Operating Expenditure Overview

December 2016

Operating Expenditure

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Approval and Document Control

VERSION	DATE	AUTHOR
1.0		

1. Purpose of this document

Operating expenditure (opex) is the operating, maintenance and other non-capital expenditure that we incur to provide our Reference Services to our customers.

This document explains and justifies our opex forecasts for our next access arrangement period (1 January 2018 to 31 December 2022). This document references other supporting documents for further detail.

Unless otherwise stated:

- Our opex is presented in real 2017 dollars and is expressed in total costs (i.e. inclusive of direct costs, overheads and real cost escalations). Total values shown in tables and referred to in the text of this document may not reconcile due to rounding; and
- Our opex forecasts refer to our total Reference Services. However, we apply different Reference Tariff Variation Mechanisms to our two types of Reference Services – Haulage Reference Services and Ancillary Reference Services. Accordingly, this document breaks down our total opex forecasts for our Reference Services between our Haulage and Ancillary Reference Services.

2. Structure of this document

This document is structured as follows:

- Section 3 details our opex profile for the previous, current and forthcoming access arrangement periods.
- Section 4 explains our actual opex against the AER's allowance in the previous and current access arrangement periods as well as the outcomes that it has delivered.
- Section 5 explains our forecasting methodology for opex for the forthcoming access arrangement period and justifies why we consider that it is the most reasonable methodology for regulatory forecasting.
- Section 6 details our opex forecast for the forthcoming access arrangement period – it details our opex forecasts for our total Reference Services and provides a breakdown for our Haulage Reference Services and our Ancillary Reference Services.
- Section 7 explains why we consider that our opex forecast meets the requirements of the National Gas Rules.
- Section 8 details the supporting documentation relevant to our opex forecast.

3. Expenditure profile

Our opex for the previous, current and forthcoming access arrangement periods is presented in Tables 1, 2 and 3 respectively.

Table 1 - Previous access arrangement period opex – excluding debt raising costs ($M, Real 2017)

	2008	2009	2010	2011	2012	TOTAL
Final Decision	52.4	52.4	51.8	51.5	51.3	259.3
Actual	60.8	58.1	60.0	63.5	84.2	326.6
Variance (Actual – Final Decision)	8.4	5.7	8.2	12.0	32.9	67.3

Table 2 - Current access arrangement period opex – excluding debt raising costs ($M, Real 2017)

	2013	2014	2015	2016*	2017*	TOTAL
Final Decision	62.8	68.8	71.3	70.9	71.8	345.6
Actual / Estimated	68.0	67.1	66.9	69.6	71.0	342.5
Variance (Actual – Determination)	5.2	(1.7)	(4.4)	(1.3)	(0.8)	(3.1)

* Estimated

Table 3 - Forthcoming access arrangement period opex – excluding debt raising costs ($M, Real 2017)

	2018	2019	2020	2021	2022	TOTAL
Opex forecast	76.5	77.4	78.4	79.7	81.1	393.0

Table 1 shows that we overspent the AER's opex benchmark allowance by $67.3 million in the previous period. Almost half of this overspend occurred in the final year of this period, 2012, where we spent $32.9 million more than the ESCV's benchmark allowance. Importantly, we fully absorbed the cost of this overspend – our customers did not pay for it.

Table 2 shows that our actual and estimated opex is in a stable band between million $66.9 million and $69.6 million between 2013 and 2016. We propose using 2016 as our base year for the forthcoming access arrangement period.

Table 3 shows that we propose increasing our total opex by $50.5 million, or 15 per cent, in the forthcoming access arrangement period, compared to the current period. This increase is largely driven by a proposed marketing step change of $23.3 over the period and price and output growth of $7.7 million and $7.2 million respectively.

4. Previous and current period expenditure

This section explains and justifies our actual and estimated opex against the AER's allowance in the previous and current access arrangement periods. It also demonstrates the efficiency of our opex having regard for trend analysis and benchmarking against our peers.

Table 4 below shows the trend in our actual and estimated opex for the period 2008 to 2017 compared to the ESCV and AER's benchmark allowances.

4.1. Previous access arrangement period 2008 to 2012

Table 4 shows that our actual opex was in a stable band between $58.1 million and $63.5 million per annum over the period 2008 to 2011 but increased to $84.2 million in 2012. Our overspend in 2012 against the AER's allowance was driven by:

- The costs of implementing our internal business transformation project based on a new competitive service provider model. We refer to this as our "Seven 13 project", in reference to the month and year in which the new model took full effect;
- Higher than forecast unaccounted for gas;
- The carbon tax that was separately recovered; and
- Low opex benchmark allowances in the ESCV's Final Decision for the period. The ESCV's allowances declined year on year throughout the 2008 to 2012 period.

In total, we overspent against the ESCV's opex allowance for the period by $67.3 million. Almost half of this overspend, $32.9 million, was in 2012 alone.

Importantly, we fully absorbed the cost of this overspend – our customers did not pay for it. Our opex in the current Access Arrangement period has reduced dramatically from the one-off high in 2012.

4.2. Current access arrangement period 2013 to 2017

Table 4 also shows that our actual and estimated opex is in a stable band between $66.9 million and $69.6 million per annum for the period 2013 to 2016.

Our current Access Arrangement period opex performance demonstrates:

- The success of our internal business transformation project, which has allowed us to manage our opex within a very stable band over the period;
- We are continuing to respond to the AER's incentives. We are forecasting to underspend the AER's opex allowance, including in our 2016 base year. We expect to underspend the AER's benchmark opex allowance by $2.2 million between 2013 and 2016; and
- 2016, being the penultimate year of the current period, is an efficient base year for our forthcoming access arrangement period. We expect to underspend the AER's allowance by $1.3 million in 2016. This shows that we have not sought to "game" the regulatory framework by back-ending our opex to inflate our proposal for the forthcoming access arrangement period.

Table 4 – Previous and current access arrangement period opex, 2008 to 2017 – excluding debt raising costs ($M, Real 2017)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Final Decision	52.4	52.4	51.8	51.5	51.3	62.8	68.8	71.3	70.9	71.8
Actual / Estimated	60.8	58.1	60.0	63.5	84.2	68.0	67.1	66.9	69.6	71.0
Variance (Actual – Determination)	8.4	5.7	8.2	12.0	32.9	5.2	(1.7)	(4.4)	(1.3)	(0.8)

4.3. Benchmarking

Unlike for electricity DNSPs, the AER has not published any comparative benchmarking of gas distribution businesses in recent years.

