Attachment 5: Operating expenditure

Access Arrangement Information for the 2016-21 ACT, Queanbeyan and Palerang Access Arrangement

Submission to the Australian Energy Regulator

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5 Operating expenditure

Key points

- ActewAGL Distribution's total operating expenditure (opex) forecast of $143.8 million ($2015/16) is a 7.4 per cent increase on the previous period, but represents a decrease of 9.2 per cent on a per customer basis.
- The opex forecast has been prepared on a basis that ensures expenditure reasonably reflects the criteria set out in the National Gas Rules and enables the safety, reliability, quality, and security of gas supply and services to be maintained during the 2016-21 access arrangement period.
- During the 2010-16 access arrangement period, ActewAGL Distribution has responded to the incentives contained in the regulatory framework by achieving opex efficiencies that will be shared with consumers over the 2016-21 access arrangement period.
- ActewAGL Distribution has adopted a combination of 'base-step-trend' and category specific approaches to forecasting opex for the 2016-21 access arrangement period that represents prudent and efficient costs. This approach has ensured the forecast has been arrived at on a reasonable basis and represent the best forecast possible in ActewAGL Distribution's circumstances.
- The forecast includes step changes for costs required to meet new or changing regulatory obligations and operate in accordance with good industry practice to achieve the lowest sustainable costs of delivering pipeline services.

Consumer benefits

ActewAGL Distribution's opex program for its gas network business over the 2016-21 access arrangement period reflects the feedback received from consumers on what is important to them and provides the following benefits.

- Safe, reliable and secure supply of gas services at efficient costs through integrated long-term asset management planning and investment in maintenance programs that manage risk and meet customer service standard expectations.
- Opportunities to engage further with ActewAGL Distribution to ensure continued alignment with the needs of consumers and ongoing developments in the gas market as well as the broader energy market that best serve the long term interests of consumers.

5.1 Overview

This attachment details ActewAGL Distribution's opex across the 2010-16 access arrangement period and forecast for the 2016-21 access arrangement period. It should be read in the context of ActewAGL Distribution's service delivery approach by reading after attachment 4 and in conjunction with attachment 6 of this access arrangement information.

The five-year total forecast is $143.8 million ($2015/16).[1] This forecast represents a 7.4 per cent increase (in real terms) over the first five years of the 2010-16 access arrangement period.[2] The main drivers of this increase are:

- forecast rate of change which contributes approximately $4.5 million to the increase to account for input price and output growth;
- proposed step changes of $5.6 million across the period, including $12.1 million in additional costs offset by a negative step change of $6.6 million to account for a change in the capitalisation policy;
- Utilities Network Facilities Tax (UNFT) liability forecast to increase by approximately $8.4 million;
- efficiency improvements between the periods in base opex which have offset some of the impact of cost pressures in other expenditure areas; and
- other minor differences in expenditure between the two periods, such as the removal of carbon tax liabilities.

Annual expenditure forecasts are provided in Table 5.1.

Table 5.1 ActewAGL Distribution's opex forecast by category ($million, 2015/16)

	2016/17	2017/18	2018/19	2019/20	2020/21	Total
Controllable opex	18.0	17.6	18.2	20.8	19.8	**94.4**
Non-controllable opex	9.3	9.7	10.0	10.1	10.3	**49.4**
Total opex	**27.3**	**27.3**	**28.1**	**30.9**	**30.2**	**143.8**

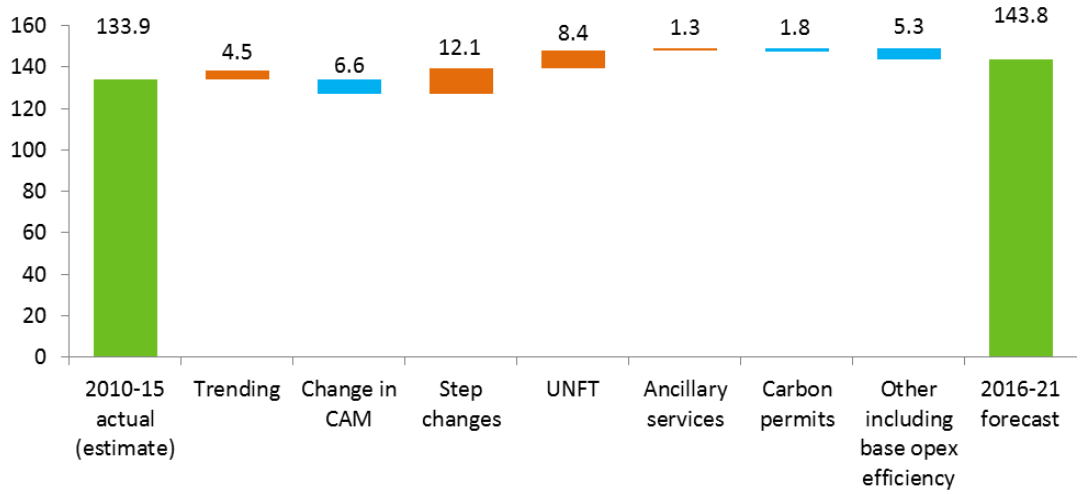
Note figures may not sum due to rounding.

Figure 5.1 depicts the bridge between ActewAGL Distribution's actual total opex during the first five years of the 2010-16 access arrangement period and total forecast opex for the 2016-21 period.

[1] Unless otherwise specified, all financial information in this attachment is expressed in real 2015/16 dollars.

[2] In the Australian Energy Regulator's (AER's) Regulatory Information Notice for ActewAGL Distribution, the AER defines the current regulatory period as the six-year period that commenced on 1 July 2010 and is intended to conclude on 30 June 2016. ActewAGL Distribution adopts the six-year definition in this access arrangement information. However, comparisons in this attachment with the amounts approved by the AER are made over the five-year period 2010-15 because the AER only approved forecasts for that period, not for 2015/16.

Figure 5.1 Opex bridge between 2010-15 actual/estimate and 2016-21 forecast ($millions, 2015/16)



ActewAGL Distribution has adopted 2014-15 as the efficient base year—adjusted to remove non-recurrent costs—for forecasting controllable opex for the 2016-21 access arrangement period. This is detailed in section 5.4.2 of this attachment.

Having operated under the rolling carryover incentive mechanism for opex in place under section 4 of its access arrangement for the 2010-15 access arrangement period,[3] ActewAGL Distribution has faced a constant incentive to seek efficiencies and has revealed its efficient level of opex. This is demonstrated by ActewAGL Distribution's performance against the approved controllable opex forecast during the 2010-15 access arrangement period. ActewAGL Distribution consistently spent below this approved forecast and has therefore earned an efficiency gain that it will carry into the 2016-21 period. The revealed efficiency of opex during the 2010-15 period, has been analysed through econometric methods, the findings of which support the efficiency of ActewAGL Distribution's expenditure. This is detailed in section 5.4.3.3 of this attachment.

