



ICRC

independent competition and regulatory commission

Issues paper
**Retail prices for franchise
electricity customers from
1 July 2014**

Report 9 of 2013

October 2013

The Independent Competition and Regulatory Commission is a Territory Authority established under the *Independent Competition and Regulatory Commission Act 1997* (the ICRC Act). The Commission is constituted under the ICRC Act by one or more standing commissioners and any associated commissioners appointed for particular purposes. Commissioners are statutory appointments and the current Commissioners are Senior Commissioner Malcolm Gray and Commissioner Mike Buckley. We, the Commissioners who constitute the Commission, take direct responsibility for delivery of the outcomes of the Commission.

We have responsibilities for a broad range of regulatory and utility administrative matters. We have responsibility under the ICRC Act for regulating and advising government about pricing and other matters for monopoly, near-monopoly and ministerially declared regulated industries, and providing advice on competitive neutrality complaints and government-regulated activities. We also have responsibility for arbitrating infrastructure access disputes under the ICRC Act. In discharging our objectives and functions, we provide independent robust analysis and advice.

Our objectives are set out in section 7 of the ICRC Act and section 3 of the Utilities Act.

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How to make a submission

The Commission is seeking comment on this issues paper. The issues paper provides an opportunity for stakeholders to inform the development of the draft report. It will also ensure that relevant information and views are made public and brought to the Commission's attention.

Submissions may be mailed to the Commission at:

Independent Competition and Regulatory Commission
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Alternatively, submissions may be emailed to the Commission at icrc@act.gov.au. The Commission encourages stakeholders to make submissions in either Microsoft Word format or PDF (OCR readable text format – that is, they should be direct conversions from the word-processing program, rather than scanned copies in which the text cannot be searched).

For submissions received from individuals, all personal details (for example, home and email addresses, and telephone and fax numbers) will be removed for privacy reasons before the submissions are published on the website.

The Commission is guided by and believes strongly in the principles of openness, transparency, consistency and accountability. Public consultation is a crucial element of the Commission's processes. The Commission's preference that all submissions it receives be treated as public and be published on the Commission's website unless the author of the submission indicates clearly that all or part of the submission is confidential and not to be made available publicly. Where confidential material is claimed, the Commission prefers that this be under a separate cover and clearly marked 'In Confidence'. The Commission will assess the author's claim and discuss appropriate steps to ensure that confidential material is protected while maintaining the principles of openness, transparency, consistency and accountability.

We may be contacted at the above addresses, by telephone on (02) 6205 0799 or by fax on (02) 6207 5887. The Commission's website is at www.icrc.act.gov.au.

Submissions on the issues paper are due with the Commission by **5 pm, 15 November 2013**.

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1 Introduction

1.1 Background to the investigation

Retail competition for small electricity customers (small businesses and households) in the ACT was introduced on 1 July 2003. This followed the opening of the market in 1998 for customers consuming more than 160 megawatt hours (MWh) per year (mainly large businesses) and in 2001 for those consuming more than 100 MWh per year (mainly medium-sized businesses).

When the ACT Government decided to open the market to all customers, it also required that ActewAGL Retail offer customers consuming less than 100 MWh per year a non-negotiated standard customer contract incorporating a tariff approved by the Independent Competition and Regulatory Commission (the Commission). Customers who remain on non-negotiated contracts are known as franchise customers and are subject to a suite of regulated tariffs. Customers who choose to enter into alternative contract arrangements with ActewAGL Retail or other electricity retailers are known as non-franchise customers.

The current price direction for the supply of electricity to franchise customers determined prices for the period 1 July 2012 to 30 June 2104. The Commission's most recent decision under this price direction was to determine a real (inflation-adjusted) increase in the regulated retail price of 1.68 per cent for 2013–14. This is equivalent to a nominal increase of 3.47 per cent, which translates to annual bill increases of between \$36 and \$90 for typical residential customers and between \$98 and \$354 for non-residential customers.

On 20 September 2013 the Treasurer signed terms of reference under the *Independent Competition and Regulatory Commission Act 1997* (the ICRC Act) for a price direction for the supply of electricity to franchise customers for the period commencing 1 July 2014.¹

This issues paper launches the consultation process to determine retail electricity prices from 1 July 2014.

1.2 Purpose of the issues paper

The purpose of the issues paper is twofold. The first is to alert stakeholders that the Commission is undertaking an investigation into retail electricity prices for the period commencing 1 July 2014 and is seeking stakeholder input on any issues they consider relevant.

¹ See Appendix 1 for a full copy of the terms of reference.

The second purpose is to inform stakeholders of those issues that the Commission has identified as relevant to this price investigation. These include issues arising from the terms of reference and recent developments in the electricity market and regulatory sector.

The Commission, through submissions in response to the issues paper, is keen to get a thorough understanding of the issues that stakeholders consider important. Stakeholder input will inform the Commission's development of the draft report and proposed price direction scheduled for release in the first quarter of 2014.

1.3 Scope of the terms of reference

The terms of reference require the Commission to consider the following matters in its investigation:

- The impact on direct electricity costs of changes in government policies and pass through of those costs to regulated prices including, but not restricted to:
 - the Commonwealth Government's carbon pricing mechanism;
 - Commonwealth and ACT retailer obligation energy efficiency schemes;
 - the Commonwealth Government's Large and Small Renewable Energy Targets; and
 - any other schemes implemented to address climate change relevant to electricity pricing.
- The efficient and prudent cost of managing risk in purchasing electricity.

The Commission is also required by the terms of reference to identify and report on:

- the cost allowance for the ACT Feed-in Tariffs (small and large scale) for the year(s) or period for which its determination is being made; and
- the efficient costs of complying with the *Energy Efficiency (Cost of Living) Improvement Act 2012*.

The terms of reference provide the Commission with discretion to set the length of the regulatory period for which retail electricity prices will be determined under the price direction.

The Commission must produce its final report in sufficient time to allow ActewAGL Retail to make any necessary changes to its billing system and provide information on the new tariff to customers for implementation effective 1 July 2014.

1.4 Structure of the issues paper

The remainder of the issues paper is structured as follows:

- Chapter 2 discusses recent developments in the electricity market and emerging regulatory issues that are relevant to the investigation.
- Chapter 3 sets out the Commission’s current regulatory approach and pricing methodology and discusses specific issues relevant to the approach and methodology.
- Chapter 4 sets out the next steps in this price investigation.
- Appendix 1 reproduces the terms of reference.
- Appendix 2 presents the equations describing the calculations in the Commission’s current energy purchase cost model.

1.5 Investigation timeline

The Commission proposes to adopt the timeline set out in Table 1.1 for the price investigation.

Table 1.1 Indicative timeline for the retail electricity price investigation

Task	Date
Terms of reference signed	20 September 2013
Release of issues paper	4 October 2013
Submissions on issues paper close	15 November 2013
Release of draft report and proposed price direction	14 February 2014
Submissions on draft report close	28 March 2014
Public hearing	Mid April 2014
Release of final report and price direction	6 June 2014

The Commission is required under clause 17(4)(a) of the ICRC Act to conduct a public hearing for all price regulation investigations. The Commission intends to conduct a hearing in mid April. The Commission will advertise the details of the public hearing in the *Canberra Times* and on its website and call for persons wishing to speak at the hearing to register their interest.

