



DRAFT DECISION
ActewAGL Distribution
Access Arrangement
2016 to 2021

Attachment 6 – Capital
expenditure

November 2015

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Note

This attachment forms part of the AER's draft decision on ActewAGL Distribution's access arrangement for 2016–21 access arrangement period. It should be read with all other parts of the draft decision.

The draft decision includes the following documents:

Overview

Attachment 1 - Services covered by the access arrangement

Attachment 2 - Capital base

Attachment 3 - Rate of return

Attachment 4 - Value of imputation credits

Attachment 5 - Regulatory depreciation

Attachment 6 - Capital expenditure

Attachment 7 - Operating expenditure

Attachment 8 - Corporate income tax

Attachment 9 - Efficiency carryover mechanism

Attachment 10 - Reference tariff setting

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Shortened forms

Shortened form	Extended form
AA	Access Arrangement
AAI	Access Arrangement Information
AER	Australian Energy Regulator
ASA	Asset Services Agreement
ATO	Australian Tax Office
capex	capital expenditure
CAPM	capital asset pricing model
CCP	Consumer Challenge Panel
CESS	Capital Expenditure Sharing Scheme
CMF	construction management fee
CPI	consumer price index
DAMS	Distribution Asset Management Services
DRP	debt risk premium
EBSS	Efficiency Benefit Sharing Scheme
EIL	Energy Industry Levy
ERP	equity risk premium
Expenditure Guideline	Expenditure Forecast Assessment Guideline
gamma	Value of Imputation Credits
GSL	Guaranteed Service Level
GTA	gas transport services agreement
ICRC	Independent Competition and Regulatory Commission
MRP	market risk premium
NECF	National Energy Customer Framework
NERL	National Energy Retail Law
NERR	National Energy Retail Rules
NGL	national gas law
NGO	national gas objective
NGR	national gas rules
NPV	net present value
opex	operating expenditure
PFP	partial factor productivity

Shortened form	Extended form
PPI	partial performance indicators
PTRM	post-tax revenue model
RBA	Reserve Bank of Australia
RFM	roll forward model
RIN	regulatory information notice
RoLR	retailer of last resort
RSA	Reference Service Agreement
RPP	revenue and pricing principles
SLCAPM	Sharpe-Lintner capital asset pricing model
STTM	Short Term Trading Market
TAB	Tax asset base
UAFG	Unaccounted for gas
UNFT	Utilities Network Facilities Tax
WACC	weighted average cost of capital
WPI	Wage Price Index

6 Capital expenditure

This attachment outlines our assessment of ActewAGL's proposed conforming capital expenditure (capex) for 2009–16 and forecast capex for the 2016–21 access arrangement period.

6.1 Draft decision

Conforming capital expenditure for the 2011–16 access arrangement period

We approve \$102.6 million (\$2015–16) of total net capex for ActewAGL for the period 2009–15 as conforming capex that complies with rule 79(1) of the NGR.

Table 6.1 AER approved capital expenditure by category over 2009–15 (\$million, 2015–16)^a

Category	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15 ^(b)	2015–16 ^(c)
Market expansion (Connections)	7.5	8.6	8.9	9.5	8.0	8.3	10.4
Capacity development (Augmentation)	3.0	4.0	2.8	2.1	8.0	10.7	11.6
Stay in business							
- Network renewal and upgrade	0.0	0.1	2.6	7.4	1.0	3.0	7.5
- Meter renewal	0.5	1.2	1.2	1.7	2.0	2.3	2.7
Capitalised regulatory expenditure	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Non-system	0.3	0.4	0.3	0.2	-0.3	0.0	0.0
Overheads	0.0	0.0	0.0	0.0	0.0	0.0	1.9
GROSS TOTAL CAPITAL EXPENDITURE	12.1	14.5	15.7	20.9	18.7	24.3	34.1
Contributions	0.3	1.5	0.1	1.6	0.1	0.1	0.1
NET TOTAL CAPITAL EXPENDITURE	11.8	13.0	15.6	19.3	18.7	24.3	34.0

Source: AER analysis.

Note: (a) Some categories include related party margins. A confidential version of this table showing direct costs (excluding related party margins) is available in confidential appendix C.

(b) As ActewAGL provided estimated capex for 2014–15, the 'approved' capex in this draft decision for 2014–15 are placeholder amounts. We expect ActewAGL will provide actual capex for 2014–15 in its revised proposal. We will assess whether this capex is conforming capex in our final decision.

(c) As set out in Attachment 2 the 2015–16 amounts have not been assessed by the AER as approved capex under this decision. This is because these values are estimates. The AER will undertake the assessment of whether the 2015–16 amounts are conforming capex as part of the next access arrangement determination.

(d) Numbers may not add due to rounding

Conforming capital expenditure for the 2016–21 access arrangement period

We approve \$76.8 million (\$2015–16) of ActewAGL’s proposed \$115.6 million (\$2015–16) of total net capex for the 2016–21 access arrangement period as conforming capex under rule 79(1) of the NGR. This is 34 per cent less than ActewAGL’s proposed capex. Much of this reduction is because we did not have sufficient information to find the proposed expenditures to be prudent or efficient. We have identified where further information needs to be provided by ActewAGL in order for us to be satisfied that the proposed expenditures meet the NGR.

Table 6.2 shows approved capex for the 2016–21 access arrangement period by category.

Table 6.2 AER approved capital expenditure by category over the 2016–21 access arrangement period (\$million, 2015–16)^a

Category	2016–17	2017–18	2018–19	2019–20	2020–21	Total
Market expansion (Connections)	7.9	8.3	8.2	8.2	8.0	40.6
Capacity development (Augmentation)	2.8	1.2	0.7	0.3	1.1	6.0
Stay in business						
- Network renewal and upgrade	3.4	4.4	3.7	1.0	1.5	14.0
- Meter renewal	2.5	2.3	2.7	2.8	2.6	12.9 ^(b)
Non-system	0.2	0.1	0.2	0.0	0.0	0.5
Escalation	0.5	0.5	0.5	0.4	0.5	2.3
Overheads ^(c)	1.0	1.0	1.0	0.8	0.8	4.6
GROSS TOTAL CAPITAL EXPENDITURE	18.3	17.8	17.0	13.4	14.5	80.9
Contributions	0.7	0.8	0.8	0.8	0.8	4.1
Asset disposals	0.0	0.0	0.0	0.0	0.0	0.0
NET TOTAL CAPITAL EXPENDITURE	17.6	17.0	16.2	12.6	13.7	76.8

Source: AER analysis.

Notes: (a) Some categories include a construction management fee (CMF) paid by ActewAGL. A confidential version of this table showing direct costs (excluding the CMF) is set out in confidential appendix C.
 (b) These expenditure numbers for meter renewal are not the modelled numbers we derived once we take into account the CMF from note (a). We included these numbers for presentational purposes as they reflect our adjustments to ActewAGL’s meter renewal capex (see Table 6.5 and section 6.4.8).

(c) The AER's approved capitalised overhead amount is based on ActewAGL's proposed overhead rate of 6 per cent

Table 6.3 shows ActewAGL's proposed capex compared with the AER's approved capex for each category. In coming to our position, we assessed ActewAGL's forecast capex taking into account the available evidence.

Our assessment has revealed that some aspects of ActewAGL's proposal such as capex for non-system capex is consistent with the NGR requirements in that the proposed expenditures are justified and would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.

We found that other aspects of ActewAGL's proposal, in particular, its proposed capex for connections, and augmentation, did not meet the NGR requirements.

Table 6.3 Comparison of AER approved and ActewAGL's proposed capital expenditure over the 2016–21 access arrangement period (\$million, 2015–16)^a

Category	Proposed	Approved	Difference (\$millions)
Market expansion (Connections)	55.5	40.6	-14.9
Capacity development (Augmentation)	17.7	6.0	-11.8
Stay in business			
- Network renewal and upgrade	15.4	14.0	-1.4
- Meter renewal	13.3	12.9	-0.4
Non-system	0.5	0.5	0.0
Escalation	7.2	2.3	-4.9
Overheads	6.6	4.6	-2.0
GROSS TOTAL CAPITAL EXPENDITURE	116.2	80.9	-35.2
Contributions	0.5	4.1	3.6
Asset disposals	0.0	0.0	0.0
NET TOTAL CAPITAL EXPENDITURE	115.6	76.8	-38.8

Source: AER analysis.

Notes: (a) Some categories include a construction management fee (CMF) paid by ActewAGL. A confidential version of this table showing direct costs (excluding the CMF) is set out in confidential appendix C.

As Table 6.3 shows, the main differences between our alternative capex estimate and ActewAGL's proposal relate to the following two capex categories:

- Connections

We have included \$40.6 million (\$2015–16, unescalated) of connections capex in our alternative capex estimate. This is 27 per cent less than ActewAGL's forecast expenditure of \$55.5 million (\$2015–16, unescalated).¹ Our reduction is driven by lower new connection forecasts for medium density type connections.

- Augmentation

We have included \$6.0 million (\$2015–16, unescalated) of augmentation capex in our alternative capex estimate. This is 66 per cent less than ActewAGL's forecast expenditure of \$17.7 million (\$2015–16, unescalated). This reduction is driven by our assessment that the capex associated with two projects over the 2016–21 access arrangement period is not prudent and efficient.

6.2 ActewAGL's proposal

2009–16 period

While the current access arrangement period covers the 2009–16 period (due to the interval of delay), the AER only approved capex amounts for the 2009–15 access arrangement period.

ActewAGL proposed total net capex over the 2009–16 period of \$136.6 million (\$2015–16), where capex in 2015–16 is an estimate. Without the estimate of capex for 2015–16, ActewAGL proposed \$102.6 million (\$2015–16) as conforming capex. We accept \$102.6 million (\$2015–16) as conforming capex for 2009–15, and will assess whether the capex incurred in 2015–16 is conforming in the next review.² This is shown in Table 6.4.

Table 6.4 ActewAGL proposed capex by category over the 2009–16 access arrangement period (\$million, 2015–16)^a

Category	2009–10	2010–11	2011–12	2012–13	2013–14	2014–15	2015–16
Market expansion (Connections)	7.5	8.6	8.9	9.5	8.0	8.3	10.4
Capacity development (Augmentation)	3.0	4.0	2.8	2.1	8.0	10.7	11.6
Stay in business							
- Network renewal and upgrade	0.0	0.1	2.6	7.4	1.0	3.0	7.5
- Meter renewal	0.5	1.2	1.2	1.7	2.0	2.3	2.7
Capitalised regulatory expenditure	0.8	0.0	0.0	0.0	0.0	0.0	0.0

¹ ActewAGL, *2016–21 Access Arrangement Information*, June 2015, 6.04.1-CONFIDENTIAL-CapexForecastModel.xlsm.

² As we noted in section 6.1, the conforming capex in 2014–15 are placeholder amounts.

Non-system	0.3	0.4	0.3	0.2	-0.3	0.0	0.0
Overheads	0.0	0.0	0.0	0.0	0.0	0.0	1.9
GROSS TOTAL CAPITAL EXPENDITURE	12.1	14.5	15.7	20.9	18.7	24.3	34.1
Contributions	0.3	1.5	0.1	1.6	0.1	0.1	0.1
NET TOTAL CAPITAL EXPENDITURE	11.8	13.0	15.6	19.3	18.7	24.3	34.0

Source: AER analysis.

Note: (a) Some categories include related party margins. A confidential version of this table showing direct costs (excluding related party margins) is available in confidential appendix C.

2016–21 access arrangement period

ActewAGL proposed net total capex of \$115.6 million (\$2015–16) for the 2016–21 access arrangement period. Table 6.5 sets out ActewAGL's proposed capex by category over each year of the forecast period.

Table 6.5 ActewAGL proposed capex by category over the 2016–21 access arrangement period (\$million, 2015–16)^a

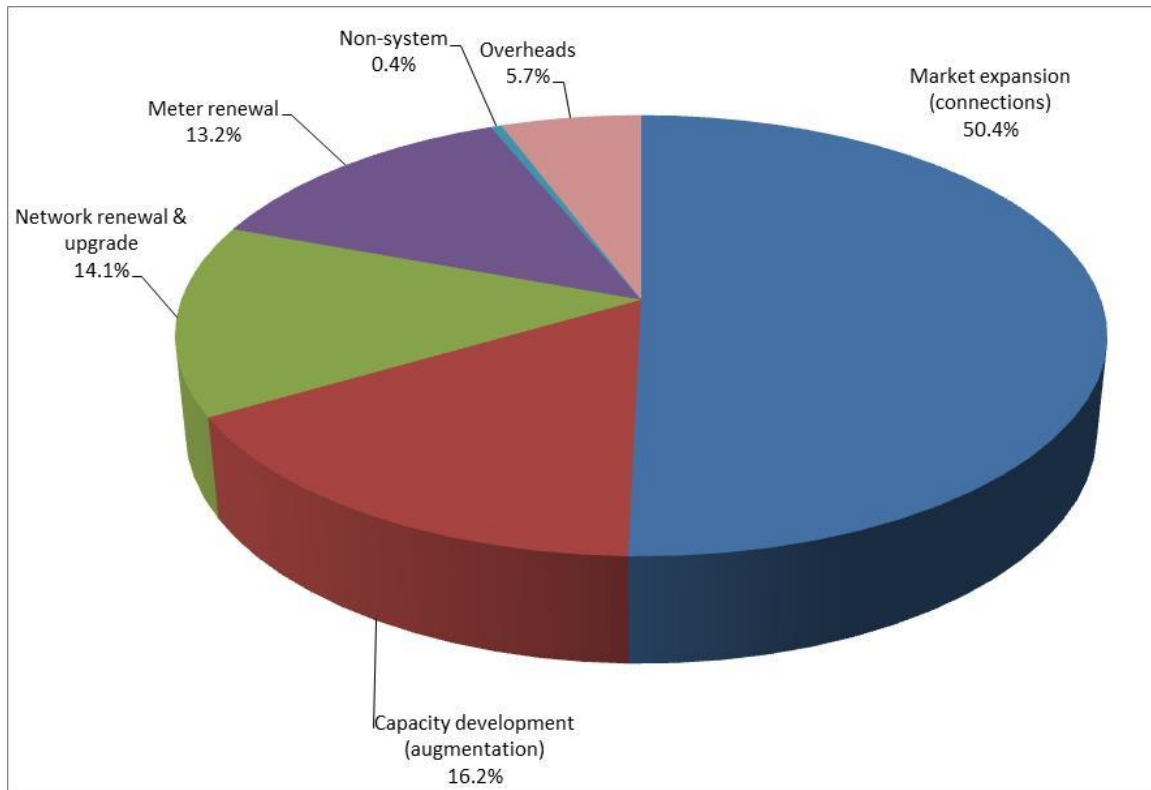
Category	2016–17	2017–18	2018–19	2019–20	2020–21	Total
Market expansion (Connections)	10.7	11.3	11.2	11.3	10.9	55.5
Capacity development (Augmentation)	2.9	5.0	2.6	6.2	1.1	17.7
Stay in business						
- Network renewal and upgrade	3.7	4.7	4.4	1.0	1.5	15.4
- Meter renewal	2.6	2.3	2.8	2.9	2.7	13.3
Non-system	0.2	0.1	0.2	0.0	0.0	0.5
Escalation	1.1	1.7	2.0	1.5	1.0	7.2
Overheads	1.3	1.5	1.4	1.4	1.0	6.6
GROSS TOTAL CAPITAL EXPENDITURE	22.5	26.7	24.6	24.2	18.2	116.2
Contributions	0.1	0.1	0.1	0.1	0.1	0.5
Asset disposals	0.0	0.0	0.0	0.0	0.0	0.0
NET TOTAL CAPITAL EXPENDITURE	22.4	26.6	24.5	24.1	18.1	115.6

Source: AER analysis.