For this reason, the three Victorian gas distribution businesses (GDBs) commissioned Economic Insights to benchmark their:

- Expenditure using partial productivity indicators; and
- Productivity performance using various econometric techniques.

We have provided with our Access Arrangement Information the Economic Insights' reports dated 15 June 2016 entitled:

- "Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators"; and
- "The Productivity Performance of Victorian Gas Distribution Businesses".

4.3.1. Expenditure benchmarking

Economic Insights benchmarked 13 Australian and New Zealand GDBs using:

- Public data, including data sourced mainly from Access Arrangement Information filings, regulators' final review reports and the GDBs' annual reports; and
- Data provided in response to common detailed surveys, covering key output and input value, price and quantity information for the calendar years 1998 to 2015 (or 2014, in the case of Jemena NSW).[1]

Economic Insights found in its analysis that the three Victorian GDBs have:

- Amongst the highest customer numbers, gas deliveries (TJ) and network length (kilometres) – only Jemena NSW is larger and ATCO is of comparable size;
- The highest customer density per kilometre of mains; and
- Average energy density per customer and high energy density per kilometre of mains.

Economic Insights found that of the 13 GDBs sampled, Multinet has:

- The third highest customer numbers (and the highest of the Victorian GDBs);
- The third highest gas throughout; and
- The fifth highest network length.[2]

Economic Insights noted that the energy use (TJ) per customer (also referred to as energy density per customer) has declined for all GDBs in recent years – including for Multinet and the other two Victorian GDBs. It attributed this general decline to decreased gas demand by energy-intensive industries and improved residential energy efficiency. It found that Multinet has the lowest energy use per customer of the Victorian GDBs, but it also faced the smallest decline in recent years. Economic Insights also noted that network energy density has declined for most GDBs over the sample period, although it has been comparatively stable for Multinet.[3]

[1] Economic Insights, "Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators", 15 June 2016, page iii

[2] Economic Insights, "Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators", 15 June 2016, pages 2 to 5

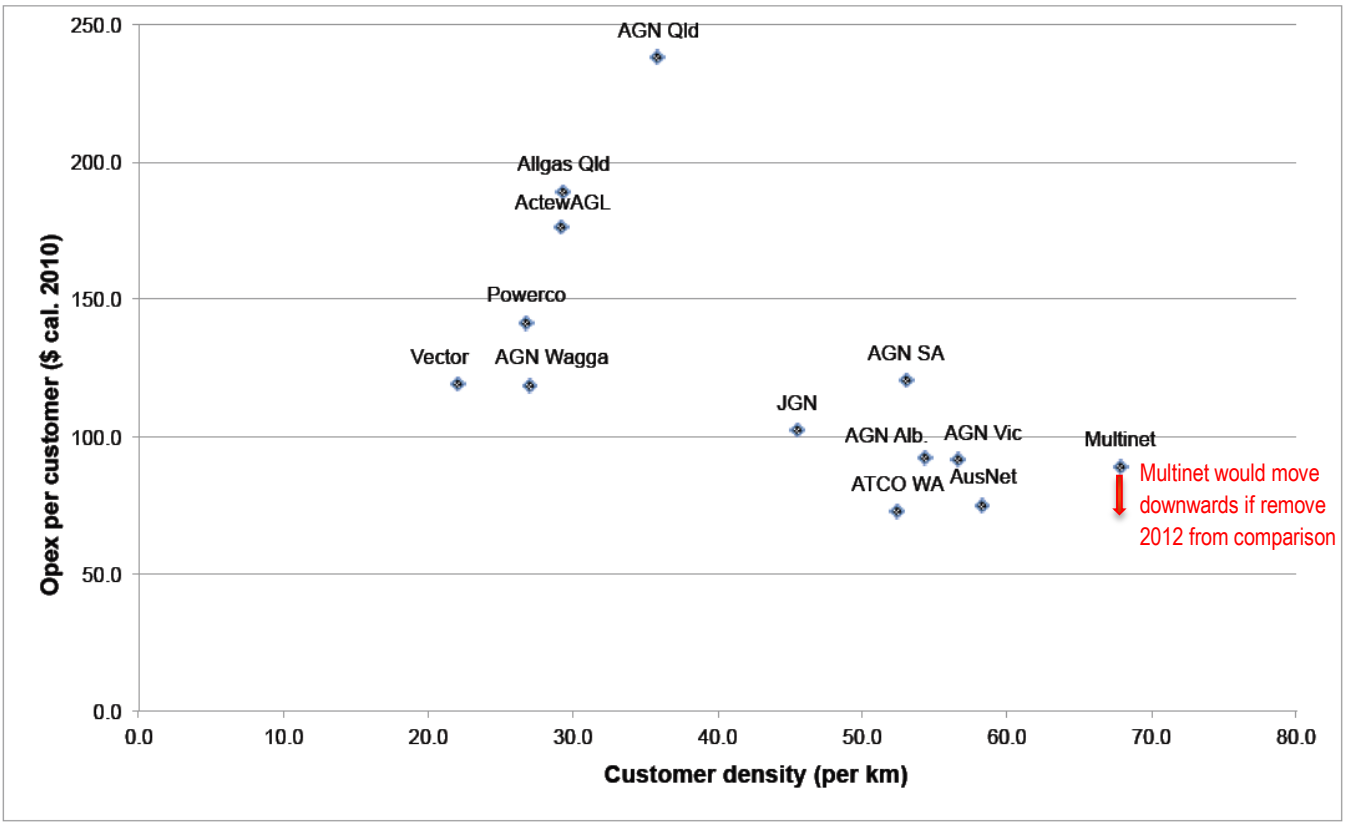
[3] Economic Insights, "Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators", 15 June 2016, page 5

Against this background, Economic Insights benchmarked the 13 GDBs expenditure over 2011 to 2015. It focussed on inputs per customer of GDBs compared to their network customer densities, in order to control for differences in the size and customer density of the GDBs. It examined three measures:

- Opex per customer relative to customer density;
- Capital asset cost per customer relative to customer density; and
- Total cost per customer relative to customer density.

Figure 1 illustrates the results of Economic Insights' benchmarking of GDBs' opex per customer relative to customer density for the 2011 to 2015 period.

