

Developing a reference price methodology for Victoria's energy market

Consultation paper

20 March 2018



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Summary

The Victorian Government has requested that the Essential Service Commission monitor and report on the competitiveness and efficiency of the Victorian energy retail market. As part of this monitoring and reporting role, the commission will develop a methodology for determining an efficient price.

The Victorian Government has asked the commission to prepare its pricing methodology to enable publication of a reference price for the purposes of monitoring and assessing the efficiency and competitiveness of the energy market from 1 July 2018.

This request gives effect to recommendation 8A from the final report of the Independent Review of the Electricity and Gas Retail Markets in Victoria, which recommends enhancing the commission's market monitoring roles and responsibilities. The commission will deliver its competitiveness review will by the end of 2019.

In this paper, we propose a methodology to establish a reference price for Victoria's electricity and gas retail markets that addresses the request made to the commission. This would not prevent further consultation and refinement of the methodology. The proposed methodology is based on existing regulatory pricing practices and applies either publicly available data or established benchmarks.

We welcome feedback on this approach, including written submissions, by 17 April 2018.

1. Introduction

1.1. Background

In November 2016, the Victorian Government appointed an independent bi-partisan panel to conduct a review of electricity and gas retail markets in Victoria. The government announced the review, following a number of public reports suggesting Victorians were paying too much for energy.¹

In August 2017, the review panel released its final report and concluded the market was not working for consumers.² In reaching its conclusion, the review panel found Victorians were paying ‘unusually high’ electricity prices compared to other jurisdictions.³ It also reported a 200 per cent increase in energy prices since 2000, with retail charges – the component of the bill that covers the retailer’s costs and profits - being a major contributor to the overall energy price.⁴

The review panel concluded there were three main reasons why the market was not working for Victorian consumers – the cost of competition, the structure of the market and the practices of the industry.⁵ The review panel considered competition has added additional costs to the market without delivering the cost reductions generally attributed to rival behaviour in a competitive market. The review panel considered marketing practices by energy companies were not supporting customers to choose the best price.⁶

Having reached these conclusions, the review panel made 29 recommendations aimed at improving energy market outcomes for consumers, including changing retailer marketing practices, improving market monitoring, establishing a regulated basic service offer and abolishing standing offer contracts.⁷

In March 2018, the government released its Interim Response, announcing support for the recommendations from the review panel, except for two recommendations – introducing a basic

¹ Victorian Government 2016, *Terms of reference for Independent Review of the Electricity and Gas Retail Markets in Victoria*, November

² Independent Review Panel, *Independent Review of the Electricity and Gas Retail Markets in Victoria*, August 2017, p.ix

³ *ibid*, p.ix

⁴ *ibid*, p.viii

⁵ *ibid*, p.ix

⁶ *ibid*, p.ix

⁷ *ibid*, p.xi-xiii

service offer and abolishing standing offer contracts.⁸ The government said it was undertaking further analysis of the application and scope of a basic service offer (BSO) and abolishing standing offers, or appropriate alternatives, and their effects on Victoria's energy sector.

The government also announced it would request the Essential Services Commission to immediately give effect to the review panel's recommendations which focus on improving customer outcomes in the market and promoting efficient pricing in the energy retail market by:

- reviewing the Energy Retail Code to improve marketing and billing information⁹
- reviewing its codes and guidelines, including the Energy Retail Code, to ensure a focus on customer outcomes and to account for new business models of service provision¹⁰
- monitoring and reporting on the competitiveness of the retail energy market.¹¹

1.2. Purpose of this consultation paper

The purpose of this paper is to commence consultation with the Victorian community regarding the commission's proposed methodology for an electricity and gas reference price. The paper seeks feedback on the commission's proposed pricing methodology.

This paper does not consider changes to the commission's energy codes, including changes to improve marketing and billing information. We will consult on these changes separately.

1.3. Regulatory framework

The commission is developing its reference price methodology within its existing legislative and regulatory functions.

The commission is established under the *Essential Services Commission Act 2001*, to promote the long-term interests of Victorian consumers while having regard to efficiency, financial viability, competition, and the benefits and costs of regulation.¹² The commission is also guided by objectives under *the Electricity Industry Act 2000 (Vic)* and *Gas Industry Act 2001 (Vic)* to promote the development of full retail competition, promote customer protections, and where practical, promote a consistent regulatory approach to the provision of gas and electricity.¹³

⁸ Victorian Government 2018, *Victorian Government Interim Response: Bipartisan Independent Review of the Electricity and Gas Retail Markets in Victoria*, March, p.2

⁹ *ibid*, p.2

¹⁰ *ibid*, p.2

¹¹ *ibid*, p.2

¹² ss 8 and 8A *Essential Services Commission Act 2001 (Vic)*,

¹³ s 10, *Electricity Industry Act 2000 (Vic)* and s 18, *Gas Industry Act 2001 (Vic)*

The legislation establishing the regulatory framework for the energy industry in Victoria assigns to the commission a range of functions and powers, including the power to grant licences to energy market participants and report on the performance of energy companies. It also enables the commission to seek information from regulated businesses for the purposes of promoting its objectives.

1.4. Structure of the consultation paper

This consultation paper is divided into the following chapters:

Chapter 2 describes pricing in the energy market, including the history of retail pricing reforms and the current state of the market.

Chapter 3 sets out potential methodologies for a reference price.

Chapter 4 outlines our proposed methodology for a reference price.

1.5. Next steps

1.5.1. Consultation

Readers are invited to make submissions in response to this consultation paper.

Submissions should be made by **5pm 17 April 2018**.

Submissions, preferably in electronic format, and marked Submission to Developing a reference price methodology for Victoria's energy market: Consultation Paper, should be sent

By email to: RetailEnergyReview@esc.vic.gov.au

By mail to: Essential Services Commission

Level 37, 2 Lonsdale Street

Melbourne, Victoria 3000

Submissions will be made available on the commission's website, except for any information that is commercially sensitive or confidential. Submissions should clearly identify which information is sensitive or confidential.

1.5.2. Implementation plan

This consultation paper sets out the commission's preferred methodology for a reference price. After we receive feedback on this approach, we will establish the methodology to inform our competitiveness review of the energy market.

The commission will be seeking data from retailers. This data will assist the commission in benchmarking its interim figures and refining the methodology through our review.

2. Pricing in the energy market

2.1. Purchasing energy in Victoria

In Victoria, most customers purchase electricity or gas from energy retailers.

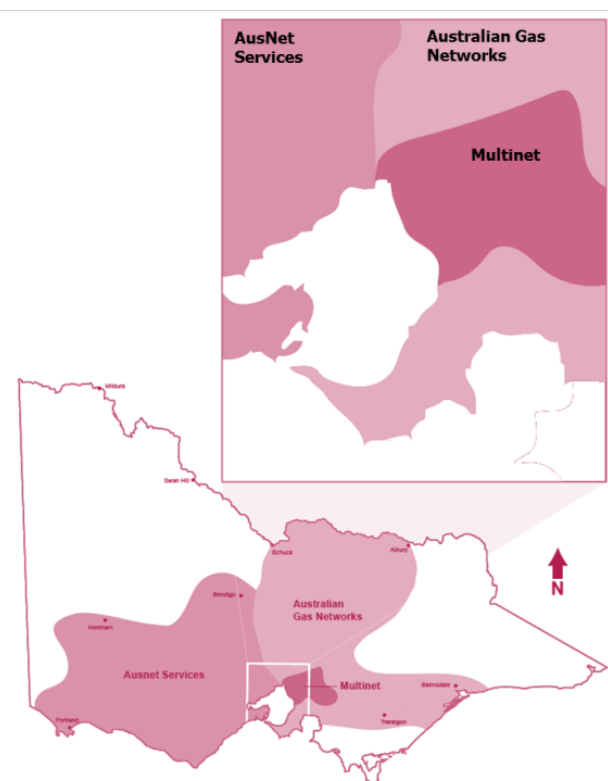
Retailers buy energy in wholesale markets, including the National Electricity Market and the Declared Wholesale Gas Market. The National Electricity Market is an interconnected network along the eastern seaboard, comprising of generators fuelled by a range of sources including gas, coal and renewable energy. Most gas bought by retailers is purchased using bilateral gas supply agreements. Gas producers are primarily based in Victoria's Gippsland Basin.