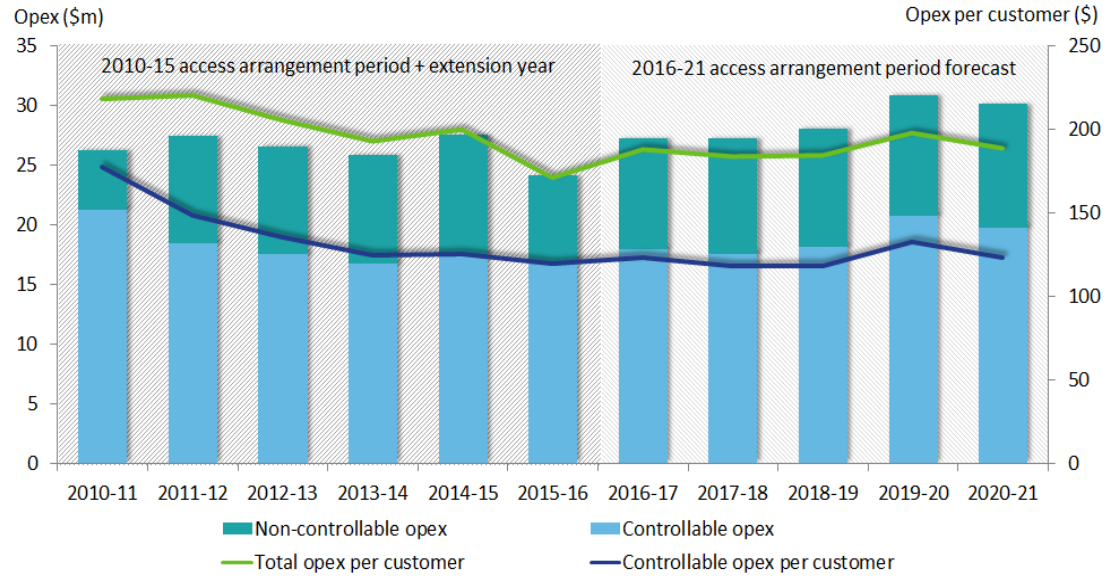
For the opex forecast, ActewAGL Distribution has adjusted annual controllable base opex to account for real price and output growth over the period, as well as prudent and efficient step changes required to meet regulatory obligations and operate in accordance with good industry practice to achieve the lowest sustainable costs of delivering pipeline services. ActewAGL Distribution's proposed step changes include a negative amount for the change in its corporate overheads capitalisation policy. This is offset by a corresponding increase in forecast capital expenditure (capex). These components of the forecast are discussed in sections 5.4.4 and 5.4.5.

For non-controllable costs, ActewAGL Distribution has developed annual category specific forecasts as these reflect a more accurate basis for estimating such costs. Government taxes and levies are the largest contributors to these costs, accounting for $36.1 million (73 per cent) of the $49.4 million forecast for this category.

[3] As detailed in attachment 10 of this access arrangement information, ActewAGL Distribution proposes to exclude the extension year (2015/16) from the rolling carryover incentive mechanism for opex.

Despite the 7.4 per cent increase in opex compared to the previous period, real total opex per customer has decreased from $208 per year, on average, during the 2010-15 period to $188 during the 2016-21 period. Controllable opex between the two periods has decreased from $143 to $124 per customer per year on average.[4] In addition to the drivers of the stable forecast listed above, this decrease in opex per customer is driven by average growth of 2.5 per cent in ActewAGL Distribution's customer base over the period. Figure 5.2 below shows ActewAGL Distribution's opex (left hand axis) and opex per customer (right hand axis) over the two periods.

Figure 5.2 ActewAGL Distribution's opex and opex per customer 2010/11 – 2020/21 ($2015/16)



In planning for the 2016-21 access arrangement period, ActewAGL Distribution has engaged with its consumers through its Gas Consumer Engagement Program, which is detailed in attachment 1 of this access arrangement information. Feedback from this engagement is reflected in the opex forecast for the period. A summary of the way this feedback has been taken into account in ActewAGL Distribution's opex forecast is provided in Table 5.2.

Table 5.2 How ActewAGL Distribution's opex forecast takes into account consumer feedback

What consumers have said	How these views are reflected in the opex forecast for 2016-21
They value reliability and safety	The operating and maintenance forecast is based on a 'base-step-trend' approach which allows ActewAGL Distribution to continue to provide safe and reliable services while meeting its regulatory obligations and responding to developments in industry best practice.
They want price stability and certainty	Efficiency gains in controllable base opex will cushion increases in non-controllable costs such as the UNFT to provide a stable opex forecast, which contributes to price-path stability.

[4] Note that these amounts exclude the extension year (2015/16) and adjustments have been made to the categorisation of expenditure between 'controllable' and 'other allowable' in the 2010-15 period to ensure a like-for-like comparison.

They want vulnerable customers to be supported	The opex forecast provides for price-path stability and will enable ActewAGL Distribution to continue existing levels of support to vulnerable customers as well as to talk to consumers about more or different ways to provide support.
They are interested in the long-term sustainability of energy infrastructure in the ACT	The forecast reflects expenditure required by a prudent and efficient service provider to achieve the lowest sustainable cost of delivering pipeline services over the long term through best practice maintenance and operation of vital gas infrastructure and services in the ACT and surrounds.
They are keen to be involved in future energy discussions	The opex forecast includes expenditure to continue engagement with consumers as well as for specific consultation on the 2021 access arrangement revision through the continuation of the Gas Consumer Engagement Program.

5.2 Requirements of the National Gas Rules

The National Gas Rules (the Rules) set out the building block approach under which total revenue is to be determined for each regulatory year of the access arrangement period. These building blocks include a forecast of opex for each regulatory year of the access arrangement period (Rule 76(e)). The primary criteria governing opex is as set out in Rule 91 of the Rules:

> *(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.*
>
> *(2) The AER's discretion under this rule is limited.*

Rule 40(2) of the Rules provides:

> *If the Law states that the AER's discretion under a particular provision of the Law is limited, then the AER may not withhold its approval to an element of an access arrangement proposal that is governed by the relevant provision if the AER is satisfied that it:*
>
> *(a) complies with applicable requirements of the Law; and*
>
> *(b) is consistent with applicable criteria (if any) prescribed by the Law.*[5]

Further, Rule 71(1) of the Rules provides:

> *In determining whether capital or operating expenditure is efficient and complies with other criteria prescribed by these rules, the AER may, without embarking on a detailed investigation, infer compliance from the operation of an incentive mechanism or on any other basis the AER considers appropriate.*

[5] 'Law' is defined in section 3 of the Rules as the National Gas Law and the Rules.

Under Rule 72(1), ActewAGL Distribution is required to include in its access arrangement information opex (by category) over the earlier access arrangement period (i.e. 2010-16),[6] as well as a forecast of opex over the access arrangement period (i.e. 2016-21) and the basis on which the forecast has been derived.[7]

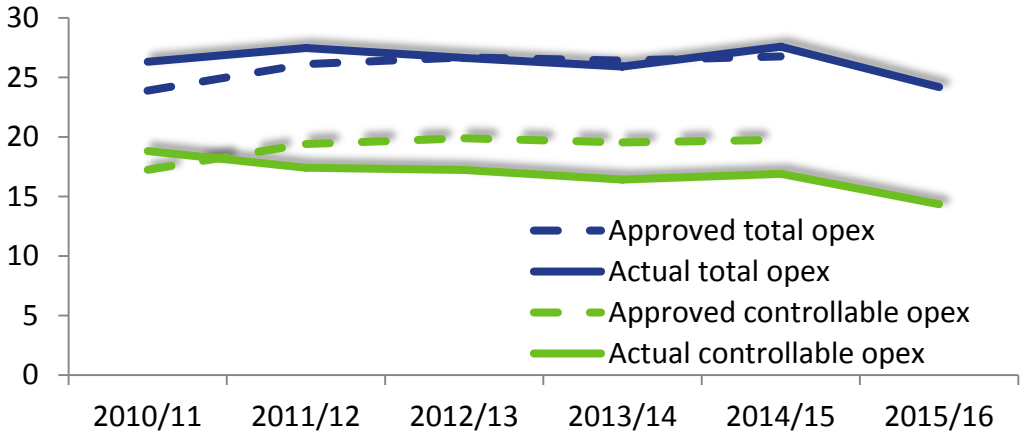
Under Rule 74(1), ActewAGL Distribution is required to support information in the nature of a forecast or estimate by a statement of the basis of the forecast or estimate. Further, Rule 74(2) requires that forecasts and estimates (a) must be arrived at on a reasonable basis; and (b) must represent the best forecast or estimate possible in the circumstances.