Figure 1 - Opex per customer relative to customer density (avg. 2011–2015) [4]



Economic Insights found that:

- There was a group of six GDBs with relatively low customer density and a group of seven GDBs with relatively high customer density. The Victorian GDBs, including Multinet, were in the latter category;
- The six GDBs with relatively low customer density generally had high opex per customer – they had average opex per customer of $164;
- The seven GDBs with relatively high customer density generally had low opex per customer – they had average opex per customer of $92; and

[4] Economic Insights, "Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators", 15 June 2016, page 10

- Multinet had average opex per customer of $89 for the 2011 to 2015 period, which is the third lowest of the 13 GDBs sampled. Our relative position would improve if our outlier year 2012 was removed from the analysis.

Economic Insights concluded that:

> *The three Victorian GDBs are either at or below the average opex per customer for GDBs with relatively high customer density. This suggests that they are among the more efficient of the GDBs in the sample.*[5]

Economic Insights also found that Multinet had the second lowest asset cost (defined as real revenue minus real opex) per customer relative to customer density for the period 2011 to 2015 of the 13 GDBs surveyed. It concluded that:

> *These comparisons are influenced among other things by asset age, original network asset valuations, and various factors not controlled-for which influence the quantity of assets per customer, and hence asset cost per customer. Thus, only qualified conclusions can be drawn from this chart. It suggests that the Victorian GDBs are amongst the more efficient in terms of asset use.*[6]

Economic Insights added the opex and asset costs per customer to determine the overall cost efficiency per customer for the 2011 to 2015 period. It found that Multinet had the second lowest overall cost efficiency per customer of the 13 GDBs surveyed. Economic Insights observed that:

> *Once again, caution is needed in drawing strong conclusions for these comparisons alone. That said, the results tend to indicate that the Victorian GDBs are amongst the more efficient of those included in the sample.*[7]

Economic Insights concluded by saying:

> *The Victorian GDBs therefore have a substantial degree of economies of scale. Even so, their opex per customer and asset cost per customer are amongst the lowest of those for GDBs of comparable scale. Similarly, comparisons of total cost per customer suggest that the Victorian GDBs are comparable to the most efficient peers, and hence amongst the most efficient of the GDBs in the sample.*
>
> *The partial indicators analysis presented in this report does not enable influences such as scale economies or different mixes of inputs to be controlled for in a rigorous fashion. This means that care needs to be taken when drawing inferences. Based on these indicators and recognising the nature of their networks, the Victorian GDBs appear to have performed at better than average levels, achieving comparatively low levels of opex per customer, asset cost per customer and hence total cost per customer.*[8]

4.3.2. Productivity benchmarking

Economic Insights examined productivity levels of the three Victorian GDBs and Jemena NSW, AGN SA and AGN Queensland using data provided by the GDBs in response to detailed surveys. Specifically, Economic Insights detailed the Victorian GDBs':

- Input index – this is the weighted average of separate opex and capital input indexes;
- Output index – this is based on the GDBs' throughput, customer numbers and system capacity;
- Total factor productivity (TFP) – this is the ratio of the output and input indexes;
- Partial factor productivity (PFP) – this measures for each GDB one or more outputs relative to one particular input:

[5] Economic Insights, "Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators", 15 June 2016, page 9

[6] Economic Insights, "Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators", 15 June 2016, page 12

[7] Economic Insights, "Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators", 15 June 2016, page 11

[8] Economic Insights, "Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators", 15 June 2016, pages 12-13

- The opex PFP index measures output produced per unit of opex (non-capital) inputs; and
- The capital PFP index measures output per unit of capital inputs.

- Multilateral TFP – this measures the relative productivity levels and productivity growth rates of the GDBs.

Economic Insights' TFP analysis for the period 1999 and 2015 found that:

- Multinet's capital input index grew fairly steadily over the period and at a similar rate to the output index – it therefore had little bearing on TFP trends. The other two Victorian GDBs had a similar experience;
- The opex input index played a key role in determining Multinet's TFP trends. Our opex inputs' usage decreased at an average annual rate of 3.7 per cent over 1999 to 2008 but increased at an average annual rate of 1.2 per cent between 2008 and 2015. This increase was largely caused by a one-off increase in opex in 2012. Over the period 1999 to 2015, Multinet's opex input index decreased on average by 1.6 per cent per annum[9];[10]
- Multinet's input index (being the weighted average of opex and capital input indexes) declined by 0.9 per cent per annum between 1999 and 2008) and increased by an annual average of 0.9 per cent from 2008 to 2015. Our input index decreased at an average annual rate of 0.1 per cent between 1999 and 2015. Economic Insights noted that this "compares favourably to AGN Vic's average input increase of 0.4 per cent and AusNet's average input increase of 0.6 per cent per year over the same period"[11]. This indicates that Multinet has had the most favourable trend in input use of the three Victorian GDBs over the analysis period[12];
- Multinet's output index grew by 0.9 per cent per annum over the 1999 to 2015 period. This rate is much slower than that for AGN Victoria and AusNet. Economic Insights noted that "This difference probably reflects the nature of its distribution region, which does not include any major residential growth corridors. Further, the growth rate of outputs slowed in the latter half of the period. It averaged 1.2 per cent per year between 1999 and 2008, decreasing to 0.5 per cent per year from 2008 to 2015"[13]. In reference to the lower output index growth, Economic Insights also noted "It is reasonable to expect that this factor would explain much of the difference between the TFP growth results of Multinet and the other two Victorian GDBs"[14]; and
- Multinet's TFP increased by 2.0 per cent per annum from 1999 to 2008 but decreased at an average rate of 0.4 per cent from 2008 to 2015, driven largely by a significant downturn in 2012. Over the 1999 to 2015 period, our TFP increased at an average annual rate of 1.0 per cent. Economic Insights concluded that "although Multinet's inputs have been slightly more contained than those of AGN Vic and AusNet, the much slower growth of its outputs has resulted in a lower average rate of TFP growth than those two businesses" over the period 1999 to 2015.[15]

Economic Insights' PFP analysis for the period 1999 and 2015 found that:

- The capital PFP index for each of the three Victorian GDBs, including Multinet, grew fairly steadily over the period, averaging 0.1 per cent per annum;[16] and
- Multinet's opex PFP index increased strongly between 1999 and 2008 at an average annual rate of 5.1 per cent, and increased at an average annual rate of 0.7 per cent from 2008 to 2015 so that it experienced an average annual rate of 2.5 per cent over the 1999 to 2015 period. Economic Insights noted that "This overall average opex PFP growth rate is lower than those of AGN Vic and AusNet, again reflecting Multinet's lower output growth rate in its more established supply region"[17]. Indeed, Economic Insight found that Multinet had the lowest comparative output index between 1999 and 2015 of the six GDBs examined in the study.