Energy retailers also make arrangements with distribution companies that deliver the energy – electricity through poles and wires, and gas through pipelines. The distribution companies also measure the amount of energy each customer uses and pass that information onto the retailers. The retailers use this information to issue customer bills. In Victoria, there are five electricity distribution companies and three gas distribution companies.

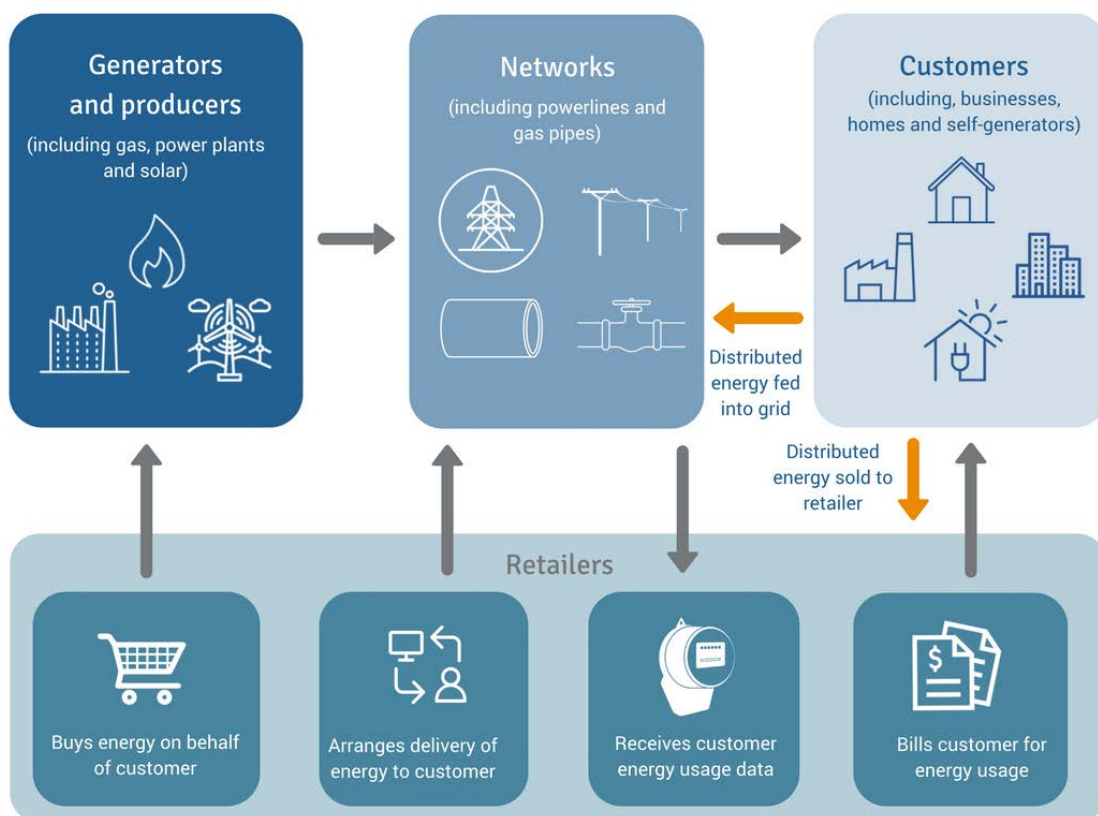
For electricity



For gas



The price energy retailers charge covers the wholesale cost of energy, the cost of delivering it to customers, and the cost of government policy obligations to buy a proportion of renewable energy and energy efficiency services. The price also covers the retailers' cost of billing and customer service and their profit margin.



When retailers set their prices, they will estimate how much they expect to pay for wholesale energy and its delivery to their customers through the distribution network. The price that distribution businesses can charge for delivering energy is determined by the Australian Energy Regulator.

Retail prices can be structured in different ways. All current price structures, or tariffs, include a fixed or supply charge that does not change with the amount of energy consumed, and a variable charge related to consumption.

In the electricity market there are three main types of variable prices offered to customers: a single rate (or flat) tariff, a flexible tariff and block tariffs.

- A single rate tariff charges the same price for all electricity consumption.
- A flexible tariff will charge a customer depending on the time when electricity is consumed. This may be based on the time of day, time of the year (usually summer and non-summer), or both.

- Block tariffs charge different rates based on how much energy is consumed. The rate for each block often is cheaper the more energy consumed.

Gas customers are charged for their usage in what is known as a declining block tariff structure. Under this arrangement, the unit price decreases as a customer uses more gas. Customers are also charged a higher price during the peak or 'winter' months of June to September and are also subject to a fixed charge.

Retailers currently offer different prices for residential and small business customers. Small business prices are generally more expensive than residential prices for electricity, but cheaper for gas customers.

It is worth noting that the tariff structures currently offered by retailers for both gas and electricity are done so on the basis of the underlying network tariff structure. When retailers derive their tariff structures they are reflecting the underlying tariff structures they are paying to the relevant network operators. There are five network zones for electricity and 13 network zones for gas, each with their own tariff structure and level of prices.

2.2. History of pricing reform

Since the 1990s, the Victorian Government has embarked on a series of energy market reforms, aimed at delivering a privatised and competitive energy market.

In 1993, the then Victorian Government commenced the reform process by structurally separating and corporatising the assets of the state-owned State Electricity Commission of Victoria, and over time privatising each of these new entities.

In 2002, the Victorian Government introduced full retail competition into the energy retail market, empowering customers to choose their own energy retailer. However, the Victorian Government maintained price controls, by regulating the standing offer for customers.

In 2008, the Australian Energy Markets Commission (AEMC) completed its inquiry into the effectiveness of competition in the Victorian energy retail market, finding that the market was effectively competitive, leading to the removal of all retail price controls from 1 January 2009.

2.3. Observations since price deregulation

Since prices were deregulated in 2009, Victoria's energy market has grown in size and activity. Retail prices have also increased, and new marketing practices have emerged, such as discounting.

2.3.1. Number of retailers

The number of energy companies participating in Victoria’s energy retail market has grown significantly – there are currently 27 electricity retailers and 14 gas retailers in Victoria. However, some regional locations in Victoria still only have one gas retailer servicing them. For example, gas consumers in Mildura can only buy energy from one retailer.

2.3.2. Customer transfers

By international standards, customer transfer rates are high in Victoria’s energy market.

Twenty-five per cent of domestic and small business electricity customers and 21 per cent of gas customers changed retailer in 2016–17.¹⁴ This is similar to the preceding two years and Victorian transfer rates remain higher than other states. However, transfer rates should always be treated with caution. We estimate only 12 per cent made an ‘active’ choice to change electricity retailer throughout 2016–17.¹⁵ The remaining transfers represent customers who opened a new account (e.g. because they moved into a new premises).