Note: (a) Some categories include a construction management fee (CMF) paid by ActewAGL. A confidential version of this table showing direct costs (excluding the CMF) is set out in confidential appendix C.

The major components of the forecast gross total expenditure are connections/market expansion (50.4 per cent), augmentation/capacity development (16.2 per cent), network renewal and upgrade (14.1 per cent), and meter renewal (13.2 per cent) (see Figure 6.1).

Figure 6.1 Composition of ActewAGL’s total capex for 2016–21 (\$million, 2015–16 direct costs)



Source: AER analysis.

6.3 AER’s assessment approach

Under the NGR we are required to make two decisions regarding ActewAGL's capex. First, we are required to assess past capital expenditure and determine whether it meets the criteria set out in the NGR, where approved capex is added to the starting capital base.³ Where capex meets these criteria, it is referred to as 'conforming'.⁴ Second, we are required to assess ActewAGL's proposed forecast of required capex for the 2016–21 access arrangement period to determine whether it is 'conforming.' The following sections set out our approach and the tools and techniques we employ in forming a view on these two decisions. We also need to take into account timing issues associated with the lag between actual capex data being available in the last year of

³ NGR, r. 77(2)(b).

⁴ NGR, r. 79.

the 2010–16 access arrangement period and the need to forecast an opening capital base for the 2016–21 access arrangement period. This is explained in the next section.

6.3.1 NGR requirements for conforming capital expenditure

The definition of capex is set out in rule 69 of the NGR. Capex is defined as costs and expenditure of a capital nature incurred to provide, or in providing, pipeline services.⁵

Capex is based on a forecast or estimate which must be supported by a statement of the basis of the forecast or estimate (under rule 74(1) of the NGR). In accordance with rule 74(2) of the NGR, any forecast or estimate submitted must:

- be arrived at on a reasonable basis; and
- represent the best forecast or estimate possible in the circumstances.⁶

Capex will be ‘conforming’ if it conforms with the new capex criteria in rule 79 of the NGR. There are two essential criteria that must be met under this rule:

- the expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with good industry practice, to achieve the lowest sustainable cost of providing services; and
- the expenditure must be justifiable on one of four grounds set out in rule 79(2) of the NGR.

The four grounds set out in rule 79(2) of the NGR can be summarised as follows. The capex must either:

- have an overall economic value that is positive
- demonstrate an expected present value of the incremental revenue that exceeds the present value of the capex
- be necessary to maintain and improve the safety of services, or maintain the integrity of services, or comply with a regulatory obligation or requirement, or maintain capacity to meet levels of demand existing at the time the capex is incurred, or
- be justifiable as a combination of the preceding two dot points.

Rule 79(3) of the NGR provides:

In deciding whether the overall economic value of capital expenditure is positive, consideration is to be given only to economic value directly accruing to the service provider, gas providers, users and end users.

We have limited discretion when making decisions under rule 79 of the NGR.⁷ This means we must approve a particular element of the access arrangement proposal if we

⁵ NGR, r. 69.

⁶ NGR, r. 74(2).

are satisfied that the element complies with the applicable requirements of the NGR and NGL and is consistent with any criteria set out in the NGR or NGL.⁸

6.3.2 Assessment of conforming capital expenditure in the previous period

In assessing ActewAGL's proposed capex in the earlier access arrangement period, we reviewed ActewAGL's supporting material. This included information on ActewAGL's reasoning and, where relevant, business cases, audited regulatory accounts, and other relevant information. This information helped us identify whether capex over the earlier access arrangement period was conforming capex and, in turn, whether that capex should be included in the opening capital base in accordance with rule 77(2)(b) of the NGR.

We do not approve certain estimates and forecasts provided by ActewAGL if the information does not meet the requirements set out in the NGR.⁹ We must exercise our economic regulatory functions in a manner that will or is likely to contribute to the achievement of the NGO.¹⁰ For instance, having regard to the NGO, we take the view that a prudent service provider will seek cost efficiencies through continuous improvements, and that customers ultimately share in these benefits. This also provides the service provider with a reasonable opportunity to recover at least its efficient costs in accordance with the revenue and pricing principles.

The revision commencement date in ActewAGL's current access arrangement was 30 June 2015. As part of the 2012 rule changes, however, the AEMC extended the submission date for its next access arrangement to 30 June 2015.¹¹ This means that ActewAGL's current access arrangement period is six years in length: the original five years from 2010–11 to 2014–15, plus 2015–16.¹² We therefore consider capex for six years, including 2015–16, when determining the opening capital base for the 2016–21 access arrangement period.

Although the capital base roll forward relates to the 2010–16 access arrangement period, we are also required to adjust for the difference between actual and forecast capex in the capital base.¹³ Generally, the final year of the previous access arrangement period is based on forecast capex (in this case, 2009–10). Therefore, our assessment of conforming capex includes the regulatory years for 2009–16. We consider the following when determining the opening capital base for 2016–21:

⁷ NGR, r. 79(6).

⁸ NGR, r. 40(2).

⁹ For instance, r. 74 of the NGR requires estimates and forecasts to be made on a reasonable basis, amongst other things.

¹⁰ NGL, s. 28(1).

¹¹ NGR, schedule 1, r. 35(3).

¹² The forthcoming period is five years in length from 2016–17 to 2020–21. AER, *Letter to ActewAGL – gas access arrangement period*, 24 November 2014 (D14/159989).

¹³ NGR, r. 77(2)(a).

- 2009–10 capex—when conducting the previous access arrangement review, we did not yet have actual capex for 2009–10. We therefore included ActewAGL’s 2009–10 capex estimate in the capital base benchmark during that review. The NGR requires adjustment for differences between actual and estimated capex.¹⁴ Since actual capex for 2009–10 is now available, we assessed whether this capex is conforming capex under the NGR.¹⁵ Where ActewAGL’s 2009–10 capex estimate differs from our conclusions on conforming capex, we adjusted the capital base roll forward.¹⁶
- 2010–11 to 2013–14 capex—since we have actual capex for these years, we assessed whether they are conforming capex under the NGR.¹⁷ We included conforming capex in the capital base roll forward.¹⁸
- ActewAGL included capex estimates for two years (2014–15 and 2015–16) due to the extension for submitting its access arrangement proposal. For the draft decision, we will assess whether these estimates are conforming capex under the NGR.
- In this draft decision, we included ActewAGL’s estimated capex for 2014–15 in the capital base roll forward as a placeholder. We expect ActewAGL to have actual 2014–15 capex when it submits its revised access arrangement proposal. We will therefore assess whether actual capex for 2014–15 is conforming capex in our final decision. We will include conforming capex in the capital base roll forward in our final decision.
- ActewAGL will not have actual capex for 2015–16 by the time of our final decision. The capital base roll forward therefore includes the estimate for 2015–16 as an input. We will assess whether ActewAGL’s actual capex for 2015–16 is conforming capex under the NGR in the next access arrangement review. Because the 2015–16 regulatory year was not subject to an ex ante review, we will conduct a detailed ex post review of capex for that year. We will adjust the capital base at that time as required.

6.3.3 Assessing forecast capex for the 2016–21 access arrangement period

We assessed the key drivers for capex to assess whether ActewAGL’s proposed capex in the projected capital base complies with the capex criteria in rule 79(1) of the NGR. In doing so, we relied on information including:

¹⁴ NGR, r. 77(2)(a).

¹⁵ NGR, r. 79.

¹⁶ NGR, r. 77(2)(b).

¹⁷ NGR, rr. 77(2)(b), 79.

¹⁸ NGR, r. 77(2)(b).

- the access arrangement information (AAI)—this document outlines ActewAGL's program of capital expenditure and describes the main drivers of increased capital expenditure¹⁹
- the Asset Management Plan, 20 Year Asset Strategy, Capacity Management Strategy and Plan, Delivery Plan, and other attachments which provided specific expenditure detail²⁰
- ActewAGL's RIN template²¹
- opportunity briefs which detail expenditure requirements of specific projects²²
- ActewAGL's tender and contract documentation²³
- ActewAGL's capex model.²⁴

We then assessed the prudence and efficiency of the proposed capex. For analysis purposes the capex was broken into categories depending on whether the expenditure is driven by:

- Growth in demand - extensions, connections, augmentation
- Replacement on the basis of asset life, obsolescence, safety or regulatory obligations - mains, services, meters, regulators, city gates, IT, SCADA, or
- Other - new regulatory or safety obligations, opex or reliability improvements.

We assessed the prudence and efficiency of the proposed capex, to determine whether the capex is such as would be incurred by a prudent operator acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services.²⁵ We also assessed whether the proposed capex is justified on one of the four grounds under rule 79(2) of the NGR.

For each category of expenditure the scope, timing and cost of the proposed expenditure was considered in order to form a view on the prudence and efficiency of the expenditure. Our assessment also considered whether cost forecasts have been arrived at on a reasonable basis and represent the best forecast possible in the circumstances.

¹⁹ ActewAGL, *Attachment 6: Capital expenditure: Access arrangement information for the 2016–21 ACT, Queanbeyan and Palerang access arrangement*, June 2015.

²⁰ ActewAGL, *Access arrangement information*, June 2015, Appendices 6.01, 6.02, 6.03, 6.06, 6.07.

²¹ ActewAGL, *Access arrangement information*, June 2015, 2016–21 – PUBLIC Gas Reset RIN MASTER FINAL_revised_6 July2015.xls.

²² ActewAGL, *Access arrangement information*, June 2015, Appendices 6.05.1, 6.05.2, 6.05.3, 6.05.4, 6.05.5 (all CONFIDENTIAL).

²³ ActewAGL, *Access arrangement information*, June 2015, Attachment 4 (CONFIDENTIAL), Appendices 4.01 – ASA, 4.01 – DAMS, 4.02, 4.03, 4.04, 4.05a, 4.05b (all CONFIDENTIAL except 4.03 and 4.04).

²⁴ ActewAGL, *Access arrangement information*, June 2015, Attachment 6.04.1 – CONFIDENTIAL - CapexForecastModel.xls.

²⁵ NGR, r. 79(1)(a).

The following sections set out our approach to assessing ActewAGL's forecast of required capex for the 2016–21 access arrangement period. Our tools and techniques cover:

- assessing whether any outsourcing to third-parties reflect genuine arm's length arrangements
- assessing historical expenditure under the revealed cost approach
- how we compare costs against previous decisions we have made (benchmarking)
- consideration of technical engineering advice
- determining the appropriate estimate for equity raising costs.

6.3.3.1 Assessing competitive tender processes for outsourced activities

Outsourcing to specialist providers of a particular service is a common means by which businesses in the economy are able to gain access to economies of scale and scope and other efficiencies.

Where ActewAGL has used tendered rates as the basis of proposed unit costs, we relied on our approach to assessing outsourcing arrangements.²⁶ The first stage of the conceptual framework is a 'presumption threshold' designed to be an initial filter to determine which contracts can be presumed to reflect efficient costs that would be incurred by a prudent operator.²⁷

In undertaking this 'presumption threshold' assessment, we consider:

- Did the service provider have an incentive to agree to non-arm's length terms at the time the contract was negotiated (or at its most recent re-negotiation)?
- If yes, was a competitive open tender process conducted in a competitive market?

In the absence of an incentive to agree to non-arm's length terms, we consider it reasonable to presume a contract price reflects efficient costs. We also consider this presumption to be reasonable where an incentive to agree to non-arm's length terms exists but the contract was the outcome of a competitive open tender process in a competitive market.²⁸

Where an arrangement 'passes' the presumption threshold, we consider the starting point for setting future expenditure should be the contract price itself, with limited further examination. This further examination involves checking whether the contract wholly relates to the relevant services and whether the contract price already compensates for risks or costs provided for elsewhere in the building blocks.

²⁶ AER, *Better Regulation: Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, pp. 9–10.

²⁷ NGR, r. 71(1).

²⁸ NGR, r. 71(1).

6.3.3.2 Revealed cost approach

The revealed cost approach considers information revealed by the past performance of a gas business. Under the ex-ante regime, gas businesses are rewarded for spending less capex than allowed by the regulator. This incentive enables us to place some reliance on the historical costs of a gas business when reviewing its forecast capex. We used historical costs and volumes as an indicator of efficient costs and volumes for certain categories of capex in this draft decision. In particular, we used historical total costs, unit costs and volumes in assessing capex related to market expansion (connections), network renewal and upgrade, and meter renewal and upgrade.

The revealed cost approach is an accepted industry practice. Many gas businesses, including ActewAGL, have used this approach as a basis to forecast expenditure proposals. We have also used this approach previously in our assessment of access arrangement proposals for the Victorian and NSW gas businesses.

6.3.3.3 Benchmarking against the other businesses' proposed unit costs and volumes

We also conducted comparative analysis of unit costs ActewAGL used to develop its capex forecast. Comparing the costs incurred by one regulated entity against the costs incurred by other regulated entities in similar circumstances, and using the comparison to assess the efficiency and prudence of those costs, is known as 'benchmarking'. We consider that the use of benchmarking to assess whether capex is conforming is consistent with the requirements of the NGR.

We undertook a high level benchmarking of a selection of ActewAGL's unit costs against similar unit costs of the Victorian, NSW and South Australian gas businesses. Where required some adjustment for compositional difference was made. We used this comparison to assess connections/market expansion and meter renewal expenditure.