[9] A decrease in opex inputs is favourable and an increase is unfavourable.

[10] Economic Insights, "The Productivity Performance of Victorian Gas Distribution Businesses", 15 June 2016, page 26

[11] Economic Insights, "The Productivity Performance of Victorian Gas Distribution Businesses", 15 June 2016, page 26

[12] Economic Insights, "The Productivity Performance of Victorian Gas Distribution Businesses", 15 June 2016, page 25

[13] Economic Insights, "The Productivity Performance of Victorian Gas Distribution Businesses", 15 June 2016, page 25

[14] Economic Insights, "The Productivity Performance of Victorian Gas Distribution Businesses", 15 June 2016, page 38

[15] Economic Insights, "The Productivity Performance of Victorian Gas Distribution Businesses", 15 June 2016, page 25

[16] Economic Insights, "The Productivity Performance of Victorian Gas Distribution Businesses", 15 June 2016, page 26

[17] Economic Insights, "The Productivity Performance of Victorian Gas Distribution Businesses", 15 June 2016, page 26

Economic Insights used:

- Multilateral TFP analysis to show that Multinet's productivity level in recent years was lower than AGN Victoria's, similar to AusNet's and Jemena NSW's and higher than each of AGN SA and AGN Queensland;[18] and
- Multilateral PFP indexes to show the levels of opex PFP for the six GDBs. It found that Multinet opex levels are below those of AusNet in 2015 but much higher than AGN SA and AGN Queensland.[19] Multinet's opex PFP levels are steadily recovering after a one-off drop in 2012.[20]

4.4. Conclusions about our current period opex

Our trend analysis discussed in sections 4.1 and 4.2 and Economic Insights' independent benchmarking analysis discussed in section 4.3 show that our current period opex has been efficient and we are operating at or close to the efficient frontier of GDBs. In particular:

- We expect to underspend the AER's benchmark opex allowance by $2.2 million between 2013 and 2016 and to underspend the 2016 base year by $1.3 million;
- We have sustained an efficient level of performance over a long period of time – although there was a one-off increase in opex in 2012 due to our corporate transformation project, as discussed in section 4.1. We have therefore not just arrived at our efficient levels of opex recently. This means that assessments of our efficiency are not just a function of which year, or years, is chosen for the benchmarking analysis;
- Economic Insights' expenditure benchmarking shows that we operated below the average opex per customer for the seven gas distributors with relatively high customer density for the 2011 to 2015 period (and considerably below the average of the 13 gas distributors in its survey analysis). It also found that we had the second lowest overall cost efficiency per customer of the 13 gas distributors surveyed;
- Economic Insights' productivity benchmarking shows that our TFP increased at an average annual rate of 1.0 per cent between 1999 and 2015 and 0.4 per cent from 2008 to 2015. Our opex PFP index increased at an average annual rate of 2.5 per cent between 1999 and 2015 and 0.7 per cent from 2008 to 2015. The reason these rates were lower than the two other Victorian gas distributors is that our outputs grew more slowly than theirs. This is largely beyond our control and reflects the nature of our distribution region, which does not include any major residential growth corridor. Indeed, Economic Insights found that we have had the most favourable trend in input use of the three Victorian gas distributors over the analysis period – this is within our control;
- Our new business model – that has resulted from our business transformation program – is successful and is delivering efficient opex outcomes. This transformation provides a strong basis for us to continue to deliver efficient outcomes;
- We have continually responded to the incentives that the AER and, prior to this, the ESCV, have provided to us through the regulatory regime. This is reflected in the efficiency of our opex. We are delivering value for money to our customers through our efficient opex and our customers are sharing in the associated benefits; and
- Our 2016 opex provides an efficient base year for determining our opex forecast for the forthcoming Access Arrangement period. There is no need for the AER to make any adjustment (over and above those that we have proposed) to our base year opex. We discuss this further below.

[18] Economic Insights, "The Productivity Performance of Victorian Gas Distribution Businesses", 15 June 2016, page 27

[19] Economic Insights, "The Productivity Performance of Victorian Gas Distribution Businesses", 15 June 2016, page 27

[20] Economic Insights, "The Productivity Performance of Victorian Gas Distribution Businesses", 15 June 2016, page 36

5. Opex forecasting method for forthcoming period

This section explains and justifies our method of forecasting opex for the forthcoming access arrangement period.

5.1. Choice of Base-Step-Trend (BST) forecasting method

We have used a BST approach to forecast our opex for the forthcoming access arrangement period. This is consistent with:

- The AER's preferred approach for use to prepare our opex forecast; and
- The approach that the AER has applied in its recent decisions for other gas distributors, including for Jemena NSW's network, ActewAGL's ACT, Queanbeyan and Palerang network and AGN SA's network.

5.2. Overview of BST approach

A BST approach involves forecasting our opex at an aggregate level, rather than preparing individual forecasts for each category of opex, as detailed in the AER's Annual RIN.

The starting point for the BST approach is that the incentive properties of the AER's opex incentive mechanism mean that our base year opex reflects prudent and efficient costs. This is because the efficiency carryover mechanism under the opex Incentive Mechanism incentivises us to minimise our opex, while ensuring that we continue to meet our regulatory obligations and to achieve our service performance targets.

The BST approach involves the following stages:

1. Nominating a base year;
2. Adding or subtracting, as relevant, adjustments to the base year opex. These could include making adjustments for:
   a. Changes in service classification;
   b. Non-recurrent costs;
   c. Efficient incremental opex in the final regulatory year of the current access arrangement period; and
   d. Costs determined through a bottom-up build (rather than the BST approach).

   Applying these adjustments results in an efficient base year for use in the forthcoming period.
3. Applying rate of change adjustments to the efficient base year opex for growth in:
   a. Real labour and non-labour prices;
   b. Output; and
   c. Productivity.
4. Adding or subtracting step changes (also known as scope changes) to the efficient base year opex.

The following section details how we have applied these four stages to achieve an efficient opex forecast for the forthcoming access arrangement period. We have checked and tested our opex forecast using trend analysis and benchmarking to confirm that our opex forecast is efficient. We have also ensured that our opex forecast prepared using the BST approach aligns with our internal budget.

5.3. Bottom-up build

We have forecast our opex debt raising costs using a bottom-up build.

6. Expenditure forecasts and expected outcomes for forthcoming period

This section details our opex forecast for the forthcoming access arrangement period. We have derived our forecast by applying the forecasting method described in section 5.

6.1. Forecast opex

Our opex forecast for the forthcoming access arrangement period is summarised in Table 5.