2.3.3. Retail prices and margins

Retail prices have increased significantly over the past decade.

In its final report, the review panel found both electricity and gas prices had grown 200 per cent since 2002 and 140 per cent since 2009.¹⁶ It also noted retail charges – the component of the bill that covers the retailer’s costs and profits from selling energy – accounted for 30 per cent of a typical residential energy bill in 2016–17 (or \$423 per year).¹⁷

In its Retail Electricity Pricing Inquiry’s preliminary report, the ACCC reports a 50 per cent increase (in real terms) in retail charges between 2007–08 and 2015–16.¹⁸ The highest retail shares of costs were in Victoria (the most developed competitive market) and the lowest retail costs are in Tasmania (where prices are regulated).¹⁹ The ACCC attributes the cost increase to costs to service customers and costs to compete (acquisition and retention costs).²⁰

We also reported growing retail costs in 2013. Following a review into retail costs and margins, we found average net margins in retailer standing offer prices increased from 13 per cent to 27 per

¹⁴ Essential Services Commission 2017, *Victorian Energy Market Report 2016–17*, November, p.20

¹⁵ *ibid*, p.20

¹⁶ Independent Review Panel, *op cit*, p.6

¹⁷ *ibid*, p.16

¹⁸ ACCC 2017, *Retail Electricity Pricing Enquiry: Preliminary Report*, September, p.73

¹⁹ ACCC, *ibid*, p.73

²⁰ ACCC, *ibid*, p.74

cent from 2009–10 to 2011–12.²¹ For the same period, average net margins in retailer market offer prices increased from nine per cent to 13 per cent for large-sized retailers (AGL, Origin Energy and EnergyAustralia), and five per cent to 11 per cent for medium-sized retailers.²²

Discounting

Discounts have also emerged as a marketing practice of choice for energy companies retailing in Victoria.

Most market offers include discounts on retailers published standard contract offers. Customers can make substantial savings by switching to a discounted contract from a standard contract offer. Savings from switching can range from \$30 to \$270 annually for an average customer,²³ depending on existing arrangements.²⁴

Customers can also be heavily penalised if they don't comply with the conditions of a discount or identify the price benchmark for the discount. For example, energy companies often market discounts off their 'standard rates'. However, these rates are unregulated and vary across retailers, making it difficult for customers to know what their discount is being pegged against. The highest discount in percentage terms does not also necessarily result in the cheapest bill. For example, we have identified numerous offers with discounts between 10 and 37 per cent that result in broadly the same annual cost for an average customer.²⁵ In fact, as at 30 June 2017, the best-priced contracts involved no discounts at all.²⁶

²¹ Essential Services Commission 2013, *Retailers margins in Victoria's electricity market*, May, p.12

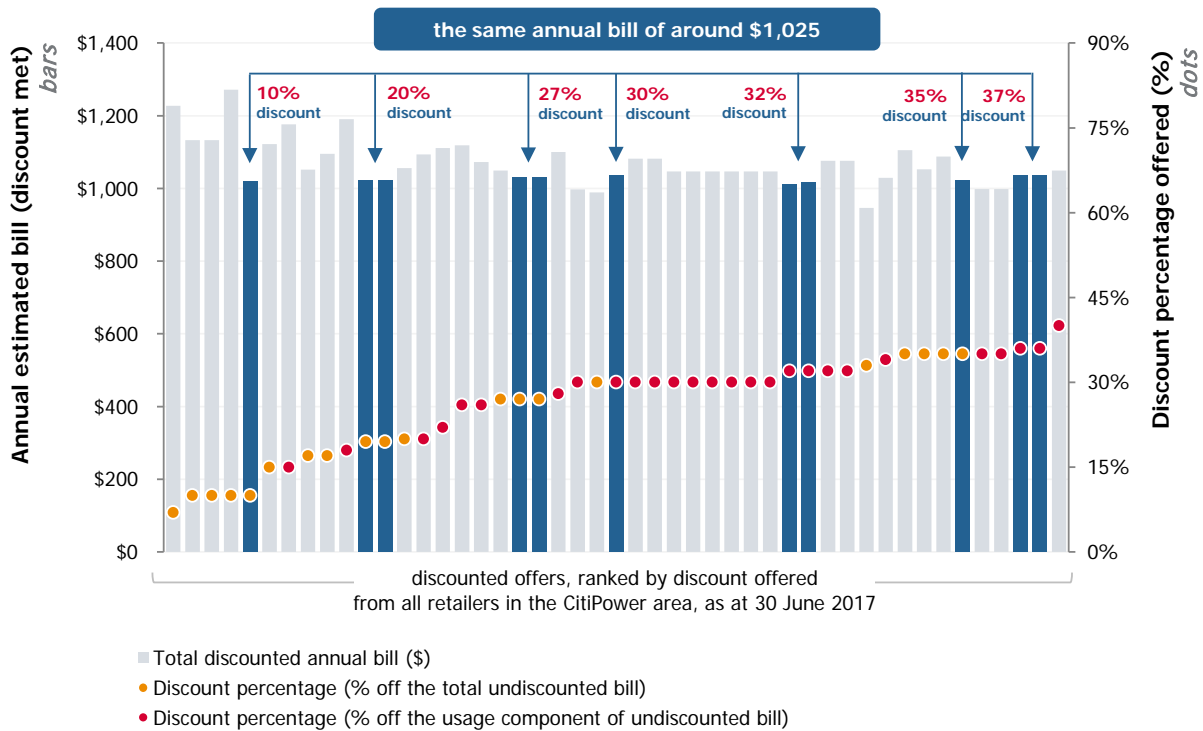
²² *ibid*, p.12

²³ Essential Services Commission 2017, *op cit*, p.33

²⁴ Average customer is assumed to consume 4,000kWh per year

²⁵ Essential Services Commission 2017, *op cit*, p.37

²⁶ Essential Services Commission 2017, *Victorian Energy Market Report: Update*, September, p.5



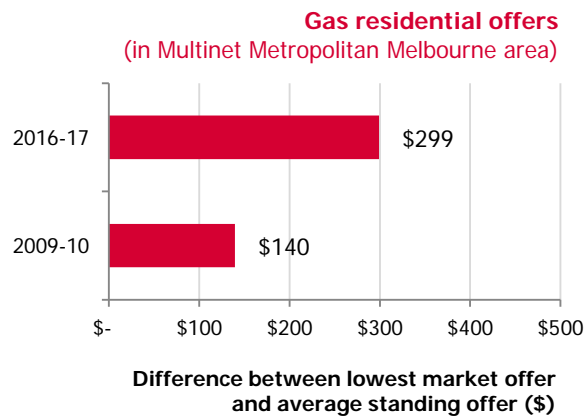
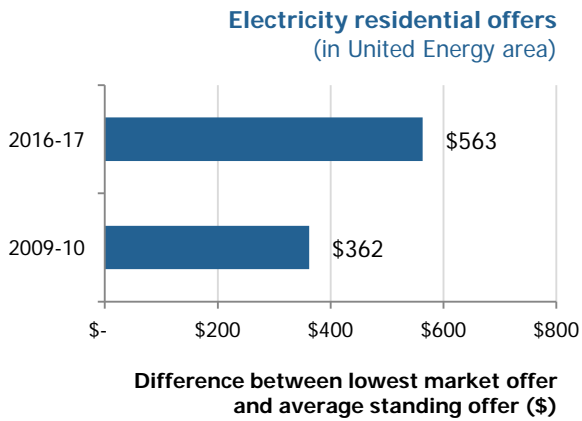
Price dispersion

Price dispersion refers to the differences in prices that are offered by retailers for a similar product. Price dispersion across energy products has also increased since 2009.