2 Recent developments in the electricity market

This chapter provides context for this retail electricity price investigation. It discusses recent market developments, including trends in wholesale electricity prices. It also summarises recent national and jurisdictional regulatory decisions and investigations.

During 2011–12, 18 utilities were licensed to supply retail electricity in the ACT; however, only 11 supplied electricity to customers during the year.²

The regulated electricity load is around 40 per cent of the total ACT load. As of March 2013 there were around 122,000 franchise customers on the regulated retail tariff. Of these, around 112,000 were residential customers and around 9,500 were business customers. The total energy supplied to franchise customers in the 12 months through March 2013 was 1,136 MWh, of which 78 per cent was consumed by residential customers. While business customers on the regulated retail electricity tariff made up only 7.8 per cent of the total customers, they consumed 22 per cent of the regulated load.

The Australian Energy Regulator's (AER) latest retail energy market update reports that ActewAGL is the largest retailer in the ACT, supplying more than 90 per cent of small electricity customers and 51 per cent of the large customer market.³

2.1 Market developments

Electricity produced by generators is sold to retailers who then sell the electricity to customers. Network electricity businesses are responsible for transporting electricity from generators to customers. Thus, there are three main cost categories in the build-up to the total cost of providing electricity to customers: wholesale electricity costs, network costs and the cost of retailing electricity. Retailers purchase electricity on the wholesale electricity market, which is administered by the Australian Energy Market Operator (AEMO).

The ACT is wholly contained in the New South Wales region of the National Electricity Market (NEM) and therefore faces wholesale prices determined in that state. This means that factors largely driven by the actions of participants in the New South Wales market affect the wholesale price of electricity for the ACT.

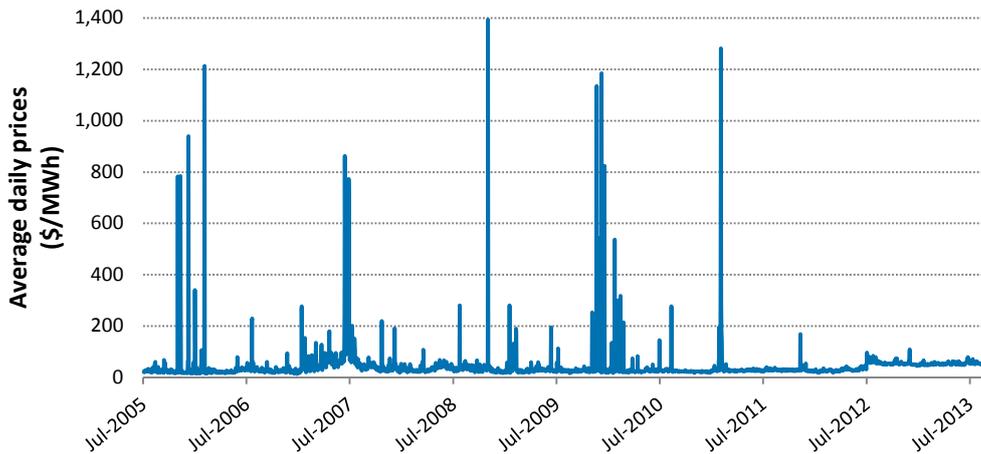
Three noteworthy developments have occurred in the last few years in the electricity market. First, the observed spot market price for electricity in New South Wales has

² ICRC, 2013b: v.

³ AER, 2013: 5.

remained relatively stable. Figure 2.1 shows the average daily price since 1 July 2005.⁴ The price has not exceeded \$200 per MWh since early 2011, although this was common prior to that time. While price volatility has fallen significantly in the past two years, some volatility remains. It is also possible that volatility may increase in the future.

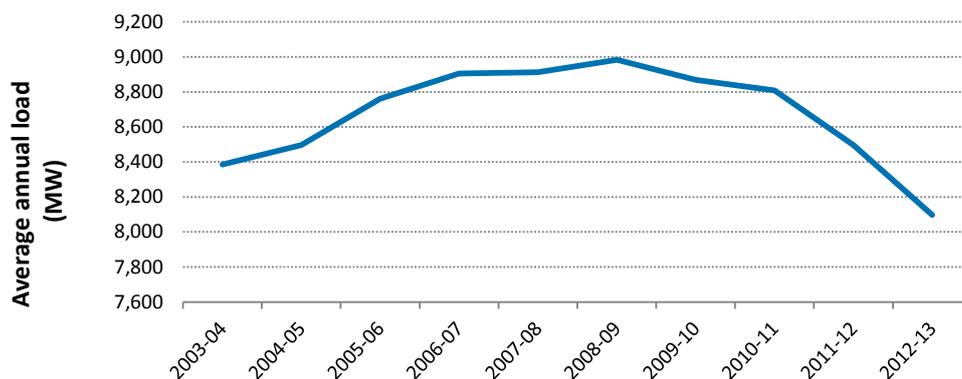
Figure 2.1 New South Wales average daily electricity spot prices from July 2005 to present



Source: AEMO.

Second, there has been a marked reduction in electricity demand in New South Wales. Figure 2.2, which presents the average annual half-hour electricity load over the last 10 years, shows the extent of the reduction. Average half-hourly loads in 2012–13 were lower than in 2003–04. There is a similar trend in the reduction in peak half-hour usage over the same period.

Figure 2.2 Average annual New South Wales electricity load from 2003–04 to 2012–13



Source: AEMO.

⁴ The average daily price is equal to the average price for the 48 half-hour periods in each day. There is intraday variation in price that is not captured in the average daily price.

The reduction in average and peak load in New South Wales has driven the relative stability in the wholesale price for electricity that the ACT faces. There has also been a similar reduction in the average and peak load in the ACT over the past few years. Figure 2.1 and Figure 2.2 together paint a picture of a wholesale electricity market that has been exhibiting significantly reduced volatility in prices in recent years. There have been fewer half-hour periods where the wholesale price has spiked, and there has been a reduction in the intraday variation in the wholesale price of electricity in New South Wales.

The third noteworthy development is the continuing uncertainty associated with the future price on carbon. The Commission's current pricing model incorporates an adjustment to the wholesale energy purchase cost to account for the price on carbon set under the Australian Government's carbon pricing legislation, the *Clean Energy Act 2011*.

It is uncertain whether a price on carbon will remain from 1 July 2014. It is also possible that alternative mechanisms may be introduced to reduce carbon emissions, which may have direct costs attributable to electricity generation.

2.2 Jurisdictional regulatory decisions

There have been a number of recent electricity regulatory decisions and investigations in other jurisdictions that may have implications for this price investigation.

New South Wales

In June 2013 the Independent Pricing and Regulatory Tribunal (IPART) of New South Wales released its final determination on regulated retail charges and prices for electricity from 1 July 2013 to 30 June 2016.

IPART determined an average nominal increase of 1.7 per cent in regulated retail electricity prices in New South Wales from 1 July 2013. This resulted in annual bill changes for typical residential customers ranging from -\$17 to \$63 and annual bill changes for typical small business customers ranging from -\$23 to \$88.⁵

IPART stated that the main driver of the 1.7 per cent price increase was higher retail operating costs, including the costs of acquiring and retaining customers in an increasingly competitive market, and higher green costs. IPART noted that the price increase was much lower than in recent years, which it attributed to reductions in network costs and wholesale costs.

