in these merits reviews. It is likely the Tribunal will make its decisions on these reviews before the end of 2015.

It is possible there will be some changes in network costs as a result of the merits reviews. Depending on the Tribunal's decision, each affected network business will likely receive a different decision on the amount of revenue (an increase or a decrease) it can recover over the regulatory period. The revenue recovery adjustment (increase or decrease) for the five year regulatory period would include adjustments for revenue in the first two years of the period. This five year adjustment would be recovered over the remaining three years of the current regulatory period. This means residential electricity prices for New South Wales and ACT would also change over the remaining three years of the distribution businesses' regulatory period. It is likely that the earliest any new determination (resulting from the Tribunal's decision) could be reflected in network costs is July 2016.

In practice, the revenues for New South Wales network businesses, including those that result from the merits review, will be limited by the electricity price guarantee that is in place in New South Wales. This guarantee is found at section 8 of the *Electricity Network Assets (Authorised Transactions) Act* 2015. It provides that the total network charges for each network business for the financial year ending 30 June 2019 will be lower than the total network charges for the financial year ending 30 June 2014.

Modelling of Potential Outcomes from the New South Wales and ACT Merits Reviews - Methodology

In order to understand the potential impacts of the Tribunal's decision on the merits review applications on residential electricity prices, the outcomes if the network businesses are successful on every aspect of their application (upper bound), and if the Public Interest Advocacy Centre are successful on every aspect of its application (lower bound) have been modelled. While these are extremes, they illustrate the range of possible outcomes from the current merits review applications, as set out in the tables below.

The revenues used for this exercise are those set out in the relevant applications by the relevant organisations to the Tribunal. These are set out in total nominal terms for the five years of the regulatory period, relative to the AER final determinations:

1. Upper – the four businesses are successful on all grounds:
    (a) Ausgrid revenues increase by $2.85 billion[12]
    (b) Endeavour revenues increase by $1.169 billion[13]
    (c) Essential revenues increase by $1.716 billion[14]
    (d) ActewAGL revenues increase by $196.46 million[15]
2. Lower – PIAC are successful on all grounds, noting appeals have only been lodged for the New South Wales businesses:
    (a) Ausgrid revenues decrease by $927 million[16]
    (b) Endeavour revenues decrease by $437 million[17]
    (c) Essential revenues decrease by $562 million[18]

In each of the upper and lower cases, these amounts are recovered over the remaining three years of the current five year regulatory period. That is, we have assumed no change to approved revenues can be reflected in residential electricity prices before 1 July 2016 and thus that true-ups for years 2014/15 and 2015/16 relative to the current AER determinations need to be accommodated in the remaining three years. More detail of our methodology is set out in Appendix K.

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12 Australian Competition Tribunal - ACT 4 of 2015 Ausgrid - Application for Leave and Application for Review, [26].

13 Australian Competition Tribunal - ACT 6 of 2015 Endeavour Energy - Application for Leave and Application for Review, [25].

14 Australian Competition Tribunal - ACT 7 of 2015 Essential Energy - Application for Leave and Application for Review, [25].

15 Australian Competition Tribunal - ACT 5 of 2015 ActewAGL - Application for Leave and Application for Review, paragraph 317.

16 Australian Competition Tribunal - ACT 1 of 2015 PIAC (Ausgrid) - Application for Leave and Application for Review, [64-65].

17 Australian Competition Tribunal - ACT 2 of 2015 PIAC (Endeavour Energy) - Application for Leave and Application for Review, [63-64].

18 Australian Competition Tribunal - ACT 3 of 2015 PIAC (Essential Energy) - Application for Leave and Application for Review, [62-63].

Modelling of Potential Outcomes from New South Wales and ACT Merits Reviews - Results

The modelling results show the effects that the potential outcomes of the merits reviews may have on the total annual bills for the representative customer in each of New South Wales and ACT (Table 2.3, Figure 2.2 and Figure 2.3). The base case reflects the AER's current final determination. New South Wales data is a weighted average across the three distribution areas. Outcomes in the upper case equate to a significant increase in costs from 2016/17. Again, as described above, this would be limited by the electricity price guarantee in place in NSW.

Table 2.3 Potential effects of merits reviews on the representative New South Wales and ACT annual residential bills

	2014/15	2015/16			2016/17			2017/18		
New South Wales	Annual bill $ per year	Annual bill $ per year	% change from base case in 2015/16	% change from prior year	Annual bill $ per year	% change from base case in 2016/17	% change from prior year	Annual bill $ per year	% change from base case in 2017/18	% change from prior year
Upper bound	$1,312	$1,242	0%	-5.3%	$1,513	20.0%	21.8%	$1,546	19.5%	2.2%
Base case	$1,312	$1,242	n/a	-5.3%	$1,260	n/a	1.5%	$1,293	n/a	2.6%
Lower bound	$1,312	$1,242	0%	-5.3%	$1,169	--7.3%	-5.9%	$1,202	-7.1%	2.8%
ACT										
Upper bound	$1,468	$1,399	0%	-4.7%	$1,610	11.0%	15.0%	$1,676	10.6%	4.1%
Base case	$1,468	$1,399	n/a	-4.7%	$1,450	n/a	3.6%	$1,515	n/a	4.5%

Figure 2.2 **Potential effects of merits reviews on the representative New South Wales annual bill**

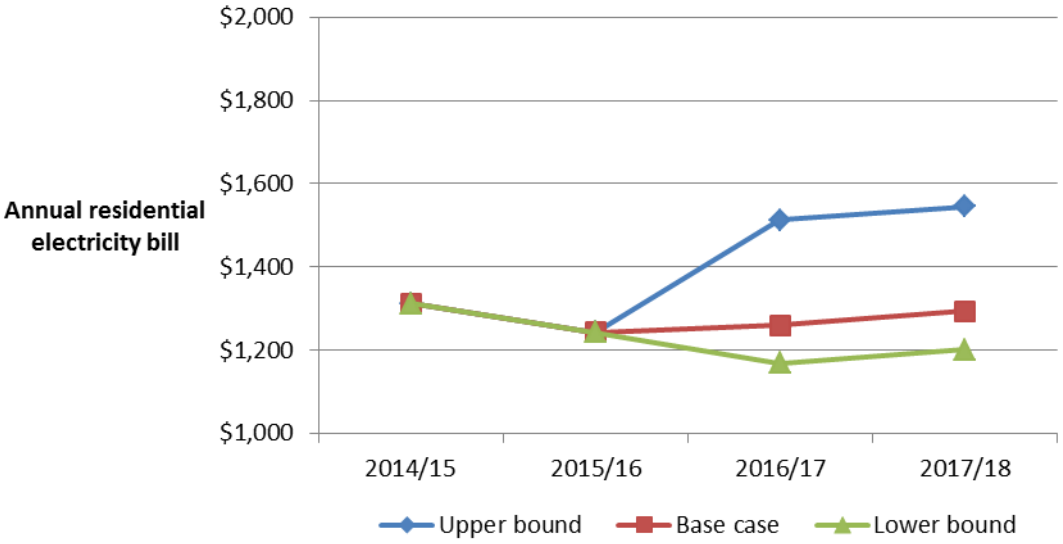
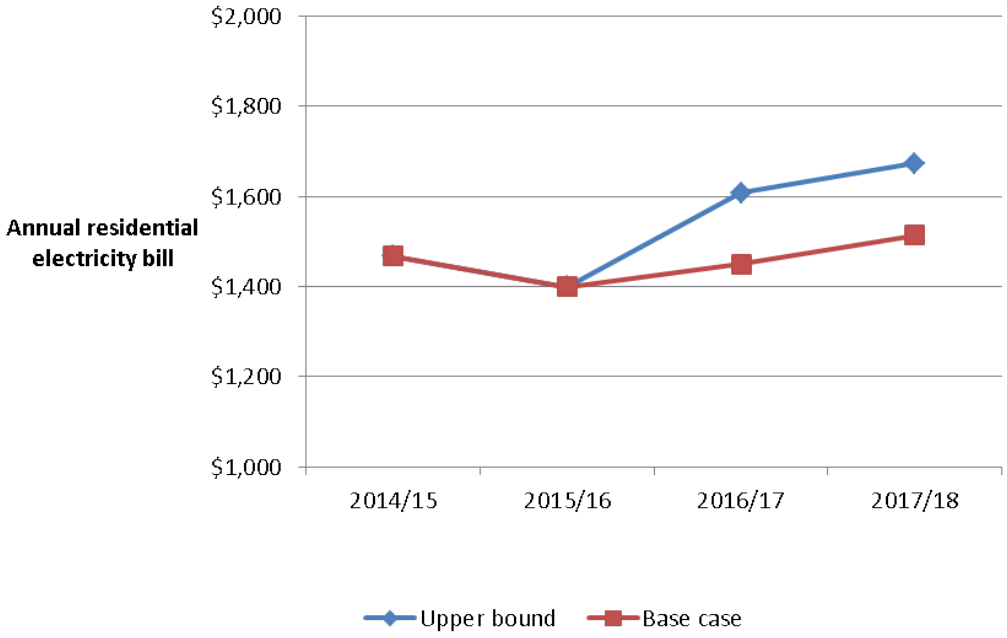


Figure 2.3 **Potential effects of merits reviews on the representative ACT annual bill**



Applications for Merits Reviews in Other Jurisdictions

Merits reviews of other current and future AER determinations are possible. SA Power Networks and the South Australian Council of Social Services have lodged merits review applications in respect of SA Power Network's final revenue determination. No merits review applications have been lodged regarding the recent AER determinations for the Queensland-government owned distribution network businesses. The AER's final determination for the Victorian distribution businesses will be made in late April 2016. Any application for merits review from these Victorian distribution businesses will be due shortly after that. The trend in regulated network costs for the reporting period will depend on the outcomes of merits reviews.

Conclusion

In summary, the actual trend in regulated network costs over the reporting period depends on when the new rules start to apply for specific network businesses and the results of merit reviews underway or commenced in the future for some distribution businesses. Based on the recent AER decisions, it is expected that in most NEM jurisdictions overall network costs will fall over the reporting period.

Network costs in Western Australia and the Northern Territory

Distribution and transmission network costs in Western Australia and the Northern Territory are regulated by the Western Australian Economic Regulation Authority and the Northern Territory Utilities Commission respectively. Network costs in these jurisdictions are expected to rise across the reporting period for reasons specific to these regions. The drivers of this trend are detailed in appendices G (Western Australia) and H (Northern Territory).

2.2 Key driver - Increasing wholesale electricity costs

Competitive market costs (including wholesale electricity costs) represent around 35 to 60 per cent of a typical residential electricity bill. Average wholesale costs are expected to rise across the reporting period from historically low levels.[19] This is mainly in response to expected increases in electricity consumption to 2017/18 as forecast by AEMO.[20] Some of the upward pressure caused by increasing consumption is offset by the short-term impacts of increased generation supply due to the Large-scale Renewable Energy Target (LRET). However in the medium term, the LRET may also contribute to retirement of generators, which may lead to higher wholesale costs over time. The impact of changing electricity consumption levels and the LRET on wholesale electricity costs are discussed below.

2.2.1 Effect of AEMO's projections of increasing electricity consumption

Electricity demand can be measured in different ways. 'Electricity consumption' represents the total amount of electricity that is used over a specific period and is generally measured in megawatt hours (MWh). 'Peak demand' represents the largest

19 A step change increase in average wholesale prices occurred with the introduction of the Carbon Pricing Mechanism in July 2012. Similarly, a step change decrease occurred in July 2014 when the Carbon Pricing Mechanism was repealed.

20 Frontier Economics, *2015 Residential Electricity Price Trends Report – Final*, August 2015, p44.

volume of electricity demanded at any one point in time and is generally measured in megawatts (MW).

The Australian Energy Market Operator (AEMO) produces the National Electricity Forecast Report (NEFR) each year. This report provides electricity consumption and maximum demand forecasts for the NEM and the five NEM regions over a twenty year outlook period.[21] The NEFR consumption and maximum demand forecasts are a major input into the wholesale electricity market modelling underpinning this report. This is because greater (or lesser) consumption and demand necessarily translates to greater (or lesser) modelled generation output requirements, which in turn affects costs in the wholesale electricity market.

Electricity consumption trends set out in the 2015 NEFR vary between the states and territories but are generally expected by AEMO to increase across the reporting period (2014/15 to 2017/18). AEMO attributes increasing consumption to:

- population increases,
- consumer responses to expected income growth, and
- consumer responses to recent decreases in electricity retail prices.

The liquefied natural gas (LNG) industrial developments in Queensland also contribute significantly to increased electricity consumption. This is because the compression and transportation of natural gas to the LNG processing facilities use significant amounts of electricity during commissioning and under normal operation. AEMO expects that rooftop solar PV uptake and increasing energy efficiency in the commercial and residential sector will continue to offset consumption from population, income and price effects.[22]

Changing electricity consumption levels affect the balance of supply and demand in the NEM. Modelling by Frontier Economics for this report shows that during the reporting period, wholesale electricity costs are roughly correlated with consumption levels, that is, increasing consumption puts upward pressure on costs and vice versa.

Figure 2.4 shows Frontier Economics' analysis of wholesale electricity costs for the NEM regions for different consumption scenarios.[23] Competitive market costs (including wholesale electricity costs) typically comprise 35% to 55% of a residential bill. The base case uses the 2015 NEFR 'medium' consumption forecast, and similarly the high/low consumption case is modelled using the 2015 NEFR high/low consumption forecast. These scenarios show a range of possible wholesale electricity cost outcomes for differing consumption levels across the reporting period.

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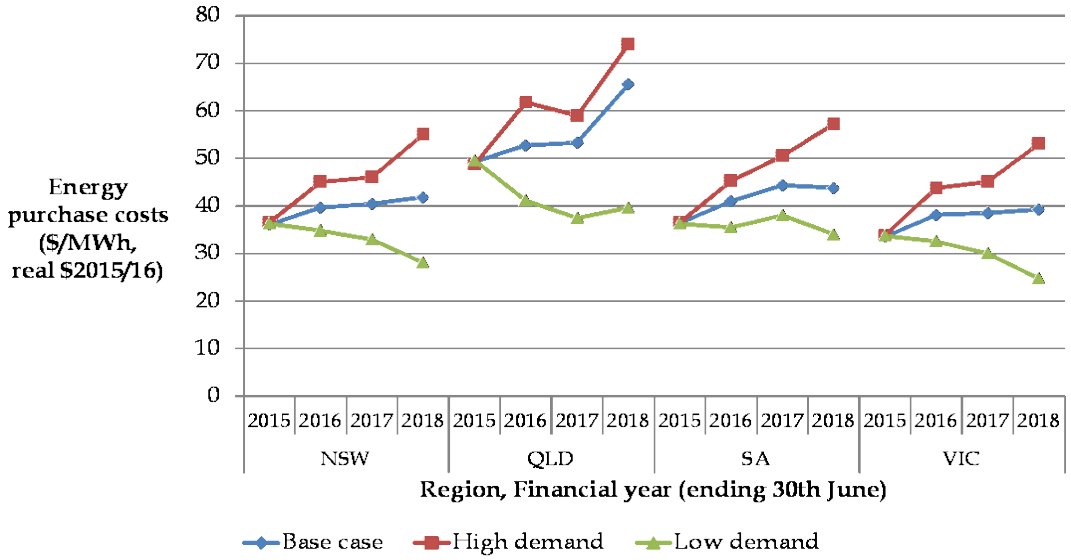
21 The five NEM regions are New South Wales (including Australian Capital Territory), Queensland, South Australia, Tasmania, and Victoria.

22 Source: Australian Energy Market Operator, National Electricity Forecasting Report 2015, June 2015.

23 The New South Wales costs also apply to the ACT. The Victorian wholesale electricity costs are indicative of the Tasmanian costs because, after accounting for transport costs, costs in these markets are similar if there are no constraints.

Figure 2.4 Wholesale electricity costs, comparison between base, and low and high consumption scenarios



2.2.2 Effect of the Large-scale Renewable Energy Target

The LRET mandates that retailers source a proportion of their electricity from renewable sources. The new target for large-scale generation of 33,000 GWh in 2020 was announced in June 2015.[24] Where the LRET leads to a greater supply of generation than would otherwise be the case it puts downward pressure on wholesale costs, particularly when demand is falling.

The LRET has impacts on both wholesale costs and retail prices.

Wholesale costs

The primary effects of the LRET on wholesale costs can be broken down into two. First, the LRET can encourage a greater supply of generation than would otherwise be the case. This effect is more pronounced where demand growth is flat or falling. By encouraging greater supply, and in the absence of generator retirements (discussed below), the LRET would put downward pressure on wholesale costs.

24 Australian Government, The Hon. Greg Hunt MP Minister for the Environment and The Hon. Ian Macfarlane MP Minister for Industry and Science, media release, *Certainty and growth for renewable energy*, 23 June 2015. p1.

Box 2.1 Types of Generation used to meet the LRET

In the 2014 calendar year, approximately 64 per cent of large-scale generation certificates created under the LRET were attributable to wind generators, that is, wind farms were the dominant renewable energy generators during that period.[25] By comparison, 15 per cent of large-scale generation certificates created in 2014 were attributable to hydro generation, the next highest renewable energy source contributing to the LRET.[26] Fifteen of the top twenty renewable energy generators were wind farms and of these, seven were located in South Australia, with Victoria and Western Australia hosting three each, and Tasmania and New South Wales hosting one each.

Second, the LRET results in a greater proportion of the generator mix coming from renewable sources. As discussed above, at present this is typically wind generation. Wind generation has lower operating costs compared with thermal generation. Due to these lower operating costs, wind generation displaces higher cost thermal plant in the merit order of generators and effectively shifts the supply curve to the right. For a given level of demand this should place downward pressure on wholesale costs.

In the longer term, if low wholesale costs mean some generators are not recovering their operating costs, this may encourage them to exit the market. This is discussed further in section 2.2.3 below. As a variable form of generation, a greater proportion of wind generation will lead to more volatile wholesale electricity spot prices. This is discussed further in section 2.2.4 below.

Retail prices

The costs of the LRET are recovered through retail prices. The LRET therefore places upwards pressure on retail prices. A separation (or wedge) between retail prices and wholesale costs can be created. This is because the increasing costs of the policy are recovered through retail prices, and these retail prices may not reflect underlying movements in the retailer's wholesale electricity costs. A wedge between retail and wholesale costs represents a distortion between the way that energy is sold and the way that it is bought. Over time, a properly functioning market is likely to be unsustainable when wholesale costs are not informing consumer choices in the retail market.

2.2.3 Effect of generator retirement

There are many reasons why a generator may be retired. These include:

- technical reasons, including when the plant is at or near the end of its life;

25 Falling renewables - LGC creation in 2014 by power station, Business Spectator, http://www.businessspectator.com.au/article/2015/6/1/renewable-energy/falling-renewables-lgc-creation-2014-power-station, viewed 1 September 2015.

26 ibid. The remaining market share of fuel sources for large-scale generation certificates was made up of: 5.4% landfill gas; 5.3% bagasse; 5.4% waste coal mine gas; 1.6 % black liquor; 1 % wood waste; 0.8% sewage gas; 0.6 % other biomass; 0.4% large-scale solar.

- the expectation that the generator's revenue from the wholesale market will no longer cover its operating costs. For example where surplus supply is created by falling demand and/or new generating capacity, placing downward pressure on wholesale costs;
- changes in policy or expectation of policy changes.

The mix of generators in a market may also influence retirements. Most gas-fired generation is better placed than coal-fired generation to supplement intermittent generation such as wind a solar. This is because gas-fired generators are quick to start-up and shut-down, and therefore are flexible to respond swiftly to changes in the output of other generators. Coal-fired generators are slow to start-up and shut-down, and need to operate at or above a technical minimum output which is generally higher than that of gas-fired generators. Coal-fired generators are therefore less flexible than gas-fired generators. They are more suited to continuous operation to supply base-load demand rather than responding to changes in intermittent generation.[27]

As described in section 2.2.2, the LRET can put downward pressure on wholesale electricity costs. If low wholesale costs mean some generators are not recovering their operating costs, this may encourage them to exit the market.

Retirements reduce the amount of generating capacity available to meet demand, and therefore almost always increase the wholesale cost of electricity. In turn, increasing wholesale costs usually place upwards pressure on retail prices because retailers pass through cost increases to consumers.

AEMO's annual Electricity Statement of Opportunities (ESOO) reports on the adequacy of existing and committed generation and transmission capacity in the NEM to meet maximum demand and annual operational consumption forecasts over the next 10 years. The 2015 ESOO states that the NEM's current installed capacity is 51,363 MW, comprising a range of technologies (54 per cent coal, 24 per cent gas, 16 per cent hydro, 6 per cent wind, and <1 per cent other). Compared to the 2014 ESOO, 1,068MW of large-scale renewable generation (946MW of wind and 122MW of solar generation) has been installed and a similar amount (1,078MW) of thermal generation has been withdrawn.[28]

Retirements of coal-fired generation have been observed in South Australia and Victoria in particular. For example, in South Australia, the permanent retirement of Northern Power Station (540MW) has been announced, as well as the mothballing of Torrens Island A (480MW). In Victoria, the decommissioning on Anglesea Power Station (150MW) has been announced.

The effect of retirements (along with increases in demand) is shown in Table 2.4. Recently announced retirements in New South Wales and South Australia exceed AEMO's 2014 ESOO projected capacity surpluses for these regions, increasing their reliance on imports from Victoria, Queensland and Tasmania. Generator retirements,

27 Energy Supply Association of Australia, *If wholesale prices are too high, why are generators exiting?*, 24 September 2015.

28 Australian Energy Market Operator, Electricity Statement of Opportunities for the National Electricity Market, August 2015, p11.

commissioning of generators and demand changes impact projected surpluses in all regions.

Table 2.4 Surplus capacity (MW) by region since the 2014 ESOO (all projected to 2023/24)*

	Queensland	New South Wales	South Australia	Victoria	Tasmania
2014 ESOO surplus capacity – medium scenario	2,000	2,100	700	2,250	350
Plant capacity withdrawal announced since 2014	0	2,315	1,505	345	386
2015 ESOO surplus capacity – medium scenario	450	nil	nil	100	50

Source: Australian Energy Market Operator, Electricity Statement of Opportunities for the National Electricity Market, August 2015.

*The data in the table cannot be aggregated due to the complex nature of the network constraints, shape of demand profiles (including maximum demand), the timing of commissioning and withdrawal of generators, and reliability of on-line generation all of which contribute to the regional assessment of surplus capacity.

2.2.4 Price volatility in the NEM

As discussed above, a high proportion of renewable generation installed recently is wind generation. As an intermittent form of generation, the output from wind generators is less constant than for thermal generators.

Increasing intermittency of generation output leads to more volatile wholesale electricity spot prices. This effect has been observed in South Australia recently.

In recent years there has been an increase in supply from intermittent generation in South Australia, while output from thermal generation has decreased. Wind generation as a proportion of total energy generated was 34 per cent of the state's total generation in 2014/15.[29] These characteristics mean the effects of increasing wind generation capacity in the South Australian market may be an indicator of the likely effects of increasing wind generation capacity in other NEM regions.

Price volatility in the wholesale electricity spot markets can occur as the market responds to unexpectedly high or low demand or supply. Weather related events or generator outages can trigger volatility. Lately, South Australia has had more volatile spot prices than other NEM regions (see Figure 2.5) and these high price events are not solely driven by demand. Figure 2.6 shows there have been many occasions where demand is high and prices do not increase to unusually high levels. AEMO pricing event reports and AER market performance reports suggest that these high price events have usually corresponded to times where wind generation capacity is low

29 Australian Energy Market Operator, *South Australian Electricity Report*, August 2015, p24.

and/or there is an outage in a generator and/or interconnectors in the system are constrained or are subject to a planned outage.

Figure 2.5 Average daily prices in all NEM regions, June to August 2015

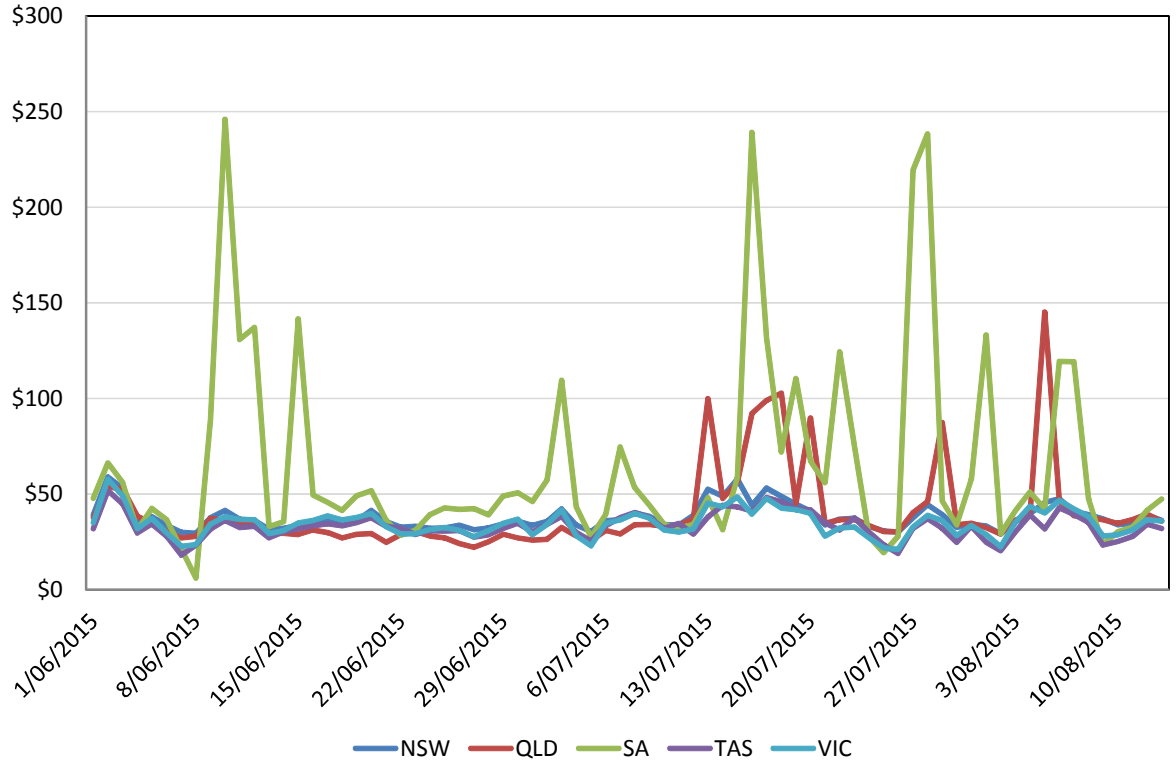
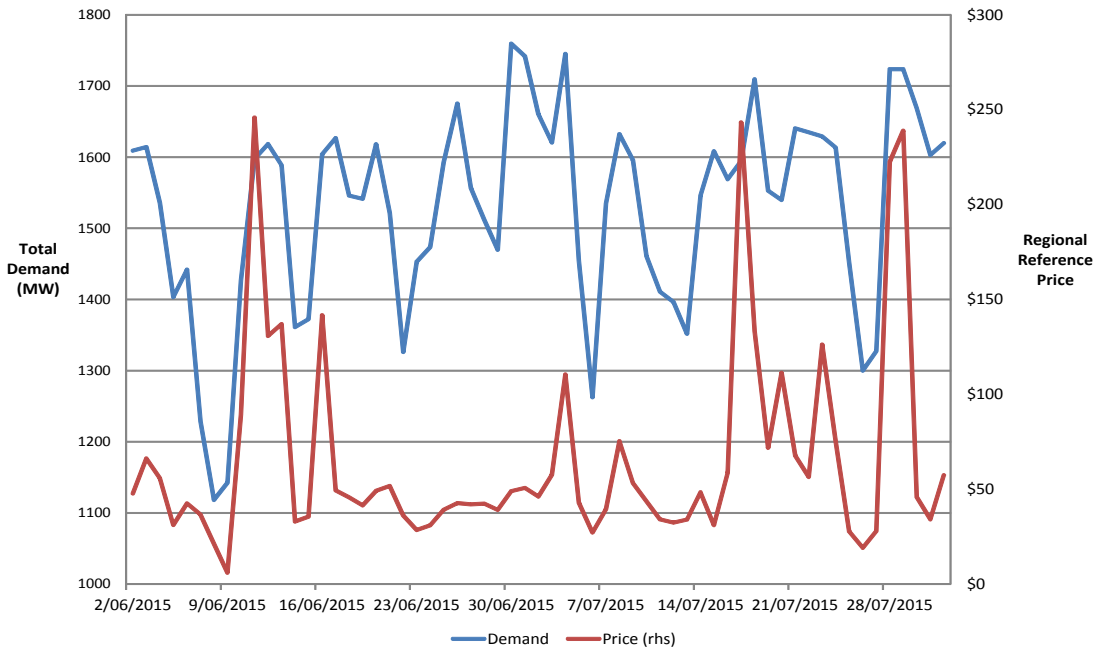


Figure 2.6 Average daily price and total demand for South Australia, June-July 2015



Impact on risk and contract prices

Increased volatility in spot prices increases the overall level of risk that retailers must manage.

One means by which retailers manage the risk of volatile electricity spot prices is by purchasing hedge contracts. Where there is greater volatility in the spot market, the cost of these contracts can be expected to be higher. These increased contract costs are then passed on by retailers to consumers through higher retail prices.

Ernst & Young has performed an analysis of the link between spot price volatility and contract prices.[30] It analysed data including:

- contract market data from ASX Energy, including settlement prices and traded volumes for quarterly base futures and quarterly cap futures; and
- wholesale market data aggregated to the contract trading day level.

The analysis covered the period between 1 January 2007 and 30 June 2015.

Ernst & Young found that periods of spot price volatility were associated with higher contract prices. There are strong, consistent relationships between the observed levels of spot price volatility that occur within a quarter and the subsequent increase or decrease in the price of electricity futures contracts. These effects are most strongly observed at the quarterly level, including on contract prices in the same quarter. There was also some evidence correlating spot market volatility and contract prices for the subsequent quarter and for the same quarter one year later.

Some evidence was found for a relationship between spot price spikes and contract prices on the same trading day, with the effect appearing strongest in Queensland.

2.2.5 Summary

In summary, there is a complex interaction of influences on wholesale electricity costs. Increasing consumption puts upward pressure on costs. The LRET encourages investment in renewable generation and can act to suppress wholesale costs in the short term when renewable generators are operating. However lower wholesale costs over time may lead to generator retirements which then places upward pressure on wholesale electricity costs. Intermittent forms of generation can also contribute to higher spot market volatility, as well as the risks and costs to retailers. These impacts are summarised in Table 2.5 below.

Table 2.5 Theoretical effect of the LRET and generator retirements on wholesale electricity markets

	Effect on wholesale electricity costs	Effect on retail electricity prices	Effect on wholesale spot price volatility
Introduce more renewable generation	decrease	increase	increase
Thermal generator retirements	increase	increase	increase

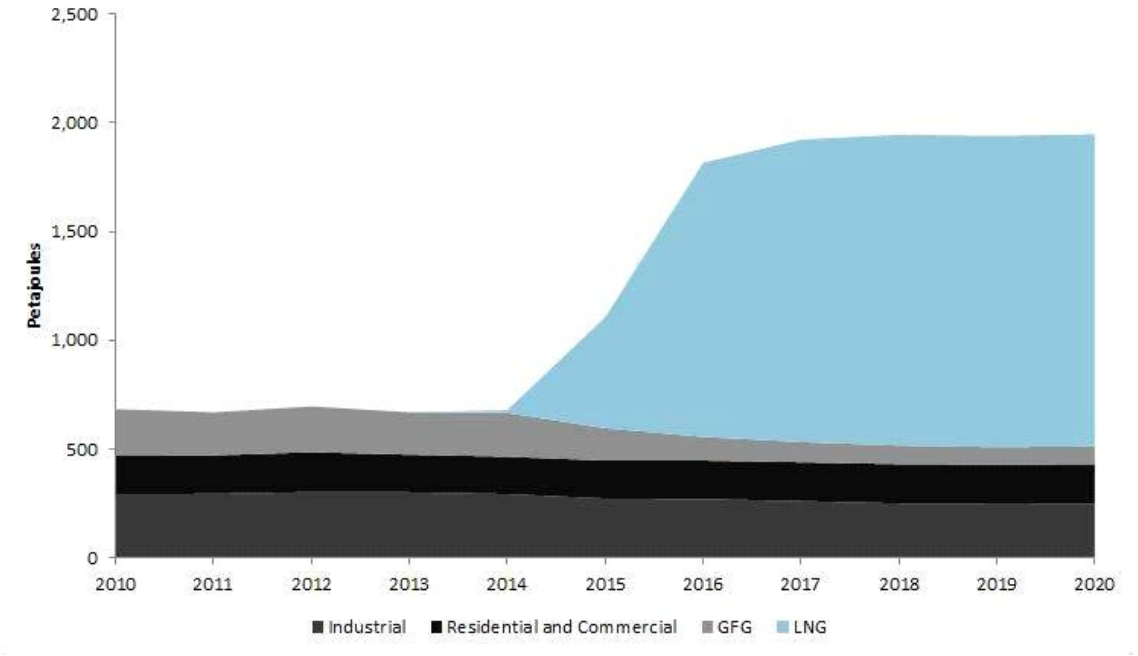
30 Ernst & Young, Impact of late rebidding on the contract market - report to the AEMC, September 2015.

2.3 Key driver - Rising wholesale gas costs leading to higher wholesale electricity costs

Wholesale electricity costs are impacted by movements in underlying fuel costs. Higher fuel costs will result in higher input costs for generators and therefore higher costs in the wholesale electricity market.

The ramp-up of the LNG facilities in Queensland is expected to result in higher wholesale gas prices across all east coast jurisdictions over the reporting period. This is mainly due to the gas supply-demand balance tightening and the domestic gas market becoming exposed to international LNG prices.[31] Figure 2.7 shows the steep increase in demand for east coast gas resulting from the LNG developments. One of six LNG trains has been commissioned to date, with the remaining five facilities expected to commence operations by 2017/18.

Figure 2.7 Demand for east coast gas - 2010 to 2020



Source: AEMO 2014 Gas Statement of Opportunities

In eastern Australia, gas-fired generation is responsible for approximately one-third of wholesale gas demand, most of which is base load generation in Queensland and South Australia.[32] Increasing wholesale gas prices creates rising costs for gas-fired generators and therefore contribute to rising wholesale electricity costs. Increasing gas prices may also contribute to decisions to temporarily or permanently retire gas-fired generators. This would have the effect of reducing supply into the wholesale electricity market, which in turn would also place upward pressure on wholesale electricity costs.

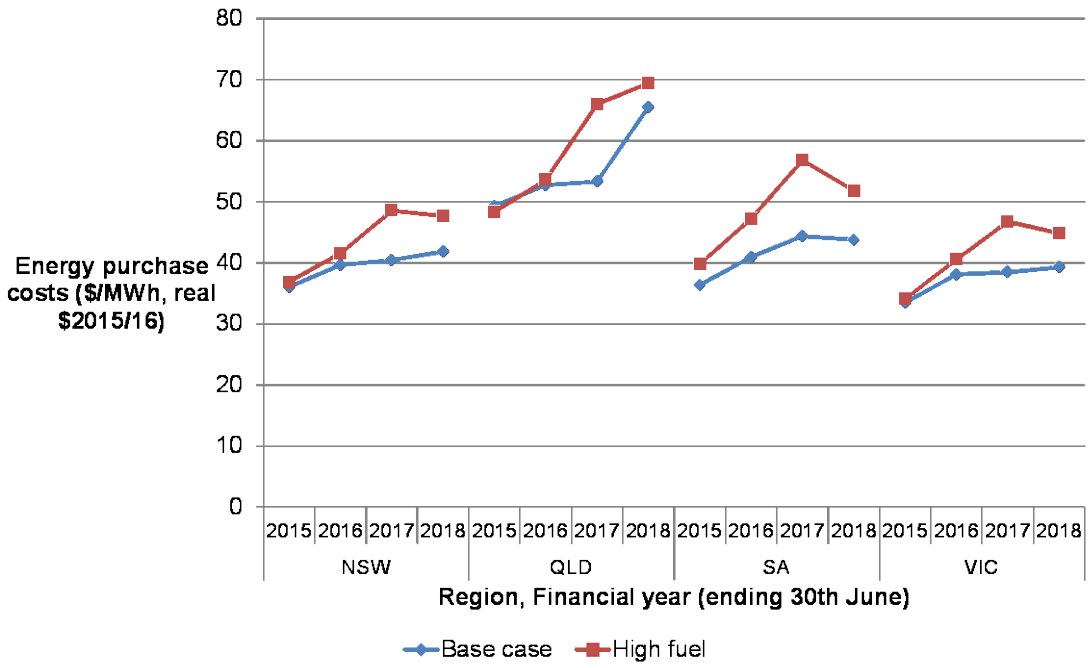
Frontier Economics modelled a 'high fuel cost' scenario for this report to show the sensitivity of wholesale electricity costs to fuel costs. Competitive market costs

31 Frontier Economics, *2015 Residential Electricity Price Trends Report – Final*, August 2015, p44.

32 Australian Energy Market Commission, *East Coast Wholesale Gas Market and Pipeline Frameworks Review - Stage 1 Final Report*, July 2015, p35.

(including wholesale electricity costs) typically comprise 35% to 55% of a residential bill. This scenario assumed that the Asia-Pacific LNG price was 10 per cent higher than the base case and that ten LNG trains were developed instead of the six LNG trains assumed in the base case.[33] The outcome of the modelling was that wholesale electricity costs were materially higher than the base case costs in all regions, reflecting higher input gas prices (see Figure 2.8). In Queensland however, the base case and high fuel cost scenario only diverge from 2016/17. This is because additional investment in gas production infrastructure in 2015/16 leads to excess gas in the market before all of the LNG facilities are operational, which in turn puts downward pressure on Queensland wholesale gas prices. Higher gas prices, and therefore wholesale electricity costs, are expected as the remaining LNG trains are commissioned and ramped up to full production.

Figure 2.8 Wholesale electricity costs, comparison between base case and high fuel cost scenarios



2.4 Other influences on electricity supply chain costs

Sections 2.1 to 2.3 above address the key drivers in residential electricity prices for the period 2014/15 to 2017/18. This section outlines other matters that could materially affect residential electricity trends over the reporting period.

2.4.1 The retail component of electricity prices

Challenges quantifying costs faced by retailers

Retail costs have been the subject of debate recently, particularly in Victoria. They have been discussed in the AEMC's Retail Competition Reviews, including in the Approach Paper for the 2016 Retail Competition Review published on 22 October 2015.

33 Frontier Economics, *2015 Residential Electricity Price Trends Report – Final*, August 2015, p113.

The retail component of a residential electricity bill contains several different components. These include:

- the retailer operating costs (OPEX) including retail billing, customer service, connections, hardship policies, the costs of managing bad debts, the costs of managing financial contracts and the costs of meeting jurisdictional obligations;
- customer acquisition and retention costs (CARC), including marketing; and
- a return for investing in the business, that is, the amount that a retailer makes per customer after all its operating and other costs are considered

Some of these costs may be able to be estimated. However, the return on investment is particularly difficult to quantify. To assess return on investment in a meaningful way would require a detailed assessment of the capital, risks, revenue and costs of energy retailers by jurisdiction.[34] This exercise would be extremely difficult and costly to undertake, especially in the absence of information gathering powers. It would inevitably involve making a range of assumptions, particularly regarding average prices paid by customers, wholesale energy costs and retailers' operational costs, and the risks involved in market participation. The results of any assessment conducted on this basis would be highly sensitive to these assumptions, significantly limiting the value of the results.

An additional challenge is that the return on investment can vary significantly over time. For example:

- This can occur as part of the competitive process where suppliers discount to attract customers or protect against new entry.
- The return on investment may increase as suppliers reduce the costs of supply through innovation or developing and marketing higher value products.
- The return on investment can vary depending on a retailer's business model, and on the level of activity of customers.
- The return on investment may also vary for reasons that are outside of the control of suppliers, such as changes in the underlying costs of supply and changes in customers' consumption and switching behaviours.

Approach to retail costs taken in this report

Given these challenges this report assesses the retail component through a residual method and does not separately report it. It is derived as the residual when all of the non-retail cost components are subtracted from the representative market or standing offer price in 2014/15 (the base year), as shown in Figure 2.9.

34 The evidentiary and other difficulties of reviewing the return on investment are described in detail in Australian Energy Market Commission, 2014 Retail Competition Review, AEMC, August 2014, pp15-16 and pp173-183.

Figure 2.9 Graphical representation of residual method

Importantly, this approach means that any errors in the levels of the other supply chain cost components will affect the retail component, as shown in Figure 2.10.

Figure 2.10 Graphical representation of the elements of the retail component in this report

Therefore, in this report for most jurisdictions the wholesale energy and retail price components are reported as a combined "competitive market" price component. This is because separately reporting retail components developed using the methodology above would be potentially misleading given their inherent error and uncertainty.

In addition, reporting a combined figure for competitive market costs better reflects how retailers operate. Network and environmental policy costs are directly observable and are passed on by retailers to their customers. However, while wholesale energy costs are modelled for the purposes of this report (as discussed in section J.3.1 below) the actual costs incurred by a retailer to supply its customers will vary considerably. These costs will depend on matters such as:

- Whether the retailer is vertically integrated with generation, and if so, how it operates its plants to meet its retail load; and
- How effectively the retailer contracts to hedge any exposure it has to the spot market.

2.4.2 Distribution Network Pricing Arrangements

In November 2014, the AEMC made a new rule to require network businesses to set prices that reflect the efficient cost of providing network services to individual consumers. This will allow consumers to make more informed decisions about their use of electricity.

The rule establishes a new pricing objective and new pricing principles for distribution businesses that will require that network prices reflect the efficient costs of providing network services. This will allow consumers to compare the value they place on using the network against the costs caused by their use of it. Consumers who choose to respond to network prices by reducing their consumption in higher cost periods will be rewarded through lower network costs.

The rule also contains new processes and timeframes for setting network prices. This will require distribution businesses to consult with consumers and retailers to develop a tariff structure statement that outlines the price structures that they will apply for the regulatory period. This statement will be approved by the AER as part of the five-year

regulatory reset process. The businesses will also publish annually an indicative pricing schedule to provide consumers and retailers with the most up to date information on likely price levels throughout the regulatory period. This new process will lead to increased certainty, transparency and timeliness with respect to network pricing for consumers.

Under the final rule, network businesses will need to submit their initial tariff structure statement to the AER by late 2015. Network prices based on the new pricing objective and pricing principles will be gradually phased in from 2017.

The final rule will not affect the amount of revenue a network business can recover from consumers and therefore the overall trend in network costs will also not be affected. However the final rule will go some way to remove cross-subsidies between different network users, for example, between consumers with different consumption profiles. Therefore the price and annual bill outcomes for different types of consumers may change. It should be noted that despite this rule requiring network tariff structures to be cost-reflective, the overall effect of this change will depend on the extent to which electricity retailers pass through network costs and tariff structures to consumers.

3 Summary of results

Chapter 3 sets out the drivers of possible future price trends for each jurisdiction and a national summary.

Key drivers of residential electricity price trends differ by jurisdiction and are based on trends occurring in the underlying supply chain cost components, which are:

- competitive wholesale and retail market costs;
- regulated network costs; and
- government environmental policy costs.

Residential electricity prices are based on the consumption level of a representative consumer, which differs by jurisdiction. Representative consumers are defined in terms of the total amount of electricity consumed in one year (measured in kWh) and how this consumption is split across the quarters of the year (the consumption profile). In some jurisdictions, some of this consumption is allocated to a controlled-load (or 'off-peak') tariff. *Standing offer* and *market offer* prices are considered throughout the analysis, where available.

3.1 Queensland

In Queensland, the most common type of residential electricity consumer (the representative consumer) is a two-person household with no pool, no mains gas connection and electric hot water on a "controlled-load" tariff. The representative consumer uses 5,173 kWh of electricity each year, of which 1,552 kWh is attributed to the controlled-load tariff.[35]

Residential electricity prices in South East Queensland are expected to decrease by 2.5 per cent in 2015/16, be flat in 2016/17 and increase by 5.0 per cent in 2017/18. This is equivalent to an average annual increase of 0.8 per cent for the representative consumer over the reporting period.

Increases during the reporting period are mostly due to increasing competitive market and environmental policy costs.

In South East Queensland, 70 per cent of small consumers have switched to a *market offer*.[36]

In 2014/15, a representative consumer on the regulated *standing offer* using 5,173 kWh per year had a total annual bill of $1,510, exclusive of GST. This consumer may have saved around $111, or 7.3 per cent, by switching from the regulated *standing offer* to the representative *market offer*.[37]

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35 This consumption level was calculated from benchmark values published by the AER. ACIL Allen Consulting, Electricity Bill Benchmarks for Residential Customers, a report to the Australian Energy Regulator, October 2014.

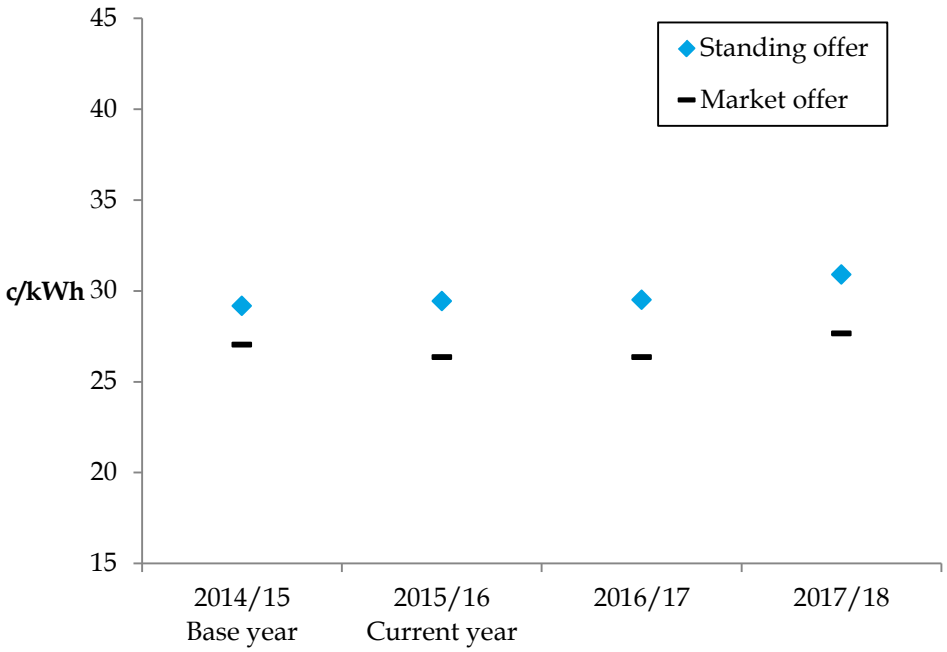
36 Australian Energy Market Commission, 2015 Retail Competition Review, p242.

37 This indicative saving is based on a representative consumer on a regulated *standing offer* switching to the representative *market offer*, as defined in this report. Actual savings will depend on individual circumstances.

Figure 3.1 shows expected movements in the regulated *standing offer* and *market offer* prices in Queensland, exclusive of GST. For 2014/15 and 2015/16, the regulated *standing offer* prices are based on the Queensland Competition Authority's determinations of retail electricity prices. The representative *market offer* price for 2014/15 was calculated using retailers' offers sourced through the Queensland Competition Authority's electricity price comparator website.

For future years, the trends for the regulated *standing offer* and *market offer* prices are based on estimated movements in the underlying supply chain cost components.

Figure 3.1 Trend in South East Queensland *market offer* and *standing offer* prices



3.1.1 Drivers of cost trends

The key drivers of costs during the reporting period are increases in competitive market and Queensland Solar Bonus Scheme costs, and decreases in regulated network costs.

Competitive market costs are expected to increase at an average annual rate of 8.8 per cent, including increases of 6.8 per cent in 2015/16, 3.2 per cent in 2016/17 and 16.9 per cent in 2017/18. These increases reflect higher wholesale electricity costs due to AEMO's forecast of expected growth in electricity consumption, and higher gas prices. Competitive market costs comprise 39 per cent of the representative *market offer* in the base year.

Growth in electricity consumption is expected as the LNG facilities at Gladstone ramp-up to full export capacity during the period to 2017/18.[38]AEMO has forecast growth in electricity consumption in the residential and commercial sector due to assumed population growth.[39] Expected consumption growth leads to a tighter supply/demand balance and therefore higher wholesale electricity costs.

The ramp-up of the LNG facilities will also result in higher gas prices across all east coast jurisdictions, which create rising costs for generators and contribute to rising wholesale electricity costs. In 2016/17, a temporary decrease is observed in the Queensland gas price forecast due to there being surplus gas during the LNG ramp-up phase. This contributes to a slower rate of increase in wholesale electricity costs in 2016/17.

Regulated network costs are currently expected to decrease at an average annual rate of 6.7 per cent, including decreases of 21.5 per cent in 2015/16 and 2.1 per cent in 2016/17 and increase by 5.5 per cent in 2017/18. This trend reflects expected movements in distribution network costs. The expected decreases in distribution network costs more than offset rising transmission network costs across the reporting period. In 2014/15, regulated network costs comprise 53 per cent of the representative *market offer*.

The trend in regulated network costs reflects the AER's final decision on the regulated revenue for the distribution network business during 2015-19. The final decision specifies a lower cost of capital allowance as well as reductions in capital and operational spending.

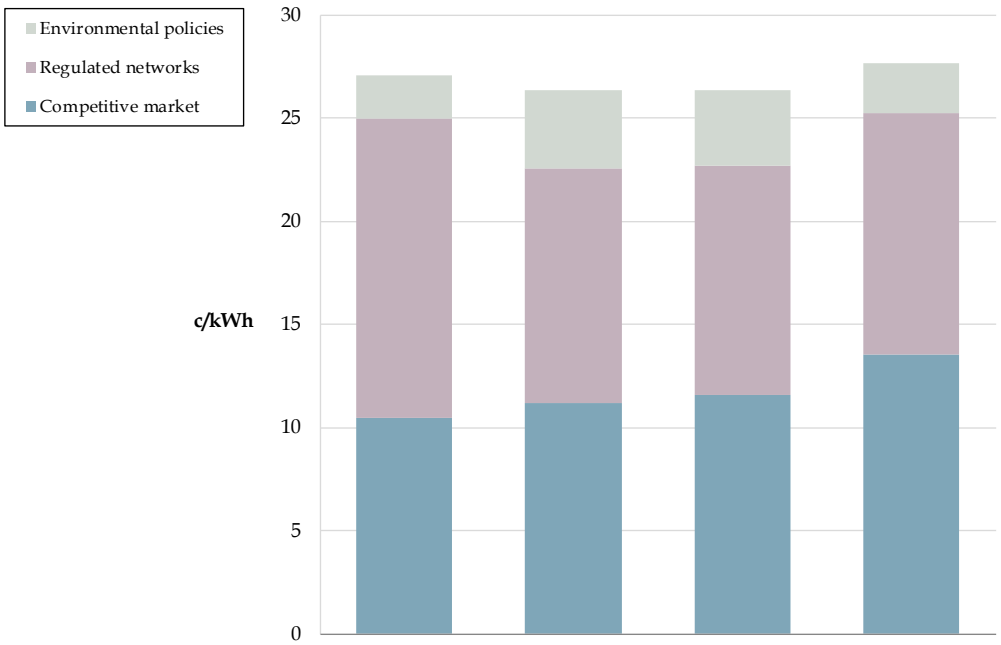
Environmental policy costs increase at an annual average of 5.1 per cent over the reporting period, including a large increase in 2015/16 of 82 per cent, and decreases of 3.3 per cent in 2016/17 and 34 per cent in 2017/18. For administrative reasons, there used to be a two year lag between when the Queensland Solar Bonus Scheme costs were incurred by network businesses and when they are recovered from consumers. With the start of the new regulatory period in 2015/16, it is possible for costs to be recovered from consumers in the same year that they are incurred. Hence in 2015/16 and 2016/17 only, the scheme costs include both the current year costs as well as the costs from two years prior.

Figure 3.2 shows the expected movements in the supply chain cost components for South East Queensland.

38 Grid electricity is used for compression and to run auxiliaries during gas production and could be used for mid-point compression during gas transmission. Lewis Grey Advisory, Projections of Gas and Electricity Used in LNG, prepared for the Australian Energy Market Operator, 15 April 2015, p14.

39 AEMO, 2015 National Electricity Forecasting Report, detailed summary of 2015 electricity forecasts, June 2015, p24.

Figure 3.2 Trend in South East Queensland supply chain cost components



	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**2.09**	**$108**	**3.79**	**$196**	**3.67**	**$190**	**2.42**	**$125**
LRET	0.48	$25	0.58	$30	0.73	$38	0.89	$46
SRES	0.48	$25	0.47	$24	0.43	$22	0.43	$22
Solar bonus scheme	1.12	$58	2.74	$142	2.51	$130	1.10	$57
Regulated networks	**14.46**	**$748**	**11.36**	**$588**	**11.12**	**$575**	**11.73**	**$607**
Transmission	2.29	$119	2.48	$128	2.59	$134	2.59	$134
Distribution	12.17	$630	8.88	$459	8.53	$441	9.14	$473
Competitive market	**10.49**	**$543**	**11.20**	**$580**	**11.56**	**$598**	**13.52**	**$699**
Wholesale and retail								
Total	**27.04**	**$1,399**	**26.35**	**$1,363**	**26.35**	**$1,363**	**27.67**	**$1,431**

3.1.2 Developments that could affect residential electricity prices in Queensland

The following jurisdiction-specific factors may impact residential electricity prices during the reporting period:

- In April 2015, the Queensland Treasurer announced that the deregulation of retail prices for residential and small business customers in South East Queensland would be delayed until July 2016. The delay allows the Queensland Productivity Commission time to undertake a public inquiry into electricity prices.[40] This was to enable the Queensland Productivity Commission to assess the costs and benefits of deregulation and whether current market monitoring

40 C Pitt (Queensland Treasurer), *Deregulation deferred as Productivity Commission conducts power price probe*, media statement, 28 April 2015.

arrangements and consumer protections are adequate. An interim report is due to be delivered to the Queensland Government by the end of January 2016.[41]

- The Queensland Government has announced a number of initiatives to promote renewable energy in Queensland, including targeting one million rooftops with solar by 2020, 50 per cent renewable energy by 2030 and a commitment to support up to 60 MW of large-scale solar generation in Queensland.[42]

3.1.3 Methodology

The analysis of residential prices and cost components applies to a typical residential consumer in Queensland consuming 5,173 kWh annually, of which 1,552 kWh is allocated to Tariff 33, a controlled-load tariff. Data provided by Energex, the distribution network business for South East Queensland, shows that close to 60 per cent of residential consumers have part of their consumption on a controlled-load tariff.[43]

The methodology for estimating electricity supply chain costs in Queensland is summarised as follows:

- **Competitive market sector**: Wholesale energy cost estimates are based on the electricity market modelling undertaken for this report by Frontier Economics. The retail component is the residual calculated for the base year when all non-retail cost components are subtracted from the representative *market offer* price, and is assumed to increase at an annual inflation rate of 2.5 per cent.
- **Regulated network sector**: Transmission and distribution network costs are estimated using revenue determinations made by the AER as well as Energex's approved pricing proposals. The current transmission determination applies until 30 June 2017. Transmission network costs have been held constant in nominal terms for 2017/18. The previous distribution determination ended on 30 June 2015. For the subsequent years of the reporting period the AER's final decision for the 2015-20 regulatory period is applied.
- **Environmental policies**: Analysis of the costs associated with the Renewable Energy Target was undertaken by Frontier Economics assuming an annual target of 33,000 GWh by 2020. Costs arising from the Queensland Solar Bonus Scheme are based on information provided by Energex. Energex allocates the costs of the scheme between the tariff classes proportional to the amount of revenue that is recovered from each class.

41 Queensland Productivity Commission, *Public Inquiry into Electricity Prices* Terms of Reference, April 2015 *http://www.qpc.qld.gov.au/inquiries/public-inquiry-into-electricity-pricing/*.

42 Queensland Government, A solar future-powering Queensland's renewable energy industries, https://www.dews.qld.gov.au/energy-industry/renewable-energy/projects/a-solar-future

43 Controlled-load tariffs are cheaper than the general tariff and controlled by the distribution network business. These tariffs most typically apply to hot water systems and pool pumps, but can also be used for other applications.

3.2 New South Wales

In New South Wales, the most common type of residential electricity consumer (the representative consumer) is a two-person household with no pool, no mains gas connection and electric hot water on an off-peak tariff. The representative consumer uses 5,936 kWh of electricity each year, of which 1,900 kWh is allocated to the off-peak tariff.[44]

Residential electricity *market offer* prices in New South Wales are expected to decrease by 5.3 per cent in 2015/16, before increasing by 1.4 per cent in 2016/17 and 2.6 per cent in 2017/18. This is equivalent to an average annual decrease of 0.5 per cent for the representative consumer over the reporting period.

The decrease in 2015/16 is mostly due to lower distribution network costs, which are expected to fall across the reporting period following the AER's final decisions for the distribution network businesses for the 2015-19 regulatory period. Increases in 2016/17 and 2017/18 are mainly due to rising competitive market costs outweighing reductions in network costs.

New South Wales consumers have a choice of two different types of retail offer: *standing offers* and *market offers*. All of these offers feature prices set by retailers in the competitive market. With the removal of retail price regulation on 1 July 2014, regulated offers are no longer available in New South Wales.[45]

In New South Wales, approximately 67% of consumers have switched to a *market offer*.[46]

In 2014/15, a representative consumer on a *standing offer* using 5,936 kWh per year had a total annual bill of $1,438, exclusive of GST. This consumer may have saved around $127, or 8.8 per cent, by switching from a *standing offer* to the representative *market offer*.[47]

Figure 3.3 shows expected movements in *standing offer* and *market offer* prices in New South Wales, exclusive of GST. For 2014/15, the *standing offer* and representative *market offer* prices were estimated using retailer data sourced through the Australian Energy Regulator's Energy Made Easy price comparator website. For future years, the trends for the *standing offer* and *market offer* prices are based on estimated movements in the underlying supply chain cost components.