Where this benchmarking indicated that ActewAGL's capex may not be efficient, we undertook a detailed review of ActewAGL's proposal. Our detailed review involved consideration of relevant documentation and the impact of factors expected to differ from the past and/or from the Victorian, NSW and South Australian gas businesses.

We recognise that forecast efficient costs may legitimately depart from those revealed through past performance, and compared with other gas businesses. For example, gas businesses may discover more efficient processes over time. The gas businesses may propose that they can best achieve their safety, reliability or regulatory obligations by incurring expenditure to implement new, more efficient processes, and include such expenditure in their proposed forecast capex. We consider it likely that a prudent service provider, acting efficiently, would only change operating processes (from revealed, or otherwise efficient processes) if they are likely to result in efficiency gains (in the absence of any information to suggest other reasons for the change). Where we consider that future cost savings should result from capex investments, we have taken this into consideration in determining ActewAGL's forecast opex.

6.3.3.4 Specialist technical advice

We drew on engineering and other technical expertise within the AER to assist with our review on the prudence and efficiency of ActewAGL's proposed market expansion capex.

We also engaged an engineering consultant, Sleeman Consulting, to provide specialist technical advice on the prudence and efficiency of ActewAGL's proposed capex related to capacity development and network renewal and upgrade.²⁹

6.3.3.5 Cash flow analysis for equity raising costs

To determine the amount of equity raising costs, we have undertaken an assessment of benchmark cash flows calculated in the PTRM. Under this method, a prudent service provider, acting efficiently, would first exhaust the cheapest sources of funding, such as internal cash flows, before using more expensive external sources of funding, such as equity financing. The cash flow modelling approach used by the AER incorporates this assumption to determine if any external equity financing would be required based on the AER's capex forecast for ActewAGL. For further discussion see attachment 3 of this draft decision (rate of return).

6.3.4 Interrelationships

In assessing ActewAGL's total forecast capex we took into account other components of its proposal, including:

- the trade-off between potential capex and opex solutions in our assessment of ActewAGL's proposed capex.
- any change in the capitalisation policy applied between the current access arrangement and the 2016–21 access arrangement period. This relates to the change from the expensing of in-line inspection (pigging), integrity digs, and corporate overhead expenditure in the current access arrangement period to capitalising in the next access arrangement period.

6.4 Reasons for draft decision

6.4.1 Conforming capital expenditure for 2009–16

We consider that the \$102.6 million (\$2015–16) net capex incurred by ActewAGL for 2009–15 is conforming capex that complies with rule 79(1) of the NGR.³⁰

In reaching this view we have considered the following factors:

²⁹ Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015.

³⁰ As we noted previously, the approved capex for 2014–15 is a placeholder because capex for that year is based on estimates. We expect ActewAGL will provide actual capex for that year in its revised proposal.

- ActewAGL’s actual capex was \$2.3 million (24.2 per cent) over the \$9.5 million (\$2015–16) amount the Independent Competition and Regulatory Commission (ICRC) approved for 2009–10.
- ActewAGL’s actual capex was \$7.9 million (eight per cent) under the AER approved amount of \$98.7 million (\$2015–16) for 2010–15.
- ActewAGL’s actual capex for the market expansion (connections) category was \$2.4 million (six per cent) over the AER approved amount of \$40.9 million (\$2015–16) for 2010–15. ActewAGL explained this was due to two unanticipated projects during the period. This also resulted in actual capital contributions being \$3.0 million over the AER approved amount of \$0.4 million (\$2015–16).³¹
- ActewAGL’s actual capex was under the AER approved amount for the other categories as follows:
 - In the capacity development (augmentation) category, ActewAGL spent \$0.6 million (1.9 per cent) less than the AER approved amount of \$28.2 million (\$2015–16).
 - In the ‘stay in business’ category, ActewAGL spent \$6.0 million (21 per cent) less than the AER approved amount of \$28.6 million (\$2015–16). ActewAGL stated this was primarily due statistical sampling which indicated it could extend the economic life of residential meters. ActewAGL was therefore able to defer metering capex.³²
 - In the non-system category, ActewAGL spent \$0.8 million (61.8 per cent) less than the AER approved amount of \$1.4 million (\$2015–16). ActewAGL stated the GIS portion of the forecast (\$0.3 million) was subsequently identified as opex and, subsequently, not rolled into the asset base.³³

Submissions received from the AER’s Consumer Challenge Panel (CCP) and the ANU College of Law note an increased level of expenditure in the 2015–16 year and suggest that we closely analyse the proposed capex in this year.³⁴ As discussed in Attachment 2 (Capital Base), we have not assessed proposed capex in the 2015–16 year as approved capex under this decision. We will assess whether the 2015–16 amounts are conforming capex as part of the next access arrangement decision.

³¹ ActewAGL, *2016–20 access arrangement period: Attachment 6: Capital expenditure*, June 2015, p. 18.

³² ActewAGL, *2016–20 access arrangement period: Attachment 6: Capital expenditure*, June 2015, p. 22.

³³ ActewAGL, *2016–20 access arrangement period: Attachment 6: Capital expenditure*, June 2015, pp. 28–29.

³⁴ Consumer Challenge Panel, *Advice to the AER from Consumer Challenge Panel sub-panel 8 regarding ActewAGL Distribution access arrangement 2016–2021 proposal*, August 2015, p. 9; Australian National University (Peter Sutherland), *Submission – ActewAGL Distribution submission to the AER for the period 2016–2021*, August 2015, p. 4.

6.4.2 Conforming capital expenditure for the 2016–21 access arrangement period

The rest of this attachment details our analysis of the capex driver categories in coming to our position in this draft decision to approve \$76.8 million (\$2015–16) of total net capex for ActewAGL for the 2016–21 access arrangement period as conforming capex under rule 79(1) of the NGR. Some of the cost drivers in this section include a construction management fee (CMF) paid to a subcontractor, Zinfra, who is a related party. Direct costs for each capex driver excluding the CMF are set out in confidential Appendix C.

6.4.3 Growth Assets (Connections)

Distribution businesses have a regulatory obligation to make a connection offer to residential and commercial/industrial customers making an application to connect to its distribution network.³⁵ The capex associated with these connections, which includes the cost of new mains, gas service pipe from the main to the meter and the meter, generally differs depending on whether the connection is for a Tariff V customer or a Tariff D customer.

Tariff V customers are residential and commercial/industrial customers who consume less than 10 TJ/year. Tariff D customers are major industrial customers who consume more than 10 TJ/year.

Connections capex is conforming capital expenditure if it would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services and is justified on a ground stated in rule 79(2). Connections capex is justified if the present value of the revenue it generates exceeds its present value.³⁶

ActewAGL proposed forecast expenditure of \$55.5 million (\$2015–16, unescalated) during the 2016–21 access arrangement period.³⁷ ActewAGL's proposed connections expenditure represents 50.4 per cent of total capex and is a 10.7 per cent increase compared to the previous period. ActewAGL attributes its proposed increase to a 61 per cent increase in the volume of medium density connections and to increased unit rates following the implementation of the NECF.³⁸

As we discuss below, we do not consider that ActewAGL's proposal of \$55.5 million (\$2015–16, unescalated) constitutes forecast conforming capital expenditure that can be included in its project capital base for the 2016–21 access arrangement period. Our

³⁵ NGR r. 119S for basic and standard connections and NGR r. 119V for negotiated connections.

³⁶ NGR r. 79(2)(b).

³⁷ ActewAGL, *2016–21 Access Arrangement Information*, June 2015, 6.04.1-CONFIDENTIAL-CapexForecastModel.xlsm.

³⁸ ActewAGL, *2016–21 Access Arrangement Information*, June 2015, Appendix 6.01 - Asset Management Plan.pdf, p. xii. Note these are unescalated direct costs and excludes overheads.

position in this draft decision is that a forecast of \$40.6 million (\$2015–16, unescalated) of connections capex constitutes forecast conforming capital expenditure. There are two main reasons for our position.

Firstly, in relation to ActewAGL’s proposed connections capex for Tariff V customers, our connection forecasts for medium density type connections are lower than that which ActewAGL proposed. This is due to the difference between the gas connection rate that ActewAGL and we have assumed. We also are not satisfied that ActewAGL’s proposed step changes for energisation and hot water meter costs and the inclusion of cost escalation are consistent with costs a prudent operator would incur.

Secondly, in relation to ActewAGL’s proposed connections capex for Tariff D customers, based on the information before us, we have not included expenditure for these customers.

Whilst we received a number of submissions on issues expressing concern over the increase in ActewAGL’s proposed forecast capex (in comparison to the actual capex it incurred during the 2019–15 access arrangement period), we did not receive any submissions that specifically addressed the specific issues that concern its proposed connections capex. We received a number of submissions about the ActewAGL’s high new connections forecast over the 2016–21 access arrangement period. These are mentioned in Attachment 13 (demand).

We also considered confidential material in coming to our position. The confidential material is contained in Appendix C. We discuss our detailed reasons for our position below.

6.4.3.1 Tariff V connections

ActewAGL calculated the total capital expenditure for Tariff V connections by determining the unit costs for mains, services and meters³⁹ and the forecast number of new connections for each of the four categories of Tariff V class customers. These categories are set out in Table 6.6.

³⁹ This includes the cost of meter data loggers (MDLs) with Tariff V residential medium density/high rise connections.

Table 6.6 Tariff V connection categories

Connection type		Description
Residential	Electricity-to-gas (E to G)	Customers currently not using gas, generally converting from electricity and/or LPG. May be on the line-of-main or may require a short main extension. It also includes infill connections, where an existing home is demolished and less than three new dwellings are constructed in its place. If three or more dwellings are constructed they are classified as medium density connections.
	New estates	Customers connected in new estate developments. Typically these are constructed in parallel with other services in the estate development with the benefits of greenfield construction and shared trenching.
	Medium/high density	Customers in medium/high density apartments. These usually involve gas for cooking and hot water using a centralised hot water system, and may include heating. This involves a service to the apartments and provision of a hot water meter and gas meter for each residence.
Industrial and commercial (I&C)	Volume market	This includes small business and industrial and commercial (I&C) customers which are not on contract. The 2011-14 historical average use was ~512 GJ p.a.

Source: AER analysis; ActewAGL, *ACT Gas Networks Asset Management Plan RY16-RY21*, 30 June 2015.

Volumes

We are not satisfied that ActewAGL’s forecast of new residential connections is the best estimate in the circumstances. In particular we did not agree with ActewAGL’s forecast of a significant increase in new MD/HR connections over the forecast period. We forecast, on average, 2600 new residential connections annually in the 2016–21 period (a reduction of 31.9 per cent from ActewAGL’s proposed 3816 of new residential connections).

ActewAGL’s forecast volumes is driven by the assumption of a 90 per cent gas connection rate – that is, of all new dwellings, it is assumed that 90 per cent connect to ActewAGL’s gas network. The 90 per cent connection rate is not based on actual historical connections but as the total number of houses with gas divided by the total number of blocks within the ACT.⁴⁰ We consider that this method leads to an

⁴⁰ ActewAGL, *Response to information request no.16*, 31 July 2015, p. 1.

overestimation of the connection rate as there can be several houses as well as medium density housing on a block of land. Our alternate estimate is based on applying the historical gas connections rate of 62 per cent for all new dwellings over the forecast period. The reason for our position is set out in attachment 13 (demand).

Our position in this draft decision is to accept ActewAGL's forecast commercial volumes. We are satisfied that the methodology and underlying assumptions used by Core Energy to derive forecast new commercial connections are reasonable, and would result in the best estimate in the circumstances.

Connection unit rates

The unit rates ActewAGL has applied to determine its forecast are the unit rates specified in the Asset Services Agreement (ASA) that was executed on 20 December 2013 by Jemena Asset Management (JAM), the ActewAGL network manager, and Zinfra, the subcontractor. Both JAM and Zinfra are 100 per cent owned by Jemena. These unit rates are weighted by the 4-year average of the volume of mains/services/meters per connection to arrive at the aggregated mains/service/meter unit rates for each connection type.

Our position in this draft decision is to accept the contract unit rates that ActewAGL has applied. However, it is important to recognise that in arriving at this position, we did not accept that the forecasting approach and the cost step changes applied by ActewAGL would result in an estimate arrived at on a reasonable basis.

We are satisfied that on balance, applying the unit rates specified in the ASA is likely to lead to an amount of connections capex that a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing connections would incur. We recognise that given JAM and Zinfra are related parties it is arguable that these unit rates may not reflect the outcome of a competitive process.

However, this is based on a presumption that there would an incentive to agree to non-arm's length terms, and that these non-arm's length terms are reflected in the connection unit rate. Further, we note that there is a question about whether the benefits of undertaking another competitive tender process specifically in the ACT, particularly in light of its small scale and size, would outweigh the synergies or benefits that may already be reflected in the units rates specified in the ASA. ActewAGL raised this point with us in response to a question we put to it regarding why it had not undertaken another competitive tender process.⁴¹ On the basis of the information available to us, we assess that it would not necessarily be the case that more benefits would be realised had ActewAGL undertaken another competitive tender process.

⁴¹ ActewAGL, *ActewAGL Distribution response to AER ActewAGL 012 Connections and Unit Rates*, 27 July 2015, question 9, p. 10.

Forecasting approach

While we accept the contract unit rates, we do not consider that applying ActewAGL's forecasting method would result in a forecast that is arrived at on a reasonable basis. This is for the following reasons:

- We were unable to reconcile the data in ActewAGL's unit rate model and access arrangement RIN due to inconsistencies and coding errors. We set out the data inconsistencies in more detail in Appendix B. We expect that ActewAGL will resolve these issues as part of its revised access arrangement proposal.
- We have concerns about ActewAGL's meter data loggers (MDLs)⁴² and hot water meter roll out assumptions. Firstly, ActewAGL applies a single unit rate. This includes the cost of individual household gas meters and gas master meters, MDLs, meter kits and hot water meters for each new connection. A single unit rate for every connection will not always result in the best estimate in the circumstances: a new connection may not require all of these items and the connection of MDLs, meter kits and hot water meters may not include connecting a gas meter.
- ActewAGL's forecast of MDLs and hot water meters is based on a historical four year average that assumes there will be a large number of apartment developments. This is not appropriate in circumstances where the HIA forecast suggests that there is an expected downturn in such developments.⁴³
- ActewAGL included more connections than household and master gas meters and more hot water meters than connections in the unit rate model. It is not clear how more hot water meters than new connections can be justified.

In our view, we consider that a better estimate would:

- take account of expected downturn in large apartment developments;
- separately forecast:
 - medium density dwellings from high rise dwellings, given the different capex requirements;
 - individual household gas meters from gas master meters, given the different capex costs and ratios of application
 - MDLs, meter kits and hot water meters.⁴⁴

⁴² Meter data loggers (MDL) are remote electronic devices installed in the network to record and transmit the consumption and/or hot water meters from apartment blocks.