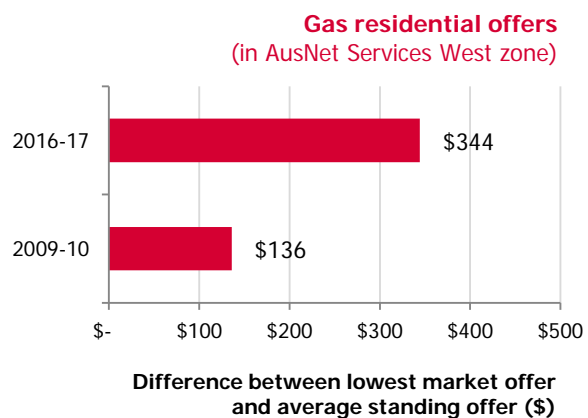
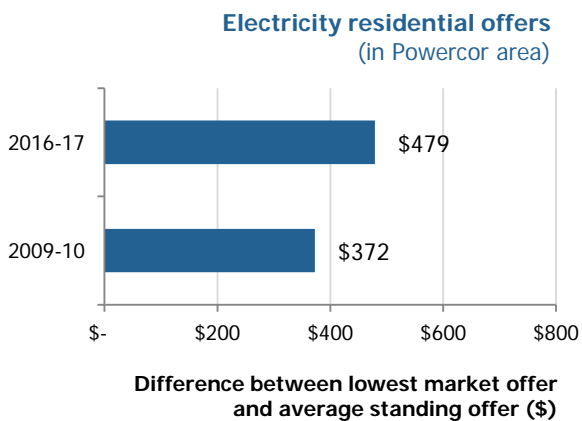
In metropolitan Melbourne, the price difference between the average residential standing offer and the cheapest market offer was approximately \$362 for electricity²⁷ and \$140 for gas²⁸ in 2009–10. In 2016–17, these price differences rose to \$563 for electricity²⁷ and \$299 for gas²⁸.

²⁷ Based on the United Energy electricity distribution zone. Figures are in 2017 dollars, excluding GST.

²⁸ Based on Multinet gas distribution supply zone (the average of Main 1 and Main 2 supply zones for 2009–10, and Melbourne Metropolitan supply zone in 2016–17). Figures are directly scaled to account for 60GJ usage assumption in 2009–10 to 54.4GJ usage in 2016–17. Figures are in 2017 dollars, excluding GST.



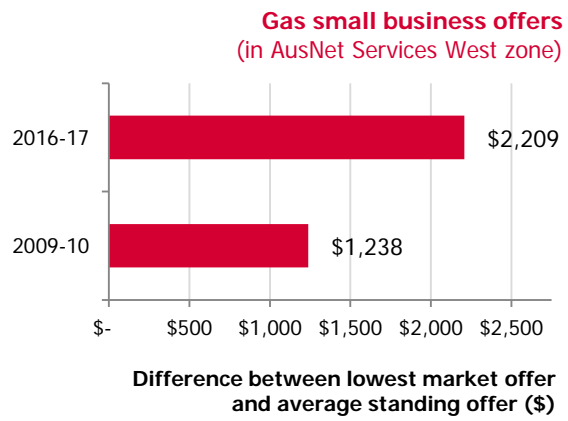
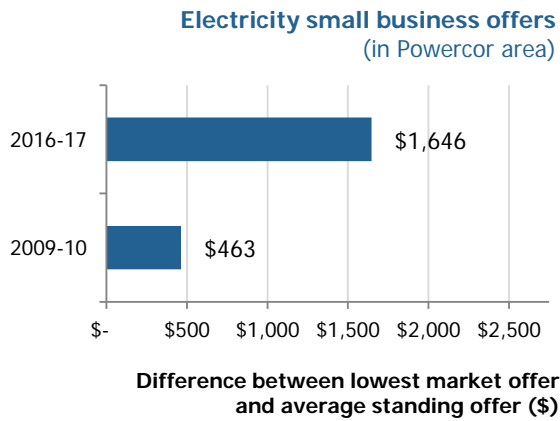
We have observed a similar trend in regional communities. For example, in western Victoria, price dispersion has increased from \$372 to \$479 for electricity²⁹ and \$136 to \$344 for gas³⁰ since 2009–10 for households.



For small businesses in regional Victoria, the price difference between the highest and lowest price product has increased from \$463 in 2009–10 to \$1,646 in 2016–17 for electricity²⁹, and from \$1,238 in 2009–10 to \$2,209 in 2016–17 for gas³⁰.

²⁹ Based on the Powercor electricity distribution zone. Figures are in 2017 dollars, excluding GST.

³⁰ Based on the AusNet Services gas distribution zone (West supply zone). Figures are in 2017 dollars, excluding GST.



Number of offers

The number of energy offers available to consumers in Victoria's energy retail market has also increased. In 2009–10, there were on average, around 78 market and standing offers available to a typical residential customer in Victoria. In 2016–17, this increased to around 230 offers for a typical household customer in Melbourne (including standard contract offers).

3. Establishing a reference price

The government's interim response stated that the commission would monitor and report on the competitiveness of the retail energy market. In giving effect to recommendation 8A from the independent panel's review, the commission has been requested to develop and apply a methodology that would enable a reference price to be published from 1 July 2018. It is intended that this reference price can inform the commission's view of the efficient cost of providing electricity and gas services to residential and small business customers. Further, it will be used to form part of the commission's assessment into the competitiveness and efficiency of the Victorian energy retail market.

The commission is required to consult on the methodology for the development of a reference price, including with consumers, consumer advocates, energy businesses, relevant experts and other regulators.

3.1. Developing a reference price

In developing our methodology, the commission will use the scope and factors outlined the terms of reference issued to us by government.³¹

There are a number of ways in which to determine a reference price. The two primary approaches are cost-based or index-based. A cost-based approach is where a regulator determines the costs that a retailer would incur in providing its services. In the energy market the cost components are well known and include the following:

- wholesale costs reflecting the cost to generate electricity or produce gas
- network charges reflecting the cost of delivering the energy to the customer's location
- environmental scheme costs representing the purchase cost of renewable energy certificates and Victorian energy efficiency certificates to meet retailer obligations under these schemes
- retail operating costs including billing and revenue collection systems, IT systems costs, call centre costs, corporate overheads, energy trading costs, provision for bad and doubtful debts, and any regulatory costs
- the retail margin (the energy retailers' profit margin)
- other costs including smaller items not included in the main categories such as transmission and distribution losses, NEM fees, ancillary service fees and retailer of last resort obligations.

³¹ Attachment 2: Terms of Reference, March 2018.

An indexed-based approach is based on a forecast of future productivity. Under this approach a reference price would be adjusted each year consistent with an expected long term productivity improvement in retailers input costs.

A requirement of an index-based approach is a starting point from which to index prices going forward. One option in establishing a starting price in a competitive market would be based on observed prices in the market in a chosen base year. Under this option a regulator could examine a sample of market offers and establish relatively simple criterion for establishing a ‘reasonable’ price as a starting point (for example: the median of the best available offers of all retailers).