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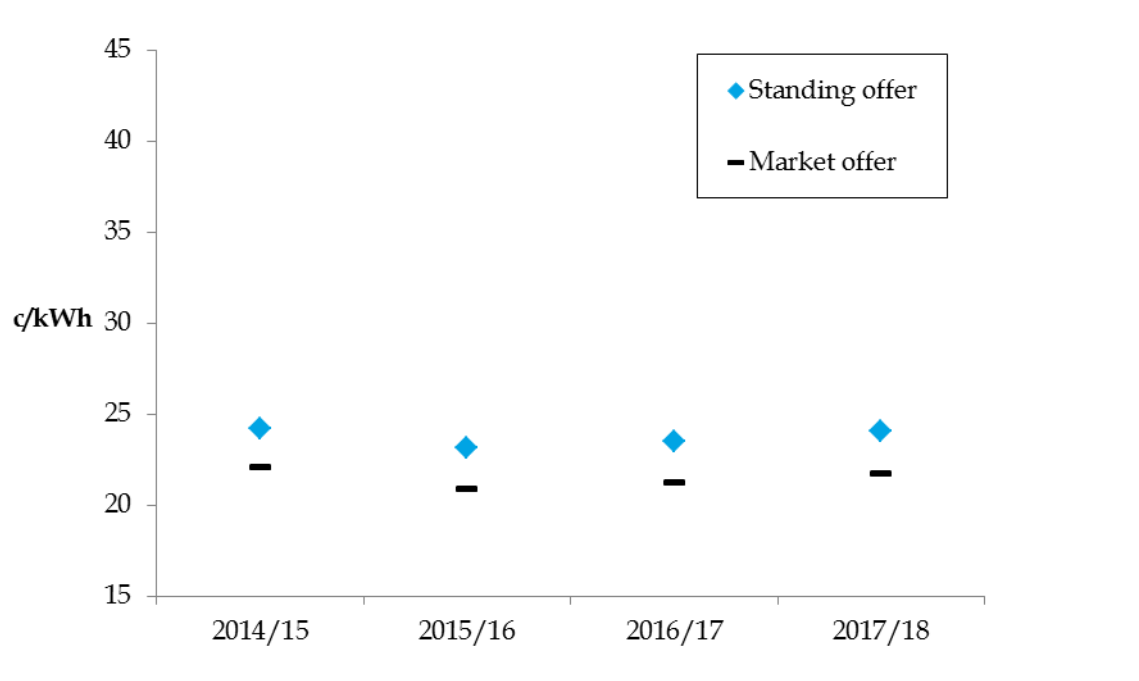
44 This consumption level was calculated from benchmark values published by the AER. ACIL Allen Consulting, Electricity Bill Benchmarks for Residential Customers, a report to the Australian Energy Regulator, October 2014.

45 Consumers that were on the regulated offer immediately prior to 1 July 2014 were placed on a transitional offer, unless they elected to move to a *standing offer* or a *market offer*. The transitional offer featured a 1.5 per cent price reduction off the regulated offer. Consumers can choose to move from the transitional offer to a *market offer* at any time. In 2015/16 the transitional offer price increase will be capped at the rate of inflation. The transitional offer ends for residential customers on 30 June 2016.

46 Australian Energy Market Commission, *2015 Retail Competition Review*, Final Report, 30 June 2015, p245.

47 This indicative saving is based on a representative consumer on a representative *standing offer* switching to the representative *market offer*, as defined in this report. Actual savings will depend on individual circumstances.

Figure 3.3 Trend in New South Wales *market offer* and *standing offer* prices



3.2.1 Drivers of cost trends

The key drivers of costs during the reporting period are decreases in regulated network costs, and increases in competitive market and environmental policy costs.

Regulated network costs are currently expected to decrease at an average annual rate of 6.2 per cent, including decreases of 15.9 per cent in 2015/16, 1.5 per cent in 2016/17 and 0.3 per cent in 2017/18. This trend reflects expected movements in transmission and distribution network costs. While transmission prices rise in 2015/16, the increase is more than offset by decreases in distribution prices. In 2014/15, regulated network costs comprised 56 per cent of the representative *market offer*.

The trend in regulated network costs reflects the AER's final decision on the regulated revenue for the transmission and distribution network businesses during their respective 2014-18 and 2015-19 regulatory periods. The final decisions specify a lower cost of capital allowance as well as reductions in operational spending. The final decision also specified reductions in capital spending for all three of the New South Wales distribution businesses and for the New South Wales transmission business.[48] The trend is subject to the outcomes of merits reviews and the operation of the electricity price guarantee connected to the sale of network assets.

Competitive market costs are expected to increase at an average annual rate of 5.2 per cent, including increases of 7.7 per cent in 2015/16, 3.6 per cent in 2016/17 and 4.4 per cent in 2017/18. These increases reflect higher wholesale electricity costs due to the

48 The final decision documents are available from the AER's website.

growth in electricity consumption and higher gas prices. In 2014/15, competitive market costs comprised 37 per cent of the representative *market offer*.[49]

Growth in electricity consumption is forecast by AEMO due to increases in residential and commercial electricity consumption in response to expected income growth and decreases in retail prices. This leads to a tighter supply/demand balance and therefore higher wholesale electricity costs.

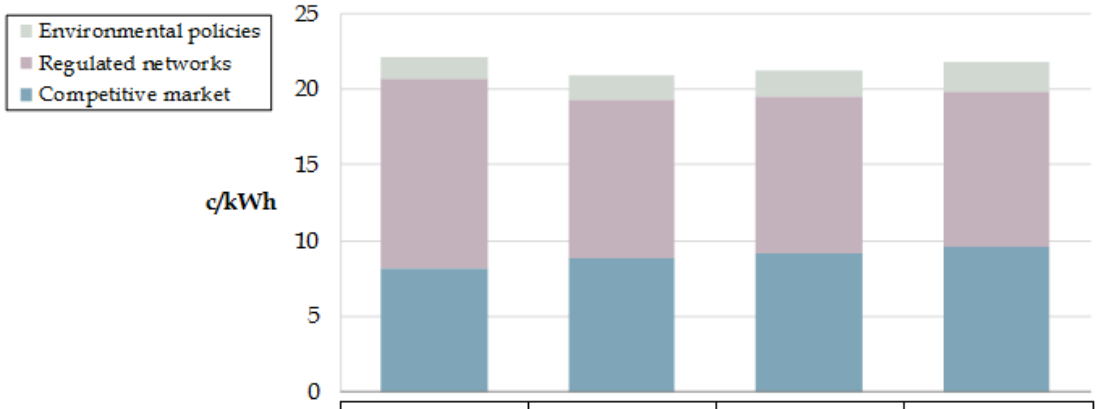
All east coast jurisdictions experience rising gas prices over the period to 2017/18, which creates rising costs for generators and contributes to rising wholesale electricity market costs.

Environmental policy costs increase at an annual average of 10 per cent over the reporting period mainly due to increasing Large-scale Renewable Energy Target costs. Costs associated with the New South Wales Government's Climate Change Fund are the same for each year of the reporting period. Minor increases in the Energy Savings Scheme costs are partially offset by small decreases in the Small-scale Renewable Energy Scheme costs. In 2014/15, environmental policy costs comprised 6.4 per cent of the representative *market offer*.

Figure 3.4 shows the expected movements in the supply chain cost components for New South Wales.

49 Wallerawang C power station retired in 2014/15, which removed 1,000 MW of capacity from the New South Wales wholesale electricity market. This generator retirement has been accounted for in the electricity market modelling undertaken for this report by Frontier Economics and therefore will not have any further impact on residential electricity prices during the reporting period.

Figure 3.4 Trends in New South Wales supply chain components



	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**1.42**	**$ 85**	**1.59**	**$ 95**	**1.73**	**$ 103**	**1.91**	**$ 113**
LRET	0.49	$ 29	0.59	$ 35	0.74	$ 44	0.90	$ 54
SRES	0.49	$ 29	0.48	$ 28	0.44	$ 26	0.43	$ 26
Climate Change fund	0.39	$ 23	0.39	$ 23	0.39	$ 23	0.39	$ 23
Energy Saving Scheme	0.06	$ 3	0.13	$ 8	0.16	$ 10	0.17	$ 10
Regulated networks	**12.43**	**$ 738**	**10.46**	**$ 621**	**10.30**	**$ 611**	**10.27**	**$ 609**
Transmission	1.66	$ 99	2.61	$ 155	2.56	$ 152	2.52	$ 150
Distribution	10.77	$ 639	7.85	$ 466	7.74	$ 459	7.74	$ 460
Competitive market	**8.24**	**$ 489**	**8.88**	**$ 527**	**9.20**	**$ 546**	**9.61**	**$ 570**
Wholesale and retail								
Total	**22.10**	**$1,312**	**20.93**	**$1,242**	**21.23**	**$1,260**	**21.78**	**$1,293**

3.2.2 Developments that could affect residential electricity prices in New South Wales

The following jurisdiction-specific factors may impact residential electricity prices during the reporting period:

- The New South Wales distribution businesses have made applications to the Australian Competition Tribunal for a review of the AER's recent distribution determinations. The trend in regulated network costs will depend on the outcomes of these merits reviews. TransGrid has not appealed the AER's decision on transmission revenue for 2014-18. The trend may also be affected to the extent the electricity price guarantee, which is set out in the *Electricity Network Assets (Authorised Transactions) Act* 2015, operates to cap network costs at the level they were in the financial year ending 30 June 2014.
- In November 2014, the New South Wales Government announced its intention to expand its Energy Savings Scheme to include gas and extend the scheme to 2025. The New South Wales Government has been consulting on further improvements, including enhancing targets and penalty rates.[50]

50 A Roberts (New South Wales Minister for Resources and Energy), *World-leading scheme to help reduce gas bills*, media statement, 11 November 2014.

3.2.3 Methodology

The analysis of residential prices and cost components applies to a typical residential consumer in New South Wales consuming 5,936 kWh annually, of which 1,900 kWh is allocated to a controlled-load tariff. New South Wales distribution network business data published by the AER shows that 45 per cent of residential consumers are on a controlled-load tariff.[51]

The methodology for estimating electricity supply chain costs in New South Wales is summarised as follows:

- **Competitive market sector**: Wholesale energy cost estimates are based on the electricity market modelling undertaken for this report by Frontier Economics. The retail component is the residual calculated for the base year when all non-retail cost components are subtracted from the representative *market offer* price, and is assumed to increase at an annual inflation rate of 2.5 per cent
- **Regulated network sector:** The network cost estimates for 2014/15 and 2015/16 are based on the New South Wales network businesses' approved pricing proposals. For the remaining two years, network costs are estimated using the AER's final transmission and distribution decisions for their respective 2014-18 and 2015-19 regulatory periods.
- **Environmental policies**: Analysis of the Renewable Energy Target was undertaken by Frontier Economics assuming an annual target of 33,000 GWh by 2020. Costs arising from state-based schemes are based on information provided by the New South Wales Government and sourced from network businesses' annual pricing proposals.

3.3 Australian Capital Territory

In the Australian Capital Territory, the most common type of residential electricity consumer (the representative consumer) is a two-person household with a mains gas connection and no pool. The representative consumer uses 7,312 kWh of electricity each year.[52]

Residential electricity prices in the Australian Capital Territory (ACT) are expected to decrease by 4.7 per cent in 2015/16, before increasing by 1.7 per cent in 2016/17 and 4.5 per cent in 2017/18. This is equivalent to an average annual increase of 0.4 per cent for the representative consumer over the reporting period.

The decrease in 2015/16 is mostly due to lower regulated network costs and competitive market costs. Falling network costs across the reporting period are based on the AER's final decisions for both the transmission and distribution network businesses for their respective 2014-18 and 2015-19 regulatory periods.

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51 Controlled-load tariffs are cheaper than the general tariff and controlled by the distribution network business. These tariffs most typically apply to hot water systems and pool pumps, but can also be used for other applications.

52 This consumption level was calculated from benchmark values published by the AER. ACIL Allen Consulting, *Electricity Bill Benchmarks for Residential Customers, a report to the Australian Energy Regulator*, October 2014.

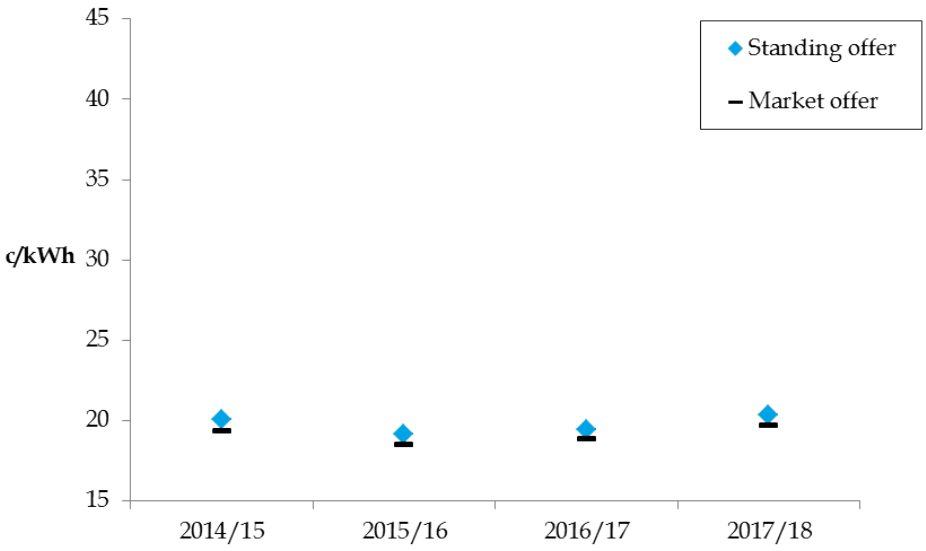
Expected price rises in the last two years of the reporting period are mainly due to increases in wholesale electricity and environmental policy costs, which outweigh the reductions in regulated network costs.

Approximately 22 per cent of consumers in the ACT have switched to a *market offer*.[53]

In 2014/15, a representative consumer on the regulated *standing offer* using 7,312 kWh per year had a total annual bill of $1,468, exclusive of GST. This consumer may have saved around $52, or 3.6 per cent, by switching from the regulated *standing offer* to the representative *market offer*.[54]

Figure 3.5 shows expected movements in the regulated *standing offer* and *market offer* prices for the ACT, exclusive of GST. The regulated *standing offer* prices are based on the Independent Competition and Regulatory Commission's electricity price direction for 2014/15, and its annual price recalibration for 2015/16. The representative *market offer* price for 2014/15 was estimated using retailer data sourced through the Australian Energy Regulator's Energy Made Easy price comparator website. For future years, the trends for the regulated *standing offer* and *market offer* prices are based on estimated movements in the underlying supply chain cost components.

Figure 3.5 Trends in Australian Capital Territory *market offer* and *standing offer* prices



3.3.1 Drivers of cost trends

The key drivers of costs during the reporting period are expected increases in competitive market and solar feed-in tariff scheme costs. These increases are partially offset by decreases in regulated network costs.

53 AEMC, *2015 Retail Competition Review*, Final Report, 30 June 2015, p248.

54 This indicative saving is based on a representative consumer on a regulated *standing offer* switching to the representative *market offer*, as defined in this report. Actual savings will depend on individual circumstances.

Regulated network costs are currently expected to decrease at an average annual rate of 3.6 per cent, including decreases of 10 per cent in 2015/16, 0.5 per cent in 2016/17 and no change in 2017/18. In 2014/15, regulated network costs comprised 42 per cent of the *standing offer* price.

The trend in regulated network costs is based on the AER's final decision on the regulated revenue for the transmission and distribution network businesses for their respective 2014-18 and 2015-19 regulatory periods. The final decisions specify a lower cost of capital allowance as well as reductions in capital and operational spending.[55] Trends in network costs are subject to the outcomes of a merits review.

Competitive market costs are expected to decrease by 3.1 per cent in 2015/16, before increasing by 3.5 per cent in 2016/17 and 4.4 per cent in 2017/18. The increases reflect higher wholesale electricity costs due to AEMO's forecast growth in electricity consumption, and higher gas prices. In 2014/15, competitive market costs comprised 47 per cent of the *standing offer* price.

AEMO has forecast growth in electricity consumption due to increases in residential and commercial electricity consumption in response to expected income growth and decreases in retail prices. This leads to a tighter supply/demand balance and therefore higher wholesale electricity costs.

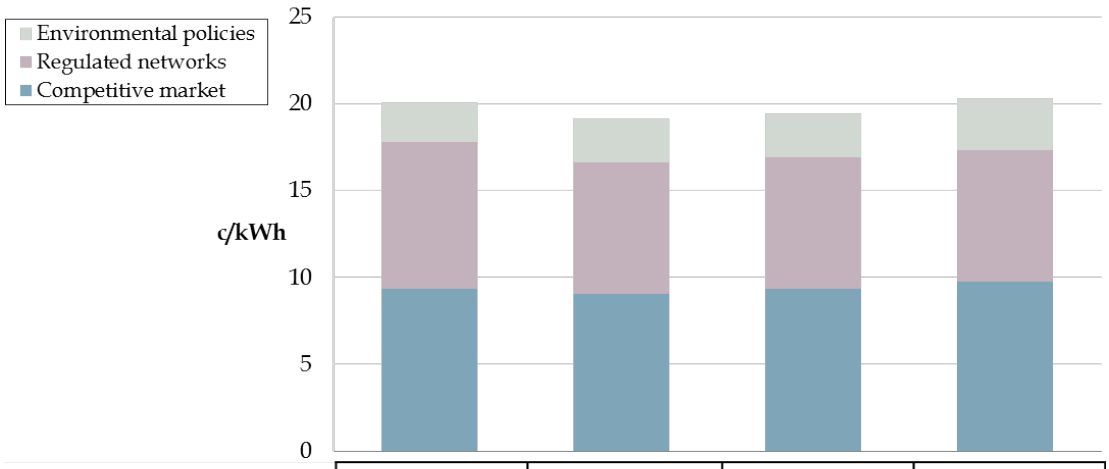
All east coast jurisdictions experience higher gas prices over the period to 2017/18, which creates rising costs for generators and contributes to rising wholesale electricity market costs.

Solar and wind feed-in tariff costs relate to schemes introduced by the ACT Government to support the uptake of small-scale solar PV systems and large-scale solar PV and wind generation. The costs of these schemes are recovered from consumers through distribution network costs. In 2014/15, environmental policy costs comprised 11 per cent of the *standing offer* price. Solar and wind feed-in tariff costs are expected to increase at an average annual rate of 17 per cent.

Figure 3.6 shows the expected movements in the supply chain cost components for the ACT.

55 The final decision documents are available from the AER's website.

Figure 3.6 Trends in Australian Capital Territory supply chain components



	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**2.28**	**$167**	**2.48**	**$182**	**2.53**	**$185**	**3.00**	**$220**
LRET	0.46	$34	0.56	$41	0.70	$51	0.86	$63
SRES	0.47	$34	0.45	$33	0.42	$30	0.41	$30
FIT schemes	0.86	$63	0.96	$70	1.07	$78	1.39	$102
EEIS	0.49	$36	0.51	$37	0.34	$25	0.34	$25
Regulated networks	**8.45**	**$618**	**7.61**	**$556**	**7.57**	**$553**	**7.57**	**$553**
Transmission	2.20	$161	2.35	$172	2.31	$169	2.28	$167
Distribution	6.26	$457	5.26	$384	5.26	$385	5.29	$387
Competitive market	**9.34**	**$683**	**9.05**	**$662**	**9.37**	**$685**	**9.78**	**$715**
Wholesale and retail								
Total	**20.08**	**$1,468**	**19.14**	**$1,399**	**19.46**	**$1,423**	**20.35**	**$1,488**

3.3.2 Developments that could affect residential electricity prices in the ACT

The following jurisdiction-specific factors may impact residential electricity prices during the reporting period:

- ActewAGL has made an application to the Australian Competition Tribunal for a review of the ActewAGL distribution determination made by the AER. The trend in regulated network costs will depend on the outcomes of this merits review.[56]

3.3.3 Methodology

The analysis of residential prices and cost components applies to a typical residential consumer in the ACT consuming 7,312 kWh per year.

The methodology for estimating electricity supply chain costs in the ACT is summarised as follows:

- **Competitive market sector**: Wholesale and retail market costs for 2014/15 and 2015/16 are sourced from ActewAGL's approved pricing proposals. For 2016/17 and 2017/18, the retail component was escalated by the assumed rate of inflation

56 See Australian Competition Tribunal website, accessed 23 July 2015 at: http://www.competitiontribunal.gov.au/current-matters/tribunal-documents/act-5-2015

of 2.5 per cent and wholesale costs were escalated by the expected trend in New South Wales wholesale energy prices, as modelled by Frontier Economics for this report.

- **Regulated network sector**: The network cost estimates for 2014/15 and 2015/16 are based on ActewAGL's approved pricing proposals. For the remaining two years, network costs are estimated using the AER's final decisions for both TransGrid and ActewAGL for their respective 2014-18 and 2015-19 regulatory periods.
- **Environmental policies**: Analysis of the Renewable Energy Target was undertaken by Frontier Economics assuming an annual target of 33,000 GWh by 2020. Costs associated with the state-based schemes are based on costs published by the ACT Independent Competition and Regulatory Commission for 2014/15 and 2015/16, and a cost trend from proved by the ACT Government for 2016/17 and 2017/18.

3.4 Victoria

In Victoria, the most common type of residential electricity consumer (the representative consumer) is a two-person household with a mains gas connection and no pool. The representative consumer uses 4,026 kWh of electricity each year.[57]

Residential *market offer* electricity prices in Victoria are expected to increase by 1.4 per cent in 2015/16, decrease by 3.2 per cent in 2016/17 and then increase by 1.0 per cent in 2017/18. This is equivalent to a 0.3 per cent decrease on an annual average basis for the representative consumer over the reporting period.

The increase in 2015/16 is due to higher competitive market costs. In 2016/17, further increases in competitive market costs are more than offset by lower regulated network costs. The increase in 2017/18 reflects increases in competitive market costs outweighing a decrease in network costs.

Approximately 89 per cent of Victorian consumers are on *market offer*.[58]

In 2014/15, a representative consumer on a representative *standing offer* using 4,026 kWh per year had a total annual bill of $1,452 , exclusive of GST. This consumer may have saved around $306, or 21 per cent, by switching from a representative *standing offer* to the representative *market offer*.[59]

Figure 3.7 shows expected movements in *standing offer* and *market offer* prices in Victoria, exclusive of GST. For 2014/15, the *standing offer* and representative *market offer* price were estimated using retailer data sourced through the Victorian Government's My Power Planner price comparator website. For future years, the trends for the

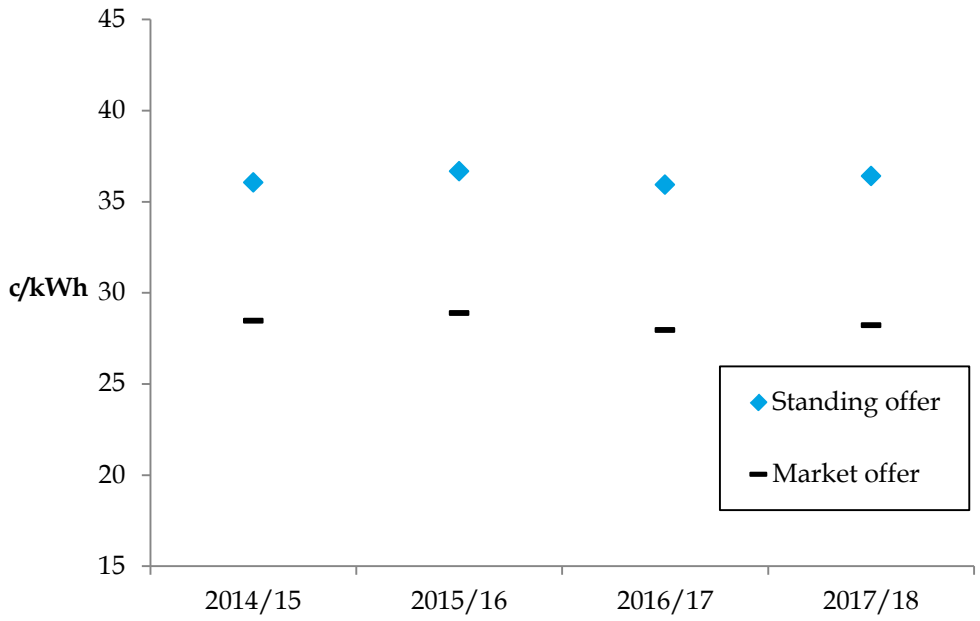
57 This consumption level was calculated from benchmark values published by the AER. ACIL Allen Consulting, Electricity Bill Benchmarks for Residential Customers, a report to the Australian Energy Regulator, October 2014.

58 Australian Energy Market Commission, *2015 Retail Competition Review*, Final Report, 30 June 2015, p251.

59 This indicative saving is based on a representative consumer on a *standing offer* switching to the representative *market offer*, as defined in this report. Actual savings will depend on individual circumstances.

standing offer and *market offer* prices are based on estimated movements in the underlying supply chain cost components.

Figure 3.7 Trends in Victorian market offer and standing offer prices



3.4.1 Drivers of cost trends

The key driver of costs during the reporting period is expected increases in wholesale electricity costs. There are also minor increases in regulated network costs and environmental policy costs.

Competitive market costs are expected to increase at an average annual rate of 4.9 per cent. These increases reflect higher wholesale electricity costs due to forecast increases in electricity consumption, generator retirements and higher gas prices. The assumption that the retail component will increase by an annual inflation rate of 2.5 per cent also contributes. In 2014/15, competitive market costs comprised 46 per cent of the representative *market offer* price.

Growth in electricity consumption is expected in the period to 2017/18, based on the AEMO's assumptions about consumer responses to the fall in retail electricity prices following the carbon price removal, as well as forecast population and income growth.[60]

Generator retirements, including Anglesea Power Station in Victoria and Northern Power Station in South Australia, also contribute to expected increases in wholesale electricity costs.[61] The closure of Northern Power Station impacts on Victorian

60 AEMO, *2015 National Electricity Forecasting Report*, detailed summary of 2015 electricity forecasts, June 2015.

61 In modelling wholesale electricity prices, Frontier Economics assumed that Anglesea Power Station will close on 1 September 2015 and Northern Power Station on 1 July 2016.

wholesale electricity costs as it is likely that more electricity will be exported from Victoria into South Australia across the upgraded Heywood interconnector.

Increasing consumption and generator retirements tighten the supply-demand balance in the short-term. This has the effect of putting upward pressure on wholesale electricity costs in the NEM.

Victorian gas prices are expected to increase by around 20 per cent, or $1/GJ, between 2014/15 and 2017/18. This increases the cost of electricity supplied by gas-fired generators.

Over the reporting period, the average annual decrease in regulated network costs is currently expected to be 6.7 per cent. This includes decreases of 4.8 per cent in 2015/16, 11 per cent in 2016/17 and 3.9 per cent in 2017/18. These expected price movements are an average of five distribution network regions. When considered individually, the size and direction of the price movements vary between the different network regions. In 2014/15, regulated network costs comprised 47 per cent of the representative *market offer* price.

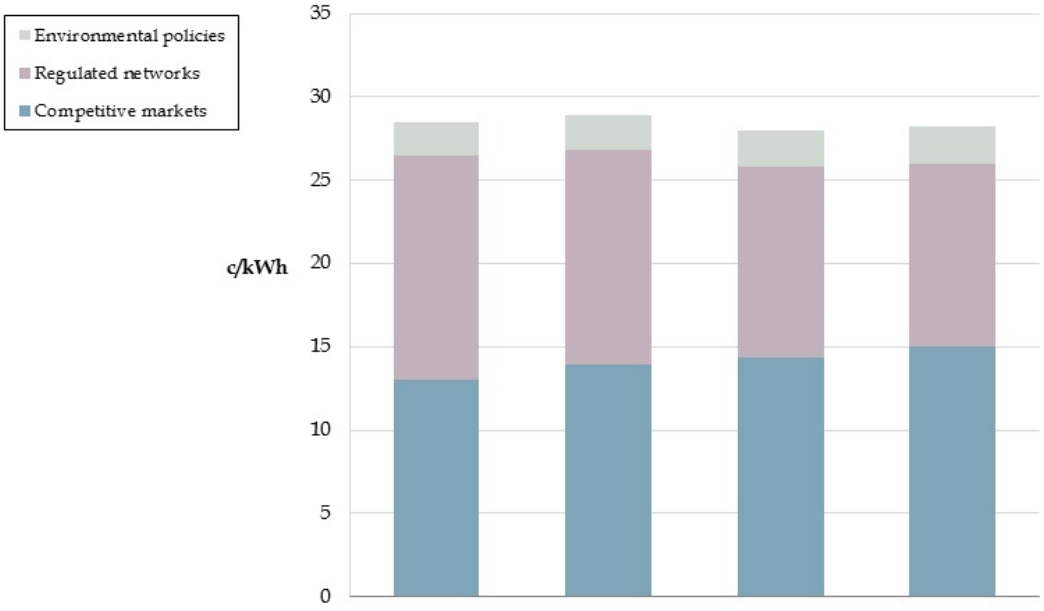
A number of different sources have been used to determine the expected trend in network costs over the reporting period:

- the AER distribution determinations that were made under the previous rules for network regulation for 2014/15; and
- the AER draft decisions that were made under the current rules for network regulation for the remainder of the reporting period.

Environmental policy costs are expected to increase by an annual average rate of 4.3 per cent between 2014/15 and 2017/18. This is primarily due to increases in the Large-scale Renewable Energy Target costs, which are partially offset by decreases in the Small-scale Renewable Energy Scheme and the Victorian Government's solar feed-in tariff scheme.

Figure 3.8 shows the expected movements in the supply chain cost components.

Figure 3.8 Trends in Victorian supply chain components



	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**1.96**	**$ 79**	**2.07**	**$ 83**	**2.16**	**$ 87**	**2.23**	**$ 90**
LRET	0.48	$ 19	0.58	$ 23	0.73	$ 29	0.89	$ 36
SRES	0.48	$ 19	0.47	$ 19	0.43	$ 17	0.43	$ 17
Feed in Tariff schemes	0.79	$ 32	0.81	$ 33	0.73	$ 29	0.67	$ 27
Victorian Energy Efficiency Target	0.21	$ 8	0.21	$ 8	0.27	$ 11	0.24	$ 10
Regulated networks	**13.51**	**$ 544**	**12.85**	**$ 517**	**11.43**	**$ 460**	**10.98**	**$ 442**
Transmission	1.55	$ 63	1.50	$ 61	1.47	$ 59	1.47	$ 59
Distribution	11.95	$ 481	11.35	$ 457	9.96	$ 401	9.51	$ 383
Competitive market Wholesale and retail	**13.01**	**$ 524**	**13.96**	**$ 562**	**14.37**	**$ 578**	**15.02**	**$ 605**
Total	**28.47**	**$ 1,146**	**28.89**	**$ 1,163**	**27.96**	**$ 1,126**	**28.23**	**$ 1,136**

3.4.2 Developments that could affect residential electricity prices in Victoria

The following jurisdiction-specific factors may impact residential electricity prices during the reporting period:

- Victorian Energy Efficiency Target (VEET) scheme costs presented in this report reflect the most recent modelling of the VEET scheme undertaken by the Victorian Government in 2015. VEET scheme targets for 2016 to 2020 have now been announced, increasing in increments from the current target of 5.4 million tonnes of CO2-e in 2016 to 6.5 million tonnes in 2020.[62]
- The Victorian Government is also developing an Energy Efficiency and Productivity Strategy to further support energy efficiency. It signalled directions and priorities in this area in its Energy Efficiency and Productivity Statement, released in June 2015.

62 Victorian government *Energy and Earth Resources* website, http://www.energyandresources.vic.gov.au/energy/about/legislation-and-regulation/energy-saver-incentive, viewed 9 November 2015.

- The Victorian Government is conducting an Inquiry into the True Value of Distributed Generation to Victorian Consumers, which may have implications for the future levels of Victoria's feed-in tariffs.

3.4.3 Methodology

The analysis of residential prices and cost components applies to a representative residential consumer in Victoria using 4,026 kWh per year.

The methodology for estimating electricity supply chain costs in Victoria is summarised as follows:

- **Competitive market sector**: Wholesale energy cost estimates are based on electricity market modelling undertaken for this report by Frontier Economics. The retail component is the residual calculated for the base year when all non-retail cost components are subtracted from the representative *market offer* price, and is assumed to increase at an annual inflation rate of 2.5 per cent.
- **Regulated network sector**: For 2014/15, regulated network costs are based on the distribution network businesses' approved pricing proposals for the 2014 and 2015 calendar years. For the remaining years of the reporting period, distribution network costs are based on the AER's draft determinations for the distribution network businesses'. Transmission network costs are based on an existing AER determination, which ends on 30 March 2017. After this time it is assumed that transmission network costs will remain constant in nominal terms.
- **Environmental policies**: Analysis of the Renewable Energy Target was undertaken by Frontier Economics assuming an annual target of 33,000 GWh by 2020. Costs arising from state-based environmental schemes are based on information provided by the Victorian Government and sourced from network businesses' annual pricing proposals.

3.5 South Australia

Residential electricity prices in South Australia are expected to decrease by 7.2 per cent in 2015/16, then increase by 6.8 per cent in 2016/17 and 3.4 per cent in 2017/18. This is equivalent to an average annual increase of 0.8 per cent for the representative consumer over the reporting period.

The decrease in 2015/16 is due to lower regulated network costs and a reduction in solar feed-in tariff scheme costs. The increase in 2016/17is due to rising competitive market and regulated network costs. The increase in 2017/18 reflects minor increases in most of the supply chain cost components.

In South Australia, approximately 84 per cent of consumers have switched to a *market offer*.[63]

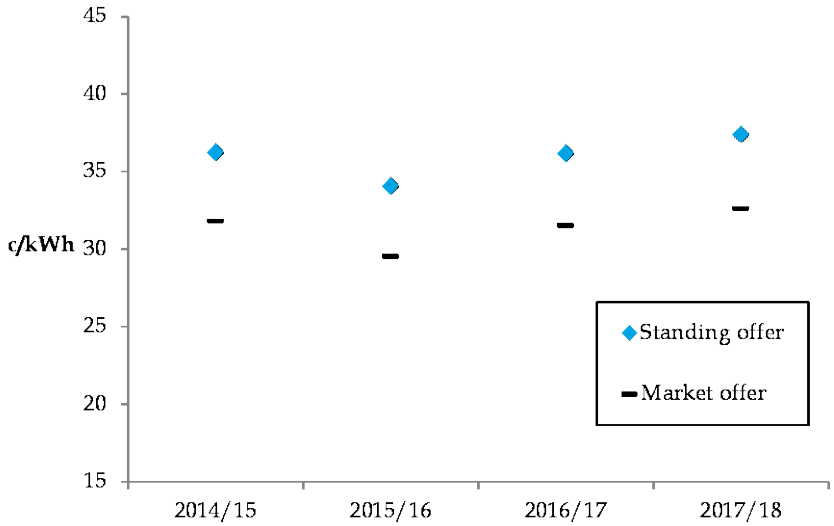
In 2014/15, a representative consumer on the representative *standing offer* using 5,000 kWh per year had a total annual bill of $1,811, exclusive of GST.[64]This consumer may

63 AEMC, *Retail Competition Review,* June 2015, p254

have saved around $222, or 12 per cent, by switching from the representative *standing offer* to the representative *market offer*.[65]

Figure 3.9 shows expected movements in *standing offer* and *market offer* prices for South Australia, exclusive of GST. For 2014/15, the *standing offer* and representative *market offer* price were estimated using retailer data sourced through the Australian Energy Regulator's Energy Made Easy price comparator website. For future years, the trends for the *standing offer* and *market offer* prices are based on estimated movements in the underlying supply chain cost components.

Figure 3.9 Trend in South Australian *market offer* and *standing offer* prices



3.5.1 Drivers of cost trends

The key drivers of costs during the reporting period are expected decreases in regulated network costs and solar feed-in tariff scheme costs, and increases in competitive market costs.

Regulated network costs are currently expected to decrease at an average annual rate of 1.8 per cent, including a decrease of 18 per cent in 2015/16, followed by increases of 8.7 per cent in 2016/17 and 5.3 per cent in 2017/18. This trend reflects expected movements in distribution network costs, which initially decrease before increasing in 2017/18. In 2014/15, regulated network costs comprised 51 per cent of the representative *market offer* price.

The trend in distribution network costs is based on the AER's final decision on the regulated revenue for the distribution network business during 2015-20. The decrease in distribution prices is driven by a lower rate of return for the 2015-20 regulatory

64 The representative consumption level was provided to the AEMC by South Australian Government officials. This consumption level is also used in key publications from the Essential Services Commission of South Australia and SA Power Networks.

65 This indicative saving is based on a representative consumer on a representative *standing offer* switching to the representative market offer, as defined in this report. Actual savings will depend on individual circumstances.

period, compared to the 2010-15 regulatory period. However the actual trends in network costs are subject to merits reviews.

Transmission network costs are expected to increase across the reporting period. This trend is based on a regulatory determination made by the AER in 2013 under the previous network regulation rules.

Solar feed-in tariff costs relate a scheme introduced by the South Australian Government to support the uptake of solar PV systems. The scheme is now closed to new entrants, however the costs continue to be recovered from consumers through distribution network costs. One part of the scheme ends on 30 September 2016. Solar feed-in tariff costs are expected to decrease by 27 per cent in 2015/16, 12 per cent in 2016/17 and 7.8 per cent in 2017/18. The remaining costs of the scheme will continue to be incurred until 30 June 2028.

Competitive market costs are expected to increase at an average annual rate of 5.9 per cent, including increases of 8.9 per cent in 2015/16, 7 per cent in 2016/17 and 1.8 per cent in 2017/18. These increases reflect higher wholesale electricity costs due to the announced retirement of Northern Power Station and growth in electricity consumption.[66] Increasing consumption and generator retirements tighten the supply-demand balance in the short-term. This has the effect of putting upward pressure on wholesale electricity costs in the NEM. In 2014/15, competitive market costs comprised 38 per cent of the representative *market offer* price.

Electricity consumption is expected to increase in the period to 2017/18 as the Port Pirie smelter returns to a pre-2014 consumption level following a redevelopment. Minor increases in residential and commercial consumption are also forecast based on income growth assumptions and further decreases in retail prices. Consumption growth leads to a tighter supply/demand balance and therefore higher wholesale electricity costs. This effect is partially offset by continued uptake of solar PV and energy efficiency measures.[67]

Significant wind powered generation is expected over the period to 2017/18, leading to lower wholesale electricity cost increases than would have otherwise been expected. However, to the extent that wind investment contributes to generator retirements, such as the announced closure of the Northern Power Station, the net impact of this new investment creates upward pressure on wholesale electricity prices.[68] The potential impacts of increasing wind generation in South Australia are discussed in more detail in Chapter 2 and Appendix E.

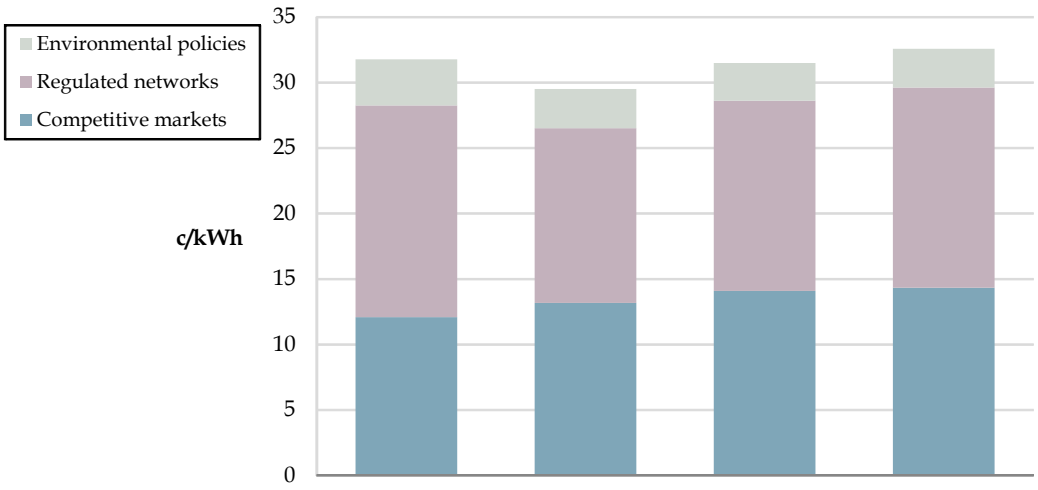
Figure 3.10 shows the expected movements in the supply chain cost components.

66 In modelling wholesale electricity prices, Frontier Economics assumed that Northern Power Station will close on 1 July 2016.

67 AEMO, *2015 National Electricity Forecasting Report*, detailed summary of 2015 electricity forecasts, June 2015, p49-51.

68 Alinta Energy cited an increase in household energy efficiency, a decline in the number of industrial customers and policies to support renewable energy generation as causing a significant supply of generation capacity in South Australia. See: Alinta Energy, *Flinder Operations Announcement*, media statement, 11 June 2015.

Figure 3.10 Trend in South Australia supply chain cost components



	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**3.53**	**$ 176**	**2.99**	**$ 150**	**2.90**	**$ 145**	**2.95**	**$ 147**
LRET	0.49	$ 25	0.59	$ 30	0.74	$ 37	0.91	$ 46
SRES	0.49	$ 25	0.48	$ 24	0.44	$ 22	0.44	$ 22
Solar FiT	2.33	$ 117	1.71	$ 85	1.50	$ 75	1.39	$ 69
REES	0.21	$ 11	0.21	$ 11	0.21	$ 11	0.21	$ 11
Regulated networks	**16.16**	**$ 808**	**13.35**	**$ 667**	**14.51**	**$ 726**	**15.29**	**$ 764**
Transmission	2.73	$ 136	3.12	$ 156	3.27	$ 163	3.48	$ 174
Distribution	13.43	$ 672	10.22	$ 511	11.24	$ 562	11.80	$ 590
Competitive market	**12.09**	**$ 605**	**13.17**	**$ 658**	**14.09**	**$ 705**	**14.34**	**$ 717**
Wholesale and retail								
Total	**31.78**	**$ 1,589**	**29.51**	**$ 1,475**	**31.50**	**$ 1,575**	**32.57**	**$ 1,629**

3.5.2 Developments that could affect residential electricity prices in South Australia

The following jurisdiction-specific factors may impact residential electricity prices during the reporting period:

- The upgrade of the Heywood Interconnector will allow increased power flows between South Australia and Victoria. The project will incrementally increase the Heywood Interconnector transfer capacity from 460 megawatts (MW) to 650 MW in both directions and is due for completion in mid-2016. Benefits of the project include:[69]
  - Providing extra electricity supply capacity and reliability to South Australia in peak demand times, which generally occur during summer heatwaves, and further develop South Australia's renewable energy resources by increasing export capacity
  - Alleviating electricity transmission congestion, and

69 Australian Energy Market Operator, *The Heywood Interconnector: Overview of the Upgrade and Current Status* , August 2015, pp2-3.

- Facilitating more efficient generation dispatch in Victoria and South Australia.

- Applications have been made to the Australian Competition Tribunal for a review of the AER's recent final distribution determination. The trend in regulated network costs will depend on the outcomes of these merits reviews.

3.5.3 Methodology

The analysis of residential prices and cost components applies to a representative residential consumer in South Australia using 5,000 kWh per year.

The methodology for estimating electricity supply chain costs in South Australia is summarised as follows:

- **Competitive market sector**: Wholesale energy cost estimates are based on electricity market modelling undertaken for this report by Frontier Economics. The retail component is the residual calculated for the base year when all non-retail cost components are subtracted from the representative *market offer* price, and is assumed to increase at an annual inflation rate of 2.5 per cent.
- **Regulated network sector**: Transmission and distribution network costs are estimated using revenue determinations made by the AER and SA Power Networks' annual pricing proposals. The current transmission determination applies for the entire reporting period, while the previous distribution determination ended on 30 June 2015. For the subsequent years the AER's final distribution determination for the 2015-20 regulatory period is applied.
- **Environmental policies**: Analysis of the Renewable Energy Target was undertaken by Frontier Economics assuming an annual target of 33,000 GWh by 2020. Costs associated with the solar feed-in tariff and energy efficiency schemes are based on information provided by the South Australian Government and sourced from SA Power Networks' annual pricing proposals.

3.6 Tasmania

Residential electricity prices in Tasmania are driven by determinations of the Office of the Tasmanian Economic Regulator (OTTER). While OTTER determinations have been made for the period to 30 June 2016, in subsequent years prices in this report are based on projected movements of costs. These prices are therefore subject to future OTTER determinations.

In Tasmania, the most common type of residential electricity consumer (the representative consumer) is a two-person household with no mains gas connection and no pool. The representative consumer uses 8,550 kWh of electricity each year, of which 41.3 per cent is allocated to Tariff 31 (light and power) and the remainder is allocated to Tariff 42 (hot water and space heating).[70]

70 This consumption level was calculated from benchmark values published by the AER. ACIL Allen Consulting, *Electricity Bill Benchmarks for Residential Customers, a report to the Australian Energy Regulator*, October 2014. This allocation of tariffs is consistent with the most common tariff combination, as set out in OTTER, *Typical Electricity Consumers*, information paper, May 2014.

Residential electricity *standing offer* prices for 2014/15 and 2015/16 were sourced from the Office of the Tasmanian Economic Regulator's retail pricing determinations. *Standing offer* prices for 2016/17 and 2017/18 were developed using the methodology described below.

Residential electricity prices in Tasmania are currently expected to increase by 2.0 per cent in 2015/16, 2.7 per cent in 2016/17 and 1.1 per cent in 2017/18, subject to future pricing determinations made by the Office of the Tasmanian Economic Regulator. This is equivalent to an average annual increase of 1.9 per cent for the representative consumer over the reporting period. This trend reflects expected increases in competitive market costs and environmental policy costs.

In 2014/15, a representative consumer on the regulated *standing offer* using 8,550 kWh per year had a total annual bill of $1,821, exclusive of GST.

Full retail contestability was introduced from 1 July 2014 and retailers are able to offer market contracts. No new retailer has entered the Tasmanian electricity market and Aurora Energy continues to be the sole supplier of electricity to residential customers. Since most residential consumers remain on *standing offers*, this year's report does not cover *market offers*.[71] On the basis that *market offers* are not yet widely available in Tasmania, a separate graph that sets out *market offer* prices has not been included. Instead Figure 3.11 shows the Tasmanian *standing offer* prices for the reporting period.

3.6.1 Drivers of cost trends

Competitive market costs are expected to increase by an average annual rate of 3.1 per cent over the reporting period. Expected cost increases of 3.8 per cent in 2016/17 and 7.1 per cent in 2017/18 reflect forecast movements in the Victorian wholesale electricity price, as discussed in Section 3.4.1 above and Section 3.6.3 below. In 2014/15, wholesale and retail costs comprised 37 per cent of the representative *standing offer* price.

Regulated network costs consist of the costs of transmission and distribution network services. Combined network costs are expected to increase at an annual average rate of 0.3 per cent over the reporting period. This includes increases of 3.2 per cent in 2015/16 and 1.4 per cent in 2016/17, and a decrease of 3.7 per cent in 2017/18. In 2014/15, regulated network costs comprised 59 per cent of the regulated *standing offer* price.

The trend in these prices is based on the AER's distribution and transmission regulatory determinations, which apply for the periods of 2012-17 and 2014-19 respectively. The AER's final decision for the transmission business was made under the new rules for network regulation. It provides for a lower rate of return allowance and reductions in capital and operational spending. The distribution determination was made under the previous rules for network regulation. In 2017/18, there is no distribution network determination. Costs in this year have been based on the revenue

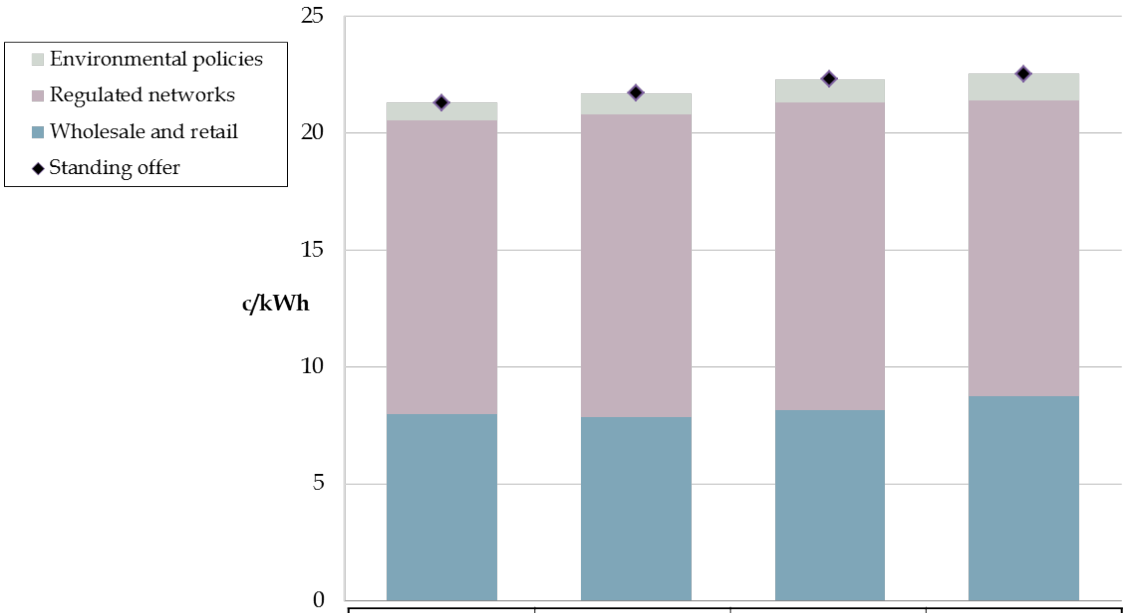
71 Aurora Energy does not provide *market offers* apart from its prepaid metering offers.

assumption that underpins TasNetworks' *Directions and Priorities Consultation Paper* for their upcoming distribution determination regulatory proposal.[72]

Environmental policy costs associated with the Renewable Energy Target are expected to increase at an annual average rate of 14 per cent across the reporting period due to overall increases in Renewable Energy Target costs. These increases have a minor impact on the overall trend because environmental policy costs comprise a small component of the *standing offer*, such as 4 per cent of the *standing offer* price in 2014/15.

Figure 3.11 shows the expected movements in the supply chain cost components for Tasmania.

Figure 3.11 Tasmanian supply chain cost components



	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$	c/kWh	$	c/kWh	$	c/kWh	$
Environmental policies	**0.76**	**$65**	**0.91**	**$77**	**1.00**	**$85**	**1.14**	**$97**
Renewable Energy Target	0.76	$65	0.91	$77	1.00	$85	1.14	$97
Regulated networks	**12.55**	**$1,073**	**12.95**	**$1,107**	**13.13**	**$1,123**	**12.65**	**$1,082**
Wholesale and retail	**7.98**	**$683**	**7.86**	**$672**	**8.16**	**$698**	**8.74**	**$747**
Standing offer	**21.30**	**$1,821**	**21.71**	**$1,856**	**22.30**	**$1,906**	**22.53**	**$1,927**

3.6.2 Developments that could affect residential electricity prices in Tasmania

The following jurisdiction-specific factors may impact residential electricity prices during the reporting period:

- Full retail contestability was introduced in Tasmania from 1 July 2014. Retailers, including Aurora Energy and new entrants, are able to provide *market offers* to retail consumers. Other retailers are yet to enter the Tasmanian residential

72 TasNetworks, *Direction and Priorities Consultation Paper: Distribution Determination 2017*, August 2015.

market, however if this changes in the future then full retail contestability may impact residential electricity prices during the reporting period.

3.6.3 Methodology

The analysis of residential prices and cost components applies to a typical residential consumer in Tasmania consuming 8,550 kWh per year of which 41.3 per cent is allocated to Tariff 31 and the remainder to Tariff 42.

The methodology for estimating electricity supply chain costs in Tasmania is summarised as follows:

- **Wholesale and retail sector**: Wholesale and retail market costs for 2014/15 and 2015/16 are sourced from the Office of the Tasmanian Economic Regulator's retail pricing determinations. For 2016/17 and 2017/18, the retail component was escalated by the assumed rate of inflation of 2.5 per cent and wholesale costs were escalated by the expected trend in Victorian wholesale energy prices, as modelled by Frontier Economics for this report. The Victorian wholesale electricity trend is used as a proxy for the Tasmanian trend because, after accounting for transport costs, prices in these markets are similar if there are no constraints. Further, more spot market and contract market information is available in the Victorian market compared to the Tasmanian market, providing the basis for better estimates of wholesale electricity costs.
- **Regulated network sector**: For 2014/15 and 2015/16, regulated network costs are based on Aurora Energy's approved retail pricing proposals. For 2016/17 and 2017/18, network costs are based on the average of the trends in both the AER's 2012-17 determination for Aurora Energy and its final transmission decision for TasNetworks.[73] In 2017/18, there is no distribution network determination. Costs in this year have been based on the revenue assumption that underpins TasNetworks' Directions and Priorities Consultation Paper for their upcoming distribution determination regulatory proposal.[74] Network costs are provided as one component in this report as Aurora Energy's pricing proposals do not provide separate components for transmission and distribution.
- **Environmental policies**: The Renewable Energy Target costs for 2014/15 and 2015/16 were sourced from Aurora Energy's approved pricing proposals. Costs for the following two years were escalated using trends established by Frontier Economics for an annual target of 33,000 GWh by 2020.

73 On 1 July 2014, the Tasmanian transmission and distribution network businesses, which were previously separate entities, were merged to create a combined entity named TasNetworks.

74 TasNetworks, *Direction and Priorities Consultation Paper: Distribution Determination 2017*, August 2015.

3.7 Western Australia

In Western Australia, the most common type of residential electricity consumer (the representative consumer) is a four-person household. The representative consumer uses 5,229 kWh of electricity each year.[75]

Residential electricity prices in Western Australia are set by the Western Australian Government rather than by market competition or an independent regulator. As a result, the methodology for Western Australia differs from the other jurisdictions.

There has been a price increase of 4.5 per cent in 2015/16 and further increases of 7 per cent per year are expected in 2016/17 and 2017/18. The increases in 2016/17 and 2017/18 are budget assumptions only and the Western Australian Government will make price decisions closer to when the prices are to apply. On the basis that *market offers* are not available in Western Australia, a separate graph that sets out these prices has not been included. Instead Figure 3.12 shows the Western Australian residential prices for the reporting period.

In 2014/15, a representative consumer using 5,229 kWh per year paid the government-set price and had a total annual bill of $1,319, exclusive of GST.

Separately, the underlying costs of supply of electricity in Western Australia have been estimated.

Residential electricity prices are currently subsidised by the Western Australian Government, meaning that the price paid by residential consumers is lower than the cost of supplying them with electricity. Based on the methodology and the modelling assumptions adopted, in 2014/15 the residential price would have needed to increase by 11 per cent to reflect the total estimated cost of supply in the South-West Interconnected System (SWIS).[76]

3.7.1 Drivers of cost trends

During the reporting period, estimated residential electricity supply cost increases are mainly driven by:

- an average annual increase of 7.0 per cent in distribution network costs during the reporting period; and
- an average annual increase of 2.7 per cent in wholesale energy costs during the reporting period.

As prices are set by the Western Australian Government, the retail prices paid by consumers do not necessarily reflect underlying costs, nor follow cost trends.

The increases in distribution network costs reflect Western Power's 2012-17 access arrangement, which is regulated by the Western Australian Economic Regulation Authority. Cost increases during this period are mostly due to increases in operational

75 This representative consumption value was provided by the Western Australian Government.

76 The SWIS is the electricity network that services the south-west region of Western Australia. Its outermost limits are Kalbarri in the north, Albany in the south, and Kalgoorlie in the east. Further detail on the SWIS can be found in Appendix G.

expenditure, resulting from forecast growth in the size of the network, greater customer numbers and increasing labour costs.[77]

Part of the increase in 2015/16 is due to revenue adjustments for revenue under-recovered in 2014/15 and the Tariff Equalisation Contribution.[78] An amount of $18 million was under-recovered in 2014/15 due to electricity sales being lower than expected.[79] The Tariff Equalisation Contribution was re-gazetted by the Western Australian Government to be $32 million larger than previously anticipated. In 2014/15, regulated network costs comprised 48 per cent of the total costs of supply.

Wholesale energy costs are expected to increase, on average, by 2.7 per cent per year. This is an output of Long Run Marginal Costs (LRMC) modelling undertaken by Frontier Economics and not based on how existing market participants may operate in the future.

The LRMC modelling assumes average increases in capital costs of between 3.1 and 3.4 per cent per year during the reporting period (depending on the fuel source and technology).[80] In real terms, the wholesale price of coal is forecast to remain constant and a minor decrease in gas prices is expected.[81] In 2014/15, wholesale electricity costs comprised 40 per cent of the total costs of supply.

In 2014/15, the costs associated with the Renewable Energy Target are estimated to have accounted for 3.5 per cent of the total cost of supply. These costs are expected to increase, on average, by 11 per cent per year.[82]

Figure 3.12 shows the expected movements in the supply chain cost components in Western Australia, plotted against the residential prices set by the Western Australian Government.

77 Western Power, *Proposed revisions to the Access Arrangement for the Western Power Network*, Appendix A, September 2011.

78 The Tariff Equalisation Contribution is an amount which is collected from SWIS customers via Western Power's network prices and used to fund the Western Australian Government's uniform tariff policy.

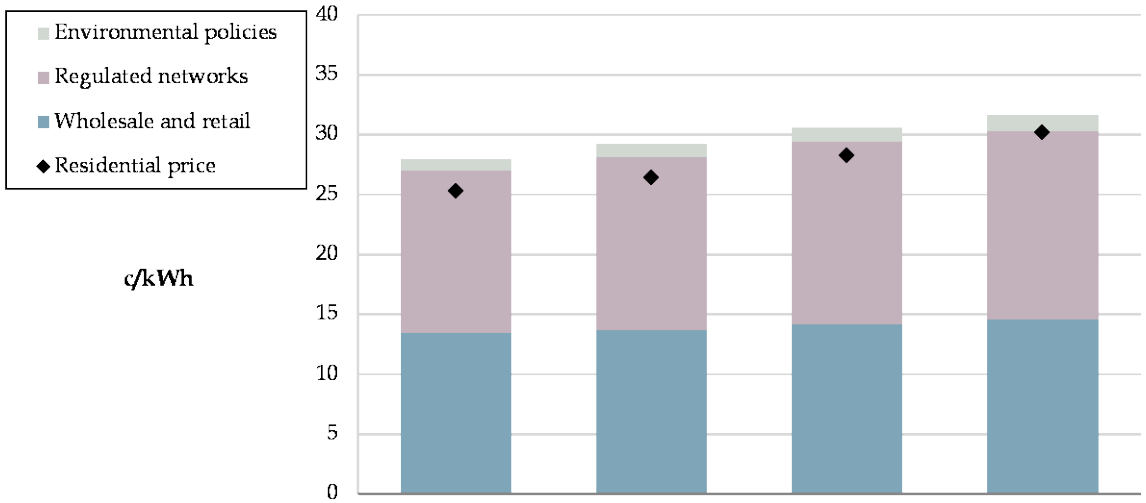
79 Since Western Power is regulated under a revenue cap, when energy sales are lower than the forecast amount, the amount of revenue that is recovered per unit of energy must increase for the total amount of revenue to be consistent with the revenue cap.

80 Changes in the modelled capital costs are due to assumptions about future exchange rates, changes in the costs of labour and materials, and technology learning curves.

81 In contrast to the Australian east coast, WA is already a gas exporter. The WA gas price is therefore influenced by movements in the Asia-Pacific LNG price.

82 This includes an average increase of 23 per cent per year in the costs of the Large-scale Renewable Energy Target, and an average decrease of 3.9 per cent per year in the costs of the Small-scale Renewable Energy Scheme.

