Cost drivers of recent retail electricity and gas prices for residential customers in NSW

A REPORT PREPARED FOR IPART

September 2017

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1.1 Background

In April 2014, the NSW Government decided to remove retail electricity price regulation, effective 1 July 2014. This decision was based on findings by both the Independent Pricing and Regulatory Tribunal (IPART) and the Australian Energy Market Commission (AEMC) that the NSW electricity market is competitive.

As part of its decision to deregulate, the NSW Government gave IPART a new role to monitor and report annually on competition in the retail electricity market. As the market monitor, IPART is required to report annually on the performance and competitiveness of the NSW retail electricity market.

IPART is currently undertaking its review of retail electricity market performance for 2016/17, and will assess whether market developments are consistent with a competitive retail market.

In addition, for both gas and electricity prices, the Minister has asked IPART to review price movements into 2017/18. IPART will provide advice to the Minister on drivers of the price changes and whether any such changes reflect efficient costs in a competitive market.

1.2 Frontier Economics' engagement

Frontier Economics has been engaged by IPART to assist in its review of the drivers of gas and electricity price movements into 2017/18. Specifically, we have been engaged to:

- Identify the cost components of supplying electricity and gas to small residential customers in NSW and estimate these cost components as a proportion of total costs for 2016/17 (using reasonable ranges), including:
  - wholesale energy costs
  - costs of meeting obligations under green schemes
  - network costs
  - retail operating and costs and margin.
- Consider the potential drivers of changes in each of these cost components. For example (this list is not exhaustive):
  - wholesale electricity costs may be influenced by a changing load shape, and changes in spot and contract price as a result of factors such as changes in demand, changing mix of generation, and changes in fuel costs

- wholesale gas costs may be influenced by oil prices, changes in the costs of extraction, changes in demand for gas, and changes in the export market
- regulatory decisions on network costs.

- Estimate reasonable ranges for the changes in these cost components from 2016/17 to 2017/18 for an efficient retailer supplying small residential customers.
- As a result of these changes in costs, estimate each of these cost components as a proportion of total costs for 2017/18 (using reasonable ranges).
- Estimate the change in the total cost of supplying electricity and gas to small retail customers from 2016/17 to 2017/18 for an efficient retailer (using reasonable ranges).
- Outline any caveats or limitations in the analysis.

1.3 Frontier Economics' previous advice to IPART

Frontier Economics was engaged by IPART last year to assist IPART in its review of the drivers of electricity price movements into 2016/17. Our final report to IPART on drivers of electricity price movements into 2016/17 is available on IPART's website.[1]

We will refer to the findings of this Frontier 2016 Electricity Report throughout this report.

1.4 This report

This report provides our findings on the drivers of recent changes in electricity prices for small retail customers in NSW.

This report is structured as follows.

Part A deals with the drivers of electricity price movements into 2017/18:

- Section 2 provides an overview of the components of the cost of supplying electricity to small retail customers.
- Section 3 considers the potential drivers of changes in wholesale electricity costs and provides our estimate of a reasonable range for the increase in these costs from 2016/17 to 2017/18.

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1 Frontier Economics, *Cost drivers of recent retail electricity prices for small retail customers*, A final report prepared for IPART, November 2016 (**Frontier 2016 Electricity Report**). Available at:

https://www.ipart.nsw.gov.au/Home/Industries/Energy/Reviews/Electricity/Retail-electricity-market-monitoring-2016?qDh=2

- Section 4 considers the potential drivers of changes in the cost of complying with green schemes and provides our estimate of a reasonable range for the increase in these costs from 2016/17 to 2017/18.
- Section 5 considers the potential drivers of changes in electricity network costs and provides our estimate of a reasonable range for the increase in these costs from 2016/17 to 2017/18.
- Section 6 discusses retail operating costs and the retail margin.
- Section 7 sets out our conclusion on the reasonable range of estimates of the increase from 2016/17 to 2017/18 in the total cost of supplying electricity to small retail customers.

Part B deals with the drivers of gas price movements into 2017/18:

- Section 8 provides an overview of the components of the cost of supplying gas to small retail customers.
- Section 9 considers the potential drivers of changes in wholesale gas costs and provides our estimate of a reasonable range for the increase in these costs from 2016/17 to 2017/18.
- Section 10 considers the potential drivers of changes in gas network costs and provides our estimate of a reasonable range for the increase in these costs from 2016/17 to 2017/18.
- Section 11 discusses retail operating costs and the retail margin.
- Section 12 sets out our conclusion on the reasonable range of estimates of the increase from 2016/17 to 2017/18 in the total cost of supplying gas to small retail customers.

Part A – Retail electricity prices to residential customers

Introduction

2 Components in the cost to supply electricity to small retail customers

In competitive markets, prices would be expected to reflect the cost of supply. For this reason, our assessment of the drivers of electricity prices focuses on the various costs that retailers face in supplying electricity to small retail customers.

2.1 Cost components

The costs that retailers face in supplying electricity to small retail customers are generally accepted to consist of:

- **Wholesale electricity costs** – which are the costs that retailers face in procuring the electricity that they supply to their customers.
- **The costs of complying with green schemes** – which include the costs that retailers face in complying with their obligations under the Large-Scale Renewable Energy Target (LRET) and the Small-Scale Renewable Energy Scheme (SRES).
- **Network costs** – which include payments for the use of the transmission network and payments for the use of the distribution network.
- **Retail operating costs** – which are the costs that a retailer incurs in operating its business to supply electricity to its customers.
- **The retail margin** – which is the return that a retailer requires in order to attract the capital needed to provide a retailing service.

In the sections that follow we consider the potential drivers of changes in the cost that retailers face under each of these cost components.

2.2 Cost proportions

The proportion of the total cost of supplying small retail customers that is accounted for by each of these cost components is a key determinant of the extent to which increases in particular cost components flow through to increases in the total cost of supply.

The best and most recent estimate of the proportion of the total cost of supplying small retail customers that is accounted for by each of these cost components is the annual Residential Electricity Price Trends reports by the Australian Energy Market Commission (AEMC). The most recent AEMC Price Trends report is the

2016 report,[2] which has estimates of the various cost components of supplying residential customers in New South Wales for each year from 2015/16 to 2018/19. These estimates are set out in Figure 1.

Figure 1: Cost components of supplying residential electricity customers in NSW

	2015/16		2016/17 Current Year		2017/18		2018/19	
	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr	c/kWh	$/yr
Environmental policies	**1.66**	**$98**	**1.83**	**$109**	**1.75**	**$104**	**1.88**	**$112**
LRET - LGC cost	0.64	$38	0.81	$48	0.74	$44	0.86	$51
SRES - STC cost	0.46	$27	0.40	$24	0.37	$22	0.36	$21
Climate Change Fund	0.40	$23	0.41	$24	0.41	$24	0.41	$24
Energy saving scheme	0.16	$10	0.21	$13	0.23	$14	0.25	$15
Regulated networks	**10.62**	**$630**	**10.90**	**$647**	**11.23**	**$667**	**11.58**	**$687**
Transmission	2.67	$159	2.59	$154	2.61	$155	2.63	$156
Distribution	7.95	$472	8.31	$493	8.63	$512	8.95	$531
Competitive market	**7.93**	**$471**	**9.46**	**$562**	**9.42**	**$559**	**10.48**	**$622**
Wholesale and Retail								
Market offer	**20.20**	**$1,199**	**22.19**	**$1,317**	**22.40**	**$1,330**	**23.93**	**$1,421**

Source: AEMC 2016 Price Trends Report, Figure 10.

The AEMC 2016 Price Trends Report combines wholesale electricity costs, retail operating costs and the retail margin into a single cost component, referred to as the 'competitive market' component. For our purposes, separate estimates of wholesale costs and retail costs are more useful. For this reason, we disaggregate the 'competitive market' component from the AEMC 2016 Price Trends Report into separate amounts for wholesale electricity costs, retail operating costs and the retail margin. We undertake this disaggregation by using estimates of retail operating costs and retail margins. Specifically, we assume that retail operating costs are $121 per customer (in 2016/17 dollars) and that the retail margin is 5.7 per cent. These retail estimates result in an estimate of the wholesale component for 2016/17 that we consider to be consistent with prices for wholesale electricity contracts for 2016/17.

Based on the estimates of cost components from the AEMC 2016 Price Trends Report for 2016/17, and undertaking the disaggregation of wholesale and retail costs described above, we estimate that the proportion of total costs accounted for by each cost component for 2016/17 is as set out in Table 1.

[2] Australian Energy Market Commission, *2016 Residential Electricity Price Trends*, Final Report, 14 December 2016 (**AEMC 2016 Price Trends Report**).

Table 1: Estimates of proportion of costs for 2016/17

Cost component	Proportion of total costs
Wholesale electricity costs	28.1%
Costs of complying with green schemes	8.2%
Network costs	49.1%
Retail operating costs	8.9%
Retail margin	5.7%
Total	**100.0%**

Source: Frontier Economics, based on AEMC 2016 Price Trends Report.

Comparison with Frontier 2016 Electricity Report

In our Frontier 2016 Electricity Report we estimated the proportion of total costs accounted for by each cost component for 2015/16, using data from the AEMC 2015 Price Trends Report. We also adopted a similar approach to disaggregating the 'competitive market' component for 2015/16, using the same estimates of retail operating costs and retail margin.

In our Frontier 2016 Electricity Report, however, when removing the estimates of retail operating costs and retail margin from the 'competitive component' we found that the resulting estimate of the wholesale component for 2015/16 was higher than we would expect. For this reason, we also estimated the proportion of total costs accounted for by each cost component by using an estimate of the wholesale component for 2015/16. This resulted in two estimates of the proportion of total costs accounted for by each cost component for 2015/16 – we referred to this as Approach 1 and Approach 2 and the results are set out in Table 2.

Table 2: Estimates of proportion of costs for 2015/16, from Frontier 2016 Electricity Report

Cost component	Approach 1	Approach 2
Wholesale electricity costs	43%	24%
Costs of complying with green schemes	6%	8%
Network costs	38%	51%
Retail operating costs and margin	13%	17%
Total	**100%**	**100%**

Source: Frontier Economics, based on AEMC 2015 Price Trends Report.

We now also have estimates of the proportion of total costs accounted for by each cost component for 2015/16 from the AEMC 2016 Price Trends Report. Adopting the same approach for the 2015/16 estimates as we did for 2016/17 provides the results set out in Table 3.

Table 3: Estimates of proportion of costs for 2015/16

Cost component	Proportion of total costs
Wholesale electricity costs	23.2%
Costs of complying with green schemes	8.2%
Network costs	52.6%
Retail operating costs	10.3%
Retail margin	5.7%
Total	**100.0%**

Source: Frontier Economics, based on AEMC 2016 Price Trends Report.