⁴³ Housing Industry Association, *New Housing Outlook, HIA Housing Forecasts – May 2015, Dwelling starts: by State and Territory*, May 2015.

⁴⁴ By calculating: the proportion of connections that connect an MDL/meter kit/hot water meter and the average of the annual average MDLs/meter kits/hot water meter per connection for those connections that include these (excluding large outliers that are not justified in the forecast period). As part way towards realising this change in measurement approach we have excluded the large apartment outliers for forecasting hot water meters. We did this on the basis of the frequency, whereby at least 70 per cent of delivery points across each of the four years had less than 30 apartments.

We invite ActewAGL address our concerns about its forecasting approach, including the data inconsistencies, in its revised proposal.

Cost step change

We are not satisfied that applying ActewAGL's proposed cost step changes for energisation costs for meters for medium density connections, hot water meters and applying escalators in its unit rates model would result in a forecast that is arrived at on a reasonable basis. This is for the following reasons.

Regarding the proposed step change for energisation costs ActewAGL proposed an energisation cost for meters for medium density connections. It attributed this to the introduction of the National Energy Customer Framework (NECF).⁴⁵ ActewAGL did not provide any further information than this to support its proposed expenditure.

We put to ActewAGL that the NGR and NERL provide for ActewAGL to be able to allocate energisation costs to the connecting party, by requiring a retail contract to be in place (and therefore a financially responsible retailer assigned) before establishing a new connection.⁴⁶ The NGR provides for ActewAGL to not energise a connection until a retailer is nominated.⁴⁷ In the case of new developments, if a retailer is nominated by the real estate developer, the developer is recognised as a shared customer and ActewAGL's proposed approach to de-energisation and re-energisation in other circumstances (for example, move-in/move-out customers) would apply. To the extent that ActewAGL departs from this approach, we consider the cost should nonetheless be borne by the benefitting party, that being the real estate developer.⁴⁸

In response, ActewAGL submitted that:⁴⁹

- a real estate developer would generally need to have a pre-existing relationship with a gas retailer in order to enter into a retail contract for a new development
- this is because a retailer would need be willing to create retail contracts with the developer as the customer for a large number (potentially hundreds) of sites that will ultimately be occupied by end-customers, but where there may be a considerable gap in time between the establishment of these retail contracts and the occupation of each premise by a gas consumer (resident)
- if a developer is unable or unwilling to enter a retail contract for each premise in its development with a retailer ActewAGL must provide the developer with an offer to

⁴⁵ ActewAGL, *2016–21 Access Arrangement Information*, June 2015, ActewAGL Distribution AAI_ Attachment 6 Capital expenditure.pdf, p. 41.

⁴⁶ NERL, s. 54.

⁴⁷ NGR, r. 119XX. ActewAGL is not required to energise a new connection unless a request to energise a new connection is submitted by a retailer or the distributor is otherwise satisfied that there is a relevant contract with a retailer in relation to the premises.

⁴⁸ AER, *AER Information request - AER ActewAGL 001 – Connections – unit rate model*, 10 July 2015, question 3.

⁴⁹ ActewAGL, *ActewAGL Distribution response to AER query AER ActewAGL 001 Connections unit rate model*, 17 July 2015, pp. 3–4.

connect to the network. That is, an offer to establish the physical connection to the network (which will not be energised until there is a financially responsible retailer for the site at some point in the future—thereby requiring a two-step connection).

We do not agree with ActewAGL's submission that there are impediments to requiring property developers to enter into retail contracts in respect of new developments. We consider that there are strong incentives for competing retailers in the ACT to contract with developers, including to grow their customer base. We remain of the view that energisation cost should be borne by the benefitting party, that being the real estate developer, and have not included the energisation cost in the medium density meter unit rate.

Regarding the proposed step change for hot water meters, ActewAGL's unit rate model refers to three different types of hot water meters but applies the unit rate for a hot water meter which is materially more expensive than these other three hot water meter types.⁵⁰

In response to our information request, ActewAGL submitted further information and tender information.⁵¹ On the information available, we cannot see why it would be appropriate for ActewAGL to use the materially more expensive hot water meter than the alternatives recommended in the tender reports. We therefore have not accepted ActewAGL's proposed step change for hot water meters on the basis that using the more expensive hot water meters would result in a forecast that is not arrived at on a reasonable basis.

Regarding the escalation of unit rates, ActewAGL has stated that it applied escalators in the same way as it did to its forecast opex, to account for expected component price changes over the 2015–20 access arrangement period.⁵² However, we have been unable to identify what these escalators are.⁵³ The ASA only refers to CPI escalation.⁵⁴ We have therefore been unable to assess these escalators and have not included these in the unit rates.

Volume of mains/services/meters per connection

ActewAGL applied a three year historical average (2011–12 to 2013–14) of the mains/services/meters per connection from its access arrangement RIN. Given the

⁵⁰ ActewAGL, *2016–21 Access Arrangement Information*, June 2015, 6.04.2-CONFIDENTIAL-MarketExpansionUnitRatesModel.xls, tab 'Input|Rates' cells I167, I171, I173.

⁵¹ AER, *AER Information request - AER ActewAGL 001 – Connections – unit rate model*, 10 July 2015, question 3.

⁵² ActewAGL, *ActewAGL Distribution response to AER ActewAGL 019 – construction management fee*, 7 August 2015, question 3, p. 4.

⁵³ We have asked ActewAGL to identify the clauses in the ASA which provide for real material and labour escalation to be applied to the unit rates: AER, *Information request AER ActewAGL 017*, 30 July 2015, question 7.

ActewAGL's response referred us to the management agreement between JAM and ActewAGL, which provides only for a pass through of the ASA unit rates and does not identify the relevant escalators: ActewAGL, *ActewAGL Distribution response to AER ActewAGL 017 connections unit rates*, 7 August 2015, question 7, pp. 6–8.

⁵⁴ ActewAGL, *2016–21 Access Arrangement Information*, June 2015, Appendix 4.01 - CONFIDENTIAL – ASA.pdf, Part 6 of Schedule E.

data inconsistencies between the access arrangement RIN and the unit rate model noted above and set out in detail in Appendix B, we have used ActewAGL's unit rate model to arrive at the average mains/services/meters per connection over a four year period. This ensures that the same data source used to derive the weights for the contract rates (which were derived over a four year period) is also used to estimate the average mains/services/meters per connection.⁵⁵

Inclusion of an internal main for medium density/high rise

We have not included the internal mains costs in the unit rates for medium density connections.

ActewAGL indicated that, unlike networks in other jurisdictions, it includes the internal main within the site of the villa complex in its connections capex proposal. ActewAGL indicated that this results in a longer average mains length for medium density dwellings. ActewAGL submit that '[a]s a result, the average cost of mains for medium-density connections may be significantly higher than would be observed for other gas networks'.⁵⁶

We do not consider this cost should be included in the connection charge to customers, and to include it would be inefficient. This internal main is contained within the property and therefore should be paid by the developer. We also note that it is not industry practice for a network provider to charge customers for an internal main.

6.4.3.2 Tariff D connections

ActewAGL calculated the total capital expenditure for Tariff D or contract industrial and commercial connections by applying a 4-year (FY11-FY14) historical average of Tariff D expenditure.

We have not included any expenditure for tariff D connections. This is because we were unable to verify the historical expenditure which ActewAGL indicates is the basis for the Tariff D forecast expenditure. Further, ActewAGL did not record any historical actual expenditure for Tariff D connections in its access arrangement RIN.

We asked ActewAGL to provide the source cost and volume data for each connection in order to verify ActewAGL's forecast I&C contract expenditure.⁵⁷ ActewAGL submitted that it was unable to provide the historical data due to an upgrade to their databases.⁵⁸ It is therefore unclear how ActewAGL has arrived at its historical expenditure which it submitted was basis of its forecast.

⁵⁵ The only exception to this is where we excluded the 2010–11 value for Tariff V commercial in calculating the average as the number of connections and the mains and meter values appear to be outliers.

⁵⁶ ActewAGL, *2016–21 Access Arrangement Information*, June 2015, Attachment 6 Capital expenditure, p. 45.

⁵⁷ AER, *AER Information request - AER ActewAGL 001 – Connections – unit rate model*, 10 July 2015, question 1.

⁵⁸ In its response to AER Information request - AER ActewAGL 001 – Connections – unit rate model, ActewAGL submitted that its staff were on leave and that it would submit a response by 31 July 2015. The quote is from ActewAGL, *ActewAGL Distribution response to various information requests*, 31 July 2015, p. 4. ActewAGL,

We expect that ActewAGL will provide its actual expenditure for Tariff D connections as part of its revised proposal.

6.4.4 Capital contributions

A customer may make a capital contribution, where the revenue generated by a new connection is less than the capex and opex cost incurred in making and maintaining the new connection.⁵⁹

For tariff V customers, ActewAGL has proposed capital contributions of \$0.5 million (2015–16, unescalated).⁶⁰ We were unable to verify ActewAGL's proposed capital contribution amounts which were hardcoded in the access arrangement RIN.⁶¹ We forecast a capital contribution of \$4.1 million (\$2015–16, unescalated), applying the method described by ActewAGL.

ActewAGL did not submit capital contributions for Tariff D customers, however, it states that '[a] forecast will be included in the revised proposal'.⁶² We expect ActewAGL to submit the historical connections expenditure and contributions data that will allow us to verify the reasonableness of its capital contributions forecast.

6.4.5 Construction management fee

ActewAGL proposed a construction management fee (CMF) for the 2016–21 access arrangement period. The CMF is paid to a subcontractor, Zinfra but Jemena Asset Management (JAM) manages ActewAGL's gas distribution network. JAM and Zinfra are related parties to ActewAGL. This is because State Grid Singapore Power (SGSP)⁶³ owns 50 per cent of the shares in ActewAGL and 100 per cent of the share of both JAM and Zinfra. The ACT Government owns the other 50 per cent share of ActewAGL, via Icon Distribution.

JAM subcontracts to Zinfra all routine and non-routine capital works under \$500 000 on ActewAGL's network. For all routine capital works, the charges are made up of two components – a fixed CMF and unit rates. The CMF includes a margin. ActewAGL

Further Information to supplement ActewAGL Distribution response to various information requests, 20 August 2015, p. 2

⁵⁹ ActewAGL, *2016–21 Access Arrangement Information*, June 2015, ActewAGL Distribution AAI_Attachment 6 Capital expenditure.pdf, p. 44; NGR r. 79(2)(b).

⁶⁰ These are forecast contributions for E-to-G, New Homes and I&C tariff connections based on historic patterns, excluding contributions for medium density connections.

⁶¹ ActewAGL submitted that it forecast the amount of capital contributions by taking the five-year average of capital contributions as a percentage of gross capex for each connection type and applying this percentage to the forecast capex for each connection type.

⁶² ActewAGL, *ActewAGL Distribution response to various information requests*, 31 July 2015, p. 4.

⁶³ SGSP (Australia) Trust is owned by State Grid International Development Australia Investment Company Limited (60% shareholding) and Singapore Power.

notes that the CMF is not a new fee but represents the costs included in other fees in its previous contract with JAM.⁶⁴

Based on the information before us, we consider that the CMF is prudent and efficient and have included it in ActewAGL's forecast capex. However, as we discuss below, we have not included ActewAGL's proposed step changes to the CMF. Nevertheless, it is important to recognise that related party fees generally remain an area of concern for us. Including these fees can result in inefficient outcomes. We therefore intend to continue to closely review these related party fees in the future.

ActewAGL has proposed a number of step changes to the CMF due to:

- additional compliance costs from changes in regulatory requirements. ActewAGL submit that the ACT Government introduced amendments to Gas Network Boundary Code May 2013, GS&I Rules Code July 2013, and is proposing amendments to the Gas General Metering Code (expected to be finalised in 2015/16),⁶⁵ and
- a change in subcontractor undertaking meter data logger (MDL) installation.

Over the 2016–21 access arrangement period, ActewAGL are proposing a step change.⁶⁶ We have not included this step changes in our alternative capex estimate as we assess that these costs are not prudent and efficient.

ActewAGL has not provided evidence to demonstrate that additional compliance costs would be required with changes in the Codes. In coming to our position, we had regard to information from the ACT Government's Environment and Planning Directorate.⁶⁷ It appears that these amendments are intended to clarify technical arrangements and liability issues for gas networks, and are therefore not a new obligation. In particular, we note that:

- the changes in the Gas Network Boundary Code May 2013 required one off costs to update staff and company documentation for the changes. We assess that the costs of these changes were incurred in 2013–14;⁶⁸
- ActewAGL is currently required to ensure that new gas meter installations (construction) comply with the relevant ACT-specific rules and codes. ActewAGL has not provided any evidence that the changes in the Codes have resulted in any change in the business as usual interactions when dealing with meter installations.

⁶⁴ ActewAGL, *Response to AER information request AER ActewAGL 010*, 23 July 2015, p. 2.

⁶⁵ ActewAGL, *Access Arrangement Information 2016-21*, June 2015, Attachment 6, p. 41; ActewAGL, *Access Arrangement Information 2016-21*, June 2015, Appendix 5.04 – Operating expenditure step changes_confidential, p. 34.

⁶⁶ ActewAGL, *Response to AER information request AER ActewAGL 029*, received 2 September 2015, p. 2.

⁶⁷ This department of the ACT Government has responsibility for technical regulation of the gas industry.

⁶⁸ The Code changes occurred in 2013 and ActewAGL went through a process of updating its GS&I Rules between the 6 September 2013 (when its draft Rules were initially released to industry) and 6 June 2014 (when final approval was granted by the Environment and Sustainable Development Directorate)(ActewAGL, *ActewAGL ACT-Gas-Service-and-Installation-Rules.pdf*, 6 June 2014, p. cover page).

- zero costs for ActewAGL are anticipated with respect to the revision of the Gas General Metering Code as ActewAGL indicated that they are already conducting these activities (as demonstrated within ActewAGL’s Asset Maintenance Plan).
- We requested that ActewAGL describe the specific changes between the pre-existing code and the new code for GS&I Rules Code July 2013 and the Gas Network Boundary Code May 2013 and the specific implementation timing of the changes.⁶⁹ ActewAGL did not provide this information.⁷⁰

With respect to the costs ActewAGL is proposing due to a change in subcontractor carrying out meter data logger installation costs, we assess there is very little change in cost.⁷¹ We consider that a change in sub-contractor should not materially impact the forecast costs, where the work requirements stay the same.