Figure 3.12 Trends in Western Australian residential electricity prices



	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**0.97**	**$51**	**1.06**	**$56**	**1.17**	**$61**	**1.34**	**$70**
LRET	0.49	$25	0.59	$31	0.74	$38	0.90	$47
SRES	0.49	$26	0.48	$25	0.44	$23	0.43	$23
Regulated networks	**13.52**	**$707**	**14.50**	**$758**	**15.30**	**$800**	**15.68**	**$820**
Transmission	1.98	$104	1.67	$88	1.52	$79	1.56	$81
Distribution	11.54	$603	12.83	$671	13.78	$721	14.12	$739
Wholesale and retail	**13.46**	**$704**	**13.65**	**$714**	**14.13**	**$739**	**14.60**	**$763**
Estimated total supply cost	**27.95**	**$1,462**	**29.22**	**$1,528**	**30.61**	**$1,600**	**31.62**	**$1,653**
Residential price	**25.23**	**$1,319**	**26.36**	**$1,378**	**28.21**	**$1,475**	**30.18**	**$1,578**

3.7.2 Developments that could affect residential electricity prices in Western Australia

The following jurisdiction-specific factors may impact residential electricity prices during the reporting period:

- The Western Australian Government is currently undertaking a wide-ranging review of the electricity market. The following reforms have been announced: retail price deregulation for households and businesses, and the transfer of regulation of Western Power to the Australian Energy Regulator.[83] Decisions on additional reforms are expected to occur progressively over 2015/16 and 2016/17.[84]

83 M Nahan (Minister for Energy), *Government energised for electricity reform*, media statement, 24 March 2015.

84 Western Australian Public Utilities Office, *Electricity Market Review - Phase 2*, website, accessed 27 June 2015.

3.7.3 Methodology

The analysis of residential prices and cost components applies to a representative residential consumer in the SWIS using 5,229 kWh per year.

The methodology for Western Australia differs from the other states because residential prices are set by the Western Australian Government and there is no formal statement of supply chain costs.[85]

Due to the Western Australian Government's uniform tariff policy, residential consumers outside the SWIS pay the same price as those consumers in the SWIS. As such, the reported price trends will also apply to residential consumers outside of the SWIS.

The sources of information used to estimate supply costs in Western Australia are:

- **Wholesale energy sector**: The wholesale energy cost estimates are based on modelling of the stand-alone LRMC undertaken by Frontier Economics. LRMC modelling was used due to the expectation that market modelling would underestimate Synergy's actual wholesale energy costs. Synergy's costs are determined by contractual arrangements, including those relating to the Reserve Capacity Mechanism (RCM), rather than the spot market price.[86]
- **Retail component**: Estimates from the Western Australian Public Utilities Office for Synergy's efficient retailer operating costs and retail margin have been used. Notably, the approach to estimating the retail cost in Western Australia is different to how the retail component is derived for other jurisdictions.[87]
- **Regulated network sector**: Western Power's Approved Revised Access Arrangement and annual price lists have been used to estimate network costs. The current determination covers the first three years of the reporting period.[88] Annual price lists are available for 2014/15 and 2015/16. There is no access arrangement for 2017/18 and it is assumed that network costs will increase at an assumed rate of inflation of 2.5 per cent in this year.

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85 In some other jurisdictions where prices are regulated an independent regulator will set the residential tariff after considering the efficient costs of supply, including efficient retail margins.

86 The objective of the RCM is to secure sufficient capacity (generation and demand side management) to meet the peak load of the SWIS. The capacity requirement is set two years in advance by the Independent Market Operator. Retailers are required to contract, or purchase capacity from the IMO, to meet the capacity requirement. The RCM has not been modelled in this analysis.

87 A 'retail component' is derived for other jurisdictions as the difference between the residential tariff or *market offer* price and the aggregate of the environmental, network and wholesale cost components. Broadly there are two reasons for using a different method for Western Australia. 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 less than the cost of supply, calculation of the retail component via the residual method used in the other jurisdictions would not provide any indication of the retail costs and would therefore underestimate the total cost of supply.

88 The expected trend in distribution and transmission costs is set out in Economic Regulation Authority, *Decision: Variation to Western Power's Access Arrangement for 2012/13 to 2016/17*, 4 June 2013, p13.

- **Environmental policies**: Analysis of the Renewable Energy Target was undertaken by Frontier Economics assuming an annual target of 33,000 GWh by 2020. The costs of the Residential Feed-in Tariff are not included in the report because this scheme is funded by Western Australian Government taxation revenue and the costs do not flow through directly to residential electricity prices.

3.8 Northern Territory

In the Northern Territory, the most common type of residential electricity consumer (the representative consumer) is a two-person household with no mains gas connection and no pool. The representative consumer uses 6,790 kWh of electricity each year.[89]

Residential electricity prices in the Northern Territory are set by the Northern Territory Government rather than by market competition or an independent regulator. As a result, the methodology for the Northern Territory differs from the other jurisdictions. Residential electricity prices are currently subsidised by the Northern Territory government, meaning that the price paid by residential consumers is lower than the cost of supplying them with electricity.

Residential tariffs in the Northern Territory are set on a calendar year basis. For consistency in this report, prices set by the Northern Territory Government for the 2014 and 2015 calendar years have been adjusted to be on a financial year basis by averaging the two these tariffs. It is assumed that residential prices will increase at an assumed inflation rate of 2.5 per cent thereafter. Actual price outcomes will depend on decisions made by the Northern Territory Treasurer closer to when the prices are to apply. On the basis that *market offers* are not available in the Northern Territory, a separate graph that sets out these prices has not been included. Instead Figure 3.13 shows Northern Territory residential prices for the reporting period.

Unlike for other jurisdictions, the total supply chain cost components are not able to be determined for the Northern Territory. For this reason Figure 3.13 does not show the total costs, as explained further in sections 3.8.1 and 3.8.3 below.

In 2014/15, a representative consumer using 6,790 kWh per year paid the government-set price and had a total annual bill of $1,997, exclusive of GST.

3.8.1 Drivers of cost trends

As prices are set by the Northern Territory Government, the retail prices paid by consumers do not necessarily reflect underlying costs, nor follow cost trends. The key drivers of costs are increases in regulated network costs and a decrease in wholesale electricity costs.

Increases in regulated network costs over the reporting period are due to higher operational expenditure and regulatory depreciation allowance.[90]

89 This consumption level was calculated from benchmark values published by the AER. ACIL Allen Consulting, *Electricity Bill Benchmarks for Residential Customers*, a report to the Australian Energy Regulator, October 2014.

Operational expenditure for the 2014-19 regulatory period is 45 per cent higher than for the previous five year regulatory period. This is due to a new asset management regime that has an increased focus on condition monitoring and preventative maintenance. The higher regulatory depreciation allowance is a result of a re-evaluation of the asset life of the network infrastructure.[91]

The decrease in the wholesale electricity costs in 2015/16 reflects a revision of Territory Generation's price for mass market customers. This is in response to changes in Territory Generation's contractual arrangements.

Figure 3.13 shows the expected movements in the supply chain cost components in the Northern Territory. With the data available to us, it has not been possible to show the retail cost component of electricity prices in the Northern Territory.[92] The unknown retail component includes a range of different costs, including the retailer operating costs, customer acquisition and retention, and return on investment for investing capital in the business. The cost stack is therefore an incomplete picture of the costs incurred to provide electricity to residential consumers. If the retail component was included, then the costs would be greater than the residential price in 2014/15 and 2015/16.[93] using the information available, it is unclear if residential electricity prices will still be subsidised at the end of the reporting period. To aid interpretation of Figure 3.13, the unknown retail component and government subsidy has been represented as the faded element at the top of the graph's cost stacks even though its magnitude is unknown.

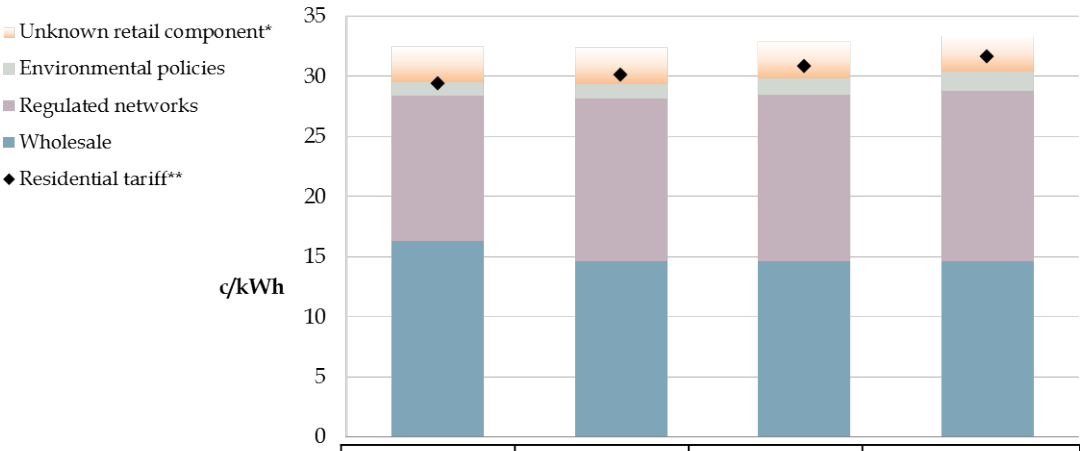
90 Utilities Commission, *2014 Network Price Determination*, final determination, Part A - Statement of Reasons, 24 April 2014, Darwin.

91 The depreciation methodology was revised to align it with the approach of the AER. Under the new methodology, the network asset base was considered as having 48 per cent of its life remaining. If the values from the previous regulatory period had been rolled forward then this figure would have been 59 per cent.

92 Jacana Energy (owned by the Northern Territory government) is the only residential retailer in the Northern Territory. Commercially sensitive retail information is not available because its publication would likely provide an advantage to competitors as the electricity retail market develops.

93 This is reflected in the Northern Territory Budgets for 2014/15 and 2015/16, which both contain a Community Service Obligation subsidy for supplying urban consumers will electricity, water and sewage services.

Figure 3.13 Northern Territory supply chain cost components



	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**1.13**	**$77**	**1.24**	**$84**	**1.39**	**$94**	**1.58**	**$107**
LRET	0.61	$41	0.73	$50	0.92	$63	1.12	$76
SRES	0.52	$35	0.51	$35	0.47	$32	0.46	$31
Regulated networks	**12.06**	**$819**	**13.46**	**$914**	**13.80**	**$937**	**14.14**	**$960**
Wholesale	**16.34**	**$1,109**	**14.69**	**$997**	**14.69**	**$997**	**14.69**	**$997**
Residual	**-0.12**	**-$8**	**0.71**	**$48**	**0.98**	**$67**	**1.22**	**$83**
Residential tariff**	**29.40**	**$1,997**	**30.10**	**$2,044**	**30.85**	**$2,095**	**31.62**	**$2,147**

Note: The "residual" is the difference between the residential price and the aggregate of the supply chain costs. It is a contribution to the retail component. As a result, the cost stack shown in the table underestimates total costs. In the case where the residual is negative, the aggregate of the supply chain costs, excluding the retail component, is higher than the residential price.

* The unknown retail component includes a range of different costs, including the retailer operating costs, customer acquisition and retention, and return on investment for investing capital in the business. The quantum of the retail component is unknown and this is illustrated by the faded element at the top of the cost stack in the graph.

** Residential tariffs in the Northern Territory are set on a calendar year basis. Prices set by the Northern Territory Government for the 2014 and 2015 calendar years have been adjusted to be on a financial year basis by averaging the two these tariffs. It is assumed that residential prices will increase at an assumed inflation rate of 2.5 per cent thereafter.

3.8.2 Developments that could affect residential electricity prices in the Northern Territory

The following jurisdiction-specific factors may impact residential electricity prices during the reporting period:

- Reforms to the regulatory framework governing the Northern Territory's electricity industry, including measures to support retail competition, the development of a wholesale electricity market and changes in the economic regulation of the electricity networks. Responsibility for network price regulation and oversight of network access has been transferred from the Northern Territory Utilities Commission to the Australian Energy Regulator with effect from 1 July 2015.[94]

94 Northern Territory Utilities Commission, *Transfer of network price regulation to the AER*, news announcement, 7 January 2015.

- The structural separation of the Power and Water Corporation's monopoly and contestable businesses into stand-alone government-owned corporations.

3.8.3 Methodology

The analysis of residential electricity prices and cost components applies to a residential consumer in the Darwin-Katherine Interconnected System using 6,790 kWh per year. As the Northern Territory Government has a uniform tariff policy, these prices apply to all residential consumers of Jacana Energy, including those outside of the Darwin-Katherine system who are provided electricity services by Indigenous Essential Services Pty Ltd (IES) under agreement with the Department of Community Services.[95]

The sources of information used to estimate electricity supply costs in the Northern Territory are as follows:

- **Wholesale energy sector**: Estimates of the wholesale electricity costs for the reporting period were provided by the Northern Territory Government.
- **Retail sector**: It has not been possible to show the retail costs in the Northern Territory. In other jurisdictions the retail residual calculated for the base year when all of the non-retail cost components are subtracted from the total representative price has been used as a proxy for the retail costs. The 'residual method' (as described in section J.3.1) cannot be used to show the retail cost component of electricity prices as the prices paid by consumers are less than the cost of supply. Applying this approach to the Northern Territory results in a residual that represents part of the retail costs.
- **Regulated network sector**: In April 2014 the Utilities Commission published a final determination on network costs for the 2014/19 regulatory period. However, the Treasurer subsequently issued a Ministerial Direction for the network utility to apply an alternative revenue path of 7.7 per cent plus inflation in 2014/15, 8 per cent plus inflation in 2015/16, and 0 per cent plus inflation from 2016/17 and 2018/19. This revenue path has been used to escalate network costs during the reporting period, however, the explanation of the trend is based on the Utilities Commission final determination.
- **Environmental policies**: Renewable Energy Target costs for 2014/15 were provided by the Northern Territory Government. For the remaining years of the reporting period this cost has been escalated by a national trend developed by Frontier Economics assuming an annual target of 33,000 GWh by 2020.

3.9 National Summary

On a national basis, residential electricity prices are expected to be slightly increasing over the reporting period.

Since the 2014 report, the AEMC has made changes to its methodology for calculating the electricity consumption of the representative set of residential consumers. These

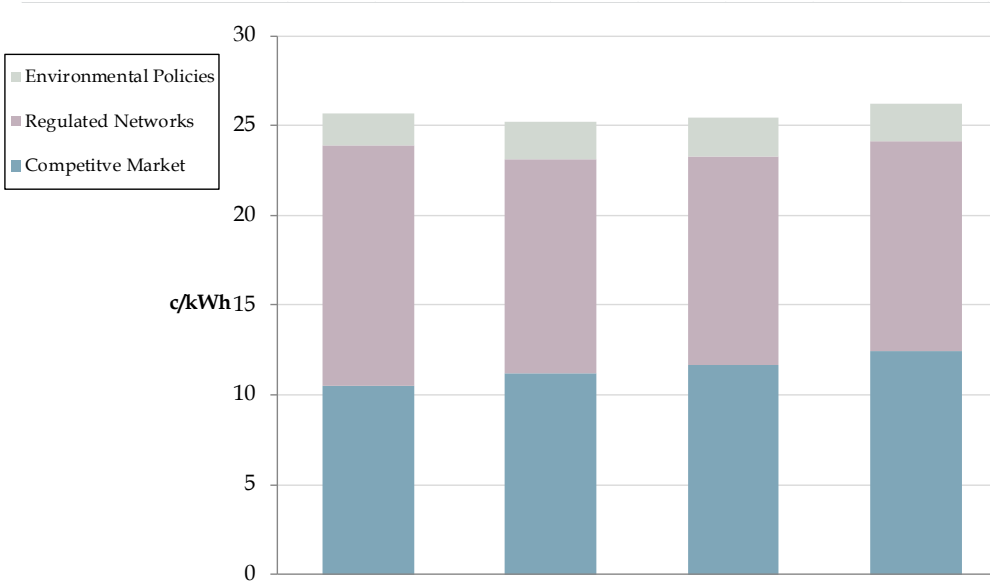
95 Jacana Energy is a government-owned electricity retailer than was created as part of the split of the Power and Water Corporation on 1 July 2014.

changes are intended to make the consumers more representative of actual households in each jurisdiction and are discussed in further detail in Appendix I and Appendix J.

The national costs are averages weighted by the number of residential connections in each jurisdiction. The national weighted average consumption level, is 5,248 kWh per year, calculated by weighting the consumption level of the representative consumer in each jurisdiction by the number of residential connections in each jurisdiction. At this consumption level, the national average total annual bill in 2014/15 is $1,348, exclusive of GST.

Where there are *market offers* available in a jurisdiction, representative *market offers* were used. In other jurisdictions, the regulated *standing offers* or government set prices were used. Changes in the cost components differ by jurisdiction as outlined and discussed throughout this chapter. Figure 3.14 shows the expected movements in the supply chain cost components on an average national basis.

Figure 3.14 National summary of supply chain cost components



	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**1.79**	**$94**	**2.10**	**$110**	**2.16**	**$113**	**2.09**	**$110**
LRET	0.49	$26	0.59	$31	0.74	$39	0.91	$48
SRES	0.47	$25	0.46	$24	0.42	$22	0.42	$22
FIT Schemes	0.73	$38	0.91	$48	0.84	$44	0.61	$32
Other state schemes	0.10	$5	0.13	$7	0.15	$8	0.15	$8
Regulated networks	**13.37**	**$702**	**11.93**	**$626**	**11.63**	**$611**	**11.67**	**$613**
Transmission	1.80	$95	2.14	$113	2.13	$112	2.13	$112
Distribution	11.57	$607	9.79	$514	9.51	$499	9.54	$501
Competitive market	**10.52**	**$552**	**11.18**	**$587**	**11.64**	**$611**	**12.43**	**$652**
Wholesale and retail								
Total	**25.68**	**$1,348**	**25.21**	**$1,323**	**25.43**	**$1,335**	**26.20**	**$1,375**

3.9.1 Drivers of cost trends

Nationally, residential electricity prices are expected to decrease by 1.8 per cent in 2015/16 and then increase by 0.9 per cent in 2016/17 and 3.0 per cent in 2017/18. This

is equivalent to an average annual increase of 0.7 per cent for the average national consumer over the reporting period.

The decrease in 2015/16 is due to decreasing network costs outweighing rises in competitive market and environmental policy costs. The increase in 2016/17 is due to increases in competitive market and environmental costs, partially offset by lower regulated network costs. The larger increase in 2017/18 primarily reflects increases in competitive market costs,.

In 2012, changes were made to the National Electricity Rules for the regulation of network businesses, and in particular for how network revenues and prices are determined. The trend in regulated network costs reflects the ongoing program of the AER's final and draft decisions on the regulated revenue for the transmission and distribution network businesses. To date, the AER's decisions have specified a lower maximum allowed revenue compared with the previous regulatory period. The actual trend in regulated network costs over the reporting period will depend on:

- When the new rules start to apply for specific network businesses. Network costs based on the new rules will take effect no later than 2017.
- The results of merit reviews underway for some distribution businesses.

Wholesale electricity costs are expected to rise across the reporting period. This is partly in response to expected increases in electricity consumption to 2017/18 as forecast by AEMO. Some of the upward pressure caused by increasing consumption is offset by the impacts of the LRET. However, the LRET may also contribute to retirement of generators, which would in turn lead to upward pressure on wholesale prices.

During the reporting period, there will also be upward pressure on wholesale electricity costs from expected higher gas prices across all jurisdictions. This is mainly due to the ramp-up of the liquefied natural gas (LNG) facilities in Queensland tightening the gas supply-demand balance and exposing the domestic gas market to higher international LNG prices. This creates rising costs for gas-fired generators and therefore contributes to rising wholesale electricity costs.

4 Retail Time of Use and Solar Offers

Two ways in which consumers are becoming more engaged in the electricity market are via the uptake of retail time of use offers and installation of solar PV systems.

Time of use offers provide consumers with the opportunity to save on their electricity bills by consuming electricity during cheaper 'off-peak' periods. By having solar PV, consumers generate their own electricity and either offset their household consumption or export electricity to the distribution network.

Consumers are expected to experience changes in their annual electricity bills through these choices. These bill impacts depend on both on a consumers' retail offer and how they use electricity.

This chapter provides an overview of the number and structure of retail time of use offers and offers available to solar households in order to better understand the nature and diversity of these offerings.[96] These are two ways in which electricity offers available to consumers are becoming increasingly diverse as retail markets mature.

Observed electricity consumption and generation data from a sample of households has been used to estimate the potential impacts on consumers' electricity bills from switching from a representative flat offer to a time of use offer.

The results and methodology used are presented in the following sub-sections.

4.1 Background

The uptake of retail time of use offers and solar PV is being facilitated by technological change.

Historically, residential electricity meters have not kept track of how electricity usage varies throughout the day. Newer interval meters (also known as "smart meters") sample electricity consumption much more frequently, thereby allowing for more dynamic pricing structures, such as time of use.

Retail time of use offers are currently an option for approximately 2.9 million households, mostly in Victoria, and will become more widely available as interval meters become more common. In Victoria, offers with different rates for different times of the day are also referred to as flexible pricing offers.

With the exception of Victorian consumers, most residential consumers in the National Electricity Market still have the older style meters. One per cent or less of small customers in South Australia, the ACT and Queensland are estimated to have meters that enable time of use pricing. Penetration is higher in New South Wales at approximately 15 per cent.[97]

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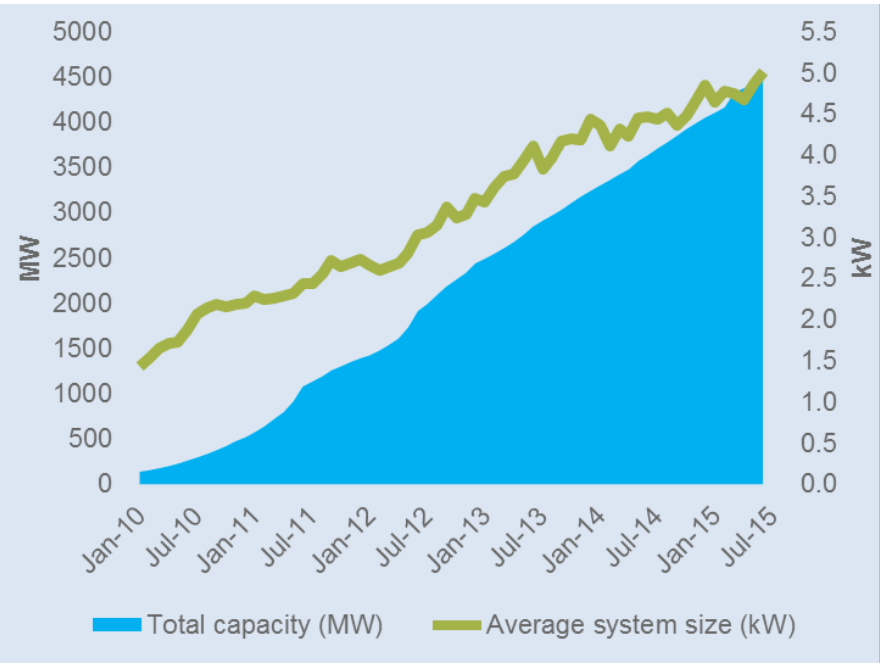
96 In this report a "solar household" is a household with rooftop solar panels. Typically offers available to solar households are also available to non-solar households.

97 These figures are derived from confidential AEMO data provided to the AEMC in September 2014. The data may underestimate the number of interval meters in some jurisdictions due to the way in which meters have been progressively integrated into AEMO's Market Settlement and Transfer Solution (MSATS) system and the consumption thresholds used to define a 'small' meter.

For context, at 30 June 2014, there were 2.79 million interval meters installed in Victoria, though by September 2014 less than 7,000 customers had switched to flexible pricing offers.[98]

Solar PV uptake has been driven by significant cost reductions in solar technology costs, coupled with rising residential electricity prices and generous government incentives. The net result is an increase from around 150 MW at the start of 2010 to over 4500 MW in 2015 (Figure 4.1 refers). The size of the systems being installed has also increased during this period.

Figure 4.1 Trend in small-scale solar PV



Data source: Clean Energy Regulator; Australian PV Institute.

The percentage of households with solar is estimated to be more than 20 per cent in Queensland, South Australia and Western Australia, while the percentages in other jurisdictions are estimated to be between 5 and 15 per cent.[99]

These statistics show that solar is a consideration for a potentially large number of consumers when they are making decisions in the retail electricity market.

4.2 Retail time of use offers

Time of use retail offers feature different prices for electricity consumption during different periods of the day. Typically these periods are classified as 'peak', 'shoulder' and 'off-peak' periods. Such pricing structures are more closely aligned to the costs of providing consumers with electricity services, thereby providing consumers with the option of reducing their peak demand to save money, or continuing to use electricity at those times when the value they place on that use outweighs the costs.

98 Victorian Auditor-General's Office, *Realising the Benefits of Smart Meters*, September 2015, pp17,36.

99 Australian PV Institute (APVI) Solar Map, funded by the Australian Renewable Energy Agency, accessed from pv-map.apvi.org.au on 17 September 2015.

4.2.1 Offers available

Table 4.1 below summarises the availability of time of use offers in each distribution network region of the National Electricity Market. These offers have been sourced from price comparison websites and retailers' websites as at February 2015.

Residential consumers in New South Wales, Victoria, South Australia and Queensland have access to the most time of use offers. The highest availability is in Victoria, reflecting the relative maturity of retail competition and prevalence of interval meters in that jurisdiction. The lowest availability is in Tasmania, where residential consumers do not currently have access to any retail time of use offers.

Table 4.1 Retail time of use offers available

Jurisdiction	Distribution network region	Number of retail time of use offers	Number of retailers	Average time of use offers per retailer
NSW	Ausgrid	56	6	9
	Endeavour	66	8	8
	Essential Energy	69	7	10
Victoria	AusNet Services (formerly SP AusNet)	194	12	16
	CitiPower	193	11	18
	Jemena	201	12	17
	Powercor	237	15	16
	United Energy	220	11	20
South Australia	SA Power Networks	55	13	4
Queensland	Energex	82	9	9
Northern Territory	Jacana Energy	1	1	1
Tasmania	Aurora	0	0	0

4.2.2 Offer structure

The typical structure of retail time of use offers varies between jurisdictions and network regions, with differences in the length of peak period, and the potential saving from shifting consumption from peak and off-peak. This part of the analysis focuses on New South Wales, Victoria and South Australia. As noted above, Victoria and New South Wales are the jurisdictions where most of the consumers who are currently able to take up a retail time of use offer are located.

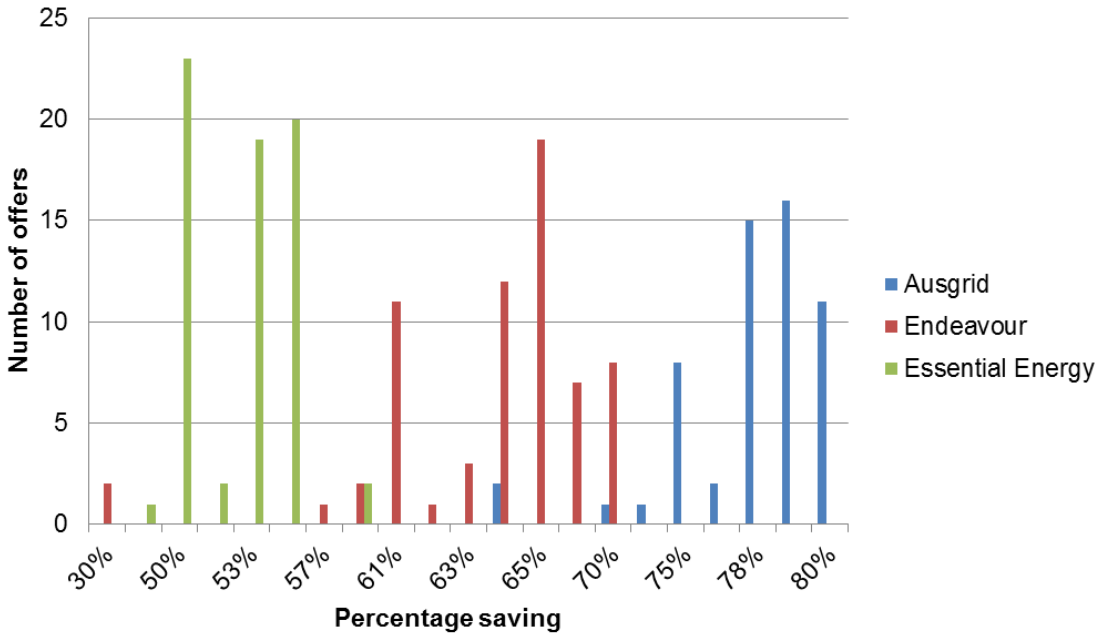
Saving from shifting load

Under retail time of use pricing, consumers can save by using electricity during the cheaper off-peak period. A larger potential saving corresponds with a more significant difference between the peak and off-peak prices.

It is important to note that just because there are potential savings for consumers who shift their energy use from peak to off-peak times, does not mean that it is necessarily in a consumer's interests to do so. Rather, consumer preferences will determine how they respond as the prevalence of time of use tariffs increases. If consumers attach greater value to the potential savings than they do to using electricity at peak times, then they will shift their load. The purpose of this analysis is purely to describe the effect of this change in behaviour.

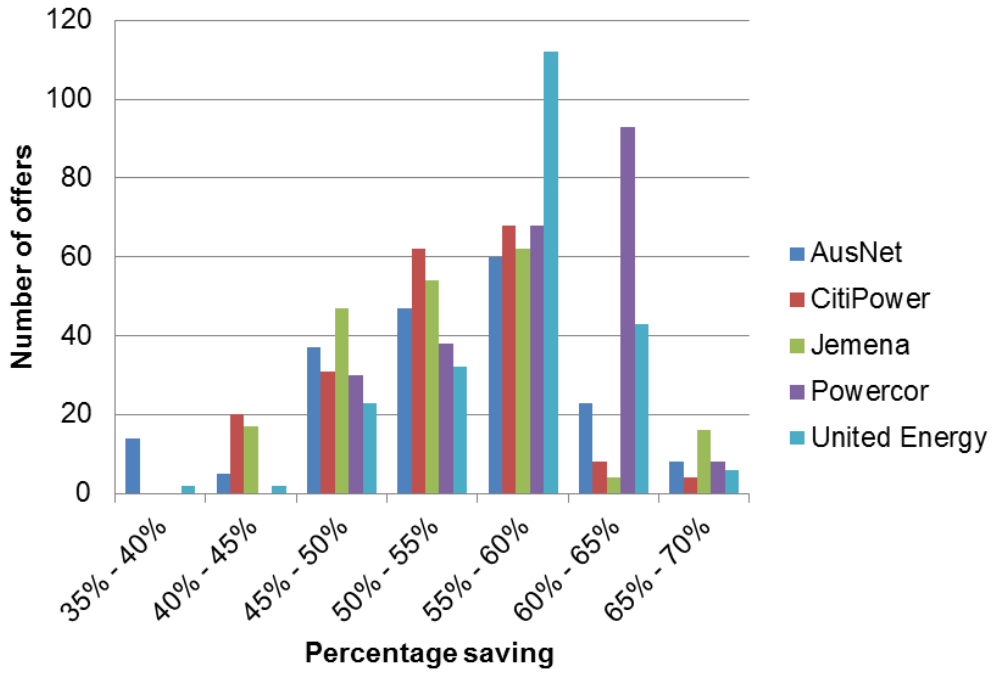
Figure 4.2 sets out the percentage saving for each kWh of load shifted from peak to off-peak times in New South Wales, with similar graphs following for Victoria and South Australia. That is, they are a measure of how different the peak price in a time of use offer is from the off-peak price; a high percentage indicates there is a big difference between peak and off peak prices. In New South Wales, the saving from shifting load varies between distribution network regions, and between individual retail offers within regions. Typically, consumers in the Ausgrid region have the highest potential saving from shifting load, followed by Endeavour, and then Essential Energy. The maximum potential saving observed in this jurisdiction is 80 per cent while the lowest is 30 per cent.

Figure 4.2 Potential saving from each kWh shifted from peak to off-peak, New South Wales



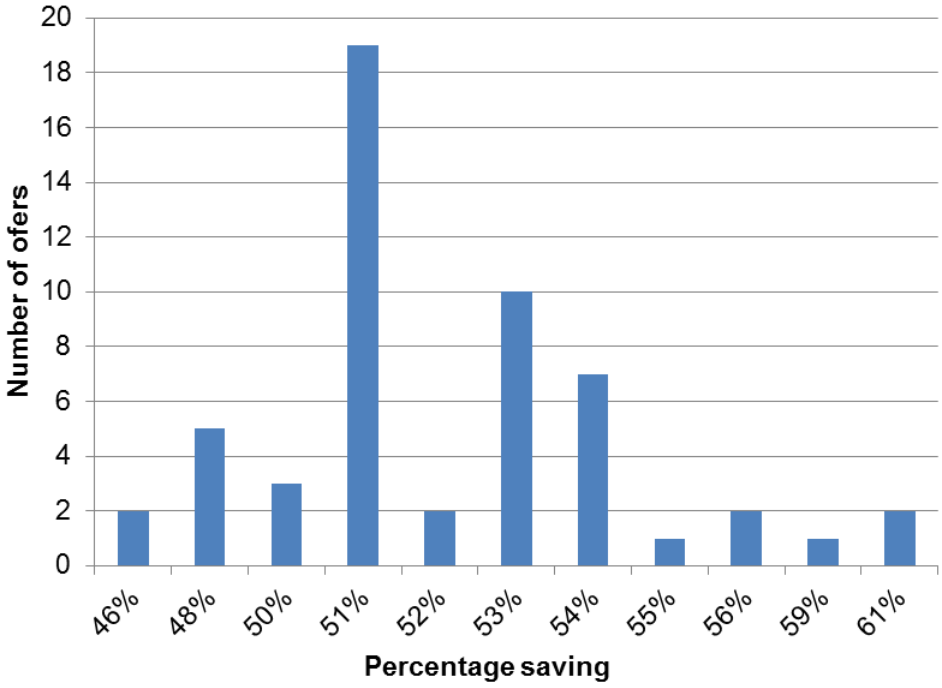
In Victoria, there is no obvious correlation between distribution network regions and the potential saving from shifting load. The average potential saving is 55 per cent, although the maximum observed in this jurisdiction is 70 per cent while the minimum is 38 per cent. There is less diversity in the range of offers available than in New South Wales, despite the higher number of retail time of use offers overall.

Figure 4.3 **Potential saving from each kWh shifted from peak to off-peak, Victoria**



In South Australia, the average potential saving is 52 per cent, the maximum is 61 per cent, and the minimum is 48 per cent. The range of offers is narrower than in either New South Wales or Victoria, reflecting the lower number of retail time of use offers available in this jurisdiction.

Figure 4.4 **Potential saving from each kWh shifted from peak to off-peak, South Australia**

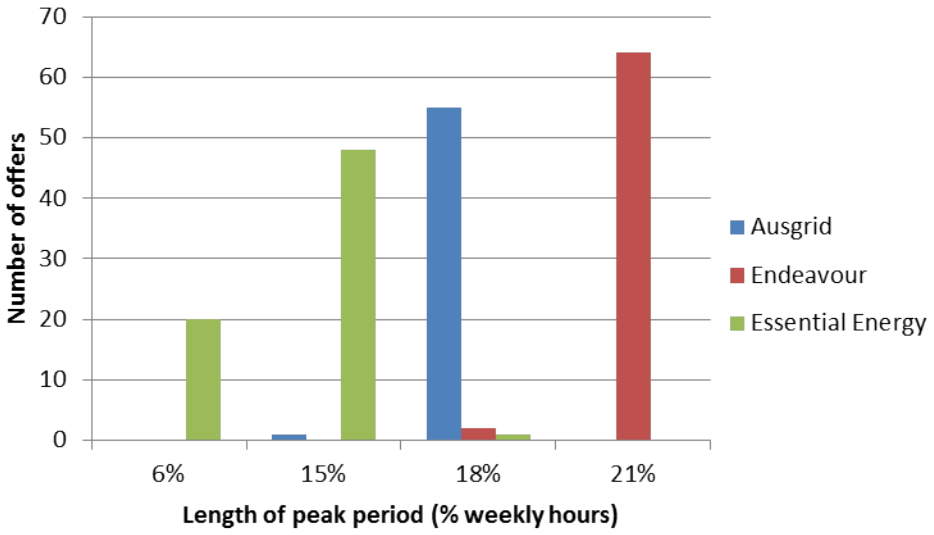


Length of peak period

A point of difference between retail time of use offers is the length of the peak pricing period. The length of this period impacts on consumers' abilities to move consumption into the off-peak period.

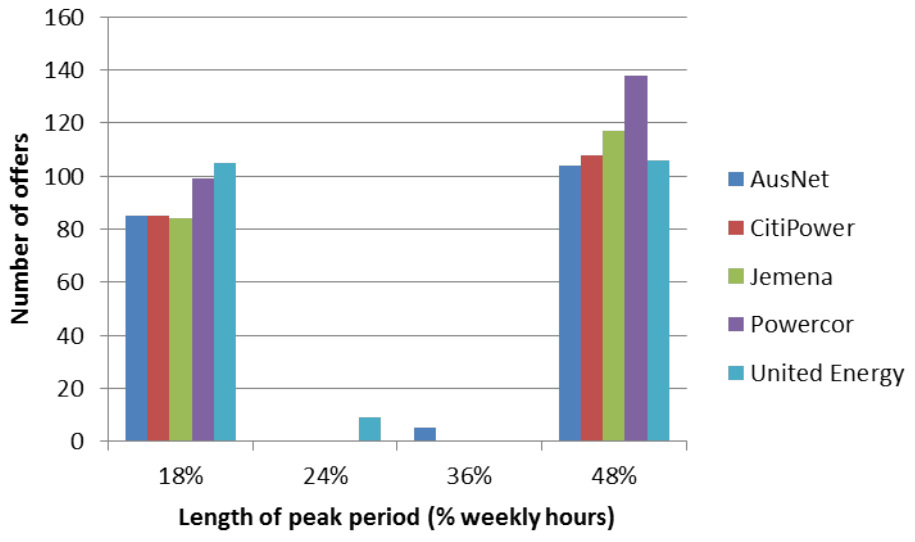
In New South Wales, the length of the peak period varies from 6 percent to 21 percent of total weekly hours and appears to be regimented by distribution network region, with the longest peak typically found in the Endeavour region, followed by Ausgrid, followed by Essential Energy.

Figure 4.5 Length of peak period in New South Wales as a percentage of weekly hours



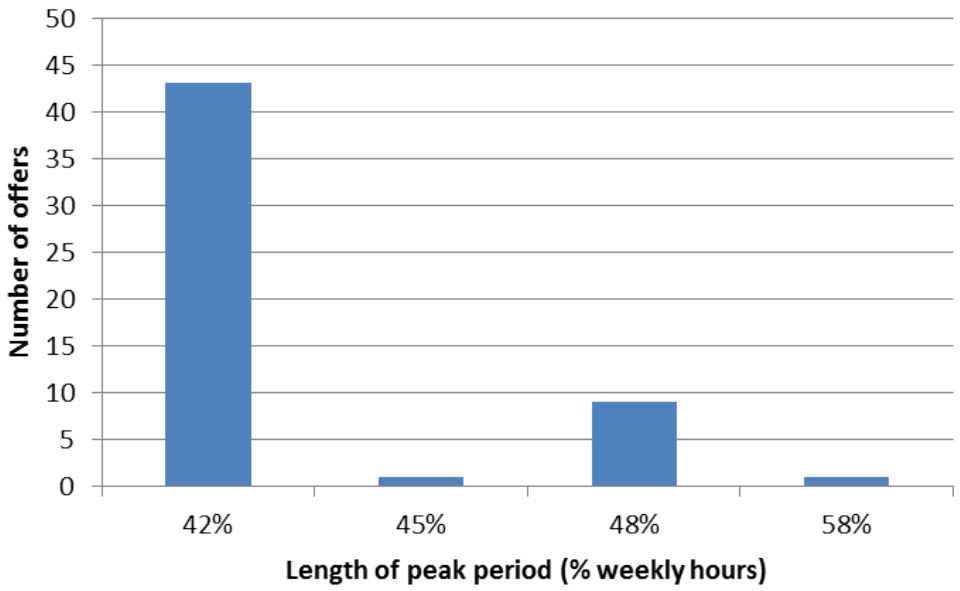
In Victoria, apart from a small number of anomalous offers, offers are divided into those with a 'long' peak (48 percent of weekly hours), and a 'short' peak (18 percent of weekly hours). Each distribution network region has numerous offers in each category.

Figure 4.6 Length of peak period in Victoria as a percentage of weekly hours



In South Australia, the length of the peak ranges from 42 percent to 58 percent of weekly hours.

Figure 4.7 Length of peak period in South Australia as a percentage of weekly hours



4.3 Availability of offers for solar households

It has been observed that some retailers do not make all of their offers available to solar households. This may be a reflection on the relative value that retailers place on having these households as their customers.

The tables below summarise the availability of offers for solar households in each distribution network in New South Wales, Victoria and South Australia. With the data available to the Commission, it was not possible to undertake this analysis for retail offers in South East Queensland.

A majority of offers are available to consumers in all network regions of New South Wales and South Australia, while just under half of retail time of use offers are available to solar consumers in Victoria. However, due to the high number offers overall, Victorian consumers still have a greater choice of retail time of use offers available to solar consumers than New South Wales or South Australia. There are no major differences in availability between flat offers and retail time of use offers for solar consumers.

Table 4.2 Solar availability for flat offer consumers

Jurisdiction	Distribution network region	Total flat offers	Available to solar	Percent available
New South Wales	Ausgrid	60	35	58
	Endeavour	67	38	57
	Essential Energy	79	41	52
	Total NSW	156	80	51
Victoria	AusNet Services (formerly SP AusNet)	221	99	45
	CitiPower	222	98	44
	Jemena	221	96	43
	Powercor	299	134	45
	United Energy	232	105	45
	Total Victoria	1195	532	45
South Australia	SA Power Networks	65	37	57

Table 4.3 Solar availability for time of use consumers

Jurisdiction	Distribution network region	Total TOU offers	Available to solar	Percent available
New South Wales	Ausgrid	56	31	55
	Endeavour	66	40	61
	Essential Energy	69	39	57
	Total NSW	191	110	58
Victoria	AusNet Services (formerly SP AusNet)	194	85	44
	CitiPower	193	86	45
	Jemena	201	89	44
	Powercor	235	102	43
	United Energy	220	101	46
	Total Victoria	1043	463	44
South Australia	SA Power Networks	55	29	53

4.4 Impact on a sample of residential electricity bills

This section analyses the potential impact on consumers' annual electricity bills from decisions relating to retail time of use offers and solar PV. The scenarios tested are:

1. a non-solar household switching from a flat offer to a time of use offer;
2. a solar household switching from a flat offer to a time of use offer.

The impacts are calculated for a sample of households in New South Wales and Victoria. Both samples were used for the first scenario, however the second scenario was only tested for New South Wales households. This was because the Victorian dataset did not include solar generation data.

In both scenarios, it is assumed that the consumption profile of the household does not change following the move to the time of use offer.

4.4.1 Methodology

This analysis of the impact on consumers' annual electricity bills is based on actual electricity consumption data from a sample of households.[100] The sample consists of:

- 200 households in the Ausgrid network region of New South Wales over a one year period from July 2010 to June 2011. All of these households have solar PV.
- 73 households in the AusNet network region of Victoria over a four year period from June 2010 to April 2014. Data on whether these households have solar PV was not available.

The data describes the daily consumption profiles at half-hourly intervals for these households. For New South Wales, the data also includes solar generation at half-hourly intervals. Solar generation was measured on a gross basis, meaning that solar data includes all of the electricity generated by the system, and the consumption data includes all of the consumption of the household.[101]

The consumers were randomly chosen by the respective distribution network businesses and are not designed to be representative of the general population of each network region.

The steps in the analysis of switching from a flat to a time of use offer are as follows:

1. Generate representative charges for flat *market* and *standing offers* in each network region. Broadly, the steps of this calculation are as follows: identify the cheapest flat *market* or *standing offer* for each retailer in each network region, weight by the market share of the respective retailers to generate daily and usage rates for each network region, and then weight by the proportion of consumers in each

100 The New South Wales dataset is publicly available at Ausgrid, Solar home electricity data, http://www.ausgrid.com.au/Common/About-us/Corporate-information/Data-to-share.aspx, viewed 19 November 2015. The Victorian data is not publicly available and was provided directly to the AEMC.

101 The alternative to gross metering is net metering, whereby a household's consumption is reported net of solar generation, i.e. net consumption = household consumption - solar generation.

network region to obtain a jurisdictional average. This process is described in greater detail in Appendix J.

2. Generate representative charges for retail time of use offers in each network region. The steps of this calculation are similar to the method used to generate representative flat offers, with an additional step to calculate representative peak, off-peak and shoulder charges (if applicable) rather than a single flat usage charge.
3. Calculate the average daily peak, off-peak and shoulder electricity usage for each of the households for which data is available
4. Multiply the average daily values for peak, off-peak and shoulder usage by 365 in order to estimate yearly peak, off-peak and shoulder usage for each household.
5. Multiply each household's estimated annual usage in each pricing interval (peak, off-peak and shoulder) by the representative charges generated in Steps 1 and 2, in order to estimate the annual bill paid by each household under either a flat or a time of use offer.
6. Compare each household's estimated annual bill under each offer in order to calculate the impact of switching from a flat to a time of use offer.

4.4.2 Scenario 1: Impact of switching from flat to retail time of use[102]

Based on jurisdictional average prices and consumers' historical electricity consumption profiles, 81 percent of the 200 sampled consumers in New South Wales would benefit from switching from a flat *market offer* to a time of use offer, with the 'best off' consumer benefiting by $410, and the 'worst off' consumer paying an additional $158 dollars per annum. The average change is a saving of $48 in the annual bill.

Figure 4.8 below compares the annual bill for each household in the New South Wales dataset under the jurisdictional average flat *market offer* (base values), and the jurisdictional average time of use offer (comparison values). Figure 4.9 shows the annual savings or losses caused by switching from a flat offer to time of use. The sampled consumers have been ranked from those with the lowest savings (or in some cases, losses) to those with the highest. It can be seen that most sampled consumers stand to benefit by switching from a flat to a time of use offer, and that this is the case even if they do not make any changes to the timing of their energy usage.

102 This scenario assumes that consumers do not shift their consumption patterns after switching to a time of use offer.

Figure 4.8 **Indicative annual bill with flat *market offer* vs retail time of use, New South Wales**

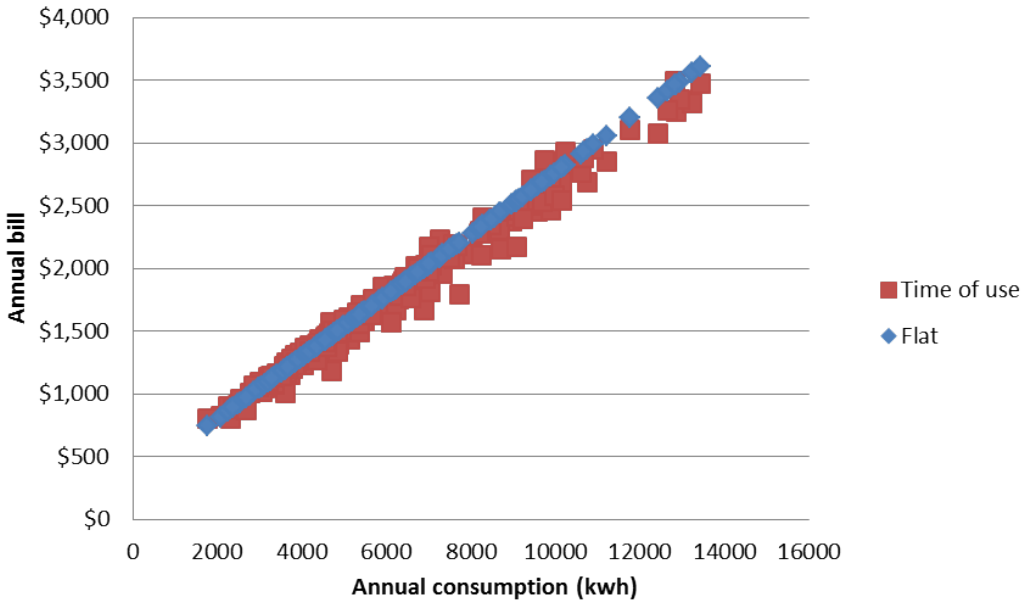
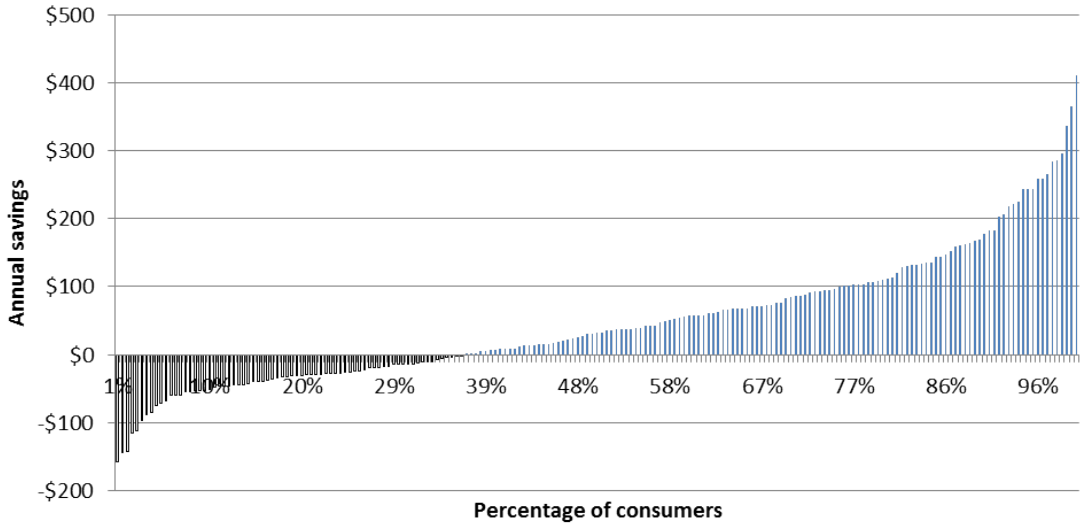


Figure 4.9 **Indicative annual savings moving from flat *market offer* to retail time of use offer, New South Wales**



For *standing offers*, 93 percent of the sampled consumers would benefit from switching from a flat *standing offer* to a time of use offer. The 'best off' consumer in the sample would save $459 per annum, while the 'worst off' consumer would lose $99 per annum. The average change is a saving of $88 in the annual bill.

Figure 4.10 and Figure 4.11 reproduce the same calculation as above for *standing offers*. It can be seen that annual bills under flat *standing offers* in New South Wales are very similar to annual bills under flat *market offers*, although benefits from switching from flat to time of use offers are slightly greater than those for consumers on *market offers*. This is because average energy usage charges are higher for *standing offers*.

Figure 4.10 **Indicative annual bill with flat *standing offer* versus retail time of use, New South Wales**

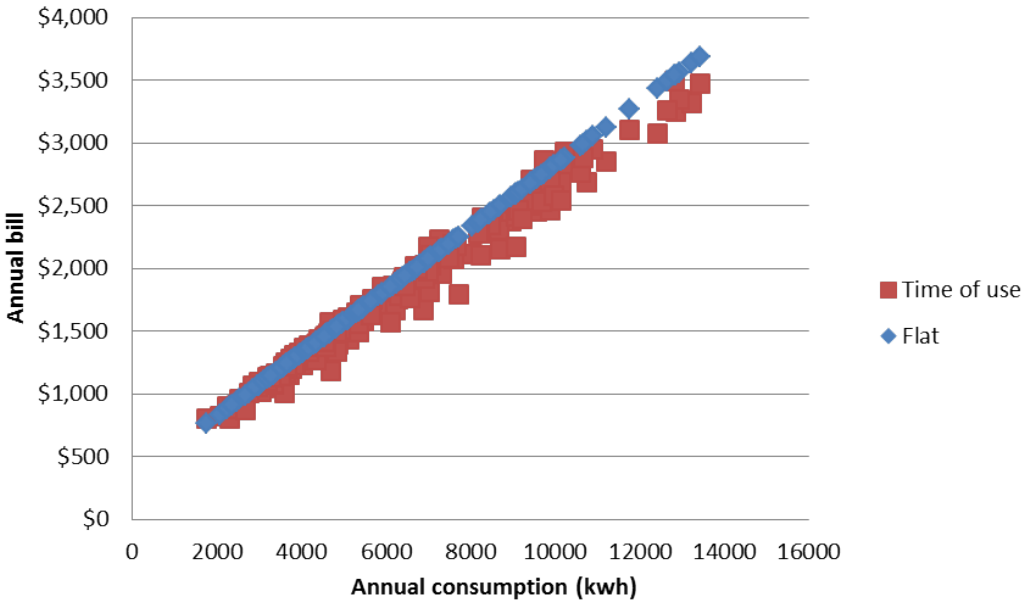


Figure 4.11 **Indicative annual savings moving from flat *standing offer* to retail time of use offer, New South Wales**

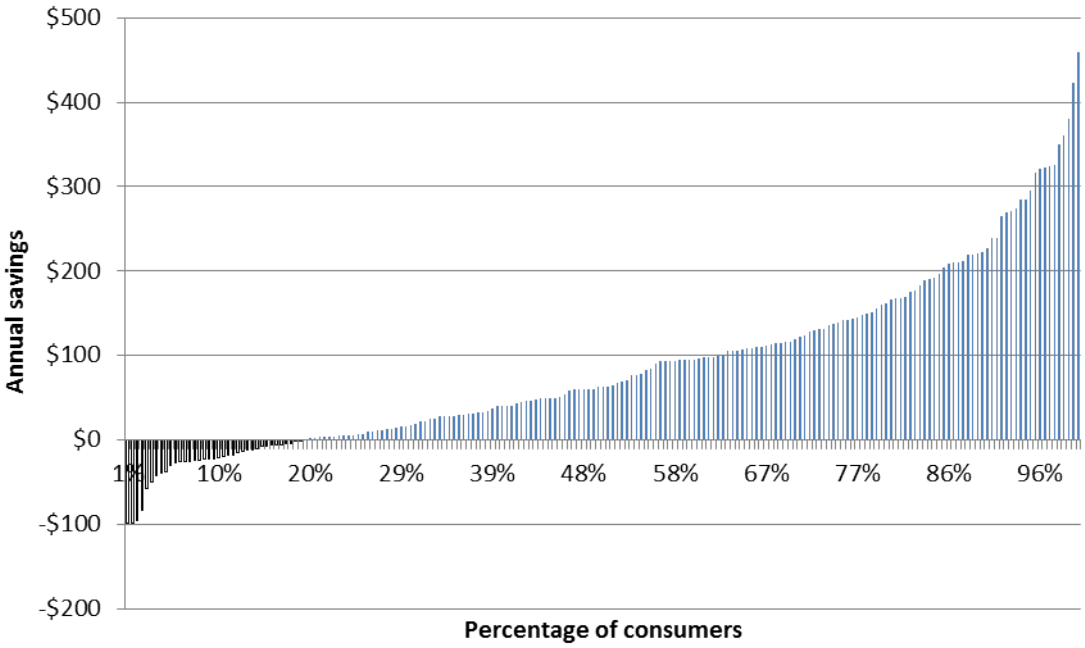


Figure 4.12 and Figure 4.13 show the number of consumers in the sample who fall into each savings 'bracket', i.e., the number of consumers in each five percent increment of saving off their annual bill (from zero to five percent, five to ten percent, and so on). A typical consumer will be between ten percent better off and five percent worse off if they switch from a flat to a time of use offer without any other change in their behaviour.

Consumers could also improve their position by shifting some of their consumption to the cheaper off-peak period.

Figure 4.12 Indicative annual percentage savings switching from flat *market offer* to retail time of use, New South Wales

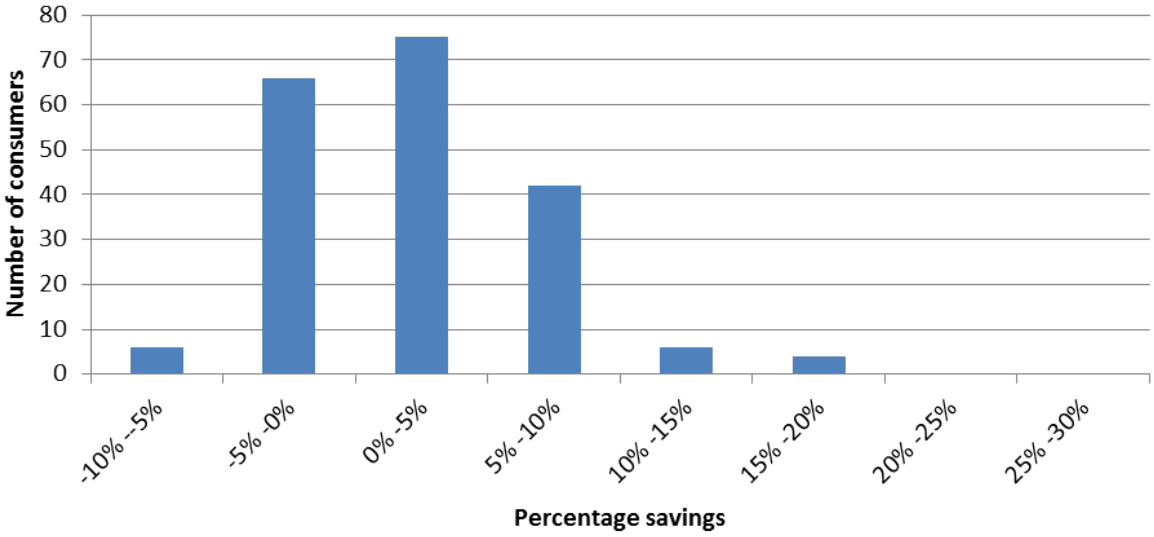
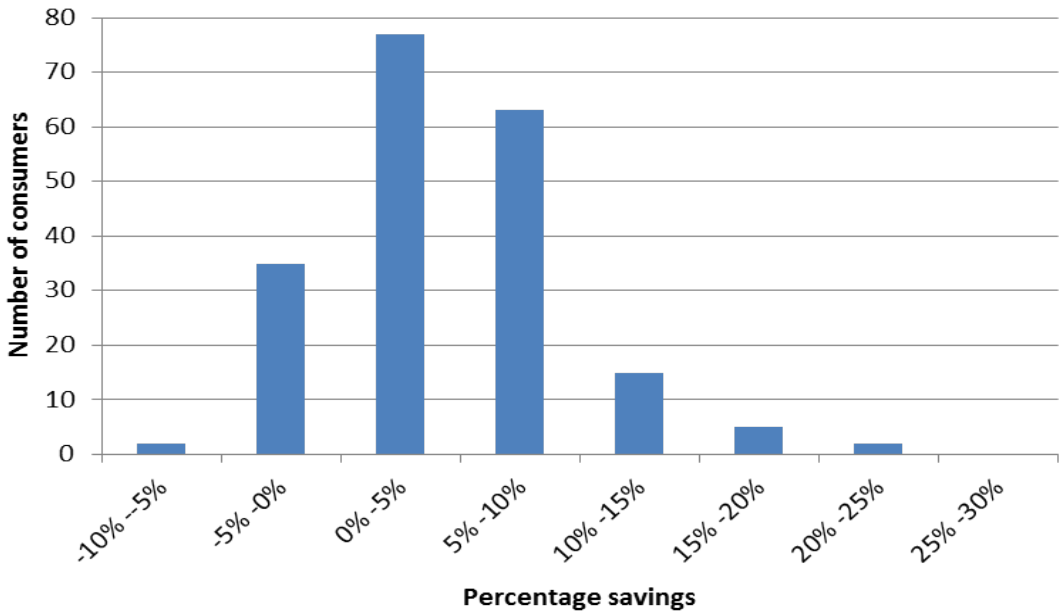


Figure 4.13 Indicative annual percentage savings switching from flat *standing offer* to retail time of use, New South Wales



Similar calculations have been undertaken for the Victorian sample. It should be noted that the sample size was only 73 consumers, and it was assumed that all of these consumers started off on the flat retail offer. As with the New South Wales data, Figure 4.14 compares the annual bill for each household under the jurisdictional average flat *market offer* and time of use offer, while Figure 4.15 shows the annual savings (or losses) from switching from flat to time of use offers. Figure 4.16 and Figure 4.17 reproduce these calculations for *standing offers*.