3.2. Estimating the costs of supply

A cost-based approach requires estimates of the different components that make up the cost of energy. Each of the component costs needs to be assessed separately, as there are a number of approaches that may be used to estimate each component. Figure 1 below outlines the different cost components for electricity and gas.

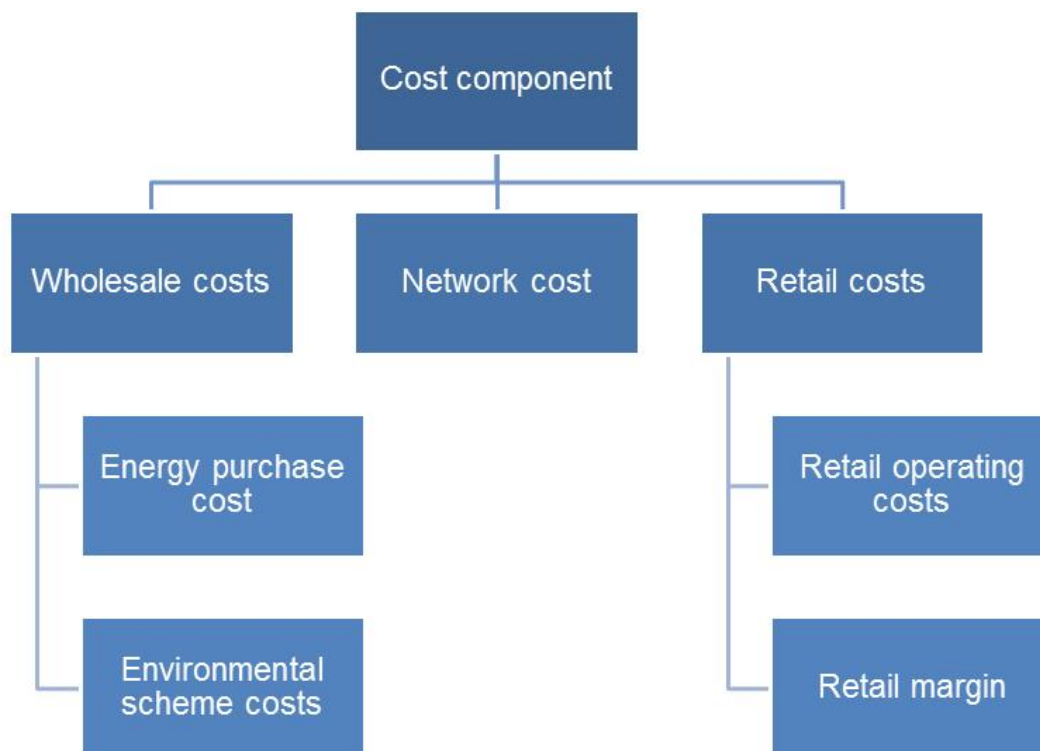


Figure 1 Cost components of electricity and gas

3.2.1. Wholesale electricity costs

Retailers purchase energy from the wholesale market to meet the demand of their customers. In the wholesale market (which is operated by the Australian Energy Market Operator) the supply and demand for electricity is balanced in real time. Generators offer prices for the supply of electricity, and based on how much electricity is consumed, a spot price is determined every half hour.³²

Spot prices can be highly volatile, depending on the supply and demand conditions of these half hour time intervals. Prices are typically higher on hot summer days as customers significantly increase consumption to run their air conditioners. During January 2018, the highest spot price in Victoria was \$12,931 /MWh, compared to the average price for that month of \$140 /MWh.

Retailers sell electricity to customers at a price that is usually left unchanged for a period of time. The volatility in the spot price therefore represents a risk the retailers must manage.

Retailers can generally manage this risk by entering into contractual arrangements where the price they will pay for electricity is set in advance. This approach to reducing the risk of price volatility is referred to as hedging. A retailer may enter into a hedging arrangement either by contracting directly with a generator or through the futures market that is facilitated by the Australian Stock Exchange (ASX). There are four main products traded on the ASX futures market for hedging purposes:

- base load swap – a contract to trade a fixed amount of electricity for a certain price at all times in a day
- peak swap – similar to a base load swap, but applying to trade only during the peak time period
- off-peak swap – similar to a base load swap, but applying to trade during the off-peak time period
- caps – a contract that gives the holder the option to buy a given amount of electricity at an agreed price.

Some retailers also own generation assets, which can be viewed as a physical hedge.

Two approaches are typically used by regulators to estimate wholesale electricity costs:

- a long-run marginal cost (LRMC) approach, and
- a market based approach.

These approaches are discussed in the following sections.

³² In November 2017, the Australian Energy Market Commission determined the national electricity market would move to a five minute settlement period from 1 July 2021.

Long-run marginal cost approaches

The long-run marginal cost approach seeks to estimate what a retailer will pay for electricity purchases based on the long-term costs of providing sufficient generation to meet future demand.

A number of different methods may be used to estimate long-run marginal cost.

- Average incremental cost. A least cost combination of generation is estimated to satisfy an increase in demand for a given year. It takes account of existing generation, and allows for future demand to be met by a mix of existing generation and the new generation.
- Perturbation (or Turvey) method. This approach estimates the cost of bringing forward new generation to meet an incremental change in demand over a future time period. It takes account of existing generation, and allows for future demand to be met by a mix of existing generation and the new generation.
- Greenfield method. The cost of building completely new generation to satisfy demand is estimated (i.e., it assumes that there is no existing generation to meet demand).

The calculation of long-run marginal cost under any of these methods relies heavily on forecasts of supply and demand. A number of underlying assumptions which influence the results of the analysis are also required, including:

- the choice of generation technology and whether the change in demand is met by a single generation plant or multiple plants with different cost structures
- the capital and operating costs of generation plant(s)
- the time horizon – the forecast period of the long-run marginal cost model can have an impact on generation technologies selected
- interconnection across the other states in the NEM.

The above requirements mean that developing a long-run marginal cost can be challenging with so many assumptions being contestable.

Because the methods are 'long-run', in which all inputs (including capital) are variable, they may not sufficiently take account of short-term dynamics, and the reliance on input assumptions means that the estimates can diverge significantly from market prices.

Market based approaches

Market based approaches aim to simulate the operation of the wholesale market. The two most common methods used are:

- the futures market method, and
- a market modelling method.

Both methods require assumptions to be made about a reasonable hedging strategy, which is then overlaid on the market modelled prices. These two methods are described in the following sections.

Futures market method

The futures market approach constructs a least cost hedging portfolio to minimise wholesale electricity costs for supplying a customer load profile, given an efficient risk management strategy. In developing this approach, an optimisation model is developed that requires a number of key inputs.

- Customer load profile – a forecast of half hourly demand for the period in which prices are being set.
- Risk management strategy – retailers hedge their exposure to the spot price by buying futures products in advance to cover their customer load, allowing them to offer firm forward retail prices to their customers. An assumption regarding a retailer's risk appetite needs to be made under this approach.
- Futures contract prices – prices for futures products consistent with the pre-hedging period. For example, if the pre-hedging period is one year, that would imply that retailers would enter into futures contracts over a one year period in advance of the forecast spot year.
- Wholesale pool price forecast – as the hedging optimisation model is constrained by futures products that are for defined electricity amounts for periods of time (base load is for electricity purchased at any time, while peak load is for electricity purchased between 7.00am and 10.00pm Monday to Friday), there will always be a mismatch between contracted quantities via the futures market and actual customer demand. The revenue settlement between the futures price and the spot pool price needs to be calculated (pool settlement) and incorporated in estimating wholesale costs. This requires a forecast of pool prices for the year in question to be developed.