⁵ IPART, 2013a: 1. The range in annual bill changes reported by IPART is across the three distribution regions in New South Wales.

In its determination IPART maintained its building-block approach to price setting but adopted:

a new approach to estimate the level of incentives, and the extent to which the costs associated with customer acquisition and retention, are included in regulated prices to promote competition.⁶

For its determination, IPART conducted a bottom-up analysis of retail operating costs. It found that the forecast efficient retail operating cost for a standard retailer is in the range of \$110 to \$116 per customer per year – much higher than the allowance of \$82.60 set in the previous determination for 2012–13. IPART also revised its retail margin up from 5.4 per cent to 5.7 per cent.

IPART has taken the view that:

for ... a competitive market to develop while regulation exists, regulated prices must be high enough to create incentives for retailers to enter the market and compete for customers, and for customers to seek out better offers in the competitive market.⁷

To that end, IPART's determination included a specific allowance for efficient customer acquisition and retention costs over and above the retail operating cost allowance. The customer acquisition and retention cost allowances were \$7.74 per MWh for EnergyAustralia, \$8.75 per MWh for Origin Energy (Endeavour supply area) and \$13.32 per MWh for Origin Energy (Essential supply area).

Queensland

On 31 May 2013, the Queensland Competition Authority (QCA) released its final determination on the state's regulated retail electricity prices for 2013–14.

The QCA decision resulted in annual bills for typical residential customers on the main retail tariff rising by about 23 per cent in 2013–14.⁸ The QCA stated that the key underlying cost drivers for the price rises in its decision were increases in network charges of 17 to 19 per cent. These were due, among other things, to large increases in distributors' revenue allowed by the AER, the costs of complying with the Queensland Government's Solar Bonus Scheme and a catch-up from the Queensland Government's main retail tariff freeze in 2012–13.

The QCA reported energy costs as the next biggest driver. It found that energy costs had risen by 9 per cent due to the tightening of the futures market, which increased the risks faced by retailers in purchasing wholesale energy. The QCA also noted that retail operating costs had increased by 24 per cent as a result of updated benchmarking using IPART's 2013 draft estimates of retail operating cost allowance.

⁶ IPART, 2013b: 8.

⁷ IPART, 2013b: 25.

⁸ QCA, 2013: ix.

In making its determination, the QCA adopted a cost build-up approach. A retail margin of 6.0 per cent was applied along with an additional headroom allowance of 5.0 per cent of total costs to support competition in the Queensland retail market.⁹

South Australia

The South Australian Government deregulated the electricity retail market in South Australia from 1 February 2013. This resulted in retail energy contracts for small customers no longer being price regulated. At the same time, the South Australian Government introduced a pricing and market monitoring regime which requires it to collect market information, including through reports issued by the Essential Services Commission of South Australia (ESCOSA).

ESCOSA released its first annual ministerial report on energy retail prices in August 2013. ESCOSA reported that electricity prices had increased significantly since 1 July 2012.¹⁰ It stated that these increases may have been due to the introduction of a price on carbon and large increases in network costs.

2.3 AEMC advice on best practice retail price regulation

The Australian Energy Market Commission (AEMC) has prepared, at the request of the Standing Council on Energy and Resources (SCER), advice on a best practice method for setting regulated retail electricity prices for small customers. The AEMC released an issues paper for public consultation in June 2013 and a final report containing its advice to SCER on 27 September 2013.¹¹

The development of this advice followed the December 2012 agreement by SCER and the Council of Australian Governments (COAG) to task the AEMC to develop a consistent methodology for determining regulated retail prices.

The terms of reference from SCER state that:

While some consistencies exist, there is no uniform pricing methodology employed by regulators across jurisdictions ... Given the varying methodologies for determining these costs, the AEMC could usefully investigate the development of a more national approach to the setting of retail prices.

...

SCER and COAG also agreed that this methodology be considered by jurisdictions in the formulation of transition plans, due by the end of 2013, which aim to outline a pathway to price deregulation. These plans will also include consideration by

⁹ QCA, 2013: 110.

¹⁰ ESCOSA, 2013: 1.

¹¹ AEMC, 2013: 4.

jurisdictions of the potential transfer of responsibility for retail price regulation in accordance with this methodology to the Australian Energy Regulator.¹²

The AEMC's approach is to propose a two-pronged objective and a number of principles for setting regulated retail prices to guide the development of the best practice methodology. The AEMC's proposals are set out in Box 2.1.

Box 2.1 AEMC proposed objective and principles for retail electricity price regulation

Objective

Having regard to the long-term interests of customers, retail price regulation should determine electricity prices for small customers, which:

- reflect the efficient costs of providing retail electricity services; and
- facilitate the development of competition in retail electricity markets, where competition may be feasible.

Principles

The AEMC has proposed seven underlying principles: cost efficiency, cost reflectivity, transparency, open and consultative process, predictability and stability, minimising administrative burden and appropriate allocation of risk.

Source: AEMC, 2013: 14–17.

The AEMC issues paper sought stakeholder feedback on how best to determine the major cost components in a retail electricity price build-up, including:

- wholesale energy costs;
- network costs;
- retail operating costs, margins and competition allowance; and
- costs associated with compliance with national and jurisdictional environmental schemes.

In addition, the paper sought comments on the best practice form of regulation, the length of the regulatory period and the cost pass-through arrangements. It also provided a useful summary of current jurisdictional approaches to setting retail electricity prices.

The Commission notes that the ACT Government and ActewAGL Retail among others made public submissions on the AEMC issues paper.¹³ Given that the AEMC's final report has only just been released, the Commission proposes to consider the AEMC's report in the Commission's draft report.

¹² SCER, 2013: 1.

¹³ Submissions are published on the AEMC website: www.aemc.gov.au/market-reviews/completed/advice-on-best-practice-retail-price-regulation-methodology-.html.

The ACT Government’s submission recommends that the AEMC not include the second part of the proposed objective – which relates to developing competition – in its best practice methodology. The basis for this recommendation was that:

The implication that consumers are required to make a financial contribution to support competition, beyond efficient costs is contradictory.¹⁴

ActewAGL Retail’s submission also comments on the proposed competition objective, suggesting the need for more explanation on the meaning of the term ‘development’ and the removal of the phrase ‘where competition may be feasible’. The latter proposal was made on the grounds that it could be:

construed as meaning that there are markets within the National Electricity Market (NEM) where competition may not be possible.¹⁵

2.4 Review of electricity retailer margins in Victoria

The Victorian retail electricity market was deregulated in July 2009. In May 2013, the Essential Services Commission (ESC) released a discussion paper on retailer margins in Victoria’s electricity market. The purpose of the paper was to gain greater insights into the factors driving higher retail prices which:

By some estimates ... have increased in Victoria by approximately 80 per cent over the five years to 2011–12.¹⁶

This compares to price increases of around 45 per cent in the ACT over the same period.