In Victoria, all of the consumers in the sample stand to benefit by switching from a flat to a time of use offer, even without changing the timing of their energy usage. This is true whether they are currently on a *standing* or a *market offer*, and irrespective of the

network region in which they are located. Based on the jurisdictional averages, the 'best off' consumer in the sample would save $472 per annum by shifting from a flat *market offer* to a time of use offer, while the 'worst off' would save $40. The average change in annual bills is a saving of $148.

Figure 4.14 Indicative annual bill with flat *market offer* versus retail time of use, Victoria

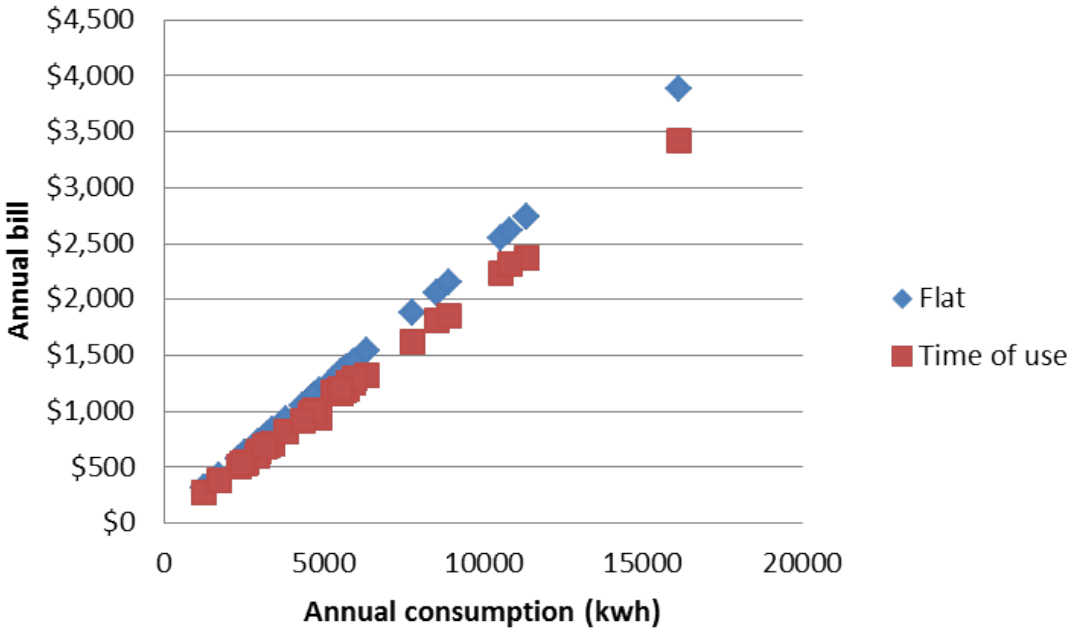
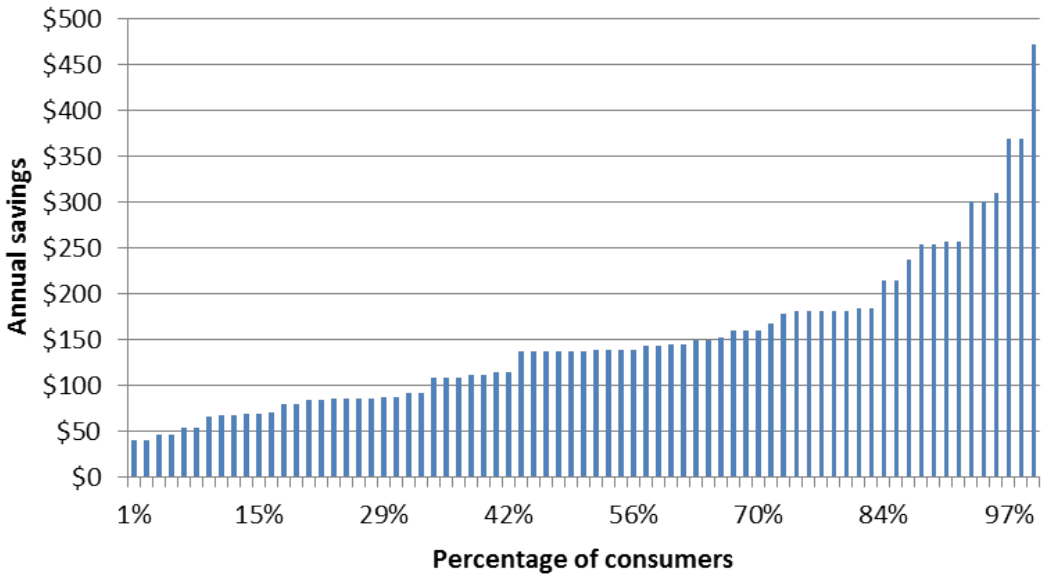


Figure 4.15 Indicative annual savings moving from flat *market offer* to retail time of use offer, Victoria



The benefits of shifting to retail time of use offers are considerably larger for Victorian consumers currently on flat *standing offers*. The 'best off' consumer would save $1928, while the 'worst off' would save $156 per annum. The average consumer would save

$593 off the annual bill by switching to a retail time of use offer. These results reflect the high usage charges for flat *standing offers* in Victoria.

Figure 4.16 Indicative annual bill with flat *standing offer* vs retail time of use, Victoria

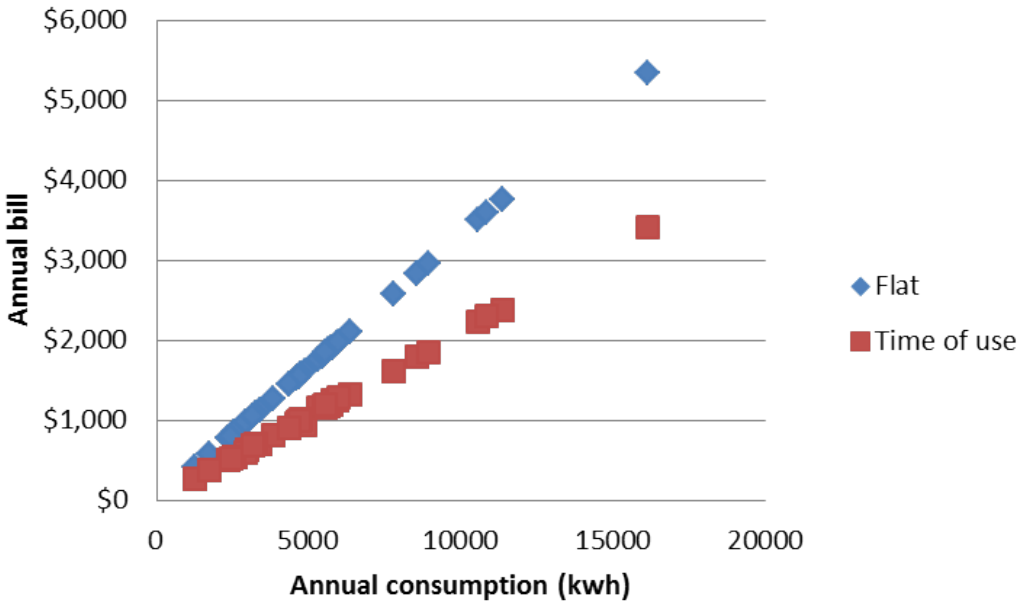
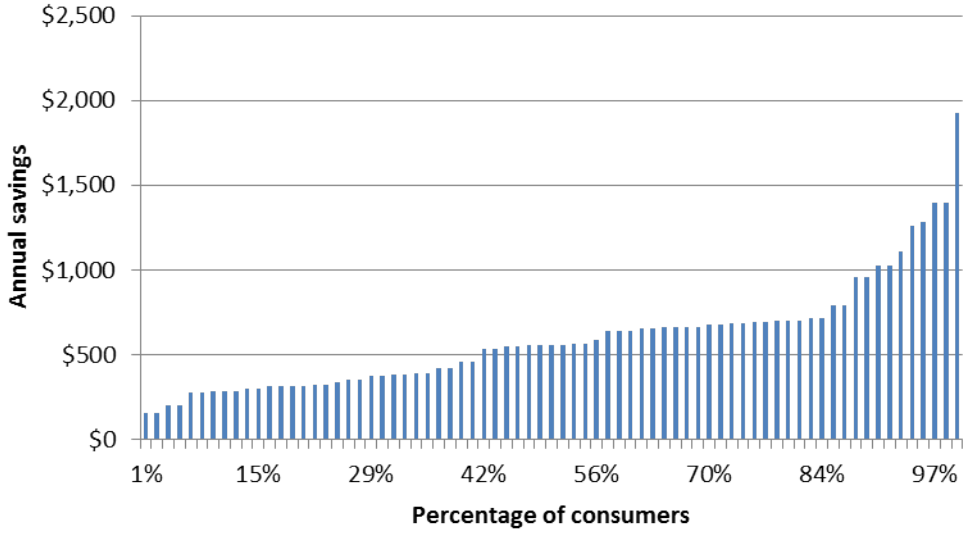


Figure 4.17 Indicative annual savings moving from flat *standing offer* to retail time of use offer, Victoria



4.4.3 Scenario 2: Impact of existing solar customers switching from flat to retail time of use offers[103]

This section estimates the impacts of shifting to a retail time of use offer for consumers who have already installed PV system.

In New South Wales, the only jurisdiction in this analysis where both time of use offers and offers available to solar households have been analysed, the average impact of moving from a flat *standing offer* to a time of use offer for consumers who do not have a PV system is a saving of $88 off the annual bill. By contrast, the average impact of switching to time of use for consumers who do have a PV system is a saving of $120. The figures for flat *market offers* are $48 and $91 respectively.

This shows that within the sample, existing solar customers stand to benefit more by shifting from a flat offer to a retail time of use offer than consumers who do not have solar. This is because solar generation offsets some of the relatively more expensive peak and shoulder consumption for time of use consumers, while allowing them to benefits from cheaper off-peak consumption relative to households on flat offers.

This analysis was only undertaken for New South Wales. If a similar analysis was undertaken for other jurisdictions, the results would differ depending on the extent to which solar PV output and peak demand overlap, and on the structure and availability of time of use offers.

4.5 Conclusion

The above analysis shows that most consumers stand to benefit from shifting to retail time of use offers, even without any change to their existing consumption patterns. Furthermore, the benefits of switching to time of use and installing a PV system compound each other, as time of use consumers stand to benefit more from installing solar systems than consumers on flat offers. Conversely, consumers who have already installed solar stand to benefit more by switching from flat to time of use offers than those who have not installed solar.

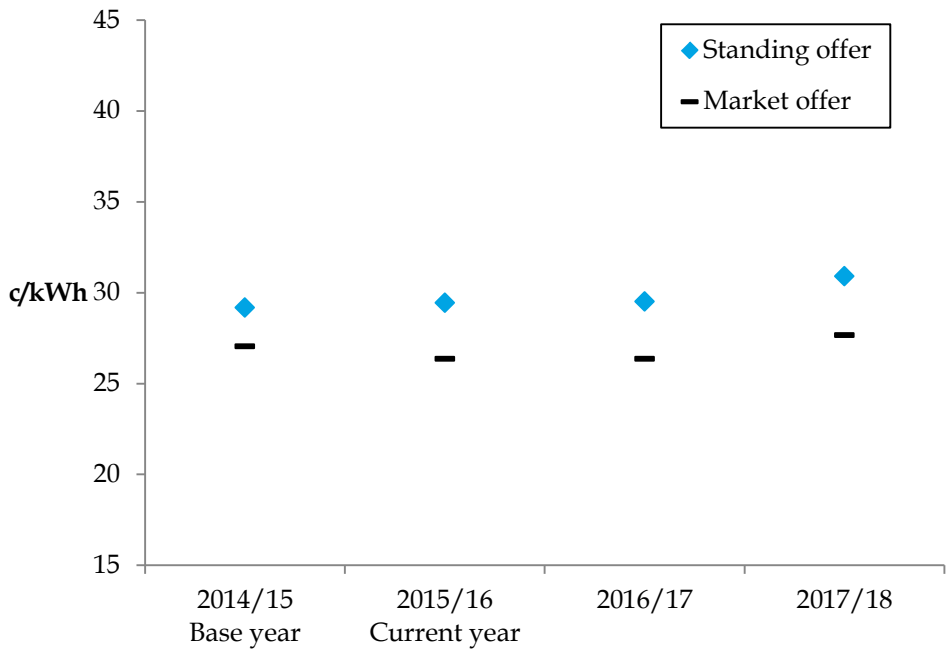
103 This scenario assumes that consumers do not shift their consumption patterns after switching to a time of use offer.

A Queensland

Box A.1 Key points

- Residential *market offer* electricity prices in South East Queensland are expected to decrease by 2.5 per cent in 2015/16, be flat in 2016/17 and increase by 5.0 per cent in 2017/18. This is equivalent to an average annual increase of 0.8 per cent for the representative consumer over the reporting period.
- The analysis of residential electricity prices and cost components applies to a representative consumer in South East Queensland connected to the Energex distribution network. Customers in regional Queensland are eligible for the same *standing offer* price as in South East Queensland under the Queensland Government's uniform tariff policy.
- Increases during the reporting period are mostly due to increasing competitive market costs and Queensland Solar Bonus Scheme costs.
- In 2014/15, a representative consumer on the regulated *standing offer* using 5,173 kWh per year had a total annual bill of $1,510 exclusive of GST. This consumer may have saved around $111, or 7.3 per cent, by switching from the regulated *standing offer* to the representative *market offer*.
- The deregulation of retail electricity prices for residential and small business customers in South East Queensland has been delayed by the Queensland Government by 12 months to July 2016. This will allow the Queensland Productivity Commission time to undertake an inquiry into electricity prices.

Figure A.1 Trend in South East Queensland *market offer* and *standing offer* prices



A.1 Trends in residential electricity prices

Figure A.1 shows expected movements in the regulated *standing offer* and *market offer* prices in Queensland, exclusive of GST. Residential *market offer* electricity prices in South East Queensland are expected to decrease by 2.5 per cent in 2015/16, be flat in 2016/17 and increase by 5.0 per cent in 2017/18. This is equivalent to an average annual increase of 0.8 per cent for the representative consumer over the reporting period.

Full retail competition was implemented in Queensland in July 2007, which means that consumers can choose a *market offer* or remain on the regulated *standing offer*. In South East Queensland 70 per cent of small consumers have switched to a *market offer*.[104]

In 2014/15, a representative consumer on the regulated *standing offer* using 5,173 kWh per year had a total annual bill of $1,510, exclusive of GST. This consumer may have saved around $111, or 7.3 per cent, by switching from the regulated *standing offer* to the representative *market offer*.

A.1.1 Representative price methodology

For 2014/15 and 2015/16, the regulated *standing offer* prices are based on the Queensland Competition Authority's determinations of retail electricity prices. The representative *market offer* price for 2014/15 was calculated using retailers' offers sourced through the Queensland Competition Authority's electricity price comparator website.[105]

The analysis of residential electricity prices and cost components applies to a representative consumer in South East Queensland connected to the Energex distribution network. Customers in regional Queensland are eligible for the same *standing offer* price as in South East Queensland under the Queensland Government's uniform tariff policy.[106] Ergon Energy Retail supplies most small electricity customers in regional Queensland. Electricity prices remain regulated and Ergon Energy Retail is not permitted to offer market contracts, so customers are limited in their ability to shop around for different energy plans.

In South East Queensland, the most common type of residential electricity consumer (the representative consumer) is a two person household with no pool, no mains gas connection and electric hot water on a "controlled-load" tariff. The representative

104 Australian Energy Market Commission, 2015 Retail Competition Review, p242.

105 The Queensland government adopted the National Customer Energy Framework from 1 July 2015, which included changing to the AER's *Energy Made Easy* price comparator website from that date.

106 The mechanism for this policy is called the Community Service Obligation and is paid by the Queensland government to Ergon Energy.

consumer uses 5,173 kWh of electricity each year,[107] of which 1,552 kWh is attributed to the controlled-load tariff.[108]

Data provided by Energex, the distribution network business for South East Queensland, shows that close to 60 per cent of residential consumers have part of their consumption on a controlled-load tariff.[109]

For future years, the trends for the regulated *standing offer* and *market offer* prices are based on estimated movements in the underlying supply chain cost components.

A detailed explanation of our methodology is set out in Appendix J.

A.1.2 Effect of different household consumption levels on electricity price and annual expenditure in 2014/15

The consumption of the representative consumer is developed using a set of assumptions to provide information about the trends in and drivers of electricity prices. The price outcomes based on the representative consumer's consumption are sensitive to these assumptions and may not reflect the actual prices paid by individual consumers.

Table A.1 demonstrates how the average unit cost of electricity and the annual electricity bill in South East Queensland are sensitive to changes in the consumption levels. Lower consumption levels result in lower annual household bills but a higher per unit average price, as the fixed component of the retail electricity price is spread over a smaller volume of electricity. The opposite effect applies to higher consumption levels, whereby annual household bills are higher but there is a lower per unit average price, as the fixed component of the retail electricity price is spread over a larger volume of electricity.

Further examples of different consumer profiles using actual offers are set out in section A.4.

107 This consumption level was calculated from benchmark values published by the AER. ACIL Allen Consulting, *Electricity Bill Benchmarks for Residential Customers,* a report to the Australian Energy Regulator, October 2014.

108 Energex customer connection data was used to establish that the most typical South East Queensland consumer is on Tariff 33 and also the proportion of the load attributed to this tariff class.

109 Controlled load tariffs are cheaper than the general tariff and controlled by the distribution network business. These tariffs typically apply to hot water systems and pool pumps, but can also be used for other applications.

Table A.1 Effect of different consumption levels on average electricity price and annual expenditure in 2014/15, excluding GST

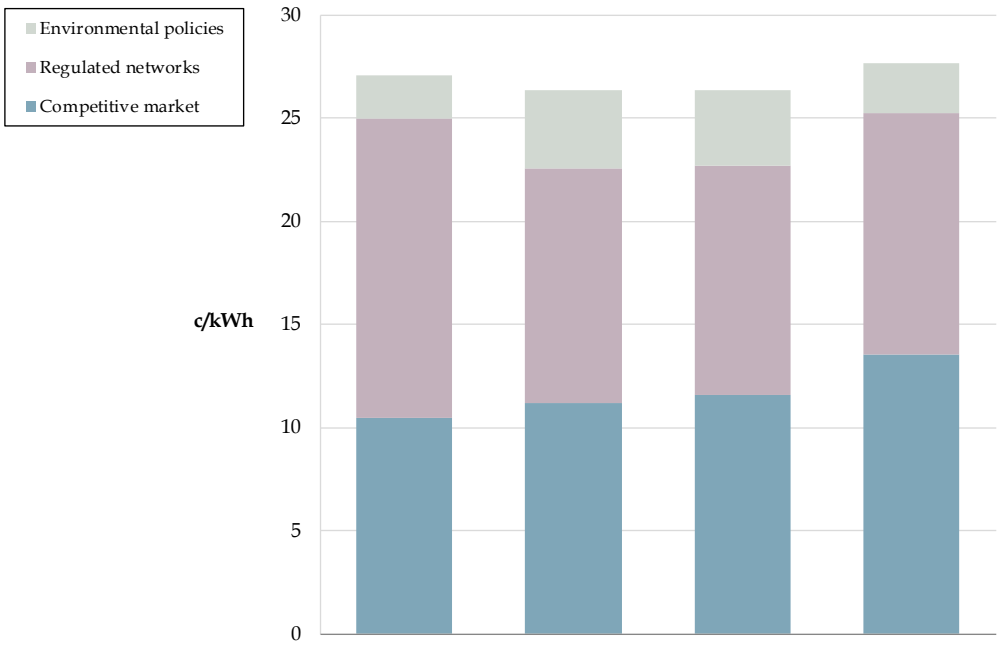
Annual consumption level	2014/15 Average *market offer* (cents per kWh)	2014/15 Annual household bill
Low (2,500 kWh)	33.31	$833
Representative consumer: 2 people, no mains gas, no pool, off-peak hot water (5,173 kWh of which 1,552 kWh is off-peak)	27.04	$1,399
High (9,500 kWh)	24.37	$2,315

Prices in this table are based on an average of actual offers.

A.2 Trends in supply chain cost components

Figure A.2 shows expected movements in the supply chain cost components for South East Queensland, which are the competitive wholesale and retail markets, regulated networks and government environmental policies.

Figure A.2 South East Queensland supply chain cost components



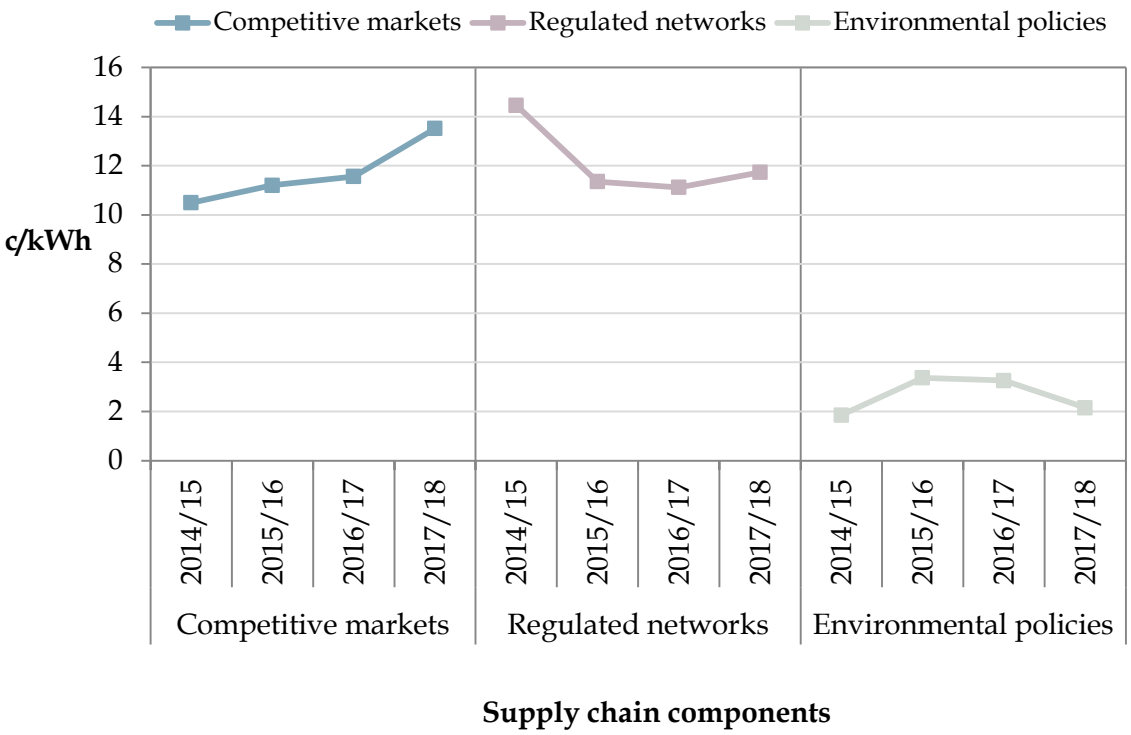
	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**2.09**	**$108**	**3.79**	**$196**	**3.67**	**$190**	**2.42**	**$125**
LRET	0.48	$25	0.58	$30	0.73	$38	0.89	$46
SRES	0.48	$25	0.47	$24	0.43	$22	0.43	$22
Solar bonus scheme	1.12	$58	2.74	$142	2.51	$130	1.10	$57
Regulated networks	**14.46**	**$748**	**11.36**	**$588**	**11.12**	**$575**	**11.73**	**$607**
Transmission	2.29	$119	2.48	$128	2.59	$134	2.59	$134
Distribution	12.17	$630	8.88	$459	8.53	$441	9.14	$473
Competitive market	**10.49**	**$543**	**11.20**	**$580**	**11.56**	**$598**	**13.52**	**$699**
Wholesale and retail								
Total	**27.04**	**$1,399**	**26.35**	**$1,363**	**26.35**	**$1,363**	**27.67**	**$1,431**

Figure A.3 shows the expected movement in each of the supply chain components for South East Queensland over the reporting period. In summary, the expected trends are:

- an average annual increase of 8.8 per cent in the competitive market component;
- an average annual decrease of 6.7 per cent in the regulated network component; and
- an average annual increase of 5.1 per cent in the environmental policy component over the reporting period.

Further detail on these trends can be found below in the supply chain component-specific sections below.

Figure A.3 Trend in South East Queensland supply chain cost components



A.2.1 Competitive market costs

Competitive market costs consist of the wholesale energy component and the costs associated with retailing electricity to residential consumers. The detailed methodology for estimating these costs is set out in Appendix J. A summary of our approach is as follows:

- The wholesale energy component was estimated by Frontier Economics and includes energy purchase costs, market fees and ancillary service costs.
- The retail component is the residual calculated for the base year when all non-retail cost components are subtracted from the representative *market offer* price, and is assumed to increase at an annual inflation rate of 2.5 per cent.

Competitive market costs are expected to increase at an average annual rate of 8.8per cent, including increases of 6.8 per cent in 2015/16, 3.2 per cent in 2016/17 and 17 per cent in 2017/18. These increases reflect higher wholesale electricity costs due to expected growth in electricity consumption and higher gas prices. In 2014/15, competitive market costs comprised 39 per cent of the representative *market offer*.

Wholesale energy component

Growth in electricity consumption is expected as the LNG facilities at Gladstone ramp-up to full export capacity during the period to 2017/18. AEMO has forecast growth in electricity consumption in the residential and commercial sector due to assumed population growth. Consumption growth leads to a tighter supply/demand balance and therefore higher wholesale electricity costs.

The ramp-up of the liquefied natural gas (LNG) facilities in Queensland will result in higher gas prices across all east coast jurisdictions. This is mainly due to the gas supply-demand balance tightening and the domestic gas market becoming exposed to international LNG prices. This creates rising costs for gas-fired generators and therefore contributes to rising wholesale electricity costs. Increasing gas prices may also contribute to decisions to temporarily or permanently retire gas generators. This would have the effect of reducing supply into the wholesale market which in turn would likely increase wholesale prices.

In 2016/17, a temporary decrease is observed in the Queensland gas price forecast. This is because additional investment in gas production infrastructure in 2015/16 leads to excess gas in the market before all of the LNG facilities are operational, which in turn puts downward pressure on Queensland wholesale gas prices. A more detailed discussion on the effect of wholesale gas prices on wholesale electricity costs can be found in Chapter 2.

Retail component

The costs of retailing electricity in Queensland are not directly observable. As detailed in Appendix J, the retail component of competitive market costs is not calculated. Retailers have different business models and cost structures, and estimating the retail component based on a representative *market offer* price is unlikely to be a true reflection of individual retailers' operating costs and return on investment.

A.2.2 Regulated networks

Transmission and distribution network businesses recover regulated network costs relating to the provision of electricity networks. Generally, transmission lines connect electricity generators to major load centres and the distribution network delivers energy at lower voltages to residential and other consumers.

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

In 2014/15, regulated network costs comprise 53 per cent of the representative *market offer*.

Transmission and distribution network costs are estimated using revenue determinations made by the AER as well as Energex's approved pricing proposals. The current transmission determination applies until 30 June 2017. The previous distribution determination ended on 30 June 2015. For the subsequent years of the reporting period the AER's draft decision for the 2015-20 regulatory period is applied.

Transmission

In 2014/15, the transmission network component comprised 8.5 per cent of the representative *market offer* and transmission costs are expected to increase on average by 4.2 per cent each year over the reporting period. This includes increases of 8.1 per cent in 2015/16 and 4.7 per cent in 2016/17 and no change in the final year of the reporting period.

The trend in regulated transmission network costs over the reporting period reflects the AER's final decision on the regulated revenue for Powerlink during 2012-17. Transmission network costs have been held constant in nominal terms for 2017/18.

The AER's final decision for Powerlink includes a lower rate of return and an increase in capital expenditure for the 2012-17 regulatory period compared to the 2007-12 regulatory period. The AER attributes the increases in capital expenditure to investment in response to peak demand growth that was anticipated at the time of the last regulatory determination and the replacement of ageing infrastructure. The component that has the greatest impact on the total revenue allowance for transmission network services is the rate of return, which has decreased from 8.76 per cent in 2007-12 to 8.61 per cent in 2012-17.[110] The AER's final determination attributes this in part to a change in financial market conditions.[111]

Distribution

In 2014/15, the distribution network component comprised 45 per cent of the representative *market offer* and is currently expected to decrease on average by 9.1 per cent each year over the reporting period. This includes decreases of 27 per cent in 2015/16 and 3.9 per cent in 2016/17 followed by an increase of 7.1 per cent in 2017/18.

For this report, distribution network costs are based on the AER's final decision on the regulated revenue for the distribution network business during 2015-2020. Inputs to the final decision include a lower rate of return allowance and reductions in capital expenditure. The rate of return that is used is 6.01 per cent, and this rate is chosen given improvements in the investment environment and lower financing costs. The lower capital expenditure component of the revenue allowance is based on costs related to asset replacement, network upgrades and capitalised overheads, such as communication an information technologies.[112]

A.2.3 Environmental policies

In this report, environmental policies are the schemes introduced by the Commonwealth and jurisdictional governments that impact residential electricity prices. These policies aim to reduce greenhouse gas emissions and meet other objectives.[113]

The environmental policies that apply in Queensland during the reporting period are the Commonwealth Government's Renewable Energy Target and the Queensland Solar Bonus Scheme.

The costs of the environmental policies are recovered from consumers in different ways. The costs of the Queensland Solar Bonus Scheme are recovered through increases in distribution network or retail prices, while costs associated with the Renewable Energy Target is recovered through increases in retail prices.

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110 See the AER's regulatory determinations for Powerlink for the 2012-17 and 2007-12 periods.

111 Australian Energy Regulator, *Final decision - Powerlink (transmission) 2012-17,* p41.

112 AER, *Final Decision: Energex (distribution) 2015-20*, fact sheet, October 2015.

113 Other objectives include encouraging investment, supporting employment and making energy efficiency measures more accessible and affordable.

In 2014/15, environmental policy costs in Queensland made up 7.7 per cent of the representative *market offer* price.

Renewable Energy Target

The Renewable Energy Target has two components: the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). Under both these components, eligible renewable energy generators are able to create certificates based on the amount of electricity they produce. In most circumstances, electricity retailers are then required to purchase these certificates and surrender them to the Clean Energy Regulator. Costs incurred by electricity retailers in purchasing certificates are passed on to consumers.

For this report, analysis of the costs associated with the Renewable Energy Target was undertaken by Frontier Economics assuming an annual target of 33,000 GWh by 2020.

In 2014/15, LRET comprised 1.8 per cent of the representative *market offer*. LRET scheme costs are expected to increase on average by 23 per cent per year over the reporting period.

In 2014/15, SRES comprised 1.8 per cent of the representative *market offer*. SRES scheme costs are expected to decrease on average by 3.9 per cent per year over the reporting period.

The trends in the LRET are based on assumptions about the percentage of renewable energy that will be required to meet the target and the resource costs of obtaining large-scale generation certificates. Similarly, SRES costs are also based on a renewable energy percentage and expectations about future certificate prices. The Clean Energy Regulator sets the renewable energy percentages for both the LRET and SRES schemes.[114]

Queensland Solar Bonus Scheme

The Queensland Solar Bonus Scheme was introduced on 1 July 2008 to provide an incentive for electricity customers to install solar energy systems. Households who installed small solar PV systems (of up to 5kW rated capacity) were eligible for a payment for all electricity exported to the grid.

The rate of payment received under this scheme depends on when households applied to connect a solar system and when the system was installed. Given that there are different levels of competition in the retail market in Queensland, there are different tariffs available based on location. The payments available under the Solar Bonus Scheme are:

- For those who lodged a connection application with their distribution network company before 9 July 2012 and installed the system before 30 June 2013, the

114 See Clean Energy Regulator "The certificate market", cleanenergyregulator.gov.au, accessed 21 August 2015. http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/The-certificate-market

payment is 44 c/kWh. As long as participants continue to meet certain eligibility criteria they will receive this payment until the scheme ends in 2028.[115]

- Since July 2014, customers in South East Queensland who are not eligible for the 44 c/kWh payment are able to negotiate a feed-in tariff with their retailer. Any payments made by retailers through these voluntary arrangements are not part of the Queensland Solar Bonus Scheme.
- Given the very limited retail competition in regional Queensland, the Queensland Competition Authority sets a feed-in -tariff rate that Ergon Energy must pay eligible customers. The feed-in-tariff for 2015/16 is 6.3 cents.[116]

Queensland Solar Bonus Scheme costs have risen significantly in 2015/16, and are expected to decrease by 8.5 per cent 2016/17 before falling by more than half in 2017/18. This results in an annual average decrease of 0.7 per cent over the reporting period.

For administrative reasons, there used to be a two year lag between when the Queensland Solar Bonus Scheme costs were incurred by network businesses and when they are recovered from consumers. With the start of the new regulatory period in 2015/16, it is possible for costs to be recovered from consumers in the same year that they are incurred. Hence in 2015/16 and 2016/17 only, the scheme costs include both the current year costs as well as the costs from two years prior.

Costs arising from the Queensland Solar Bonus Scheme are based on information provided by Energex. Energex allocates the costs of the scheme between the tariff classes proportional to the amount of revenue that is recovered from each class.

A.3 Developments that could affect residential electricity prices in Queensland

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

Inquiry into electricity prices

In April 2015, the Queensland Treasurer announced that the deregulation of retail prices for residential and small business customers in South East Queensland would be delayed until July 2016. The delay allows the Queensland Productivity Commission time to undertake a public inquiry into electricity prices.[117] The inquiry's terms of reference seeks recommendations from the Commission that promotes the long term interests of Queensland electricity consumers, place downward pressure on electricity prices and ensure a dynamic and responsive pricing framework.[118]

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115 Participants are no longer eligible for the 4 cent per kWh payment if they sell or lease their house, or if they upgrade their solar inverter to a larger capacity.

116 Queensland Competition Authority, *Final Report: Solar feed-in tariff for regional Queensland 2015–16*, fact sheet, May 2015.

117 C Pitt (Queensland Treasurer), *Deregulation deferred as Productivity Commission conducts power probe,* media statement, 28 April 2015.

118 Queensland Productivity Commission, *Public Inquiry into Electricity Prices* Terms of Reference, April 2015 *http://www.qpc.qld.gov.au/inquiries/public-inquiry-into-electricity-pricing/*

The Queensland Government is also seeking advice from the inquiry on the costs and benefits of deregulation and whether the proposed market monitoring arrangements and consumer protections are sufficient to allow price regulation to be removed. An interim report is due to be delivered to the Queensland Government by the end of January 2016.[119]

Inquiry into solar feed-in pricing

The Queensland Government has asked the Queensland Productivity Commission to undertake an inquiry into solar feed-in pricing in Queensland. The inquiry's terms of reference seeks a report on a fair price for solar energy generated by a 'small customer' and exported to the Queensland electricity grid, including a methodology for setting a fair price and a consideration of barriers and constraints associated with monetising the value of exported solar.[120] A draft report is due in February 2016, with the final report due 31 May 2016.

Solar Future Program

The Queensland Government has announced a number of initiatives to promote renewable energy in Queensland, including:[121]

- a target for one million rooftops in Queensland to have solar panels by 2020;
- a 50 per cent renewable energy target by 2030, with an independent public inquiry into a credible pathway to achieving this target; and
- a commitment to support up to 60 MW of large-scale solar generation in Queensland. The Queensland Government will provide long-term revenue contracts to Queensland large-scale solar projects that successfully bid for Australian Renewable Energy Agency (ARENA) funds.[122]

A.4 Queensland consumer profiles

The analysis in this report is focussed on the "representative" or most typical consumer for each jurisdiction. The consumer profiles below give examples of different consumer types where factors such as household size, off-peak hot water use and the presence of a pool or solar panels contribute to different consumption levels, and therefore annual bills.

119 ibid.

120 Queensland Productivity Commission, *Public Inquiry into a Fair Price for Solar Exports* Terms of Reference, http://www.qpc.qld.gov.au/inquiries/solar-feed-in-pricing/

121 Queensland Government, A solar future-powering Queensland's renewable energy industries, https://www.dews.qld.gov.au/energy-industry/renewable-energy/projects/a-solar-future

122 Queensland Government, *Solar 60 - Queensland's large-scale solar investment program*, https://www.business.qld.gov.au/industry/energy/renewable-energy/solar-60

Box A.2 Electricity consumption in a Queensland one-person household

Liam lives in Albany Creek, Brisbane. The main features of his energy consumption are that he has no gas connection; no swimming pool; uses a moderate amount of air conditioning; and has electric hot water which is on an off-peak tariff to reduce his electricity costs. He also travels a lot for work. He always pays his bill on time via a direct debit.

Liam currently uses 3,349 kWh of electricity each year, of which 1,005 kWh is for off-peak hot water. He pays 32.29 c/kWh in total for his power. This includes a fixed component of 116.38 cents per day and a variable tariff component of 22.23 c/kWh for his main usage. The off-peak tariff is 12.44 c/kWh and has an additional fixed component of 2.89 cents per day. Overall, Liam has a GST-exclusive annual household electricity bill of $1,081.

Liam has been with the same electricity retailer for many years and has never shopped around for his electricity supply.

The most common consumer type in Queensland uses an average of 5,173 kWh per year, of which 1,552 kWh is off-peak hot water. This consumer has shopped around, pays 26.35 c/kWh in total for power and has an annual bill of $1.363, based on an average of actual offers.

Liam was interested in reducing his household electricity costs. In November 2015, he consulted the Australian Energy Regulator's *Energy Made Easy* price comparator website (www.energymadeeasy.gov.au) to see whether there was a more suitable electricity plan available for him. He found an offer available in Albany Creek (which is in the Energex network region) that would cost $961 per year, excluding GST. The new offer features a lower fixed component of 86.75 cents per day and higher variable component of 24.74 c/kWh. The off-peak tariff is 11.45 c/kWh and has no additional fixed component. Both the fixed and variable tariff components include a 5 per cent discount for paying each bill by the due date. Liam may save up to $120 per annum by switching to this offer.

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer	Liam	
	2 people, no gas, no pool, off-peak hot water	1 person, no gas, no pool, off-peak hot water	
		Current offer	**New offer**
Consumption (kWh/yr)	5,173	3,349	3,349
Competitive market charges	$580	$574	$454
Network charges	$ 588	$380	$380
Environmental policy charges	$196	$127	$127
Annual bill	**$1,363**	**$1,081**	**$961**
Average price (c/kWh)	26.35	32.29	28.70

Note: Due to rounding, the annual bill may not be the same as the total of the cost components.

Between July 2014 and June 2018, Liam can expect his electricity bills to increase at an annual average rate of 0.8 per cent. Further information and analysis can be found in the Queensland section of this report.

Box A.3 Electricity consumption in a Queensland four-person household

Basel, Fatima and their two children live in Redbank Plains, Ipswich. The main features of their energy consumption are that they have solar panels; no gas connection; no swimming pool; use a moderate amount of air conditioning; and have electric hot water which is on an off-peak tariff to reduce their electricity costs. They do not have many energy efficient appliances. They always pay their bill on time via a direct debit.

Basel and Fatima currently use 6,240 kWh of electricity from the grid each year, of which 1,872 kWh is for off-peak hot water. They pay 28.21 c/kWh in total for their grid power. This includes a fixed component of 116.40 cents per day and a variable tariff component of 22.24 c/kWh. The off-peak tariff is 18.87 c/kWh and has an additional fixed component of 2.90 cents per day. Basel and Fatima use 1,106 kWh each year from their solar panels. They also export 4,422 kWh to the grid from their solar panels and receive a feed-in tariff of 6 c/kWh for this electricity. Overall, Basel and Fatima have a net annual household electricity bill of $1,495, exclusive of GST.

Basel and Fatima have been with the same electricity retailer for many years and

have never shopped around for their electricity supply.

The most common consumer type in Queensland uses an average of 5,173 kWh per year, of which 1,552 kWh is off-peak hot water. This consumer has shopped around, pays 26.35 c/kWh in total for power and has an annual bill of $1,363, based on an average of actual offers.

Fatima was interested in reducing their household electricity costs. In November 2015, she consulted the Australian Energy Regulator's *Energy Made Easy* price comparator website (www.energymadeeasy.gov.au) to see whether there was a more suitable electricity plan available for her family. She found an offer available in Redbank Plains (which is in the Energex network region) that would cost $1,315 per year, including a 4 c/kWh feed-in tariff and excluding GST. The new offer features a fixed component of 118 cents per day and lower variable component of 19.68 c/kWh. The off-peak tariff is 10.75 c/kWh and has no additional fixed component. The variable tariff components include a 15 per cent discount for paying each bill by the due date. Basel and Fatima may save up to $180 per annum by switching to this offer.

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer	**Basel, Fatima and two children**	
	2 people, no gas, no pool, no solar panels, off-peak hot water	4 people, no gas, no pool, solar, off-peak hot water	
		Current offer	**New offer**
Consumption from the grid (kWh/yr)	5,173	6,240	6,240
Competitive market charges	$580	$815	$546
Network charges	$588	$709	$709
Environmental policy charges	$196	$237	$237
Gross annual bill	**$1,363**	**$1,760**	**$1,492**
Average price (c/kWh)	26.35	28.21	23.90
Solar feed-in tariff for electricity exported to the grid	nil	($265)	($177)
Net annual bill	**$1,363**	**$1,495**	**$1,315**

Note: Due to rounding, the annual bill may not be the same as the total of the cost components.

Between July 2014 and June 2018, Basel and Fatima can expect their electricity

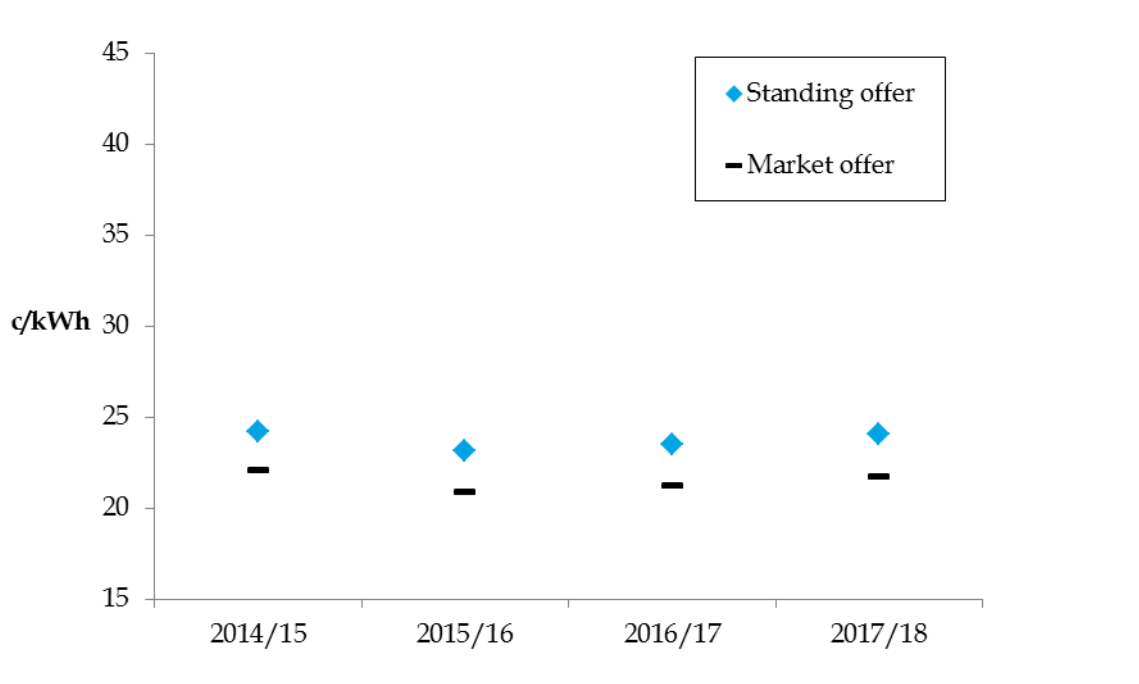
bills to increase at an annual average rate of 0.8 per cent. Further information and analysis can be found in the Queensland section of this report.

B New South Wales

Box B.1 Key points

- Residential electricity *market offer* prices in New South Wales are expected to decrease by 5.3 per cent in 2015/16, before increasing by 1.4 per cent in 2016/17 and 2.6 per cent in 2017/18. This is equivalent to an average annual decrease of 0.5 per cent for the representative consumer over the reporting period.
- The decrease in 2015/16 is mostly due to lower distribution network costs, which fall across the reporting period following the AER's final decisions for the distribution network businesses for the 2015-18 regulatory period. Increases in 2016/17 and 2017/18 are mainly due to rising competitive market costs outweighing reductions in network costs.
- In 2014/15, a representative consumer on a *standing offer* using 5,936 kWh each year, had a total annual bill of $1,438 exclusive of GST. This consumer may have saved around $127 or 8.8 per cent, by switching from a *standing offer* to the representative *market offer*.
- The New South Wales distribution businesses have made applications to the Australian Competition Tribunal for a review of the AER's recent distribution determinations. The trend in regulated network costs will depend on the outcomes of these merits reviews and business transaction legislation.

Figure B.1 Trend in New South Wales *market offer* and *standing offer* prices



B.1 Trends in residential electricity prices

Residential electricity *market offer* prices in New South Wales are expected to decrease by 5.3 per cent in 2015/16, before increasing by 1.4 per cent in 2016/17 and 2.6 per cent in 2017/18. This is equivalent to an average annual decrease of 0.5 per cent for the representative consumer over the reporting period. Figure B.1 shows the expected movements in *standing offer* and *market offer* prices.

New South Wales consumers have the choice of two different types of retail offer: *standing offers* and *market offers*. All of these offers feature prices set by retailers in the competitive market. With the removal of retail price regulation on 1 July 2014, regulated offers are no longer available in New South Wales.[123]

Around 67 per cent of New South Wales consumers are on *market offer.*[124] In 2014/15, a representative consumer on a *standing offer* using 5,936 kWh per year had a total annual bill of $1,438 exclusive of GST. This consumer may have saved around $127, or 8.8 per cent, by switching from the representative *standing offer* to the representative *market offer*.[125]

B.1.1 Representative pricing methodology

The analysis of residential prices and cost components applies to a representative residential consumer in New South Wales consuming 5,936 kWh of electricity per year, of which 1,900 kWh is allocated to the off-peak tariff.[126] In New South Wales, the most common type of residential electricity consumer (the representative consumer) is a two-person household with no pool, no mains gas connection and electric hot water on an off-peak tariff.

For 2014/15, the representative *standing offer* and representative *market offer* price were estimated using retailer data sourced through the Australian Energy Regulator's Energy Made Easy price comparator website. For future years, the trends for the *standing offer* and *market offer* prices are based on estimated movements in the underlying supply chain cost components.

A detailed explanation of the methodology is set out in Appendix J.

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123 Consumers that were on the regulated offer immediately prior to 1 July 2014 were placed on a transitional offer, unless they elected to move to a *standing offer* or a *market offer*. The transitional offer featured a 1.5 per cent price reduction off the regulated offer. Consumers can choose to move from the transitional offer to a *market offer* at any time. In 2015/16 the transitional offer price increases will be capped at the rate of inflation. The transitional offer ends for residential customers on 30 June 2016.

124 Australian Energy Market Commission, *2015 Retail Competition Review*, Final Report, 30 June 2015, p245.

125 This indicative saving is based on a representative consumer on a representative *standing offer* switching to the representative *market offer*, as defined in this report. Actual savings will depend on individual circumstances.

126 This consumption level was calculated from benchmark value published by the AER. ACIL Allen Consulting, *Electricity Bill Benchmarks for Residential Customers*, a report to the Australian Energy Regulator, October 2014.

B.1.2 Effect of different household consumption levels on electricity price and annual expenditure in 2014/15

The consumption of the representative consumer is developed using a set of assumptions in order to provide information about the trends in and drivers of electricity prices. The price outcomes based on the representative consumer's consumption are sensitive to these assumptions and may not reflect actual prices paid by individual consumers.

Table B.1 demonstrates how the average unit cost of electricity and the annual electricity bill in New South Wales are sensitive to changes in the consumption levels. Lower consumption levels result in lower annual household bills but a higher per unit average price, as the fixed component of the retail electricity price is spread over a smaller volume of electricity. The opposite effect applies to higher consumption levels, whereby annual household bills are higher but there is a lower per unit average price, as the fixed component of the retail electricity price is spread over a larger volume of electricity.

Further examples of different consumer profiles using actual offers are set out in sectionB.4.

Table B.1 Effect of different consumption levels on average electricity price and annual expenditure in 2014/15, excluding GST

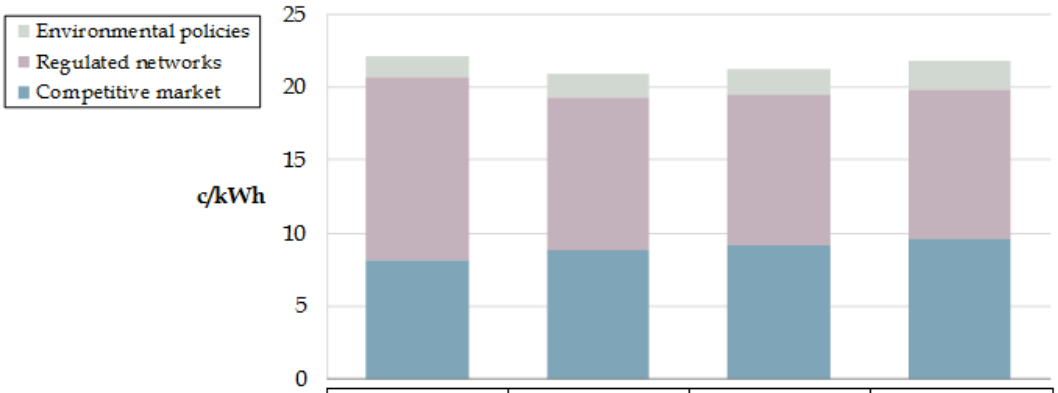
Annual consumption level	2014/15 Average *market offer* (cents per kWh)	2014/15 Annual household bill
Low (2,500 kWh)	29.70	$742
Representative consumer: 2 people, no pool, no gas and off-peak hot water (5,936 kWh of which 1,900 kWh is off-peak)	22.10	$1,312
High (9,500 kWh)	20.03	$1,902

Prices in this table are based on an average of actual offers.

B.2 Trends in supply chain components

Figure B.2 shows the expected movements in the supply chain cost components for New South Wales, which are the competitive wholesale and retail markets, regulated networks and government environmental policies.

Figure B.2 Trends in New South Wales supply chain components



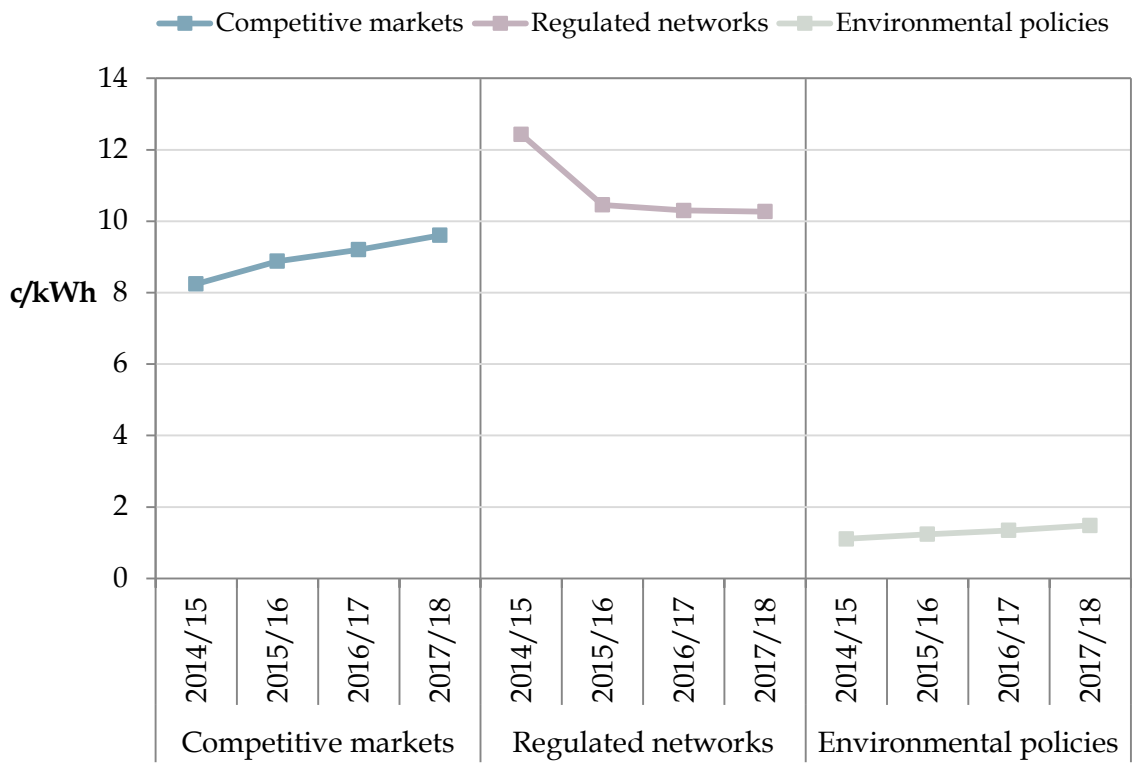
	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**1.42**	**$ 85**	**1.59**	**$ 95**	**1.73**	**$ 103**	**1.91**	**$ 113**
LRET	0.49	$ 29	0.59	$ 35	0.74	$ 44	0.90	$ 54
SRES	0.49	$ 29	0.48	$ 28	0.44	$ 26	0.43	$ 26
Climate Change fund	0.39	$ 23	0.39	$ 23	0.39	$ 23	0.39	$ 23
Energy Saving Scheme	0.06	$ 3	0.13	$ 8	0.16	$ 10	0.17	$ 10
Regulated networks	**12.43**	**$ 738**	**10.46**	**$ 621**	**10.30**	**$ 611**	**10.27**	**$ 609**
Transmission	1.66	$ 99	2.61	$ 155	2.56	$ 152	2.52	$ 150
Distribution	10.77	$ 639	7.85	$ 466	7.74	$ 459	7.74	$ 460
Competitive market	**8.24**	**$ 489**	**8.88**	**$ 527**	**9.20**	**$ 546**	**9.61**	**$ 570**
Wholesale and retail								
Total	**22.10**	**$1,312**	**20.93**	**$1,242**	**21.23**	**$1,260**	**21.78**	**$1,293**

Figure B.3 shows the expected trends in the supply chain cost components in New South Wales over the reporting period. In summary, the expected trends are:

- an average annual increase of 5.2per cent in the competitive market component;
- an average annual decrease of 6.2 per cent in regulated networks; and
- an average annual increase of 10 per cent in the environment policy component over the reporting period.

Further detail on these trends can be found below in the supply chain component-specific sections below.

Figure B.3 Trends in New South Wales supply chain cost components



B.2.1 Competitive market costs

Competitive market costs consist of the wholesale energy component and the costs associated with retailing electricity to residential consumers. The detailed methodology for estimating these costs is explained in Appendix J. A summary of the approach is as follows:

- The wholesale energy cost component was modelled by Frontier Economics and includes energy purchase costs, market fees and ancillary services costs; and
- The retail component is the residual calculated for the base year when all non-retail cost components are subtracted from the representative *market offer* price, and is assumed to increase at an annual inflation rate of 2.5 per cent.

In New South Wales, competitive market costs are expected to increase at an average annual rate of 5.2 per cent, including increases of 7.7 per cent in 2015/16, 3.6 per cent in 2016/17 and 4.4 per cent in 2017/18.

In 2014/15, competitive market costs comprised 37 per cent of the representative *market offer* in 2014/15 and will comprise an increasing proportion of a residential electricity customer's bill over the reporting period.[127]

127 Wallerawang C power station retired in 2014/15, which removed 1,000 MW of capacity from the New South Wales wholesale electricity market. This generator retirement has been accounted for in the electricity market modelling undertaken for this report by Frontier Economics and therefore will not have any further impact on residential electricity prices during the reporting period.

Wholesale energy component

Frontier Economics expects the wholesale energy cost component for New South Wales to increase by more than the rate of inflation over the reporting period. The expected increase in wholesale energy costs is due to the growth in electricity consumption and higher gas prices.

Over the reporting period, AEMO forecasts a recovery of consumption growth in New South Wales, driven by the residential and commercial sector.[128] Average annual consumption is expected to increase over the period to 2017/18, leading to a tightening supply-demand balance in the short-term. This has the effect of putting upward pressure on wholesale electricity costs in the NEM.

Higher gas prices across east coast jurisdictions creates rising costs for gas-fired generators, contributing to rising wholesale electricity costs. Further detail on the effects of increasing consumption and increasing gas prices on wholesale electricity costs can be found in Chapter 2.

Retail component

The costs of retailing electricity in New South Wales are not directly observable. As detailed in Appendix J, the retail component of competitive market costs is not calculated. Retailers have different business models and cost structures, and estimating the retail component based on a representative *market offer* is unlikely to be a true reflection of individual retailers' operating costs and return on investment.

B.2.2 Regulated networks

Transmission and distribution network businesses recover regulated network costs relating to the provision of electricity networks. Generally, transmission lines connect electricity generators to major load centres and the distribution network delivers energy at lower voltages to residential and other consumers.

In New South Wales, transmission network services are provided by TransGrid,[129] and distribution network services are provided by Ausgrid, Endeavour Energy and Essential Energy.

A number of different sources have been used to determine the expected trend in network costs over the reporting period:

- The network costs for 2014/15 and 2015/16 are derived from approved pricing proposals from the network businesses; and
- The expected trend in New South Wales network costs for 2016/17 and 2017/18 is based on the AER's final decisions for the distribution and transmission businesses revenue determinations for the 1 July 2014 to 30 June 2019 period, that

128 Australian Energy Market Operator, Detailed Summary of 2015 Electricity Forecasts, *2015 National Electricity Forecasting Report*, June 2015, p36.