On this basis, we do not consider that a step change in costs is justified. We considered confidential material in coming to our position. The confidential material is contained in Appendix C.

6.4.6 Capacity development/augmentation

Network augmentation capex is directed at increasing the capacity of the existing network to meet the demand of existing and future customers. Augmentation capex is required to maintain gas pressure and minimise the risk of gas outages.

ActewAGL has proposed augmentation capex to meet growth in peak hourly demand on its distribution network. This is to accommodate demand from new customers and to meet growth in peak demand from existing customers as they upgrade or add appliances.⁷²

ActewAGL stated its augmentation capex provides ‘supply security and maintenance of supply reliability’, and maintains ‘capacity to supply existing services’, pursuant to rule 79(2)(c)(ii) and (iv), respectively, of the NGR.⁷³

We have included \$6.0 million (\$2015–16, unescalated) of augmentation capex in our alternative estimate (see Table 6.2). We are not satisfied that ActewAGL’s proposed amount of \$17.7 million (\$2015–16, unescalated) is conforming capex that complies with rule 79.⁷⁴ Instead, we have included in our alternative estimate, which we consider is conforming capex that complies with rule 79:

⁶⁹ AER, *AER Information request - AER ActewAGL 029 – Compliance to revised technical codes for metering – opex and capex (construction management fee) step change*, 26 August 2015, question f(i)-(ii).

⁷⁰ ActewAGL, *Response to AER Information request - AER ActewAGL 029*, 2 September 2015.

⁷¹ ActewAGL, *Response to AER Information request - AER ActewAGL 029*, 2 September 2015, pp. 3–4.

⁷² ActewAGL, *2016–20 access arrangement period: Attachment 6: Capital expenditure*, June 2015, pp. 47–49.

⁷³ ActewAGL, *2016–20 access arrangement period: Attachment 6: Capital expenditure*, June 2015, p. 48.

⁷⁴ NGR, r. 79(1)(a), 79(2)(c).

- capex associated with a key project totalling \$2.9 million is justifiable as the project is necessary to maintain the integrity of gas services and to maintain ActewAGL's capacity to meet levels of demand for services⁷⁵
- capex associated with 24 smaller scale augmentation projects totalling \$3.1 million is justifiable as the projects are necessary to maintain the integrity of gas services and to maintain ActewAGL's capacity to meet levels of demand for services⁷⁶

We do not agree with ActewAGL's submissions that capex associated with two projects totalling \$11.9 million is justified. This is because we consider the projects are not required in the 2016–21 access arrangement period.⁷⁷

We assessed the capital expenditure for ActewAGL's augmentation projects by considering the timing of the proposed works, the capacity benefit resulting from the augmentation solution and whether the input cost of each project represents the efficient, lowest sustainable cost, as provided for in the NGR.⁷⁸ In undertaking this assessment we sought advice from our engineering consultant, Sleeman Consulting, who examined the business cases and where relevant requested further information from ActewAGL.

In assessing the prudence and efficiency of the capital expenditure for the proposed projects, we and Sleeman Consulting considered:⁷⁹

- the capacity shortfall and/or projected growth demonstrating the requirement for the augmentation
- whether ActewAGL considered alternative options to address the issue
- the prudence of the timing of the proposed augmentation
- the prudence and efficiency of the scale of the proposed augmentation
- the efficiency of the proposed project costs.

Table 6.7 shows three projects make up 83.4 per cent of ActewAGL's capacity development forecast. These projects are:

- Molonglo Secondary Extension Stage 2 (Molonglo Secondary)
- Molonglo Primary Main Extension Stage 1 (Molonglo Primary)
- West Belconnen Secondary Main (Southern Cross Dr West) (West Belconnen)

⁷⁵ NGR, rr. 79(2)(c)(ii), 79(2)(c)(iv).

⁷⁶ NGR, rr. 79(2)(c)(ii), 79(2)(c)(iv).

⁷⁷ NGR, r. 79(2)(c).

⁷⁸ NGR, r. 79(1)(a).

⁷⁹ Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015.

The rest of the capacity development forecast comprise of 24 smaller augmentation works ranging in forecast expenditure between approximately \$2,300 and \$340,000 (\$2015–16).

Our assessment focused largely on the three projects in Table 6.7 (the key projects).

Table 6.7 ActewAGL capacity development forecast (\$2015–16, unescalated direct cost only)

	2016-17	2017-18	2018-19	2019-20	2020-21	TOTAL	Per cent of total capacity development
Molonglo Secondary	0.21	2.58	0.87	0.00	0.00	3.66	20.61
Molonglo Primary	0.00	1.24	1.04	5.95	0.00	8.22 ^a	46.33
West Belconnen	2.15	0.77	0.00	0.00	0.00	2.92	16.46
Total	2.36	4.58	1.91	5.95	0.00	14.80	83.40

Source: ActewAGL, 2016–21 – Public: Gas reset RIN: Master final_revised, July 2015; ActewAGL, 2016–20 access arrangement period: Attachment 6: Capital expenditure, June 2015, p. 48.

a The \$8.22 million figure is consistent with the total forecast expenditure for the project (which is the direct cost, plus other factors). It appears ActewAGL should have inputted a lower figure into its RIN and capex model for this project. This does not affect our derivation of conforming capex.

Assessment of capacity development/augmentation expenditure forecast

We consider the West Belconnen project, costing \$2.92 million (\$2015–16, unescalated), and the 24 smaller scale augmentation projects costing \$2.95 million is conforming capex that complies with rule 79. In coming to this view we took into account the advice we received from Sleeman Consulting which we found to be persuasive. The two main reasons for this view are:

- ActewAGL's proposed augmentation solutions for these projects have been arrived at on a reasonable basis in light of forecast connections growth.⁸⁰
- ActewAGL's proposed input costs for these augmentation projects are within a reasonable range and are likely to reflect that of a prudent and efficient service provider.⁸¹

However, we consider that ActewAGL's proposed capex for two key projects, totalling \$11.9 million (\$2015–16, unescalated direct costs) is not conforming capex that complies with rule 79 of the NGR.

⁸⁰ Sleeman Consulting, ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects, 18 November 2015, section 2.3.

⁸¹ Sleeman Consulting, ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects, 18 November 2015, section 2.3.

Firstly, the driver for ‘Molonglo Secondary Extension Stage 2’ project is the gas requirements arising from the development of the Molonglo land subdivision.⁸² Sleeman Consulting has advised us that any gas requirements in the early stages of this development can be accommodated by the existing infrastructure arising from the Molonglo Secondary Extension Stage 1 project.⁸³ We have taken into consideration that a developer for these early stages was only recently announced (July 2015) and there are no commitments yet for the latter stages of the development.⁸⁴ We therefore do not consider the Molonglo Secondary Extension Stage 2 project is likely to be required in the 2016–21 access arrangement period. Given the scope for deferral, we do not consider ActewAGL’s expenditure forecast for this project reflects capex that a prudent service provider, acting efficiently, would incur.⁸⁵ This reduces ActewAGL’s capex forecast by \$3.7 million (\$2015–16, unescalated direct expenditure).

Regarding ‘Molonglo Primary Extension Stage 1’, we consider ActewAGL’s modelling overestimated the number of connections (and subsequently, peak load) required to either maintain the integrity of gas services or to maintain ActewAGL’s capacity to meet levels of demand for services.⁸⁶ In particular, Sleeman Consulting noted that whilst there is the potential for 6,000 sites to be available on the Molonglo land development by 2020, it is not necessarily the case that all of these dwellings will have been developed or will connect to gas by 2020.⁸⁷ It follows that the number of connections that ActewAGL has assumed for this project is excessive relative to the number of available sites (see confidential appendix C).⁸⁸ Further, ActewAGL did not provide any information to demonstrate whether or the extent to which it has considered more optimal choices to meet any forecast constraints other than extensions to the primary and secondary systems.⁸⁹

We invite ActewAGL address our concerns about the Molonglo Secondary and Molonglo Primary projects, including its assumptions about the number of connections, in its revised proposal.

⁸² Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015, section 2.2.

⁸³ Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015, section 2.2.

The Molonglo Secondary Extension Stage 1 project is a separate project from the Stage 2 project we consider in this draft decision. ActewAGL forecasts completion of Stage 1 in 2015–16 having also incurred expenditure in 2013–14 and 2014–15.

⁸⁴ Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015, section 2.2.

⁸⁵ NGR, r. 79(1)(a).

⁸⁶ NGR, rr. 79(2)(c)(ii), 79(2)(c) (iv).

⁸⁷ Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015, section 2.1.

⁸⁸ Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015, section 2.1. (Confidential version).

⁸⁹ Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015, section 2.1.

6.4.7 Network renewal and upgrade

Network renewal and upgrade expenditure is related to the replacement and upgrade of network infrastructure (mains and facilities) to facilitate changes to:⁹⁰

- ensure the reliable transport of gas through the ACT network
- ensure the integrity of the gas network infrastructure
- replace any outdated equipment.

We have included \$14.0 million (\$2015–16, unescalated) of network renewal and upgrade expenditure in our alternative estimate. We do not consider that ActewAGL's proposed amount of \$15.4 million (\$2015–16, unescalated) is conforming capex that complies with rule 79.⁹¹

To assist our review, we asked Sleeman Consulting to review the major projects included in ActewAGL's network renewal and upgrade capex in terms of the requirement for and the scope and timing of the proposed works, and whether the proposed costs are efficient and prudent. Based on Sleeman Consulting's advice⁹² and the information before us, our view is that:

- three out of the five projects which formed part of its review were prudent and efficient
- the proposed capex for the Watson CTS pressure limiting station is not efficient⁹³ and
- the proposed capex for the ACT facilities compliance upgrade program is not justified.⁹⁴

We discuss our reasons for this view.

Watson CTS pressure limiting station

ActewAGL submitted that in the future gas will primarily be sourced via Fyshwick, from the Eastern Gas Pipeline (EGP).⁹⁵ At present gas is primarily sourced via Watson, from the Moomba to Sydney Pipeline. For Fyshwick to operate as the principal source of gas supply into the network, ActewAGL has proposed to install pressure control

⁹⁰ ActewAGL, *2016–21 Access Arrangement Information*, June 2015, ActewAGL Distribution AAI_Attachment 6 Capital expenditure.pdf, p. 51.

⁹¹ NGR, rr. 79(1)(a), 79(2)(c).

⁹² Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015, section 3.

⁹³ NGR, r. 79(1)(a).

⁹⁴ NGR, rr. 79(2)(c)(i)–(iv).

⁹⁵ This corresponds with public announcements by AGL Energy Limited that, from January 2018, it will source gas from the Bass Strait.

facilities at the Watson delivery point.⁹⁶ ActewAGL proposed a total forecast cost of \$1.9 million for this project.⁹⁷

ActewAGL has estimated the cost of designing and installing pressure control facilities at Watson based upon the cost estimate prepared for the Coolamon POTS upgrade.⁹⁸ In response to an information request, ActewAGL provided detailed information prepared for the Coolamon POTS upgrade.⁹⁹

Having reviewed this information and a preliminary breakdown of costs for the installation of pressure control facilities at Watson provided by ActewAGL, Sleeman Consulting advised us that:

- the scope of works for the Coolamon POTS upgrade included the installation of pressure control facilities and a water-bath heater, which results in a higher estimate than is reasonable for the Watson CTS pressure limiting station;¹⁰⁰
- further, the total estimated cost of the Watson CTS pressure limiting station is high relative to that of the Hoskinstown CTS upgrade, which includes metering and associated facilities as well as filtration and flow control;¹⁰¹ and
- the provision for contractor costs represents an excessive proportion of the total forecast costs, and the total direct costs, when compared to other projects such as the Hoskinstown CTS Upgrade.¹⁰²

Based on the information before us and the advice we received from Sleeman Consulting which we found to be persuasive, we do not consider that the proposed capex for the pressure limiting station is conforming capex that complies with rule 79. We agree with Sleeman Consulting that the contractor cost provision should be reduced by \$0.6 million.¹⁰³ This results in a reduced total forecast cost for the Watson pressure limiting station.

⁹⁶ ActewAGL, *Opportunity brief: Pressure limiting station at Watson CTS outlet (C424-146) (confidential)*, December 2014.

⁹⁷ ActewAGL, *Access arrangement information*, June 2015, 2016–21 – PUBLIC Gas Reset RIN MASTER FINAL_revised_6 July2015.xls.

⁹⁸ ActewAGL, *Opportunity brief: Pressure limiting station at Watson CTS outlet (C424-146) (confidential)*, December 2014.

⁹⁹ ActewAGL, *Response to AER information request 036*, 6 October 2015, p. 1.

¹⁰⁰ Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015, section 3.2.

¹⁰¹ Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015, section 3.2.

¹⁰² Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015, section 3.2.

¹⁰³ Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015, section 4.1.

ACT facilities compliance program

ActewAGL proposed total forecast capex of \$1.4 million (2015–16, unescalated)¹⁰⁴ to address these non-conformances.¹⁰⁵

In our view, instances of non-conformance on another gas distribution system do not establish the case for ActewAGL's proposal. This is consistent with Sleeman Consulting's view that it would be appropriate to review existing facilities documentation and undertake preliminary site reviews before committing to a comprehensive programme of upgrade works.¹⁰⁶

Sleeman Consulting also noted that major works are separately proposed for the Hoskinstown CTS and the Fyshwick Trunk Receiving Station. If compliance work did prove to be necessary at these locations it would be prudent for the various programs of work to be coordinated.¹⁰⁷

Accordingly, ActewAGL has not demonstrated the need for its proposed compliance program. We therefore do not consider the proposed costs for its compliance program are conforming capex that complies with rule 79.¹⁰⁸

6.4.8 Meter renewal and upgrade

Meter renewal and upgrade expenditure relates to the replacement of meters and associated equipment as it reaches the end of its economic life (or is found to be defective). This is to ensure the safety of customers and accurate customer billing.¹⁰⁹ We are satisfied that meter renewal and upgrade capex complies with rule 79(2)(c)(ii) and (iii) of the NGR as it is required to maintain the integrity of gas services and meet the AS4944 regulatory requirements.

We have included \$12.9 million (\$2015–16, unescalated) of meter renewal and upgrade expenditure in our alternative capex forecast.¹¹⁰ This is driven by a reduction in the unit rate for hot water meters. We are not satisfied that ActewAGL's proposed amount of \$13.3 million (\$2015–16, unescalated) is conforming capex because ActewAGL's proposed unit rates do not comply with rule 79(1)(a) of the NER.

¹⁰⁴ This forecast includes expenditure proposed in the 2015–16 year.