The ESC engaged SKM-MMA to model retailers’ costs, which were then deducted from observed prices to estimate movements in retailer margins between 2006 and 2012. The SKM-MMA findings were reported across the five electricity distribution regions in Victoria, and the ESC concluded:

the overall picture is one of decreasing retailer margins in the last few years prior to full deregulation and increasing margins since then; particularly in 2011–12.¹⁷

SKM-MMA also compared retail margins on discounted market offers in Victoria, New South Wales and South Australia for single rate customers. It found that retail margins in Victoria were generally higher than in New South Wales and South Australia.¹⁸

¹⁴ ACT Government, 2013: 1.

¹⁵ ActewAGL Retail, 2013: 2–3.

¹⁶ ESC, 2013: i.

¹⁷ ESC, 2013: i–ii.

¹⁸ SKM-MMA, 2013: x.

3 The Commission's regulatory approach and pricing model

The first section of this chapter describes the Commission's current regulatory approach and canvasses issues relevant to this investigation. The second section describes the pricing model used by the Commission in determining regulated retail prices. Issues relevant to the pricing model are also discussed. The third section describes the individual cost components of the Commission's pricing model in more detail and considers specific issues relevant to this investigation.

3.1 Regulatory approach

The term 'regulatory approach' refers to the way in which the Commission determines and adjusts regulated prices over the length of a regulatory period. The key elements of the Commission's current regulatory approach are described below.

Weighted average price cap

The Commission determines the extent to which standard customer contract tariffs can be increased or decreased over those in the previous year. As the standard customer contract includes a suite of tariffs offered by ActewAGL Retail, the Commission has adopted a weighted average price cap form of regulation. This allows ActewAGL Retail to adjust its individual prices under the cap as long as the total adjustment does not exceed the allowed percentage change.

In its submission to the AEMC issues paper, ActewAGL Retail stated that it supported the weighted average price cap methodology for adjusting regulated prices over time.¹⁹

Length of the regulatory period

The current two-year regulatory period was a requirement of the terms of reference from the Treasurer, which obligated the Commission to determine prices from 1 July 2012 to 30 June 2014.

As noted earlier, the terms of reference for this investigation provide the Commission with discretion to set the length of the next regulatory period. The Commission has not previously determined the length of the regulatory period. In determining the length of the regulatory period, a number of considerations may be taken into account.

Shorter regulatory periods can provide more flexibility for the regulator to deal with changes in retailer costs, but are more costly as they require frequent major price investigations.

¹⁹ActewAGL Retail, 2013: 3.

It has been argued that longer regulatory periods can provide more certainty for retailers and customers because the pricing methodology is clearly set out for a number of years. It is also often argued that longer periods:

create strong incentives for retailers to operate more efficiently, as retailers are able to retain any difference between the regulated price and their costs as profit.²⁰

The Commission’s current regulatory pricing model uses a cost benchmark approach with annual price adjustments. This model provides some flexibility to deal with retailer cost changes even under a longer regulatory period. However, the risk remains that unforeseen changes in retailer costs may arise during a regulatory period that the current model cannot deal with.

The incentives argument associated with a longer regulatory period may be irrelevant when the pricing model is based on industry benchmarks rather than actual retailer costs. As long as the industry benchmark is calculated without any reference to the actual costs of the retailer, the length of time between reviews has no effect on the incentive of the retailer to seek efficiency gains. Under this pricing model and benchmark assumption, the retailer notionally keeps the full efficiency gains that it makes through its own efforts.

In coming to a decision on the length of the regulatory period in this investigation, the Commission must balance the trade-offs between regulatory certainty, flexibility, incentives and cost burden.

In its submission to the AEMC issues paper, ActewAGL Retail stated that, on balance, it supported short regulatory periods of, for example, two years, but with firmly embedded regulatory principles that are stable across periods.²¹

Cost pass-through arrangements

Pass-through arrangements typically apply to events that are unplanned, or whose extent is uncertain, and which are beyond the ability of the regulated entity to control. If a pass-through ‘trigger’ event occurs, a new investigation can be undertaken to update the prices or an automatic adjustment may be made.

The Commission’s current approach provides for a range of pass-through events. The first category includes regulatory change events that materially alter the nature, scope, standard or risk of providing services to regulated retail tariff customers. An example of such an event is a change in the Australian Government’s carbon pricing mechanism. The second category includes a range of tax change events.

²⁰ AEMC, 2013: 60.

²¹ ActewAGL Retail, 2013: 7.

Pass-through claims have had to meet a materiality threshold, which for the current regulatory period is set at 0.25 per cent of ActewAGL Retail’s franchise customer revenue.

In its submission to the AEMC issues paper, ActewAGL Retail stated:

Any best practice regulation methodology should allow for the full pass-through of costs that are beyond a retailer’s control, including network costs, environmental costs such as carbon pricing and the costs of renewable energy targets, and other jurisdictional government scheme costs (such as energy efficiency schemes).²²

As part of this investigation, the Commission will consider the necessity of maintaining pass-through arrangements, the set of allowable pass-through events and the level of the materiality threshold.

3.2 Pricing model

The Commission currently uses a pricing model based on cost benchmarks. These costs are built up over the three main cost categories: wholesale energy costs, network costs and retail costs. The Commission annually estimates the likely change in benchmark costs of supplying electricity to customers and adjusts prices accordingly. The Commission’s current pricing model and its constituent cost benchmarks are illustrated in Figure 3.1.

²² ActewAGL Retail, 2013: 6.

Figure 3.1 The Commission’s current pricing model

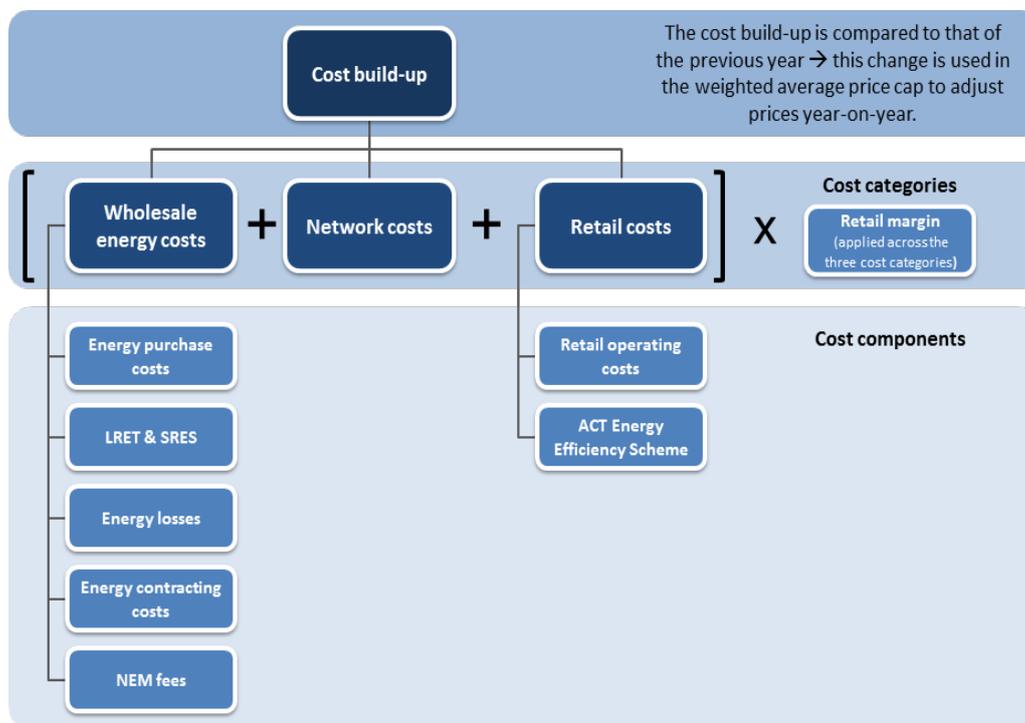


Table 3.1 details the cost benchmarks in the 2013–14 price adjustment and their percentage contribution to total costs.