These requirements are addressed across this attachment and ActewAGL Distribution's response to the Regulatory Information Noticed (RIN) issued on it by the AER.

5.3 2010-16 opex performance

ActewAGL Distribution's controllable opex has been below the forecast approved by the AER since the second year of the 2010-16 access arrangement period. Total expenditure, which includes an approved amount for other non-controllable costs, has been in line with the total approved forecast. This is shown in Figure 5.3.

Figure 5.3 Total and controllable opex actual* against approved amounts ($millions, 2015/16)



**Estimated opex for 2014/15 and forecast opex for 2015/16*

5.3.1 Allowed and actual opex by category

As required by Rule 72(1)(a)(ii), Table 5.3 provides a comparison of ActewAGL Distribution's actual opex against the approved forecast across the period for each of the categories of 'controllable' and 'other allowable' opex.[8]

[6] Rule 72(1)(a)(ii).

[7] Rule 72(1)(e).

[8] The approved amounts in the table have not been adjusted to include approved pass through amounts for unaccounted-for gas (UAG), UNFT and the Energy Industry Levy (EIL).

Table 5.3 2010-16 access arrangement period approved forecast against actuals/estimates by category ($millions, 2015/16)

	2010/11	2011/12	2012/13	2013/14	2014/15 (base year estimate)	2015/16 forecast	Total 2011 – 15
Controllable costs							
Operations & maintenance							
AER approved forecast	11.0	13.1	13.5	12.1	12.5		**62.2**
Actual/estimate	10.6	10.6	10.8	11.7	11.9	12.0	**55.5**
Corporate overheads							
AER approved forecast	3.8	3.9	4.0	4.1	4.1		**19.8**
Actual/estimate	3.9	3.5	3.2	2.8	2.8	0.9	**16.2**
Non-system asset charge							
AER approved forecast	0.6	0.6	0.6	0.6	0.6		**3.0**
Actual/estimate	0.7	0.6	0.7	0.0	0.0	0.0	**1.9**
Marketing							
AER approved forecast	1.6	1.6	1.6	1.6	1.6		**7.9**
Actual/estimate	1.3	0.9	1.2	0.6	1.1	1.0	**5.0**
Other direct costs							
AER approved forecast	0.3	0.3	0.3	1.2	1.0		**3.0**
Actual/estimate	2.3	1.9	1.4	1.3	1.2	1.1	**8.1**
Total controllable costs							
AER approved forecast	**17.2**	**19.4**	**19.9**	**19.5**	**19.8**		**95.8**
Actual/estimate	**18.8**	**17.4**	**17.2**	**16.4**	**16.9**	**15.1**	**86.8**
Variance	**1.6**	**(2.0)**	**(2.7)**	**(3.1)**	**(2.8)**		**(9.0)**
Other allowable costs							
Energy Industry Levy							
AER approved forecast	0.8	0.8	0.8	0.8	0.8		**3.8**
Actual/estimate	0.6	1.0	0.3	0.8	0.2	0.6	**2.9**
UNFT							
AER approved forecast	3.9	4.0	4.0	4.1	4.2		**20.2**
Actual/estimate	4.3	4.6	5.3	5.4	5.5	5.7	**24.9**
Carbon - permits							
AER approved forecast	0.0	0.0	0.0	0.0	0.0		**0.0**
Actual/estimate	0.0	0.0	0.9	0.8	0.0	0.0	**1.8**
Contestability costs							
AER approved forecast	0.7	0.7	0.7	0.7	0.7		**3.4**
Actual/estimate	0.6	0.6	0.6	0.0	0.0	0.0	**1.8**
Unaccounted for gas (UAG)							
AER approved forecast	0.8	0.8	0.8	0.8	0.8		**4.1**
Actual/estimate	0.9	1.4	1.1	1.1	1.2	1.5	**5.7**
Ancillary services							
AER approved forecast	0.2	0.2	0.2	0.2	0.2		**0.9**

	2010/11	2011/12	2012/13	2013/14	2014/15 (base year estimate)	2015/16 forecast	Total 2011 – 15
Actual/estimate	0.9	0.9	0.9	1.0	1.0	0.9	**4.7**
Other direct costs							
AER approved forecast	0.3	0.3	0.3	0.3	0.3		**1.5**
Actual/estimate	0.3	1.6	0.3	0.4	2.7	1.2	**5.4**
Total other allowable costs							
AER approved forecast	**6.6**	**6.7**	**6.8**	**6.9**	**7.0**	**0.0**	**34.0**
Actual/estimate	**7.5**	**10.1**	**9.4**	**9.5**	**10.7**	**9.9**	**47.1**
Variance	**0.9**	**3.4**	**2.6**	**2.6**	**3.7**		**13.1**
Total opex*							
AER approved forecast	**23.9**	**26.1**	**26.7**	**26.4**	**26.8**	**0.0**	**129.9**
Actual/estimate	**26.3**	**27.5**	**26.7**	**25.9**	**27.6**	**24.9**	**133.9**
Variance	**2.4**	**1.4**	**(0.0)**	**(0.5)**	**0.8**		**4.1**

**excluding debt raising costs*

5.3.2 Variances between allowed and actual opex

Schedule 1 of the RIN requires ActewAGL Distribution to identify and explain material differences between reported opex and the amount approved for the 2010-15 access arrangement period. Material differences are defined as plus or minus five per cent. These variances are identified and explained by opex category in Table 5.4.

Table 5.4 Variances between allowed/forecast and actual opex during 2010-15 period

Opex category	2010-15 variance	Explanation of variance
Controllable costs		
Operations and maintenance (O&M)	$6.7m (11%) below approved forecast	The variance is driven by revisions to expenditure for pipeline integrity testing and timing of the program, as well as continued prudent financial management of the agreement throughout the period. Movement in the variance between 2012/13 and 2013/14 is largely a result of the new Distribution Asset Management Services (DAMS) Agreement. This variance is also explained by the simplification of fees under the new DAMS Agreement, resulting in some costs (e.g. non-system assets and contestability) not previously included in O&M expenditure now being reported as O&M, as noted below. When these three categories are combined, the variance is actual expenditure of $9.4 million or 14% below the combined approved amounts.
Non-system asset charge	$1.1m (37%) below approved forecast	As noted above, this variance is largely a result of these costs being rolled into O&M expenditure when the new DAMS Agreement came into effect in July 2013.
Marketing	$2.8m (36%) below approved forecast	Expenditure below the approved forecast has been as a result of a review into the marketing incentives programs which identified lower cost marketing campaign options. The variance has also been driven by short- term resourcing constraints during the period.