These more recent results suggest that the estimates under Approach 2 from our Frontier 2016 Electricity Report were more accurate. This is also suggested by comparing the estimates in Table 3 and Table 1: the increase in the proportion of total costs that is accounted for by wholesale electricity costs (and the decrease in other components) is consistent with the observation from our Frontier 2016 Electricity Report that wholesale electricity costs for retailers have increased from 2015/16 to 2016/17.

Components in the cost to supply electricity to small retail customers

3 Wholesale electricity costs

In supplying electricity to small retail customers, retailers incur wholesale electricity costs. These are the costs that retailers face in procuring the electricity that they supply to their customers.

There are a number of approaches that are available for assessing the wholesale electricity costs that retailers face. These include forecasting wholesale electricity costs on the basis of the long-run marginal cost of supplying customers, and forecasting wholesale electricity costs on the basis of market forecasts of spot prices and contract prices. For this review, we are not undertaking market modelling of the kind that would be used to implement these approaches. Rather, we analyse trends over time in the two key drivers of changes in wholesale electricity costs: changes in load shape and changes in spot and contract electricity prices.

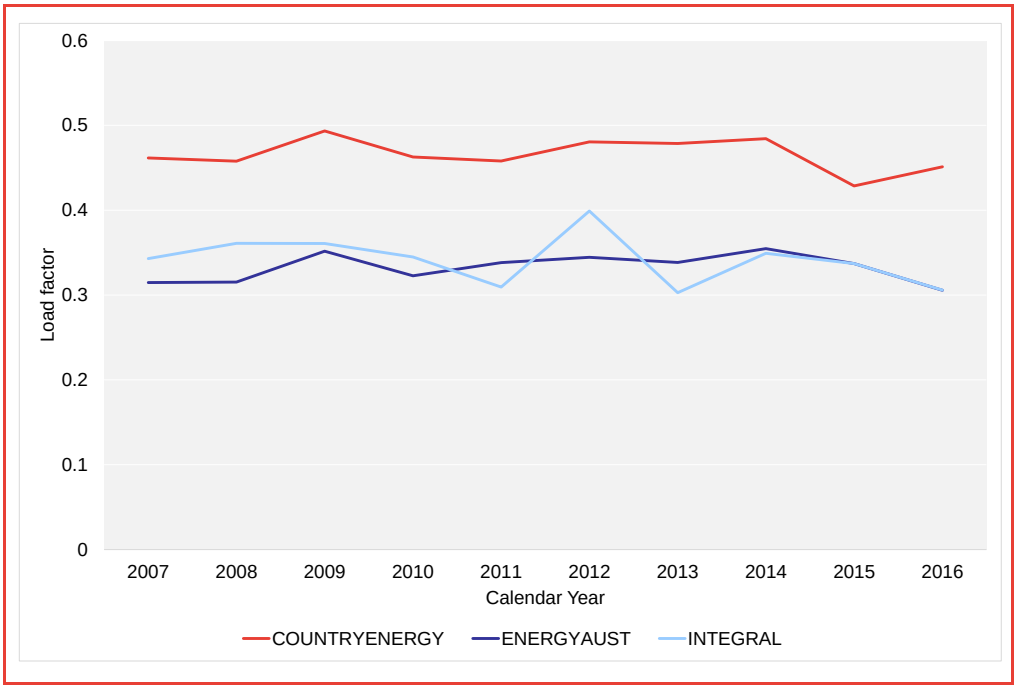
3.1 Load shape

The load shape for retail customers is a key determinant of the cost of supplying electricity to those customers: the peakier the load shape, and the more closely correlated that load is to wholesale electricity prices, the more expensive it is to supply those customers.

Data on the load shape of individual residential customers is not publicly available. However, a good proxy for the aggregate load shape for residential customers is the net system load profile (NSLP), which is published by the Australian Energy Market Operator (AEMO). The NSLP measures the aggregate load shape of all customers that have accumulation meters (only small customers – residential and commercial – have accumulation meters).

To investigate whether there have been changes in the load shape for customers in New South Wales, we have analysed data on the NSLP for each distribution area in New South Wales for the last ten years. A good summary of this NLSP data is the annual load factor (which is measured as average demand divided by peak demand). This is shown in Figure 2.

Figure 2: Historical NSLP load factor



Source: Frontier Economics' analysis of AEMO data

Our view is that this data on the load factor for the NSLP is mixed: for Country Energy (now Essential Energy) and Integral (now Endeavour Energy) there may be a slight long-term trend towards a peakier load shape (a lower load factor), but for EnergyAustralia (now Ausgrid) there may be a slight long-term trend towards a flatter load shape (a higher load factor). The more recent changes, for instance from calendar year 2015 to 2016, are also mixed. For these reasons, we do not think that there is strong evidence to suggest that changes in load shape would be an important driver of changes in retailer prices into 2017/18.

3.2 Spot and contract electricity prices

Wholesale electricity prices – both spot and contract prices – are clearly a key determinant of the cost of supplying electricity to retail customers: the higher electricity prices, the more expensive it is for a retailer to supply those customers.

In the remainder of this section we use publicly available information on electricity prices for 2016/17 and 2017/18 to assess what this information suggests about the increase in wholesale electricity costs from 2016/17 to 2017/18. Because we are comparing last year with this current year, we have actual electricity spot prices for 2016/17 but not for 2017/18. This means that, conceptually, there are two ways that we can compare electricity prices for 2016/17 and 2017/18:

- We can compare actual prices for 2016/17 with expectations of prices for 2017/18.
- We can compare expectations of prices for 2016/17 (prior to the commencement of 2016/17) with expectations of prices for 2017/18 (prior to the commencement of 2017/18).

We discuss each of these approaches in the sections below.

3.2.1 Approach 1 – comparing actual prices for 2016/17 with expectations of prices for 2017/18

AEMO publishes spot electricity prices for every half-hour of the year. The annual average spot price that AEMO has calculated for New South Wales for 2016/17 is $81.22.[3]

Of course we do not yet know what will be the annual average spot price for New South Wales for 2017/18. However, the electricity futures market provides an indication of the market's expectation of the annual average spot price for New South Wales for 2017/18. The best indication of the annual average spot price for New South Wales that is publicly available is the price of an implied base load financial year 2017/18 strip for New South Wales, as published by ASX Energy.[4] The price of this implied base strip as of 1 June 2017 (which is presumably around the time that retailers decide their retail prices for 2017/18) was $106.03. It is generally accepted that contracts of this kind trade at a premium to expected spot prices. If we deduct a contract premium of 5 per cent, this suggests that as of 1 June 2017, the market's expectation was that the annual average spot price for New South Wales for 2017/18 was $100.73.

This simple comparison of actual spot prices for 2016/17 with forward prices for 2017/18 suggests that, as of 1 June 2017, retailers could have expected that there would be a noticeable change in the spot electricity prices that they faced in 2016/17 and the spot electricity prices that they would face in 2017/18.

However, the issue with this comparison is that retailers set their electricity tariffs in advance. If we assume that retailers set their electricity tariffs once for 2016/17 (prior to the commencement of 2016/17) and once for 2017/18 (prior to the commencement of 2017/18) then comparing actual prices for 2016/17 with expected prices for 2017/18 isn't likely to capture the difference in *expected* costs. To capture this difference in expected costs we would need to compare

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3 See AEMO's website: http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Data-dashboard#average-price-table

4 See ASX Energy's website: https://www.asxenergy.com.au/

expectations of prices for 2016/17 with expectations of prices for 2017/18. This is what we do in the following section.

3.2.2 Approach 2 – comparing expectations of prices for 2016/17 and 2017/18

Methodology

One way of comparing expectations of electricity prices for 2016/17 with expectations of electricity prices for 2017/18 would be to compare the prices of implied base load financial year strips for New South Wales. However, we know that a typical retailer uses a mix of products to manage their retail load, including a mix of different contracts available from ASX Energy. For this reason, rather than just comparing the prices of implied base load financial year strips, we compare the prices for a number of individual contracts that are settled in each of 2016/17 and 2017/18. The contracts that we consider are:

- peak quarterly swaps
- base quarterly swaps
- base quarterly caps.

ASX Energy publishes daily prices for each of these products.

Since the prices of these instruments have changed by different amounts from 2016/17 to 2017/18 we need an approach for estimating an indicative increase in the overall wholesale electricity cost. We adopt the following approach to assess the overall change in the wholesale electricity cost, from these changes in individual contract prices:

- We report the changes in prices (including a range) for quarterly base and peak swap contracts, and for quarterly cap contracts.
- Of these, we use the changes in prices for quarterly base and peak swap contracts as the best indicators of the increase in the wholesale electricity cost (since the premium for cap contracts is typically a relatively small component of the wholesale electricity cost).
- We use previous modelling of energy purchase costs for IPART to determine the mix of quarterly base and peak swap contracts that an efficient retailer is likely to enter into for small customers, and we calculate a weighted average increase in the price of this mix of contracts.

In addition, as prices of ASX Energy contracts are quoted on every trading day, in order to compare the prices of contracts prices for 2016/17 and 2017/18, it is necessary to determine the days on which these contract prices should be assessed. Under this approach, of comparing expectations of prices for 2016/17 with expectations of prices for 2017/18, it is clear that we want to compare contract

prices at an equivalent point of time prior to the commencement of each financial year. The question is, what point of time? As part of previous regulatory determinations of electricity prices there has been a debate about whether retailers set retail prices on the basis of contract prices at a point-in-time or whether retailers set retail prices based on a rolling average of contract prices over a longer period of time (typically two years, on the basis that retailers have argued that they purchase contracts over a two year period leading up to the relevant year). Our view has always been that prices should be based on a point-in-time approach, but we nevertheless adopt both approaches for the purpose of this review. Specifically, we compare contract prices under the following three approaches:

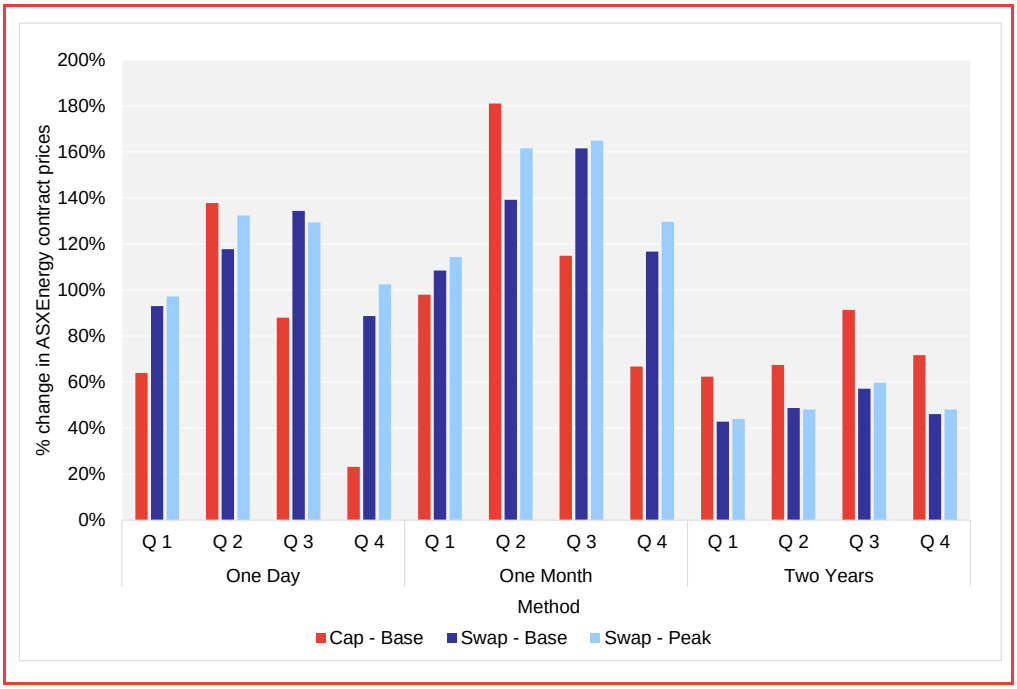
- Looking at prices on the day closest to the time retailers are likely to make their decisions on retail prices (which we assumes is June 1st of each year).
- Looking at prices averaged over one month leading up to the time that retailers are likely to make their decisions on retail prices (from 1st May to 1st June each year).
- Looking at prices averaged over the two years leading up to the time that retailers are likely to make their decisions on retail prices.

Through comparing prices for the three types of contracts across the four quarters available for settlement in 2016/17 with prices for contracts for settlement in 2017/18 we can develop an estimation of the market's expectations of the change in the wholesale electricity cost to supply small retail customers.

Assessment

Figure 3 provides an indication of the percentage change in ASX contract prices (quarterly base caps and quarterly base and peak swaps) between 2016/17 and 2017/18 using the three methods outlined above. Each of the methods provides quite different results. For the first method, the increase in the price of swaps is roughly between 90 per cent and 140 per cent, depending on the quarter. For the second method, the increase in the price of swaps is roughly between 100 per cent and 160 per cent, depending on the quarter. And for the third method, the increase in the price of swaps varies roughly between 40 per cent and 60 per cent. The difference in the price of caps is even larger.

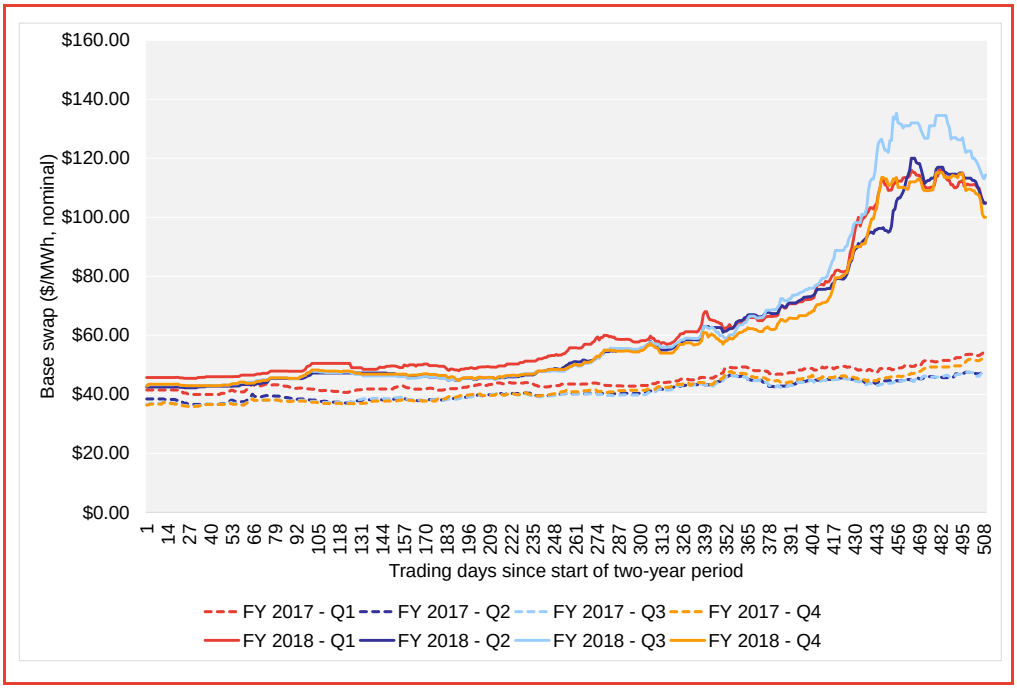
Figure 3: Percentage change in ASX contract prices between 2016/17 and 2017/18 (nominal)



Source: Frontier Economics using data form ASX Energy

The reason for this difference between the methods is that the increase in contract prices for 2017/18 that we observe under the first two methods has happened fairly close to the start of financial year 2017/18; so, the increase is apparent if we look at contract prices on 1 June 2016, or over the month from 1 May 2016 to 1 June 2016, but far less apparent before that. This is apparent if we compare the prices of base quarterly swaps for 2016/17 and 2017/18 over the two year period that we consider, as shown in Figure 4. Placing these series on the same x-axis (by using a date index rather than the actual trade date) shows that contracts for 2016/17 remained fairly flat up to the start of the financial year while prices for 2017/18 increased up to the start of the financial year (before a slight reduction again immediately before the start of the financial year).

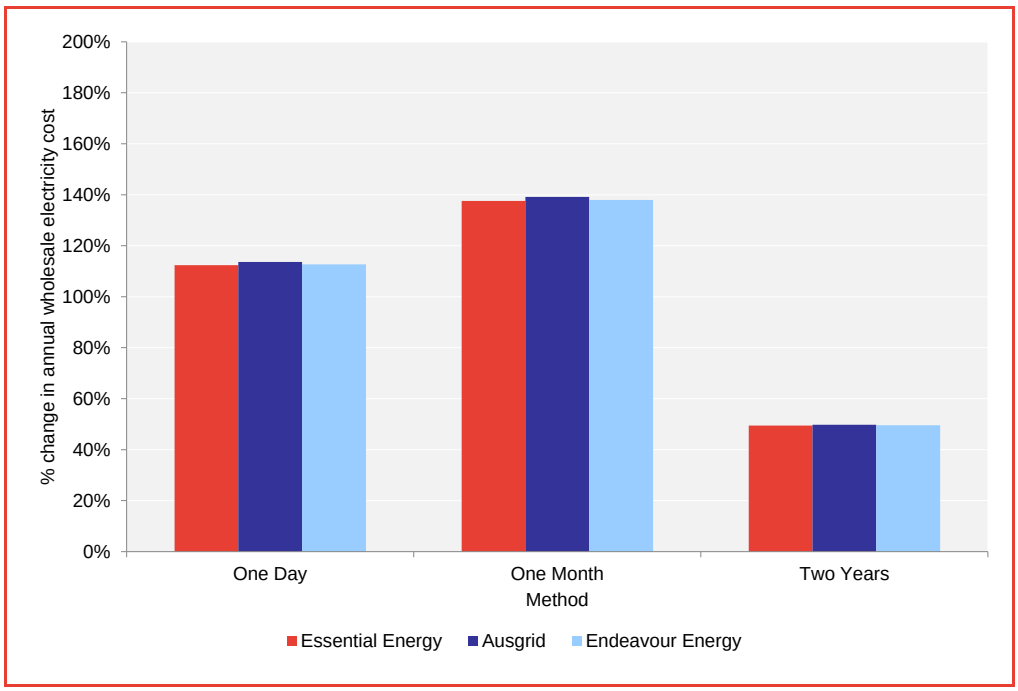
Figure 4: Comparison of base swap contracts price for 2016/17 and 2017/18 (nominal)



Source: Frontier Economics using data form ASX Energy

Applying the approach discussed above, Figure 5 presents the estimated increase in wholesale electricity costs based on the increase in contract prices shown in Figure 3. Since the contract mix will be slightly different for the three distribution areas, we present results separately for the Ausgrid, Essential Energy and Endeavour Energy distribution areas; although the results from Figure 5 show that there is not much difference in outcomes between the different distribution areas. However, there are significantly different results as between the three methods of determining contract prices. The first method – using contract prices on 1 June each year – results in an estimated increase in the wholesale electricity cost of around 115 per cent. The second method – using average contract prices in the month leading up to 1 June each year – results in an estimated increase in the wholesale electricity cost of around 140 per cent. The final method – using average prices in the 2 years leading up to 1 June each year – results in an estimated increase in wholesale electricity costs of around 50 per cent. This difference simply reflects the difference in contract prices under the three methods.

Figure 5: Percentage increase in wholesale electricity costs between 2016/17 and 2017/18 (nominal)



Source: Frontier Economics using data form ASX Energy

What has driven the increase in contract prices for 2017/18?

What we observed in the previous section is that spot prices for 2016/17 were higher than the market expected them to be at the start of 2016/17, and that, over the same period that spot prices for 2016/17 were increasing, spot price and forward prices for 2017/18 were increasing. This raises the question of what was driving these increases in electricity prices.