Table 5 – Forthcoming access arrangement period opex ($M, Real 2017)

	2018	2019	2020	2021	2022	TOTAL
Base (including adjustments) [21]	71.0	71.0	71.0	71.0	71.0	354.9
Price Growth	0.4	0.8	1.3	2.1	3.0	7.7
Output Growth	0.5	0.9	1.4	1.9	2.4	7.2
Productivity Growth	-	-	-	-	-	-
Step Changes	4.7	4.7	4.7	4.7	4.7	23.3
Debt raising costs	0.6	0.7	0.7	0.7	0.7	3.4
Total	77.2	78.0	79.1	80.4	81.8	396.4

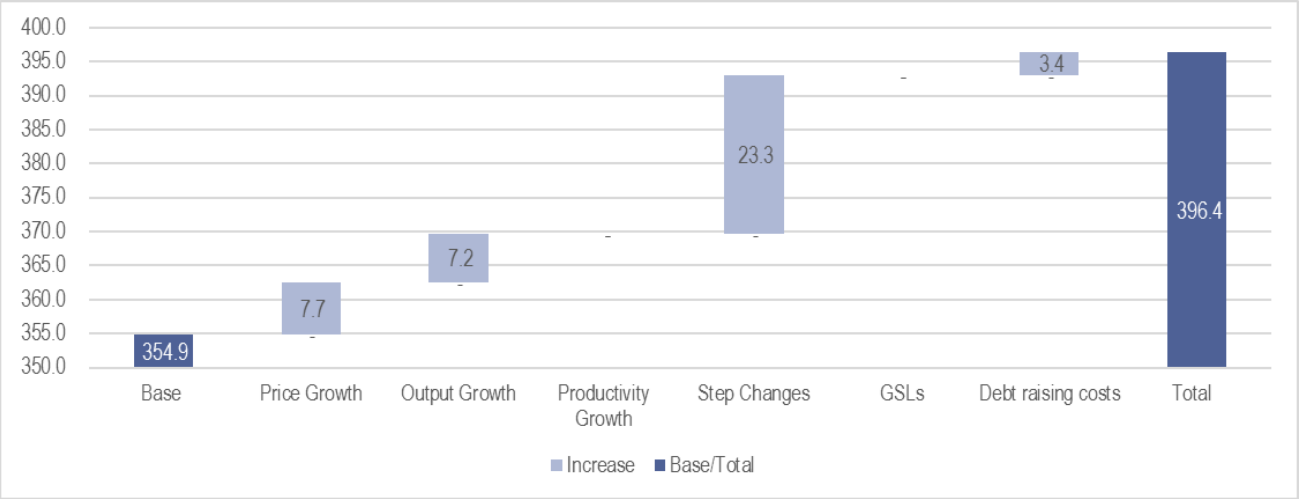
Figure 2 illustrates how we have built-up our opex forecasts for the forthcoming access arrangement period. It shows that we have:

- Started with our 2016 opex, incorporating certain Base Year adjustments;
- Added allowances for real price growth and output growth;
- Determined productivity savings to be zero;
- Added a market step change; and
- Added our debt raising costs that have not been determined using a base-step-trend approach.

We explain our rationale for this build up below.

[21] Refer to Table 6.

Figure 2 - Forthcoming access arrangement period opex ($M, Real 2017)



6.2. Efficient Base Year inclusive of Adjustments

We have chosen 2016 as our base year for our opex forecast because:

- It is the most recent full regulatory year of actual reported expenditure at the time of preparing this Access Arrangement Information (albeit that we have had to estimate the last few months of opex as we submitted our Access Arrangement Information to the AER on 30 December 2016);
- It is representative of our underlying operating conditions in the current and forthcoming access arrangement periods;
- It reflects the efficiencies that we have achieved in transitioning to our new business model;
- We benchmark at the efficient frontier compared with our peers, based on the independent analysis undertaken by Economic Insights that is discussed in section 4.3; and
- It reflects our response to the incentives of the regulatory regime and shows that the incentives are working.

We have assessed our efficient base year opex to be $71.0 million, which we have calculated as set out in Table 7.

Table 6 – Calculation of base year opex including adjustments

Component	Year / value	$ million
Total estimated regulated opex	*Real 2016*	78.1
Less Unaccounted for Gas	*Real 2016*	(8.2)
Plus carbon tax	*Real 2016*	0.3
Less licence fees	*Real 2016*	(0.1)
Less movement in provisions	*Real 2016*	(1.4)
Less one-off costs	*Real 2016*	-
Sub Total	*Real 2016*	**68.7**
Convert from mid to end of 2016 dollars (half year inflation)	*0.65%*	0.4
Convert from 2016 dollars to 2017 dollars	*1.30%*	0.9
Sub Total		**70.1**
Add 2016 to 2017 adjustment	*Real 2017*	0.9
Total Base Opex	***Real 2017***	**71.0**

On this basis, Table 7 details our efficient base year opex for each year of the forthcoming access arrangement period.

Table 7 - Forthcoming access arrangement period efficient base year opex including adjustments ($M, Real 2017)

	2018	2019	2020	2021	2022	TOTAL
Efficient base year opex including adjustments	71.0	71.0	71.0	71.0	71.0	354.9

6.3. Rate of change – price

Our opex involves two inputs – labour and materials.

The AER adopted a weighting of 62 per cent for labour and 38 per cent non-labour for the purposes of determining the rate of price change in its:

- Final Decisions for AGN's South Australian network for their 2016-17 to 2020-21 Access Arrangement period and for Jemena Gas Networks' NSW network for their 2015-16 to 2019-20 Access Arrangement period; and
- Distribution Determinations for the Victorian electricity DNSPs' opex for their 2016 to 2020 regulatory period.

We have adopted these same percentages to determine the real price growth for our opex forecast for our forthcoming access arrangement period.

We expect that the costs of materials' inputs will increase in line with the consumer price index (CPI) in the forthcoming access arrangement period. We therefore are not proposing any rate of change for materials in our opex forecast.

We are proposing an allowance to our opex forecast for real price growth in labour in the forthcoming access arrangement period. This is because we expect that our labour costs will increase at a faster rate than the CPI.

We engaged an independent expert, BIS Shrapnel, to forecast real labour cost escalations relevant to our opex for the forthcoming access arrangement period. We have provided a copy of their report to the AER with this Access Arrangement Information.