Opex category	2010-15 variance	Explanation of variance
Other direct controllable costs	$1.1m (37%) above approved forecast	Expenditure above the approved amounts is due to unforeseen consulting/contractor costs relating to the due diligence review for the purchase of the Country Energy Gas Network, as well as the DAMS Agreement review, and initial implementation of the National Energy Customer Framework. These are one-off variations.
Other allowable costs		
Energy Industry Levy	$0.9m (23%) below approved forecast	This variance is beyond ActewAGL Distribution's control and is due to actual costs being determined annually by the Independent Competition and Regulatory Commission. Variances are accounted for through the annual tariff variation mechanism.
UNFT	$4.7m (23%) above approved forecast	This variance is beyond ActewAGL Distribution's control—the approved forecast was based on the best available forecast at the time of the decision, but actual costs were determined by the rate set annually by the ACT Government and actual line length. The UNFT rate per kilometre has increased over the period from $737 used for the forecast to $945 ($2013/14) for the year ending 31 March 2014. Variances are accounted for through the annual tariff variation mechanism.
Carbon permits	$1.8m (no approved forecast)	This variance is beyond ActewAGL Distribution's control and is non-recurrent. No forecast was approved as the carbon pricing mechanism under the *Clean Energy Act 2011* had not been introduced at the time of the 2010-15 access arrangement review. ActewAGL Distribution's carbon permit liability costs were accounted for through the annual tariff variation mechanism.
Contestability costs	$1.6m (47%) below approved forecast	As noted in the explanation on the O&M variance, this variance is largely a result of these costs being rolled into O&M expenditure when the new DAMS Agreement came into effect in July 2013.
UAG	$1.6m (39%) above approved forecast	This variance is beyond ActewAGL Distribution's control. Expenditure above the approved forecast is due to increases in both gas receipts and the wholesale gas price. Gas receipts over the period ranged from between three per cent lower and 11 per cent higher than forecast between 2010/11 and 2013/14. The gas price increased over the period from a forecast for 2010/11 of $5.48 to $8.01 in 2013/14. Variances are accounted for through the annual tariff variation mechanism.
Ancillary services	$3.7m (399%) above approved forecast	This variance is beyond ActewAGL Distribution's control as these services are provided at the request of customers. The significant variance above the forecast is due to the number of special meter reads performed significantly exceeding the forecast in each year of the period.
Other direct allowable costs	$3.8m (248%) above approved forecast	Regulatory operations expenditure was included in the 'other direct costs' category for the 2010-15 access arrangement period. This variance is non-recurrent and is primarily due to higher than forecast regulatory costs associated with the Australian Competition Tribunal review of the AER's April 2010 decision, as well as costs for the 2016-21 access arrangement revision proposal.

The material variances between actual expenditure and amounts approved detailed in Table 5.4 have been factored into the opex forecast for the 2016-21 access arrangement period as the forecast has been prepared using a combination of base-step-trend and category specific forecasts as detailed in section 5.4.2 of this attachment. For controllable costs where base year expenditure has been used as the basis for the forecast, non-recurrent costs in that year have been removed to ensure the base opex starting point reflects the efficient costs of a prudent service provider.

5.4 Opex forecast for 2016-21

ActewAGL Distribution's opex forecast for the 2016-21 access arrangement period by category is provided in Table 5.5.

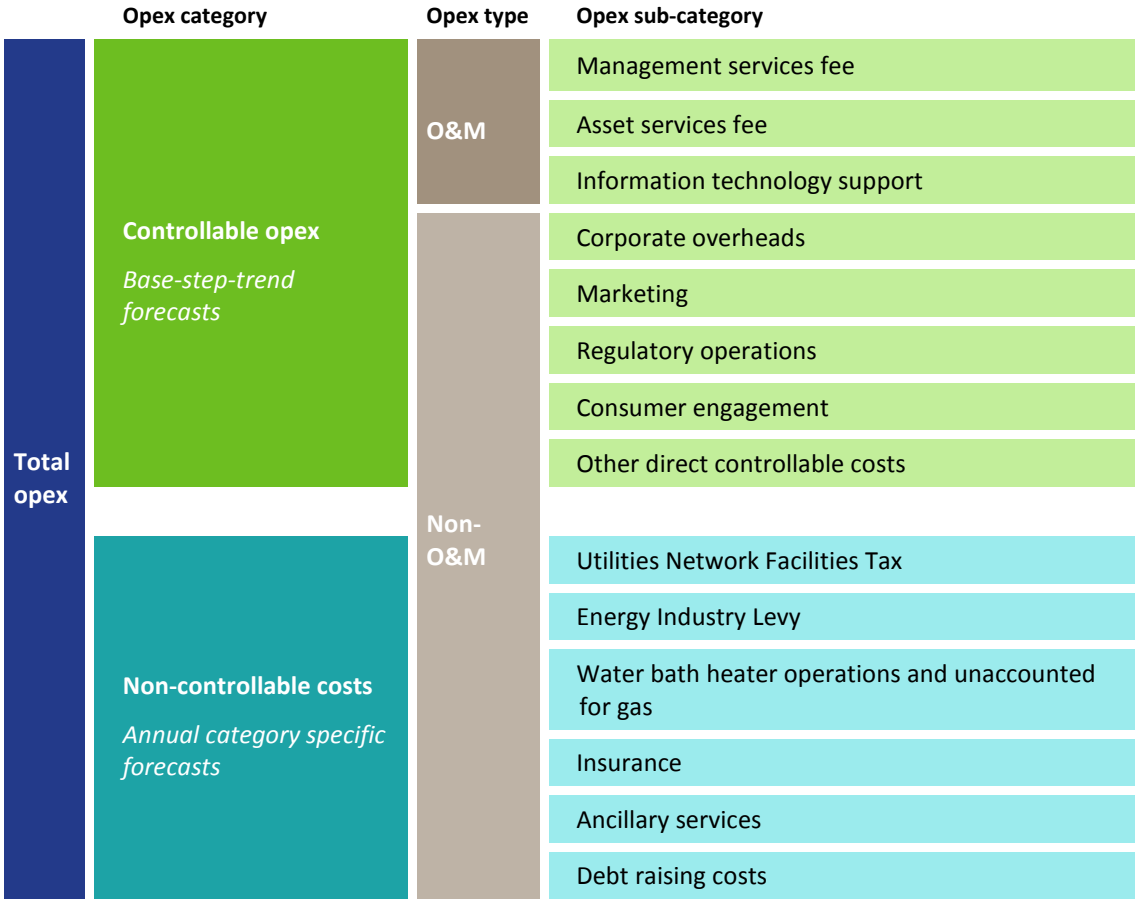
Table 5.5 ActewAGL Distribution's 2016-21 opex forecast by category ($millions, 2015/16)

	2016/17	2017/18	2018/19	2019/20	2020/21	Total
Controllable costs						
Management services fee	9.1	8.9	8.8	9.0	9.2	**45.0**
Asset services fee	4.6	4.8	5.1	5.4	5.3	**25.1**
Corporate overheads	1.6	1.4	1.5	1.6	1.9	**7.9**
Information technology support	0.2	0.2	0.2	0.2	0.2	**1.2**
Regulatory operations	0.1	0.1	0.2	2.4	0.9	**3.7**
Consumer engagement	0.1	0.1	0.1	0.1	0.1	**0.5**
Marketing	1.1	1.1	1.1	1.1	1.1	**5.3**
Other direct costs	1.2	1.2	1.2	1.2	1.2	**5.9**
Total controllable costs	**18.0**	**17.6**	**18.2**	**20.8**	**19.8**	**94.4**
Non-controllable costs						
Government levies	0.6	0.6	0.6	0.6	0.6	**2.8**
UNFT	6.1	6.4	6.6	6.9	7.3	**33.3**
UAG	1.2	1.2	1.2	1.2	1.2	**6.1**
Water bath heater operations	0.1	0.1	0.1	0.1	0.1	**0.7**
Ancillary services	1.2	1.3	1.3	1.2	1.1	**6.0**
Insurance	0.1	0.1	0.1	0.1	0.1	**0.6**
Total non-controllable costs	**9.3**	**9.7**	**10.0**	**10.1**	**10.3**	**49.4**
Total opex	**27.3**	**27.3**	**28.1**	**30.9**	**30.2**	**143.8**

5.4.1 Operating cost categories

ActewAGL Distribution's opex forecast consists of 'controllable costs' and 'non-controllable costs'.[9] Within each of these are a number of opex sub-categories as detailed in Figure 5.4.