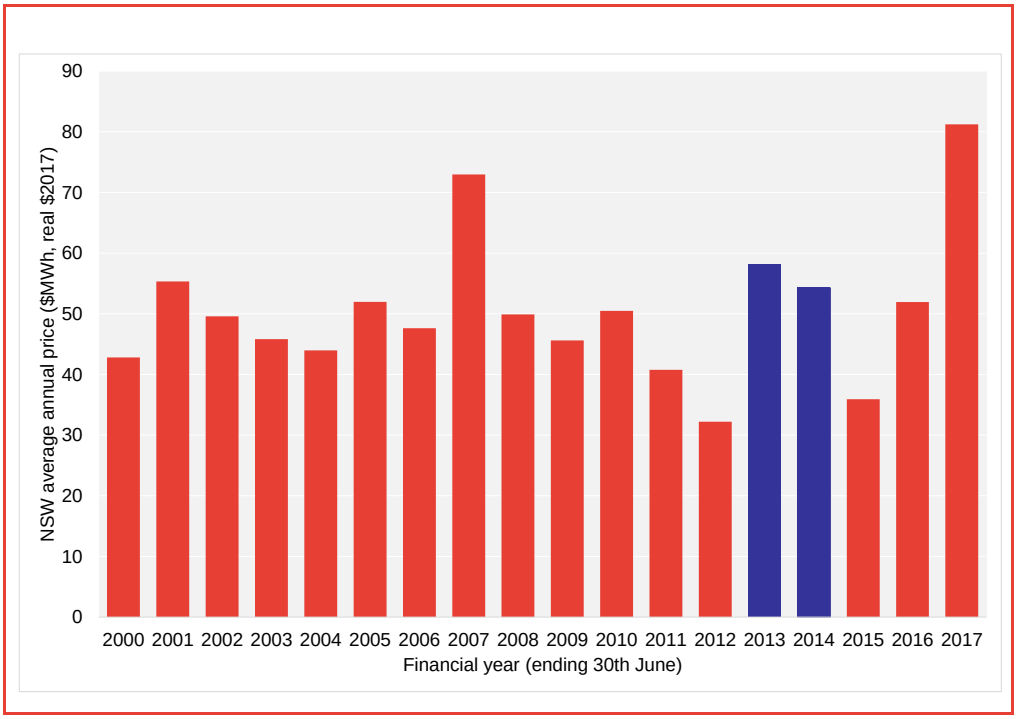
In our Frontier 2016 Electricity Report we saw a similar pattern: spot prices for 2015/16 were higher than the market expected at the start of 2015/16 and as spot prices for 2015/16 were increasing forward prices for 2016/17 were also increasing. However, the increases that we observed in our Frontier 2016 Electricity Report compared with the increases that we have seen more recently were much smaller. Last year we observed that the increases in wholesale electricity prices were not out of the ordinary and, in fact, were really just a return to prices that were more characteristic of longer-term prices. This year, however, the increases in wholesale electricity prices have been much more significant. Indeed, spot prices for 2016/17 are the highest since the commencement of the National Electricity Market (NEM). This can be seen in Figure 6, which shows the average annual New South Wales regional reference price for each year since the market commenced in 1998/99. These prices are in real dollars, and the average prices for 2012/13 and 2013/14 are highlighted, because these prices were affected by the carbon price that was in place in those years (which increased electricity prices by around $20/MWh).

It is clear from Figure 6 that the electricity prices for 2011/12 through to 2014/15 were the lowest prices, in real terms, that New South Wales has experienced (once the impact of carbon in 2012/13 and 2013/14 is accounted for). When retailers were setting prices for 2015/16, their only recent experience would have been with these historically low spot prices.

The electricity price in 2015/16 was a return to levels that were much more typical over the period 1998/99 to 2009/10 (before demand started falling). When retailers were setting prices for 2016/17, their recent experience would have included the material increase in spot prices in 2015/16.

However, the electricity price in 2016/17 has been a very material increase again, and when retailers were setting prices for 2017/18, their recent experience would have included this very material increase in spot prices.

Figure 6: Average annual NSW regional reference price (real $2017)

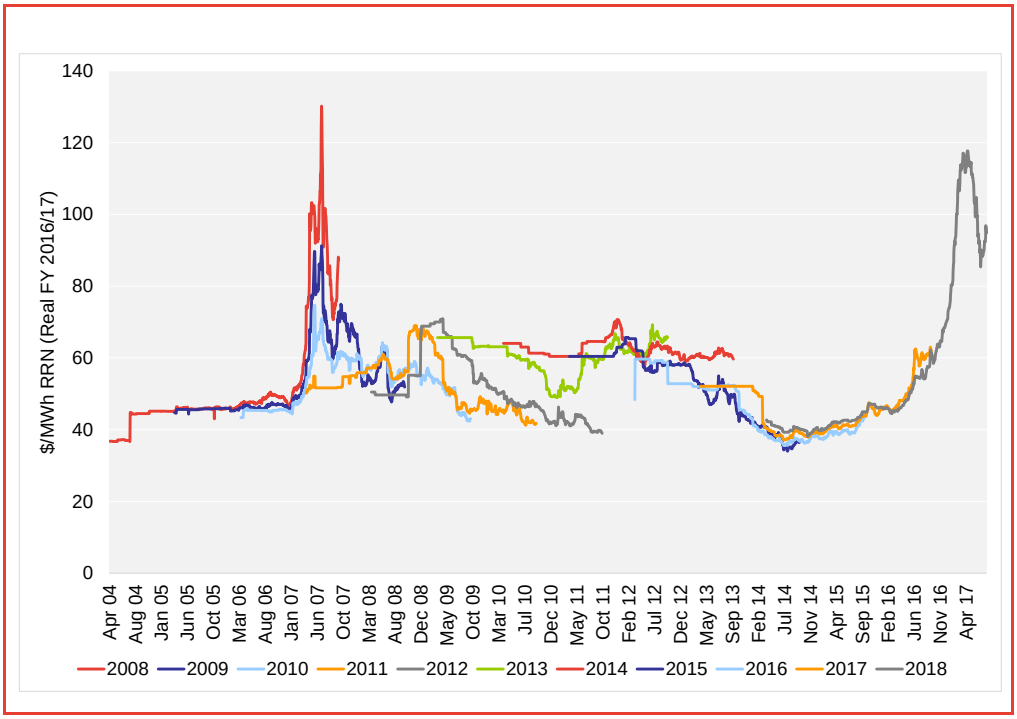


Source: Frontier Economics analysis of AEMO data

Figure 7 shows the price of implied base load financial year strips for New South Wales for each year from 2007/08 to 2017/18, as published by ASX Energy.[5] Consistent with what we saw for annual average spot prices, the recent increases in contract prices for settlement in 2017/18 have resulted in prices that are at, or near, historical highs.

5 See ASX Energy's website: https://www.asxenergy.com.au/

Figure 7: Financial year strip prices for NSW (real $2017)



Source: Frontier Economics using data form ASX Energy

More specifically, in our view, there are likely to be a number of key explanations for the increase in electricity prices that we have seen recently.

The first explanation is that there have been a number of retirements of baseload generators over recent years in the NEM. We observed that this has been the case in our Frontier 2016 Electricity Report and, since then, the trend has continued. In New South Wales, Munmorah, Wallerawang C and Redbank have all retired since demand started falling around 2009, and Smithfield has retired in the last year. In South Australia, Northern Power Station retired last year (following the earlier retirement of Playford), which was an important cause of the high price events that have been observed in South Australia since then (with flow on effects for other NEM regions). And, most recently, Hazelwood Power Station in Victoria retired early this year, which has had significant effect on the supply-demand balance in the NEM. A decrease in generation supply – particularly in the supply of baseload generation – can be expected to increase electricity prices as generation plant with higher marginal costs set the market clearing price more often.

The second explanation is that gas prices have been higher during 2017/18 than they have been historically. We discuss these higher gas prices in more detail in Part B of this report. Higher gas prices increase the marginal cost of gas-fired generation; particularly when combined with a decrease in coal-fired generation

making gas generation marginal more often, this can be expected to increase electricity prices.

There has also been some suggestion that generators have been bidding less competitively into the NEM. For instance, there have been reports that Government-owned generators in Queensland have been bidding to increase electricity prices, and the Queensland Government only recently directed that Government-owned generator Stanwell to undertake strategies to place downward pressure on electricity prices.

3.3 Conclusion on wholesale electricity costs

If we compare actual prices for electricity in 2016/17 with expectations of prices for electricity in 2017/18, the available data suggests that there likely would be a moderate increase in the wholesale electricity component of retail electricity prices for small customers; around 25 per cent.

However, this is unlikely to be the best comparison. The reason is that retailers tend to set retail prices in advance, for a period of time, based on their expectation of their cost of supply over that period of time. To reflect this, we also compare expectations of prices for electricity in 2016/17 with expectations of prices for electricity in 2017/18.

This comparison of expectations of energy prices can provide differing results, depending on the time over when we assess expectations of future prices. If we assume that retailers base their expectations of energy prices on the rolling-average contract price over a two-year period, then the implied increase in wholesale electricity costs is around 50 per cent. However, if we assume that retailers base their expectation of energy prices on contract prices at a point in time (either a day, or an average over a month), then then implied increase in wholesale electricity costs is between 115 per cent and 140 per cent.

Of course each of these estimates can only provide an indication of the increase in wholesale electricity costs. We have not done detailed forecasting of changes in load shapes or prices, or changes in the correlation between the two; nor have we estimated an efficient mix of wholesale contracts and estimated the cost meeting load using this mix of contracts for 2016/17 and 2017/18. This more detailed work would provide a more precise estimate of wholesale electricity costs.

However, we consider that we have accounted for the two principle indicators of changes in wholesale electricity costs: changes in load shapes and changes in swap prices. In regard to our estimate of the change in expectations of future prices, it may be that more detailed analysis would suggest a different mix of quarterly swap products, and therefore provide a different estimate of the change in wholesale electricity costs. However, the fact that all swaps have increased by similar amounts suggests that this more detailed analysis is unlikely to change our result significantly. Similarly, it may be that accounting for the role of caps in hedging

load would provide a different estimate of the change in wholesale electricity costs. However, given that caps are a relatively small component of wholesale electricity costs, accounting for caps is unlikely to significantly increase our result.

Finally, we would get different results if we assumed that retailers made their pricing decisions at a time other than 1 June each year. In particular, for contracts for settlement in 2017/18, prices seemed to peak around April and May 2017 and have declined since then, although volatility remains material.

4 Costs of complying with green schemes

In supplying electricity to small retail customers, retailers must incur costs associated with complying with green schemes, including the costs that retailers face in complying with their obligations under the Large-Scale Renewable Energy Target (LRET) and the Small-Scale Renewable Energy Scheme (SRES).

Through comparing prices of large-scale generation certificates (LGCs) and small-scale technology certificates (STCs), and their corresponding renewable power percentage (RPP) and small-scale technology percentage (STP), we can estimate the change in the cost of complying with these schemes from 2016/17 to 2017/18.

4.1 Approach

Utilising time series data on traded prices for LGCs and STCs from Mercari, we can compare the prices of certificates for 2016/17 and 2017/18. Our approach for estimating the costs of complying with green schemes is similar to the approach we adopted for ASX Energy contracts, with one key difference: ASX Energy contracts are forward prices while certificate prices are spot prices. This means that we do not have the same direct information on the expected price for certificates for 2017/18 that we do for ASX Energy contracts. However, we consider using spot prices as a guide to retailer's expectations of future certificate prices is a reasonable approach for this review.

As in our analysis of wholesale electricity costs, we adopt three different methodologies to compute the costs of complying with green schemes:

- Looking at prices on the day closet to the time retailers are likely to make their decisions on retail prices (which we assume is June 1st of each year);
- Looking at prices averaged over one month leading up to the time that retailers are likely to make their decisions on retail prices (from 1st May to 1st June each year); and
- Looking at prices averaged over the two years leading up to the time that retailers are likely to make their decisions on retail prices.