Table 3.1 Composition of regulated retail electricity costs for 2013–14

	2013–14 final decision	% of total cost
Energy purchase cost (\$/MWh)	68.99	34.5
LRET and SRES costs (\$/MWh)	11.66	5.8
Energy losses (\$/MWh)	3.91	2.0
Energy contracting cost (\$/MWh)	0.82	0.4
NEM fees (\$/MWh)	0.82	0.4
Total energy purchase cost (\$/MWh)	86.20	43.1
Retail operating costs (\$/MWh)	11.43	5.7
ACT Energy Efficiency Scheme costs (\$/MWh)	3.75	1.9
Total retail costs (\$/MWh)	15.18	7.6
Network costs (\$/MWh)	88.29	44.2
Total energy + retail + network costs (\$/MWh)	189.67	94.9
Retail margin (\$/MWh)	10.24	5.1
Total costs (\$/MWh)	199.91	100.0

Source: ICRC, 2013a.

There are three broad methodological issues associated with the Commission’s current pricing model that are likely to be of particular interest to stakeholders in this investigation.

The first is the Commission’s use of a hypothetical incumbent retailer as the benchmark for the cost components used in the pricing model rather than, for example, a hypothetical new entrant electricity retailer. The Commission’s decision to base the regulated retail tariff on the efficient costs of an incumbent business providing the regulated retail service rather than on the efficient costs of a new entrant has been a matter of some discussion in previous price investigations.

In its submission to the AEMC issues paper, ActewAGL Retail proposes that the standard retailer:

should be an efficient, mass-market, single fuel [electricity] new entrant operating in a competitive market.²³

ActewAGL Retail argues that using an efficient, mass-market single fuel new entrant to the competitive market as the standard would also allow for regulated retail prices to provide for cost-reflective retail operating costs.

The second methodological issue concerns the Commission’s use of a market-based approach to determining the change in wholesale energy purchase costs rather than adopting a long-run marginal cost approach. In its submission to the AEMC issues paper, ActewAGL Retail notes that it has consistently supported the use of long-run marginal cost to establish a deemed wholesale purchase cost for electricity.²⁴ ActewAGL Retail states that this approach is necessary to ensure adequate investment in new generation capacity to maintain security of supply for customers.

The third methodological issue concerns the absence of any specific competition allowance in the form of customer acquisition and retention costs in the Commission’s pricing model. In its submission to the AEMC issues paper, ActewAGL Retail states:

In line with the AEMC’s proposed objective, ActewAGL views a ‘competition allowance’ or ‘headroom’ as an important part of ensuring that the regulated price outcomes reflect those that would be expected in a competitive market.²⁵

3.3 Cost components of the pricing model

3.3.1 Energy purchase cost

Retailers must purchase electricity for resale to their customers. This energy can be purchased directly from the wholesale spot market. However, due to the volatility of the spot market, it is accepted practice for prudent retailers to hedge their purchases of energy in the wholesale market. Retailers can physically hedge their exposure to risk in the wholesale electricity market by forward purchasing electricity in the contract

²³ ActewAGL Retail, 2013: 3-4.

²⁴ ActewAGL Retail, 2013: 5.

²⁵ ActewAGL Retail, 2013: 5.

market. Alternatively, they can financially hedge their risk by taking positions in the futures market, trading in electricity options or purchasing caps which insure against high spot prices. Hence, regulators face the complicated problem of determining the efficient cost of purchasing electricity as part of a build-up of the efficient costs of providing retail electricity services.

This section reviews the Commission’s approach to the energy purchase cost component of retail electricity costs in the ACT. The Commission is seeking comment from stakeholders on three specific issues relating to its energy purchase cost model.

The first is whether the Commission’s current approach for determining hedging costs in the energy purchase cost model is still relevant. Second, as described below, the Commission switched from using futures prices to forward contract prices in its 2012 review, which will be revisited as part of the current investigation. The third issue is whether the Commission should have regard to the long-run marginal cost in determining the energy purchase cost. Each of these issues is discussed in more detail below.

Overview

The cost of purchasing energy from the wholesale energy market accounts for 35 per cent of the total cost of providing retail electricity services to customers who pay the regulated retail tariff in the ACT. While not the largest component in the build-up of efficient costs (network costs account for 44 per cent of the total cost), energy purchase costs provide the greatest challenge to regulators due to complexity of wholesale energy markets, the volatility of wholesale energy prices, and the potential adverse outcomes if wholesale energy costs are not properly compensated for in the regulatory model.²⁶ The Commission is mindful that overcompensating for costs results in customers paying more than the efficient cost for electricity. The Commission needs to strike the right balance between properly compensating the retailer and protecting the interests of customers.

Given the nature of the wholesale electricity market, especially the volatility in customer loads and wholesale prices, there is no simple method for determining a retailer’s efficient energy purchase costs. The Commission undertook a dedicated review of the wholesale energy purchase cost as part of the 2010 investigation of regulated retail tariffs. Following the review, the Commission produced a technical paper containing its revised energy purchase cost model.²⁷

²⁶ It is worth noting that the experiences in the state of California during the early part of this millennium are frequently cited when decrying the evils of a regulated retail price with unregulated and competitive wholesale prices. Joskow (2001) provides an excellent survey of the policy failures that led to the crisis in California. The events that occurred in California are extremely unlikely to occur in the ACT, as retailers in California purchased electricity from the wholesale spot market but faced retail prices which were fixed for four years. Neither of these factors is present in the current configuration of the ACT regulatory regime.

²⁷ ICRC, 2010.

The technical paper set out the high-level principles that a model of the energy purchase cost component should meet in the Commission’s regulatory framework. These principles are:

- The model should be simple, transparent and predictable.
- The model should provide an unbiased estimate of electricity purchase costs.
- Outputs from the model should be replicable.²⁸

The Commission’s adoption of these principles in 2010 resulted in a model that determines an energy purchase cost that stakeholders can independently confirm. The model is based on observable forward prices and relies on historical wholesale spot prices and loads to compensate an incumbent retailer adequately for the potential risks inherent in the electricity market. The Commission employed this model in the 2010 and 2012 investigations to determine the energy purchase cost component.

As part of the 2012 review of regulated retail electricity prices, the Commission made two adjustments to the model.²⁹ First, the model as developed in 2010 relied on annual data and the Commission rebased the model to utilise quarterly data. Second, the recently introduced price on carbon resulted in the Commission incorporating provisions for this cost on electricity in the model. The introduction of a price on carbon also necessitated a switch from using futures prices as the basis of the hedging approach to using forward contract prices. As part of the 2013 price reset the Commission reaffirmed the use of forward contract prices as the basis of its energy purchase cost model.³⁰

Thus, the Commission’s energy purchase cost model has, with minor revisions, been used for calculating the energy purchase cost for the past four years. The next subsection explains the components of the model, with particular reference to how the model incorporates hedging.