¹⁰⁵ ActewAGL, *Access arrangement information*, June 2015, 2016–21 – PUBLIC Gas Reset RIN MASTER FINAL_revised_6 July2015.xls.

¹⁰⁶ Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015, section 3.4.

¹⁰⁷ Sleeman Consulting, *ActewAGL access arrangement 2016–21: Review of capex forecasts for selected projects*, 18 November 2015, section 3.4.

¹⁰⁸ NGR, r. 79(2).

¹⁰⁹ ActewAGL, *2016–21 Access Arrangement Information*, June 2015, ActewAGL Distribution AAI_Attachment 6 Capital expenditure.pdf, p. 52.

¹¹⁰ As we noted in section 6.1, this is not the figure we derived in our modelling once we allocate the construction management fee. We have included this figure as it reflects our adjustment to ActewAGL's direct, unescalated capex for meter renewal.

ActewAGL provided its metering capex model which allowed us to also examine the proposed unit costs of different meter types. As discussed earlier in this attachment, we consider that ActewAGL did not seek to choose the most cost effective and reliable hot water meters. We have therefore reduced ActewAGL's hot water meter unit rate as we are not satisfied that this is a cost that would be incurred by a prudent operator acting efficiently.¹¹¹

6.4.9 Non-system capex

ActewAGL proposed \$0.5 million (\$2015–16, unescalated) for non-system capex.¹¹² Upon review of ActewAGL's historic non-system capex and business case¹¹³ for this project, we accept ActewAGL's proposed non-system capex forecast and have included it in our alternative capex forecast. The cost estimates for this project are based on estimates for the main system components gathered by ActewAGL's GIS/IT specialists.¹¹⁴ We are satisfied that ActewAGL's estimate of costs has been arrived at on a reasonable basis, and is consistent with rule 79 of the NGR¹¹⁵ We are also satisfied that this capex is necessary to maintain the integrity of services and to improve the safety of services, and is therefore justified under rule 79(2)(c)(i) and (ii) of the NGR.

ActewAGL's non-system capex forecast consists of one project to develop functionality in its geospatial information system (GIS through the connection of data to mobile devices and to assist in data access, transfer and alignment between ActewAGL and JAM).¹¹⁶

6.4.10 Corporate overheads

Overheads are costs that are not directly attributable to the output of distribution businesses but are necessary to support their operations.

ActewAGL has proposed a forecast overhead allocation of 6 per cent across its forecast capital program.¹¹⁷ Based on the information before us, we are satisfied that ActewAGL's forecast overhead allocation rate of 6 per cent is prudent and efficient.¹¹⁸ Applying this rate to our alternative capex estimate results in an overhead amount of

¹¹¹ NGR, r. 79(1)(a).

¹¹² ActewAGL, *Overview: Access Arrangement Information for the 2016–21 ACT, Queanbeyan and Palerang Access Arrangement*, June 2015, p. 58.

¹¹³ ActewAGL, *Attachment 6: Capital Expenditure: Access Arrangement Information for the 2016–21 ACT, Queanbeyan and Palerang Access Arrangement*, June 2015, p. 63.

¹¹⁴ ActewAGL, *Attachment 6: Capital Expenditure: Access Arrangement Information for the 2016–21 ACT, Queanbeyan and Palerang Access Arrangement*, June 2015, p. 63.

¹¹⁵ NGR, rr. 79(1), 79(2)(c)(i), 79(2)(c) (ii).

¹¹⁶ ActewAGL, *Attachment 6: Capital Expenditure: Access Arrangement Information for the 2016–21 ACT, Queanbeyan and Palerang Access Arrangement*, June 2015, p. 62.

¹¹⁷ ActewAGL, *2016–20 Access Arrangement Information Attachment 6: Capital expenditure*, June 2015, p. 63.

¹¹⁸ NGR, r. 79(1)(a).

\$4.6 million (\$2015–16, unescalated), lower than ActewAGL estimate of \$6.6 million (\$2015–16, unescalated).

6.4.11 Labour and material cost escalation

ActewAGL has applied labour and material cost escalation to its capex forecasts. We do not consider that ActewAGL's proposed labour cost escalation is the best estimate in the circumstances. Our reasons for this are set out in Attachment 7. We have substituted our estimate of the labour and material escalation in place of that proposed by ActewAGL.

With respect to materials escalation, we have revised ActewAGL's proposed materials escalation to zero. This is discussed in the capex attachment at appendix B of this draft decision.

6.5 Revisions

We require the following revisions to make the access arrangement proposal acceptable:

Revision 6.1: Make all necessary amendments to reflect our draft decision on conforming capex for 2016–21, as set out in Table 6.2.

A Real material cost escalation

Real material cost escalation is a method for accounting for expected changes in the costs of key material inputs to forecast capex. The materials input cost model submitted by ActewAGL includes forecasts for changes in the prices of commodities such as aluminium, brass, concrete, plastic and steel, rather than the prices of physical inputs themselves (e.g., pipes and meters) which are the inputs directly sourced by ActewAGL in the provision of its network services.

A.1 Position

We are not satisfied that ActewAGL's proposed real material cost escalators (leading to cost increases above CPI) are arrived at on a reasonable basis, and are the best forecast possible in the circumstances.¹¹⁹ In our view, the real material cost escalation should be no real cost escalation. We have arrived at this conclusion on the basis that:

- the degree of the potential inaccuracy of commodities forecasts is such that we consider that zero per cent real cost escalation is likely to provide a more reliable estimation for the price of input materials used by ActewAGL to provide network services
- ActewAGL has not provided sufficient evidence to support how accurately materials escalation forecasts reasonably reflect changes in prices paid by ActewAGL for physical assets in the past and by which we can assess the reliability and accuracy of its capex forecast model. Without this supporting evidence, it is difficult to assess the accuracy and reliability of ActewAGL's capex forecast model as a predictor of the prices of the assets used by ActewAGL to provide network services, and
- ActewAGL did not provide any supporting evidence to show that it has considered whether there may be some material exogenous factors that impact on the cost of physical inputs that are not captured by the capex forecast model used by ActewAGL.

Our approach to real materials cost escalation discussed above does not affect the proposed application of labour escalators by ActewAGL which apply to its capital expenditure. We consider that labour cost escalation as proposed by ActewAGL is likely to more reasonably reflect a realistic expectation of the cost inputs required to achieve the capex criteria given these are direct inputs into the cost of providing network services.¹²⁰

¹¹⁹ NGR, cl. 74(2).

¹²⁰ NGR, cl. 79.

A.2 ActewAGL's proposal

ActewAGL applied material and labour cost escalators to various asset classes in forecasting its capex for the 2015–20 period.¹²¹ Real cost escalation indices for the following material cost drivers were calculated for ActewAGL by BIS Shrapnel¹²²:

- aluminium
- brass
- plastic
- steel
- copper
- zinc
- concrete
- gas and fuel construction price index, and
- general materials prices.

BIS Shrapnel commodity forecasts are converted into Australian dollars using its own in-house methodology based on three key drivers; commodity price forecasts, interest rate differentials between Australia and the United States and the VIX volatility index.¹²³

Table 6.8 outlines the real input materials escalation forecasts provided to ActewAGL by BIS Shrapnel.

¹²¹ ActewAGL, *2016–20 Access Arrangement Information Attachment 6: Capital expenditure*, June 2015, p. 40.

¹²² ActewAGL, *Access Arrangement Proposal, Appendix 5.03 BIS Shrapnel - Real labour and material cost escalation forecasts to 2020–21*, February 2015.

¹²³ ActewAGL, *2016–20 Access Arrangement Information Attachment 6: Capital expenditure*, June 2015, pp. 5–7.

Table 6.8 BIS Shrapnel real materials cost escalation forecast—inputs (per cent)

	2016–17	2017–18	2018–19	2019–20	2020–21
Aluminium	1.9	5.1	3.7	-11.0	-4.8
Brass	0.5	2.9	2.0	-12.0	-6.0
Steel	-1.3	3.7	3.7	-11.1	-3.9
Copper	0.6	3.6	1.9	-12.4	-5.9
Plastic	1.4	4.2	3.1	-7.6	-3.5
Concrete	2.6	-0.7	-2.0	-1.3	0.5
Zinc	0.3	1.8	2.2	-11.4	-6.0
Gas and fuel construction price index	-2.3	0.5	0.8	0.9	1.2
General materials prices	0.0	0.0	0.0	0.0	0.0

Source: ActewAGL, Access Arrangement Proposal, Appendix 5.03 BIS Shrapnel - Real labour and material cost escalation forecasts to 2020–21, February 2015, p. 43.

ActewAGL stated that for each average unit rate and the Construction Management Fee it estimated the proportion of labour and materials, and that these weights were then applied to escalate each unit rate to account for price changes. ActewAGL also stated that these escalators are used to predict the price changes to expenditure categories that are inputs to its capital expenditure, which mostly consists of specialised labour to install mains, connections of meters and station construction in addition to the cost of materials used to produce inputs such as a length of steel main.¹²⁴

A.3 Assessment approach

In determining whether real cost escalators would be applied by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services,¹²⁵ the approach we have applied in this draft decision is the same as that which we apply in electricity distribution and transmission determinations. In particular, the views expressed in our Expenditure Forecast Assessment Guideline (Expenditure Guideline) in respect to assessing the input price modelling approach to forecast materials cost are relevant.¹²⁶

¹²⁴ ActewAGL, *2016–20 Access Arrangement Information Attachment 6: Capital expenditure*, June 2015, p. 40.

¹²⁵ NGR, cl. 79(1)(a).

¹²⁶ AER, *Better Regulation - Explanatory Statement Expenditure Forecast Assessment Guideline*, November 2013, pp. 50–51.

In this regard the Expenditure Guideline is also relevant in our assessment of proposed expenditure by gas service providers.

In the Expenditure Guideline we stated that we had seen limited evidence to demonstrate that the commodity input weightings used by service providers to generate a forecast of the cost of material inputs have produced unbiased forecasts of the costs the service providers paid for manufactured materials.¹²⁷ We considered it important that such evidence be provided because the changes in the prices of manufactured materials are not solely influenced by the changes in the raw materials that are used.¹²⁸ Subsequently, the price of manufactured network materials may not be well correlated with raw material input costs. We expect service providers to demonstrate that their proposed approach to forecast manufactured material cost changes is likely to reasonably reflect changes in raw material input costs.

In our assessment of material cost escalation, we:

- reviewed the BIS Shrapnel report commissioned by ActewAGL¹²⁹
- reviewed the cost escalation model used by ActewAGL and
- reviewed the approach to forecasting manufactured material costs in the context of gas service providers mitigating such costs and producing unbiased forecasts.

A.4 Reasons

We must be satisfied that a forecast is based on a sound and robust methodology in order to accept that ActewAGL's proposed total capex is conforming capex that complies with rule 79, is arrived at on a reasonable basis, and are the best forecast possible in the circumstances.¹³⁰ In making our assessment, we recognise that predicting future materials costs for gas service providers involves a degree of uncertainty. However, for the reasons set out below, we are not satisfied that the materials forecasts proposed by ActewAGL satisfy the requirements of the NGR. Accordingly, we have not accepted it as part of our substitute estimate in our draft decision on total forecast capex. We are satisfied that applying a zero per cent real cost escalation is reasonably likely to result in conforming capex that complies with rule 79.

Materials input cost model

ActewAGL's capex forecast model does not demonstrate how and to what extent material inputs have affected the cost of inputs such as gas mains and meters. In particular, there is no supporting evidence to substantiate how accurately ActewAGL's

¹²⁷ AER, *Better Regulation - Explanatory Statement Expenditure Forecast Assessment Guideline*, November 2013, p. 50.

¹²⁸ AER, *Better Regulation - Explanatory Statement Expenditure Forecast Assessment Guideline*, November 2013, p. 50.

¹²⁹ BIS Shrapnel, *Real labour and material cost escalation forecasts to 2020–21*, February 2015.

¹³⁰ NGR, cl. 74(2).

materials escalation forecasts reasonably reflected changes in prices they paid for assets in the past to assess the reliability of forecast materials prices.

In our Expenditure Guideline, we requested service providers demonstrate that their proposed approach to forecast materials cost changes reasonably reflected the change in prices they paid for physical inputs in the past. ActewAGL's proposal does not include supporting data or information which demonstrates movements or interlinkages between changes in the input prices of commodities and the prices ActewAGL paid for physical inputs. ActewAGL's capex forecast model assumes a weighting of commodity inputs for each asset class but does not provide information which explains the basis for the weightings or that the weightings applied have produced unbiased forecasts of the costs of ActewAGL's assets. For these reasons, there is no basis on which we can conclude that the forecasts are reliable. In summary, ActewAGL has not demonstrated that their proposed approach to forecast materials cost changes reasonably reflects the change in prices they paid for assets in the past.

Materials input cost model forecasting

ActewAGL has used its consultant's report to estimate cost escalation factors in order to assist in forecasting future operating and capital expenditure. These cost escalation factors include commodity inputs in the case of capital expenditure. The consultant has adopted a high level approach hypothesising a relationship between these commodity inputs and the physical assets purchased by ActewAGL. Neither the consultant's report nor ActewAGL have successfully attempted to explain or quantify this relationship, particularly in respect to movements in the prices between the commodity inputs and the physical assets and the derivation of commodity input weightings for each asset class.

We recognise that active trading or futures markets to forecast prices of assets such as pipes and meters are not available and that in order to forecast the prices of these assets a proxy forecasting method needs to be adopted. Nonetheless, that forecasting method must be reasonably reliable to estimate the prices of inputs used by service providers to provide network services. ActewAGL has not provided any supporting information that indicates whether the forecasts have taken into account any material exogenous factors which may impact on the reliability of material input costs. Such factors may include changes in technologies which affect the weighting of commodity inputs, suppliers of the physical assets changing their sourcing for the commodity inputs, and the general volatility of exchange rates.

Materials input cost mitigation

We consider that there is potential for ActewAGL to mitigate the magnitude of any overall input cost increases. This could be achieved by:

- potential commodity input substitution by the gas service provider and the supplier of the inputs. An increase in the price of one commodity input may result in input substitution to an appropriate level providing there are no technically fixed proportions between the inputs. Although there will likely be an increase in the cost of production for a given output level, the overall cost increase will be less than the

weighted sum of the input cost increase using the initial input share weights due to substitution of the now relatively cheaper input for this relatively expensive input.