129 Ausgrid is primarily a Distribution Network Services Provider but is also registered as a Transmission Network Services Provider. Ausgrid's network includes dual function assets with a voltage 66kV and above that are owned by Ausgrid and operate in parallel with and provide material support to the TransGrid transmission network. Ausgrid's transmission assets are covered together with their distribution assets under the distribution network revenue determination.

were made under the new rules for network regulation. The New South Wales distribution businesses have made applications to the Australian Competition Tribunal for a review of the AER's distribution determinations. TransGrid has not appealed the AER's decision on transmission revenue for 2014-18. The trend in regulated network costs will depend on the outcomes of these merit reviews and the operation of the electricity price guarantee that forms part of the network business transaction legislation.[130]

In 2014/15, the regulated network component comprised 56 per cent of the representative *market offer* price.

Transmission

In 2014/15, the transmission network component comprised 7.5 per cent of the representative *market offer* and transmission costs are expected to increase on average by 15 per cent each year over the reporting period. This includes a 57 per cent increase in transmission costs between 2014/15 and 2015/16 (from $99 in 2014/15 to $155 in 2015/16), a 1.9 per cent decrease in 2016/17 and a 1.5 per cent decrease in 2017/18.

The trend in regulated transmission network costs over the reporting period reflects the AER's final decision on the regulated revenue for TransGrid for the period 2014-18.

The AER's final decision for TransGrid is based on a lower rate of return, capital expenditure and operating expenditure for the 2014-18 regulatory period, compared to the 2009-14 regulatory period. The component that has the greatest impact on the total revenue allowance for transmission network services is the rate of return, which has decreased from 10.02 per cent in 2009-14 to 6.75 per cent in 2014-18.[131] The AER's final determination attributes this in part to a change in financial market conditions.[132]

Distribution

In 2014/15, the distribution network component comprised 49 per cent of the representative *market offer*. Distribution costs are currently expected to decrease on average by 10 per cent each year over the reporting period. This includes a 27 per cent decrease in distribution costs between 2014/15 and 2015/16, a 1.4 per cent decrease in 2016/17 and a 0.1 per cent increase in 2017/18.

The trend in regulated distribution network charges over the reporting period reflects the AER's final decisions on the regulated revenue for each of Ausgrid, Endeavour Energy and Essential Energy during 2015-19.[133] The decrease in distribution prices is driven by a lower rate of return, and lower capital and operating expenditure for the 2015-19 regulatory period, compared to the 2009-14 regulatory period.

The AER's final decisions for 2015-19 include setting a lower rate of return as an input to the overall revenue allowance, compared with the 2009-14 regulatory period. The

130 See section 8 of the *Electricity Network Assets (Authorised Transactions) Act* 2015

131 Australian Energy Regulator, Fact Sheet, *Final decision - TransGrid (transmission) 2014-19*, p1.

132 ibid, p2.

133 It is noted that this trend may be impacted by the outcome of the merits review. The New South Wales distribution businesses have made applications to the Australian Competition Tribunal for a review of the AER's recent distribution determinations. TransGrid has not appealed the AER's decision on transmission revenue for 2015-18.

AER's rate of return of 6.68 per cent for each of the three distribution businesses for 2015-19 is lower than the rate of return of 10.02 per cent for the 2009-14 regulatory period. The AER's final determination attributes this in part to a change in financial market conditions.[134]As discussed in Chapter 2, the rate of return makes a significant contribution to network costs and is a key factor in the expected trend over the reporting period.

The decrease in distribution prices is also driven by the reduced capital and operating expenditure components for 2015-19 for all three of the New South Wales distribution businesses, compared with the 2009-14 regulatory period.

The decrease in capital expenditure between regulatory periods is partly due to a change in jurisdictional planning standards. The AER noted that a key driver of capital expenditure in the 2009-14 regulatory period was the NSW licence conditions around design standards. The removal of these standards by the New South Wales Government in 2014 has contributed to lower capital expenditure for the NSW distribution businesses in the 2015-19 regulatory period.[135]

B.2.3 Environmental policies

In this report, environmental policies are the schemes that have been introduced by the Commonwealth and jurisdictional governments that impact residential electricity prices. These policies aim to reduce greenhouse gas emissions and meet other objectives.[136] The environmental policies that apply in New South Wales during the reporting period are the Commonwealth Government's Renewable Energy Target, and New South Wales government's policies, these being the Climate Change Fund that supports the Solar Bonus Scheme and the Energy Savings Scheme.

Environmental costs are recovered from consumers in different ways. The costs of the Climate Change Fund are recovered through increases in distribution network costs. The costs associated with the Renewable Energy Target and Energy Savings Scheme are recovered through increases in retail prices.

In 2014/15, environmental policies comprised 6.4 per cent of the representative *market offer*.

In summary, the contributions of the individual environmental policy components are:

- Large-scale Renewable Energy Target costs make up 2.2 per cent of the representative *market offer* in 2014/15;
- Small-scale Renewable Energy Scheme costs make up 2.2 per cent of the representative *market offer* in 2014/15;
- Costs of the Climate Change Fund are expected to remain flat across the reporting period. It comprised 1.8 per cent of the representative *market offer* in 2014/15; and

134 Australian Energy Regulator, Fact Sheet, *Final decision - Ausgrid 2015-19*, p2

135 Australian Energy Regulator, Final Decision, Ausgrid distribution determination 2015-16 to 2018-19, p6-33.

136 Other objectives include encouraging investment, supporting employment and making energy efficiency measures more accessible and affordable.

- Costs associated with the Energy Savings Scheme are expected to rise slightly across the reporting period. It comprised 0.3 per cent of the representative *market offer* in 2014/15.

Renewable Energy Target

For this report, analysis and modelling of the costs associated with the Renewable Energy Target was undertaken by Frontier Economics assuming an annual target of 33,000 GWh by 2020.

The Renewable Energy Target has two components: the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). Under both these components, eligible renewable energy generators are able to create certificates based on the amount of electricity they produce. In most circumstances, electricity retailers are then required to purchase these certificates and surrender them to the Clean Energy Regulator. Costs incurred in purchasing certificates are passed on to consumers.

In 2014/15, LRET comprised 2.2 per cent of the representative *market offer*. LRET scheme costs are expected to increase on average by 23 per cent per year over the reporting period.

In 2014/15, SRES comprised 2.2 per cent of the representative *market offer*. SRES scheme costs are expected to decrease on average by 3.9 per cent per year over the reporting period.

The trends in the LRET are based on assumptions about the percentage of renewable energy that will be required and the resource costs of obtaining large-scale generation certificates. Similarly, SRES costs are also based on a renewable energy percentage and expectations about future certificate prices. The Clean Energy Regulator sets the renewable energy percentages for both the LRET and SRES schemes.[137]

Climate Change Fund

The Climate Change Fund was established by the New South Wales Government to support energy and water savings initiatives.[138] It is mostly funded through electricity distribution businesses, which pass on the costs to consumers through network distribution prices.[139]

The legacy Solar Bonus Scheme is the largest obligation of the Climate Change Fund.[140] It provides feed-in tariffs to support residential solar PV systems.

The Solar Bonus Scheme includes two separate tariffs:

- a 60c/kWh premium tariff, continuing until 31 December 2016;[141] and

137 See Clean Energy Regulator "The certificate market", cleanenergyregulator.gov.au, accessed 21 August 2015. http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/The-certificate-market

138 For more information, see: http://www.environment.nsw.gov.au/grants/ccfund.htm

139 NSW Government, Office of Environment & Heritage, NSW Climate Change Fund Annual Report 2013-14, p1. http://www.environment.nsw.gov.au/resources/grants/140739CCFAR1314.pdf

140 NSW Government, Office of Environment and Heritage, NSW Climate Change Fund, Annual Report 2013-14, p24.

- a 20c/KWh premium tariff, continuing until 31 December 2016.[142]

The cost of the Solar Bonus Scheme is expected to remain constant for the reporting period, as new solar installations are not eligible for the Solar Bonus Scheme.

In 2014/15, the Climate Change Fund comprised 1.8 per cent of the representative *market offer*. Climate Change Fund costs are the same for each year of the reporting period. Costs arising from the Climate Change Fund were provided by the New South Wales Government.

New South Wales Energy Savings Scheme

The Energy Savings Scheme is a New South Wales Government program to assist households and businesses reduce their energy consumption. This is a certificate trading scheme where retailers are required to fund energy efficiency through the purchase of certificates.

In 2014/15, the Energy Saving Scheme comprised 0.3 per cent of the representative *market offer*. Energy Saving Scheme costs are expected to increase on average by 46 per cent per year over the reporting period. This increase is expected due to the expansion of the Energy Saving Scheme, as outlined in section B.3 below. Costs arising from the Energy Savings Scheme were provided by the New South Wales government and are based on their preferred future policy option.

B.3 Developments that could affect residential electricity prices in New South Wales

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

Merits review

The New South Wales distribution businesses have made applications to the Australian Competition Tribunal for a review of the AER's recent distribution determinations. The trend in regulated network costs will depend on the outcomes of these merits reviews. TransGrid has not appealed the AER's decision on transmission revenue for 2014-19. The trend may also be affected to the extent the electricity price guarantee, which is set out in the *Electricity Network Assets (Authorised Transactions) Act* 2015, operates to cap network costs at the level they were in the financial year ending 30 June 2014.

Review of and proposed amendments to New South Wales Energy Savings Scheme

The New South Wales Government is concurrently considering reforms to the ESS and undertaking a statutory review of the scheme.

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141 To be eligible for the 60 cent tariff, a consumer must have entered a binding agreement to purchase or lease a complying generator on or before 27 October 2010, lodge an application to connect that generator to the network on or before 18 November 2010, and for the generator to have been connected on or before 30 June 2012

142 To receive the tariff, the consumer must have connected to the network by meter installation on or before 30 June 2011, or the network must have received an 'application to connect' on or before 28 April 2011 and the consumer must have connected the solar panels to the network by meter installation on or before 30 June 2012.

In November 2014, the New South Wales Government proposed a number of changes to the Energy Savings Scheme, including:[143]:

- expanding the fuel coverage of the scheme to include gas
- extending the duration of the scheme to 2025
- introducing a regional factor into the scheme to more accurately reward energy saved in regional New South Wales; and
- improving the administration and effectiveness of the scheme.

In April 2015, the New South Wales Government proposed further details and options to enhance the scheme, including increasing the retailer obligation from 5 per cent to 6.5 per cent of liable electricity sales.[144]

The statutory review of the Energy Savings Scheme was completed in June 2015. It examined the scheme's performance during its first five compliance years (2009 to 2013) and concluded that the policy objectives of the scheme remain valid. Supporting legislative changes are intended to take effect from January 2016.[145]

B.4 New South Wales consumer profiles

The analysis in this report is focussed on the "representative" or most typical consumer for each jurisdiction. The consumer profiles below give examples of different consumer types where factors such as household size, off-peak hot water use and the presence of a pool or solar panels contribute to different consumption levels, and therefore annual bills.

143 Energy Savings Scheme, Scheme Changes, *Energy Savings Scheme website*, viewed on 20 August 2015. http://www.ess.nsw.gov.au/How_the_scheme_works/Scheme_changes

144 New South Wales Government, *Review of the NSW Energy Savings Scheme Part 2: Options Paper*, April 2015.

145 New South Wales Government, *Review of the NSW Energy Savings Scheme: Final Statutory Review Report*, June 2015.

Box B.2 Electricity consumption in a New South Wales one-person household

Richie lives in an apartment in Parramatta, Sydney. The main features of his energy consumption are that he does not have a mains gas connection to his apartment; does not have a swimming pool; does not have off-peak hot water; and uses a small amount of air conditioning. He always pays his bill on time via a direct debit.

Richie currently uses 3,462 kWh of electricity each year. He pays 29.65 c/kWh in total for his power. This includes a fixed component and a variable tariff as set out in the table below. Therefore, Richie has a GST-exclusive annual household electricity bill of $1,026.

Tariff structure

	Tariff
Daily supply charge (c/day)	74.32
First 10.96 kWh per day (c/kWh)	21.81
Next 8.22 kWh per day (c/kWh)	21.22
Further usage (c/kWh)	20.45

Richie has never shopped around for his electricity supply. After moving into his apartment he has continued to pay the same price as the former tenant.

The most common consumer type in New South Wales uses an average of 5,936 kWh per year, of which 1,900 kWh is on an off-peak hot water tariff. This consumer has shopped around, pays 20.93 c/kWh in total for power and has an annual bill of $1,242, based on an average of actual offers.

Richie was interested in reducing his household electricity costs. In November 2015, he consulted the Australian Energy Regulator's Energy Made Easy price comparator website (www.energymadeeasy.gov.au) to see whether there was a more suitable electricity plan available for him. He found an offer available in Parramatta (which is in the Endeavour Energy network region) that would cost $847 per year, excluding GST. The new offer features a lower fixed component of 66.60 cents per day and a lower variable tariff as set out in the table below. The variable charges include a 20 per cent discount for paying each bill by the due date. Richie may save up to $178 per annum by switching to this offer.

Tariff structure - new offer

	Tariff
Daily supply charge (c/day)	66.60
First 1,750 kWh per quarter (c/kWh)	17.46
Further usage (c/kWh)	16.98

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer	Richie	
	2 people, no gas, no pool, off-peak hot water	1 person, no gas, no pool, no off-peak hot water	
		Current offer	**New offer**
Consumption (kWh/yr)	5,936	3,462	3,462
Competitive market charges	$527	$515	$336
Network charges	$621	$452	$452
Environmental policy charges	$95	$59	$59
Annual bill	**$1,242**	**$1,026**	**$847**
Average price (c/kWh)	20.93	29.65	24.47

Note: Due to rounding, the annual bill may not be the same as the total of the cost components.

Between July 2014 and June 2018, consumers in New South Wales can expect their electricity bills to decrease at an annual average rate of 0.5 per cent. Further information and analysis can be found in the New South Wales section of this report.

Box B.3 Electricity consumption in a New South Wales four-person household

Helen, Ed and their two children live in a house in Dee Why, Sydney. The main features of their energy consumption are that they have a mains gas connection to their house; a swimming pool; solar panels; use a moderate amount of air conditioning; have some energy efficient appliances; and have hot water which is on an off-peak tariff to reduce their electricity costs. They always pay their bill on time via a direct debit.

Helen and Ed currently use 7,491 kWh of electricity each year from the grid, of which 2,397 kWh is for off peak hot water. They pay 22.43 c/kWh in total for their grid power. This includes a fixed component of 67.12 cents per day and a variable tariff, as set out in the table below. The off-peak tariff is 11.11 c/kWh for usage, as well as an additional fixed component of 9.15 cents per day. Helen and Ed use 967 kWh each year from their solar panels. They also export 3,870 kWh to the grid from their solar panels and receive a feed-in tariff of 5.1 c/kWh for this electricity. Therefore, Helen and Ed have a net annual household electricity bill of $1,483, exclusive of GST.

Tariff structure

	Tariff
Daily supply charge (c/day)	67.12
First 10.96 kWh per day (c/kWh)	22.35
Next 10.96 kWh per day (c/kWh)	22.05
Further usage (c/kWh)	21.76

Helen and Ed have been with the same electricity retailer for many years and have never shopped around for their electricity supply. The most common consumer type in New South Wales uses an average of 5,936 kWh per year, of which 1,900 kWh is on an off-peak hot water tariff. This consumer has shopped around, pays 20.93c/kWh in total for power and has an annual bill of $1,242, based on an average of actual offers.

Ed was interested in reducing his household's electricity costs. In November 2015, he consulted the Australian Energy Regulator's Energy Made Easy price comparator website (www.energymadeeasy.gov.au) to see whether there was a more suitable electricity plan available for him. He found an offer available in Dee Why (which is in the Ausgrid network region) that would cost $1,220 per year, including the same feed-in tariff but excluding GST. The new offer features a lower fixed component of 66 cents per day and lower variable tariff as set out in the table below. The variable charges include a 21 per cent discount for paying each bill by the due date. The off-peak tariff is 10.92 c/kWh and has a fixed component of 9 cents per day. Helen and Ed may save up to $263 per annum by switching to this offer.

Tariff structure - new offer

	Tariff
Daily supply charge (c/day)	66.00
First 10.96 kWh per day (c/kWh)	17.36
Next 10.96 kWh per day (c/kWh)	17.13
Further usage (c/kWh)	16.91

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer	Ed, Helen and two children	
	2 people, no gas, no pool, no solar panels, off-peak hot water	4 people, gas, pool, solar panels, off-peak hot water	
		Current offer	**New offer**
Consumption from the grid (kWh/yr)	5,936	7,491	7,491
Competitive market charges	$527	$840	$578
Network charges	$621	$719	$719
Environmental policy charges	$95	$121	$121
Gross annual bill	**$1,242**	**$1,680**	**$1,417**
Average price (c/kWh)	20.93	22.43	18.92
Solar feed-in tariff for electricity exported to the grid	n/a	($197)	($197)
Net annual bill	**$1,242**	**$1,483**	**$1,220**

Note: Due to rounding, the annual bill may not be the same as the total of the cost components.

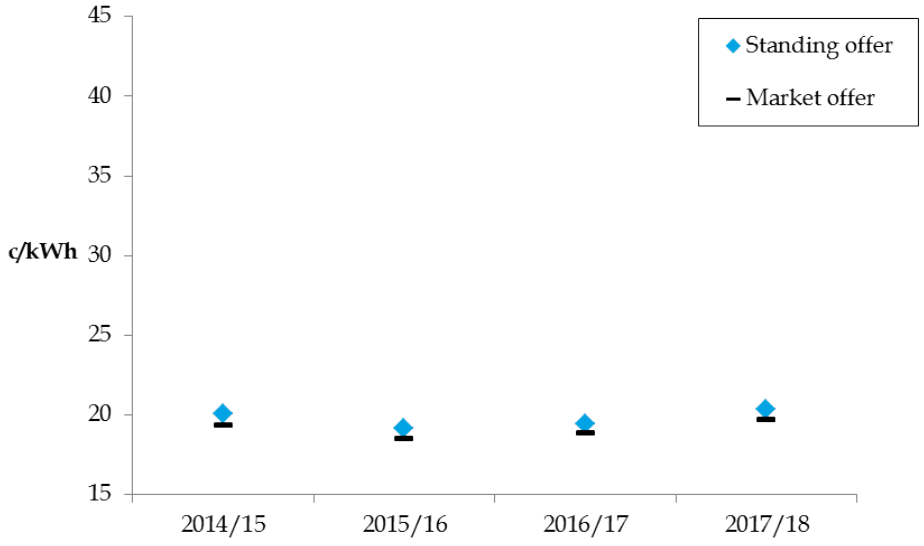
Between July 2014 and June 2018, consumers in New South Wales can expect their electricity bills to decrease at an annual average rate of 0.5 per cent. Further information and analysis can be found in the New South Wales section of this report.

C Australian Capital Territory

Box C.1 Key points

- Residential *standing offer* electricity prices in the Australian Capital Territory (ACT) are expected to decrease by 4.7 per cent in 2015/16, before increasing by 1.7 per cent in 2016/17 and 4.5 per cent in 2017/18. This is equivalent to an average annual increase of 0.4 per cent for the representative consumer over the reporting period.
- The decrease in 2015/16 is mostly due to lower distribution network costs and competitive market costs. Falling network costs across the reporting period are based on the AER's final decisions for both the transmission and distribution network businesses in their regulatory periods.
- Expected price rises in the last two years of the reporting period are mainly due to increases in wholesale electricity and environmental policy costs, which outweigh the reductions in regulated network costs.
- In 2014/15, a representative consumer on the regulated *standing offer* using 7,312 kWh each year, had a total annual bill of $1,468 exclusive of GST. This consumer may have saved around $52, or 3.6 per cent, by switching from a regulated *standing offer* to the representative *market offer*.
- ActewAGL has made an application to the Australian Competition Tribunal for a review of the ActewAGL distribution determination made by the AER. The trend in regulated network costs for ActewAGL will depend on the outcomes of this merits review

Figure C.1 Trends in Australian Capital Territory *market offer* and *standing offer* prices



C.1 Trends in residential electricity prices

Residential *standing offer* electricity prices in the ACT are expected to decrease by 4.7 per cent in 2015/16, before increasing by 1.7 per cent in 2016/17 and 4.5 per cent in 2017/18. This is equivalent to an average annual increase of 0.4 per cent for the representative consumer over the reporting period. Figure C.1 shows the expected movements in regulated *standing offer* and *market offer* prices.

Approximately 22 per cent of consumers in the ACT have switched to a *market offer*[146]. In 2014/15, a representative consumer on a *standing offer* using 7,312 kWh per year had a total annual bill of $1,468 exclusive of GST. This consumer may have saved around $52, or 3.6 per cent, by switching from a regulated *standing offer* to the representative *market offer*.[147]

C.1.1 Representative price methodology

The analysis of residential prices and cost components applies to a representative residential consumer in the ACT consuming 7,312 kWh of electricity per year.[148] In the ACT, the most common type of residential electricity consumer (the representative consumer) is a two-person household with a mains gas connection and no pool.

The regulated *standing offer* prices are based on the Independent Competition and Regulatory Commission's electricity price direction for 2014/15, and its annual price recalibration for 2015/16. The representative *market offer* price for 2014/15 was estimated using retailer data sourced through the Australian Energy Regulator's Energy Made Easy price comparator website. For future years, the trends for the regulated *standing offer* and *market offer* prices are based on estimated movements in the underlying supply chain cost components.

A detailed explanation of the methodology is set out in Appendix J.

C.1.2 Effect of different household consumption levels on electricity price and annual expenditure in 2014/15

The consumption of the representative consumer is developed using a set of assumptions in order to provide information about the trends in and drivers of electricity prices. The price outcomes based on the representative consumer's consumption are sensitive to these assumptions and may not reflect actual prices paid by individual consumers.

Table C.1 demonstrates how the average unit cost of electricity and the annual electricity bill in the ACT are sensitive to changes in the consumption levels. Lower consumption levels result in lower annual household bills but a higher per unit average price, as the fixed component of the retail electricity price is spread over a

146 AEMC, *2015 Retail Competition Review*, Final Report, 30 June 2015, p248.

147 This indicative saving is based on a representative consumer on a regulated *standing offer* switching to the representative *market offer*, as defined in this report. Actual savings will depend on individual circumstances.

148 This consumption level was calculated from benchmark values published by the AER. ACIL Allen Consulting, *Electricity Bill Benchmarks for Residential Customers*, a report to the Australian Energy Regulator, October 2014.

smaller volume of electricity. The opposite effect applies to higher consumption levels, whereby annual household bills are higher but there is a lower per unit average price, as the fixed component of the retail electricity price is spread over a larger volume of electricity.

Examples of different consumer profiles are set out in section C.4.

Table C.1 Effect of different consumption levels on average electricity price and annual expenditure in 2014/15, excluding GST

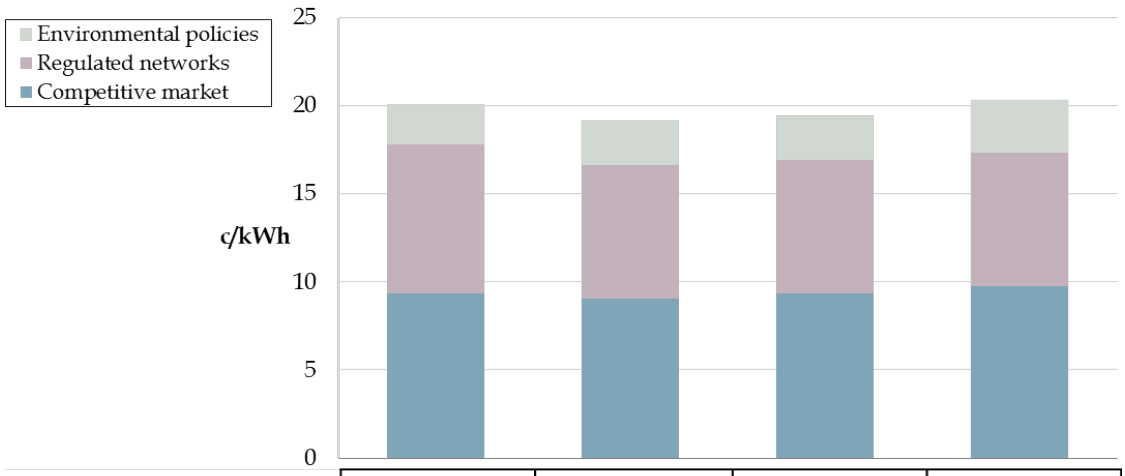
Annual consumption level	2014/15 Average *standing offer* (cents per kWh)	2014/15 Annual household bill
Low (2,500 kWh)	26.70	$667
Representative consumer: 2 person house, gas and no pool (7,312 kWh)	20.08	$1,468
High (9,500 kWh)	19.29	$1,832

Prices in this table are based on the regulated standing offer.

C.2 Trends in supply chain components

Figure C.2 shows the expected movements in the supply chain cost components for the ACT, which are the competitive wholesale and retail markets, regulated networks and government environmental policies.

Figure C.2 Trends in Australian Capital Territory supply chain components



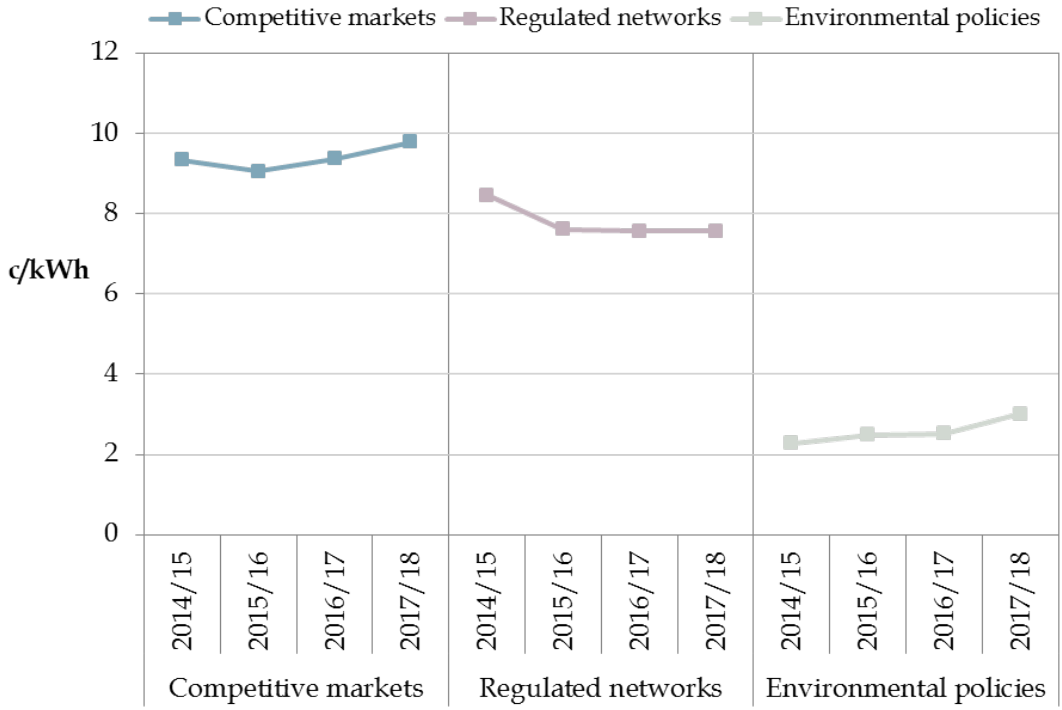
	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**2.28**	**$167**	**2.48**	**$182**	**2.53**	**$185**	**3.00**	**$220**
LRET	0.46	$34	0.56	$41	0.70	$51	0.86	$63
SRES	0.47	$34	0.45	$33	0.42	$30	0.41	$30
FIT schemes	0.86	$63	0.96	$70	1.07	$78	1.39	$102
EEIS	0.49	$36	0.51	$37	0.34	$25	0.34	$25
Regulated networks	**8.45**	**$618**	**7.61**	**$556**	**7.57**	**$553**	**7.57**	**$553**
Transmission	2.20	$161	2.35	$172	2.31	$169	2.28	$167
Distribution	6.26	$457	5.26	$384	5.26	$385	5.29	$387
Competitive market	**9.34**	**$683**	**9.05**	**$662**	**9.37**	**$685**	**9.78**	**$715**
Wholesale and retail								
Total	**20.08**	**$1,468**	**19.14**	**$1,399**	**19.46**	**$1,423**	**20.35**	**$1,488**

Figure C.3 shows the expected trends in the supply chain cost components in the ACT over the reporting period. In summary, the expected trends are:

- an average annual increase of 1.5 per cent in the competitive market component;
- an average annual decrease of 3.6 per cent in regulated networks; and
- an average annual increase of 10 per cent in the environment policy component over the reporting period.

Further detail on these trends can be found below in the supply chain component-specific sections below.

Figure C.3 Trends in Australian Capital Territory supply chain cost components



C.2.1 Competitive market costs

Competitive market costs consist of the wholesale energy component and the costs associated with retailing electricity to residential consumers. The detailed methodology for estimating these costs is explained in Appendix J. A summary of the approach is as follows:

- Wholesale market costs for 2014/15 and 2015/16 are sourced from ActewAGL's approved pricing proposals. For 2016/17 and 2017/18, wholesale market costs were escalated by the expected trend in New South Wales wholesale energy costs; and
- Retail market costs for 2014/15 and 2015/16 are sourced from ActewAGL's approved pricing proposals. For 2016/17 and 2017/18, the retail component was escalated by the assumed rate of inflation of 2.5 per cent.

In the ACT, competitive market costs are expected to increase at an average annual rate of 1.5 per cent, including a decrease of 3.1 per cent in 2015/16, and increases of 3.5 per cent in 2016/17 and 4.4 per cent in 2017/18.

In 2014/15, competitive market costs comprised 47 per cent of the regulated *standing offer* price.

Wholesale energy component

Frontier Economics expects the wholesale energy cost component for the ACT to increase in 2016/17 and 2017/18. These increases are based on the expected trend in

New South Wales wholesale energy prices due to AEMO's expectation of growth in electricity consumption, and higher gas prices.

AEMO has forecast growth in electricity consumption due to increases in residential and commercial electricity consumption in response to expected income growth and decreases in retail prices. This leads to a tighter supply/demand balance and therefore higher wholesale electricity costs.

All east coast jurisdictions experience higher gas prices over the period to 2017/18, which creates rising costs for generators and contributes to rising wholesale electricity market costs.

Further detail on the effects of increasing consumption and increasing gas prices on wholesale electricity costs can be found in Chapter 2.

Retail component

The Independent Competition and Regulatory Commission (ICRC) determines the maximum retail component for the regulated *standing offer* in the ACT. In the 2015/16 retail price determination, the ICRC increased the allowance for retailer operating costs by 4 per cent[149] and decreased the return on investment allowance for retailers by 5 per cent.

C.2.2 Regulated networks

Transmission and distribution network businesses recover regulated network costs relating to the provision of electricity networks. Generally, transmission lines connect electricity generators to major load centres and the distribution network delivers energy at lower voltages to residential and other consumers.

In the ACT, transmission network services are provided by TransGrid and distribution network services are provided by ActewAGL.

A number of different sources were used to determine the expected trend in network costs over the reporting period:

- The network costs for 2014/15 and 2015/16 are based on ActewAGL's approved pricing proposal; and
- For 2016/17 and 2017/18, network costs are estimated using the AER's final decisions for both TransGrid and ActewAGL for their respective 2014-18 and 2015-19 regulatory periods, that were made under the new rules for network regulation. ActewAGL has made an application to the Australian Competition Tribunal for a review of the ActewAGL distribution determination made by the AER.[150]TransGrid has not appealed the AER's decision on transmission revenue for 2014-18. The trend in regulated network costs will depend on the outcomes of these merit reviews.

149 Independent Competition and Regulatory Commission, Final decision, *Retail electricity price recalibration 2015-16*, June 2015, p27.

150 See Australian Competition Tribunal website, accessed 23 July 2015 at: http://www.competitiontribunal.gov.au/current-matters/tribunal-documents/act-5-2015

In 2014/15, the regulated network component comprised 42 per cent of the regulated *standing offer* price.

Transmission

In 2014/15, the transmission network component comprised 11 per cent of the regulated *standing offer*. Transmission costs are expected to increase on average by 1.2 per cent each year over the reporting period. This includes a 6.8 per cent increase in transmission costs between 2014/15 and 2015/16, a 1.7 per cent decrease in 2016/17 and a 1.4 per cent decrease in 2017/18.

The trend in regulated transmission network costs is based on the AER's final decision on the regulated revenue of TransGrid for the 2014-18 regulatory period.

The AER's final decision for TransGrid includes lower rate of return, capital expenditure and operating expenditure components for the 2014-18 regulatory period, compared to the 2009-14 regulatory period. The component that has the greatest impact on the total revenue allowance for transmission network services is the rate of return, which has decreased from 10.02 per cent in 2009-14 to 6.75 per cent in 2014-18.[151] The AER's final determination attributes this in part to a change in financial market conditions.[152]

Distribution

In 2014/15, the distribution network component comprised 31 per cent of the regulated *standing offer*. Distribution costs are currently expected to decrease on average by 5.4 per cent each year over the reporting period. This includes a 16 per cent decrease in distribution costs between 2014/15 and 2015/16, a 0.1 per cent increase in 2016/17 and a 0.5 per cent increase in 2017/18.

The trend in regulated distribution network costs over the reporting period reflects the AER's final decisions on the regulated revenue for ActewAGL for the period 2015-19.[153] The decrease in distribution prices is driven by lower rate of return, and lower capital and operating expenditure components for the 2015-19 regulatory period, compared to the 2009-14 regulatory period.

The AER's rate of return of 6.38 per cent for ActewAGL for 2015-19 is lower than the rate of return of 8.79 per cent for the 2009-14 regulatory period.[154] The AER's final determination attributes this in part to a change in financial market conditions.[155] As discussed in Chapter 2 , the rate of return makes a significant contribution to network costs and is a key factor in the expected trend over the reporting period.

The decrease in distribution prices is also driven by a reduction in approved operating expenditure for 2015-19, compared to the 2009-14 regulatory period. The AER's final

151 Australian Energy Regulator, Fact Sheet, *Final decision - TransGrid (transmission) 2015-18*, p1.

152 Australian Energy Regulator, Fact Sheet, *Final decision - TransGrid (transmission) 2015-18*, p2.

153 It is noted that this trend may be impacted by the outcome of the merits review. ActewAGL has made applications to the Australian Competition Tribunal for a review of the AER's recent distribution determinations.

154 Australian Energy Regulator, *Australian Capital Territory distribution determination 2009-10 to 2013-14*, 28 April 2009, p108.

155 Australian Energy Regulator, Fact Sheet, *Final decision - Ausgrid 2015-18*, p2

decision assessed that ActewAGL's distribution services could be provided at a substantially lower cost in 2015-19 compared to the previous regulatory period, while maintaining safety and complying with reliability obligations.[156]

C.2.3 Environmental policies

In this report, environmental policies are the schemes introduced by the Commonwealth and jurisdictional governments that impact residential electricity prices. These policies aim to reduce greenhouse gas emissions and meet other objectives.[157] The environmental policies that apply in the ACT during the reporting period are the Commonwealth Government's Renewable Energy Target, and the ACT Government's Feed-in Tariff Schemes and Energy Efficiency Improvements Scheme (EEIS).

Environmental costs are recovered from consumers in different ways. The costs of the Feed-in Tariff schemes are recovered through increases in distribution network costs. The costs associated with the Renewable Energy Target and Energy Efficiency Improvements Scheme are recovered through increases in retail prices.

In 2014/15, environmental policies comprised 11 per cent of the regulated *standing offer*.

In summary, the contributions of the individual environmental policy components are:

- Large-scale Renewable Energy Target costs of 2.3 per cent of the regulated *standing offer* in 2014/15;
- Small-scale Renewable Energy Scheme costs of 2.3 per cent of the regulated *standing offer* in 2014/15;
- Feed-in tariff costs of 4.3 per cent of the regulated *standing offer* in 2014/15; and
- ACT Energy Efficiency Improvement Scheme costs of 2.5 per cent of the regulated *standing offer* in 2014/15.

Renewable Energy Target

The Renewable Energy Target has two components: the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). Under both these components, eligible renewable energy generators are able to create certificates based on the amount of electricity they produce. In most circumstances, electricity retailers are then required to purchase these certificates and surrender them to the Clean Energy Regulator. Costs incurred in purchasing certificates are passed on to consumers.

For this report, analysis and modelling of the costs associated with the Renewable Energy Target was undertaken by Frontier Economics assuming an annual target of 33,000 GWh by 2020.

156 ActewAGL's draft Australian Energy Regulator, *Fact Sheet - Final decisions: ActewAGL (distribution) 2015-19*, April 2015, p2.

157 Other objectives include encouraging investment, supporting employment and making energy efficiency measures more accessible and affordable.

In 2014/15, LRET comprised 2.3 per cent of the regulated *standing offer*. LRET scheme costs are expected to increase on average by 23 per cent per year over the reporting period.

In 2014/15, SRES comprised 2.3 per cent of the regulated *standing offer*. SRES scheme costs are expected to decrease on average by 4 per cent per year over the reporting period.

The trends in the LRET are based on assumptions about the percentage of renewable energy that will be required and the resource costs of obtaining large-scale generation certificates. Similarly, SRES costs are also based on a renewable energy percentage and expectations about future certificate prices. The Clean Energy Regulator sets the renewable energy percentages for both the LRET and SRES schemes.[158]

Feed-in Tariff schemes

There are a number of feed-in tariff (FiT) schemes in the ACT which were introduced to encourage the installation of renewable energy systems. These schemes, which are now closed to new entrants, include:

- *The micro (Household) FiT scheme* was designed to subsidise renewable generation from small-scale solar generators of 30 kW or less. From 1 March 2009 to 30 June 2010, registered system 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. Both rates apply to all electricity generated over a period of 20 years;
- From 1 July 2010 to 31 May 2011, the FiT was 45.7c/kWh for all systems up to 30 kW. There is no longer a regulated feed-in tariff available for new residential consumers, although consumers receiving the 20 year feed-in tariff will continue to do so for a period of 20 years after the system was connected to the distribution network;
- *The Medium Feed-in Tariff scheme* was designed for generators between 30 kW and 200 kW. The scheme opened for applications on 7 March 2011 and originally offered a 34.27c/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 30.16c/kWh for all systems up to 200 kW; and
- *Large-scale solar Feed-in Tariff scheme* involved reverse auctions for the right to receive a large-scale FiT for generators that have installed capacity of greater than 200 kW. The winning proposals receive a payment from the distribution network business equal to the difference between spot price income from the National Electricity Market and the auction FiT price.

In 2014/15, the Feed-in Tariff schemes comprised 4.3 per cent of the regulated *standing offer*. Feed-in tariff scheme costs are expected to increase on average by 17 per cent each year over the reporting period. Costs associated with the Feed-in Tariffs schemes in 2014/15 and 2015/16 are from ICRC reports on *standing offer* prices. The 2016/17 and

158 See Clean Energy Regulator "The certificate market", cleanenergyregulator.gov.au, accessed 21 August 2015. http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/The-certificate-market

2017/18 costs are estimates provided by the ACT Government based on the long-term costs of the Feed-in Tariff schemes.

ACT Energy Efficiency Improvements 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 on a portion of their compliance costs to ACT electricity consumers. The ICRC determines the allowable costs that retailers can pass through to consumers.

In 2014/15, the EEIS comprised 2.5 per cent of the regulated *standing offer*. EEIS costs are expected to decrease on average by 11.6 per cent per year over the reporting period. Costs associated with the EEIS in 2014/15 and 2015/16 are based ICRC Price Directions, while the 2016/17 and 2017/18 costs are estimates provided by the ACT Government.

The scheme commenced on 1 January 2013 and was initially proposed to run until 31 December 2015. The ACT Government has extended the EEIS to run until 2020.[159]

C.3 Developments that could affect residential electricity prices in the ACT

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

Merits review

ActewAGL has made an application to the Australian Competition Tribunal for a review of the ActewAGL distribution determination made by the AER. The trend in regulated network costs will depend on the outcomes of this merits review.[160]

C.4 ACT consumer profiles

The analysis in this report is focussed on the "representative" or most typical consumer for each jurisdiction. The consumer profiles below give examples of different consumer types where factors such as household size, off-peak hot water use and the presence of a pool or solar panels contribute to different consumption levels, and therefore annual bills.

Box C.2 Electricity consumption in an ACT one-person household

Tanya lives in an apartment in Kingston, Canberra. The main features of her energy consumption are that she does not have a mains gas connection to her apartment; does not have a swimming pool; does not have off-peak hot water; and has a reverse cycle air-conditioner that she only uses on the hottest and coldest days. She always pays her bill on time via a direct debit.

159 ACT Government, Environment and Planning Directorate - Environment, Energy Efficiency Improvement Scheme, website last viewed 26 August 2015. http://www.environment.act.gov.au/energy/energy_efficiency_improvement_scheme_eeis

160 See Australian Competition Tribunal website, accessed 23 July 2015 at: http://www.competitiontribunal.gov.au/current-matters/tribunal-documents/act-5-2015

Tanya currently uses 4,837 kWh of electricity each year. She pays 22.12 c/kWh in total for her power. This includes a fixed component of 132.80 cents per day and a variable tariff component of 12.48 c/kWh for all of her usage. Overall, Tanya has a GST-exclusive annual household electricity bill of $1,070. This includes a 5 cents per day discount for paying by direct debit.

Tanya has never shopped around for her electricity supply. After moving into her apartment she has continued to pay the same price as the former tenant.

The most common consumer type in the ACT uses an average of 7,312 kWh per year. This consumer pays 19.14 c/kWh in total for power and has an annual bill of $1,399, based on the regulated standing offer.

Tanya was interested in reducing her household electricity costs. In November 2015, she consulted the Australian Energy Regulator's *Energy Made Easy* price comparator website (www.energymadeeasy.gov.au) to see whether there was a more suitable electricity plan available to her. She found an offer available in Kingston that would cost $920 per year, excluding GST. The new offer features a lower fixed component of 68.90 cents per day and higher variable tariff of 13.82 c/kWh for all usage. The variable charge includes a 12 per cent discount for paying each bill by the due date. Tanya may save up to $150 per annum by switching to this offer.

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer	**Tanya**	
	2 people, gas, no pool, no off-peak load	1 person, no gas, no pool, no off-peak load	
		Current offer	**New offer**
Consumption (kWh/yr)	7,312	4,837	4,837
Competitive market charges	$662	$537	$387
Network charges	$556	$413	$413
Environmental policy charges	$182	$120	$120
Annual bill	**$1,399**	**$1,070**	**$920**
Average price (c/kWh)	19.14	22.12	19.02

Note: Due to rounding, the annual bill may not be the same as the total of the cost components.

Between July 2014 and June 2018, Tanya can expect her electricity bills to increase at an annual average rate of 0.4 percent. Further information and analysis can be found in the ACT section of this report.

Box C.3 Electricity consumption in an ACT four-person household

Stirling, Alison and their two children Lily and Eliza live in a house in Belconnen, Canberra. The main features of their energy consumption are that they have a mains gas connection to their house; do not have a swimming pool; have installed a number of energy efficient appliances and use a moderate amount of air-conditioning. They always pay their bill on time via a direct debit.

Stirling and Alison currently use 7,441 kWh of electricity each year. They pay 18.83 c/kWh in total for their power. This includes a fixed component of 68.90 cents per day and a variable tariff component of 15.70 c/kWh for all usage. Overall, Stirling and Alison have a GST-exclusive annual household electricity bill of $1,401. This includes a 5 cents per day discount for paying by direct debit.

Stirling and Alison have been with the same electricity retailer for many years and have never shopped around for their electricity supply.

The most common consumer type in the ACT uses an average of 7,312 kWh per year. This consumer pays 19.14 c/kWh in total for power and has an annual bill of $1,399, based on the regulated standing offer.

Alison was interested in reducing her household's electricity costs. In November 2015, she consulted the Australian Energy Regulator's *Energy Made Easy* price comparator website (www.energymadeeasy.gov.au) to see whether there was a more suitable electricity plan available to her. She found an offer available in Kingston that would cost $1,255 per year, excluding GST. The new offer features a fixed component of 90.10 cents per day and variable tariff of 12.44 c/kWh for the first 60 kWh per day and 13.82 c/kWh for any further usage. These variable charges include a 12 per cent discount for paying each bill by the due date. Stirling and Alison may save up to $147 per annum by switching to this offer.

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer	Stirling and Alison	
	2 people, gas, no pool	4 people, gas, no pool	
		Current offer	**New offer**
Consumption (kWh/yr)	7,312	7,441	7,441
Competitive market charges	$662	$653	$506
Network charges	$556	$564	$564
Environmental policy charges	$182	$185	$185
Annual bill	**$1,399**	**$1,401**	**$1,255**
Average price (c/kWh)	19.14	18.83	16.86

Note: Due to rounding, the annual bill may not be the same as the total of the cost components.

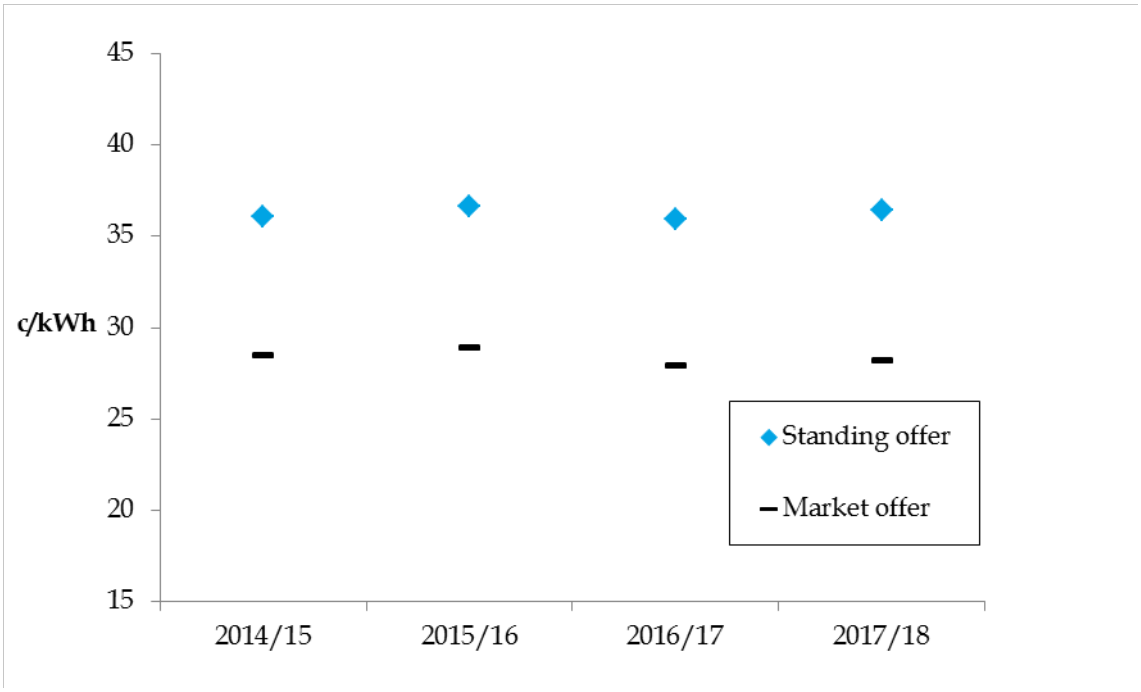
Between July 2014 and June 2018, Stirling and Alison can expect their electricity bills to increase at an annual average rate of 0.4 percent. Further information and analysis can be found in the ACT section of this report.

D Victoria

Box D.1 Key points

- Residential *market offer* electricity prices in Victoria are expected to increase by 1.4 per cent in 2015/16, decrease by 3.2 per cent in 2016/17 and then increase by 1.0 per cent in 2017/18. This is equivalent to a 0.3 per cent decrease on an annual average basis for the representative consumer over the reporting period.
- The increase in 2015/16 is primarily due to higher competitive market costs. In 2016/17, further increases in competitive market costs are more than offset by lower regulated network costs. The increase in 2017/18 reflects increases in competitive market costs outweighing a decrease in network costs.
- The trend in regulated network costs is subject to the AER's final revenue determinations for the Victorian network businesses due to be released in April 2016.
- In 2014/15, a representative consumer on a *standing offer* using 4,026 kWh each year, had a total annual bill of $1,452 exclusive of GST. This consumer may have saved around $306, or 21 per cent, by switching from a *standing offer* to the representative *market offer*.
- Competitive market costs are expected to increase by an average of 4.9 per cent per year over the reporting period. These increases are due to changes in the supply/demand balance due to rising electricity consumption and from generator retirements.

Figure D.1 Trends in Victorian *market offer* and *standing offer* prices



D.1 Trends in residential electricity prices

Residential *market offer* electricity prices in Victoria are expected to increase by 1.4 per cent in 2015/16, decrease by 3.2 per cent in 2016/17 and then increase by 1.0 per cent in 2017/18. This is equivalent to a 0.3 per cent decrease on an annual average basis for the representative consumer over the reporting period. Figure D.1 shows the expected movements in *standing offer* and *market offer* prices.

Victoria consumers have the choice of two different types of retail offer: *standing offers* and *market offers*. All of these offers feature prices set by retailers in the competitive market.

Around 89 per cent of Victorian consumers are on *market offer.*[161] In 2014/15, a representative consumer on a *standing offer* using 4,026 kWh per year had a total annual bill of $1, 452, exclusive of GST. This consumer may have saved around $306, or 21 per cent, by switching from a representative *standing offer* to the representative *market offer*.[162]

D.1.1 Representative Price Methodology

The analysis of residential prices and cost components applies to a representative residential consumer in Victoria consuming 4,026 kWh of electricity per year.[163] In Victoria, the most common type of residential electricity consumer (the representative consumer) is a two-person household with a mains gas connection and no pool.

For 2014/15, the representative *standing offer* and representative *market offer* price were estimated using retailer data sourced through the Victorian Government's *Victorian Energy Compare* price comparator website. For future years, the trends for the *standing offer* and *market offer* prices are based on estimated movements in the underlying supply chain cost components.

A detailed explanation of the methodology is set out in Appendix J.

D.1.2 Effect of different household consumption levels on electricity price and annual expenditure in 2014/15

The consumption of the representative consumer is developed using a set of assumptions in order to provide information about the trends in and drivers of electricity prices. The price outcomes based on the representative consumer's consumption are sensitive to these assumptions and may not reflect actual prices paid by individual consumers.

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161 Australian Energy Market Commission, *2015 Retail Competition Review*, Final Report, 30 June 2015, p251.

162 This indicative saving is based on a representative consumer on a representative *standing offer* switching to the representative *market offer*, as defined in this report. Actual savings will depend on individual circumstances.

163 This consumption level was calculated from benchmark value published by the AER. ACIL Allen Consulting, *Electricity Bill Benchmarks for Residential Customers*, a report to the Australian Energy Regulator, October 2014.

Table D.1 demonstrates how the average unit cost of electricity and the annual electricity bill in Victoria are sensitive to changes in the consumption levels. Lower consumption levels result in lower annual household bills but a higher per unit average price, as the fixed component of the retail electricity price is spread over a smaller volume of electricity. The opposite effect applies to higher consumption levels, whereby annual household bills are higher but there is a lower per unit average price, as the fixed component of the retail electricity price is spread over a larger volume of electricity.

Further examples of different consumer profiles using actual offers are set out in section D.4.

Table D.1 Effect of different consumption levels on average electricity price and annual expenditure in 2014/15, excluding GST

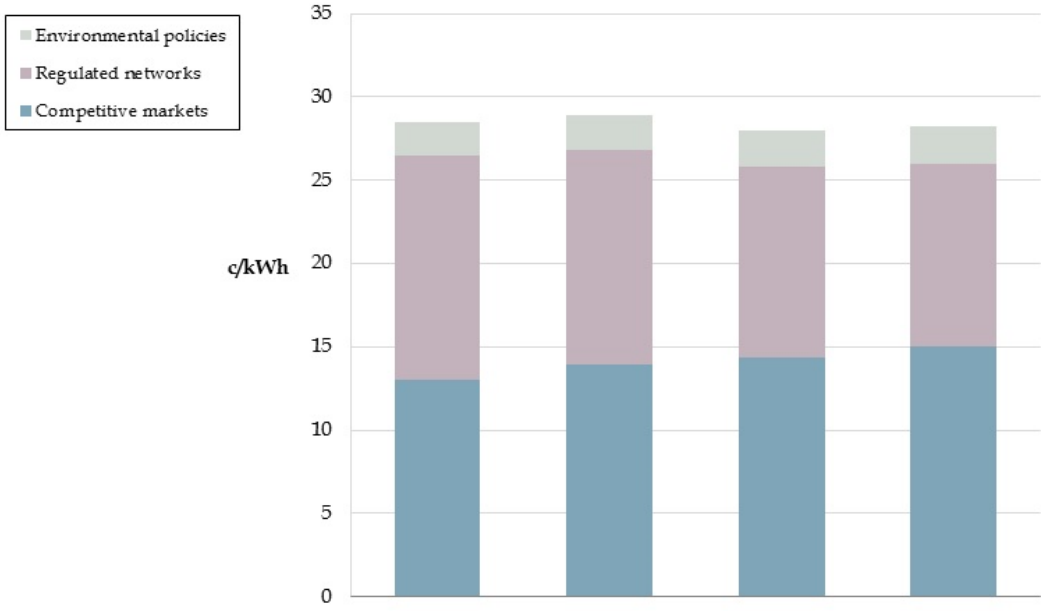
Annual consumption level	2014/15 Average *market offer* (cents per kWh)	2014/15 Annual household bill
Low (2,500 kWh)	33.47	$837
Representative consumer: 2 people, mains gas and no pool (4,026 kWh)	28.47	$1,146
High (9,500 kWh)	23.76	$2,257

Prices in this table are based on an average of actual offers.

D.2 Trends in supply chain components

Figure D.2 shows the expected movements in the supply chain cost components for Victoria, which are the competitive wholesale and retail markets, regulated networks and government environmental policies.

Figure D.2 Trends in Victorian supply chain components



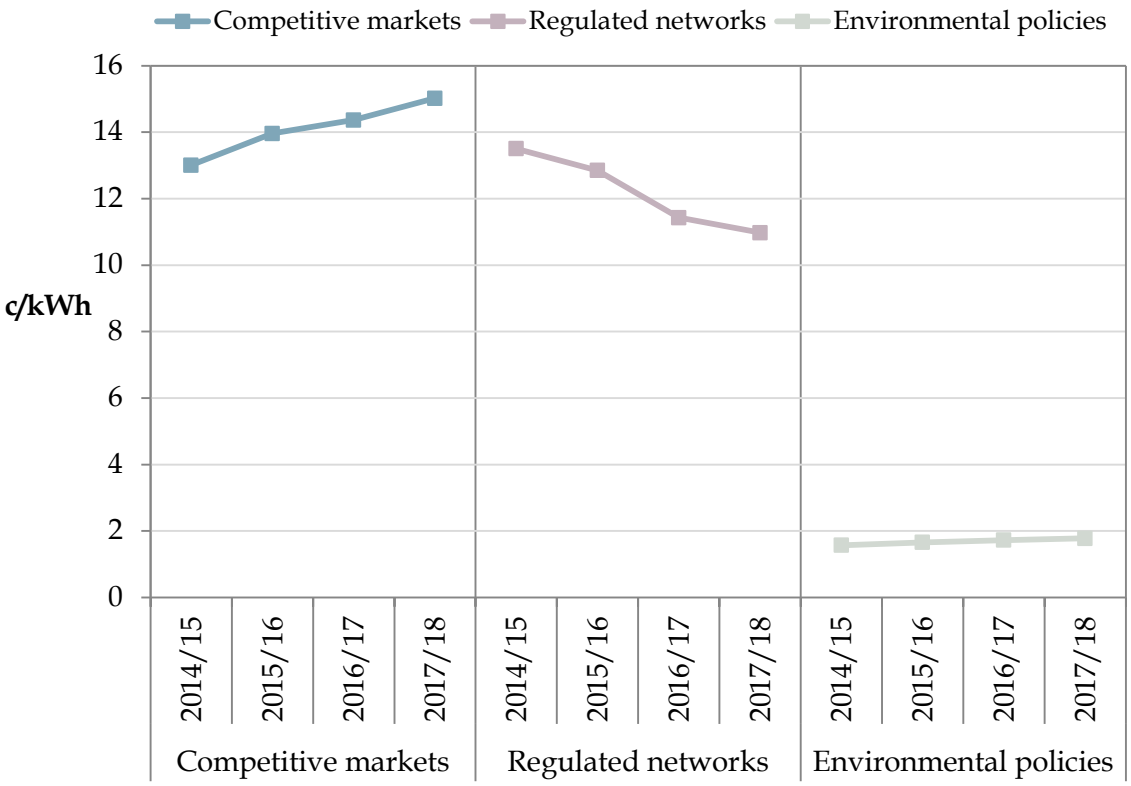
	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**1.96**	**$ 79**	**2.07**	**$ 83**	**2.16**	**$ 87**	**2.23**	**$ 90**
LRET	0.48	$ 19	0.58	$ 23	0.73	$ 29	0.89	$ 36
SRES	0.48	$ 19	0.47	$ 19	0.43	$ 17	0.43	$ 17
Feed in Tariff schemes	0.79	$ 32	0.81	$ 33	0.73	$ 29	0.67	$ 27
Victorian Energy Efficiency Target	0.21	$ 8	0.21	$ 8	0.27	$ 11	0.24	$ 10
Regulated networks	**13.51**	**$ 544**	**12.85**	**$ 517**	**11.43**	**$ 460**	**10.98**	**$ 442**
Transmission	1.55	$ 63	1.50	$ 61	1.47	$ 59	1.47	$ 59
Distribution	11.95	$ 481	11.35	$ 457	9.96	$ 401	9.51	$ 383
Competitive market Wholesale and retail	**13.01**	**$ 524**	**13.96**	**$ 562**	**14.37**	**$ 578**	**15.02**	**$ 605**
Total	**28.47**	**$ 1,146**	**28.89**	**$ 1,163**	**27.96**	**$ 1,126**	**28.23**	**$ 1,136**

Figure D.3 shows the expected trends in the supply chain cost components in Victoria over the reporting period. In summary, the expected trends are:

- an average annual increase of 4.9 per cent in the competitive market component;
- an average annual decrease of 6.7 per cent in regulated networks; and
- an average annual increase of 4.3 per cent in the environment policy component over the reporting period.

Further detail on these trends can be found below in the supply chain component-specific sections below.

Figure D.3 Trends in Victorian supply chain cost components



D.2.1 Competitive market costs

Competitive market costs consist of the wholesale energy component and the costs associated with retailing electricity to residential consumers. The detailed methodology for estimating these costs is explained in Appendix J. A summary of the approach is as follows:

- The wholesale energy cost component was modelled by Frontier Economics and includes energy purchase costs, market fees and ancillary services costs; and
- The retail component is the residual calculated for the base year when all non-retail cost components are subtracted from the representative *market offer* price, and is assumed to increase at an annual inflation rate of 2.5 per cent.

In Victoria, competitive market costs are expected to increase at an average annual rate of 4.9 per cent, including increases of 7.3 per cent in 2015/16, 2.9 per cent in 2016/17 and 4.5 per cent in 2017/18.