Details of the model

The characteristics of electricity as a commodity provide unique challenges when modelling the wholesale market for electricity. Electricity is non-storable under currently available technologies. Peak usage is also two or three times the average daily usage, which results in a small proportion of generating capacity rarely being used but commanding high prices at peak times. There are also marked seasonal differences in average and peak electricity usage. Given these characteristics, forward contract markets and futures markets have evolved to provide market participants with hedging options to mitigate some of the inherent risks in the wholesale electricity market.

²⁸ ICRC, 2010: 9.

²⁹ A detailed explanation of these issues can be found in the Commission’s 2012 final report (ICRC, 2012).

³⁰ ICRC, 2013a.

In 2010 the Commission developed an approach to account for the risks faced in the market. The Commission's energy purchase cost model consists of six components: the forward price, the load shape, the load ratio, the forward price margin, the quarterly load weights and the cost of carbon. These components are briefly described below. The equations that constitute the model are contained in Appendix 2.

The Commission assumes that the retailer purchases electricity in advance of supplying customers as part of its hedging strategy using carbon-exclusive over-the-counter contracts. The forward price in the Commission's model represents the cost of purchasing electricity using the average price of these contracts over an extended period. The model multiplies the forward price by an uplift factor in an attempt to ensure that the retailer is compensated for the risks it faces in purchasing electricity. The Commission has adopted an extremely conservative hedging strategy by assuming purchasing of forward contracts in excess of the historical maximum load.

The bidding arrangements in the wholesale market result in electricity being priced in half-hourly intervals across the year. In a non-leap year there are 17,520 half-hour intervals. The forward price is the cost of purchasing a flat load for these half-hour intervals. However, a retailer's customers do not demand a flat load. Customer loads rise in peak periods such as the early evening hours of work days and are low during the small hours of the night. Thus, a retailer is exposed to the spot market as it buys electricity when its hedged load is less than the demanded load and it sells electricity back into the market when its load is less than the pre-purchased load. The load shape captures this aspect of the risk faced by a retailer. The Commission uses as a proxy for the regulated retail load the net system load profile as reported by AEMO.³¹

The load shape measures the extent to which the level of the load and the spot price move together. If, as commonly occurs, high prices are associated with high loads, the load shape will be greater than one. The magnitude of the load shape depends on the degree of this relationship. The Commission uses the historical average as its forecast of the load shape.

The load ratio measures the peakiness of the regulated retail load. It is calculated by dividing the maximum half-hour load in a quarter by the average load in that quarter. The Commission uses the highest observed historical load ratio in its hedging approach. An extra 0.1 is added to this ratio to allow for the future load ratio to exceed the currently observed maximum. The Commission's hedging approach assumes that the retailer purchases its hypothetical maximum load in advance for each quarter. A retailer is at liberty to adopt its own hedging strategy which may, even when adjusting for its risk profile, cost less than the Commission's hedging approach.

The forward price margin captures the observation that forward prices generally exceed average spot prices. The Commission assumes that the retailer purchases its expected maximum load in advance and must resell the excess on the spot market. This

³¹ This data is available from the AEMO website: www.aemo.com.au.

advance purchase protects the retailer from price spikes but comes at a cost due to the forward price exceeding the average spot price. This cost is accounted for in the Commission’s model through the forward price margin. The Commission set the margin at 5 per cent in 2010 based on the observed relationship between forward and spot prices. It maintained this value in 2012.

The load shape, the load ratio and the forward price margin together comprise the uplift factor that is applied to the forward price.

The final two components of the Commission’s energy purchase cost model are the quarterly load weights and the cost of carbon. The load weights capture the fact that the average summer load in the ACT is less than the winter load, which results in the annual price being a load weighted average of the quarterly prices. The cost of carbon is then added to yield the final energy purchase cost. The Commission multiplies the price on carbon set out in the Commonwealth legislation by the national carbon intensity factor as reported by AEMO.

The Commission welcomes comments from stakeholders on the continued relevance of its energy purchase cost model and in particular the approach to hedging.

Carbon price uncertainty and the forward price

The Commission identified the incorporation of the price on carbon into the energy purchase cost model as the major challenge of the previous investigation. The issue the Commission faced at that time was the uncertainty leading up to the passage of carbon pricing legislation. The futures market at that time incorporated into its prices an expectation of a future price on carbon. The over-the-counter contract market developed contractual arrangements under which the cost of carbon became contingent on whether or not there was a price on carbon. Carbon-exclusive over-the-counter contracts became the norm where the price on carbon was imposed after the fact.

These over-the-counter arrangements essentially resolved the uncertainty over the price on carbon. This led to the Commission’s 2012 decision to switch from using futures prices to carbon-exclusive over-the-counter contracts as the basis of the forward price of electricity. The Commission also allowed for a pass-through if the price on carbon was removed during the 2012–14 regulatory period. The Commission reaffirmed the decision to use over-the-counter contract prices in 2013.

As discussed in chapter 2, in conducting this price investigation, the Commission faces continuing uncertainty over a future price on carbon. The Commission seeks stakeholder views on whether the current approach – that is, using over-the-counter contract prices and allowing for pass-through arrangements if the uncertainty is not resolved before the price direction is finalised – is sufficient to deal with potential carbon pricing outcomes.

Long-run marginal cost

The Commission’s energy purchase cost model is a market-based model that estimates the cost of purchasing electricity for the coming year based on forward prices and observed market outcomes. An alternative approach for determining the energy purchase cost is to estimate the long-run marginal cost of generating electricity to cover the regulated retail load.

ActewAGL Retail has called for the long-run marginal cost to be instituted as a price floor when determining the energy purchase cost in the previous two reviews and, as noted earlier, has repeated this claim in its submission to the AEMC issues paper. The Commission also notes that AGL in its submission to the AEMC review has called for long-run marginal cost to be used as a floor when determining the energy purchase cost.³²

As part of its review of the energy purchase cost model, the Commission will once again review the merit of adopting a long-run marginal cost floor. The Commission is interested in receiving submissions on this issue.

3.3.2 Large-scale Renewable Energy Target and Small-scale Renewable Energy Scheme

The Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES) create financial incentives for investment in renewable energy sources through market-based mechanisms. The LRET applies to the establishment and growth of centralised renewable-energy power stations, such as wind, solar or hydro, while the SRES applies to dispersed installations, such as solar panel systems and solar water heaters. The schemes require electricity retailers to purchase and surrender Large-scale Generation Certificates and Small-scale Technology Certificates at regular intervals.³³

The Commission applies a market-based approach to determine efficient LRET and SRES costs. The model forecasts costs using historical certificate prices and includes an ex post adjustment to account for differences between forecast and actual costs. Full details of the Commission’s approach can be found in the 2012 final report.³⁴

The Commission welcomes stakeholder comments on its current approach to determining LRET and SRES costs.

³² AGL, 2013: 5.