We are aware of input substitution occurring in the electricity industry during the late 1960's when copper prices increased, potentially impacting significantly on the cost of copper cables. Electricity service provider's cable costs were mitigated as relatively cheaper aluminium cables could be substituted for copper cables. We do however recognise that the principle of input substitutability cannot be applied to all inputs, at least in the short term, because there are technologies with which some inputs are not substitutable. However, even in the short term there may be substitution possibilities between operating and capital expenditure, thereby potentially reducing the total expenditure requirements of a gas service provider.

- the substitution potential between opex and capex when the relative prices of operating and capital inputs change. For example, ActewAGL has not demonstrated whether there are any opportunities to increase the level of opex (e.g. maintenance costs) for any of its asset classes in an environment of increasing material input costs
- the scale of any operation change to the gas service provider's business that may impact on its capex requirements, including an increase in capex efficiency, and
- increases in productivity that have not been taken into account by ActewAGL in forecasting its capex requirements.

By discounting the possibility of commodity input substitution throughout the 2015–2020 period, we consider that there is potential for an upward bias in estimating material input cost escalation by maintaining the base year cost commodity share weights.

Forecasting uncertainty

The NGR requires that a gas service provider's forecast capital expenditure must be arrived at on a reasonable basis and must represent the best forecast or estimate possible in the circumstances.¹³¹ We consider that there is likely to be significant uncertainty in forecasting commodity input price movements. The following factors have assisted us in forming this view:

- recent studies which show that forecasts of crude oil spot prices based on futures prices do not provide a significant improvement compared to a 'no-change' forecast for most forecast horizons, and sometimes perform worse¹³²

¹³¹ NGR, cl. 74(2).

¹³² R. Alquist, L. Kilian, R. Vigfusson, *Forecasting the Price of Oil*, Board of Governors of the Federal Reserve System, International Finance Discussion Papers, Number 1022, July 2011 (also published as Alquist, Ron, Lutz Kilian, and Robert J. Vigfusson, 2013, *Forecasting the Price of Oil*, in *Handbook of Economic Forecasting*, Vol. 2, ed. by Graham Elliott and Allan Timmermann (Amsterdam: North Holland), pp. 68–69 and pp. 427–508) and International Monetary Fund, *World Economic Outlook — Recovery Strengthens, Remains Uneven*, Washington, April 2014, pp. 25–31.

- evidence in the economic literature on the usefulness of commodities futures prices in forecasting spot prices is somewhat mixed. Only for some commodities and for some forecast horizons do futures prices perform better than ‘no change’ forecasts;¹³³ and
- the difficulty in forecasting nominal exchange rates (used to convert most materials which are priced in \$US to \$AUS). A review of the economic literature of exchange rate forecast models suggests a “no change” forecasting approach may be preferable to the forward exchange rate produced by these forecasting models.¹³⁴

Strategic contracts with suppliers

We consider that gas service providers can mitigate the risks associated with changes in material input costs by including hedging strategies or price escalation provisions in their contracts with suppliers of inputs (e.g. by including fixed prices in long term contracts). We also consider there is the potential for double counting where contract prices reflect this allocation of risk from the gas service provider to the supplier, where a real escalation is then factored into forecast capex. In considering the substitution possibilities between operating and capital expenditure, we note that it is open to a gas service provider to mitigate the potential impact of escalating contract prices by transferring this risk, where possible, to its operating expenditure.

Cost based price increases

Allowing individual material input costs that constitute cost escalation reflects more cost based price increases. We consider this cost based approach reduces the incentives for gas service providers to manage their capex efficiently, and may instead incentivise gas service providers to over forecast their capex. This is not consistent with the revenue and pricing principles in the NGL in respect of promoting efficient investment.¹³⁵ It is also not consistent with the requirements of the NGL in respect of incentives.¹³⁶

¹³³ International Monetary Fund, *World Economic Outlook — Recovery Strengthens, Remains Uneven*, Washington, April 2014, p. 27, Chinn, Menzie D., and Olivier Coibion, *The Predictive Content of Commodity Futures*, Journal of Futures Markets, 2014, Volume 34, Issue 7, p. 19 and pp. 607–636 and T. Reeve, R. Vigfusson, *Evaluating the Forecasting Performance of Commodity Futures Prices*, Board of Governors of the Federal Reserve System, International Finance Discussion Papers, Number 1025, August 2011, pp. 1 and 10.

¹³⁴ R. Meese, K. Rogoff, (1983), *Empirical exchange rate models of the seventies: do they fit out of sample?*, Journal of International Economics, 14, B. Rossi, (2013), *Exchange rate predictability*, Journal of Economic Literature, 51(4), E. Fama, (1984), *Forward and spot exchange rates*, Journal of Monetary Economics, 14, K. Froot and R. Thaler, (1990), *Anomalies: Foreign exchange*, the Journal of Economic Perspectives, Vol. 4, No. 3, CEG, *Escalation factors affecting expenditure forecasts*, December 2013, and BIS Shrapnel, *Real labour and material cost escalation forecasts to 2019/20, Australia and New South Wales*, Final report, April 2014.

¹³⁵ NGL, Division 2, cl. 24.

¹³⁶ NGL, Division 2, cl. 24(3).

Selection of commodity inputs

The limited number of material inputs included in ActewAGL's capex forecast model may not be representative of the full set of inputs or input choices impacting on changes in the prices of assets purchased by ActewAGL. ActewAGL's capex forecast model may also be biased to the extent that it may include a selective subset of commodities that are forecast to increase in price during the 2016–21 access arrangement period.

Commodities boom

The relevance of material input cost escalation post the 2009 commodities boom experienced in Australia when material input cost escalators were included in determining approved capex for energy service providers. We consider that the impact of the commodities boom has subsided and as a consequence the justification for incorporating material cost escalation in determining forecast capex has also diminished.

A.5 Review of independent expert's reports

We have reviewed the BIS Shrapnel report commissioned by ActewAGL. We consider that this review, along with our review of two other reports detailed below, provides further support for our position to not accept ActewAGL's proposed materials cost escalation.

BIS Shrapnel report

- BIS Shrapnel has forecast prices of gas service provider related materials to increase, in part due to movements in the exchange rate. BIS Shrapnel are forecasting the Australian dollar to stabilise around US\$0.75 over 2015–16 and to attain around US\$0.70 during 2018–19¹³⁷. This is significantly lower than the exchange rate forecasts by Sinclair Knights Merz (SKM) of between US\$0.91 to US\$0.85 from 2014–15 to 2018–19.¹³⁸ In a report for Jemena Gas Networks in New South Wales, BIS Shrapnel stated that there is a lack of authoritative long term exchange rate forecasts.¹³⁹

We consider the forecasting of foreign exchange movements during the next access arrangement period to be another example of the potential inaccuracy of modelling for material input cost escalation.

- In its forecast for general materials such as stationary, office furniture, electricity, water, fuel and rent, BIS Shrapnel assumed that across the range of these items, the average price increase would be similar to consumer price inflation and that the

¹³⁷ BIS Shrapnel, *Real labour and material cost escalation forecasts to 2020–21*, February 2015, p. 6.

¹³⁸ SKM, *TransGrid Commodity Price Escalation Forecast 2013/14 – 2018/19*, 9 December 2013, p. 10.

¹³⁹ BIS Shrapnel, *Real labour and material cost escalation forecasts to 2020–21*, February 2015, p. A-9.

appropriate cost escalator for general materials is the CPI.¹⁴⁰ This treatment of general business inputs supports our view that where we cannot be satisfied that a forecast of real cost escalation for a specific material input is robust, and cannot determine a robust alternative forecast, CPI is a reasonable estimate of growth for a broad range of input prices.

In addition to our review of the BIS Shrapnel report, we have also received submissions from energy service providers on other revenue determinations that we have recently undertaken.¹⁴¹ We have considered the relevance of those submissions to the issues raised by ActewAGL in order to arrive at a position that takes into account all available information. Our views on these reports are set out below. Overall, these reports lend further support to our position to not accept ActewAGL's proposed materials cost escalation.

Competition Economists Group (CEG) report

- CEG acknowledge that forecasts of general cost movements (e.g. CPI or producer price index) can be used to derive changes in the cost of other inputs used by electricity service providers or their suppliers separate from material inputs (e.g. energy costs and equipment leases etc.).¹⁴² This is consistent with the Post-tax Revenue Model (PTRM) which reflects at least in part movements in an electricity service provider's intermediary input costs.
- CEG acknowledge that futures prices will be very unlikely to exactly predict future spot prices given that all manner of unexpected events can occur.¹⁴³ This is consistent with our view that there are likely to be a significant number of material exogenous factors that impact on the price of assets that are not captured by the capex forecast model used by ActewAGL.
- CEG provide the following quote from the International Monetary Fund (IMF) in respect of futures markets:¹⁴⁴

While futures prices are not accurate predictors of future spot prices, they nevertheless reflect current beliefs of market participants about forthcoming price developments.

This supports our view that there is a reasonable degree of uncertainty in the modelling of material input cost escalators to reliably and accurately estimate the prices of assets used by NSPs to provide network services. Whilst the IMF may conclude that commodity futures prices reflect market beliefs on future prices, there

¹⁴⁰ BIS Shrapnel, *Real labour and material cost escalation forecasts to 2020–21*, February 2015, .p. 52.

¹⁴¹ These revenue determinations include networks in New South Wales/ACT (ActewAGL, Ausgrid, Endeavour Energy, Essential Energy and TransGrid), Queensland (Energex and Ergon Energy) and South Australia (SA Power Networks).

¹⁴² CEG, *Escalation factors affecting expenditure forecasts*, December 2013, p. 3.

¹⁴³ CEG, *Escalation factors affecting expenditure forecasts*, December 2013, pp. 4–5.

¹⁴⁴ CEG, *Escalation factors affecting expenditure forecasts*, December 2013, p. 5.

is no support from the IMF that futures prices provide an accurate predictor of future commodity prices.

- Figures 1 and 2 of CEG's report respectively show the variance between aluminium and copper prices predicted by the London Metals Exchange (LME) 3 month, 15 month and 27 month futures less actual prices between July 1993 and December 2013.¹⁴⁵ Analysis of this data shows that the longer the futures projection period, the less accurate are LME futures in predicting actual commodity prices. Given the next access arrangement period covers a time span of 60 months we consider it reasonable to question the degree of accuracy of forecast futures commodity prices towards the end of this period.

Figures 1 and 2 also show that futures forecasts have a greater tendency towards over-estimating of actual aluminium and copper prices over the 20 year period (particularly for aluminium). The greatest forecast over-estimate variance was about 100 per cent for aluminium and 130 per cent for copper. In contrast, the greatest forecast under-estimate variance was about 44 per cent for aluminium and 70 per cent for copper.

- In respect of forecasting electricity service providers future costs, CEG stated that:¹⁴⁶

There is always a high degree of uncertainty associated with predicting the future. Although we consider that we have obtained the best possible estimates of the NSPs' future costs at the present time, the actual magnitude of these costs at the time that they are incurred may well be considerably higher or lower than we have estimated in this report. This is a reflection of the fact that while futures prices and forecasts today may well be a very precise estimate of current expectations of the future, they are at best an imprecise estimate of future values.

This statement again is consistent with our view about the degree of the precision and accuracy of futures prices in respect of predicting electricity service providers future input costs. CEG also highlights the (poor) predictive value of LME futures for actual aluminium prices.¹⁴⁷

- CEG also acknowledge that its escalation of aluminium prices are not necessarily the prices paid for aluminium equipment by manufacturers. As an example, CEG referred to producers of electrical cable who purchase fabricated aluminium which has gone through further stages of production than the refined aluminium that is traded on the LME. CEG also stated that aluminium prices can be expected to be influenced by refined aluminium prices but these prices cannot be expected to move together in a 'one-for-one' relationship.¹⁴⁸

GEG provided similar views for copper and steel futures. For copper, CEG stated that the prices quoted for copper are prices traded on the LME that meet the

¹⁴⁵ CEG, *Escalation factors affecting expenditure forecasts*, December 2013, pp. 5–6.

¹⁴⁶ CEG, *Escalation factors affecting expenditure forecasts*, December 2013, p. 13.

¹⁴⁷ CEG, *Escalation factors affecting expenditure forecasts*, December 2013, p. 5.

¹⁴⁸ CEG, *Escalation factors affecting expenditure forecasts*, December 2013, p. 19.

specifications of the LME but that there is not necessarily a 'one-for-one' relationship between these prices and the price paid for copper equipment by manufacturers.¹⁴⁹ For steel futures, CEG stated that the steel used by electricity service providers has been fabricated, and as such, embodies labour, capital and other inputs (e.g. energy) and acknowledges that there is not necessarily a 'one-for-one' relationship between the mill gate steel and the steel used by electricity service providers.¹⁵⁰

These statements by CEG support our view that the capex forecast model used by ActewAGL has not demonstrated how and to what extent material inputs have affected the cost of intermediate outputs. We note, as emphasised by CEG, there is likely to be significant value adding and processing of the raw material before the physical asset is purchased by ActewAGL.

- CEG has provided data on historical indexed aluminium, copper, steel and crude oil actual (real) prices from July 2005 to December 2013 as well as forecast real prices from January 2014 to January 2021 which were used to determine its forecast escalation factors.¹⁵¹ For all four commodities, the CEG forecast indexed real prices showed a trend of higher prices compared to the historical trend. Aluminium and crude oil exhibited the greatest trend variance. Copper and steel prices were forecast to remain relatively stable whilst aluminium and crude oil prices were forecast to rise significantly compared to the historical trend.

SKM report

- SKM caution that there are a variety of factors that could cause business conditions and results to differ materially from what is contained in its forward looking statements.¹⁵² This is consistent with our view that there are likely to be a significant number of material exogenous factors that impact on the cost of assets that are not captured by ActewAGL's capex forecast model.
- SKM stated it used the Australian CPI to account for those materials or cost items for equipment whose price trend cannot be rationally or conclusively explained by the movement of commodities prices.¹⁵³
- In its modelling of the exchange rate, SKM has in part adopted the longer term historical average of \$0.80 USD/AUD as the long term forecast going forward.¹⁵⁴ This is consistent with our view that longer term historical commodity prices should be considered when reviewing and forecasting future prices. In general, we consider that long term historical data has a greater number of observations and as a consequence is a more reliable predictor of future prices than a data time series of fewer observations.

¹⁴⁹ CEG, *Escalation factors affecting expenditure forecasts*, December 2013, p. 19.

¹⁵⁰ CEG, *Escalation factors affecting expenditure forecasts*, December 2013, p. 23.

¹⁵¹ CEG, *Escalation factors affecting expenditure forecasts*, December 2013, Figures 3, 4 and 5, pp. 23, 25 and 28.

¹⁵² SKM, *TransGrid Commodity Price Escalation Forecast 2013/14 – 2018/19*, 9 December 2013, p. 4.