In 2014/15, competitive market costs comprised 46 per cent of the representative *market offer* in 2014/15 and will comprise an increasing proportion of a residential electricity customer's bill over the reporting period.[164]

164 These increases reflect higher wholesale electricity costs due to forecast increases in electricity consumption, generator retirements and higher gas prices. The assumption that the retail component will increase by an annual inflation rate of 2.5 per cent also contributes.

Wholesale energy component

Frontier Economics expects the wholesale energy cost component for Victoria to increase by more than the rate of inflation over the reporting period. The expected increase in wholesale energy costs is due to the growth in electricity consumption, generator retirements and higher gas prices.

Growth in electricity consumption is expected in the period to 2017/18, based on AEMO's assumptions about consumer responses to the fall in retail electricity prices following the carbon price removal, as well as forecast population and income growth.[165]

Generator retirements, including Anglesea Power Station in Victoria and Northern Power Station in South Australia, also contribute to expected increases in wholesale electricity costs. The upcoming closure of Northern Power Station impacts on Victorian wholesale electricity costs as it is likely that more electricity will be exported from Victoria into South Australia across the upgraded Heywood interconnector.

Increasing consumption and generator retirements tighten the supply-demand balance in the short-term. This has the effect of putting upward pressure on wholesale electricity costs in the NEM.

Victorian gas prices are expected to increase by around 20 per cent, or $1/GJ, between 2014/15 and 2017/18. This increases the cost of electricity supplied by gas-fired generators.

Further detail on the effects of increasing consumption and increasing gas prices on wholesale electricity costs can be found in Chapter 2.

Retail component

The costs of retailing electricity in Victoria are not directly observable. As detailed in Appendix J, the retail component of competitive market costs is not calculated. Retailers have different business models and cost structures, and estimating the retail component based on a representative *market offer* is unlikely to be a true reflection of individual retailers' operating costs and return on investment.

D.2.2 Regulated networks

Transmission and distribution network businesses recover regulated network costs relating to the provision of electricity networks. Generally, transmission lines connect electricity generators to major load centres and the distribution network delivers energy at lower voltages to residential and other consumers.

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

A number of different sources have been used to determine the expected trend in network costs over the reporting period:

165 AEMO, *2015 National Electricity Forecasting Report*, detailed summary of 2015 electricity forecasts, June 2015.

- the AER distribution determinations that were made under the previous rules for network regulation for 2014/15; and
- the AER draft decisions that were made under the current rules for network regulation for the remainder of the reporting period.

In 2014/15, the regulated network component comprised 47 per cent of the representative *market offer* price.

Transmission

In 2014/15, the transmission network component comprised 5.5 per cent of the representative *market offer* and transmission costs are expected to decrease on average by 1.8 per cent each year over the reporting period. This includes a 3.3 per cent decrease in transmission costs between 2014/15 and 2015/16, a 2.3 per cent decrease in 2016/17 and no change in 2017/18.

Transmission network costs are based on an existing AER determination, which ends on 30 March 2017. After this time it is assumed that transmission network costs will remain constant in nominal terms.

Transmission network arrangements in Victoria are different from those in other jurisdictions. AusNet Services owns and operates the Victorian transmission systems, while planning and procurement of network augmentation is the responsibility of AEMO. In respect of these transmission services, both AusNet's costs and AEMO's costs are recovered by the distribution network businesses through the 'transmission use of service' component of their tariffs.

The AER's final decision for AusNet Services includes a lower rate of return and higher capital and operating expenditure for the 2016-20 regulatory period, compared to the 2011-15 regulatory period. The approved rate of return has decreased from 9.76 per cent in 2011-15 to 7.87 per cent in 2015-19, primarily due to lower interest rates.[166]

Distribution

In 2014/15, the distribution network component comprised 42 per cent of the representative *market offer*. Distribution costs are currently expected to decrease on average by 7.3 per cent each year over the reporting period. This includes a 5 per cent decrease in distribution costs between 2014/15 and 2015/16, and decreases of 12 per cent in 2016/17 and 4.5 per cent in 2017/18.

For 2014/15, regulated network costs are based on the distribution network businesses' approved pricing proposals for the 2014 and 2015 calendar years. For the remaining years of the reporting period, distribution network costs are based on the distribution network businesses' 2016-20 AER draft determinations. The regulated network price trends in Victoria may change when the AER final decisions on these proposals are released on 30 April 2016.[167]

The decrease in distribution prices is primarily driven by a lower rate of return for the 2016-20 regulatory period, compared to the 2011-15 regulatory period. For example, the

166 Australian Energy Regulator, Fact Sheet, *Final decision - SPAusNet (transmission) 2014-17*, p2.

167 Australian Energy Regulator, *Final Framework and approach for the Victorian electricity distributors, Regulatory control period commencing 1 January 2016*, p13.

AER's rate of return for CitiPower was 9.49 per cent for 2011-15,[168] while the draft determination for CitiPower applies a rate of return of 6.02 per cent for 2016-20.[169] As discussed in Chapter 2, the rate of return makes a significant contribution to network costs and is a key factor in the expected trend over the reporting period.

D.2.3 Environmental policies

In this report, environmental policies are the schemes that have been introduced by the Commonwealth and jurisdictional governments that impact residential electricity prices. These policies aim to reduce greenhouse gas emissions and meet other objectives.[170] The environmental policies that apply in Victoria during the reporting period are the Commonwealth Government's Renewable Energy Target, and Victorian Government's Feed-in Tariff schemes and the Victorian Energy Efficiency Target (VEET) scheme.

Environmental costs are recovered from consumers in different ways. The costs of the Feed-in Tariff schemes are recovered either through increases in distribution or retail network costs. The costs associated with the Renewable Energy Target and VEET scheme are recovered through increases in retail prices.

In 2014/15, environmental policies comprised 6.9 per cent of the representative *market offer*.

In summary, the contributions of the individual environmental policy components are:

- Large-scale Renewable Energy Target costs make up 1.7 per cent of the representative *market offer* in 2014/15;
- Small-scale Renewable Energy Scheme costs make up 1.7 per cent of the representative *market offer* in 2014/15;
- Costs of the Feed in Tariff Scheme are expected to decrease across the reporting period. It comprised 2.8 per cent of the representative *market offer* in 2014/15; and
- Costs associated with the Victorian Energy Efficiency Target are expected to rise slightly across the reporting period. It comprised 0.7 per cent of the representative *market offer* in 2014/15.

Renewable Energy Target

For this report, analysis and modelling of the costs associated with the Renewable Energy Target was undertaken by Frontier Economics assuming an annual target of 33,000 GWh by 2020.

The Renewable Energy Target has two components: the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). Under both these components, eligible renewable energy generators are able to create certificates based

168 CitiPower Pty, Distribution determination 2011–2015 Pursuant to Orders of the Australian Competition Tribunal in Application by United Energy Distribution Pty Limited (No 2) [2012] ACompT 8, September 2012.

169 Australian Energy Regulator, Preliminary decision Citipower distribution 2016−20.

170 Other objectives include encouraging investment, supporting employment and making energy efficiency measures more accessible and affordable.

on the amount of electricity they produce. In most circumstances, electricity retailers are then required to purchase these certificates and surrender them to the Clean Energy Regulator. Costs incurred in purchasing certificates are passed on to consumers.

In 2014/15, LRET comprised 1.7 per cent of the representative *market offer*. LRET scheme costs are expected to increase on average by 23 per cent per year over the reporting period.

In 2014/15, SRES comprised 1.7 per cent of the representative *market offer*. SRES scheme costs are expected to decrease on average by 3.8 per cent per year over the reporting period.

The trends in the LRET are based on assumptions about the percentage of renewable energy that will be required and the resource costs of obtaining large-scale generation certificates. Similarly, SRES costs are also based on a renewable energy percentage and expectations about future certificate prices. The Clean Energy Regulator sets the renewable energy percentages for both the LRET and SRES schemes.[171]

Feed-in tariff schemes

A number of feed-in tariffs schemes have been introduced in Victoria in recent years. These include the premium schemes (now closed to new entrants) and an ongoing retailer funded scheme. Consumers who took part in the premium schemes remain eligible to claim the relevant tariff until the schemes conclude. The now closed schemes included three separate tariffs:

- a 60 c/kWh premium feed-in tariff (PFIT), continuing until 2024;
- a 25 c/ kWh transitional feed-in tariff (TFIT), continuing until December 2016; and
- a standard feed-in tariff (SFIT), paying a "fair and reasonable tariff", being equivalent to the price of electricity as bought by residential consumers from their retailers, continuing until December 2016.

Currently, Victorian residential customers can access a retailer funded feed-in tariff scheme that provides a tariff that is no less than 6.2c/kWh. Individual retailers may offer a premium on this rate.[172]

A key difference between the premium / transitional schemes and the retailer funded schemes is the way in which the costs of the schemes are recovered from consumers. The costs of the premium and transitional schemes are recovered from residential consumers through distribution network costs.

Retailers face the cost of the retailer funded schemes and individual retailers will determine whether and/or how the costs of these schemes are to be recovered from

171 See Clean Energy Regulator "The certificate market", cleanenergyregulator.gov.au, accessed 21 August 2015. http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/The-certificate-market

172 Victorian Government, Victorian Feed-in Tariff Schemes, website viewed on 9 September 2015. http://www.energyandresources.vic.gov.au/energy/environment-and-community/victorian-feed-in-tariff-schemes

consumers. This means that the cost of both the standard tariff and the current 6.2c/kWh tariff are effectively part of the retail component.

The costs of the premium, transitional and standard feed-in tariffs will continue to flow through into representative *market offer* prices until the schemes end.

Victorian Energy Efficiency Target

The VEET is a Victorian Government scheme that is designed to reduce greenhouse gas emissions, encourage the efficient use of electricity and gas, and encourage the development of energy efficiency businesses. It commenced in January 2009 and is legislated to continue in three-year phases until January 2030.[173]

D.3 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.

Victorian Government consultation on VEET future and energy efficiency

The VEET scheme costs presented in this report reflect the most recent modelling of the VEET scheme undertaken by the Victorian Government in 2015. VEET scheme targets for 2016 to 2020 have now been announced, increasing in increments from the current target of 5.4 million tonnes of CO2-e in 2016 to 6.5 million tonnes in 2020.[174]

The Victorian Government is also developing an Energy Efficiency and Productivity Strategy to further support energy efficiency. It signalled directions and priorities in this area in its Energy Efficiency and Productivity Statement, released in June 2015.[175]

Essential Services Commission (ESC) inquiry into distributed generation

The ESC is conducting an inquiry into the "true value of distributed generation to Victorian consumers", which may have implications for the future levels of Victoria's feed-in tariffs.[176]

The Inquiry involves two separate but related stages. The first looks at the energy value of distributed generation, and the second looks at the network value. The ESC published its draft report in relation to Stage 1 of the inquiry on 6 May 2016 and is due to publish its final report in relation to this stage in August 2016. The ESC is due to

173 Essential Services Commission, *Victorian Energy Efficiency Target,* website viewed on 4 September 2015. https://www.veet.vic.gov.au/Public/Public.aspx?id=Overview

174 Victorian government *Energy and Earth Resources* website, http://www.energyandresources.vic.gov.au/energy/about/legislation-and-regulation/energy-saver-incentive, viewed 9 November 2015.

175 Media release, Premier of Victoria The Hon. Daniel Andrews MP, *Targets To Achieve Victoria's Energy Efficient Future*, 25 August 2015.

176 Victorian Government, *Inquiry into the true value of distributed generation to Victorian Consumers*, terms of reference, September 2015.

publish its draft report in relation to Stage 2 of the inquiry in October 2016 and is due to publish its final report in relation to this stage in February 2017.[177]

D.4 Victorian consumer profiles

The analysis in this report is focussed on the "representative" or most typical consumer for each jurisdiction. The consumer profiles below give examples of different consumer types where factors such as household size, off-peak hot water use and the presence of a pool or solar panels contribute to different consumption levels, and therefore annual bills.

Box D.2 Electricity consumption in a Victorian two-person household

Christine and Sally live in an apartment in Footscray, Melbourne. The main features of their energy consumption are that they do not have a mains gas connection to their apartment; do not have off-peak hot water; they have installed energy efficient appliances and both are away from home a lot for work. They always pay their bill on time via a direct debit.

Christine and Sally currently use 3,485 kWh of electricity each year. They pay 38.26 c/kWh in total for their power. This includes a fixed component of 128.55 cents per day and variable tariff component of 24.80 c/kWh for all usage. Therefore, Christine and Sally have a GST-exclusive annual household electricity bill of $1,333.

Christine and Sally have never shopped around for their electricity supply. After moving into their apartment they have continued to pay the same price as the former tenants.

The most common consumer type in Victoria uses an average of 4,026 kWh per year. This consumer has shopped around, pays 28.89 c/kWh in total for power and has an annual bill of $1,163, based on an average of actual offers.

Christine was interested in reducing her household's electricity costs. In November 2015, she consulted the Victorian Government's *Victorian Energy Compare* website (https://compare.switchon.vic.gov.au/) to see whether there was a more suitable electricity plan available to her. She found an offer available in Footscray (which is in the Jemena network region) that would cost $934 per year, excluding GST. The new offer features a fixed component of 103.85 cents per day and 15.93 c/kWh for all usage. Both the fixed and variable components include a 32 per cent discount for paying on time by direct debit. Christine and Sally may save up to $399 per annum by switching to this offer.

177 http://esc-staging.grindstone.com.au/project/energy/22790-inquiry-into-the-true-value-of-distributed-generation-to-victorian-customers/.

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer	Christine and Sally	
	2 people, gas, no pool, no off-peak hot water	2 people, no gas, no pool, no off-peak hot water	
		Current offer	**New offer**
Consumption (kWh/yr)	4,026	3,485	3,485
Competitive market charges	$562	$749	$350
Network charges	$517	$512	$512
Environmental policy charges	$83	$72	$72
Annual bill	**$1,163**	**$1,333**	**$934**
Average price (c/kWh)	28.89	38.26	26.81

Note: Due to rounding, the annual bill may not be the same as the total of the cost components.

Between July 2014 and June 2018, consumers in Victoria can expect their electricity bills to decrease at an average annual rate of 0.3 per cent. Further information and analysis can be found in the Victorian section of this report.

Box D.3 Electricity consumption in a Victorian four-person household

Stuart, Helena and their children Lucas, Isabella and Marcus live in a house in Dandenong, Melbourne. The main features of their energy consumption are that they have a mains gas connection to their house; do not have a swimming pool; do not have an off-peak load; and have a reverse cycle air conditioner which they use only on the hottest days. They always pay their bill on time via a direct debit.

Stuart and Helena currently use 4,745 kWh of electricity each year. The family pay 31.81 c/kWh in total for their power. This includes a fixed component of 106.14 cents per day and a variable tariff component of 23.65 c/kWh for all usage. Therefore, Stuart and Helena have a GST-exclusive annual household electricity bill of $1,510.

Stuart and Helena have been with the same electricity retailer for many years and have never shopped around for their electricity supply.

The most common consumer type in Victoria uses an average of 4,026 kWh per year. This consumer has shopped around, pays 28.89 c/kWh in total for power

and has an annual bill of $1,163, based on an average of actual offers.

Helena was interested in reducing her household's electricity costs. In November 2015, she consulted the Victorian Government's *Victorian Energy Compare* website (https://compare.switchon.vic.gov.au/) to see whether there was a more suitable electricity plan available to her. She found an offer available in Dandenong (which is in the United Energy network region) that would cost $1,045 per year, excluding GST. The new offer features a fixed component of 95.81 cents per day and 14.66 c/kWh for all usage. Both the fixed and variable components include a 33 per cent discount for paying on time by direct debit. The family may save up to $465 per annum by switching to this offer.

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer	**Stuart and Helena**	
	2 people, no gas, no pool, no off-peak hot water	4 people, no gas, no pool, no off-peak hot water	
		Current offer	**New offer**
Consumption (kWh/yr)	4,026	4,745	4,745
Competitive market charges	$562	$906	$442
Network charges	$517	$506	$506
Environmental policy charges	$83	$97	$97
Annual bill	**$1,163**	**$1,510**	**$1045**
Average price (c/kWh)	28.89	31.81	22.03

Note: Due to rounding, the annual bill may not be the same as the total of the cost components.

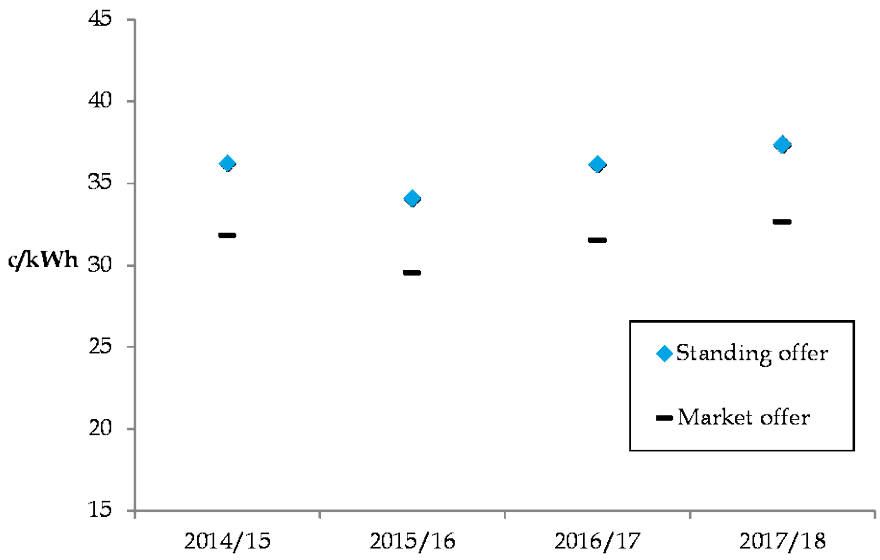
Between July 2014 and June 2018, consumers in Victoria can expect their electricity bills to decrease at an average annual rate of 0.3 per cent. Further information and analysis can be found in the Victorian section of this report.

E South Australia

Box E.1 Key points

- Residential *market offer* electricity prices in South Australia are expected to decrease by 7.2 per cent in 2015/16, followed by increases in the final two years of the reporting period of 6.8 per cent in 2016/17 and 3.4 per cent in 2017/18. This is equivalent to an average annual increase of 0.8 per cent for the representative consumer over the reporting period.
- The price decrease in 2015/16 are driven by reductions in distribution network costs and the cost of the South Australian Solar Feed-in Scheme. The expected increases in the final two years of the reporting period are reflective of increased network costs and competitive market costs.
- In 2014/15, a representative consumer on the representative *standing offer* using 5,000 kWh per year had a total annual bill of $1,811 exclusive of GST. This consumer may have saved around $222, or 12 per cent, by switching from the *standing offer* to the representative *market offer*.
- Competitive market prices are expected to increase by an average of 5.9 per cent per year over the reporting period. These increases are due to changes in the supply/demand balance from generator retirements, increases in wind generation and rising electricity consumption
- Applications have been made to the Australian Competition Tribunal for merits reviews of the AER's recent final revenue determination for the South Australian distribution network business. The trend in regulated network costs will depend on the outcomes of these merits reviews.

Figure E.1 Trend in South Australian *market offer* and *standing offer* prices



E.1 Trends in residential electricity prices

Residential *market offer* electricity prices in South Australia are expected to decrease by 7.2 per cent in 2015/16, followed by increases in the final two years of the reporting period, with increases of 6.8 per cent expected in 2016/17 and 3.4 per cent in 2017/18. This is equivalent to an average annual increase of 0.8 per cent for the representative consumer over the reporting period

Figure E.1 shows the expected movements in the *standing offer* and the *market offer* prices over the reporting period.

Following deregulation of retail prices for residential electricity consumers, the standing offer prices are set by energy retailers in the competitive market and monitored by the Essential Services Commission of South Australia.

South Australia has among the highest proportion of consumers on *market offers* for electricity and gas in the NEM. Around 84 per cent of electricity consumers have chosen a *market offer*. There is a high level of awareness of the ability to choose electricity retailers. Consumers continue to actively shop around for an energy deal, with 25 per cent of residential consumers investigating their options and 16 per cent changing their retailer in 2014.[178]

In 2014/15, a representative consumer on the representative *standing offer* using 5,000 kWh per year had a total annual bill of $1,811, exclusive of GST.[179] This consumer may have saved around $222, or 12 per cent, by switching from the *standing offer* to the representative *market offer*.[180]

E.1.1 Representative price methodology

Our analysis of residential electricity prices and cost components applies to a representative consumer. The representative consumer in South Australia uses 5,000 kWh of electricity a year.[181]

For 2014/15 the *standing offer* and *market offer* prices were estimated using retailer data sourced through the Australian Energy Regulator's *Energy Made Easy* price comparator website. For future years, the price trend is based on estimated movements in the underlying supply chain cost components.

A detailed explanation of the methodology is set out in Appendix J.

178 AEMC, *Retail Competition Review,* June 2015, p254

179 The representative consumption level was provided to the AEMC by South Australian Government officials. This consumption level is also used in key publications from the Essential Services Commission of South Australia and SA Power Networks.

180 This indicative saving is based on a representative consumer on a *standing offer* switching to the representative *market offer*, as defined in this report. Actual savings will depend on individual circumstances.

181 This consumption level was provided to the AEMC by South Australian Government officials. This consumption level is also used in key publications from the Essential Services Commission of South Australia and SA Power Networks.

E.1.2 Effect of different household consumption levels on electricity price and annual expenditure in 2014/15

The representative consumer is developed using a set of assumptions to provide information about the trends in and drivers of electricity prices. The price outcomes based on the representative consumer are sensitive to these assumptions and may not reflect actual prices paid by individual consumers.

Table E.1 demonstrates how the average unit cost of electricity and the annual electricity bill in South Australia are sensitive to changes in the consumption levels. Lower consumption levels result in lower annual household bills but a higher per unit average price, as the fixed component of the retail electricity price is spread over a smaller volume of electricity. The opposite effect applies to higher consumption levels, whereby annual household bills are higher but there is a lower per unit average price, as the fixed component of the retail electricity price is spread over a larger volume of electricity.

Further examples of different consumer profiles using actual offers are set out in section E.4.

Table E.1 Effect of different consumption levels on average electricity price and annual expenditure in 2014/15, excluding GST

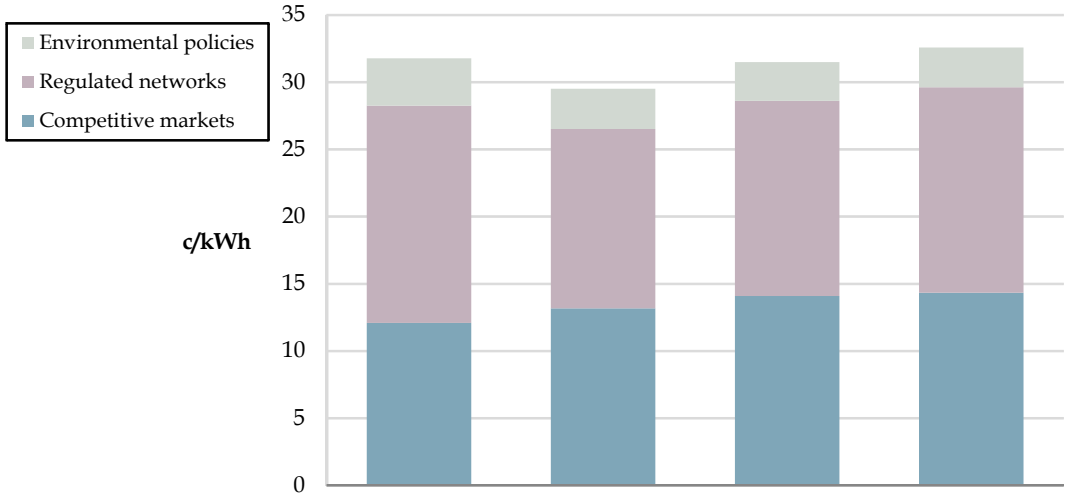
Annual consumption level	2014/15 Average *market offer* (cents per kWh)	2014/15 Annual household bill
Low (2,500 kWh)	36.85	$921
South Australian-specific average (5,000 kWh)	31.78	$1,589
High (9,500 kWh)	29.38	$2,791

Prices in this table are based on an average of actual offers.

E.2 Trends in supply chain cost components

Figure E.2 shows expected movements in the supply chain cost components for South Australia, which are the competitive wholesale and retail markets, regulated networks and government environmental policies.

Figure E.2 South Australian supply chain cost components



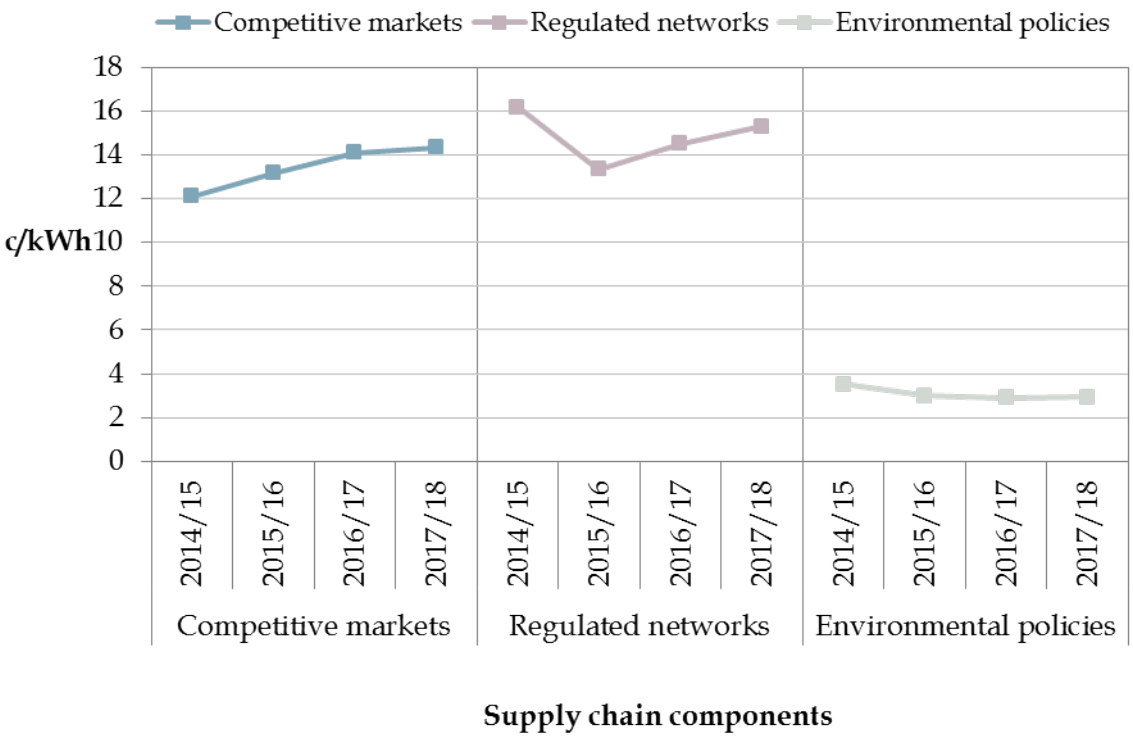
	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**3.53**	**$ 176**	**2.99**	**$ 150**	**2.90**	**$ 145**	**2.95**	**$ 147**
LRET	0.49	$ 25	0.59	$ 30	0.74	$ 37	0.91	$ 46
SRES	0.49	$ 25	0.48	$ 24	0.44	$ 22	0.44	$ 22
Solar FiT	2.33	$ 117	1.71	$ 85	1.50	$ 75	1.39	$ 69
REES	0.21	$ 11	0.21	$ 11	0.21	$ 11	0.21	$ 11
Regulated networks	**16.16**	**$ 808**	**13.35**	**$ 667**	**14.51**	**$ 726**	**15.29**	**$ 764**
Transmission	2.73	$ 136	3.12	$ 156	3.27	$ 163	3.48	$ 174
Distribution	13.43	$ 672	10.22	$ 511	11.24	$ 562	11.80	$ 590
Competitive market	**12.09**	**$ 605**	**13.17**	**$ 658**	**14.09**	**$ 705**	**14.34**	**$ 717**
Wholesale and retail								
Total	**31.78**	**$ 1,589**	**29.51**	**$ 1,475**	**31.50**	**$ 1,575**	**32.57**	**$ 1,629**

Figure E.3 shows the expected movement in each of the supply chain components for South Australia over the reporting period. In summary, the expected trends are:

- an average annual increase of 5.9 per cent in the competitive market component;
- an average annual decrease of 1.8 per cent in the regulated network component, although the actual trends in network costs are subject to merits reviews; and
- an average annual decrease of 5.8 per cent in the environmental policy component over the reporting period.

Further detail on these trends can be found below in the supply chain component-specific sections.

Figure E.3 Trends in South Australian supply chain cost components



E.2.1 Competitive market costs

Competitive market costs consist of the wholesale energy component and the costs associated with retailing electricity to residential consumers. The detailed methodology for estimating these costs is set out in Appendix J. A summary of the approach is as follows:

- The wholesale electricity component was estimated by Frontier Economics and includes energy purchase costs, market fees and ancillary service costs.
- The retail component is the residual when all of the non-retail supply chain cost components are subtracted from the representative *market offer* price, and is assumed to increase at an annual inflation rate of 2.5 per cent.

In 2014/15, competitive market costs were estimated to have made up 38 per cent of the representative market offer.

Wholesale electricity component

Wholesale electricity costs are expected to rise over the period. The increase is due to a reduction in generation capacity, including the announced retirement of Northern Power Station, and also AEMO's expectations of electricity consumption growth in South Australia.[182] The increase in wholesale costs will be partially dampened by significant investment in wind generation over the reporting period. Increasing

182 In modelling wholesale energy prices, Frontier Economics assumed that Northern Power Station will close on 1 July 2016.

consumption and generator retirements tighten the supply-demand balance in the short-term. This has the effect of putting upward pressure on wholesale electricity costs in the NEM.

Wholesale electricity prices have been low in recent years due to a capacity oversupply in the market and lower than expected demand. Low wholesale prices may mean that some generators may not recover their costs which may encourage them to exit the market. This may have contributed to the decision to close Northern Power Station, which in turn will put upward pressure on wholesale prices.

The closure of Northern Power Station reduces the generation capacity reserves in South Australia, leading to increasing reliance on imports from Victoria. The 2015 Statement of Electricity Opportunities, published by AEMO, finds that there may be a shortfall of generation capacity in South Australia by 2019/20.[183] Generation investment in South Australia is expected to be mainly wind generation, which is discussed in more detail below and in Chapter 2.

Historically, electricity consumption in South Australia has been declining since 2009/10. However, according to the AEMO short term energy consumption outlook in the NEFR, consumption is expected to recover over the reporting period.[184] Under the AEMO medium growth planning scenario, energy consumption will increase annually by around 0.8 per cent to 2017/18. This increase in consumption is driven by increased industrial consumption in the short term, in particular the redevelopment of the Port Pirie smelter, which will see production returning to pre-2014 levels. Increased consumption is also partly due to income growth and decreases in retail electricity prices.[185]

Consumption growth will contribute to higher wholesale prices over the reporting period. However, this effect is offset by continued uptake of rooftop PV and energy efficiency. South Australia has the highest proportion of rooftop PV in the NEM. In the medium term, rooftop PV and efficiency effects outpace increases in consumption due to economic factors, leading to decreases in consumption.[186]

Wind generation in South Australia accounted for 35 per cent of the state's total generation, the largest of all NEM regions.[187] Frontier Economics estimates that significant investment in wind generation will take place in South Australia over the reporting period with around 500MW of wind investment in 2016/17 and around 700MW in 2017/18.[188] Investment in wind generation partially offsets the increases in wholesale electricity costs resulting from increased demand and the retirement of Northern Power Station, because wind has lower short run marginal costs than thermal generators.

183 AEMO, *2015 Electricity Statement of Opportunities*, August 2015.

184 AEMO, *2015 National Energy Forecasting Report*,June 2015, p48.

185 ibid

186 ibid

187 The Energy Supply Associated of Australia, *Electricity Gas Australia 2014*

188 Frontier Economics, *2015 Residential Electricity Price Trends Report: Report prepared for the AEMC,* August 2015

However, as an intermittent form of energy generation, a greater proportion of wind may lead to more volatile wholesale prices (as discussed in Chapter 2). This can impact the average wholesale electricity price, and also leads to an increase in the level of risk that retailers must manage. The management of volatility will add to costs in the wholesale electricity market, which are ultimately passed through to consumers in the form of higher retail prices.

Retail component

The costs of retailing electricity in South Australia are not directly observable. As detailed in Appendix J, the retail component of competitive market costs is not calculated. Retailers have different business models and cost structures, and estimating the retail component based on a representative *market offer* is unlikely to be a true reflection of individual retailers' operating costs on return on investment.

E.2.2 Regulated networks

Transmission and distribution network businesses recover regulated network costs relating to the provision of electricity networks. Generally, transmission lines connect electricity generators to major load centres and the distribution network delivers energy at lower voltages to residential and other consumers.

Transmission and distribution network services in South Australia are provided by ElectraNet and SA Power Networks respectively. Transmission and distribution network costs are estimated using revenue determinations made by the AER and SA Power Networks' annual pricing proposals. SA Power Networks and the South Australian Council of Social Services have lodged merits review applications in respect of SA Power Network's final revenue determination. The trend in regulated network costs will depend on the outcomes of these merits reviews.

In 2014/15, regulated network costs comprised 51 per cent of the representative *market offer* price.

Transmission

In 2014/15, the transmission network component comprised 9 per cent of the representative *market offer*. Transmission costs are expected to increase on average by 8.5 per cent each year over the reporting period. This includes increases of around 14 per cent in 2015/16, 4.7 per cent in 2016/17 and 6.6 per cent in 2017/18.

The trend in regulated transmission prices over the reporting period reflects the AER's final decision on regulated revenue for ElectraNet for the period 2013-18.

The AER's final decision for ElectraNet includes an increase in approved total revenue of 15.2 per cent (in nominal terms) compared to total network revenue in the previous regulatory period.[189] The increase in expenditure was allowed in order to replace and upgrade network assets.

The increase in allowed expenditure is partially offset by a decrease in the rate of return for the 2013-18 regulatory period. The AER's final decision applied a rate of

189 Australian Energy Regulator, Final Decision ElectraNet Transmission Determination 2013-2014 to 2017-2018, April 2013.

return of 7.5 per cent, which was less than the 10.65 per cent determined for the previous regulatory period. The AER's final determination attributes this in part to a change in financial market conditions. The rate of return of 7.5 per cent provides a reasonable opportunity for ElectraNet to recover at least the efficient costs of capital financing.[190]

Distribution

In 2014/15, the distribution network component comprised 42 per cent of the representative *market offer*. Distribution costs are currently expected to decrease on average by 4.2 per cent each year over the reporting period. This includes decreases of around 24 per cent in 2015/16, and increases of 10 per cent in 2016/17 and 5 per cent in 2017/18.

The distribution network in South Australia is owned by SA Power Networks. For this report distribution network costs are based on the AER's final decision on the regulated revenue for SA Power Networks during 2015-2020. The decrease in distribution prices is driven by a lower rate of return for the 2015-20 regulatory period, compared to the 2010-15 regulatory period.[191] The AER's rate of return of 6.17 per cent for SA Power Networks for 2015-20 is lower than the rate of return of 9.76 per cent for the 2010-15 regulatory period. The AER's final determination attributes this in part to a change in financial market conditions.[192] As discussed in Chapter 2, the rate of return makes a significant contribution to network costs and is a key factor in the expected trend over the reporting period. Trends in the distribution network component is subject to the outcomes of merits reviews.

E.2.3 Environmental policies

In this report, environmental policies are the schemes introduced by the Commonwealth and jurisdictional governments that impact residential electricity prices. These policies aim to reduce greenhouse gas emissions and meet other objectives.[193] The policies that apply in South Australia during the reporting period are the Renewable Energy Target, which is a Commonwealth scheme, and the South Australian Solar Feed-in Scheme and the Retailer Energy Efficiency Scheme.

The costs of the environmental policies are recovered from consumers in different ways. The cost of the Solar Feed-in Scheme is recovered through increases in distribution network or retail prices, while costs associated with the Renewable Energy Target and jurisdictional energy efficiency schemes are recovered through increases in retail prices.

In 2014/15, environmental policy costs made up 11 per cent of the representative *market offer* price and are expected to decrease over the reporting period.

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190 ibid

191 Australian Energy Regulator, Final Decision, SA Power Networks distribution determination 2015-16 to 2019-20, October 2015.

192 Australian Energy Regulator, Fact Sheet, *Preliminary decision - SA Power Networks 2015-20,* p2.

193 Other objectives include to encourage investment, support employment and make energy efficiency measure more affordable.

Renewable Energy Target

The Renewable Energy Target has two components: the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). Under both these components, eligible renewable energy generators are able to create certificates based on the amount of electricity they produce. In most circumstances, electricity retailers are then required to purchase these certificates and surrender them to the Clean Energy Regulator. Costs incurred by electricity retailers in purchasing certificates are passed on to consumers.

For this report, analysis of the costs associated with the Renewable Energy Target was undertaken by Frontier Economics, assuming an annual target of 33,000 GWh by 2020.

In 2014/15, LRET comprised 1.5 per cent of the representative *market offer*. LRET scheme costs are expected to increase on average by 23 per cent per year over the reporting period.

In 2014/15, SRES comprised 1.6 per cent of the representative *market offer*. SRES costs are expected to decrease on average by 3.9 per cent per year over the reporting period.

The trends in the LRET are based on assumptions about the percentage of renewable energy that will be required to meet the target and the resource costs of obtaining large-scale generation certificates. Similarly, SRES costs are also based on a renewable energy percentage and expectations about future certificate prices. The Clean Energy Regulatory sets the renewable energy percentages for both the LRET and SRES.[194]

Feed-in-tariff schemes

The feed-in tariff schemes operating in South Australia are the South Australian Solar Feed-in Scheme (now closed to new entrants) and the ongoing Minimum Retailer Payment (R-FiT)scheme.[195]

The Solar Feed-in Scheme continues to contribute to electricity prices because consumers who took part are still eligible to claim the tariff. The applicable tariffs over the reporting period are:[196]

- a 44 c/kWh tariff, continuing until 30 June 2028; and
- a 16 c/kWh tariff, continuing until 30 September 2016.

The actual tariff received depends on the eligibility criteria and the date on which the connection of a solar PV to the grid was approved.

The costs of the Solar Feed-in Scheme are recovered through distribution network costs. Scheme costs are expected to decrease by 27 per cent in 2015/16, 12 per cent in 2016/17 and 7.8 per cent in 2017/18. The 16c/kWh the category will end on 30 September 2016 which will reduce costs.

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194 See Clean Energy Regulator "The certificate market", *cleanernergyregulator.gov.au,* accessed on 21 August 2015. *http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/The-certificate-market*

195 South Australian Government, "Solar feed-in scheme", *sa.gov.au,* accessed 13 August 2015, *http://www.sa.gov.au/topics/water-energy-and-environment/energy/energy-supply-and-sources/renewable-energy-sources/solar-energy/solar-photovoltaic-systems/solar-feed-in-scheme#title1*

196 ibid

The R-FiT scheme is still open to new entrants. The scheme involves minimum retail payments which are credited to solar customers' electricity bills when they generate more electricity than they use. After a consultation process the Essential Services Commission of South Australia determined that the minimum retailer payment is 5.3 c/kWh, excluding GST.[197] Retailers who contract with eligible solar customers must provide at least this price but they may choose to credit a higher amount. The costs of the R-FiT scheme are not included in this report because they are borne by the retailers who can choose whether and/or how to recover the costs of the schemes.

South Australian Retailer Energy Efficiency Scheme

The Retailer Energy Efficiency Scheme requires large energy retailers to assist households to save energy by offering energy audits and undertaking energy efficiency activities.[198] The scheme involves setting targets that retailers must meet in terms of the number of energy saving activities they undertake.

Retailer Energy Efficiency Scheme costs are expected to account for less than 1 per cent of the representative *market offer* in 2014/15 and are not expected to change over the reporting period.

E.3 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.

Merits review

SA Power Networks and the South Australian Council of Social Services have lodged merits review applications in respect of SA Power Network's final revenue determination. The trend in regulated network costs will depend on the outcomes of these merits reviews.

Heywood Interconnector Upgrade

South Australia's transmission network is connected to Victoria through the Murraylink and Heywood interconnectors, which allow electricity to flow between South Australia and Victoria. Electricity typically flows from South Australia to Victoria during periods of high generation in South Australia, and vice versa.

The closure of Northern Power Station will alter the dispatch mix in South Australia. Wind generation and imports through Heywood and Murraylink interconnectors will become more significant. In 2014/15 and 2015/16 imports contribute 22 per cent of South Australian demand, and with the closure of Northern this is expected to increase to almost 40 per cent of state demand in 2016/17.[199]

197 ibid

198 Government of South Australia, "Retailer energy efficiency scheme", *sa.gov.au,* viewed 13 August 2015, *https://www.sa.gov.au/topics/water-energy-and-environment/energy/rebates-concessions-and-incentives/retailer-energy-efficiency-scheme-rees*

199 Frontier Economics, *2015 Residential Electricity Price Trends Report: Report prepared for the AEMC,* August 2015

The changes to the dispatch mix are also likely to have an impact on system security in South Australia. The Heywood Interconnector will be relied upon for frequency control almost continually. Operational issues may arise during times of Heywood outages or otherwise.[200]

The upgrade of the Heywood Interconnector will allow increased power flows between South Australia and Victoria. The project will address congestion, high market price events and restrictions on wind farm output. The interconnector capacity will increase from 460MW to 650MW as a result of the upgrade, providing up to 190 MW of additional capacity. The completion date for this project is July 2016.[201]

E.4 South Australian consumer profiles

The analysis in this report is focussed on the "representative" or most typical consumer for each jurisdiction. The consumer profiles below give examples of different consumer types where factors such as household size, off-peak hot water use and the presence of a pool or solar panels contribute to different consumption levels, and therefore annual bills.

Box E.2 Electricity consumption in a South Australia two-person household

Michael and Kate live in a house in suburban Adelaide. The main features of their energy consumption are that they do not have a mains gas connection to their house, they do not have many energy efficient appliances; they have recently swapped their light bulbs from incandescent to LEDs; and they do not have a swimming pool. They always pay their bill on time via a direct debit.

Michael and Kate currently use 6,238 kWh of electricity each year. The couple pay 32.60 c/kWh in total for their power. This includes a fixed component of 61.08 cents per day and a variable tariff that depends on the time of year. They pay a higher variable tariff in the summer months than the rest of the year, as set out in the table below. Overall, Michael and Kate have a GST-exclusive annual household electricity bill of $2,034.

200 ibid

201 ElectraNet, *SA-Vic (Heywood) Interconnector Upgrade*, available at *http://www.electranet.com.au/network/current-and-planned-projects/south-east/sa-vic-interconnection-upgrade/*, accessed 17 August 2015.

Table E.2 Tariff structure

	Summer (1 January to 31 March)	Non-summer
Daily supply charge (c/day)	61.08	61.08
First 3.29 kWh per day (c/kWh)	29.18	27.67
Next 7.67 kWh per day (c/kWh)	31.84	28.21
Further usage (c/kWh)	37.04	33.37

The representative consumer in South Australia uses an average of 5,000 kWh per year. This consumer has shopped around, pays 29.51 c/kWh in total for power and has an annual bill of $1,475, based on an average of actual offers.

Michael was interested in reducing their household's electricity costs. In November 2015, he consulted the Australian Energy Regulator's *Energy Made Easy* price comparator website (www.energymadeeasy.gov.au) to see whether there was a more suitable electricity plan available for them. He found an offer that would cost $1,745 per year, excluding GST. The new offer features a higher fixed component of 63.79 cents per day but lower variable rates as set out in the table below. The variable charges include a 14 per cent discount for paying by direct debit. Michael and Kate may save up to $289 per annum by switching to this offer.

Tariff structure - new offer

	Summer (1 January to 31 March)	Non-summer
Daily supply charge (c/day)	63.79	63.79
First 10.96 kWh per day (c/kWh)	25.11	23.08
Further usage (c/kWh)	29.29	26.51

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer	Michael and Kate	
		2 people, no gas, no pool	
		Current offer	**New offer**
Consumption (kWh/yr)	5,000	6,238	6,238
Competitive market charges	$658	$1,012	$724
Network charges	$667	$834	$834
Environmental policy charges	$150	$187	$187
Annual bill	**$1,475**	**$2,034**	**$1,745**
Average price (c/kWh)	29.51	32.60	27.98

Note: Due to rounding, the annual bill may not be the same as the total of the cost components.

Between July 2014 and June 2018, Michael and Kate can expect their electricity bills to increase at an annual average rate of 0.8 percent. Further information and analysis can be found in the South Australian section of this report.

Box E.3 Electricity consumption in a South Australia four-person household

Luke, Holly and their two children Logan and Jasmine live in a house in Murray Bridge. The main features of their energy consumption are that they have a swimming pool, have solar panels installed on their roof and use their air conditioner a lot in summer. They always pay their bill on time via a direct debit.

Luke and Holly currently use 8,428 kWh of electricity each year from the grid. The couple pay 32.33 c/kWh for their grid power. This includes a fixed component of 63.79 c/day and a variable tariff that depends on the time of year. They pay a higher variable tariff in the summer months than the rest of the year, as set out in the table below. Luke and Holly use 1,382kWh each year from their solar panels. They also export 5,528 kWh to the grid from their solar panels and receive a feed-in tariff of 5.3 c/kWh for this electricity. Overall, Luke and Holly have a net annual household electricity bill of $2,432, excluding GST.

Tariff structure

	Summer (1 January to 31 March)	Non-summer
Daily supply charge (c/day)	63.79	63.79
First 10.96 kWh per day (c/kWh)	29.20	26.84
Further usage (c/kWh)	34.06	30.83

Luke and Holly have been with the same electricity retailer for many years and have never shopped around for their electricity supply.

The representative consumer in South Australia uses an average of 5,000 kWh per year. This consumer has shopped around, pays 29.51 c/kWh in total for power and has an annual bill of $1,475, based on an average of actual offers.

Holly was interested in reducing the household's electricity costs. In November 2015, she consulted the Australian Energy Regulator's *Energy Made Easy* price comparator website (www.energymadeeasy.gov.au) to see whether there was a more suitable electricity plan available. She found an offer available in Murray Bridge that would cost $2,068 per year, including the same feed-in tariff and excluding GST. The new offer features a fixed component of 69.50 cents per day and lower variable tariff that does not depend on the time of year, as set out in the table below. The variable charges include a 21 per cent discount for paying each bill by the due date. Luke and Holly may save up to $364 per annum by switching to this offer.

Tariff structure - new offer

	Tariff
Daily supply charge (c/day)	69.50
First 10.96 kWh per day (c/kWh)	23.14
Next 16.44 kWh per day (c/kWh)	26.68
Further usage (c/kWh)	26.70

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer	Luke and Holly	
		4 person, pool, solar PV, no gas	
		Current offer	**New offer**
Consumption from the grid (kWh/yr)	5,000	8,428	8,428
Competitive market charges	$658	$1,342	$978
Network charges	$667	$1,130	$1,130
Environmental policy charges	$150	$253	$253
Gross annual bill	**$1,475**	**$2,725**	**$2,361**
Average price (c/kWh)	29.51	32.33	28.01
Solar feed-in tariff for electricity exported to the grid	n/a	($293)	($293)
Net annual bill	**$1,475**	**$2,432**	**$2,068**

Note: Due to rounding, the annual bill may not be the same as the total of the cost components.

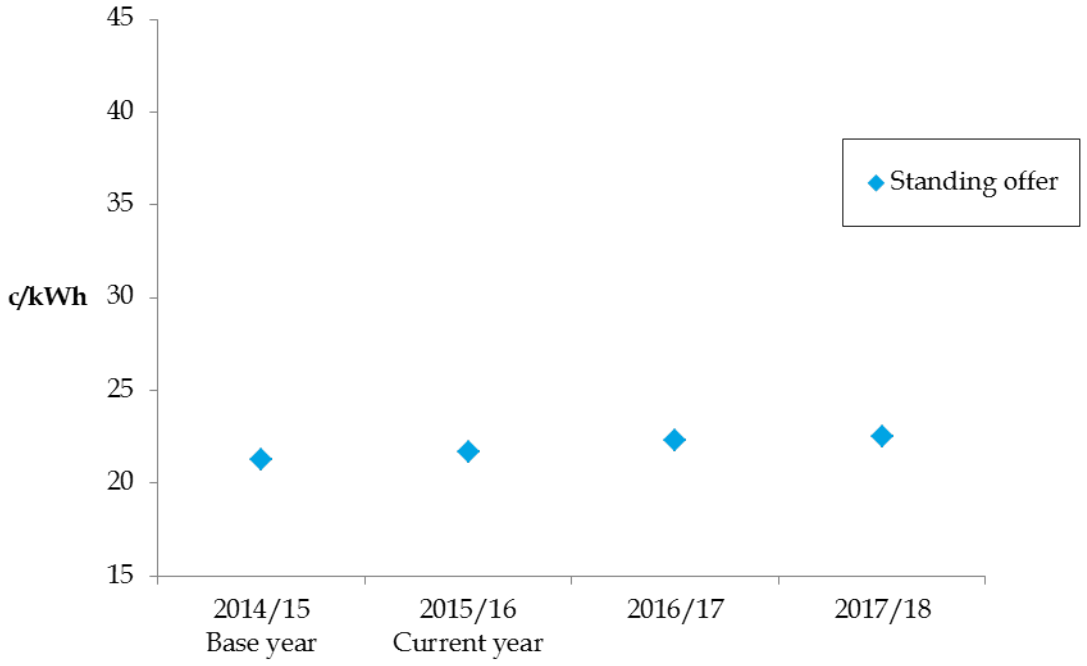
Between July 2014 and June 2018, Luke and Holly can expect their electricity bills to increase at an annual average rate of 0.8 percent. Further information and analysis can be found in the South Australian section of this report

F Tasmania

Box F.1 Key Points

- Residential electricity prices in Tasmania are driven by determinations of the Office of the Tasmanian Economic Regulator (OTTER). While OTTER determinations have been made for the period to 30 June 2016, in subsequent years prices in this report are based on projected movements of costs. These prices are therefore subject to future OTTER determinations.
- Residential electricity prices in Tasmania are expected to increase by 2 per cent in 2015/16, 2.7 per cent in 2016/17 and 1.1 per cent in 2017/18, subject to future pricing determinations made by the Office of the Tasmanian Economic Regulator. This is equivalent to an average annual increase of 1.9 per cent for the representative consumer over the reporting period
- This trend reflects expected increases in competitive market costs, network costs and environmental policy costs.
- In 2014/15, a representative consumer on the regulated *standing offer* using 8,550 kWh per year had a total annual bill of $1,821 exclusive of GST.
- The Tasmanian retail electricity market is undergoing a period of change with the introduction of full retail competition from 1 July 2014. No new retailer has entered the electricity market yet and Aurora Energy continues to be the sole supplier of electricity to residential consumers.

Figure F.1 Trend in Tasmanian *standing offer* prices



F.1 Trends in residential electricity prices

Residential electricity prices in Tasmania are driven by determinations of the Office of the Tasmanian Economic Regulator (OTTER). While OTTER determinations have been made for the period to 30 June 2016, in subsequent years prices in this report are based on projected movements of costs. These prices are therefore subject to future OTTER determinations.

Residential electricity prices in Tasmania are expected to increase by 2 per cent in 2015/16, 2.7 per cent in 2016/17 and 1.1 per cent in 2017/18, subject to future pricing determinations made by OTTER. This is equivalent to an average annual increase of 1.9 per cent for the representative consumer over the reporting period. This trend reflects expected increases in all of the supply chain cost components.

Full retail contestability was introduced from 1 July 2014 and retailers are able to offer market contracts. No new retailer has entered the Tasmanian electricity market and Aurora Energy continues to be the sole supplier of electricity to residential customers. Since most residential customers remain on *standing offers*, this report does not cover *market offers*.[202] Figure F.1 shows the Tasmanian residential *standing offer* prices for the reporting period, noting that *market offers* for residential customers are not available in Tasmania and are therefore not represented on this graph.

F.1.1 Representative price methodology

In Tasmania, the most common type of residential electricity consumer (the representative consumer) is a two-person household with no mains gas and no pool. The representative consumer uses 8,550 kWh of electricity each year, of which 41.3 per cent is allocated to Tariff 31 (light and power) and the remainder is allocated to Tariff 42 (hot water and space heating).[203]

Residential electricity *standing offer* prices for 2014/15 and 2015/16 were sourced from OTTER's retail pricing determinations. The methodology used for calculating *standing offer* prices for 2016/17 and 2017/18 is discussed in more detail in the sections below.

A detailed explanation of the methodology is set out in Appendix J.

F.1.2 Effect of different household consumption levels on electricity price and annual expenditure in 2014/15

The consumption of the representative consumer is developed using a set of assumptions to provide information about the trends in and drivers of electricity prices. The price outcomes based on the representative consumer's consumption are sensitive to these assumptions and may not reflect the actual prices paid by individual consumers.

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202 Aurora Energy does not provide *market offers* apart from its prepaid metering offers.

203 This consumption level was calculated from benchmark values published by the AER. ACIL Allen Consulting, *Electricity Bill Benchmarks for Residential Customers,* a report to the Australian Energy Regulator, October 2014. The allocation of tariffs is consistent with the most common tariff combination, as set out in OTTER, Typical Electricity Consumers, information paper, May 2014.

Table F.1demonstrates how the average unit cost of electricity and the annual electricity bill in Tasmania are sensitive to changes in the consumption levels. Lower consumption levels result in lower annual household bills but a higher per unit average price, as the fixed component of the retail electricity price is spread over a smaller volume of electricity. The opposite effect applies to higher consumption levels, whereby annual household bills are higher but there is a lower per unit average price, as the fixed component of the retail electricity price is spread over a larger volume of electricity.

Further examples of different consumer profiles using actual offers are set out in section F.4.

Table F.1 Effect of different consumption levels on average electricity price and annual expenditure in 2014/15, excluding GST

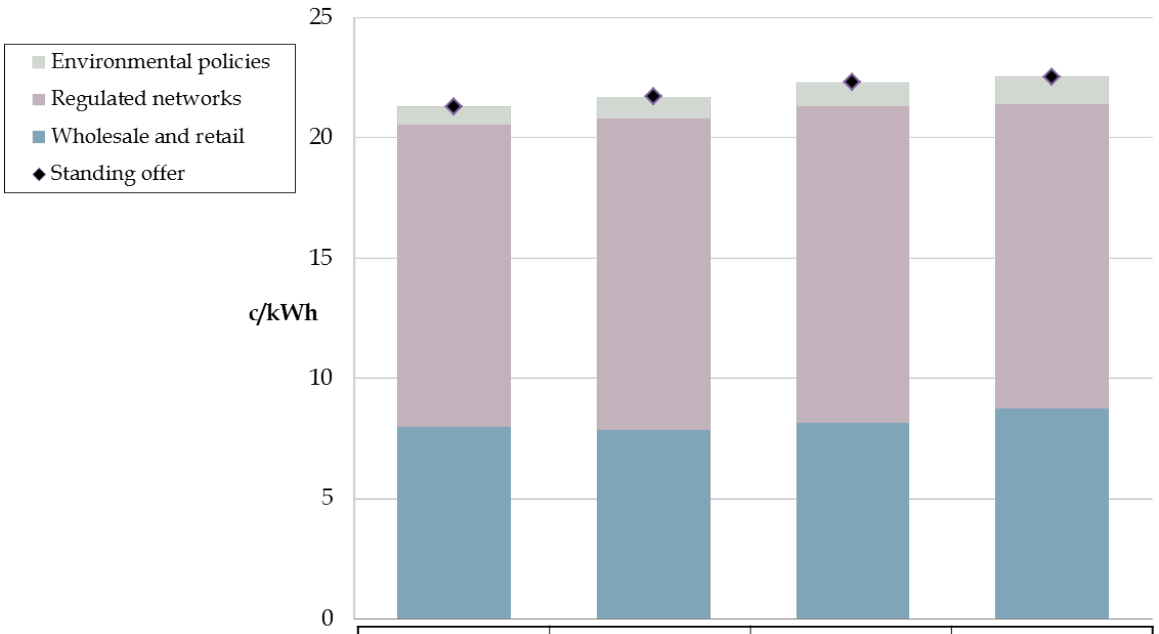
Annual consumption level	2014/15 Average *standing offer* (cents per kWh)	2014/15 Annual household bill
Low (2,500 kWh)	31.13	$778
Representative consumer: 2 people, no gas, no pool (8,550 kWh)	21.30	$1,821
High (9,500 kWh)	20.89	$1,985

Prices in this table are based on the regulated standing offer.

F.2 Trends in supply chain cost components

Figure F.2 shows expected movements in the supply chain cost components for Tasmania, which are the competitive wholesale and retail markets, regulated networks and government environmental policies.

Figure F.2 Tasmanian supply chain cost components



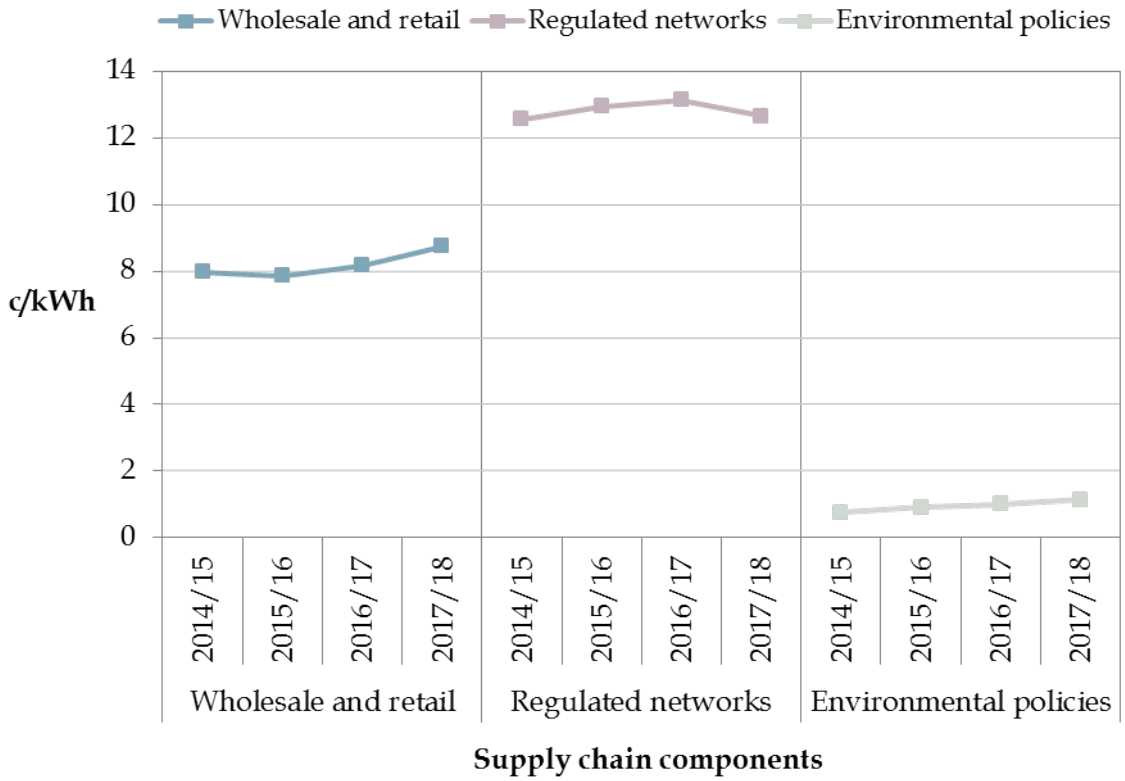
	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$	c/kWh	$	c/kWh	$	c/kWh	$
Environmental policies	**0.76**	**$65**	**0.91**	**$77**	**1.00**	**$85**	**1.14**	**$97**
Renewable Energy Target	0.76	$65	0.91	$77	1.00	$85	1.14	$97
Regulated networks	**12.55**	**$1,073**	**12.95**	**$1,107**	**13.13**	**$1,123**	**12.65**	**$1,082**
Wholesale and retail	**7.98**	**$683**	**7.86**	**$672**	**8.16**	**$698**	**8.74**	**$747**
Standing offer	**21.30**	**$1,821**	**21.71**	**$1,856**	**22.30**	**$1,906**	**22.53**	**$1,927**

Figure F.3 shows the expected movement in each of the supply chain components for Tasmania over the reporting period. In summary, the expected trends are:

- an average annual increase of 3.1 per cent in the competitive market component;
- an average annual increase of 0.3 per cent in the regulated network component; and
- an average annual increase of 14 per cent in the environmental policy component over the reporting period.