Figure 5.4 ActewAGL Distribution's opex categories



5.4.1.1 Controllable costs

DAMS fees (Management services and Asset services fees)

As detailed in attachment 4, ActewAGL Distribution's gas network is managed through the Distribution Asset Management Services (DAMS) Agreement between ActewAGL Distribution and Jemena Asset Management Pty Ltd (JAM). In July 2013, the new DAMS Agreement came into effect, which simplified and restructured the services in the agreement into two services (with associated fees); management services and asset services. Concurrent with renegotiation of the DAMS Agreement, an Asset Services Agreement was negotiated between JAM and one of Zinfra's subsidiaries, ZNX(2), under which the costs for asset services provided by ZNX(2) are passed through by JAM to ActewAGL Distribution.

[9] Note that 'non-controllable costs' were previously referred to as 'other allowable costs'.

In the previous access arrangement period, these costs were reported together under the 'operations and maintenance' opex category. For the 2016-21 access arrangement period, ActewAGL Distribution will report forecast expenditure and information relating to these services under these two fees to improve clarity and transparency. Together, these fees account for 74 per cent of ActewAGL Distribution's controllable opex or 49 per cent of the total opex forecast for the 2016-21 access arrangement period. Both of these fees include opex under the following activities:

- regulatory management;
- asset management;
- commercial operations;
- customer management;
- marketing and network development (note that marketing services provided through the DAMS Agreement are excluded from this category in the opex forecast and are included in the 'marketing' opex category);
- network operations; and
- general management.

Further detail on the services provided through the DAMS Agreement and included in the management services and asset services fees is provided in section 4.4 of attachment 4 and the DAMS Agreement provided with ActewAGL Distribution's RIN response.

Information technology support

Information technology support costs cover support of ActewAGL Distribution's geographic information system and account for only around one per cent of ActewAGL Distribution's total opex forecast.

Corporate overheads

Corporate overheads include direct labour costs associated with ActewAGL Distribution's gas network manager, as well as charges for services provided through service level agreements for ActewAGL Distribution's corporate services and network management services. This does not include JAM's overheads, which are included in the management services fee.

The service level agreement charges have been apportioned to the gas network in accordance with ActewAGL Distribution's cost allocation method (CAM). This is consistent with the CAM approved by the AER in June 2013 for ActewAGL Distribution's electricity network business. After a portion of these costs has been capitalised, corporate overheads account for approximately eight per cent of forecast controllable opex over the 2016-21 access arrangement period, or five per cent of total opex.

Marketing

Marketing expenditure includes both marketing services provided by JAM through the DAMS Agreement, as well as ActewAGL Distribution's marketing activities undertaken directly by ActewAGL Distribution.

Marketing expenditure is necessary to maintain and increase demand for gas services through marketing campaigns that both encourage new connections—mainly for new homes, including medium density housing—and maintain the level of demand for gas services in existing homes. This expenditure is particularly significant in the face of increasing gas prices and improvements in electrical appliance efficiency and performance, which has led to households increasingly opting for electrical appliances instead of gas.

ActewAGL Distribution's marketing expenditure accounts for approximately four per cent of total forecast opex over the 2016-21 access arrangement period. Continuing to invest in marketing of gas services that have a positive return on investment is in the long term interests of consumers through lower prices in the medium to long term. Maintaining and expanding ActewAGL Distribution's customer base and average demand enables efficient costs to be shared across a larger number of customers, hence avoiding undesirable price path impacts and promoting efficient use of gas appliances.

Regulatory operations

Regulatory operations costs cover those resources of ActewAGL Distribution's Networks division allocated to gas network regulatory requirements, such as the access arrangement revision proposal, and annual and reset RIN preparation as explained in relevant step changes in appendix 5.4. These costs make up approximately four per cent of ActewAGL Distribution's forecast of controllable costs for the 2016-21 access arrangement period.

Consumer engagement

Consumer engagement costs are a small proportion (less than one per cent) of ActewAGL Distribution's total forecast and cover the gas network's share of internal and external resources to deliver ActewAGL Distribution's Gas Consumer Engagement Program as detailed in attachment 1.

Other direct controllable costs

Other direct controllable costs account for only around four per cent of ActewAGL Distribution's total opex and include such costs as general rates, levies, leases, and consultant fees, as well as services provided through a negotiated service level agreement with ActewAGL Retail.

5.4.1.2 Non-controllable costs

Utilities Network Facilities Tax and Energy Industry Levy

ActewAGL Distribution is required to pay an annual UNFT to the ACT Government, under the *Utilities (Network Facilities Tax) Act 2006* (ACT). The tax rate is set by the responsible Minister, and the final tax amount is calculated as the determined rate multiplied by total network route

length. The UNFT forecast accounts for around 67 per cent of non-controllable costs, or 23 per cent of ActewAGL Distribution's total opex for the 2016-21 access arrangement period.

ActewAGL Distribution is also required to pay an Energy Industry Levy (EIL) which covers national and local regulatory costs, including a contribution to support the Australian Energy Market Commission. The EIL forecast accounts for six per cent of non-controllable costs, or two per cent of ActewAGL Distribution's total opex for the 2016-21 access arrangement period.

ActewAGL Distribution's tariff variation mechanism allows for the differences between forecast amounts for the UNFT and EIL and those amounts actually paid to be passed through in reference tariffs. Further details of this adjustment mechanism are discussed in attachment 13 of this access arrangement information.

Unaccounted for gas and water bath heater operations

UAG is defined as the difference between the amount of gas measured entering the system and the amount of gas measured leaving the system through consumer meter sets. This difference is effectively lost and considered as UAG. A level of UAG is a characteristic of all gas networks.

ActewAGL Distribution is required to replace UAG under the terms of its 2010-15 access arrangement. JAM manages UAG as part of the services provided to ActewAGL Distribution under the DAMS Agreement.

Water bath heater operations costs are driven by the need to maintain gas temperatures entering downstream pipework above their minimum design temperatures. This eliminates the risk of failure due to the pipework becoming brittle. As gas is used as a heat source to operate the water bath heaters, it is consumed within the network and is hence characterised as UAG.

Together, UAG and water bath heater operations account for approximately five per cent of ActewAGL Distribution's total opex forecast.

Insurance

Insurance costs are allocated throughout the ActewAGL group of businesses on the basis of cost drivers specific to insurance and account for less than one per cent of ActewAGL Distribution's total opex forecast. Premium categories include industrial special risk, public liability and professional indemnity, directors and officers, and other.