Estimates of the RPP and STP are more straightforward. The RPP and STP provide an indication of the rate of liability under the LRET and SRES, respectively. Utilising published estimates from the Clean Energy Regulator, supplemented by our own estimates calculated in a manner set out in the *Renewable Energy (Electricity) Act* 2000, we can estimate the changes in the number of certificates that retailers need to surrender from 2016/17 to 2017/18.

4.2 Assessment

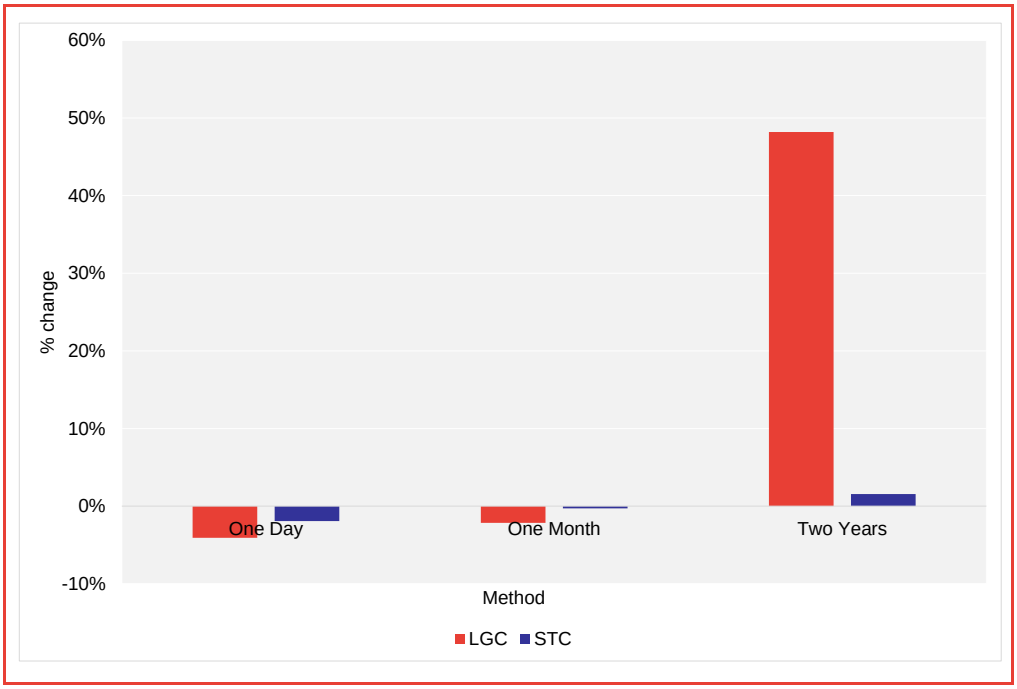
Figure 8 provides an indication of the change in prices for LGC and STCs between 2016/17 and 2017/18.

For STCs, we see that there has been little change in the STC price over time, regardless of the method that we adopt. The reason is that the price of STCs has been very close to the STC clearing house price of $40 for a number of years now (although prices have started to fall very recently).

For LGCs, we see that the price varies materially depending on the method of estimation utilised. For instance, averaging prices over the two years leading up to June 1st of each year and comparing them indicates that LGC prices have increased by around 50 per cent, while taking the price on June 1st of each year or an average of the prices between May 1st and June 1st of each year, suggest that prices have remained relatively constant. This difference reflects the trend in LGC prices over the last two years, which is shown in Figure 9. LGC prices increased materially between June 2015 and June 2016, but remained much more consistently at these higher levels between June 2016 and June 2017.

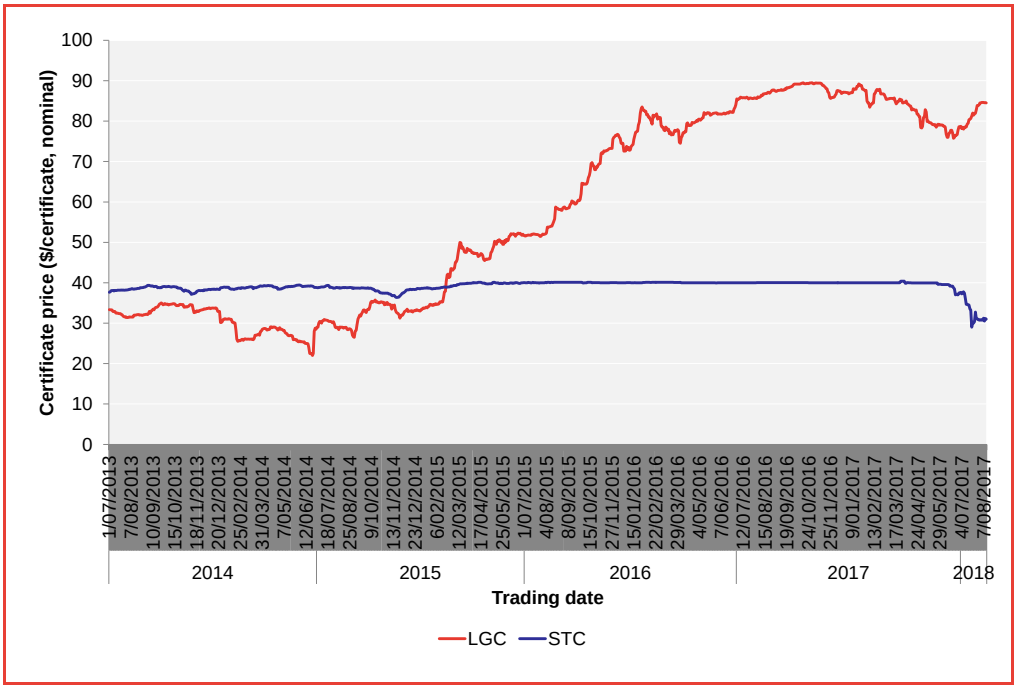
The high LGC prices over the last year seems to be driven by some businesses facing a shortage of LGCs, meaning that they have to procure LGCs through the spot market. It is typically the case that large retailers will procure a large proportion of their LGCs by entering into power purchase agreements with wind generators. However, recent market activity suggests that some businesses are procuring a significant number of LGCs on the spot market, which is driving up spot prices. This is likely to have come about because renewable investments were delayed in recent years as a result of the policy uncertainty that existed at the time.

Figure 8: Percentage increase in LGC and STC prices between 2016/17 and 2017/18 (nominal)



Source: Frontier Economics using data from Mercari

Figure 9: Time series of LGC and STC prices

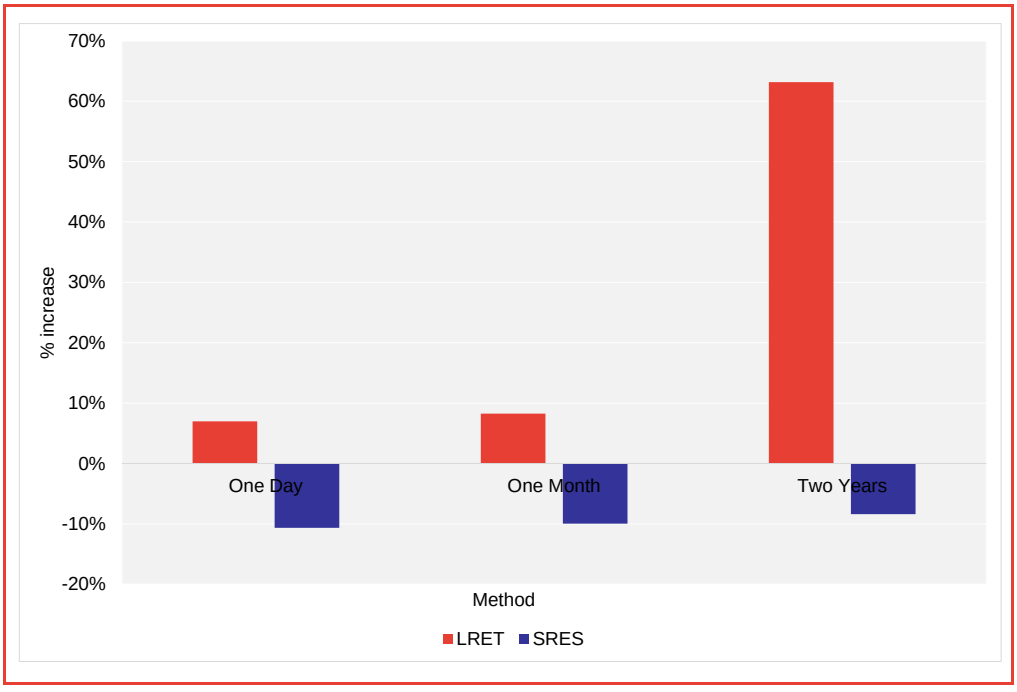


Source: Frontier Economics using data from Mercari

Combining these changes in LGC and STC prices with changes in the RPP and the STP, Figure 10 provides an indication of the percentage change in the cost of complying with the LRET and the SRES from 2016/17 to 2017/18 across the three methods.

The change in cost of complying with the SRES is fairly consistent across the estimation methods, and is largely the result of a reduction in the STP. The change in cost of complying with the LRET varies materially depending on the method of estimation utilised. For instance, averaging prices over the two years leading up to June 1st of each year and comparing them indicates that the cost of complying with the LRET has increased by around 60 per cent, while taking the price on June 1st of each year or an average of the prices between May 1st and June 1st of each year, suggest that the cost has increased by under 10 per cent.

Figure 10: Percentage change in cost of complying with the LRET and SRES between 2016/17 and 2017/18 (nominal)



Source: Frontier Economics using data from Mercari

Costs of complying with green schemes

4.3 Conclusion on cost of complying with green schemes

Each of the methods that we have adopted provides similar estimates of the change in the cost of complying with the SRES, however when we look at the cost of complying with the LRET, we see that there is a marked difference between the first two methods, which are very similar to one another, and the last method, which indicates a considerably larger increase. The reason that we see moderate changes in the cost of complying with the SRES and, when the first two methods are used, with the LRET, is that certificate prices have been relatively stable.

The key uncertainty with these results is whether current (or past) spot prices for LGCs and STCs provide a reasonable indicator of forward prices for LGCs and STCs. While these are clearly an imperfect indicator of forward prices, retailers operate with the same information that we use.

5 Network costs

In supplying electricity to small retail customers, retailers must incur network costs, which include payments for the use of the transmission network and the distribution network.

Through using publicly available data on network tariffs we can estimate network costs incurred by retailers in suppling small retail customers.

5.1 Approach

In supplying electricity to small retail customers, retailers incur network costs which they pass through to customers. Network tariffs for the three electricity distributors in NSW are publicly available, and can be compared for each distribution area in NSW. Through using information on the breakdown of network tariffs and an estimation of primary and controlled load electricity consumption for a typical customer (4,060 kWh and 1,900 kWh respectively), we can estimate the cost incurred by retailers in supplying a typical small retail customer in NSW for each year. A comparison between the bill of the typical consumer in 2016/17 and 2017/18 provides an indication of any changes in the costs incurred by retailers in suppling small retail customers.