The futures market approach tries to replicate the process retailers undergo to minimise wholesale electricity costs, it is therefore considered by many jurisdictional regulators to be a more accurate reflection of real retailer costs compared to other approaches.

In order for this approach to produce a reliable estimate for electricity purchasing costs, there needs to be a sufficient level of trading in the market. The level of trading in a market, both in terms of number of trades as well as the volume of electricity traded, is referred to market liquidity. The more liquidity in the market, the more the market prices can be relied upon to represent what retailers will be paying for electricity.

The futures market method is the most transparent method for estimating wholesale electricity costs as it relies more on publicly available data, making it easily observable.

Market modelling method

This method is very similar to the futures market method, except under this approach the future contract prices are estimated using computational models which attempt to predict the outcome of the wholesale market. This approach requires a large number of assumptions regarding the costs of generation, regional demand and the bidding behaviour of generators.

A major criticism of this approach is its lack of transparency. The models used to estimate the wholesale electricity costs under this approach are often proprietary and therefore not readily observable.

3.2.2. Wholesale gas market costs

Retailers purchase most of their gas directly from suppliers using gas supply agreements (GSA). These agreements generally specify annual contract quantities (ACQ), with some flexibility to allow for days when consumption peaks. The degree of flexibility in GSAs varies with each contract and may range from maximum daily quantities (MDQ) being 10 to 30 per cent higher than average daily quantities.

Unlike the electricity market, there is no Victorian gas spot or futures market and the Victorian Declared Wholesale Gas Market (DWGM) is only used to manage imbalances in forecast supply and demand schedules. Only 5 to 15 per cent of total gas demand is sold through this market.

Two approaches to estimate wholesale gas costs have been identified and are described in the following sections.

Market based approach

Under the market based approach, the LNG netback price – the price of LNG less the cost of liquefaction and shipping – can be used as a proxy for the opportunity cost of gas supply to the east coast gas market. This is because most large east coast gas suppliers have the option to supply gas for LNG exports.

LNG prices for most Pacific Basin LNG supply contracts are linked to the price of Japan Customs-cleared Crude (or JCC) which is closely linked to the price of Brent Crude. This relationship of LNG and JCC is based on a pricing formula that varies with LNG supply contracts, but typically takes the form as shown below.

$$\text{LNG} = (a * \text{JCC} + b)$$

where:

- JCC is the price of Japan Customs-cleared Crude (closely linked to Brent)
- *a* determines the degree to which the LNG price is linked to the price of JCC. It is typically between 0.12 and 0.15

– b is a constant term.

As Brent futures are traded extensively, the price of Brent futures can be used to forecast the price of LNG in the Pacific Basin.

The market based approach could be used to forecast wholesale cost of gas based on the following inputs.

- Annual contract quantity costs can be calculated based on the forecast of LNG netback prices, being LNG prices adjusted for the cost of liquefaction and transportation.
- Maximum daily quantities costs can be based on pricing benchmarks obtained from peaking gas providers (such as storage providers Iona and Dandenong LNG supply). In addition, park and lend services provided by gas transporters can also be used to assess the cost of peaking gas.
- Establishing an efficient contracting strategy – in an efficient market, retailers would have entered into GSAs for firm supply of gas well before the spot year.

The market based approach is conceptually sound, simple to implement and relatively transparent. However, this approach relies on there being a strong relationship between the prices paid by retailers in their GSAs and the international price of gas.

The Independent Pricing and Regulatory Tribunal (IPART) engaged NERA and Marsden Jacobs to undertake a market based approach when it last reviewed gas prices in New South Wales in June 2016.³³

Actual cost approach

This approach requires the assessment of actual underlying GSAs, and contracts for peaking gas supply. An efficient retailer would have GSAs and peaking contracts from a variety of gas suppliers delivering gas from different gas supply regions. The GSAs would also be of differing contract periods, provide for different flexibility and take or pay arrangements and have different pricing structures.

³³ NERA Economic Consulting 2016, *Forecasting wholesale gas costs for standard retail gas suppliers in NSW*, April.

In an interconnected east coast gas market, this diversity of gas supply options (including flexibility in contracts), coupled with trading gas in the Declared Wholesale Gas Market and the short term trading market provides retailers with the ability to optimise gas costs by taking advantage of trading opportunities across a diversity of demand conditions in regional markets.

While the option of basing gas costs on existing contracts may be accurate in the sense that it reflects a point in time estimate of actual costs faced by market participants, there are a number of potential drawbacks and implementation challenges:

- Deciding the exact mix of contracts that supply the Victorian market, and therefore estimating an accurate cost estimate, would be complex. Linking GSA contracts to particular regions/markets is difficult as the east coast market is by construct interconnected. Gas can be supplied from multiple sources. This presents difficulties when attempting to use state specific GSA contracts to reflect the wholesale gas price that an efficient retailer would face in a particular state.
- Historical contract prices may not reflect current contract prices – given that GSA contract terms can span multiple years, using these prices may not reflect an efficient price at the time of determining the wholesale gas price.
- GSAs are confidential documents so access may be limited. Even where contracts are available, as they are confidential this key input information would not be able to be shared with market participants or other stakeholders, and could diminish confidence in the regime.

3.2.3. Network costs: electricity and gas

Retailers pay network providers to transport the energy they sell to their customers via poles and wires for electricity and pipelines for gas. In Victoria, there are five electricity and three gas distribution networks, as well as a transmission network. The charges that are levied by network providers are approved by the Australian Energy Regulator (AER) on an annual basis.

When establishing a retail price, the network tariff components can be subject to a simple pass-through arrangement. As the majority of retail price structures mimic the underlying network tariff structure, this is a straightforward approach.

3.2.4. Environmental scheme costs

Retailers in Victoria currently face a number of environmental costs.

- The Commonwealth government's renewable energy target scheme – comprising the large-scale renewable energy target (LRET) and the small-scale renewable energy scheme (SRES). The LRET is designed to encourage renewable energy generation by creating a market for renewable energy certificates, while the SRES supports the installation of small-scale renewables, such as household solar rooftop panels and solar hot water systems.

- Victorian Energy Upgrades Program – which places a liability on Victorian energy retailers (both electricity and gas) to surrender a specified number of Victorian Energy Efficiency Certificates each year.
- Feed in tariff schemes – requires retailers to purchase electricity fed into the grid by a distributed generator at a minimum rate, taking account of avoided wholesale and other costs and environmental benefits.

The approach to estimating the costs for each of these schemes are outlined below.

Large-scale renewable energy target scheme

The large-scale renewable energy target scheme operates through the creation of tradable certificates. One mega-watt hour of renewable energy generation from accredited power stations creates one certificate. The amount of renewable energy that must be generated each year is specified in the *Renewable Energy (Electricity) Act 2000 (Cth)*. An obligation is placed on electricity retailers to purchase and surrender a certain number of certificates each year to meet their renewable energy obligations.

There are two broad approaches that could be used to forecast the cost of participating in the LRET scheme.

- Cost based approach: Undertake a modelling approach to forecast the cost of certificates. This would rely on a LRMC model that would reflect the timing and cost of investment to meet the target.
- Market-based approach: Rely on spot and futures market prices and then multiply by the retailer's forecast liability.

Small-scale renewable energy scheme

Under the small-scale renewable energy scheme (SRES) all retailers are required to purchase small-scale renewable energy technology certificates (STCs). All STCs are required to be registered in the renewable energy certificate registry. Once registered, STCs can be traded in the open market. Unlike the LRET market, there is not a well-developed futures market for STCs.