Further detail on these trends can be found below in the supply chain component-specific sections below.

Figure F.3 Trend in Tasmanian supply chain cost components



F.2.1 Competitive market costs

Competitive market costs consist of the wholesale energy component and the costs associated with retailing electricity to residential consumers. The detailed methodology for estimating these costs is set out in Appendix J. In summary:

- Wholesale market costs for 2014/15 and 2015/16 are sourced from the OTTER's retail pricing determinations. For 2016/17 and 2017/18, wholesale costs were escalated by the expected trend in Victorian wholesale energy prices, as modelled by Frontier Economics for this report. The Victorian wholesale electricity trend is used as a proxy for the Tasmanian trend because, after accounting for transport costs, prices in these markets are similar if there are no constraints. Further, more spot market and contract market information is available in the Victorian market compared to the Tasmanian market, providing the basis for better estimates of wholesale electricity costs. Information on the expected trends in the Victorian wholesale electricity market can be found in Appendix D of this report.
- Retail market costs for 2014/15 and 2015/16 are also sourced from the OTTERS's retail pricing determinations. For 2016/17 and 2017/18, the retail component was escalated by the assumed rate of inflation of 2.5 per cent.

In Tasmania, competitive market costs are expected to increase by an average of 3.1 per cent per year over the reporting period. Expected cost increases of 3.8 per cent in 2016/17 and 7.1 per cent in 2017/18 reflect forecast movements in the Victorian wholesale electricity price, as discussed below. In 2014/15, wholesale and retail costs comprised 37 per cent of the representative *standing offer* price.

Wholesale market

Hydro Tasmania is the dominant generator in Tasmania. OTTER is, therefore, required to regulate Hydro Tasmania's wholesale electricity contracts to provide retailers with similar levels of risk faced by retailers operating in other regions of the NEM.[204] This is to facilitate full retail contestability by providing confidence to retailers to enter the retail market.

Wholesale market costs for 2014/15 and 2015/16 are sourced from the Office of the Tasmanian Economic Regulator's retail pricing determinations. For 2016/17 and 2017/18, the wholesale costs were escalated by the expected trend in Victorian wholesale energy prices, as modelled by Frontier Economics for this report and discussed above.

Trends in annual electricity consumption can influence wholesale energy purchase costs. During the reporting period, the Australian Energy Market Operator (AEMO) expects a small increase in electricity consumption. These short term increases are driven by income growth and declining energy prices.

Over the next ten years, AEMO expects that electricity consumption will remain relatively flat, with high solar PV uptake and savings from energy efficiency measures offsetting short term increases in consumption. In the 2015 Electricity Statement of Opportunities, AEMO found that there is sufficient generation capacity in Tasmania to meet expected electricity consumption for the next ten years.

Retail Component

The retail component of the *standing offer* price is determined by OTTER.

OTTER has increased the return on investment for Aurora Energy from 4.85 per cent for the period 1 January 2014 to 30 June 2014 to 5.7 per cent in 2014/15 and 2015/16.[205] This was done in order to:

- reflect extra risks for retailers relating to the introduction of full retail contestability; and
- make the return on investment allowance more comparable to other jurisdictions with retail competition.

F.2.2 Regulated networks

Transmission and distribution network businesses recover regulated network costs relating to the provision of electricity networks. Generally, transmission lines connect electricity generators to major load centres and the distribution network delivers energy at lower voltages to residential and other consumers.

Transmission and distribution network services in Tasmania are provided by TasNetworks, which was formed in July 2014 by the merger of Transend, the former transmission network business, and Aurora Energy's distribution network business.

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204 OTTER, *Report on the investigation of maximum prices for the interim price-regulated electricity retail services for small customers on mainland Tasmania,* July 2013.

205 OTTER, *Aurora Energy Pty Ltd Interim Price-Regulated Retail Service Price Determination,* 28 February 2014.

For 2014/15 and 2015/16, regulated network costs are based on Aurora Energy's approved retail pricing proposals. For 2016/17 and 2017/18, network costs are based on the average of trends in both the AER's 2012-17 determination for Aurora Energy and its final transmission decision for TasNetworks. In 2017/18, there is no distribution network determination. Costs in this year have been based on the revenue assumption that underpins TasNetworks' Directions and Priorities Consultation Paper for its upcoming distribution determination regulatory proposal.[206] The regulatory proposal is due to be submitted to the AER in January 2016.

Reductions in the network business regulated revenues have the effect of moderating network price increases, but do not lead to network price decreases in Tasmania.

network costs are provided as one component in this report as Aurora Energy's pricing proposals do not provide separate components for transmission and distribution.

Regulated network costs consist of the costs of transmission and distribution network services. Combined network costs are expected to increase at an annual average rate of 0.3 per cent over the reporting period. This includes increases of 3.2 per cent in 2015/16 and 1.4 per cent in 2016/17, and a decrease of 3.7 per cent in 2017/18. In 2014/15, regulated network costs comprised 59 per cent of the regulated *standing offer* price.

Transmission

The trend in regulated transmission network costs over the reporting period reflects the AER's final decision on the regulated revenue for TasNetworks for the period 2014-19.

The AER's final decision for TasNetworks includes a lower rate of return, capital expenditure and operating expenditure for the 2014-19 regulatory period.[207]The component that has the greatest impact on the total revenue allowance for transmission network services is the rate of return, which has decreased from 10 per cent in 2009-14 to 6.37 per cent in 2014-19. The AER's determination attributes this in part to a change in financial market conditions.

Operational expenditure is set 12 per cent lower than actual operating expenditure in the previous regulatory period, this decrease is mainly due to the merger of the Transend transmission and Aurora distribution businesses. The combined entity, TasNetworks, is expected to incur more efficient costs by rationalising its functions and systems. Capital expenditure is set at a lower level than previous regulatory period due to expected flat peak demand growth, which is resulting in historically low levels of forecast augmentation to the network.[208]

Distribution

The AER's distribution determination applies for the period 2012-17 and was made under previous rules for network regulation.

206 TasNetworks, *Direction and Priorities Consultation Paper: Distribution Determination 2017*, August 2015.

207 AER, *Final Decision Transmission Determination Tas Networks 2014/15 to 2019/20*

208 ibid

Aurora Energy's determination features a rate of return of 8.28 per cent and smaller allowances for capital expenditure compared to the previous determination. Operating expenditure remains flat over the period, although at a higher level than the previous regulatory period.[209]

F.2.3 Environmental policies

In this report, environmental policies are the schemes introduced by the Commonwealth and jurisdictional governments that impact residential electricity prices. These policies aim to reduce greenhouse gas emissions and meet other objectives.[210] The environmental policy that applies in Tasmania during the reporting period is the Commonwealth Government's Renewable Energy Target.

Aurora Energy also 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 have a direct impact on residential prices.

The costs of the environmental policies are recovered from consumers in different ways. The costs of the Renewable Energy Target are recovered through increases in retail prices.

Renewable Energy Target

The Renewable Energy Target has two components: the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). Under both these components, eligible renewable energy generators are able to create certificates based on the amount of electricity they produce. In most circumstances, electricity retailers are then required to purchase these certificates and surrender them to the Clean Energy Regulator. Costs incurred by electricity retailers in purchasing certificates are passed on to consumers.

In 2014/15, Renewable Energy Target costs made up 4 per cent of the representative *standing offer*.

Renewable Energy Target costs are expected to increase by an average of 14 per cent per year over the reporting period.

The Renewable Energy Target costs for 2014/15 and 2015/16 were sourced from Aurora Energy's approved pricing proposals. Costs for the following two years were escalated using trends established by Frontier Economics for an annual target of 33,000 GWh by 2020.

F.3 Developments that could affect residential electricity prices in Tasmania

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

209 AER, *Final Distribution Determination Aurora Energy PTY Ltd 2012-13 to 2016-17,* April 2012.

210 Other objectives include encouraging investment, supporting employment and making energy efficiency measures more accessible and affordable.

Full retail contestability

Full retail contestability was introduced in Tasmania from 1 July 2014. Retailers, including Aurora Energy and new entrants, are able to provide *market offers* to retail consumers. Other retailers are yet to enter the Tasmanian market, however if this changes in the future then full retail contestability may impact residential electricity prices during the reporting period.

F.4 Tasmanian consumer profiles

The analysis in this report is focussed on the "representative" or most typical consumer for each jurisdiction. The consumer profiles below give examples of different consumer types where factors such as household size, off-peak hot water use and the presence of a pool or solar panels contribute to different consumption levels, and therefore annual bills.

Box F.2 Electricity consumption in a Tasmania one-person household

Patrick lives in Launceston. The main features of his energy consumption are that he does not have a mains gas connection to their house and he does not have a swimming pool. He has bought energy efficient appliances for his house and is careful with his general electricity use. He always pays his bill on time via direct debit.

Patrick uses 6,183 kWh of electricity each year, of which 3,629 kWh is for hot water and space heating. He pays 25.63 c/kWh in total for power and has a GST-exclusive annual household electricity bill of $1,585. This includes a daily charge of 89.389 cents per day and a variable tariff of 25.200 c/kWh for his general usage, and a daily charge of 17.312 cents per day and a variable tariff of 15.197 c/kWh for hot water and space heating.

The most common consumer type in Tasmania uses an average of 8,550 kWh per year. This consumer pays 21.71 c/kWh in total for power and has an annual bill of $1,856, based on the regulated standing offer.

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer*	Patrick
	2 people, no gas, no pool	1 person, no pool, no gas
Consumption (kWh/yr)	8,550	6,183
Competitive market charges	$672	$574
Network charges	$1,107	$945
Environmental policy charges	$77	$66
Annual bill	**$1,856**	**$1,585**
Average price (c/kWh)	21.71	25.63

* The average price and annual bill for the representative consumer are based on Aurora Energy's approved pricing proposals for 2015/16. The average price and annual bill for the consumer profile is based on an actual offer available from Aurora Energy in November 2015.

Between July 2014 and June 2018, Patrick can expect his electricity bills to increase at an annual average rate of 1.9 per cent. Further information and analysis of the drivers of electricity price trends can be found in the Tasmanian section of this report.

Box F.3 Electricity consumption in a Tasmania four-person household

Aiden and Sarah live in Hobart with their two sons Lance and Jake. The main features of their energy consumption are that they do not have a mains gas connection to their house and they do not have a swimming pool. The family has a wood burner installed in their home for heating which reduces their winter electricity needs by almost a half. They always pay their bill on time via direct debit.

Aiden and Sarah use 10,053 kWh of electricity each year from the grid, of which 5,901 kWh is for hot water and space heating. They pay 23.20 c/kWh in total for power and has a GST-exclusive annual household electricity bill of $2,333. This includes a daily charge of 89.389 cents per day and a variable tariff of 25.200 c/kWh for their general usage, and a daily charge of 17.312 cents per day and a variable tariff of 15.197 c/kWh for hot water and space heating.

The most common consumer type in Tasmania uses an average of 8,550 kWh per year. This consumer pays 21.71 c/kWh in total for power and has an annual bill of $1,856, based on the regulated standing offer.

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer*	Aiden and Sarah
	2 people, no pool, no gas	4 people, no pool, no gas
Consumption (kWh/yr)	8,550	10,053
Competitive market charges	$672	$844
Network charges	$1,107	$1,391
Environmental policy charges	$77	$97
Annual bill	**$1,856**	**$2,333**
Average price (c/kWh)	21.71	23.20

* The average price and annual bill for the representative consumer are based on Aurora Energy's approved pricing proposals for 2015/16. The average price and annual bill for the consumer profile is based on an actual offer available from Aurora Energy in November 2015.

Between July 2014 and June 2018, Aiden and Sarah can expect their electricity bills to increase at an annual average rate of 1.9 per cent. Further information and analysis of the drivers of electricity price trends can be found in the Tasmanian section of this report.

G Western Australia

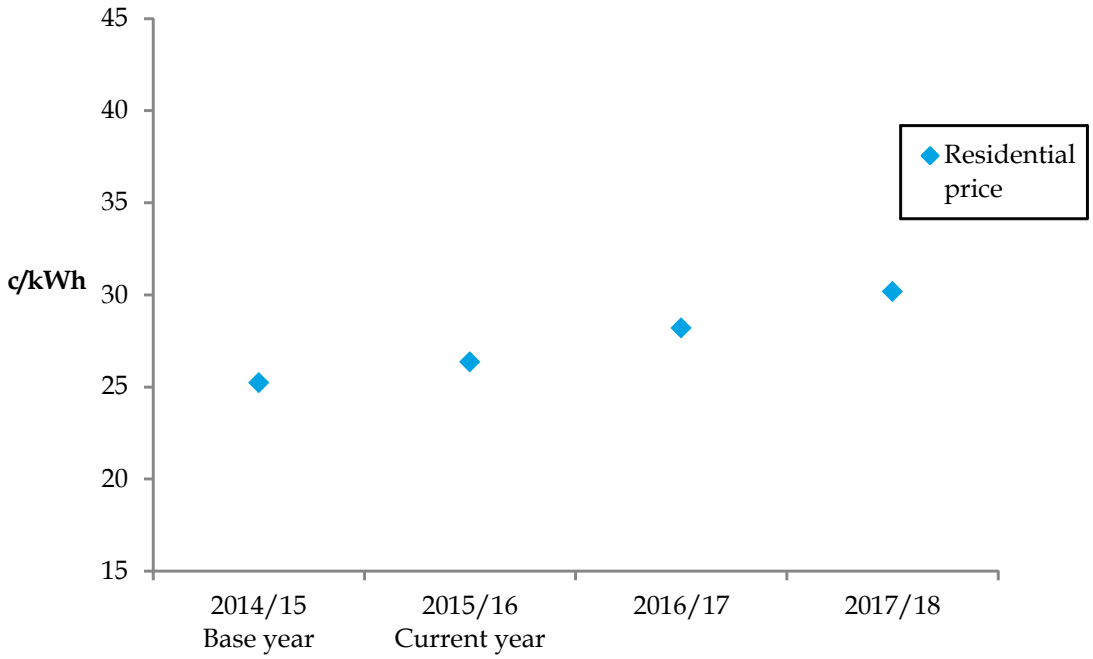
Box G.1 Key points

- Residential electricity prices in Western Australia are set by the Western Australian Government, which subsidises electricity prices such that the prices paid by consumers are less than the cost of supply.
- Residential electricity prices in Western Australia are expected to increase on average by 6.2 per cent per year over the reporting period. Based on the methodology and the modelling assumptions adopted, in 2014/15 the residential price would have needed to increase by 11 per cent to reflect the total estimated cost of supply. As prices are set by the Western Australian Government, the retail price paid by consumers does not necessarily reflect underlying costs of supplying electricity, nor follow cost trends.
- Estimated residential electricity supply cost increases are mainly driven by increases in distribution network costs and wholesale energy costs during the reporting period.
- In 2014/15, a representative consumer using 5,229 kWh per year paid the government-set price and had an annual bill of $1,319 exclusive of GST.
- The Western Australian Government is currently undertaking a wide-ranging review of the electricity market. The following reforms have been announced: retail price deregulation for households and businesses, and the transfer of regulatory oversight of Western Power from the Economic Regulation Authority to the Australian Energy Regulator.[211] Decisions on additional reforms are expected to occur progressively over 2015/16 and 2016/17.[212]

211 M Nahan (Minister for Energy), *Government energised for electricity reform*, media statement, 24 March 2015.

212 Western Australian Public Utilities Office, *Electricity Market Review - Phase 2*, website, accessed 24 August 2015.

Figure G.1 Trends in Western Australian residential electricity prices



G.1 Trends in residential electricity prices

Residential electricity prices are expected to increase by 4.5 per cent in 2015/16, followed by further increases of 7 per cent per year in 2016/17 and 2017/18. These movements are based on prices published by the Western Australian Government (for 2014/15 and 2015/16) and by the trend announced in the 2015/16 State Budget (for 2016/17 and 2017/18).[213] Figure G.1 shows the Western Australian residential prices for the reporting period, noting that market offers are not available in Western Australia and are therefore not represented on the graph.

In undertaking this report the supply chain costs in the South-West Interconnected System (SWIS) are calculated according to the methodology set out below.[214] Based on the methodology and the modelling assumptions adopted, in 2014/15 residential prices would have had to increase by 11 per cent to reflect the total estimated cost of supply in the SWIS.

The subsidy paid by the Western Australian Government is based on its modelling of supply costs in the SWIS and is expected to decrease over the reporting period. This mainly reflects a reduction in costs associated with changes in demand, business efficiency improvements, the adoption of a Long Run Marginal Cost operating subsidy model, and lower costs of supply for Horizon Power. These reductions in subsidy payments are partially offset by the Western Australian Government decision to

213 Western Australian Government, *2015/16 Budget - Budget Paper No. 3*, 14 May 2015.

214 The SWIS is the electricity network that services the south-west region of Western Australia. Its outermost limits are Kalbarri in the north, Albany in the south, and Kalgoorie in the east.

increase tariffs by 4.5 per cent in 2015/16, instead of the previously assumed 7 per cent.[215]

G.1.1 Representative price methodology

The analysis of residential electricity prices and cost components applies to a representative consumer. In Western Australia, the most common type of residential electricity consumer (the representative consumer) is a four-person household. The representative consumer uses 5,229 kWh of electricity each year and in 2014/15 has a total annual bill of $1,319, exclusive of GST.[216]

The methodology used for Western Australia differs from the other states because residential prices are set by the Western Australian Government and there is no formal statement of the supply chain costs. Price increases are published by the Western Australian Government for the reporting period in the Budget. Price increases in 2015/16 and for the rest of the reporting period are assumed for budget planning purposes.[217]

The Western Australian Government's uniform tariff policy means that residential consumers outside the SWIS pay the same price as those consumers in the SWIS. The analysis of prices and cost components for Western Australia is for consumers in the SWIS; however, the reported price trends will also apply to residential consumers outside of the SWIS.

G.1.2 Effect of different household consumption levels on electricity price and annual expenditure in 2014/15

The consumption of the representative consumer is developed using a set of assumptions in order to provide information about the trends in and drivers of electricity prices. The price outcomes based on the representative consumer's consumption are sensitive to these assumptions and may not reflect actual prices paid by individual consumers.

Table G.1 demonstrates how the average unit cost of electricity and the annual electricity bill in Western Australia are sensitive to changes in the consumption levels. Lower consumption levels result in lower annual household bills but a higher per unit average price, as the fixed component of the retail electricity price is spread over a smaller volume of electricity. The opposite effect applies to higher consumption levels, whereby annual household bills are higher but there is a lower per unit average price, as the fixed component of the retail electricity price is spread over a larger volume of electricity.

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215 Western Australian Government, *2015/16 Budget - Budget Paper No. 3*, 14 May 2015. Lower than previously anticipated price increases will lead to larger subsidy payments because more government subsidy is needed to cover the difference between the cost of supplying electricity and the residential tariff paid by consumers.

216 This representative consumption value was provided to the AEMC by the Western Australian Government.

217 Western Australian Government, *2015/16 Budget - Budget Paper No.3,* 14 May 2015.

Further examples of different consumer profiles using actual offers are set out in section G.4.

Table G.1 Effect of different consumption levels on average electricity price and annual expenditure in 2014/15, excluding GST

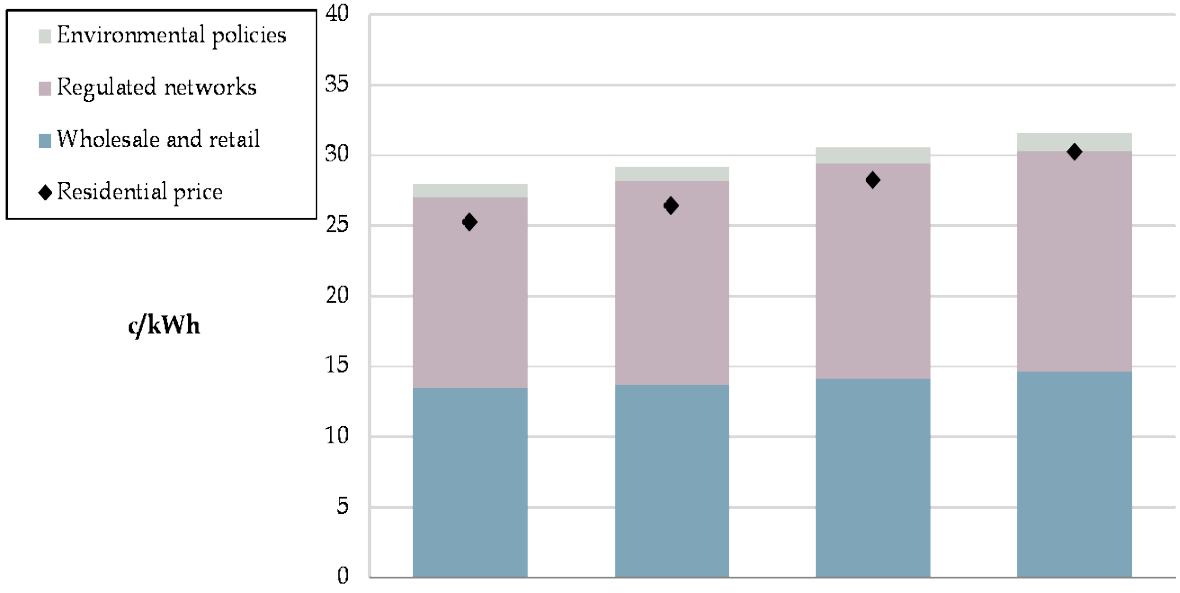
Annual consumption level	2014/15 Average residential price (cents per kWh)	2014/15 Annual household bill
Low (2,500 kWh)	28.35	$709
Representative consumer: 4 people (5,229 kWh)	25.23	$1,319
High (9,500 kWh)	23.94	$2,274

Prices in this table are based on the government-set price.

G.2 Trends in supply chain cost components

Figure G.2 shows expected movements in the supply chain cost components for Western Australia, which are the wholesale and retail costs, regulated network costs and government environmental policy costs.

Figure G.2 Western Australian supply chain cost components



	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**0.97**	**$51**	**1.06**	**$56**	**1.17**	**$61**	**1.34**	**$70**
LRET	0.49	$25	0.59	$31	0.74	$38	0.90	$47
SRES	0.49	$26	0.48	$25	0.44	$23	0.43	$23
Regulated networks	**13.52**	**$707**	**14.50**	**$758**	**15.30**	**$800**	**15.68**	**$820**
Transmission	1.98	$104	1.67	$88	1.52	$79	1.56	$81
Distribution	11.54	$603	12.83	$671	13.78	$721	14.12	$739
Wholesale and retail	**13.46**	**$704**	**13.65**	**$714**	**14.13**	**$739**	**14.60**	**$763**
Estimated total supply cost	**27.95**	**$1,462**	**29.22**	**$1,528**	**30.61**	**$1,600**	**31.62**	**$1,653**
Residential price	**25.23**	**$1,319**	**26.36**	**$1,378**	**28.21**	**$1,475**	**30.18**	**$1,578**

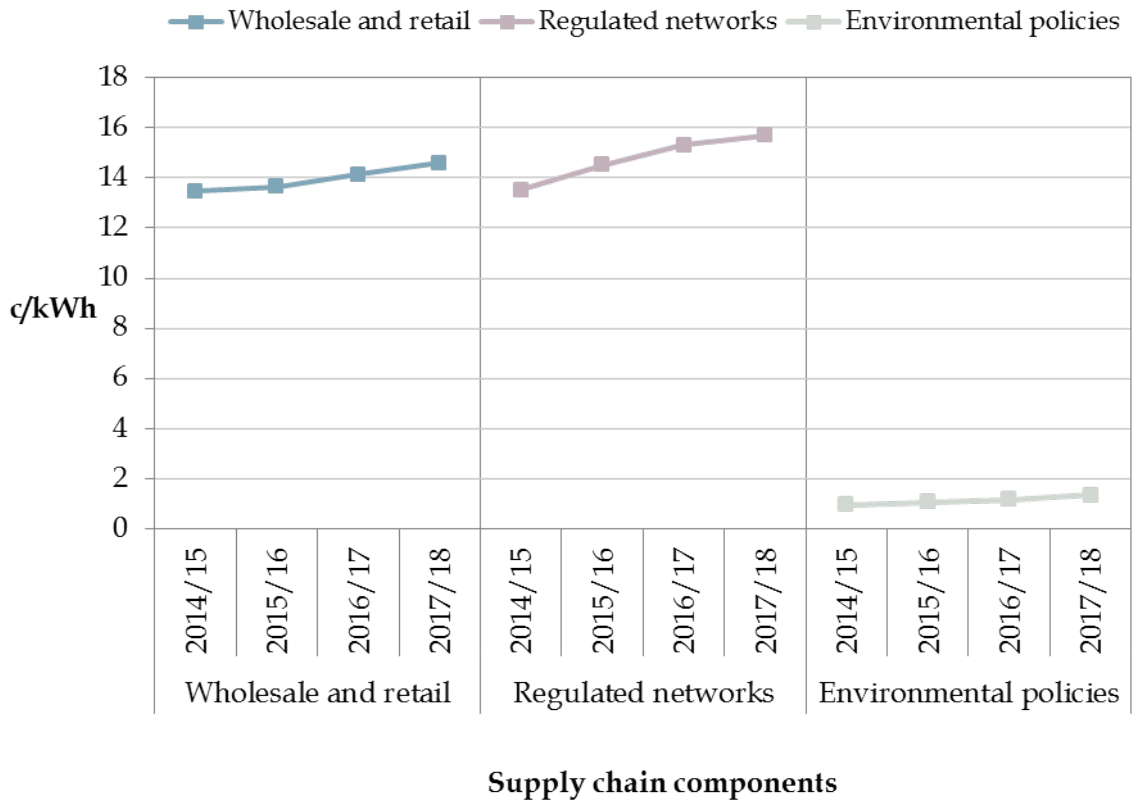
Figure G.3 shows the expected trends in the supply chain cost components in Western Australia over the reporting period. In summary, the expected trends are:

- an average annual increase of 2.7 per cent in the wholesale and retail component;
- an average annual increase of 5.1 per cent in the regulated networks component; and
- an average annual increase of 11 per cent in the environmental policy component over the reporting period.

As prices are set by the Western Australian Government, the retail prices paid by consumers do not necessarily reflect underlying costs, nor follow cost trends.

Further detail on these trends can be found below in the supply chain component-specific sectors.

Figure G.3 Trends in Western Australian supply chain cost components



G.2.1 Wholesale and retail costs

Wholesale and retail costs consist of the wholesale energy component and the costs associated with retailing electricity to residential consumers. A summary of the approach used is as follows:

- The wholesale energy cost estimates are based on modelling of the stand-alone Long Run Marginal Cost (LRMC) undertaken by Frontier Economics. LRMC modelling was used due to the expectation that market modelling would underestimate Synergy's actual wholesale energy costs. Synergy's costs are determined by contractual arrangements, including those relating to the Reserve Capacity Mechanism (RCM), rather than the spot market price.[218]
- For the retail component, estimates from the Western Australian Public Utilities Office have been used for Synergy's efficient retailer operating costs and retail margin. Notably, the chosen approach to estimating the retail cost in Western Australia is different to how the retail component is derived for other jurisdictions.[219]

218 The objective of the RCM is to secure sufficient capacity (generation and demand side management) to meet the peak load of the SWIS. The capacity requirement is set two years in advance by the Independent Market Operator. Retailers are required to contract, or purchase capacity from the IMO to meet the capacity requirement. RCM has not been modelled in the analysis.

219 A 'retail component' is derived for other jurisdictions as the difference between the residential tariff or *market offer* price and the aggregate of the environment, network and wholesale cost components.

Wholesale energy component

Wholesale energy costs are expected to increase, on average, by 2.7 per cent per year. This is the output of LRMC modelling undertaken by Frontier Economics and not based on how existing market participants may act in the future. In 2014/15, wholesale electricity costs comprised 40 per cent of the total cost of supply.

The stand-alone LRMC is the best approach to estimating wholesale energy costs given the structure of the Western Electricity Market (WEM) (see Box G.2 below). This approach has also been used by the Western Australian Government and the Economic Regulation Authority to forecast wholesale energy costs for the residential market.[220]

The LRMC modelling assumes average increases in capital costs of between 3.1 and 3.4 per cent during the reporting period (depending on the fuel source and technology).[221]In real terms, the wholesale price of coal is forecast to remain constant and a minor decrease in gas prices is expected.[222]

Box G.2 The Western Electricity Market

The wholesale electricity market that operates in the South Western Interconnected System (SWIS) is called the Western Electricity Market (WEM). The WEM comprises of two components, an energy market (for the buying and selling of electricity) and a capacity market.

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.

The Capacity market is known as the Reserve Capacity Mechanism (RCM). Retailers are required to contract two years in advance for a set amount of generation capacity to meek peak demand in the SWIS.

The key bodies in the WEM are the Independent Market Operator, which maintains and develops the Market Rules; Western Power, the network owner and operator; Synergy, the government-owned utility; and the Economic Regulatory Authority which is responsible for economic regulation and market monitoring.

Broadly there are two reasons for using a different method for Western Australia. 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 less 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 therefore underestimate the total cost of supply.

220 Frontier Economics, *2015 Residential Electricity Price Trends Report*, August 2015, p5.

221 Changes in the modelled capital costs are due to assumptions about future exchange rates, changes in the costs of labour and material, and technology learning curves. For a detailed description of the methodology used see Frontier Economics, *2015 Residential Electricity Price Trends Report*, August 2015.

222 In contrast to the Australian east coast, WA is already a gas exporter. The WA gas price is therefore influenced by movements in the Asia-Pacific LNG price. See Frontier Economics, *2015 Residential Electricity Price Trends Report*, August 2015, p58.

Retail component

The retail sector in Western Australia is not competitive because the government-owned utility, Synergy, is the only retailer for electricity users who consume less than 50 MWh per year (by comparison, an average household in the SWIS is considered to consume less than 6 MWh per year).[223] However, Synergy provides several different offers and consumers may find that one of the offers is most suited to their individual circumstances.

G.2.2 Regulated networks

Transmission and distribution network businesses recover regulated network costs relating to the provision of electricity networks. Generally, transmission lines connect electricity generators to major load centres and the distribution network delivers energy at lower voltages to residential and other consumers.

The transmission and distribution networks in Western Australia are operated by the Western Australian State Government owned corporation, Western Power.

Western Power's Approved Revised Access Arrangement and annual price lists have been used to estimate network costs. The current determination covers the first three years of the reporting period.[224] There is no access arrangement for 2017/18 and it is assumed that network costs will increase at an assumed rate of inflation of 2.5 per cent in this year.

In 2014/15, regulated network costs comprised 48 per cent of the total cost of supply.

Transmission

In 2014/15, the transmission network component comprised 7.1 per cent of the cost of supply. The transmission network component decreases in each year of the reporting period covered by the current determination, by 16 per cent in 2015/16 and 9.2 per cent in 2016/17. This is a result of decreases in capital expenditure in the transmission network. Capital expenditure is reduced because Western Power is meeting service level targets despite significant underspending of capital expenditure under previous access arrangements. This could indicate that there has been some inefficiency in capital expenditure planning in the past.

Distribution

In 2014/15, the distribution network component comprised 41 per cent of the total cost of supply. The distribution network component increases in each year of the reporting period covered by the current determination, by 11 per cent in 2015/16 and by 7.4 per cent in 2016/17.

The increases in distribution network costs reflect Western Power's 2012-17 access arrangement, which is regulated by the Western Australian Economic Regulation Authority. Cost increases during this period are mostly due to increases in operational

223 The representative consumer is considered to have an annual consumption level of 5,229 kWh, a figure provided by the Western Australian Government.

224 The expected trend in distribution and transmission costs is set out in Economic Regulatory Authority, *Decision: Variation to Western Power's Access Arrangement for 2012/13 to 2016/17*,4 June 2013, p13.

expenditure, resulting from forecast growth in the size of the network, greater customer numbers and increasing labour costs.[225]

Part of the increase in 2015/16 is due to revenue adjustments for revenue under-recovered in 2014/15 and the Tariff Equalisation Contribution.[226] An amount of $18 million was under-recovered in 2014/15 due to electricity sales being lower than expected.[227] The Tariff Equalisation Contribution was re-gazetted by the Western Australian Government to be $32 million larger than previously anticipated.

G.2.3 Environmental policies

In this report, environmental policies are the schemes introduced by the Commonwealth and jurisdictional governments that impact residential electricity prices. These policies aim to reduce greenhouse gas emissions and meet other objectives.[228] The environmental policy that applies in Western Australia during the reporting period is the Commonwealth Government's Renewable Energy Target.

There is also a Residential Feed-in Tariff scheme in operation in Western Australia, however, this is not included in the report because this scheme is funded by Western Australian Government taxation revenue and the costs do not flow through directly to residential electricity prices.

Renewable Energy Target

The Renewable Energy Target has two components: The Large-scale Renewable Energy Target and the Small-scale Renewable Energy Scheme. Under both these components, eligible renewable energy generators are able to create certificates based on the amount of electricity they produce. In most circumstances, electricity retailers are then required to purchase these certificates and surrender them to the Clean Energy Regulator. Costs incurred by electricity retailers in purchasing certificates are passed on to consumers.

For this report, analysis of the costs associated with the Renewable Energy Target was undertaken by Frontier Economics assuming an annual target of 33,000 GWh by 2020.

In 2014/15, the Large-scale Renewable Energy Target comprised 1.7 per cent of the total cost of supply. Large-scale Renewable Energy Target costs are expected to increase on average by 23 per cent per year over the reporting period.

In 2014/15, the Small-scale Renewable Energy Scheme comprised 1.7 per cent of the total cost of supply. Small-scale Renewable Energy Scheme costs are expected to decrease by 3.9 per cent per year over the reporting period.

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225 Western Power, *Proposed revisions to the Access Arrangement for the Western Power Network,* Appendix A, September 2011.

226 The Tariff Equalisation Contribution is an amount which is collected from the SWIS customers via Western Power's network prices and used to fund the Western Australian Government's uniform tariff policy.

227 Since Western Power is regulated under a revenue cap, when energy sales are lower than the forecast amount, the of revenue that is recovered per unit of energy must increase for the total amount of revenue to be consistent with the revenue cap.

228 Other objectives include encouraging investment, supporting employment and making energy efficiency measures more accessible and affordable.

The trends in the LRET are based on assumptions about the percentage of renewable energy that will be required to meet the target and the resource cost of obtaining large-scale generation certificates. Similarly, Small-scale Renewable Energy Scheme costs are also based on a renewable energy percentage and the expectations about future certificate prices. The Clean Energy Authority sets the renewable energy percentages for both the Large-scale Renewable Target and the Small-scale Renewable Energy schemes.

G.3 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 in residential retail prices in Western Australia.

Electricity Market Review

The Western Australian Government is currently undertaking a wide-ranging review of the electricity market.[229] The review will examine the structures of the electricity generation, wholesale and retail sectors within the SWIS and the incentives for industry participants to make efficient investments and minimise costs. The objectives of the Energy Market Review are to reduce the costs of production and supply of electricity without compromising safety and reliability, to reduce the Western Australian Government's exposure to energy market risks and to attract private sector participants that are able to facilitate long term stability and investment.[230]

The first phase of the Electricity Market Review assessed the structure of the market and examined options to achieve the review's objectives. This phase is now complete and on 24 March 2015 the second phase of the review was launched. The second phase will focus on the detailed design of reforms identified in phase one and outlining implementation arrangements. There are four workstreams currently in process, these are related to network regulation, market competition, institutional arrangements and wholesale electricity market improvements.

The Following reforms have already been announced:[231]

- retail price deregulation for households and businesses; and
- the transfer of regulatory oversight of Western Power from the Economic Regulation Authority to the Australian Energy Regulator.

Decisions with respect to reforms are expected to be made progressively over 2015/16 and 2016/17. Any changes that occur as a result of this review may impact on future residential retail prices within the period covered by this report.

229 Information on the Western Australian Government's Electricity Market Review is available at *https://www.finance.wa.gov.au/cms/Public_Utilities_Office/Electricity_Market_Review/Electricity_Market_Review.aspx*

230 Western Australian Government, *2015/16 Budget - Budget Paper No. 3*, 14 May 2015.

231 M Nahan (Minister for Energy), *Government energised for electricity reform*, media statement, 24 March 2015.

G.4 Western Australian consumer profiles

The analysis in this report is focussed on the "representative" or most typical consumer for each jurisdiction. The consumer profiles below give examples of different consumer types where factors such as household size, off-peak hot water use and the presence of a pool or solar panels contribute to different consumption levels, and therefore annual bills.

Box G.3 Electricity consumption in a Western Australia two-person unit

Peter and Mary are retirees who live in a two bedroom unit in Mandurah. They are meticulous about minimising their electricity consumption by being careful with heating and cooling, and by switching off appliances and lights when they are not being used.

Peter and Mary pay for electricity at a price set by the Western Australian Government, which is less than the estimated cost of supply. They use 3,914kWh of electricity each year. The couple pay 27.37 c/kWh in total for power. This includes a fixed component of 42.89 cents per day and a variable tariff component of 23.37 c/kWh for all usage. Overall, Peter and Mary have a GST-exclusive annual household electricity bill of $1,071.

The most common consumer type in the Western Australia uses an average of 5,229 kWh per year. This representative consumer pays 26.36 c/kWh in total for power and has an annual bill of $1,378.

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer	Peter and Mary
	4 people	2 people
Consumption (kWh/yr)	5,229	3,914
Wholesale and retail charges	$714	$537
Network charges	$758	$652
Environmental policy charges	$56	$42
Estimated cost of supply	$1,528	$1,231
Annual bill	**$1,378**	**$1,071**
Average price (c/kWh)	26.36	27.37

Between July 2014 and June 2018, Peter and Mary can expect their electricity bills to increase at an annual average rate of 6.2 per cent. Since the price they pay for their electricity is set by the Western Australian Government these price

increases may not follow the trends in the underlying cost components of electricity supply. Further information and analysis of the drivers of electricity supply cost trends can be found in the Western Australian section of this report.

Box G.4 Electricity consumption in a Western Australia two-person large apartment

Brian and Amy are a young Irish couple who live in a large two bedroom apartment in Highgate, Perth. Brian works from home and hasn't acclimatised to Western Australia so he relies on the air conditioner running throughout the day. They use 5,436kWh of electricity each year, which is higher than a typical consumer in the state.

Brian and Amy pay for electricity at a price set by the Western Australian Government, which is less than the estimated cost of supply. The couple pay 26.25 c/kWh for their power. This includes a fixed component of 42.89 cents per day and a variable tariff component of 23.37 c/kWh for all usage. Overall, Brian and Amy have a GST-exclusive annual household electricity bill of $1,427.

The most common consumer type in the Western Australia uses an average of 5,229 kWh per year. This representative consumer pays 26.36 c/kWh in total for power and has an annual bill of $1,378.

Comparison with representative consumer (2015/16, all figures exclusive of GST)

	Representative consumer	Brian and Amy
	4 people	2 people
Consumption (kWh/yr)	5,229	5,436
Wholesale and retail charges	$714	$742
Network charges	$758	$775
Environmental policy charges	$56	$58
Estimated cost of supply	$1,528	$1,574
Annual bill	**$1,378**	**$1,427**
Average price (c/kWh)	26.36	26.25

Between July 2014 and June 2018, Brian and Amy can expect their electricity bills to increase at an annual average rate of 6.2 per cent. Since the price they pay for their electricity is set by the Western Australian Government these price increases may not follow the trends in the underlying cost components of

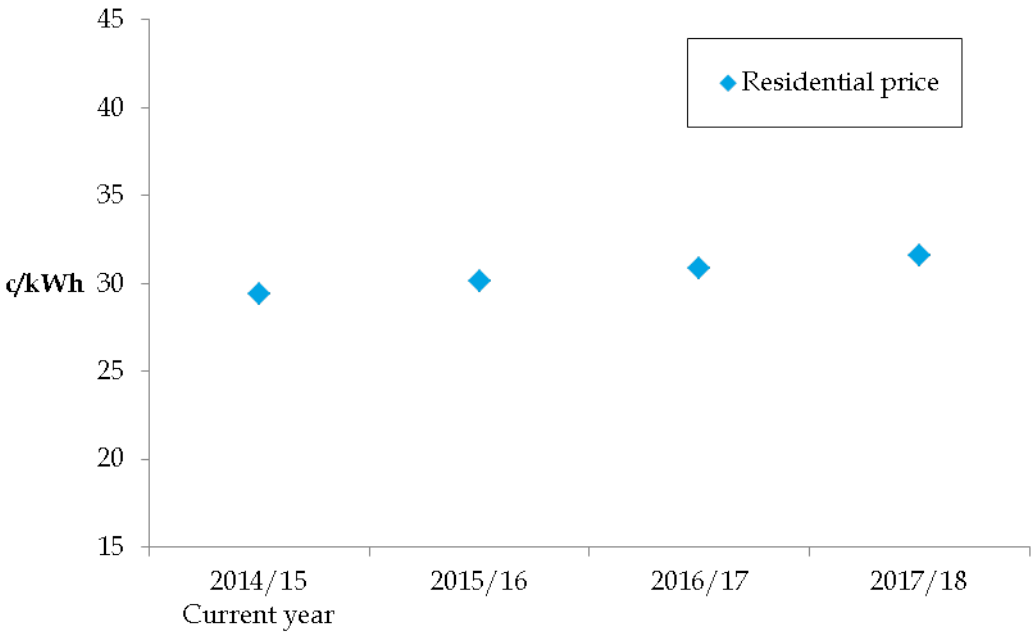
electricity supply. Further information and analysis of the drivers of electricity supply cost trends can be found in the Western Australian section of this report.

H Northern Territory

Box H.1 Key points

- Residential electricity prices in the Northern Territory are set by the Northern Territory Government, which subsidises electricity prices such that the prices paid by consumers are less than the cost of supply.
- Residential electricity prices in the Northern Territory are expected to increase on average by 2.5 per cent per year over the reporting period, based on an assumed rate of inflation. As prices are set by the Northern Territory Government, the retail prices paid by consumers do not necessarily reflect underlying costs, nor follow cost trends.
- The key drivers of supply costs in the Northern Territory are increases in regulated network costs and a decrease in wholesale electricity costs. Increases in regulated network costs are due to higher operational expenditure and regulatory depreciation allowance. The decrease in wholesale electricity costs reflects a revision of Territory Generation's wholesale prices.
- In 2014/15, a representative consumer using 6,790 kWh per year paid the government-set price and had a total annual bill of $1,997 exclusive of GST.

Figure H.1 Trend in Northern Territory regulated residential prices



H.1 Trends in residential electricity prices

Residential electricity prices in the Northern Territory are expected to increase, on average, by 2.5 per cent per year over the reporting period, based on an assumed rate of inflation.

Figure H.1 shows Northern Territory residential prices for the reporting period, noting that market offers are not available in the Northern Territory and are therefore not represented on the graph.

A number of reforms have been underway in the Northern Territory's electricity industry since 2014, including:

- ongoing reforms to the regulatory framework governing the Northern Territory's electricity industry; and
- the structural separation in 2014 of the Power and Water Corporation's monopoly and contestable businesses into stand-alone government-owned corporations.

H.1.1 Representative price methodology

The analysis of residential electricity prices and cost components is based on a representative consumer. In the Northern Territory and for the purposes of this report, the most common type of residential electricity consumer (the representative consumer) is a two person household with no mains gas connection and no pool. The representative consumer uses 6,790kWh of electricity each year.[232]

Residential electricity prices in the Northern Territory are set by the Northern Territory Government rather than by market competition or an independent regulator. As a result, the methodology used for the Northern Territory differs from the other jurisdictions. Residential electricity prices are currently subsidised by the Northern Territory Government, meaning that the price paid by residential consumers is lower than the cost of supplying them with electricity.

The analysis of residential electricity prices and cost components is based on a residential consumer in the Darwin-Katherine Interconnected System using 6,790 kWh per year. As the Northern Territory Government has a uniform tariff policy, these prices apply to all residential consumers of Jacana Energy, the government-owned retailer, including those outside of the Darwin-Katherine system.[233] It should be noted that the costs to service regions outside of the Darwin-Katherine system are greater and therefore a higher level of subsidy is provided for these areas. For example, the electricity market in the Northern Territory includes 72 remote indigenous communities that are provided electricity services by the Power and Water Corporation's not-for-profit subsidiary, Indigenous Essential Services Pty Ltd (IES) under agreement with the Department of Community Services. The current residential electricity tariff charged by Power and Water Corporation, as the retailer for IES, mirrors that of Jacana's residential tariff.

Residential tariffs in the Northern Territory are set on a calendar year basis. For consistency in this report, prices set by the Northern Territory Government for the 2014 and 2015 calendar years have been adjusted to be on a financial year basis by averaging

232 This consumption level was calculated from benchmark values published by the AER. ACIL Allen Consulting, *Electricity Bill Benchmarks for Residential Customers,* a report to the Australian Energy Regulator, October 2014.

233 Jacana Energy is a government-owned electricity retailer that was created as part of the split of the Power and Water Corporation on 1 July 2014.

the two these tariffs. It is assumed that residential prices will increase at an assumed inflation rate of 2.5 per cent thereafter. Actual price outcomes will depend on decisions made by the Northern Territory treasurer closer to when the prices apply.

There is no competition in the retail market in the Northern Territory. Jacana Energy is responsible for retail functions in the electricity market. This entity was created after the structural separation the Power and Water Corporation's functions in 2014. Jacana energy serves all electricity consumers using less than 750 MWh per year, which includes all residential consumers. Retail competition in this market has been allowed since 2010, however there are no other retailers currently active in the residential market.

H.1.2 Effect of different household consumption levels

The consumption of the representative consumer is developed using a set of assumptions in order to provide information about the trends in and drivers of electricity prices. The price outcomes based on the representative consumer's consumption are sensitive to these assumptions and may not reflect actual prices paid by individual consumers.

Table H.1 demonstrates how the average unit cost of electricity and the annual electricity bill in the Northern Territory are sensitive to change in the consumption levels. Lower consumption levels result in lower annual household bills, but a higher per unit average price, as the fixed component of the retail electricity price is spread over a smaller volume of electricity. The opposite effect applies to higher consumption levels, whereby annual household bills are higher but there is a lower per unit average price, as the fixed component of the retail electricity price is spread over a larger volume of electricity.

Table H.1 Effect of different household consumption levels on average electricity price and annual expenditure in 2014/15, excluding GST

Annual consumption level	2014/15 average residential price (cents per kWh)	2014/15 annual household bill
Low (2,500 kWh)	34.18	$854
Representative consumer: 2 people, no gas, no pool (6,790 kWh)	29.40	$1,997
High (9,500)	28.61	$2,718

Prices in this table are based on the government-set price.

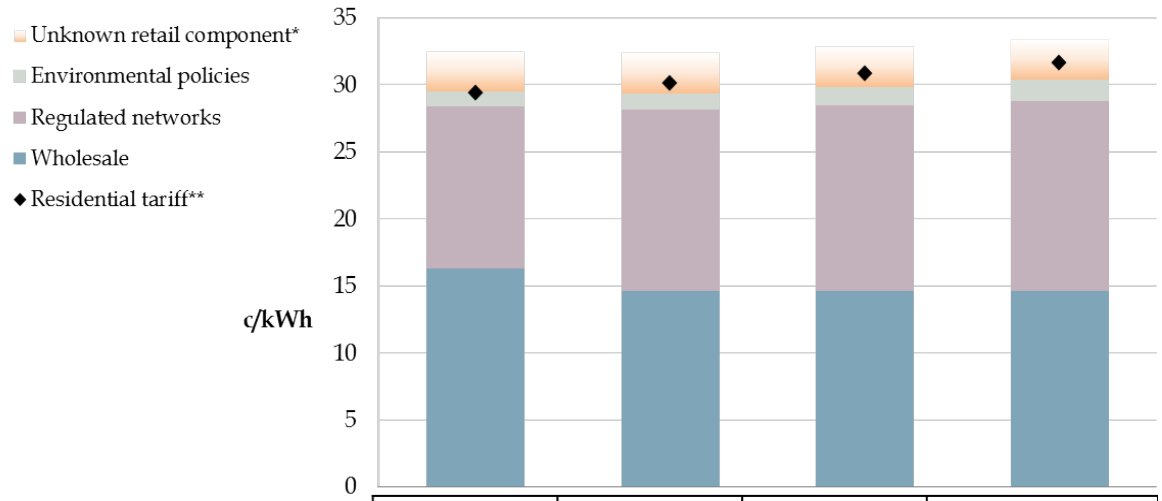
Further examples of different consumer profiles are set out in section H.4.

H.2 Trends in supply chain cost components

Figure H.2 shows the expected movements in the supply chain cost components for the Northern Territory, which are wholesale and retail costs, regulated networks and government environmental policies.

Unlike for other jurisdictions it is not possible to determine the total supply chain cost. For this reason Figure H.2 does not show the total costs. This is explained in more detail below.

Figure H.2 Northern Territory supply chain cost components



	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**1.13**	**$77**	**1.24**	**$84**	**1.39**	**$94**	**1.58**	**$107**
LRET	0.61	$41	0.73	$50	0.92	$63	1.12	$76
SRES	0.52	$35	0.51	$35	0.47	$32	0.46	$31
Regulated networks	**12.06**	**$819**	**13.46**	**$914**	**13.80**	**$937**	**14.14**	**$960**
Wholesale	**16.34**	**$1,109**	**14.69**	**$997**	**14.69**	**$997**	**14.69**	**$997**
Residual	**-0.12**	**-$8**	**0.71**	**$48**	**0.98**	**$67**	**1.22**	**$83**
Residential tariff**	**29.40**	**$1,997**	**30.10**	**$2,044**	**30.85**	**$2,095**	**31.62**	**$2,147**

Note: The "residual" is the difference between the residential price and the aggregate of the supply chain costs. It is a contribution to the retail component. As a result the cost stack shown in the table underestimates total costs. In the case where the residual is negative, the aggregate of the supply chain costs, excluding the retail component, is higher than the residential price.

*The unknown retail component includes a range of different costs, including the retailer operating costs, customer acquisition and retention, and return on investment for investing capital in the business. The quantum of the retail component is not known and this is illustrated by the faded element at the top of the cost stack in the graph.

** Residential tariffs in the Northern Territory are set on a calendar year basis. Prices set by the Northern Territory Government for the 2014 and 2015 calendar years have been adjusted to be on a financial year basis by averaging the two these tariffs. It is assumed that residential prices will increase at an assumed inflation rate of 2.5 per cent thereafter.

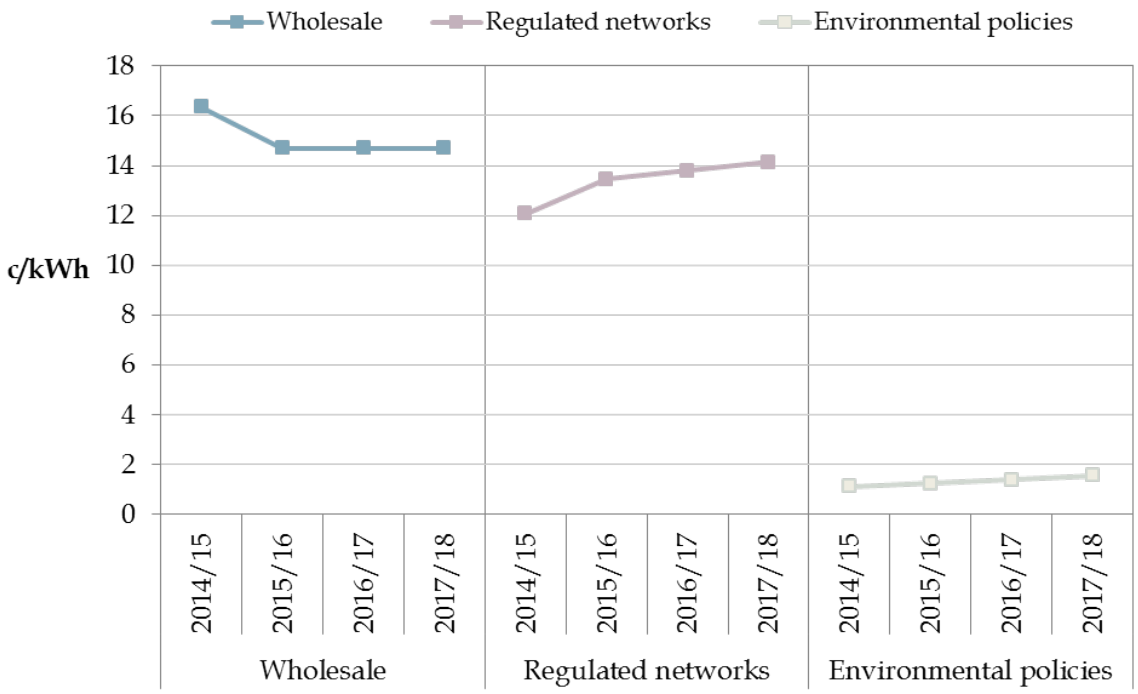
Figure H.3 shows the expected movements in each of the supply chain components for the Northern Territory over the reporting period. In summary, the expected trends are:

- an average annual decrease of 3.5 per cent in the wholesale component. Figure H.3 only shows the trend in the wholesale market component as it not possible, with the data available, to identify the retail component;
- an average annual increase of 5.5 per cent in the regulated network component; and

- an average annual increase of 12 per cent in the environmental policy component over the reporting period.

Further detail on these trends can be found below in the supply chain component-specific sections.

Figure H.3 Trends in Northern Territory supply chain cost components



The wholesale cost component only is shown instead of aggregated wholesale and retail costs. This is because the retail cost component is unknown.

H.2.1 Wholesale and retail costs

Wholesale and retail costs consist of the wholesale energy component and the costs associated with retailing electricity to residential consumers. A summary of the approach taken in this report is as follows:

- Wholesale energy costs for the reporting period were provided to the AEMC by the Northern Territory Government.
- It has not been possible to estimate the retail component in the Northern Territory. This is discussed in more detail below.

In the Northern Territory wholesale market costs are expected to decrease by an average of 3.5 per cent per year over the reporting period. This includes a decrease of 10 per cent in 2015/16 and no change for the final two years of the reporting period.

In 2014/15 wholesale market costs comprised 56 per cent of the residential tariff.

Since July 2014, Power and Water Corporation's functions have been separated out. The functions which could be subject to competition, wholesale energy and retail, are now performed by stand-alone government corporations. Jacana Energy and Territory Generation are responsible for retail and generation functions respectively.

It has not been possible to show the retail costs in the Northern Territory. In other jurisdictions we have used the residual when all of the non-retail cost components are subtracted from the total representative price as a proxy for the retail costs. However, when we apply this approach to the Northern Territory, the residual is a value representing *part* of the retail costs.

The unknown retail component includes a range of different costs, including retailer operating costs customer acquisition and retention, and return on investment for investing capital in the business. The cost stack presented in this report is therefore an incomplete picture of the costs incurred to provide electricity to residential consumers. If the retail component was included, then the costs would be greater than the residential price in 2014/15 and 2015/16.[234] Using the information available, it is unclear if residential electricity prices will still be subsidised at the end of the reporting period.

Wholesale energy costs

The decrease in wholesale electricity costs in 2015/16 reflects a revision in Territory Generation's prices, in response to changes in Territory Generation's contractual arrangements.

Electricity supply in the urban areas of Darwin-Katherine, Alice Springs and Tennant Creek is subsidised and all consumers pay the same price. The subsidy for consumers outside of the Darwin-Katherine system is larger owing to wholesale energy costs being more expensive in these areas. A Community Service Obligation payment covers the subsidy paid to all urban electricity consumers. In 2015/16, this payment is $65.8 million.[235]

The Northern Territory Government has endorsed the adoption of an interim wholesale electricity market. This is discussed in more detail below in Section H.3.

Retail costs

It has not been possible to identify a trend in Northern territory retail costs because, unlike other jurisdictions, the 'residual method' (as described in section J.3.1) cannot be used to show the retail cost component of electricity prices. This is because the prices paid by consumers are less than the cost of supply.

H.2.2 Regulated networks

Transmission and distribution network businesses recover regulated network costs relating to the provision of electricity networks. Generally, transmission lines connect electricity generators to major load centres and the distribution network delivers energy at lower voltages to residential and other consumers. In the Northern Territory, there is no distinction between transmission and distribution costs when network costs are recovered from customers.

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234 This is reflected in the Northern Territory Budgets for 2014/15 and 2015/16, which both contain a Customer Service Obligation subsidy for supplying urban customers with electricity, water and sewerage services.

235 A separate government payment, the Indigenous Essential Services grant, subsidises utility services in remote areas. In 2015/16, this is $75 million and includes electricity water and sewage. See page 324 of Budget Paper No.3 from the 2015-16 Budget.

Transmission and distribution network services in the Northern Territory are provided by the government-owned Power and Water Corporation.

In April 2014 the Utilities Commission published a final determination on network prices for the 2014/19 regulatory period.[236] However, the Treasurer subsequently issued a Ministerial Direction for the network utility to apply an alternative revenue path of 7.7 per cent plus inflation in 2014/15, 8 per cent plus inflation in 2015/16 and 0 per cent plus inflation from 2016/17 and 2018/19.[237] The revision includes a downwards adjustment of the regulated rate of return from 7.86 per cent used by the Utilities Commission to the cost of borrowing of the government, which is 4.61 per cent. This revenue path is used to escalate network costs during the reporting period, however, the explanation of the trend provided in this report is based on the Utilities Commission final determination.

The increases in regulated network costs are due to higher operational expenditure and regulatory depreciation allowance. Operational expenditure for the 2014-19 regulatory period is 45 per cent higher than in the previous five year period. This is due to a new asset management regime that has an increased focus on condition monitoring and preventative maintenance. In recent years, there have been several instances of wide-spread power outages in the Darwin-Katherine system, including the System Black events on 12 March 2014 and 30 January 2010. The new asset management regime will address these types of events.