Ancillary services

Ancillary services costs include costs to provide special meter reads, request for services, connections and disconnections. These services are provided at the request of customers. Ancillary services opex makes up four per cent of ActewAGL Distribution's total opex forecast. Actual ancillary services opex will depend on actual demand for these services.

Debt raising costs

ActewAGL Distribution's owners incur costs when funds are raised, both debt and equity, to spend on ActewAGL Distribution's capital program. Debt raising costs are incurred each time debt is rolled over and may include underwriting fees, legal fees, company credit rating fees and other transaction costs. Unless otherwise specified, these costs are not included in ActewAGL

Distribution's total opex forecast, but are accounted for in ActewAGL Distribution's post-tax revenue modelling for the period.

5.4.2 Opex forecasting method

ActewAGL Distribution's opex forecast has been prepared on a basis that ensures its expenditure during the 2016-21 access arrangement period reasonably reflects the criteria set out in Rule 91(1). Two methods have been adopted for forecasting opex in the next access arrangement period.

- A ***base-step-trend approach*** has been used for controllable costs.
- ***Annual category specific forecasts*** have been used for non-controllable costs, for which base year expenditure does not necessarily reflect ActewAGL Distribution's expectations of these costs over the 2016-21 access arrangement period. For some of these costs, ActewAGL Distribution proposes to continue to pass through actual costs incurred by way of an annual tariff variation.

ActewAGL Distribution notes the AER's concerns that hybrid forecasting approaches can produce biased opex forecasts.[10] However, ActewAGL Distribution considers this approach best delivers a forecast that reflects the opex that 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 in its circumstances. This approach is appropriate given the non-controllable nature of those costs.

The steps taken to develop ActewAGL Distribution's opex forecast for the 2016-21 access arrangement period are outlined below.

Step 1: Establish the efficient base year opex

ActewAGL Distribution reviewed its opex during the 2010-16 access arrangement period to determine the opex incurred to supply pipeline services in its base year. The proposed base year is 1 July 2014 to 30 June 2015 (2014/15), as detailed in section 5.4.3.1.

Step 2: Make adjustments to base year opex for non-recurrent costs

Adjustments were made to base year opex to account for any non-recurrent costs incurred in that year, or changes in the treatment of costs applied between access arrangement periods, to ensure the base year opex used for forecasting reflects the efficient base costs incurred to provide pipeline services, as explained in section 5.4.3.2.

Step 3: Make annual adjustments to account for real price change, output growth and productivity growth to trend base opex across the access arrangement period

ActewAGL Distribution then made adjustments to trend its adjusted base year opex forward. These include:

[10] AER 2014, *Draft decision Jemena Gas Networks Access arrangement 2015–20 | Attachment 7 Operating expenditure* p. 7-15.

- real change in input prices to account for annual changes in the price of certain inputs (e.g. labour) beyond that of inflation, as explained in section 5.4.4.1; and
- change in opex required as a result of growth in output and productivity, which is based on incremental costs per customer**,** as explained in section 5.4.4.2.

Step 4: Add step changes

Efficient foreseeable costs not reflected in base opex or trending were then added to the opex forecast as 'step changes'. ActewAGL Distribution's proposed step changes are detailed in section 5.4.5 and appendix 5.4.

Step 5: Add annual category specific forecasts

After base opex had been trended and step changes added, ActewAGL Distribution added category specific forecasts for non-controllable costs. For these categories, base year costs do not necessarily reflect ActewAGL Distribution's expectations of these costs over the next access arrangement period. The forecasts for these costs are explained in section 5.4.6.

5.4.3 Base opex

5.4.3.1 Selection of the base year

ActewAGL Distribution has selected 2014/15 as the base year for the purpose of opex forecasting for the 2016-21 access arrangement period. Due to the extension of the 2010-15 access arrangement period by one year to include 2015/16, use of 2014/15 is consistent with ActewAGL Distribution's typical approach of using the penultimate year of a regulatory period and ensures that its forecasts are based on up-to-date data. It is also consistent with the AER's preferred method set out in the explanatory statement which accompanies the AER's expenditure forecast assessment guidelines for electricity transmission and distribution networks, which states:

> *Typically, we use the revealed costs of the second or third last year in a regulatory control period as the base year. The second last year is the most recent available data at the time of the determination and likely to best reflect the forecast period.*[11]

ActewAGL Distribution has reviewed actual annual opex across the 2010-16 access arrangement period and considers the selected base year reflects efficient base expenditure when adjustments are made to remove non-recurrent costs. ActewAGL Distribution expands on the reasons why its adjusted 2014/15 opex represents its prudent and efficient costs in section 5.4.3.3 and appendix 5.01.

The estimate of 2014/15 opex in this proposal is based on financial year-to-date actual expenditure to February 2015 month-end, with remaining months based on budget forecasts. ActewAGL Distribution intends to update the base year opex used for forecasting at the time of providing its response to the AER's draft decision on this access arrangement revision proposal.

[11] AER, *Better Regulation Forecast Expenditure Forecast Assessment Guideline Explanatory Statement,* November 2013, p. 92.

5.4.3.2 Adjustments to base year opex

To establish the efficient base year opex for controllable costs, ActewAGL Distribution has adjusted 2014/15 opex to remove non-recurrent costs and non-controllable opex, for which category specific forecasts have been used. These adjustments are set out in Table 5.6.

Table 5.6 Base year opex adjustments ($million, 2014/15)

	Adjustments	2014/15 base opex
Total base opex		**26.89**
Less one-off costs:		
Access arrangement revision proposal	(2.24)	
Access arrangement revision proposal consumer engagement	(0.05)	
JAM one-off costs	(0.18)	
Total one-off cost adjustments	***(2.46)***	
Adjusted efficient total base opex		**24.43**
Less non-controllable costs:		
UNFT	(5.32)	
EIL	(0.22)	
UAG	(1.21)	
Insurance	(0.11)	
Water bath heater operations	(0.08)	
Ancillary services	(1.02)	
Total category specific cost adjustments	***(7.97)***	
Adjusted efficient base opex excluding category specific forecasts		**16.46**
Adjusted efficient base opex excluding category specific forecasts ($2015/16)		**16.88**

Non-recurrent costs in the base year

Access arrangement revision costs

Costs incurred in the base year to prepare this access arrangement revision proposal and engage with consumers on the proposal have been removed from base year opex on the basis that they are non-recurrent. Because these costs have been adjusted out of base opex, ActewAGL Distribution has included a step change for costs it expects to incur to prepare and engage on the next access arrangement revision proposal between 2018/19 and 2020/21.

JAM one-off costs and changes in allocation of costs

There are several non-recurrent costs included in the asset services and management services fees that have been adjusted out of base year opex to ensure it reflects efficient ongoing costs.

- Canberra primary main pigging project costs, which are an additional service under the DAMS agreement and are periodic in nature (nominally every ten years), have been treated as opex during the 2010-15 period.
- An adjustment to correct for an allocation of JAM costs to capex in 2013/14, which was required to be written back to opex in 2014/15 to ensure consistency with relevant accounting rules.
- Costs associated with a non-recurrent project to determine the impacts and changes required to conform to the new Gas Service & Installation Code and Network Boundary Code (due to local ACT Technical Regulation (Metering related) Code changes in 2013/14) were accrued in 2013/14, but not invoiced until 2014/15.
- A number of minor budget allocation adjustments were made for costs not incurred in 2014/15 and beyond.