³³ More information on the LRET and the SRES can be found on the Clean Energy Regulator’s website: www.cleanenergyregulator.gov.au/Renewable-Energy-Target/Pages/default.aspx.

³⁴ ICRC, 2012.

3.3.3 Energy losses

Energy is lost in transporting electricity from generators to customers via transmission and distribution networks. These losses affect the price paid for electricity by the incumbent retailer in two ways. First, the spot price is the price of electricity at the reference node in Western Sydney. Electricity consumed in the ACT is priced at the point of connection, or node, between the national transmission network and the ACT distribution network. This price is determined by applying a marginal loss factor to the spot price. The marginal loss factor reflects the energy lost in the transmission network in transporting energy to the ACT relative to the losses involved in providing energy to the reference node.

Second, there are losses in the distribution network that takes electricity from the ACT node to the customer’s premises. These losses impose a cost on retailers, because they must purchase more electricity than they are able to sell. The loss factors are calculated by AEMO and are used by all regulators to determine the energy loss allowances where regulated tariffs still apply.

AEMO publishes reports which provide marginal and distribution loss factors for the forthcoming financial year.³⁵ The Commission calculates an adjustment factor combining the marginal and distribution loss factors applicable to the ACT.

3.3.4 Energy contracting costs

Energy contracting costs represent the costs incurred by the incumbent retailer in managing an electricity trading desk. An electricity trading desk is necessary to manage electricity purchases, which are typically made using a forward-looking portfolio approach, and the associated financial risks.

The Commission estimated the energy contracting costs of the incumbent retailer in 2003 and has adjusted this component to reflect the annual change in the consumer price index (CPI) since then.

3.3.5 National Electricity Market fees

The NEM is the market for electricity that flows across the interconnected electricity grid that covers most parts of Queensland, New South Wales, the ACT, Victoria, Tasmania and South Australia. The NEM is managed by AEMO, which is funded through user fees that are ultimately borne by customers. The fees cover a range of functions necessary for the safe and reliable delivery of electricity to all consumers. The Commission estimated the NEM fees of the incumbent retailer in 2003 and has adjusted this component to reflect the annual change in the CPI since then.

³⁵ AEMO publishes marginal and distribution loss factors on its website: www.aemo.com.au/Electricity/Market-Operations/Loss-Factors-and-Regional-Boundaries.

3.3.6 Retail operating costs

Retail operating costs are the efficient costs incurred by the incumbent retailer in providing retail services to franchise customers. These costs include billing services, call centre costs, customer information costs and general operating overhead costs.

In 2003 the Commission took a cost build-up and benchmarking approach to determining retail operating costs and has increased this component in line with changes in the CPI since then.

There are two key issues related to the determination of the efficient level of retail operating costs in this investigation. These issues have been explored in the Commission’s previous investigations, by other jurisdictional regulators, and by the AEMC in its recent issues paper on best practice retail price regulation.

The first issue relates to the fundamental objective of regulation and whether a headroom allowance is required over and above efficient retail operating costs to promote competition in a regulated market. The second is specific to the regulation of the ACT retail electricity market and whether there is evidence of diseconomies of scale due to the small size of the ACT market that should be accounted for in determining efficient retail costs.

As noted earlier, in previous investigations the Commission has determined efficient retail operating costs using the incumbent retailer benchmark rather than that of a mass-market new entrant. This has resulted in the Commission not including costs associated with customer acquisition and retention in the efficient retail operating costs. Therefore, the Commission has not included a headroom or competition allowance. This differs from other regulators that continue to set a regulated retail electricity price. For example, IPART explicitly models customer acquisition and retention costs, which provides headroom, as a separate cost element for the three retailers which it regulates in New South Wales. The QCA, as discussed earlier, does not determine customer acquisition and retention costs in its cost build-up; rather, it allows for 5 per cent headroom in its most recent decision.

The second issue is whether there are economies of scale in the provision of retail electricity services and, if so, whether the ACT market is too small to take advantage of them. In the past, ActewAGL Retail has argued that benchmarking retail operating costs to much larger businesses in other jurisdictions fails to adequately compensate them for their efficient retail operating costs. ActewAGL Retail also raised this issue in its submission to the AEMC.³⁶

The Commission is interested in the views of stakeholders on these two important issues.

³⁶ ActewAGL Retail, 2013: 5.

3.3.7 Energy Efficiency Scheme costs

The ACT Government’s Energy Efficiency Scheme places a mandatory obligation on all active retailers in the ACT to promote energy efficiency measures in households and small businesses. The scheme came into effect 1 January 2013 under the *Energy Efficiency (Cost of Living) Improvement Act 2012* (the Energy Efficiency Act).

The terms of reference for this price investigation require the Commission to identify and report on the efficient costs associated with compliance with this scheme.

For the 2012–13 regulatory year, the Commission based Energy Efficiency Scheme costs on estimates in the regulatory impact statement accompanying the Energy Efficiency Act. For the 2013–14 regulatory year, the Commission used estimated costs provided by ActewAGL Retail. In the 2013–14 price adjustment final report, the Commission foreshadowed that it would assess the prudence and efficiency of Energy Efficiency Scheme costs for the regulatory period commencing 1 July 2014.³⁷

The Commission welcomes stakeholder views on how best to determine the prudent and efficient costs of complying with the scheme.

3.3.8 Network costs

Transmission and distribution network costs are paid by the retailer to transport electricity from generators to customers. Transmission and distribution charges are determined by the AER and released each year in early June. The network costs are equal to the sum of transmission and distribution charges paid by ActewAGL Retail.

The AER is currently undertaking a new determination of ActewAGL Distribution’s costs. The determination will cover a transitional period from 1 July 2014 to 30 June 2015 and subsequent regulatory control period from 1 July 2015 to 30 June 2019.³⁸ The transmission network around the ACT is owned by TransGrid. The AER will produce a price determination for TransGrid for the period from 1 July 2014 to 30 June 2019.³⁹

Included in the build-up of efficient distribution costs by the AER are the costs of complying with the ACT Government’s feed-in tariff scheme.⁴⁰ Recent changes to the feed-in tariff arrangements, such as the introduction of medium renewable energy generators in the *Electricity Feed-in (Renewable Energy Premium) Amendment Act 2011*, will have an impact on the distribution charges payable by ActewAGL Retail.

³⁷ ICRC, 2013a: 13.

³⁸ The AER’s upcoming distribution determination for ActewAGL Distribution may be found on its website: www.aer.gov.au/node/11482.

³⁹ The AER’s current transmission determination for TransGrid may be found on its website: www.aer.gov.au/node/3333.

⁴⁰ The AER determination excludes the feed-in tariff scheme costs paid directly by the retailer.

The terms of reference for this price investigation require the Commission to identify and report on the cost allowance of the ACT feed-in tariffs. The Commission will use the AER’s final determination on distribution charges to identify this cost allowance.

As network costs are unavoidable for all retail businesses, the Commission passes through the network costs determined by the AER.

3.3.9 Retail margin

The retail margin provides the return the incumbent retailer earns on the investment it must undertake to provide retail services. The Commission currently applies the retail margin to all of the efficient costs in the pricing model.