5.2 Assessment and conclusion

Table 4 provides a range of the change in the total primary and controlled load bills for a typical customer across the three electricity distributors in NSW. Across the three energy distributors, network charges for primary load have decreased by between –6 per cent and –2 per cent and NUOS charges for controlled load have decreased by between –6 per cent and –1 per cent. For a typical residential customer, the result is a decrease in total network charges of between –6 per cent and –2 per cent.

Table 4: Percentage change in network tariffs between 2016/17 and 2017/18 (nominal)

	NUOS primary load	NUOS controlled load	Total network charge for typical residential customer
% change (across the three distribution businesses)	–6% to –2%	–6% to –1%	–6% to –2%

Source: Frontier Economics analysis, using data from the AEMC and tariffs from network businesses

6 Retail operating costs and retail margin

In supplying electricity to small retail customers, retailers must incur retail operating costs (the costs that a retailer incurs in supplying electricity to its customers) and cover their retail margin.

Retail operating costs and retail margins account for a comparatively small portion of the total costs incurred by a retail business. We also note that there is no clear evidence that retail operating costs and retail margins have changed materially over recent years, and certainly there is no reliable public data that would indicate how these have changed from 2016/17 to 2017/18.

For these reasons, we have not attempted to estimate a percentage change in this component of the cost to supply small retail customers.

7 Summary and conclusion for electricity prices

The analysis provided in the sections above allows us to quantify a reasonable range for the increase in wholesale electricity costs, green costs and network tariffs from 2016/17 to 2017/18.

Table 5 provides a range of estimates of changes in total costs incurred by retailers in supplying electricity to small retail customers, for each of the methods we adopt for wholesale electricity costs and green costs. The range accounts for differences across the three distribution areas.

Table 5 only accounts for the range when comparing expected energy costs for 2016/17 with expected energy costs for 2017/18. The range if comparing actual energy costs for 2016/17 with expected energy costs for 2017/18 would be lower than any of these approaches.

Table 5: Changes in total electricity supply cost between 2016/17 and 2017/18 (nominal)

	Method 1 Energy and green costs priced on 1 June	Method 2 Energy and green costs priced over 1 month to 1 June	Method 3 Energy and green costs priced over 2 years to 1 June
Change in total cost	30.6% to 32.4%	38.2% to 39.9%	14.0% to 15.8%

Source: Frontier Economics

This increase in total costs is primarily a result of increases in wholesale electricity costs. These wholesale electricity costs would typically be considered variable costs,[6] and so would be expected to be reflected in an increase in the variable component of the retail tariff, rather than the fixed component. In contrast, our analysis shows that there has been very little change in the fixed component of tariffs and no strong evidence that retail operating costs (which also have a material fixed component) have increased.

It may be that some retailers consider that the measures that they take to manage the risk of wholesale electricity price volatility (which can include investing in generation plant, signing long-term power purchase agreements (PPAs) or entering into financial contracts) represent a fixed cost, because many of these

6 This is the assumption that has been made in previous estimates of the electricity retail margin for IPART.

arrangements involve capital investments or take-or-pay contractual terms. However, retailers would typically be able to on-sell their generation plant, PPAs and financial contracts, making it much less clear that there are genuinely fixed costs associated with these measures.

Lastly, we present the cost proportions for 2017/18 – in a similar manner as in Section 2, but we have updated these proportions to account for the expected changes in each individual components and present a range of potential proportions based on the three methods used.

The results shown in Table 6 also accounts for differences across the three distribution areas.

Table 6: Estimates of proportion of costs for 2017/18

Cost component	Method 1 Range of proportions	Method 2 Range of proportions	Method 3 Range of proportions
Wholesale energy	45.0% to 45.7%	47.6% to 48.3%	36.2% to 36.8%
Cost of complying with green schemes	6.3% to 6.4%	6.0% to 6.1%	9.0% to 9.1%
Network costs	35.4% to 36.3%	33.5% to 34.3%	40.6% to 41.5%
Retail operating costs	6.7% to 6.8%	6.3% to 6.4%	7.7% to 7.8%
Retail margin	5.7%	5.7%	5.7%

Source: Frontier Economics

7.1 Comparison with Frontier 2016 Electricity Report

The increases in the total cost of electricity supply between 2016/17 and 2017/18 that is set out in Table 5 follows the finding in our Frontier 2016 Electricity Report that there were also increases in the total cost of electricity supply between 2015/16 and 2016/17. Based on our two reports, the changes in total cost of electricity supply from 2015/16 to 2017/18 are summarised in Table 7.

Table 7: Changes in total electricity supply cost between 2015/16 and 2017/18 (nominal)

	Change in total cost from 2015/16 to 2016/17	Change in total cost from 2016/17 to 2017/18
Method 1 Energy and green costs priced on 1 June	11.2% to 12.5%	30.6% to 32.4%
Method 2 Energy and green costs priced over 1 month to 1 June	11.0% to 12.2%	38.2% to 39.9%
Method 3 Energy and green costs priced over 2 years to 1 June	4.5% to 5.7%	14.0% to 15.8%

Source: Frontier Economics

Note: The changes in total cost from 2015/16 to 2016/17 that are presented in this table are based on Approach 2 for estimating the proportion of costs for 2015/16. As discussed in Section 2.2, data that has become available since the release of our Frontier 2016 Electricity Report suggests that this is the better approach.

Part B –
Retail gas prices to residential customers

Summary and conclusion for electricity prices

8 Components in the cost to supply gas to small retail customers

In competitive markets, prices would be expected to reflect the cost of supply. For this reason, our assessment of the drivers of gas prices focuses on the various costs that retailers face in supplying gas to small retail customers.

8.1 Cost components

The costs that retailers face in supplying gas to small retail customers are generally accepted to consist of:

- **Wholesale gas costs** – which are the costs that retailers face in procuring the gas that they supply to their customers.
- **Transmission costs** – which are the costs that retailers face transporting gas through long-distance gas transmission pipelines.
- **Distribution costs** – which are the payments that retailers make for the use of the distribution network.
- **Retail operating costs** – which are the costs that a retailer incurs in operating its business to supply gas to its customers.
- **The retail margin** – which is the return that a retailer requires in order to attract the capital needed to provide a retailing service.

In the sections that follow we consider the potential drivers of changes in the cost that retailers face under each of these cost components.

8.2 Cost proportions

The proportion of the total cost of supplying small retail customers that is accounted for by each of these cost components is a key determinant of the extent to which increases in particular cost components flow through to increases in the total cost of supply.

The best and most recent estimate of the proportion of the total cost of supplying small retail customers that is accounted for by each of these cost components is from a report on gas price trends by Oakley Greenwood for the Australian Department of Industry, Innovation and Science.[7] The Oakley Greenwood Price Trends Review has estimates of the various cost components of supplying gas to small residential customers in New South Wales for each year from 2006 to 2015.

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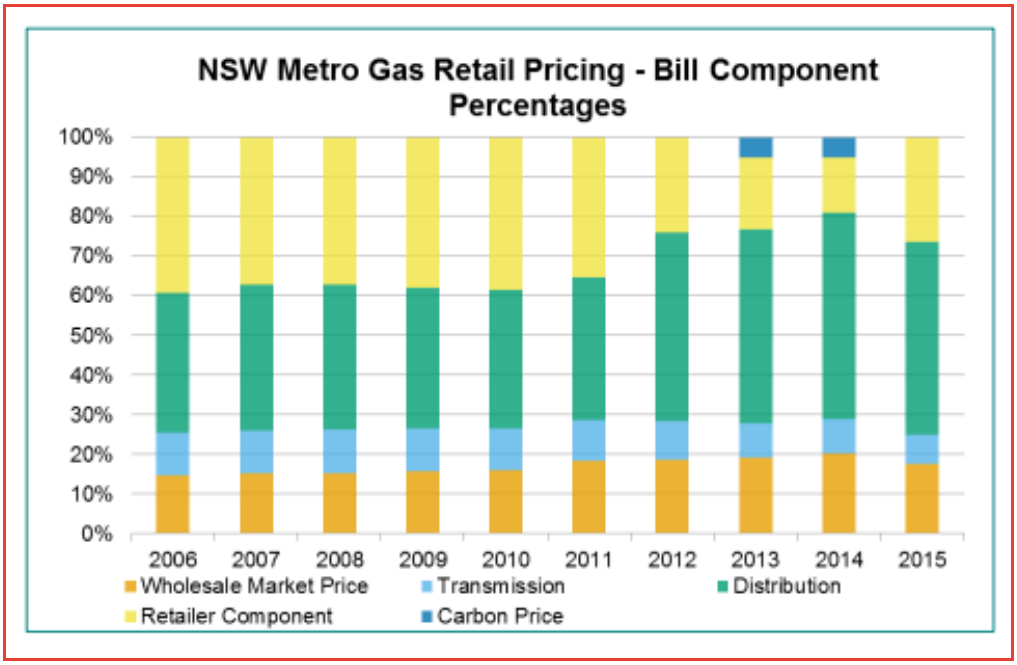
7 Oakley Greenwood, *Gas Price Trends Review*, February 2016 (**Oakley Greenwood Price Trends Review**).

Given that average consumption and distribution tariffs are quite different for coastal customers and country customers, the proportion of cost components is also quite different for these customers; this is reflected in the Oakley Greenwood Price Trends Review, as shown in Figure 11 and Figure 12.