Removal of non-controllable costs

As explained in section 5.4.2, ActewAGL Distribution has not applied the base-step-trend approach to non-controllable costs for which it will use category specific forecasts, so these have been removed to establish the efficient base controllable opex for this part of the forecast. Forecasts for each of these costs are later added to provide the total opex forecast.

5.4.3.3 Base opex efficiency

After making the adjustments set out in section 5.4.3.2, ActewAGL Distribution's base year opex estimate represents the costs of a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of delivering pipeline services. This is based on:

- revealed costs under the operation of the rolling carryover incentive mechanism set out in the 2010-15 access arrangement during the period;
- ActewAGL Distribution's actual opex costs compared with the amount approved as efficient by the AER for the current access arrangement period;
- the operation of the new DAMS Agreement which came into effect from July 2013 and the efficiency of the services provided through this agreement; and
- econometric analysis of ActewAGL Distribution's opex cost function.

These are discussed in detail in appendix 5.01 and are summarised below.

Rolling carryover incentive mechanism

Under incentive-based regulation, revealed costs provide the efficient level of opex required to achieve the sustainable cost of delivering pipeline services in the long term interest of consumers. During the current access arrangement period, ActewAGL Distribution has been operating under the rolling carryover incentive mechanism for opex as set out in section 4.5 of the access arrangement. The purpose of this incentive mechanism is to provide ActewAGL Distribution with a continuous and consistent incentive to reveal its efficient level of

expenditure. This incentive is achieved through the retention of efficiency gains (or losses) for the length of a carryover period regardless of the year of the regulatory period in which the gain (loss) occurs. ActewAGL Distribution has responded to this incentive proposes to carryover a total of $11.2 million to be included in the revenue building blocks across the 2016-21 period.

Actual opex costs compared with amounts approved by the AER

As discussed in section 5.3 and shown in Figure 5.3 and Table 5.3, ActewAGL Distribution's estimated total opex in 2014/15 is in line with the amounts approved as efficient costs by the AER in making its 2010 distribution determination, with controllable opex approximately nine per cent lower.

DAMS Agreement and efficiency of services

As detailed in attachment 4, a significant proportion of ActewAGL Distribution's opex is for services provided by JAM through the DAMS Agreement, which was renewed in 2013. This revised agreement includes specific provisions to ensure that JAM's costs are competitive and efficient.

JAM's cost allocation method ensures that its costs allocated to ActewAGL Distribution are actual, ascertainable, reasonably justifiable, and verifiable costs.

JAM also provides gas network asset management, network operations and maintenance services to Jemena Gas Networks (JGN). For services provided by JAM to both gas networks, the shared costs are essentially the same.

JGN's costs for the services provided by JAM have recently undergone detailed review by the AER for its 2015 access arrangement decision for JGN, in which the AER found JGN's costs to be efficient, with the exception of some minor components of JGN's opex proposal.

Productivity analysis findings

ActewAGL Distribution commissioned ACIL Allen Consulting to undertaken productivity analysis including estimation of the opex cost function and forecast partial factor productivity growth, as well as historical productivity growth rates using unilateral total factor productivity and opex and capex partial factor productivity analysis. Detailed discussion of this analysis is provided in appendix 5.01 and appendix 5.02 to this attachment. While this analysis should be interpreted with caution due to limitations such as data availability and quality issues, sample size limitations and model specification issues, it provides a useful analysis for comparison with other evidence of efficiency.

The opex cost function analysis suggests that ActewAGL Distribution's opex is efficient relative to its peers.

The opex partial factor productivity analysis finds strong annual productivity growth over the analysis period.

ActewAGL Distribution has had regard to the findings of this analysis in the context of other primary evidence of efficiency, and considers that the findings of the econometric analysis are

generally consistent with other available evidence and do not identify anomalies requiring further assessment.

ActewAGL Distribution has had regard to the above evidence in preparing its opex forecast for the 2016-21 access arrangement period and considers its base year opex estimate represents the efficient costs of a prudent service provider and thus a reasonable starting point for its controllable opex forecast.

5.4.4 Trending base opex

ActewAGL Distribution has adopted an approach consistent with the AER's rate of change formula[12] to trend efficient opex in the base year and its proposed rates for each component are provided in Table 5.7. Each of these components is summarised in turn within this section. Details are provided in appendix 5.01.

Table 5.7 ActewAGL Distribution's proposed rate of change (%)

	FY16	FY17	FY18	FY19	FY20	FY21
Real input price growth	0.38	0.60	0.85	1.03	1.06	1.00
Output growth	0.56	0.55	0.59	0.58	0.62	0.57
Productivity growth	0.00	0.00	0.00	0.00	0.00	0.00
Total rate of change	**0.93**	**1.15**	**1.44**	**1.61**	**1.68**	**1.57**

5.4.4.1 Real price change

ActewAGL Distribution's costs are affected by changes in labour cost inputs. ActewAGL Distribution engaged BIS Shrapnel to provide an expert report on the outlook for relevant labour cost escalators in both the ACT and NSW. BIS Shrapnel's forecast is detailed in appendix 5.01 and the report is provided at appendix 5.03.

5.4.4.2 Output and productivity growth

ActewAGL Distribution has used a bottom-up approach to determine output growth opex for the 2016-21 access arrangement period. ActewAGL Distribution considers this approach to produce a more accurate and robust forecast than an alternative of basing the growth rate on econometric analysis. However, the econometric analysis has been used as a check of the reasonableness of the bottom-up forecast and supports the use of customer growth as the main opex cost driver for ActewAGL Distribution.

The bottom-up approach is consistent with the approach adopted for ActewAGL Distribution's opex proposal for the 2010-15 access arrangement period and entails quantification of incremental costs per customer including only costs that apply to the secondary (1,050 kPa) network and the medium pressure network, so as not to double count those costs included in the capex-driven step change detailed in appendix 5.04.

[12] As set out in section 4.2 of the AER's November 2013 *Better Regulation Forecast Expenditure Forecast Assessment Guideline for Electricity Distribution,* p. 23.

ActewAGL Distribution's analysis provides an incremental cost of $26.70 ($2015/16) per customer, which is around 28 per cent lower than the incremental cost per customer assumed for the 2010-15 access arrangement period in real terms (of around $32 in $2009/10 or $37 in $2015/16). ActewAGL Distribution considers this to be a conservative estimate that also includes a level of implicit productivity growth.

As detailed in section 2.3 of appendix 5.01, ActewAGL Distribution considers the incentive mechanism for achieving efficient costs to be preferable to an approach that involves both efficiency gains being targeted through the incentive mechanism as well as expected productivity growth being set through the application of a specified productivity growth rate. Having regard to the limitations of benchmarking and the tested incentive mechanism in place that ensures efficient costs are achieved, ActewAGL Distribution has not include a specified productivity growth target in the rate of change applied to forecast its efficient opex for the 2016-21 access arrangement period.

Together with the use of a bottom-up approach to forecasting output growth, this provides the best possible forecast of efficient costs in ActewAGL Distribution's circumstances.

5.4.5 Step changes

ActewAGL Distribution's opex forecast includes the 11 step changes, listed in Table 5.8, for changes in costs to be incurred due to changes in regulatory obligations, changes in good industry practice and changes in ActewAGL Distribution's operating environment and policies. These costs reflect forecast expenditure not captured by base year opex or trending that would be incurred by a prudent service provider acting efficiently to achieve lowest sustainable costs over the long term. This includes some costs that are non-recurrent, including some that are periodic. ActewAGL Distribution's step changes are detailed in appendix 5.04.