Given the above, the approaches to estimating STC future prices are relatively limited. We consider that there are two possible approaches to estimate this cost component:

- basing future prices on historical prices, for example, average market prices over the preceding 12 months
- modelling the STC price based on forecasts of the electricity demand and small-scale installations.

Victorian energy efficiency target

Similar to the LRET, the VEET scheme places an obligation on Victorian energy retailers (both electricity and gas) to surrender a specified number of Victorian energy efficiency certificates (VEECs) every year. If the retailer falls short of certificates it must pay a penalty.

Over the past 12 months the VEEC price has been between \$10 and \$20, averaging around \$15. While the ESC maintains the VEET register, we do not have information on the level of liquidity in forward VEET certificates, but note that in the case of the NSW ESC scheme, forward liquidity is low.

We consider that the options for the VEET are the same as for the SRES. For VEET, historical certificate price data is available and provide some guidance as to future market costs, given current information.

Feed in tariff

Under energy laws, Victorian energy retailers must purchase energy fed into the grid by a distributed generator at a minimum rate, taking account of avoided energy costs and environmental benefits. The minimum rate is updated by the commission on a financial year basis, using a market model approach.

3.2.5. Retail operating costs

Retail operating costs consist of all of the costs incurred by the retailer in conducting its business. These costs can be separated into two main sub-categories.

- Operational costs – a range of costs include billing and revenue collection systems, IT systems costs, call centre costs, corporate overheads, energy trading costs, provision for bad and doubtful debts, and any regulatory compliance costs.
- Competition costs – the costs associated with acquiring new customers and retaining existing customers, and include general marketing, business development, promotions and sponsorships, costs of transferring customers to and from other retailers.

Consistent with the recommendation by the Panel, the terms of reference state that the commission must not include competition costs associated with acquiring new customers and retaining existing customers in the reference price.

There are two broad approaches to estimating retail operating costs, bottom-up and benchmarking approaches. Most Australian regulators have adopted a combination of these two approaches in their recent reviews into retail prices. The following discussion provides more detail on these approaches.

Bottom-up approach

The bottom-up approach involves requesting operating cost data from retailers operating in Victoria. The data is then analysed to build up a view of efficient retail operating costs with consideration to differences in cost structures between retailers.

The bottom-up approach should provide the most accurate estimate of retail operating costs as it is based on actual data, although it is relatively time intensive.

Benchmark approach

A benchmarking approach utilises publicly available data on operating costs that can usually be sourced from annual reports. It is also common practice to adopt a benchmark based on the decisions of other Australian regulators, based on the assumption that retail operating costs are similar across these jurisdictions. Most regulators use benchmarking as a check against the bottom-up method.

The benchmarking approach is relatively simple to implement and transparent. However, when relying on publicly available data, sourcing this data can be challenging.

3.2.6. Retail operating margin

The retail operating margin (ROM) represents the return that a retailer requires to support sufficient capital in order to finance the ongoing operation of its business. The ROM needs to compensate the investor for the capital invested in the business and the non-diversifiable risks associated with the investment.

It is important that risks that are accounted for in other components of the cost stack are not double counted in the ROM. For example, if the risk associated with forecast future energy costs are reflected in the wholesale energy cost component then they should not also be included in the ROM.

Three methods are typically used in Australia to estimate the ROM. These are described below.

Expected returns approach

The expected returns approach sets the retail margin at a level so that there is a match between the systematic risk to net cash flows of an energy retailer and the systematic risk that is assumed when estimating the cost of capital for the same energy retailer. This approach was one of the approaches considered by IPART in its 2009 review of electricity prices.³⁴ Under this approach, the estimated retail margin is a function of the following assumptions:

- cost of capital assumptions – including the risk-free rate of interest, debt margin, market risk premium, equity beta, corporate tax rate and the value of imputation credits
- economic assumptions – a measure of the change in the volume of energy sold in response to a change in economic conditions and the change in market returns
- an assumption regarding the proportion of costs that change at a constant rate with changes in the volume of energy sold.

This approach is highly sensitive to the inputs that are used and inherently relies on the assumption that energy volumes are correlated with economic growth, which may not necessarily be the case.

Bottom-up approach

The bottom-up approach relies on developing an estimate of the representative retailer's asset base (including intangibles and working capital). The asset base would then be multiplied by an estimate of the weighted cost of capital (WACC) to determine the revenue requirements of the representative retailer.

³⁴ SFG Consulting 2009, *Estimation of the regulated profit margin for electricity retailers in New South Wales*, August, pp.3–14

This approach relies on being able to estimate an asset base, which is difficult given retailers' assets are largely intangible. While estimating a market value for the representative retailers' assets will be difficult, the overall approach is likely to be relatively transparent.

Benchmark approach

The benchmarking approach relies on examination of publicly available data on reported margins from comparable listed firms (not necessarily other energy retailers) and the analysis of previous regulatory decisions. The underlying assumption is that the representative retailers' ROM will be broadly consistent with that of the businesses used in the benchmarking assessment.

The largest challenge in using this approach is the availability of sufficient data from which to benchmark. The majority of Australian regulators have adopted a benchmark approach to estimating retail margins in their most recent reviews of retail prices. As with the approach to estimating retail operating costs, an option that is available to the commission is to use a retail margin based on the decisions of other Australian regulators.³⁵

3.2.7. Other costs

Other costs represent a range of costs that we have not explicitly discussed above.

- Australian Energy Market Operator (AEMO) registration fees – to participate in the energy market, retailers must be registered with AEMO as participants and there are costs associated with this.
- Ancillary fees – AEMO procures ancillary services, such as frequency response, that are not covered in the wholesale market prices. Historical data is available from AEMO on these and this may be a reasonable indicator of future costs for the retailers.
- Losses – A proportion of electricity generated is lost along the transmission and distribution system. This adds cost to the retailer which is reflected in the final retail price of electricity. AEMO publishes transmission and distribution loss factors for each distribution region, therefore it is possible to determine specific loss factors for the five Victorian distribution regions.
- Unaccounted for gas (UAFG) – Similar to losses in the electricity network, the gas distribution and transmission networks also incur losses, which are referred to as UAFG. This is determined by the difference between the measured quantity of gas entering the distribution system from various supply points and the gas delivered to customers. Retailers are required to purchase sufficient gas to cover actual consumption and UAFG. In Victoria, UAFG is managed by a benchmarking process that is administered by the commission. We will add the UAFG benchmarks to the cost of gas for the purposes of estimating this cost.

³⁵ ICRC 2017, *Final report: Standing offer prices for the supply of electricity to small customers from 1 July, July*, p.25

4. Proposed approach

The commission has been asked to develop a reference price methodology as part of a competitiveness review into the Victorian energy market. The commission would like to receive the views of stakeholders on its proposed approach and seeks comments in response to this paper.

The remainder of this chapter will outline the approach that the commission proposes to adopt in undertaking its task of developing a reference price methodology for the competitiveness review.

The previous chapter outlined the two primary approaches that are available to the commission when developing a reference price, namely a cost-based or index-based approach. In order to assist the commission decide on the most appropriate approach, the following criteria have been adopted:

Timeliness – the approach should be implementable from 1 July 2018. This would not prevent the commission from consulting on possible refinements to the methodology or updates on the inputs after that date.