BIS Shrapnel prepared its forecasts using top-down and bottom-up approaches. Its bottom-up approach models industry sectors at a regional and individual category level, which are aggregated to a national level. The top-down modelling reconciles the bottom-up forecasts with prevailing trends, investment and business cycles and assumptions about the general macroeconomic outlook.[22]

BIS Shrapnel is forecasting that:

> *Wages within the Australian Electricity, Gas, Water and Waste Services (EGWWS or 'Utilities) sector are (sic) forecast to exceed the all industry result. A stronger union presence, a pick-up in employment and a turnaround in wage increases awarded to staff on individual agreements are the key drivers.*[23]

The report states that for Australia as a whole:

> *BIS Shrapnel is forecasting an average of 3.7 per cent per annum (also 0.5 percentage points higher than the national 'All Industries' WPI average of 3.2 per cent per annum) over the five years to 2022.*[24]

In relation to Victoria, the report states that:

> *The utilities wage forecasts for Victoria are expected to slightly exceed the national average over the five years to December 2022 (i.e. the distributors' next Access Arrangement period). Victorian utilities WPI growth is forecast to average 3.8 per cent per annum compared with Australian utilities industry wage forecast of 3.7 per cent per annum over the same period.*[25]

BIS Shrapnel's forecasts of growth in the Wage Price Index (WPI) are detailed in Table 8 below.

Table 8 – Wage Price Index – 2018 to 2022 [26]

		2018	2019	2020	2021	2022	Average
Nominal Price Changes	Electricity, Gas, Water and Waste Services – Victoria	3.10	3.40	3.70	4.20	4.50	3.80
	Contractor – Victoria	2.80	3.30	3.70	4.30	4.50	3.70
Real Price Changes	Electricity, Gas, Water and Waste Services – Victoria	1.10	0.90	1.20	1.70	2.00	1.40
	Contractor – Victoria	0.80	0.80	1.20	1.80	2.00	1.30

We applied the BIS Shrapnel labour cost escalators to our mix of employees and contractors to determine our forecast real labour cost increases.

[22] BIS Shrapnel, "Utilities Sector and Construction Industry Wage Forecasts to 2022 – Australia and Victoria", October 2016, page 1

[23] BIS Shrapnel, "Utilities Sector and Construction Industry Wage Forecasts to 2022 – Australia and Victoria", October 2016, page ii

[24] BIS Shrapnel, "Utilities Sector and Construction Industry Wage Forecasts to 2022 – Australia and Victoria", October 2016, page ii

[25] BIS Shrapnel, "Utilities Sector and Construction Industry Wage Forecasts to 2022 – Australia and Victoria", October 2016, page 40

[26] BIS Shrapnel, "Utilities Sector and Construction Industry Wage Forecasts to 2022 – Australia and Victoria", October 2016, page iii

Table 9 details our forecast opex increase attributable to real labour price growth in the forthcoming access arrangement period.

Table 9 - Real rate of change – labour price – Standard Control Services ($M, Real 2017)

	2018	2019	2020	2021	2022	TOTAL
Real Price Growth	0.4	0.8	1.3	2.1	3.0	7.7

6.4. Rate of change – output

We have included an allowance in our opex forecast for the impact of output growth in the forthcoming access arrangement period. This reflects the fact that greater output costs more to operate and maintain.

We have applied the following output change measures and respective weightings for the forthcoming access arrangement period:

- Customer numbers (45 per cent); and
- Pipeline length (55 per cent).

We have chosen these measures having regard for economic modelling analysis by Economic Insights, whom we engaged to undertake econometric estimation of the opex cost function for gas distributors, including network length, customer numbers and gas throughput as outputs. They examined 11 Australian and three New Zealand gas distributors using historical data that generally covered the period 1999 to 2015.

Economic Insights' report, which we have provided to the AER in support of this Overview Document and our Access Arrangement Information, stated:

> *The conclusions of this study in regard to the significance of outputs are as follows:*
>
> - *gas throughput is not a statistically significant determinant of real opex;*
> - *network length is a statistically significant determinant of real opex; and*
> - *customer numbers are a statistically significant determinant of real opex.*[27]

We therefore consider that customer numbers and pipeline length:

- Are significant outputs that we deliver;
- Drive our opex forecasts, consistent with Economic Insights' findings;
- Align with the objectives of the National Gas Rules (NGR) and the National Gas Law (NGL);
- Reflect services provided to customers; and
- Are consistent with two of the three output measures that the AER accepted in its May 2016 Distribution Determination for determining output growth for the Victorian electricity DNSPs for their 2016 to 2020 regulatory control period.

We have not applied either consumption (i.e. gas throughout) or maximum demand as output measures because they are not drivers of opex. This is consistent with Economic Insights' findings.

We are using the same weightings for our two output measures as the AER used in its recent Final Decision for the Victorian electricity DNSPs' 2016 to 2020 regulatory period, although we have proportionately scaled them up as we are not applying the maximum demand measure that was used for electricity.

Table 10 details our forecast opex increase attributable to the impact of output growth in the forthcoming access arrangement period.

[27] Economic Insights, *Gas Distribution Businesses Opex Cost Function*, 22 August 2016, page ii

Table 10 - Forthcoming access arrangement period Rate of Change ($M, Real 2017)

	2018	2019	2020	2021	2022	TOTAL
Output Growth	0.5	0.9	1.4	1.9	2.4	7.2

6.5. Rate of change – productivity

We propose that a rate of change productivity adjustment of zero per cent be applied in each of the five years of the forthcoming access arrangement period. This is consistent with the AER's position in its Final Decisions for AGN SA's gas network and for the Victorian electricity DNSPs.

We agree with the assessment that AGN SA made in its Access Arrangement Information for its 2016-17 to 2020-21 period, where it stated:

> *a forecast of productivity growth cannot be arrived at on a reasonable basis and therefore cannot meet the criteria as detailed in Rule 74 of the NGR. As such, AGN has removed the productivity adjustment from the Rate of Change formula incorporated into the Opex Model.*[28]

AGN SA went on to reject the 0.5 productivity adjustment that the AER had proposed in its Draft Decision[29] for the following reasons:

- *The labour cost escalation rate does not compensate the business for forecast productivity improvements;*
- *AGN does not consider that a forecast of productivity growth can be arrived at on a reasonable basis;*
- *AGN considers the forecast of productivity growth applied by the AER to forecast opex does not meet the AER's forecast assessment principles;*
- *AGN has absorbed significant opex costs in its Revised AA Proposal (effectively applying a productivity adjustment of 0.7%), so it is not necessary for the AER to apply an additional productivity adjustment;*
- *the productivity adjustment applied by the AER in its Draft Decision is irrelevant to AGN.*[30]

In its Final Decision for AGN SA, the AER stated:

> *Based on a review of the material and our own analysis, we were unable to identify a better productivity factor estimate than that proposed by AGN. Therefore, we have concluded that it is reasonable to accept AGN's proposal to apply a zero productivity factor for the forecast period. We consider this is the best estimate available in the circumstances.*[31]

We consider that this logic applies equally to our gas distribution network. For this reason, we are also proposing that a rate of change productivity adjustment of zero per cent be applied for the next access arrangement period.