Table 5.8 Proposed step changes for the 2016-21 access arrangement period ($million, 2015/16)

Proposed step change	Total
Management services step changes	
National Energy Customer Framework compliance	0.77
National B2B harmonisation	1.06
IT asset utilisation fee	4.18
Network risk and security management	0.54
Asset services step changes	
Hoskinstown O&M contracts	[redacted]
Periodic inspections	0.31
New capex-driven opex	0.63
Revised metering technical codes compliance and service delivery strategy	(0.45)
ActewAGL Distribution/JAM step changes	
RIN reporting	1.63
2021 access arrangement revision	3.23
ActewAGL Distribution step change	
Change in capitalisation policy	(6.58)
Total	**5.57**

5.4.6 Category specific forecast costs

For non-controllable cost categories where future forecasts are not necessarily expected to reflect base year opex, ActewAGL Distribution has adopted forecasts based on assumptions specific to these categories for the purpose of forecasting costs for the 2016-21 access arrangement period.

For UNFT, EIL and UAG price and volumes, ActewAGL Distribution proposes to continue to make annual adjustments such that variations between estimate and actual costs can continue to be passed through by way of annual tariff variations. These adjustments and the tariff variation mechanism are detailed in attachment 13.

5.4.6.1 Utilities Network Facilities Tax and Energy Industry Levy

ActewAGL Distribution's UNFT liability is forecast to increase by approximately 34 per cent to $33.3 million for the 2016-21 access arrangement period compared to $24.9 million during the 2010-15 period. This is driven by forecast growth in the line length and increases in the tax rate.

ActewAGL Distribution's expenditure on the EIL is forecast to be in line with the 2010-15 period. However, this is subject to annual variations to the amount payable as determined by the Independent Competition and Regulatory Commission under the *Utilities Act 2000*.

5.4.6.2 UAG and water bath heater costs

JAM manages UAG as part of the services provided to ActewAGL Distribution under the DAMS Agreement. For the 2016-21 access arrangement period, it is proposed that the four-year historical average of 1.96 per cent of gas receipts is applied as the forecast for the UAG level. This is consistent with the analysis of the causes of ActewAGL Distribution's UAG and the approach and reasoning adopted by the Essential Services Commission of Victoria in its 2013 review of UAG benchmarks for the Victorian gas network businesses. This UAG-level proposal is detailed in appendix 5.05.

UAG costs are forecast to be slightly higher during the 2016-21 access arrangement period than the 2010-15 period due to modest increases in UAG levels experienced over recent years and model improvements enabling a more realistic efficient range than was forecast for the current access arrangement period.

Water bath heaters are used at several ActewAGL Distribution sites to maintain gas temperatures entering downstream pipework above minimum design temperatures to ensure safe operation. This reflects good industry practice. As discussed earlier in section 5.4.2.2, gas is used as the heat source to operate the water bath heaters. ActewAGL Distribution purchases gas to operate water bath heaters together with its purchase of UAG.

Forecast water bath heater operations costs are based on constant volumes of [redacted] gigajoules and an average forecast gas price of [redacted] per gigajoule across the period, resulting in a forecast of $0.13 million per year.

5.4.6.3 Insurance

ActewAGL Distribution's annual insurance costs are forecast to be in line with base year costs of $0.11 million.

5.4.6.4 Ancillary services

Through its asset services provider, JAM, ActewAGL Distribution provides ancillary services at the request of customers. These include special meter reads, requests for service, connections, disconnections and decommissions.

As discussed in attachment 12 of this access arrangement information, high-level analysis has been undertaken on the cost build-up of each of these services, and changes to fees for these services are proposed that better reflect the costs to provide these services, while not presenting a barrier to market growth. Forecast opex to provide these ancillary services is based on forecast demand and cost-reflective fees for each of these services. ActewAGL Distribution's opex forecast for these services is shown in Table 5.9.

Table 5.9 Ancillary services opex forecast ($2015/16)

	Average annual demand	2016-21 total opex estimate ($millions)
Residential (<6m^3/hour meter)		
Special meter reads	25,066	2.444
Reconnections	104	0.025
Disconnections	127	0.093
Decommissions	847	3.305
Non-residential (>6m3/hour meter)		
Special meter reads	655	0.064
Reconnections	15	0.004
Disconnections	11	0.010
Decommissions	6	0.043
Request for service	6	0.003
Total		**5.992**

5.4.6.5 Debt raising costs

ActewAGL Distribution's total opex forecast includes an average annual allowance for debt raising costs of $0.46 million, totalling $2.31 million over the period. Details of this proposed allowance are provided in attachment 8 of this access arrangement information.

5.4.7 Interactions between opex and capex

Interactions between opex and capex have been taken into account in the development of ActewAGL Distribution's opex forecast.

Opex included in the forecast enables delivery of ActewAGL Distribution's maintenance program which has been developed in accordance with the asset management plan. This plan sets out a best practice approach for all asset classes, including both capex and opex requirements, which optimises asset lives and life-cycle cost to delivery levels of service, safety and costs that are in the long term interests of consumers. Additionally, ActewAGL Distribution's 20 year asset strategy outlines long term asset scenarios and related interaction between capex and opex levels of service and average cost per customer.

Specific interactions between opex and capex accounted for in ActewAGL Distribution's opex forecast include the following matters.

- The change in the CAM applied to ActewAGL Distribution's gas network expenditure results in a portion of corporate overheads being capitalised from 1 July 2015. This reallocation of costs results in a reduction in opex and a corresponding increase in capex.
- Primary main pigging costs previously treated as opex are to be treated as capex from 1 July 2015 and this is reflected in the expenditure forecasts.

- The proposed allowance for debt raising costs required when debt is required to facilitate investment in ActewAGL Distribution's capital program has been calculated on ActewAGL Distribution's capital base.

5.4.8 Summary of total opex forecast

Table 5.10 summarises the components of ActewAGL Distribution's total forecast opex.

Table 5.10 Summary of total opex ($million, 2015/16)

	FY17	FY18	FY19	FY20	FY21	Total
Base opex	16.9	16.9	16.9	16.9	16.9	**84.4**
Real price growth	0.2	0.3	0.5	0.7	0.9	**2.5**
Output growth	0.2	0.3	0.4	0.5	0.6	**2.0**
Step changes	0.7	0.1	0.4	2.8	1.5	**5.6**
Category specific forecast costs	9.3	9.7	10.0	10.1	10.3	**49.4**
Total	**27.3**	**27.3**	**28.1**	**30.9**	**30.2**	**143.8**
Debt raising costs	0.4	0.4	0.5	0.5	0.5	**2.3**
Total including debt raising costs	**27.7**	**27.8**	**28.6**	**31.4**	**30.7**	**146.2**

Abbreviations used in this document

Abbreviation	Full term
ACT	Australian Capital Territory
AER	Australian Energy Regulator
CAM	cost allocation method
capex	capital expenditure
DAMS	Distribution Asset Management Services Agreement
EIL	Energy Industry Levy
IT	information technology
JAM	Jemena Asset Management Pty Ltd
JGN	Jemena Gas Networks (NSW) Ltd
kPa	kilopascal(s)
m	metre(s) / millions (when relating to financial information)
NSW	New South Wales
O&M	operations and maintenance
opex	operating and maintenance expenditure
RIN	Regulatory Information Notice
Rules, the	National Gas Rules
UAG	unaccounted-for gas
UNFT	Utilities Network Facilities Tax
ZNX(2)	ZNX (2) Pty Ltd