¹⁵³ SKM, *TransGrid Commodity Price Escalation Forecast 2013/14 – 2018/19*, 9 December 2013, p. 8.

¹⁵⁴ SKM, *TransGrid Commodity Price Escalation Forecast 2013/14 – 2018/19*, 9 December 2013, p. 9.

- SKM stated that the future price position from the LME futures contracts for copper and aluminium are only available for three years out to December 2016 and that in order to estimate prices beyond this data point, it is necessary to revert to economic forecasts as the most robust source of future price expectations.¹⁵⁵ SKM also stated that LME steel futures are still not yet sufficiently liquid to provide a robust price outlook.¹⁵⁶
- SKM stated that in respect to the reliability of oil future contracts as a predictor of actual oil prices, futures markets solely are not a reliable predictor or robust foundation for future price forecasts. SKM also stated that future oil contracts tend to follow the current spot price up and down, with a curve upwards or downwards reflecting current (short term) market sentiment.¹⁵⁷ SKM selected Consensus Economics forecasts as the best currently available outlook for oil prices throughout the duration of the next access arrangement period.¹⁵⁸ The decision by SKM to adopt an economic forecast for oil rather than using futures highlights the uncertainty surrounding the forecasting of commodity prices.

Comparison of independent expert's cost escalation factors

To illustrate the potential uncertainty in forecasting real material input costs, we have compared the material cost escalation forecasts derived by the consultants as shown Table 6.9.

Table 6.9 Real material input cost escalation forecasts (per cent)

	2014–15 (%)	2015–16 (%)	2016–17 (%)	2017–18 (%)	2018–19 (%)
Aluminium					
<i>CEG</i>	4.2	5.8	5.0	4.2	3.6
<i>SKM</i>	4.69	4.88	3.09	4.42	2.97
<i>BIS Shrapnel</i>	13.3	16.6	1.9	5.1	3.7
<i>Range (low to high)</i>	4.2 to 13.3	4.88 to 16.6	1.9 to 5.0	4.2 to 5.1	2.97 to 3.7
Copper					
<i>CEG</i>	-0.9	1.1	0.3	-0.3	-0.7
<i>SKM</i>	-0.17	0.17	-1.15	-0.16	-1.45
<i>BIS Shrapnel</i>					

¹⁵⁵ SKM, *TransGrid Commodity Price Escalation Forecast 2013/14 – 2018/19*, 9 December 2013, p. 12.

¹⁵⁶ SKM, *TransGrid Commodity Price Escalation Forecast 2013/14 – 2018/19*, 9 December 2013, p. 16.

¹⁵⁷ SKM, *TransGrid Commodity Price Escalation Forecast 2013/14 – 2018/19*, 9 December 2013, p. 18.

¹⁵⁸ SKM, *TransGrid Commodity Price Escalation Forecast 2013/14 – 2018/19*, 9 December 2013, p. 20.

	2014–15 (%)	2015–16 (%)	2016–17 (%)	2017–18 (%)	2018–19 (%)
<i>Range (low to high)</i>	3.5 -0.9 to 3.5	9.6 0.17 to 9.6	0.6 -1.15 to 0.6	3.6 -0.3 to 3.6	1.9 -1.45 to 1.9
Steel					
<i>CEG</i>	0.6	3.2	0.6	0.3	-0.1
<i>SKM</i>	2.84	2.45	-0.35	0.38	-1.11
<i>BIS Shrapnel¹</i>	2.1	9.2	-1.3	3.7	3.7
<i>Range (low to high)</i>	0.6 to 2.1	2.45 to 9.2	-1.3 to 0.6	0.3 to 3.7	-1.11 to 3.7
Oil					
<i>CEG</i>	-0.5	2.8	2.6	2.1	1.8
<i>SKM</i>	-5.11	-0.79	0.74	1.85	0.51
<i>BIS Shrapnel²</i>	-9.0	0.2	1.4	4.2	3.1
<i>Range (low to high)</i>	-9.0 to -0.5	-0.79 to 2.8	0.74 to 2.6	1.85 to 4.2	0.51 to 3.1

Source: CEG, Escalation factors affecting expenditure forecasts, December 2013, pp. 21, 24 and 27, SKM, TransGrid Commodity Price Escalation Forecast 2013/14 - 2018/19, 9 December 2013, p. 2 and BIS Shrapnel, Real labour and material cost escalation forecasts to 2020–21, February 2015, p. iv.

Note: Asian market price as BIS Shrapnel believes the Asia market is more appropriate.¹⁵⁹
 BIS Shrapnel have forecast plastics prices based on price changes in Nylon-11 and HDPE (Polyethylene). BIS Shrapnel state that Castor Oil is the key raw material of Nylon-11 and because it does not have any historical data on Castor Oil, it has approximated Nylon-11 by using HDPE growth rates. HDPE (Polyethylene) prices are proxied by BIS Shrapnel using Manufacturing Wages, General Materials, and Thermoplastic Resin prices. BIS Shrapnel state that Thermoplastic Resin is primarily driven by Crude Oil.¹⁶⁰

As Table 6.9 shows, there is considerable variation between the consultant's commodities escalation forecasts. The greatest margin of variation is 11.7 per cent for aluminium in 2015–16, where CEG has forecast a real price increase of 4.88 per cent and BIS Shrapnel a real price increase of 16.6 per cent. BIS Shrapnel's forecasts exhibit the greatest margin of variation but there also considerable variation between CEG and SKM's forecasts. These forecast divergences between consultants further demonstrate the uncertainty in the modelling of material input cost escalators to reliably and accurately estimate the prices of intermediate outputs used by service

¹⁵⁹ BIS Shrapnel, *Real labour and material cost escalation forecasts to 2020–21*, February 2015, p. 44.

¹⁶⁰ BIS Shrapnel, *Real labour and material cost escalation forecasts to 2020–21*, February 2015, p. iv.

providers to provide network services. This supports our view that ActewAGL's forecast real material cost escalators are not arrived at on a reasonable basis, and are not the best forecast possible in the circumstances¹⁶¹ and do not meet the capital expenditure criteria.¹⁶²

A.6 Conclusions on materials cost escalation

We are not satisfied that ActewAGL has demonstrated that the weightings applied to the intermediate inputs have produced unbiased forecasts of the movement in the prices it expects to pay for its physical assets. In particular, ActewAGL has not provided sufficient evidence to show that the changes in the prices of the assets they purchase are highly correlated to changes in raw material inputs.

The consultant's reports to the energy service providers identified a number of factors which are consistent with our view that ActewAGL's capex forecast model has not demonstrated how and to what extent material inputs are likely to affect the cost of intermediate outputs. BIS Shrapnel assumed that for general materials such as stationary, office furniture, electricity, water, fuel and rent the average price increase would be similar to consumer price inflation and that the appropriate cost escalator for general materials is the CPI.¹⁶³ CEG in its report stated that futures prices are unlikely to exactly predict future spot prices given that all manner of unexpected events can occur.¹⁶⁴ CEG also stated that while futures prices and forecasts today may well be a very precise estimate of current expectations of the future, they are at best an imprecise estimate of future values.¹⁶⁵ BIS Shrapnel also stated that there is a lack of authoritative long term exchange rate forecasts.¹⁶⁶

Recent reviews of commodity price movements show mixed results for commodity price forecasts based on futures prices. Further, nominal exchange rates are in general extremely difficult to forecast and based on the economic literature of a review of exchange rate forecast models, a "no change" forecasting approach may be preferable.

It is our view that where we are not satisfied that a forecast of real cost escalation for materials is robust, and we cannot determine a robust alternative forecast, then real cost escalation over and above CPI should not be applied in determining a service provider's required capital expenditure. We accept that there is uncertainty in estimating real cost changes but we consider the degree of the potential inaccuracy of commodities forecasts is such that there should be no escalation for the price of input materials used by ActewAGL to provide network services.

¹⁶¹ NGR, r. 74(2).

¹⁶² NGR, r. 79(1).

¹⁶³ BIS Shrapnel, *Real labour and material cost escalation forecasts to 2020–21*, February 2015, p. 52.

¹⁶⁴ CEG, *Escalation factors affecting expenditure forecasts*, December 2013, pp. 4–5.

¹⁶⁵ CEG, *Escalation factors affecting expenditure forecasts*, December 2013, p. 13.

¹⁶⁶ BIS Shrapnel, *Real labour and material cost escalation forecasts to 2020–21*, February 2015, p. A-9.

In previous AER decisions, namely our Final Decisions for Australian Gas Network's (AGN) Queensland and South Australian gas networks, we took a similar approach. This was on the basis that as all of AGN's real costs are escalated annually by CPI under its tariff variation mechanism, CPI must inform the AER's underlying assumptions about AGN's overall input costs. Consistent with this, we applied zero real cost escalation and by default AGN's input costs were escalated by CPI in the absence of a viable and robust alternative. Likewise, for ActewAGL we consider that in the absence of a well-founded materials cost escalation forecast, escalating real costs annually by the CPI is the better alternative that will contribute to a total forecast capex that reasonably reflects the capex criteria.

The CPI can be used to account for the cost items for equipment whose price trend cannot be conclusively explained by the movement of commodities prices. This approach is consistent with the revenue and pricing principles of the NGL which provide that a regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs it incurs in providing direct control network services.¹⁶⁷

A.7 Labour escalators

Our approach to real materials cost escalation does not affect the application of labour cost escalators, which will continue to apply to reference services capital and operating expenditure.

We consider that labour cost escalation more reasonably reflects a realistic expectation of the cost inputs required to achieve the capex objectives.¹⁶⁸ We consider that real labour cost escalators can be more reliably and robustly forecast than material input cost escalators, in part because these are not intermediate inputs and productivity improvements have been factored into the analysis (refer to the opex attachment).

Further details on our consideration of labour cost escalators are discussed in Attachment 7 of this decision.

¹⁶⁷ NGL, Division 2, s. 24(2).

¹⁶⁸ NGR, r. 79(1).

B Unit rate model - data reporting and reconciliation issues with the access arrangement RIN

We identified reconciliation issues between the historical volumes of services/mains/meters applied in the unit rate model compared with the access arrangement RIN. We requested that ActewAGL reconcile the volume differences.¹⁶⁹

Table 6.10 Difference between service numbers in access arrangement RIN and unit rate model

Connection type	WBS accounting code prefix	FY11	FY12	FY13	FY14	Total
Services E-G	400	60%	16%	2%	0%	20%
Services New Homes	401	-4%	-3%	-1%	-1%	-2%
Services I&C	403	239%	45%	34%	-15%	64%
Services MD/HR	404	-62%	-1%	10%	69%	1%

Source: AER analysis.

Table 6.11 Difference between mains numbers in access arrangement RIN and unit rate model

Connection type	WBS accounting code prefix	FY11	FY12	FY13	FY14	Total
Mains E-G	406	478%	-94%	28%	-41%	6%
Mains New Homes	407	-1%	1%	26%	-3%	3%
Mains I&C	409	159%	-46%	-79%	-52%	38%
Mains MD/HR	410	-63%	47%	664%	206%	220%

Source: AER analysis.

¹⁶⁹ AER, *AER Information request - AER ActewAGL 004 - Connections - unit rate model - Part 3*, 14 July 2015, question 2.

Table 6.12 Difference between meters numbers in access arrangement RIN and unit rate model

		FY11	FY12	FY13	FY14	Total
Mains E-G	400	44%	6%	1%	2%	12%
Mains New Homes	401	-8%	-3%	1%	1%	-2%
Mains I&C	403	-21%	-3%	0%	3%	-5%
Mains MD/HR	404	44%	0%	19%	4%	13%

Source: AER analysis.

ActewAGL resubmitted its access arrangement RIN and unit rate model and stated that the errors were minor and attributable to:¹⁷⁰

- incorrect reporting
- inadvertent transposition
- different data sets being used for the purposes of completing the access arrangement RIN (billing data from JAM's SAP system) and the unit rate model (operational data from JAM's GASS system)
- exclusion of some data due to work codes no longer being valid.

We do not consider the data errors to be minor. We consider that data from the same data set should be used to populate the access arrangement RIN and the unit rate model. This is to ensure consistency of both volumes and expenditure. We do not consider that data should be excluded because of a change in where data is captured within the accounting system.

There were still material reconciliation issues between ActewAGL's resubmitted access arrangement RIN and the unit rate model (see Table 6.13, Table 6.14 and Table 6.15).

¹⁷⁰ ActewAGL, *ActewAGL Distribution response to various information requests*, 31 July 2015, response 1, 2.3, 2.4, 2.5 and 2.6.

Table 6.13 Difference between service numbers in the resubmitted access arrangement RIN and unit rate model

Connection type	WBS accounting code prefix	FY11	FY12	FY13	FY14	Total
Services E-G	400	33%	16%	2%	0%	13%
Services New Homes	401	-1%	-3%	-1%	-1%	-1%
Services I&C	403	50%	45%	56%	36%	46%
Services MD/HR	404	-11%	-1%	-6%	6%	-3%

Source: AER analysis.

Table 6.14 Difference between mains numbers in the resubmitted access arrangement RIN and unit rate model

Connection type	WBS accounting code prefix	FY11	FY12	FY13	FY14	Total
Mains E-G	406	379%	-94%	28%	-41%	-3%
Mains New Homes	407	2%	1%	26%	-3%	4%
Mains I&C	409	14%	-7%	25%	47%	19%
Mains MD/HR	410	-16%	-15%	29%	1%	0%

Source: AER analysis.

Table 6.15 Difference between meters numbers in the resubmitted access arrangement RIN and unit rate model

		FY11	FY12	FY13	FY14	Total
Mains E-G	400	19%	6%	2%	3%	7%
Mains New Homes	401	-5%	-3%	1%	1%	-2%
Mains I&C	403	-39%	0%	19%	4%	2%
Mains MD/HR	404	48%	-3%	0%	3%	12%

Source: AER analysis.

There are also coding errors in ActewAGL's unit rate model.

ActewAGL also included meters with a reason installed descriptor of 'government test'. In response to our request to explain the meter inclusions, ActewAGL responded that it

tests meters at the request of customers and replaces meters where they fail.¹⁷¹ Replacement of failed meters is captured within the meter renewal and upgrade capex category. To include it in connections capex would be double counting so we removed them.

We consider that these data reconciliation issues should be resolved and the access arrangement RIN and unit rate models resubmitted in ActewAGL's revised proposal.

¹⁷¹ ActewAGL, *ActewAGL Distribution response to AER ActewAGL 002 Connections unit rate model part 2*, 20 July 2015, question 7, p. 3.

C Confidential appendix