Representative – the approach should produce results that broadly reflect costs faced by retailers efficiently operating in Victoria. This does not mean that the results would necessarily reflect the cost of an individual retailer or group of retailers.

Transparent – the approach should be able to be understood and reproducible.

Well accepted – the approach should rely on estimation techniques that are familiar and readily applicable (though these techniques could be enhanced in future, subject to appropriate consultation).

Table 1 summarises our evaluation of the index-based and cost-based approaches against the criteria established by the commission.

Table 1: evaluation of index-based and cost-based approaches

	Index-based approach	Cost-based approach
Timeliness	No reliable starting point from which to index	Model could be developed quickly. However some approaches would find it challenging to meet timelines
Representative	No reliable starting point from which to index	Most approaches provide a reasonable estimate of costs
Transparent	Easy to understand and straightforward to replicate	Most approaches are easy to understand and replicate. However some approaches fail on this criteria
Well accepted	Not widely used by Australian regulators to set retail energy prices	Has been used by Australian regulators to set retail energy prices

Index-based approach

The index-based approach only meets one of the four criteria, namely transparency, as this approach is easy to understand and fairly straightforward to replicate. This approach does not sufficiently satisfy the remaining three criteria.

As outlined in the previous chapter, an index-based approach requires a starting point from which to index. In a competitive market that is operating effectively, the starting price could be based on a sample of observable market offers. Given the findings of the review panel it does not appear possible to establish what a competitive retail price that is representative of all consumers for the purpose of establishing a starting point. As a result, this approach to establishing a starting point is not viable.

Without the ability to establish a credible starting point from which to begin indexation, this approach does not meet the criteria of timeliness or representative.

An index-based approach has been used by regulators to set regulated prices. However, this has usually been in markets where they are relatively stable (e.g. regulated electricity distribution networks in overseas jurisdictions). An index-based approach has not been used to regulate energy retail prices in Australia and would therefore not meet this criterion.

Cost-based approach

In evaluating a cost-based approach against the criteria adopted by the commission, it is important to acknowledge that multiple approaches are available when estimating the individual cost components.

At a high level, the cost-based approach meets the majority of the criteria, with transparency the only criterion that is not entirely met. Table 2 on the next page outlines a more detailed analysis of the different approaches to estimating three of the key cost components: wholesale costs, retail operating costs and margins. Network costs and environmental scheme costs are not considered further, as they are relatively straightforward in terms of approach.

Wholesale costs

Of the three approaches identified by the commission, only the futures market method satisfies all of the evaluation criteria.

The long run marginal cost approach would be challenging to implement in a timely manner as there is a large amount of data that would be required to be collected, verified and analysed in a short timeframe. This approach also can produce results that differ significantly from short term market conditions (as discussed in section 3.3.1).

The market modelling approach has been criticised for its lack of transparency. The models used to estimate the wholesale electricity costs under this approach are often proprietary and therefore not readily observable.

Retail operating costs

The benchmark approach meets all of the evaluation criteria to the extent that it is possible to source benchmark data from decisions made by other Australian regulators. If the commission were to source benchmark data from other sources, this approach may be challenging in the timeframe available. The bottom-up approach does not fully meet the representative evaluation criteria, as the information provided by retailers is often difficult to sufficiently verify in terms of its accuracy and integrity. This approach also fails against the criteria of timeliness and transparency as the effort to assess the accuracy and integrity of the data is time consuming, and the majority of the information that would be provided by retailers would be done so on a confidential basis.

Retail margin

Similar to the approach to retail operating costs, the benchmark approach also meets all of the evaluation criteria for estimating retail margins, either by relying on other regulatory decisions or utilising data from other sources (which may be challenging in the timeframe available). The expected returns approach is the next best when assessed against the evaluation criteria, however, it does not fully meet the representative and transparency criteria. Similar to its

assessment for retail operating costs, the bottom-up approach fails to meet two of the criteria and does not meet one other.

Table 2: further evaluation of cost-based approaches

	Wholesale costs			Retail operating costs			Retail margin	
	Long run marginal cost approach	Futures market method	Market modelling method	Benchmarking approach	Bottom up approach	Benchmark approach	Bottom up approach	Expected returns approach
Timeliness	Obtaining reliable data would be challenging	Model could be developed in a short timeframe	Model could be developed in a short timeframe	Benchmark data is readily available	Obtaining reliable data would be challenging	Regulator benchmark data is readily available	Obtaining reliable data would be challenging	Model could be developed in a short timeframe
Representative	Due to long-run nature may not sufficiently take account of short-term dynamics of the market	Provides for a reasonable estimate of wholesale costs	Provides for a reasonable estimate of wholesale costs	Provides for a reasonable estimate of retail costs	Obtaining reliable data would be challenging	Provides for a reasonable estimate of retail costs	Obtaining reliable data would be challenging	Highly sensitive to inputs
Transparent	Relatively easy to understand and replicate	Relatively easy to understand and replicate	Has been criticised for its lack of transparency	Relatively easy to understand and replicate	Would be provided on a commercial basis	Relatively easy to understand and replicate	Would be provided on a commercial basis	Conceptually complex approach
Well accepted	Has been used by Australian regulators to set retail energy prices	Has been used by Australian regulators to set retail energy prices	Has been used by Australian regulators to set retail energy prices	Has been used by Australian regulators to set retail energy prices	Has been used by Australian regulators to set retail energy prices	Has been used by Australian regulators to set retail energy prices	Has been used by Australian regulators to set retail energy prices	Has been used by Australian regulators to set retail energy prices

4.1. The commission's proposed approach

The commission has assessed the two primary approaches that could be adopted when developing a reference price methodology for assessing the competitiveness in the Victorian energy market. It is our view that an index-based approach does not satisfy the criteria the commission has adopted.

A cost-based approach generally meets the criteria, with some of the approaches to estimating individual cost components better meeting the evaluation criteria than others. For this reason the commission has undertaken an analysis of the different methods to establish individual cost components for wholesale costs, retail operating costs and retail margins.

This has concluded that the futures market method is the most appropriate approach to estimating wholesale costs, and that a benchmarking approach is the best approach for retail operating costs and margins.

Approach to estimating the cost components for electricity

At this time, the commission proposes to adopt the following approach to estimate the cost components for electricity as part of the competitiveness review:

- wholesale electricity costs – market based approach using the futures market method
- network costs – pass through of network charges as approved by the Australian Energy Regulator
- environmental scheme costs – market based approach
- retail operating costs – cost based benchmarking approach
- retail margin – a benchmarking approach.

Approach to estimating the cost components for gas

At this time, the commission proposes to adopt the following approach to estimate the cost components for gas as part of the competitiveness review:

- wholesale gas costs – market based approach
- network costs – pass through of network charges as approved by the Australian Energy Regulator
- environmental scheme costs – market based approach
- retail operating costs – cost based benchmark approach
- retail margin – a benchmarking approach

Interim approach

The approaches outlined above are based on applying the methodology for the competitiveness review which will conclude in December 2019. The government has asked the commission to have

a methodology prepared for use by 1 July 2018. In the interim, we will use regulatory benchmarks to inform the retail operating costs and retail margin until full analysis has been undertaken.

Feedback on the commission's proposed approach

The commission is seeking feedback from stakeholders on its proposed approach to developing a reference price methodology. In particular the commission would like stakeholders to consider the following questions when providing their feedback:

- Is the commission's proposal to adopt a cost-based approach reasonable? If not, why not?
- Are there other approaches not outlined in this paper that the commission should consider?
- Are there any other issues we should consider?