Table 11 - Forthcoming access arrangement period real rate of change – productivity ($M, Real 2017)

	2016	2017	2018	2019	2020	TOTAL
Productivity Growth	0.0	0.0	0.0	0.0	0.0	0.0

We note that in proposing a zero rate of change productivity adjustment we are absorbing a range of cost increases that we expect to face in the forthcoming Access Arrangement period, including in relation to:

[28] AGN SA, "Australian Gas Networks Revised SA - Access Arrangement Information, January 2016", page 17

[29] The AER's proposed 0.5 per cent productivity adjustment was based on advice from ACIL Allens in relation to ActewAGL.

[30] AER, "Attachment 7 – Operating expenditure – Final Decision: Australian Gas Networks Access Arrangement 2016-21", page 7-19

[31] AER, "Attachment 7 – Operating expenditure – Final Decision: Australian Gas Networks Access Arrangement 2016-21", page 7-19

- **Real increase in material costs** – we have not applied any real cost escalations in relation to our material inputs although we expect to incur some cost increases. Rather, we have confined our real cost escalations to our labour inputs, as discussed in section 6.3. In effect, we are implicitly applying a productivity saving equivalent to the real increase in material costs that we will face in the next period.
- **Custody transfer meters** – we will incur additional opex in the next period because of the APA Group's proposed lifecycle replacement of Custody Transfer Meters (CTMs) on its Victorian Transmission System. APA Group has identified, as part of its Metering Strategy Plan, seven CTMs for lifecycle replacement. We support the need for their replacement but have chosen not to include the additional cost as an opex step-change for the forthcoming Access Arrangement period. As a result, we are implicitly applying a productivity saving of about $0.4 million, which is the estimated cost of the APA Group's works that will be passed through to us.
- **Insurance** – we expect our total insurance costs to increase by about $0.9 million over the next Access Arrangement period relative to 2016 levels due to changes in market conditions for our existing insurance program and the addition of cyber insurance. We note that the AER accepted Jemena Gas Networks' application for increase insurance costs for their current Access Arrangement period because the AER considered that insurance reflects a prudent and efficient risk management practice. We have chosen to include the additional cost as an opex step-change. As a result, we are implicitly applying a productivity saving of about $0.9 million in the next Access Arrangement period.
- **High Pressure Pipeline In-line inspection** - we are due to carry out in-line inspection (ILI) of the Inner Ring Main in conjunction with AGN, Ausnet and APA in 2019-20. It has been ten years since the last ILI was run. Ten yearly ILI is industry good practice in the absence of measured deterioration rates and engineering assessment. We will incur additional opex cost of approximately $0.5 million on this project. Two other ILI pigging projects are forecast within the Access Arrangement period, which will incur opex costs of approximately $0.4 million each.

6.6. Step change

We propose including the marketing step change in Table 12 in our opex forecasts for the forthcoming Access Arrangement period. This sub-section explains and justifies this proposal.

Table 12 - Step Change – Reference Services ($M, Real 2017)

	2018	2019	2020	2021	2022	TOTAL
Marketing Step Change	4.7	4.7	4.7	4.7	4.7	23.3

AEMO is projecting that demand will fall in Victoria by 1 per cent between 2015 and 2022. While AEMO expects some growth in the number of new residential connections, it expects this to be offset by a reduction in average consumption per connection. AEMO's forecast is largely consistent with our own analysis, where we forecast that our average residential consumption will continue to decline over the forthcoming Access Arrangement period.

This means there is a risk of our future average network prices increasing as we recover our largely fixed costs over a smaller consumption base. The decline in average residential consumption on our network is being driven by:

- The reduced competitiveness of gas compared with electricity, as wholesale gas prices rise and wholesale and network electricity prices fall;
- The increased penetration of reverse-cycle air conditioners;
- Increased energy and thermal efficiency, which is causing average residential gas consumption to decline, particularly for new customers who need to comply with minimum energy performance standards;
- Growth in the proportion of smaller, all-electric apartment in high risk buildings; and
- A lack of growth corridors in our gas network, which means that our forecast rate of new connections is relatively low.

Gas must be financially attractive to attract new customers to connect to the gas network and to encourage them to purchase additional natural gas appliances.

Research indicates that potential new customers see the upfront costs of purchasing new gas appliances, and getting them installed, as barriers to connecting to our network and to using gas, particularly when they have alternatives such as electricity readily available.

We therefore need to be proactive in:

- Promoting natural gas as a fuel of choice;
- Increasing the rate of new residential connections and average residential consumption; and
- Increasing the take-up of gas in regional areas, including those areas that have recently been connected through the Energy for the Regions program.

Other gas distributors have proven that incentive rebate programs can be effective in addressing these barriers. They can be targeted at influencing customer behaviour by helping them with the upfront costs of buying natural gas appliances.

Our proposed marketing step change would introduce a targeted marketing campaign in the forthcoming Access Arrangement period, in conjunction with the two other Victorian gas distributors. The campaign would have four elements:

- Appliance rebates – we would provide appliance rebates on central heating, space heating and hot water systems;
- Advertising campaign – we would promote the use of gas and appliance rebates to residential customers, including through the development of a joint website;
- Industry representation – we would promote gas to builders, developers, plumbers, gas fitters and appliance retailers; and
- Connection incentive program – we would pay incentives to plumbers, gas fitters and appliance retailers where their actions clearly result in new connections.

NIEIR has prepared an independent expert demand forecasts of our gas network for the forthcoming Access Arrangement period. NIEIR updated its demand forecast for our proposed step change in marketing opex.

On the basis of NIEIR's analysis, we forecast that over the forthcoming Access Arrangement period, the marketing step change will:

- Grow our customer base by a total of 1,405 new connections;
- Increase total residential consumption by 1.42 PJ;
- Increase average annual consumption by 0.6 GJ per residential customer by 2022; and
- Reduce average network prices over time, in the long-term interests of customers.