The higher regulatory depreciation allowance is a result of a re-evaluation of the asset life of the network infrastructure.[238]

In 2014/15, regulated network costs comprised 41 per cent of the residential tariff.

H.2.3 Environmental policies

In this report, environmental policies are the schemes introduced by the Commonwealth and jurisdictional governments that impact residential electricity prices. These policies aim to reduce greenhouse gas emissions among other objectives.[239] The environmental policies that apply in Northern Territory during the reporting period are the Commonwealth Government's Renewable Energy Target and a feed-in tariff scheme.

Renewable Energy Target costs for 2014/15 were provided to the AEMC by the Northern Territory Government. For the remaining years of the reporting period this cost has been escalated by a national trend developed by Frontier Economics.

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236 Utilities Commission, Network Price Determination, *final determination, Part A - Statement of Reasons,* 24 April 2014, Darwin.

237 The alternative revenue path was provided by the Northern Territory Government.

238 The depreciation methodology was revised to align it with the approach of the Australian Energy Regulator. Under the new methodology, the network asset base was considered as having 48 per cent of its life remaining. If the values from the previous regulatory period had been rolled forward then this figure would have been 59 per cent.

239 Other objectives include encouraging investment, supporting employment and making energy efficiency measures more accessible and affordable.

Renewable Energy Target

The Renewable Energy Target has two components: the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). Under both these components, eligible renewable energy generators are able to create certificates based on the amount of electricity they produce. In most circumstances, electricity retailers are then required to purchase these certificates and surrender them to the Clean Energy Regulator. Costs incurred by electricity retailers in purchasing certificates are passed on to consumers.

For this report, analysis of the costs associated with the Renewable Energy Target was undertaken by Frontier Economics assuming an annual target of 33,000GWh by 2020.

In 2014/15, LRET comprised 2.1 per cent of the representative *government set price*. LRET scheme costs are expected to increase on average by 23 per cent per year over the reporting period.

In 2014/15, SRES comprised 1.8 per cent of the representative *government set price*. SRES scheme costs are expected to decrease on average by 4.3 per cent per year over the reporting period.

The trends in the LRET are based on assumptions about the percentage of renewable energy that will be required to meet the target and resource costs of obtaining large-scale generation certificates. Similarly, SRES costs are also based on a renewable energy percentage and expectations about future certificate prices. The Clean Energy Regulator sets the renewable energy percentages for both the LRET and the SRES schemes.[240]

Feed -in tariff

Jacana Energy offers a voluntary feed-in tariff for residential customers with an eligible solar photovoltaic system. As of January 2015, an energy buy-back rate of 26.88 c/kWh is payable to domestic consumers.[241] As this scheme is not legislated by the Northern Territory Government, the scheme has not been included in the reporting on environmental policy costs.

H.3 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.

As discussed above, the Northern Territory is going through a process of electricity industry reform that covers all parts of the electricity supply chain.

240 See Clean Energy Regulator "The certificate market"' *cleanenergyregulator.gov.au,* accessed 21 August 2015. *http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/The-certificate-market*

241 Jacana Energy, 'Photovoltaic (PV) solar systems", *Jacana Energy*, viewed 28 August 2015 at *http://jacanaenergy.com.au/sustainability_and_environment/photovoltaic_pv_solar_systems*

Interim Northern Territory Electricity Market

The Northern Territory Government has endorsed the adoption of an interim wholesale electricity market, which would be implemented through amendments to the System Control Technical Code.[242]

The Northern Territory's Utilities Commission approved amendments to the system control technical standards which introduces the Interim Northern Territory Electricity Market (I-NTEM). The Code sets out operating protocols, arrangements for security dispatch, arrangements for disconnection, and other matters relating to monitoring operation and control of regulated power systems.[243] The I-NTEM commenced on 28 May 2015.

The I-NETM provides a framework to facilitate the wholesale arrangements of electricity between generators and retailers in the electricity market. This will facilitate competition in the retail market as consumers can buy electricity from any retailer approved by the Utilities Commission. The I-NTEM will align the Northern Territory market with other modernised Australian electricity Markets. Initially, I-NTEM will only operate in the Darwin-Katherine region. The initiative is supported by the creation of a Market Operator in addition to the existing System Controller.[244]

Network Regulation

On 1 July 2015, the Northern Territory Government transferred network access and price regulation from the Northern Territory Utilities Commission to the Australian Energy Regulator (AER).[245] The AER will initially 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 will be adopted and then apply for the subsequent regulatory period commencing 1 July 2019.

The transfer of network access and price regulation to the AER will mean that decisions with regard to revenue determinations, which affect distribution and transmission network costs will be made under a new regulatory framework, The extent to which this change will affect electricity prices will depend on the specific decisions made by the AER in these determinations.

Retail competition

The Northern Territory Government has proposed or implemented the following measures to support retail competition for residential consumers:[246]

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242 Utilities Commission, *Power System Review 2013-14,* May 2015, p11.

243 Power Water Corporation, *System Control Technical Code Review*, accessed 2 September 2015, *http://www.powerwater.com.au/networks_and_infrastructure/system_control/system_control_technical_code_review*

244 Power Water Corporation, *What is the I-NETM?*, accessed 2 September 2015, *http://www.powerwater.com.au/networks_and_infrastructure/market_operator*

245 Utilities Commission, Transfer of network price regulation to the AER, media release, 1 July 2015, *http://www.utilicom.nt.gov.au/Newsroom/Lists/Posts/Post.aspx?ID=200*

246 Northern Territory Department of Treasury and Finance, Northern Territory Electricity Market Reform, information paper, February 2014, pp3-4.

- The subsidy for households and small customers being made available to all consumers regardless of the electricity retailer they are served by.
- For consumers up to 750 MWh per year, standard contracts have been be introduced and consumers are able to negotiate an alternative market contract with an electricity retailer.
- The introduction of the National Energy Retail Law, including the National Consumer Framework.

The introduction of competition among electricity retailers will provide consumers with more choice of offers to best suits their needs, although the extent to which this development will affect prices is not known at this stage.

H.4 Northern Territory consumer profiles

The analysis in this report is focussed on the "representative" or most typical consumer for each jurisdiction. The consumer profiles below give examples of different consumer types where factors such as household size, off-peak hot water use and the presence of a pool or solar panels contribute to different consumption levels, and therefore annual bills.

Box H.2 Electricity consumption in an urban Northern Territory four-person household

Richard and Rebecca and their two young daughters Kimberly and Kayla live in the suburb of Johnston, near Darwin. The main features of their energy consumption are that they have a swimming pool and use air conditioning in the four bedrooms and living area of their house. Currently, Richard and Rebecca both work part-time so they can share parenting responsibilities. Therefore one of them is always home with the children and electricity is consumed throughout the day.

Richard and Rebecca pay for electricity at the price set by the Northern Territory government. They use 7,372 kWh of electricity each year. The couple pay 29.50 c/kWh in total for their power. This includes a daily charge of 53 c/day regardless of how much they use, and a variable tariff component of 26.88 c/kWh. Overall, Richard and Rebecca have a GST-exclusive annual household electricity bill of $2,175.

For the purposes of this report, the representative consumer in the Northern Territory uses an average of 6,790 kWh per year. This consumer pays 30.10 c/kWh in total for power and has an annual bill of $2,044.

Comparison with representative consumer (all figures exclusive of GST)

	Representative consumer*	Richard and Rebecca*
	2 people, no gas, no pool	4 people, no gas, pool
Consumption (kWh/yr)	6,790	7,372
Wholesale charges	$997	$1,083
Network charges	$914	$982
Environmental policy charges	$84	$92
Residual**	$48	$19
Annual bill	**$2,044**	**$2,175**
Average price (c/kWh)	30.10	29.50

*Residential tariffs in the Northern Territory are set on a calendar year basis whereas wholesale charges, network charges and environmental policy charges are set or calculated on a financial year basis. The representative consumer profile reflects costs and prices for the financial year 2015/16, as discussed and reported in the Northern Territory section of this report. The consumer profile has been developed to reflect costs and actual prices as at November 2015 i.e. the 2015 residential price and wholesale, network and environmental policy charges for the 2015/16 financial year.

**The "residual" is the difference between the residential price and the aggregate of the supply chain costs, excluding the retail component. It is a contribution to the retail component. As a result, the cost stack shown in the table underestimates total costs. The retail component includes a range of different costs, including the retailer operating costs, customer acquisition and retention, and return on investment for investing capital in the business. The quantum of the retail component is unknown.

From July 2014 to June 2018, Richard and Rebecca can expect their electricity bills to increase at an annual average rate of 2.5 per cent, based on an assumed rate of inflation. As prices are set by the Northern Territory Government, the retail prices paid by consumers do not necessarily reflect underlying costs, nor follow cost trends. Further information and analysis of the drivers of electricity price trends can be found in the Northern Territory section of this report.

Box H.3 Electricity consumption in a semi-rural Northern Territory four-person household

Brian and Maree and their two sons Mitchell and Kyle live in rural Humpty Doo, Northern Territory. The main features of their energy consumption are that they have a swimming pool, use air conditioning, have two fridges and a bore water pump. The family also has a large solar panel system installed to offset some of their grid electricity consumption.

Residential electricity prices are currently subsidised by the Northern Territory Government, meaning that the price paid by residential consumers is lower than

the cost of supplying them. Brian and Maree pay for electricity at a price set by the Northern Territory government and they are currently on a flat rate tariff.

The family uses 3,916kWh of electricity each year from the grid. Overall, the couple pay 31.82 c/kWh for their grid power. This includes a daily charge of 53 c/day regardless of how much they use, and a variable component of 26.88 c/kWh. Brian and Maree use half of the electricity generated by their solar panels each year (3,456kWh) . They export the other half (3,456kWh) to the grid and receive the Northern Territory gross feed-in tariff of 26.88 c/kWh for this electricity. Overall, Brian and Maree have a net annual household electricity bill of $317, excluding GST.

The most common consumer type in the Northern Territory uses an average of 6,790 kWh per year. This consumer pays 30.10 c/kWh in total for power and has an annual bill of $2,044. Brian and Maree's total bill is lower because they use less electricity from the grid, and because their feed-in tariff is significant.

Comparison with representative consumer (all figures exclusive of GST)

	Representative consumer*	**Brian and Maree***
	2 people, no gas, no pool, no solar panels	4 people, no gas, pool, solar panels
Consumption from the grid (kWh/yr)	6,790	3,916
Wholesale charges	$997	$575
Network charges	$914	$579
Environmental policy charges	$84	$49
Residual**	$48	$43
Gross annual bill	**$2,044**	**$1,246**
Average price (c/kWh)	30.10	31.82
Solar feed-in tariff for electricity exported to the grid	n/a	($929)
Net annual bill	**$2,044**	**$317**

*Residential tariffs in the Northern Territory are set on a calendar year basis whereas wholesale charges, network charges and environmental policy charges are set or calculated on a financial year basis. The representative consumer profile reflects costs and prices for the financial year 2015/16, as discussed and reported in the Northern Territory section of this report. The consumer profile has been developed to reflect costs and actual tariffs as at November 2015 i.e. the 2015 residential price and wholesale, network and environmental policy charges for the 2015/16 financial year.

**The "residual" is the difference between the residential price and the aggregate of the supply chain costs, excluding the retail component. It is a contribution to the retail component. As a result, the cost stack shown in the table underestimates total costs. The retail component includes a range

of different costs, including the retailer operating costs, customer acquisition and retention, and return on investment for investing capital in the business. The quantum of the retail component is unknown.

From July 2014 to June 2018, Brian and Maree can expect their electricity bills to increase at an annual average rate of 2.5 per cent, based on an assumed rate of inflation. As prices are set by the Northern Territory Government, the retail prices paid by consumers do not necessarily reflect underlying costs, nor follow cost trends. Further information and analysis of the drivers of electricity price trends can be found in the Northern Territory section of this report.

I National Summary

Under the terms of reference provided to the Australian Energy Market Commission by the Council of Australian Government's Energy Council, a national level summary where the jurisdictional estimates are weighted to determine nationally indicative prices and cost components must be included in this report.

As the national numbers are an average of jurisdictional results that are, in some cases, already averages of several different network regions, they do not reflect the actual costs faced by consumers in Australia. Due to this averaging process, the trends are only indicative.

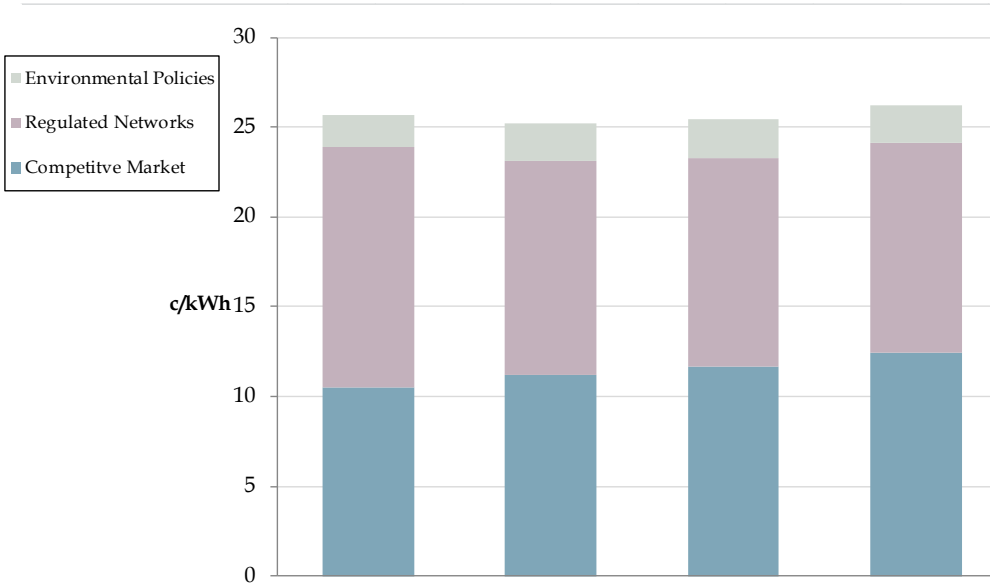
In order to calculate the national weighted average consumption level and national weighted average prices, the representative consumption level and the estimate of price used for each jurisdiction has been weighted by the number of residential connections in each jurisdiction. As such, the trends in 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 that covers the eastern states. This methodology is described further in section I.1 below.

Since the 2014 report, the AEMC has made changes to its methodology for calculating the electricity consumption of the representative set of residential consumers. These changes are intended to make the consumers more representative of actual households in each jurisdiction and are discussed in further detail in section I.1 and Appendix J.

The national weighted average consumption level is 5,248 kWh per year. At this consumption level, the national average total annual bill in 2014/15 is $1,348, exclusive of GST.

As observed in Figure I.1, national residential electricity prices are expected to be slightly increasing over the reporting period.

Figure I.1 National summary of supply chain cost components



	2014/15 Base year		2015/16 Current year		2016/17		2017/18	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**1.79**	**$94**	**2.10**	**$110**	**2.16**	**$113**	**2.09**	**$110**
LRET	0.49	$26	0.59	$31	0.74	$39	0.91	$48
SRES	0.47	$25	0.46	$24	0.42	$22	0.42	$22
FIT Schemes	0.73	$38	0.91	$48	0.84	$44	0.61	$32
Other state schemes	0.10	$5	0.13	$7	0.15	$8	0.15	$8
Regulated networks	**13.37**	**$702**	**11.93**	**$626**	**11.63**	**$611**	**11.67**	**$613**
Transmission	1.80	$95	2.14	$113	2.13	$112	2.13	$112
Distribution	11.57	$607	9.79	$514	9.51	$499	9.54	$501
Competitive market	**10.52**	**$552**	**11.18**	**$587**	**11.64**	**$611**	**12.43**	**$652**
Wholesale and retail								
Total	**25.68**	**$1,348**	**25.21**	**$1,323**	**25.43**	**$1,335**	**26.20**	**$1,375**

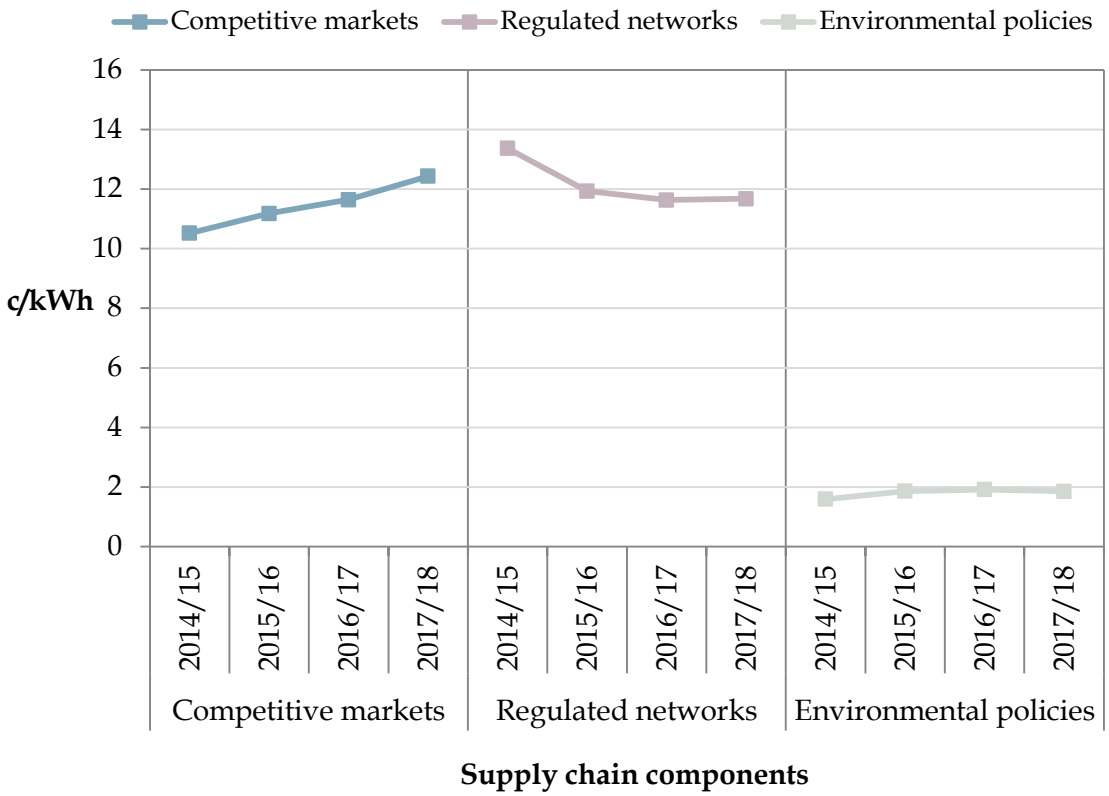
Nationally, residential electricity prices are expected to decrease by 1.8 per cent in 2015/16 and then increase by 0.9 per cent in 2016/17 and 3.0 per cent in 2017/ 18. This is equivalent to an average annual increase of 0.7 per cent for the average national consumer over the reporting period.

The decrease in 2015/16 is due to decreasing network costs outweighing rises in competitive market and environmental policy costs. The increase in 2016/17 is due to increases in competitive market and environmental costs, partially offset by lower regulated network costs. The larger increase in 2017/18, primarily reflects increases in competitive market costs.

Figure I.2 shows the expected national trends in the supply chain cost components over the reporting period. In summary, the trends are:

- an average annual increase of 5.7 per cent per year in the competitive market component;
- an average annual decrease of 4.4 per cent per year in the regulated market component; and
- an average annual increase of 5.2 per cent per year in the environmental policies component.

Figure I.2 National trends in supply chain cost components



In 2012, changes were made to the National Electricity Rules for the regulation of network businesses, and in particular for how network revenues and prices are determined. The trend in regulated network costs reflects the ongoing program of the AER's final and draft decisions on the regulated revenue for the transmission and distribution network businesses. To date, the AER's decisions have specified a lower maximum allowed revenue compared with the previous regulatory period. The actual trend in regulated network costs over the reporting period will depend on:

- When the new rules start to apply for specific network businesses. Network costs based on the new rules will take effect no later than 2017.
- The results of merit reviews underway for some distribution businesses.

Wholesale electricity costs are expected to rise across the reporting period. This is partly in response to expected increases in electricity consumption to 2017/18 as forecast by AEMO. Some of the upward pressure caused by increasing consumption is offset by the impacts of the LRET. However, the LRET may also contribute to retirement of generators, which would in turn lead to upward pressure on wholesale electricity costs.

During the reporting period, there will also be upward pressure on wholesale electricity costs from expected higher gas prices across all jurisdictions. This is mainly due to the ramp-up of the liquefied natural gas (LNG) facilities in Queensland tightening the gas supply-demand balance and exposing the domestic gas market to higher international LNG prices. This creates rising costs for gas-fired generators and therefore contributes to rising wholesale electricity costs.

Changes in the cost components differ by jurisdiction as outlined and discussed in Chapter 3 and in the jurisdictional appendices.

I.1 Note on the methodology used

The national summary is an average of the jurisdictional estimates, where these estimates have been weighted by the number of residential connections in each jurisdiction. The national weighted average consumption level and national weighted average prices have been 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 Appendix A through Appendix H; and
- weighting by the number of residential connections in each jurisdiction.

The national average total annual bill is the product of the weighted average consumption level and the weighted average price.

Since the 2014 report, the AEMC has made changes to its methodology for calculating the electricity consumption of the representative set of residential consumers. These changes are intended to make the consumers more representative of actual households in each jurisdiction.

In summary, the changes are:

- The data source used to calculate consumption levels. Previously the annual consumption values were provided by jurisdictional governments. In 2015, annual consumption values have been calculated for most jurisdictions using benchmark values published by the AER based on a survey. The consumption value is the average consumption of consumers in the AER survey who fit the most commonly occurring profile in each jurisdiction.
- Accounting for "off-peak" 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 New South Wales and Queensland only, the majority of residential consumers have part of their consumption on an off-peak tariff.

Different methodologies have been used to estimate jurisdictional costs and prices. Where there are *market offers* available in a jurisdiction, representative *market offers* were used. In other jurisdictions, the regulated *standing offer* or government set tariffs were used.[247]

The methodology used for estimating *market offers* and *standing offers* for each jurisdiction is described in Appendix J.

247 The national representative price consists of *market offer* prices in New South Wales, Victoria, South Australia and Queensland; representative *standing offer* prices in the ACT and Tasmania; and the government determined tariffs in Western Australia and the Northern Territory.

J Methodology

This appendix outlines the Commission's approach to estimating trends in residential electricity prices over the period of 2014/15 to 2017/18 (the reporting period). It covers the types of data collected, and how they have been used in this analysis. This appendix is structured as follows:

- Household electricity consumption.
- Representative retail prices.
- Electricity supply chain costs components.

The AEMC collected retail electricity offers and calculated the price that would be paid by representative consumers if they were to be on these offers. These prices mostly refer to the base year of the reporting period. The AEMC then developed trends in supply chain cost components, which are used to inform the price and annual bills that would be paid by the representative consumers in future years.

J.1 Household electricity consumption

In accordance with the COAG Energy Council's terms of reference, the AEMC has estimated the electricity prices that would be paid by a representative set of residential consumers. These representative consumers are defined by their electricity consumption characteristics.

Since the 2014 report, the AEMC has made changes to its methodology for calculating the electricity consumption of the representative set of residential consumers. These changes are intended to make the consumers more representative of actual households in each jurisdiction.

In summary, the changes are:

- The data source used to calculate consumption levels. Previously the annual consumption values were provided by jurisdictional governments. In 2015, annual consumption values have been calculated for most jurisdictions using benchmark values published by the Australian Energy Regulator (AER).
- Accounting for "off-peak" 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 New South Wales and Queensland only, the majority of residential consumers have part of their consumption on an off-peak tariff.

The two key characteristics of the representative consumers are their total annual electricity consumption (measured in kWh) and how this consumption is split across the quarters of the year.

For all jurisdictions aside from South Australian and Western Australia, both the annual consumption value and quarterly profile are benchmark values published by

the AER.[248] They are based on a survey of 4,000 households where participants were asked about their homes and the way in which they use electricity. The survey produced consumption values for different types of households. The households are defined by the presence of a pool, the presence of a mains gas connection and the number of occupants.

By analysing the survey results, the most common type of household in each jurisdiction was determined. The consumption value and quarterly profile associated with these household types have been used as the representative consumer in each jurisdiction.

In the case of New South Wales and Queensland, the most common household types do not have a mains gas connection. In the absence of a mains gas connection, it is assumed that the representative consumers in these jurisdictions have off-peak hot water systems. As a result, part of their consumption has been allocated to an off-peak tariff, which is also referred to as a controlled load tariff. In New South Wales this allocation is estimated to be 32 per cent of the total annual consumption, whereas in Queensland it is 30 per cent.[249]

There are no benchmark values for Western Australia as it was not included in the household survey commissioned by the AER. A consumption value provided by the Western Australian Government has been used. The South Australian Government requested that the AEMC use a consumption level which is consistent with several South Australian organisations that report on electricity prices.

The annual consumption of the representative consumers are set out in Table J.1 below. The same consumption levels have been used for the whole reporting period.

248 ACIL Allen Consulting, *Electricity Bill Benchmarks for Residential Customers*, a report to the Australian Energy Regulator, October 2014.

249 These percentage allocations were calculated using network businesses' Regulatory Information Notice responses which are published by the AER.

Table J.1 Most common household types and consumption levels

Jurisdiction	Most common household type	General consumption (kWh)	"Off-peak" consumption (kWh)	Total annual consumption (kWh)
Derived by the AEMC				
Queensland	2 person household; no pool; no mains gas; off-peak hot water.	3,621	1,552	5,173
New South Wales	2 person household; no pool; no mains gas; off-peak hot water.	4,036	1,900	5,936
Australian Capital Territory	2 person household; mains gas; no pool.	7,312	0	7,312
Victoria	2 person household; mains gas; no pool.	4,026	0	4,026
Tasmania	2 person household; mains gas; no pool.	8,550	0	8,550
Northern Territory	2 person household; no mains gas; no pool.	6,790	0	6,790
Provided by jurisdictional governments				
South Australia	N/A	5,000	0	5,000
Western Australia	4 person household (2 adults and 2 children).	5,229	0	5,229

A range of factors lead to differences in the representative consumption levels for each jurisdiction, such as variations in climate, population density, economic conditions and the availability of mains gas. The relative prevalence of residential solar PV systems may also impact on the results.

The other important consumption characteristic of the representative consumers are their quarterly consumption profiles, which allocate household electricity consumption depending on the quarter of the year in which the electricity is used. This is relevant

for retail offers where the first block of energy is charged at a different price to subsequent blocks. When this is the case, the way in which consumption is distributed throughout the year may impact on the overall c/kWh value that a household will pay.[250]

As noted above, the quarterly profiles are based on the benchmark values published by the AER. This data source has also been used for the South Australian quarterly profile, which is applied to the annual consumption level supplied by the South Australian Government. No quarterly profile is required for Tasmania, Western Australia or the Northern Territory since the most common regulated retail tariffs in these jurisdictions are structured such that all consumption is charged at the same rate.

For the jurisdiction in which they apply, the quarterly profiles are set out in Table J.2 below.

Table J.2 Quarterly profiles of the representative consumers

Jurisdiction	Summer	Autumn	Winter	Spring
Queensland	26%	24%	26%	24%
New South Wales	23%	25%	29%	23%
Australian Capital Territory	20%	26%	32%	22%
Victoria	25%	24%	29%	22%
South Australia	28%	24%	27%	21%

Data source: ACIL Allen Consulting, *Electricity Bill Benchmarks for Residential Customers*, a report to the Australian Energy Regulator, October 2014.

J.2 Representative retail prices

This report contains representative retail prices for each jurisdiction for each year of the reporting period. The AEMC's methodology involves:

- collecting both *standing offers* and *market offers* that were available in February 2015;[251]
- expressing the collected offers in terms of a single c/kWh value; and
- calculating prices for the base year using currently available retail offers, then estimating prices for future years.

These processes are explained below.

250 For example, an offer could feature different c/kWh values for the first 1,000 kWh per quarter, the next 1,000 kWh per quarter, and any consumption in excess of 2,000 kWh per quarter.

251 In the case of Victoria, offers available in September 2014 were also collected.

Market offers and *standing offers*

Broadly, retail offers are classified as being either *market offers* or *standing offers*. The difference between these two categories of offers is the contractual terms and conditions:

- *Standing offer* contracts are basic electricity contracts with terms and conditions that are regulated by law; retailers cannot change them.[252] In some, but not all, jurisdictions the *standing offer* price is also regulated.
- *Market offers* are electricity contracts determined by retailers in the competitive market. They must contain a regulated set of minimum terms and conditions, such as consumer protection obligations.

Outside of the minimum requirements, retailers have greater flexibility in how they design their *market offers* in response to consumer preferences and retail market conditions. The terms and conditions of *market offer* contracts generally vary from *standing offer* contracts, and could include incentives, different billing periods, and additional fees and charges.

In jurisdictions where residential electricity prices are regulated, *standing offer* prices are set by either jurisdictional regulators or governments.[253] In the other jurisdictions, retail prices have been deregulated and *standing offer* prices are set by electricity retailers.

The AEMC collected generally-available *market* and *standing offers* from each electricity retailer in each distribution network region of each jurisdiction. The offers used to calculate 2014/15 prices were collected in February 2015. For Victoria, offers were also collected in September 2014 and the 2014/15 prices are an average of these two points in time.[254]

To be included in the analysis, offers needed to be a single energy price, inclining block or seasonal block structure. The representative prices calculated by the AEMC do not include time-varying offers, such as time-of-use or variable pricing.

The AEMC collected:

- Regulated *standing offers* for 2014/15 and 2015/16;
- Non-regulated *standing offer* for 2014/15 only; and
- *Market offers* for 2014/15 only.

Regulated *standing offers* can be used for 2015/16 since the same price applies to the whole financial year. In contrast, non-regulated *standing offers* and *market offers* may change throughout the year. For this reason, non-regulated *standing offers* and *market offers* were only collected for the previous financial year (2014/15).

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252 In jurisdictions that have adopted the National Energy Customer Framework, the applicable terms and conditions are set out in the National Energy Retail Rules. This currently applies to the ACT, Tasmania, South Australia, New South Wales and Queensland.

253 This is currently the case in Queensland, Western Australia, Tasmania, the Northern Territory and the ACT

254 This was because network prices in Victoria are set on a calendar year basis, whereas in most other cases they are set on a financial year basis.

The AEMC sourced offers from price comparator websites, governments, independent regulators and retailers' websites.[255]

In the case of New South Wales and Queensland, where the representative consumers have some consumption on an off-peak tariff, the AEMC focussed on retail offers that are applicable to this type of consumer.

Single c/kWh value

The terms of reference specifies that the AEMC must report retail prices in terms of a single c/kWh value. In contrast, actual retail offers typically feature a fixed daily charge and variable energy charge. Further, retail offers typically feature discounts tied to timely payments or the use specific payment options (such as direct debit and online payment).

The first step is to convert each retail offer into a single c/kWh value. This process is described in Box J.1 below.

Box J.1 Process of calculating a single c/kWh value

Residential electricity prices are generally made up of the following structure:

- a fixed charge that applies on a daily basis and is independent of the amount of electricity consumed; and
- a variable charge (also referred to a "usage" or "energy" charge) for each unit of electricity consumed. It is variable in the sense that the contribution of this component to a consumer's annual bill will vary depending on how much electricity they consume.

  Some retail offers have only one price for all electricity consumed whereas others are structured such that the first block of energy is charged at a different price to subsequent blocks.

The AEMC reports on prices in terms of a single c/kWh value that includes both the fixed and variable charges. For each individual offer, the steps involved in calculating the c/kWh value are as follows:

- multiply the variable charge by the amount of electricity (in kWh) that is consumed in each block of the tariff in each quarter of the year;
- multiply the fixed daily charge by the number of days in the quarter;
- sum the fixed and variable results from each quarter to obtain an annual total cost; and
- divide the annual total cost by the average annual consumption to obtain a single c/kWh value.

For a retail offer with a non-zero fixed charge, the single c/kWh value will be lower for high electricity consumption households than low consumption households as the fixed daily charge is spread across a larger volume of

255 The price comparator websites used were the AER's Energy Made Easy website, Victorian Government's My Power Planner and Queensland Competition Authority's price comparator (which has been replaced by Energy Made Easy from 1 July 2015).

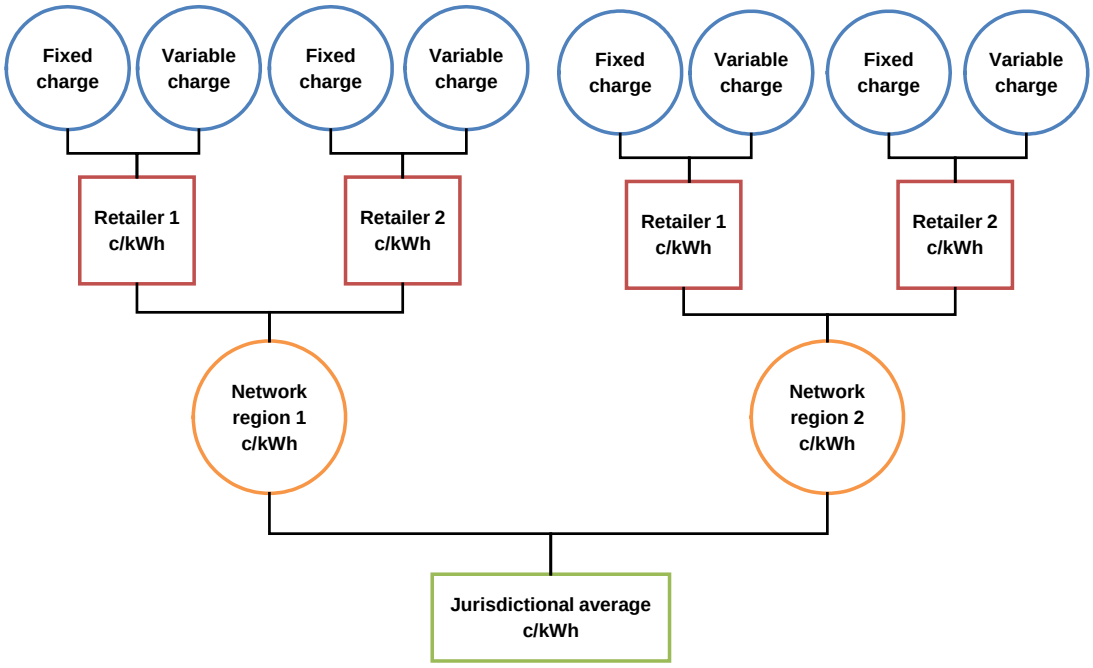
consumption.

A single c/kWh value was calculated for all of the retailer's offers collected. In doing this it has been assumed that all discounts are awarded and that no penalties are incurred. The AEMC has not attempted to assign a monetary value to non-monetary incentives (such as gift vouchers).

Where there was only one relevant offer in a jurisdiction (e.g the government-regulated price), the corresponding c/kWh value is used for that jurisdiction. Where there are multiple retailers it is necessary to calculate a jurisdictional average, as follows.

For each network region, the AEMC took the cheapest offer from each retailer and weighted the corresponding c/kWh value by the market share of the respective retailers to calculate an average rate for each network region. For New South Wales and Victoria, where there are multiple network regions, the network region rates were averaged, weighting by the proportion of consumers in each network region, to obtain a jurisdictional average.[256] This process is illustrated in Figure J.1 below

Figure J.1 Process of calculating jurisdictional average



Base, current and future years

The retail price in the base year (2014/15) is calculated using actual offers available to residential consumers. Where there is a regulated *standing offer* for the current year (2015/16), this is the reported *standing offer* price for this year. In all other instances, retail prices are projections based on expected trends in underlying costs or other assumptions.

Market offer prices in the period from 2015/16 to 2017/18 are based on movements in the underlying cost stack components. Future prices are calculated as the aggregate, for a specific year, of the estimated wholesale electricity cost, regulated network costs,

256 For Queensland, all reporting refers to the Energex network region covering South East Queensland.

environmental policy costs, plus the inflation-adjusted residual from the base year (2014/15). The residual is the amount that is left over when the estimated costs (wholesale electricity, networks and environmental policies) for 2014/15 are subtracted from the 2014/15 representative *market offer* price.

The same methodology applies for future *standing offer* prices when there is no retail price determination or *standing offer* prices are set by retailers.

A different approach applies to Western Australia and the Northern Territory. In these jurisdictions residential prices are set by the respective governments and do not necessarily reflect costs, nor follow expected cost trends. In Western Australia, future prices reflect a trend set out in the Western Australian Government's 2015/16 Budget Paper. Northern Territory prices are assumed to increase in line with inflation during the modelling period.

Importantly, the future prices in this report do not seek to pre-empt the decisions of governments or jurisdictional regulators.

J.3 Electricity supply chain costs components

Electricity supply chain cost components are reported separately in the jurisdictional sections and also inform the analysis of future trends in the representative *market* and *standing offers*. All costs are reported in c/kWh terms, in accordance with the terms of reference from the COAG Energy Council.

The Commission has grouped the supply chain cost components into the following segments:

- The *competitive market* sector for the purchase of wholesale electricity and the retail sale of electricity. Wholesale electricity costs include purchases from the spot market and financial hedging contracts, ancillary services, market fees and energy losses from transmission and distribution networks. The retail component captures all of the costs that arise from retailing electricity and marketing to customers, as well as any return to the owners of the retailer for investing in the business. For most jurisdictions the AEMC does not report separately on the wholesale energy and retail components.

  This terminology is most appropriate to the mainland states of the National Electricity Market (NEM) where there is competition between firms in the generation and retail sectors.

- The *regulated network* sector transports electricity between the location where it is generated and where it is consumed. Regulated network costs refer to the costs associated with building and operating transmission and distribution networks, including a return on capital and metering costs. These costs are regulated by the

AER in the NEM and Northern Territory[257] and the Economic Regulation Authority in Western Australia.[258]

- *Environmental policies*, introduced by Commonwealth and/or state and territory governments. There are a number of environmental policies or programs that directly impact or integrate with the electricity market. These include the Renewable Energy Target and the various state and territory feed-in tariff and energy efficiency schemes.[259]

The following sections cover the AEMC's approach to estimating the supply chain costs for the mainland NEM jurisdictions. The NEM is the interconnected power system that services the eastern states and territories of Queensland, New South Wales, ACT, Victoria, Tasmania and South Australia. A brief overview of the NEM is provided in Box J.2. A similar methodology has been used to estimate the supply chain costs in these jurisdictions (with the exception of Tasmania).

The methodologies used for the other jurisdictions - Tasmania, Western Australia and the Northern Territory - are covered in Chapter 3 and the jurisdictional appendices.

Box J.2 National Electricity Market

The NEM is the interconnected power system that covers New South Wales, Victoria, Queensland, South Australia, Tasmania and the ACT.

The NEM is an energy-only market where all electricity is traded through a central clearing mechanism. There are five market regions, corresponding to one region for each of the jurisdictions listed above (with the exception of the ACT, which is included in the New South Wales region). For each region, a price is calculated for each five minute interval, based on generator bidding and electricity demand.

In 2013/14, there was 48,997 MW of total installed generation capacity and 195 terrawatt-hours (TWh) of electricity was supplied to around 9.5 million consumers (of which 8.4 million were residential consumers). Around 71 per cent of the energy generated in the NEM was produced by coal-fired generation, 16 per cent by gas-fired generation and 8 per cent by hydroelectricity. Wind generation is the primary non-hydro renewable and currently provides around 5 per cent of total energy generated.[260]

In 2014/15, the average regional prices ranged from $32 per MWh in Victoria to $61 per MWh in Queensland.[261] In any five minute interval, prices can be set

257 From 1 July 2015, responsibility for network price regulation and oversight of network access in accordance with the Northern Territory's Electricity Networks (Third Party Access) Act and Code has been transferred to the AER.

258 The Western Australian Government intends to transfer regulation of the Western Power electricity network to the AER. M Nahan (Western Australian Treasurer), *Government energised for electricity reform*, media statement, 24 March 2015.

259 The Renewable Energy Target comprises the Large-scale Renewable Energy Target and the Small-scale Renewable Energy Scheme.

260 ESAA, *Electricity Gas Australia 2015*.

261 AER industry statistics, available at: http://www.aer.gov.au/node/9756

between the market price cap ($13,800 per MWh in 2015/16) and the market price floor (negative $1,000 per MWh). To manage potential price volatility, market participants hedge risk via secondary contract markets and/or vertically integrate retail and generation activities.

The main governance institutions in the NEM are:

- The Australian Energy Market Commission (AEMC) is the institution responsible for making changes to the National Electricity Rules and providing market development advice to the COAG Energy Council.
- The Australian Energy Regulator (AER) is responsible for the economic regulation of electricity distribution and transmission networks. The AER also has compliance responsibilities under the National Electricity Rules and National Energy Retail Rules.
- The Australian Energy Market Operator (AEMO) operates the power system and is responsible for long term planning, including forecasting demand and supply scenarios and network development.

All of the governance institutions are guided by the National Electricity Objective, as stated in the National Electricity Law, which is:

> "to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to – price, quality, safety, reliability, and security of supply of electricity; and the reliability, safety and security of the national electricity system."

J.3.1 Competitive market

As noted above, the competitive market costs consist of the wholesale purchase cost of electricity and the costs associated with retailing electricity to residential consumers.

Wholesale electricity costs

The AEMC's wholesale electricity cost estimates are based on modelling that was undertaken by Frontier Economics.[262] These costs have been used in calculating *market offer* prices and non-regulated *standing offer* prices. In jurisdictions that have a regulated *standing offer* price, the AEMC has used the wholesale energy costs from published price determinations and then escalated the prices in future years by the trend in Frontier's modelled wholesale energy costs.

The wholesale energy costs include modelled spot prices, hedging costs, market fees and ancillary service costs.

Modelling of the **wholesale spot prices** involves forecasting supply and demand conditions in the market and the strategic bidding behaviour of market participants. Importantly, the prices are correlated to assumed residential load shapes to properly

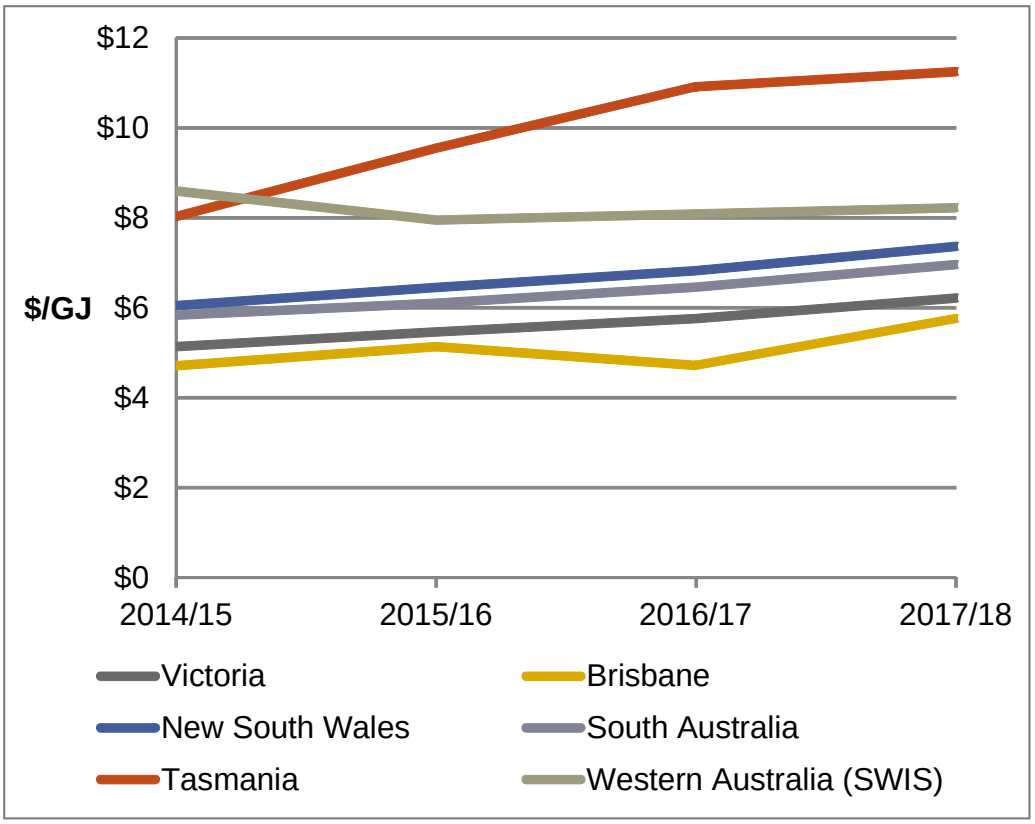
262 Frontier's approach is explained in their wholesale modelling report which is available from the Price Trends project page on the AEMC website.

capture the risks faced by retailers. In the base case of the modelling, the key assumptions are:

- Electricity demand consistent with the medium scenario from the Australian Energy Market Operator's 2015 National Electricity Forecasting Report and the "expected" scenario from the Western Australian Independent Market Operator's 2014 Electricity Statement of Opportunities.
- The current legislation of the Renewable Energy Target, which was amended by the Commonwealth Government in June 2015 to reduce the large-scale target to 33,000 GWh per year by 2020.
- Fuel prices based on Frontier's modelling and analysis of the Australian gas and coal markets. The forecasts are specific to each power station and thereby account for factors including coal mine ownership arrangements, exposure to international commodity prices and the operational regimes of gas-fired generators.

  An important variable for future gas prices is the scale of the liquefied natural gas (LNG) export facilities in Gladstone. In the base case Frontier assume that there will be six LNG export trains developed during the modelling period, with mainland gas prices on the east coast ranging between $4 and $6 per gigajoule (GJ) in 2014/15 and, in most cases, increasing over the reporting period (see Figure J.2).
- There are no generator retirements aside from those that have already been announced. The announced retirements during the modelling period are Northern Power Station and Torrens Island Power Station A, both in South Australia.

Figure J.2 Forecast gas prices used in base case of wholesale modelling



Source: Frontier Economics' report on wholesale energy cost modelling, accessible via the Price Trends project page on the AEMC website.

Retailers' **hedging costs** will depend on the specific hedging strategy adopted by a retailer, which in turn depends on its expectations of future price volatility and its appetite for risk. A single hedging strategy was assumed across all regions. This involved the purchase of peak and off-peak swap contracts to cover a fixed proportion of the assumed load on a quarterly basis and cap contracts to cover the remaining load. Frontier has assumed that contract prices represent a 5 per cent premium on spot prices for all retailers.

This contract premium value was established based on initial analysis of spot and contract price data over 2006/07 as part of Frontier Economics' advice to IPART's 2007 retail price determination. In practice, there is no single percentage or absolute contract premium value that applies exactly to all retailers in all markets at all times. Expectations around both the level and volatility of spot and contract prices evolve over time and differ by region.

Both the **market fees and the ancillary service costs** were estimated by Frontier Economics. Market fees are charged to market participants in order to recover the cost of operating the market. Ancillary services are those services used by the market operator to manage key technical characteristics of the power system. Frontier make note of the specific components on these costs in their wholesale modelling report.

For the NEM, Frontier used the Australian Energy Market Operator's estimated market fees for the years they were available and escalated the value in the final available year by inflation for the remaining years when necessary. Estimated future market fees for the SWIS were also escalated by inflation.

Ancillary services costs for the NEM jurisdictions were based on the average of historical costs for each NEM region. Costs for the SWIS are based on an inflation-adjusted estimate from the Independent Market Operator.

Retail component

The retail component is not directly observable and has been derived as the residual when all of the non-retail cost components are subtracted from the representative *market offer* price in 2014/15 (this is shown in Figure J.3). By using this residual method, the retail component also includes any errors, positive or negative, in the AEMC's estimates of the other supply chain cost components. For example, if the wholesale contracting premium is more than 5 per cent, then this method of calculation would overestimate the size of the retail component.

Figure J.3 Graphical representation of residual method

In aggregate, the retail component consists of the retailer operating costs (OPEX), customer acquisition and retention costs (CARC), return for investing in the business, and any errors in the other supply chain cost components, as shown in Figure J.4.

Figure J.4 Graphical representation of retail component

As the retail component is derived in aggregate, it is not possible to report on the individual sub-components shown in Figure J.4. Importantly, this means that the reported retail component is not equivalent to the profit earned by retailers. Further, the retail 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.

For all NEM jurisdictions, the AEMC derived a retail component for 2014/15 and escalated this retail component by an inflation rate of 2.5 per cent for the remaining years of the reporting period. For the jurisdictions that still have retail price regulation (in the NEM these are Queensland, Tasmania and ACT), the AEMC used the retail allowances that have been set by the jurisdictional regulators in their retail price determinations and then escalated these by 2.5 per cent.

J.3.2 Regulated networks

Transmission and distribution networks in the NEM are regulated by the AER. The AER makes determinations that set out the revenue that network business are allowed to recover during the regulatory period. There is then some flexibility in how network businesses structure their prices in any particular year to recover the allowed revenue. Currently, network businesses typically publish their prices shortly before they come

into effect. Published prices are used for the years in which they are available (2014/15 and 2015/16).

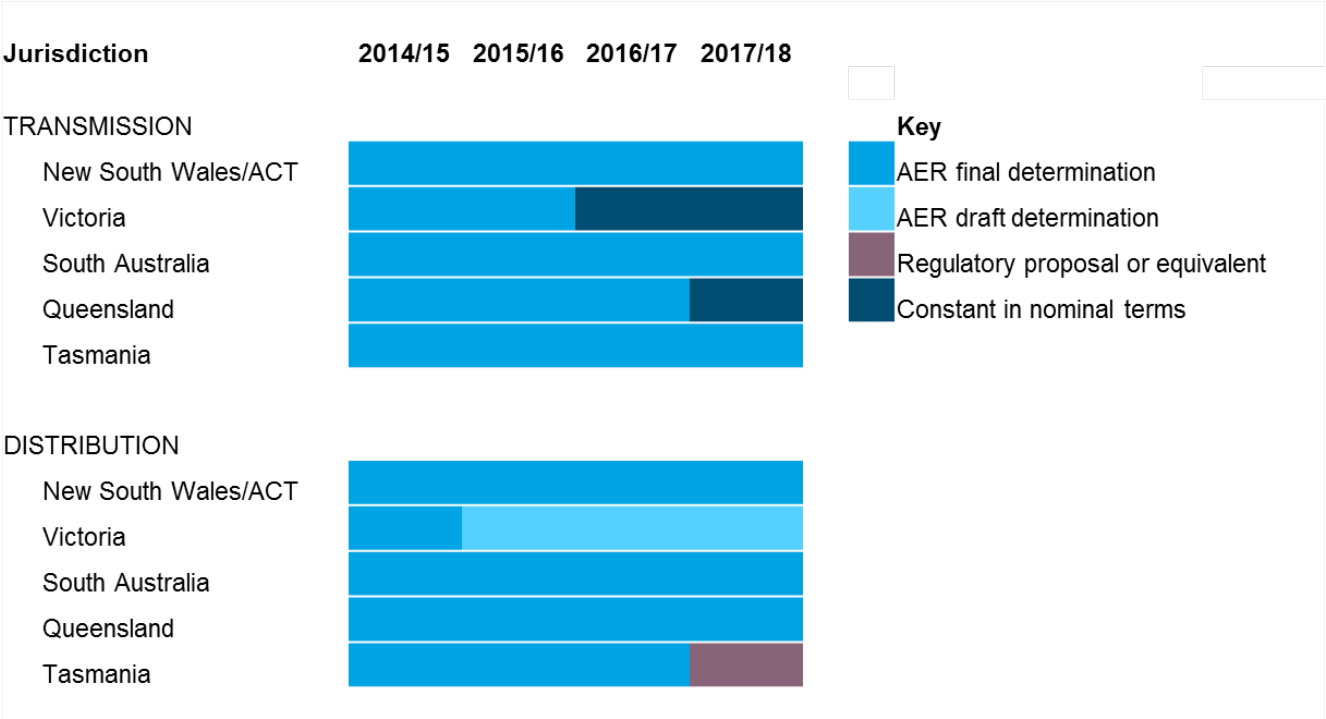
In future years, where a determination has been made by the AER, network costs are escalated by the trend indicated in this determination.[263] This trend may differ from actual cost outcomes depending on how network businesses structure their prices, and if there are any cost pass-through events for allowable costs that were unforeseen at the beginning of the regulatory period.

Where the current AER determination ends before for the final year of the reporting period, regulatory proposals or other published information from the network businesses are used where possible. The cost trend indicated by regulatory proposals (or equivalent) is the best available information in the absence of an AER determination. However, it is acknowledged that the AER's final determination, and thereby the actual prices outcomes for consumers, would differ.

For years where there was no AER determination or regulatory proposal, network costs have been kept constant in nominal terms.

The instances in which the AEMC's has used these approaches is indicated in Figure J.5.

Figure J.5 Summary of network approach to estimating network costs



The regulated network costs were separately determined for each distribution region. In jurisdictions with multiple distribution regions, these values were then weighted by the share of total residential consumers in each distribution region, to provide a state-wide, representative transmission and distribution cost estimates for each year in c/kWh terms.

263 Where possible, separate trends have been applied to Standard Control Services and Alternative Control Services (metering).

J.3.3 Environmental policies

A collection of schemes have been introduced by the Commonwealth and state governments to achieve greenhouse gas emission reductions and other objectives (such as to encourage investment, support employment and make energy efficiency measures more affordable). Throughout this report these schemes are grouped together as environmental policies. The Renewable Energy Target applies on a national basis and the costs of this scheme were estimated by Frontier Economics. Jurisdictional scheme costs were either sourced from distribution network businesses' annual pricing proposals or provided by jurisdictional governments.

The AEMC's approach is to include scheme costs for the duration that the schemes have been legislated. If schemes are legislated to end during the reporting period and it is unknown whether or not the schemes will continue, then the AEMC has not attempted to quantify the costs for the unknown years.

Renewable Energy Target

The Renewable Energy Target consists of two components: the Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES). The costs of both of these schemes have been estimated by Frontier Economics based on the current legislation of a 33,000 GWh LRET by 2020.

Scheme costs are assumed to be the same across all jurisdictions because both schemes involve certificates that can be traded on a national basis. Therefore, all liable entities, in theory, have access to the same certificate price.[264]

The trends in the LRET are based on assumptions about the percentage of renewable energy that will be required and the resource costs of obtaining certificates. Similarly, SRES costs are also based on a renewable energy percentage and estimates of the certificate prices. The Clean Energy Regulator sets the renewable energy percentages for both schemes.[265]

Jurisdictional schemes

Jurisdictional schemes mostly involve incentives for energy efficiency and feed-in tariffs for solar PV systems. Solar PV feed-in tariffs can be defined in terms of either net or gross electricity generation. A gross feed-in tariff means that the consumer receives a payment for all electricity generated by the solar PV system, whereas under a net feed-in tariff the consumer is only paid for the electricity generated that is in excess of the household's electricity needs and is exported to the grid.[266]

Originally all solar PV feed-in tariff schemes involved payments that were in excess of the value of the electricity to the retailer. Access to most of these schemes has now

264 In some cases certificate costs are determined through bilateral contracts. These costs are not publically available and are not considered in this analysis.

265 Clean Energy Regulator, *The 2015 small-scale technology percentage and renewable power percentage set*, Clean Energy Regulator, website update, 27 February 2014.

266 Details on the current and closed feed-in tariff schemes can be found on the websites of jurisdictional governments and electricity retailers. A summary of these schemes can be found in Appendix E of the AEMC's 2015 Retail Competition Review as well as in APVI, 2015, *PV in Australia 2014*, July 2014, pp11-13.

closed for new applicants, with existing participants receiving feed-in tariff payments until the schemes come to an end. Feed-in tariffs that are currently available are either set by retailers, or determined by governments or regulators with consideration to the value of the exported electricity. When the feed-in tariff payments are set at the value of the exported electricity then the payments should have a neutral impact on electricity prices. The solar PV feed-in tariff schemes that are reported on are those that involve a payment in excess of the electricity value as these can impact directly on electricity prices (depending on how the costs are recovered).

The costs associated with the energy efficiency schemes operating in New South Wales, the ACT, Victoria and South Australia were provided by the respective jurisdictional governments.

Solar scheme costs were calculated in slightly different ways for each jurisdiction:

- New South Wales scheme costs are based on the distribution network businesses approved annual pricing proposals for 2014/15 and 2015/16. In subsequent years it is assumed that the scheme costs will increase in line with inflation.
- Queensland scheme costs were provided by Energex, the distribution network business for South East Queensland. The 2014/15 and 2015/16 values are actual costs while the future year values are a projection based on expected total scheme costs and electricity consumption.
- ACT scheme costs for 2014/15 and 2015/16 were sourced from ACT Independent Competition and Regulatory Commission reports, while 2016/17 and 2017/18 costs are based on a trend provided by the ACT Government. These costs include all costs associated with the small, medium and large-scale renewable energy schemes.
- Victorian scheme costs were provided by the Victorian Government.
- South Australian scheme costs were based on distribution network businesses approved annual pricing proposals for 2014/15 and 2015/16. It was assumed that the inflation adjusted 2015/16 scheme costs would apply in the remaining years of the reporting period, with the exception of the 16 cents per kWh part of the scheme which is scheduled to end on 30 September 2016.[267]

267 South Australian Government, *Solar feed-in scheme*, sa.gov.au website, viewed at http://www.sa.gov.au/topics/water-energy-and-environment/energy/energy-supply-and-sources/renewable-energy-sources/solar-energy/solar-photovoltaic-systems/solar-feed-in-scheme

K Merits review analysis methodology

This Appendix sets out further detail of how we have modelled the potential outcomes from the applications to the Competition Tribunal in respect of the AER's final determinations in New South Wales and the ACT.

As described in chapter 2, the relevant revenues have been obtained from the applications to the Tribunal. These revenues have been adjusted, or "smoothed", to account for both the Tribunal outcome in future years and any true-up in years 2014/15 and 2015/16 relative to the current determinations. Our approach is as follows:

- Determine the annual allowed revenue impact (on unsmoothed revenue) for each year of the determination:
  - For the upper case, this involves allocating the 5-year total to each year of the determination. We have allocated this in flat nominal terms over the five years.
  - For the lower case, PIAC presented annual effects and these have been used directly.
- Determine the over- and under-recovery by comparing the revised unsmoothed revenues to the AER's final smoothed revenues for 2014/15 and 2015/16 in present value terms. This allows a net present value total of over- and under-recovery to be calculated
- Allocate the over- and under-recovery total equally over the last three years of the regulatory period in present value terms.
- Smooth the annual revenues in line with the AER's final determination, to achieve net present value equivalence over the five year regulatory period.

The result is annual allowed revenues that account for both the appeal and a true-up for 2014/15 and 2015/16.

L Abbreviations

AEMO	Australian Energy Market Operator
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
COAG	Council of Australian Governments'
ESOO	Electricity Statement of Opportunities
LNG	Liquefied natural gas
LRET	Large-scale Renewable Energy Target
LRMC	Long Run Marginal Costs
NEFR	National Electricity Forecast Report
NER	National Electricity Rules
RCM	Reserve Capacity Mechanism
SWIS	South-West Interconnected System