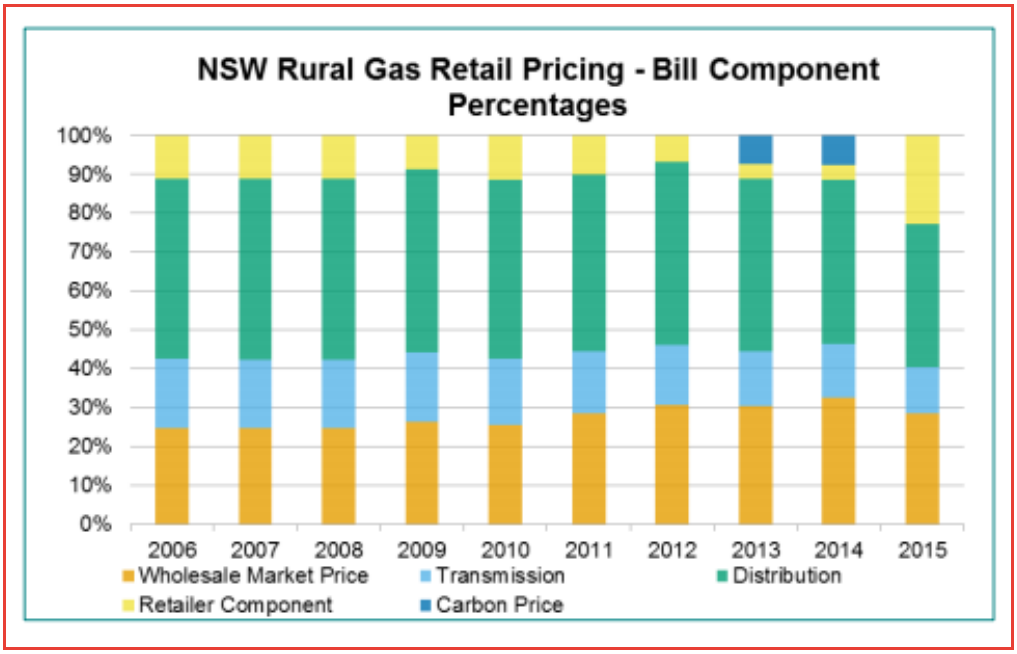
Figure 11: Cost components of supplying coastal residential gas customers in NSW



Source: Oakley Greenwood Price Trends Review, Figure 79.

Components in the cost to supply gas to small retail customers

Figure 12: Cost components of supplying country residential gas customers in NSW



Source: Oakley Greenwood Price Trends Review, Figure 79.

Using the most recent data from the Oakley Greenwood Price Trends Review, the proportion of total costs accounted for by each cost component for 2015, for coastal and country customers. is as set out in Table 8. We will use this as our estimate of the proportion of costs for 2016/17; our view is that these proportions out unlikely to have changed materially from 2015 to 2016/17.

Table 8: Estimates of proportion of costs for 2015

Cost component	Proportion of total costs – coastal customers	Proportion of total costs – country customers
Wholesale gas costs	17.3%	28.6%
Transmission costs	7.1%	11.8%
Distribution costs	47.5%	36.9%
Retail operating cost and margin	28.1%	22.7%
Total	**100.0%**	**100.0%**

Source: Oakley Greenwood Price Trends Review.

9 Wholesale gas costs

In supplying gas to small retail customers, retailers incur costs of purchasing wholesale gas. These are the costs that retailers face in procuring the gas that they supply to their customers.

There are a number of approaches that are available for assessing the wholesale gas costs that retailers face, including forecasting wholesale gas costs. For this review, we are not undertaking gas market modelling of the kind that would be used to provide this forecast. Rather, we analyse trends over time in the two key drivers of changes in wholesale gas costs: changes in load shape and changes in wholesale gas prices.

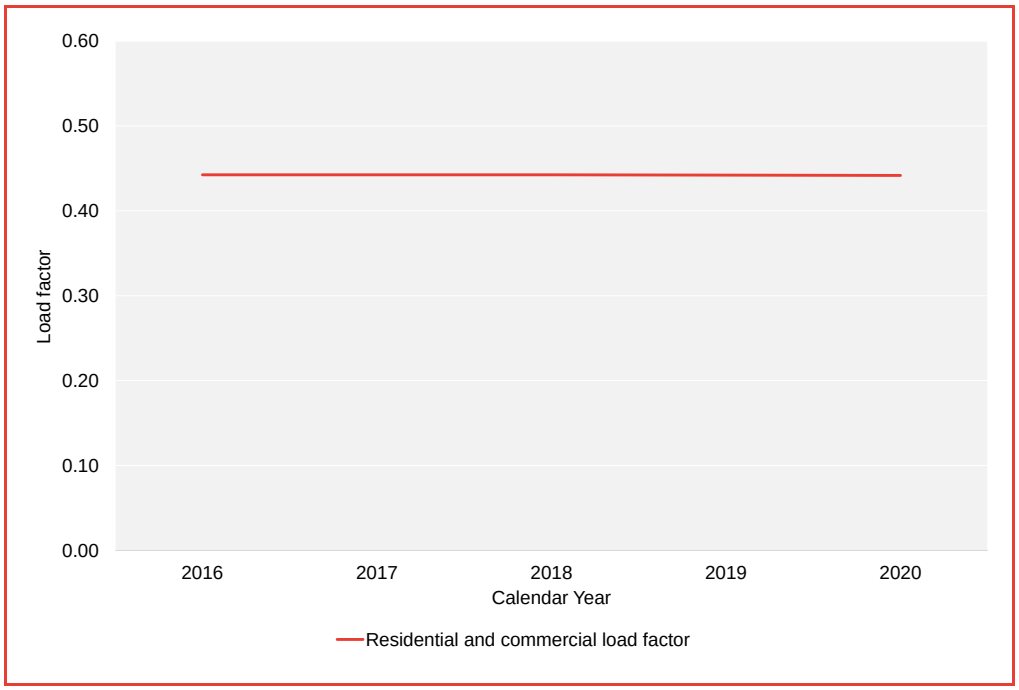
9.1 Load shape

The load shape for retail customers is a key determinant of the cost of supplying gas to those customers: the peakier the load shape, and the more closely correlated that load is to wholesale gas prices, the more expensive it is to supply those customers.

In analysing the load shape for residential electricity customers (in Section 3.1) we made use of the NSLP published by AEMO. For the gas market there is no equivalent of the NSLP that is publicly available; nor is there other public information available on the daily consumption profile of typical residential customers in NSW.

In the absence of public information available on the consumption profile of typical residential customers in NSW, we instead make use of demand forecasts developed by AEMO for the purposes of the National Gas Forecasting Report (NGFR). Among other things, AEMO's NGFR has forecasts of annual consumption and peak day demand for residential and commercial customers in NSW. Based on this information, we have calculated the load factor that AEMO is forecasting for these customers. This load factor (based on the neutral scenario forecasts and 1-in-20 peak winter day forecasts) is shown in Figure 2.

Figure 13: Forecast load factor for residential and commercial customers in NSW



Source: Frontier Economics' analysis of AEMO data

This data on the load factor forecast by AEMO clearly demonstrates that AEMO is not forecasting a change in load factor over time. Based on this, we do not think that there is strong evidence to suggest that changes in load shape would be an important driver of changes in retailer prices into 2017/18.

9.2 Wholesale gas prices

Wholesale gas prices – both spot and contract prices – are clearly a key determinant of the cost of supplying gas to retail customers: the higher gas prices, the more expensive it is for a retailer to supply those customers.

In the remainder of this section we use publicly available information on gas prices for 2016/17 and 2017/18 to assess what this information suggests about the increase in wholesale gas costs from 2016/17 to 2017/18. Because we are comparing last year with this current year, we have actual gas spot prices for 2016/17 but not for 2017/18. These gas spot prices are the daily prices for the gas Short-Term Trading Market (STTM) in Sydney. We also have some information on average prices received by gas producers in 2016/17, but not for 2017/18.

When considering wholesale electricity prices (in Section 3.2) we also were able to make use of publicly available prices for swap and cap contracts; this provided information about market expectations of prices for 2017/18. However, trade in gas derivatives has not developed in Australia, which means that we do not have

Wholesale gas costs

this same information on market expectations of gas prices for 2017/18. This means that we have similar data available on wholesale gas prices as we do for LGC and STC prices (discussed in Section 4); and as with LGCs and STCs, we consider using spot prices as a guide to retailer's expectations of future wholesale gas prices is a reasonable approach for this review.

As in our analysis of wholesale electricity costs and the costs to electricity retailers of complying with green schemes, we adopt three different methodologies to compute changes in wholesale gas costs:

- Looking at prices on the day closest to the time retailers are likely to make their decisions on retail prices (which we assume is June 1st of each year);
- Looking at prices averaged over one month leading up to the time that retailers are likely to make their decisions on retail prices (from 1st May to 1st June each year); and
- Looking at prices averaged over the two years leading up to the time that retailers are likely to make their decisions on retail prices.

In addition, to get some understanding of expectations of future gas prices, an alternative is to use public forecasts of future gas prices. We have regard to the most recent publicly available gas price forecasts from AEMO.

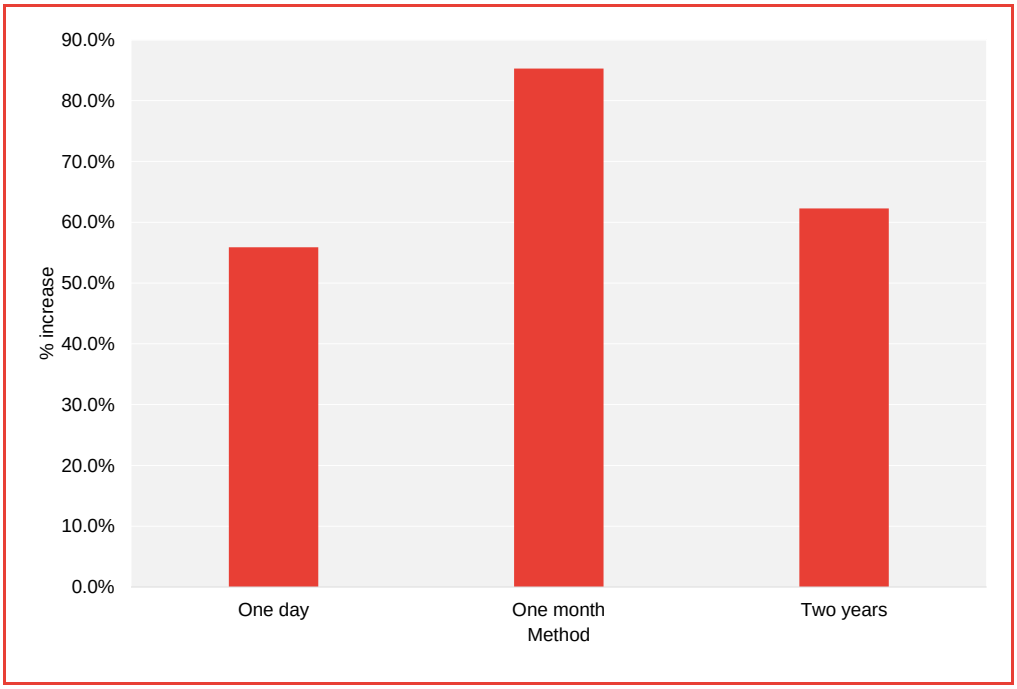
9.2.1 Approach 1: historical spot gas prices

Figure 14 provides an indication of the change in STTM prices for Sydney between 2016/17 and 2017/18. We can see that the price increase varies materially depending on the method of estimation utilised:

- Comparing the price on June 1st of each year indicates the STTM prices in Sydney have increased by around 85 per cent.
- Averaging prices over the month leading up to June 1st of each year and comparing them indicates that STTM prices in Sydney have increased by around 55 per cent.
- Averaging prices over the two years leading up to June 1st of each year and comparing them indicates that STTM prices in Sydney have increased by around 60 per cent.