We have engaged with our stakeholders about our proposed marketing step change. They have told us that they support this strategy and see that it will promote customers' long-term interests with respect to price and gas availability.

We note that in 2015 the AER approved a marketing step change for JGN of $45 million (Real 2016) and the Economic Regulation Authority of Western Australia (ERA) approved a business development and marketing opex allowance for ATCO of $12.3 million (Real 2016). This followed the AER's approval of $16.6 million (Real 2016) for AGN Victoria for its current Access Arrangement period and $29.1 million (Real 2016) for AGN SA from 2011.

We currently have no provision for marketing in our base year opex. By contrast, we note that AGN Victoria already has a marketing allowance included in its base year.

We have provided an accompanying independent expert report prepared by Axiom Economics which sets out the net benefit of our proposed market opex step change. The report explains how:

- Our proposal is in users' long-term interests by showing that our reference tariffs will be lower than they otherwise would have been, consistent with the NGO;
- The benefits of our proposal exceed the costs;

- Our proposal is consistent with the opex incurred by a prudent service provider, acting efficiently, in accordance with good industry practice, as is required by Rule 91;
- Our proposal has been arrived at on a reasonable basis and represents the best forecast or estimate possible in the circumstances, as is required by Rule 74(2); and
- The incremental load and / or connections arising from our proposal have been taken into account in our demand forecasts.

We have also provided a marketing strategy that details how we will deliver the step change in the forthcoming Access Arrangement period.

6.7. Debt raising costs

Table 13 details our forecast debt raising costs in the forthcoming access arrangement period.

Table 13 - Debt raising costs ($M, Real 2017)

	2018	2019	2020	2021	2022	Total
Debt raising costs	0.6	0.7	0.7	0.7	0.7	3.4

Our justification for our debt raising costs is detailed in our Access Arrangement Information.

6.8. Split of opex forecast between Haulage and Ancillary Reference Services

As discussed in section 1, our opex forecast described in this Overview Document relates to our Reference Services.

Table 14 splits the total opex in Table 5 between our Haulage Reference Services and our Ancillary Reference Services because different Reference Tariff Adjustment Mechanisms apply to each type of service.

Table 14 - Split of Total opex for Reference Services ($M, Real 2017)

	2018	2019	2020	2021	2022	TOTAL
Controllable opex – Reference Services	76.5	77.4	78.4	79.7	81.1	393.0
Debt raising costs	0.6	0.7	0.7	0.7	0.7	3.4
Total opex – Reference Services	77.2	78.0	79.1	80.4	81.8	396.4
Opex – Ancillary Reference Services	(2.3)	(2.3)	(2.3)	(2.3)	(2.4)	(11.7)
Opex – Haulage Reference Services	74.8	75.7	76.7	78.0	79.4	384.7

Our opex forecast for our Haulage Reference Services is reflected into our Total Revenue forecast for Haulage Reference Services in our Access Arrangement Information.

7. Meeting Rules' requirements

7.1. Meeting the opex criteria

The Rules set out the criteria the proposed opex for the forthcoming regulatory control period is required to achieve.

NGR Rule 91 states that

(1) *Operating expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of delivering pipeline services*.

We have used a BST approach to forecast our opex for the forthcoming access arrangement period. This is the AER's preferred approach for how it would like us to prepare our opex forecast, and is consistent with the approach that it has used in recent regulatory determinations for electricity and gas network businesses.

A BST approach involves forecasting our opex at an aggregate level, rather than preparing individual forecasts for each category of opex, as detailed in the AER's Annual RIN.

The starting point for the BST approach is that the incentive properties of the AER's EBSS mean that our base year opex reflects prudent and efficient costs. This is because the efficiency carryover mechanism under the EBSS incentivises us to minimise our opex, while ensuring that we continue to meet our regulatory obligations and to achieve our service performance targets.

The BST approach is detailed in section 5 of this Overview Paper.

In relation to the efficiency criteria:

- Economic Insights' benchmarking indicates that our historical opex is at, or close to, the efficient frontier of gas distributors in Australia and New Zealand;
- We have applied the AER's preferred BST approach to forecasting opex, which is based on an efficient build-up of costs;
- Our 2016 opex provides an efficient base year for our opex forecast;
- Our real labour cost escalators have been determined by independent experts, BIS Shrapnel;
- Our output growth forecast has been determined based on movements in customer numbers and pipeline length, which are supported by Economic Insights as the most appropriate output measures; and
- We have proposed one step change for costs associated with marketing our gas network. This has been forecast using a build-up of labour and material costs that are detailed in section 6.6 above. We note that the AER recently approved a significant step-change for Jemena Gas Network in its current Access Arrangement for its NSW network.

We have structured our opex forecasts to maintain the quality, reliability and security of supply of our services to our customers.

7.2. Key assumptions – opex

The key assumptions underpinning our opex forecasts for the forthcoming access arrangement period are that:

- The 2016 base year is efficient but should be adjusted for changes in input costs and output growth;
- The base year opex should be increased for certain step changes in the forthcoming access arrangement period that we did not incur in the current access arrangement period;
- The forecast opex will maintain, but not improve, network reliability;
- Our current legislative and regulatory obligations will not change materially.

8. Supporting documentation

The following documents support our opex forecast for the forthcoming access arrangement period:

- Economic Insights, "Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators", 15 June 2016
- Economic Insights, "Benchmarking the Victorian Gas Distribution Businesses' Operating and Capital Costs Using Partial Productivity Indicators", 15 June 2016
- Economic Insights, "Gas Distribution Businesses Opex Cost Function", 5 August 2016
- BIS Shrapnel, "Utilities Sector and Construction Industry Wage Forecasts to 2022 – Australia and Victoria", October 2016

Glossary

Abbreviations	
AER	Australian Energy Regulator
BST	Base-Step-Trend
CPI	Consumer Price Index
CTMs	Custody Transfer Meters
DNSP	Distribution Network Service Provider
EBSS	Efficiency Benefit Sharing Scheme
EGWWS	Electricity, Gas, Water and Waste Services
ESCV	Essential Services Commission of Victoria
GDBs	Gas distribution businesses
GSL	Guaranteed Service Levels
M	Millions
MTFP	Multilateral Total Factor Productivity
NGR	National Gas Rules
NGL	National Gas Law
Opex	Operating expenditure
PFP	Partial Factor Productivity
Rules	National Electricity Rules
TFP	Total Factor Productivity
TJ	Terajoules
UAFG	Unaccounted for Gas
VTS	Victorian Transmission System
WPI	Wage Price Index