The Commission granted a retail margin of 5.4 per cent in 2012 for the period from 1 July 2012 through 30 June 2014. This percentage was based on the extensive research done by IPART and its consultants at that time. As noted earlier, in June 2013 IPART increased the New South Wales retail margin to 5.7 per cent on the recommendation of its current consultants.

For the purposes of this investigation, the Commission is keen to hear stakeholder views on the level of a reasonable retail margin for the next regulatory period.

4 Next steps

This issues paper is the first step in the Commission’s consultation for this price investigation. Stakeholders will have further opportunities to participate in the consultation process.

The proposed timing of the next steps in the investigation process is set out in Table 4.1. The Commission encourages stakeholders to participate in the consultation process.

Table 4.1 Next steps in the retail electricity price investigation

Task	Date
Submissions on issues paper close	15 November 2013
Release of draft report and proposed price direction	14 February 2014
Submissions on draft report close	28 March 2014
Public hearing	April 2014
Release of final report and price direction	6 June 2014

Appendix 1 Terms of reference

Australian Capital Territory

Independent Competition and Regulatory Commission (Price Direction for the Supply of Electricity to Franchise Customers) Terms of Reference Determination 2013

Disallowable instrument DI2013–244

made under the

Independent Competition and Regulatory Commission Act 1997 ('the Act'), Section 15 (Nature of industry references) and Section 16 (Terms of industry references).

Reference for investigation under Section 15

Pursuant to section 15(1) of the Act, I refer to the Independent Competition and Regulatory Commission (the 'Commission') the provision of a price direction for the supply of electricity to franchise customers for such period from 1 July 2014 to be determined by the Commission with provision for annual review where appropriate.

Terms of reference for investigation under section 16

Pursuant to section 16(1) of the Act, I require that the Commission consider the following matters in relation to the conduct of the investigation:

1. The Commission should consider the following matters:
 - a. The impact on direct electricity costs of changes in government policies and pass through of those costs to regulated prices including, but not restricted to:
 - i. the Commonwealth Government's carbon pricing mechanism;
 - ii. Commonwealth and ACT retailer obligation energy efficiency schemes;

- iii. the Commonwealth Government’s Large and Small Renewable Energy Targets; and
 - iv. any other schemes implemented to address climate change relevant to electricity pricing.
- b. The efficient and prudent cost of managing risk in the cost of purchasing electricity.
2. The Commission must identify and report on the cost allowance of the ACT Feed-in Tariffs (small and large scale) for the year(s) or period for which its determination is being made.
 3. The Commission must identify and report on the efficient costs of complying with the *Energy Efficiency (Cost of Living) Improvement Act 2012*.
 4. The Commission must produce its final report in time sufficient to allow ActewAGL Retail to make any necessary changes to its billing system and to provide information on the new tariff to customers for implementation effective 1 July 2014.

Andrew Barr MLA
Treasurer
20 September 2013

Appendix 2 Energy purchase cost model

This appendix summarises the mathematical model the Commission applied in determining the energy purchase cost over the 2012–14 period.

The first step is to present the basic hedging equation as derived in 2010 and applied in 2010 and 2012:⁴¹

$$EPC_s = FP_s \times [(1 - M_s) \times LS_s + M_s \times LR_s]$$

where the following are defined for each quarter s :

EPC_s denotes the carbon-exclusive energy purchase cost.

FP_s denotes the forward price.

M_s denotes the forward price margin.

LS_s denotes the load shape.

LR_s denotes the load ratio.

The portion in square brackets, $[(1 - M_s) \times LS_s + M_s \times LR_s]$, is the uplift factor for each quarter s . As part of the 2012 investigation the Commission recast the original 2010 energy purchase cost model so that it was based on quarterly data.

The next step is to describe the determination of the load shape, the load ratio, and the forward to spot price margin. Define the following for each half hour in each period:

$L_{s,t}$ be the load in period s for the half-hour trading interval t

$SP_{s,t}$ be the spot price in period s for the half-hour trading interval t

FP_s be the forward price in period s for a ‘flat’ or ‘base load’ contract

\widehat{L}_s be the quantity of ‘flat’ forward contracts that have been purchased for period s

\bar{L}_s be the average load in period s which is calculated by:

$$\bar{L}_s = \frac{1}{T} \times \sum_{t=1}^T L_{s,t}$$

⁴¹ See Appendix 4 of ICRC (2012) for the full derivation of this equation.

\overline{SP}_s be the time-weighted average spot price in period s which is calculated by:⁴²

$$\overline{SP}_s = \frac{1}{T} \times \sum_{t=1}^T SP_{s,t}$$

This is contrasted with $\overline{\overline{SP}}_s$ which is the load-weighted average spot price, which is determined by:

$$\overline{\overline{SP}}_s = \frac{\sum_{t=1}^T (SP_{s,t} \times L_{s,t})}{\sum_{t=1}^T L_{s,t}}$$

Three ratios can be calculated from these defined variables:

the load shape, LS_s , defined as the ratio of the load-weighted spot price to the time-weighted spot price for period s :

$$LS_s = \frac{\overline{\overline{SP}}_s}{\overline{SP}_s}$$

the load ratio, LR_s , defined as the ratio of the hedged load to the average load for period s :

$$LR_s = \frac{\widehat{L}_s}{\overline{L}_s} + 0.1$$

the forward to spot price margin, M_s , for period s , defined as the ratio of the forward price less the spot price to the forward price. In other words it is percentage by which the forward price exceeds the time-weighted spot price and is given by:

$$M_s = \frac{(FP_s - \overline{SP}_s)}{FP_s}$$

The load weights, which are equal to the percentage of electricity consumed in each quarter, are calculated as:

$$w_s = \frac{\overline{L}_s}{\sum_{i=1}^4 \overline{L}_i}$$

where \overline{L}_s is the average load for each quarter s .

⁴² In what follows, use of the term ‘spot price’ generally refers to the time-weighted or simple average spot price.

The load weights, which are equal to the percentage of electricity consumed in each quarter, are calculated as:

$$w_s = \frac{\bar{L}_s}{\sum_{i=1}^4 \bar{L}_i}$$

where \bar{L}_s is the average load for each quarter s .

The load weights are applied to determine the annual carbon-exclusive energy purchase cost:

$$EPC = \sum_{i=1}^4 w_s \times EPC_s$$

The following formula shows how the price on carbon is incorporated into this calculation:

$$EPC^C = EPC + C$$

where C is the cost of carbon, which equals the price on carbon as mandated in the legislation multiplied by the national carbon intensity factor.

Abbreviations and acronyms

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
Commission	Independent Competition and Regulatory Commission
COAG	Council of Australian Governments
CPI	consumer price index
Energy Efficiency Act	<i>Energy Efficiency (Cost of Living) Improvement Act 2012 (ACT)</i>
ESC	Essential Services Commission (Victoria)
ESCOSA	Essential Services Commission of South Australia
ICRC	Independent Competition and Regulatory Commission
ICRC Act	<i>Independent Competition and Regulatory Commission Act 1997 (ACT)</i>
IPART	Independent Pricing and Regulatory Tribunal (New South Wales)
LRET	Large-scale Renewable Energy Target
MWh	megawatt hour
QCA	Queensland Competition Authority
SCER	Standing Council on Energy and Resources
SRES	Small-scale Renewable Energy Scheme

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