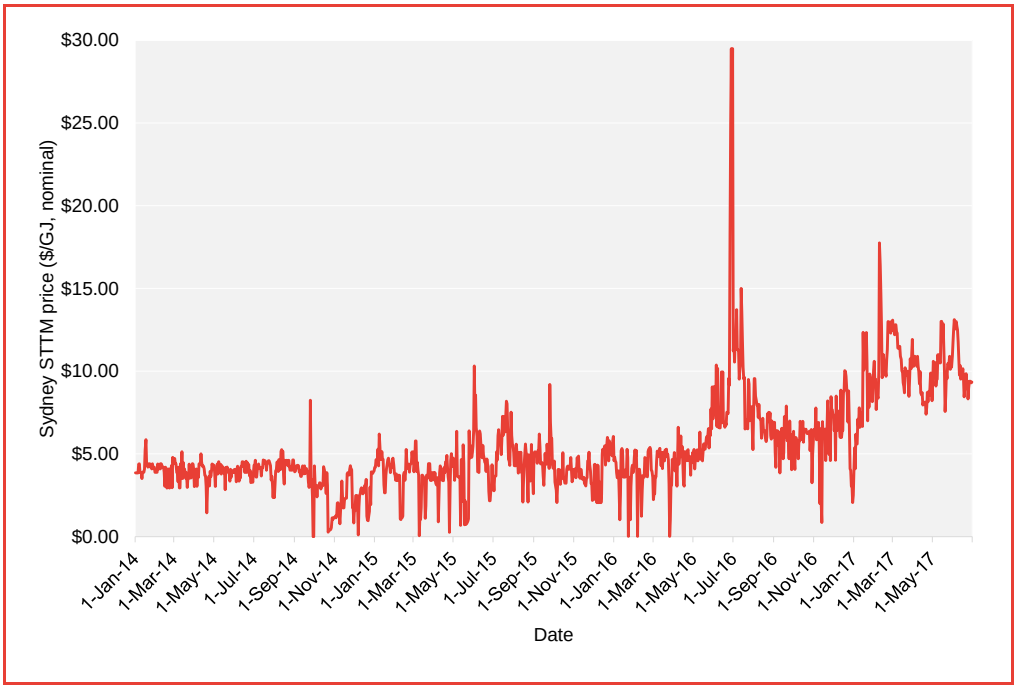
This difference reflects the trend in STTM prices over the last two years, which is shown in Figure 15. STTM prices increased materially starting around June and July 2016. The high peak prices in winter 2016 then continued into higher prices throughout the rest of 2016 and into 2017.

Figure 14: Percentage increase in STTM spot prices between 2016/17 and 2017/18 (nominal)



Source: Frontier Economics analysis of AEMO data.

Figure 15: Time series of STTM prices for Sydney



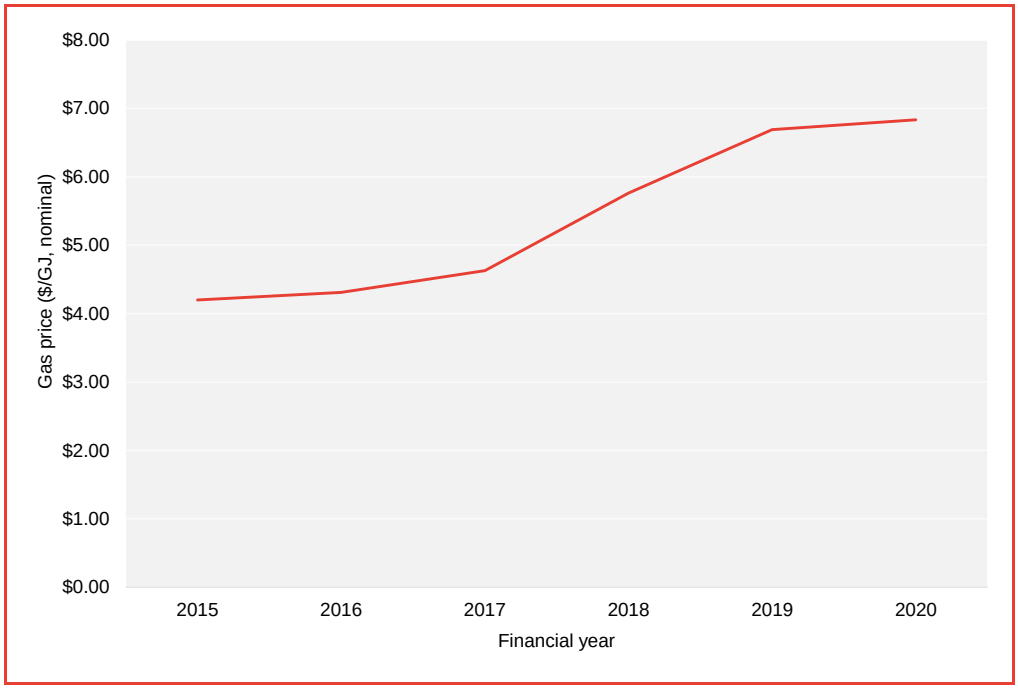
Source: Frontier Economics analysis of AEMO data.

Wholesale gas costs

9.2.2 Approach 2: forecast gas prices

Figure 16 shows the forecast increase in the wholesale component of retail gas prices from AEMO's most recent gas price forecasts. AEMO's forecast gas prices suggest that the wholesale component of retail gas prices will increase 25 per cent, in nominal terms, from 2016/17 to 2017/18.

Figure 16: Forecast wholesale gas cost component of retail gas price for Sydney (nominal)



Source: Core Energy Group, AEMO Pricing Consultancy, February 2016.

9.3 What has driven the increase in gas prices for 2017/18

As we saw in Figure 15, wholesale gas prices in NSW have increased substantially over the last 12 months. Similar increases have been observed in other parts of eastern Australia, the reports suggest that there have also been significant increases in the price of long-term gas supply agreements.

These price increases appear to be driven in large part by significant changes in demand and supply conditions in eastern Australia. The most obvious of these is the commencement of LNG exports at Gladstone, which has had the effect of

tripling demand for gas in eastern Australia within the space of a few years. As these LNG projects have been developed there have, of course, also been corresponding increases in gas production capacity. However, gas production capacity has not increases as much as would have been expected when construction of the LNG projects commenced, for a few reasons:

- In some cases, the rates of gas production from Queensland's coal seam gas fields has not been as high as was expected.
- A number of potential new developments have been delayed or abandoned as a result of State Government policies restricting or preventing the development of certain gas projects.
- Gas production from a number of existing projects has begun to decline, including from the Cooper-Eromanga basin and Victoria's offshore gas basins, in some cases more quickly than was expected.

The combined effect of these supply and demand trends has been a tightening of the supply-demand balance for gas in eastern Australia and an increase in the marginal opportunity cost of supplying gas. This has resulted in higher prices.

There have also been a number of inquiries into the gas sector in eastern Australia over recent years, and suggestions coming from these inquiries that a lack of competition has exacerbated this pricing pressure.

10 Network costs

In supplying gas to small retail customers, retailers must incur network costs, which include payments for the use of the transmission pipelines and the distribution network.

Through using publicly available data on network prices we can estimate network costs incurred by retailers in suppling gas to small retail customers.

10.1 Approach

In supplying gas to small retail customers, retailers incur network costs which they pass through to customers.

Tariffs for transmission pipelines – including the two major pipelines that supply gas to NSW, the Eastern Gas Pipeline and the Moomba to Sydney Pipeline – tend to be published by the pipeline operator.

Tariffs for Jemena's distribution network are also publicly available. Through using information on the breakdown of network tariffs and an estimation of gas consumption for a typical customer (20.4 GJ/a for coastal customers and 45 GJ/a for country customers), we can estimate the cost incurred by retailers in supplying a typical small residential customer in NSW for each year.

A comparison between these costs for a typical consumer in 2016/17 and 2017/18 provides an indication of any changes in the network costs incurred by retailers in suppling small retail customers.

10.2 Assessment and conclusion

Table 9 provides a range of the change in transmission tariffs and distribution tariffs for coastal and country residential customers in NSW.

Table 9: Percentage change in network tariffs between 2016/17 and 2017/18 (nominal)

	Transmission pipeline tariffs	Distribution tariffs
% change for coastal customers	1.2%	-6.3%
% change for country customers	1.2%	-9.9%

Source: Frontier Economics analysis, using data from the Oakley Greenwood Price Trends Review and tariffs from network businesses.

11 Retail operating costs and retail margin

In supplying gas to small retail customers, retailers must incur retail operating costs (the costs that a retailer incurs in supplying electricity to its customers) and cover their retail margin.

Retail operating costs and retail margins account for larger portion of the total costs incurred by gas retailers than they do for electricity retailers; the reason is that gas bills tend to be smaller than electricity bills but a proportion of retail operating costs are fixed.

Nevertheless, our view is that there is no clear evidence that retail operating costs and retail margins have changed materially over recent years, and certainly there is no reliable public data that would indicate how these have changed from 2016/17 to 2017/18.

For these reasons, we have not attempted to estimate a percentage change in this component of the cost to supply gas to small retail customers.

12 Summary and conclusion for gas prices

The analysis provided in the sections above allows us to quantify a reasonable range for the increase in wholesale gas costs and network tariffs from 2016/17 to 2017/18.

Table 10 provides a range of estimates of changes in total costs incurred by retailers in supplying gas to small retail customers, for each of the methods we adopt for wholesale gas costs.

Table 10: Changes in total gas supply cost between 2016/17 and 2017/18 (nominal)

	Method 1 Wholesale gas costs priced on 1 June	Method 2 Wholesale gas costs priced over 1 month to 1 June	Method 3 Wholesale gas costs priced over 2 years to 1 June	Wholesale gas costs based on AEMO price forecasts
Change in total cost – Coastal customers	6.8%	11.8%	7.9%	1.3%
Change in total cost – Country customers	12.5%	20.9%	14.3%	3.5%

As with the increases in electricity prices that we observe, this increase in gas costs is primarily a result of increases in wholesale gas costs. These wholesale gas costs would typically be considered variable costs,[8] and so would be expected to be reflected in an increase in the variable component of the retail tariff, rather than the fixed component. In contrast, our analysis shows that there has been very little change in the fixed component of network tariffs and no strong evidence that retail operating costs (which also have a material fixed component) have increased.

However, as with wholesale electricity costs there is some uncertainty about the extent to which measures to manage wholesale gas price volatility may imply some component of fixed costs to wholesale gas costs.

8 This is the assumption that has been made in previous estimates of the electricity retail margin for IPART.

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