



FINAL DECISION
ActewAGL Distribution
Access Arrangement
2016 to 2021

Attachment 13 – Demand

May 2016

© Commonwealth of Australia 2016

This work is copyright. In addition to any use permitted under the Copyright Act 1968, all material contained within this work is provided under a Creative Commons Attributions 3.0 Australia licence, with the exception of:

- the Commonwealth Coat of Arms
- the ACCC and AER logos
- any illustration, diagram, photograph or graphic over which the Australian Competition and Consumer Commission does not hold copyright, but which may be part of or contained within this publication. The details of the relevant licence conditions are available on the Creative Commons website, as is the full legal code for the CC BY 3.0 AU licence.

Requests and inquiries concerning reproduction and rights should be addressed to the:

Director, Corporate Communications
Australian Competition and Consumer Commission
GPO Box 4141, Canberra ACT 2601

or publishing.unit@acc.gov.au.

Inquiries about this publication should be addressed to:

Australian Energy Regulator
GPO Box 520
Melbourne Vic 3001

Tel: (03) 9290 1444

Fax: (03) 9290 1457

Email: AERInquiry@aer.gov.au

Note

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

The final 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

Attachment 11 - Reference tariff variation mechanism

Attachment 12 - Non-tariff components

Attachment 13 - Demand

Contents

Note	13-2
Contents	13-3
Shortened forms	13-4
13 Demand	13-6
13.1 Final decision	13-6
13.2 ActewAGL's revised proposal	13-8
13.3 AER's assessment approach	13-9
13.3.1 Interrelationships.....	13-10
13.4 Reasons for final decision	13-11

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
CMF	construction management fee
CPI	consumer price index
DAMS	Distribution Asset Management Services
DRP	debt risk premium
EBSS	Efficiency Benefit Sharing Scheme
ECM	Efficiency Carryover Mechanism
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

Shortened form	Extended form
PFP	partial factor productivity
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

13 Demand

This attachment sets out our assessment of ActewAGL's demand forecasts for the 2016–21 access arrangement period. Demand is an important input into the derivation of ActewAGL's reference tariffs. It also affects operating expenditure (opex) and capital expenditure (capex) linked to network growth.¹

13.1 Final decision

We are satisfied that ActewAGL's demand forecasts for Tariff V residential new connections for medium density/high rise (MD/HR) dwellings for the 2016-21 access arrangement period comply with rule 74(2) of the NGR. This is the only issue that ActewAGL did not accept in our draft decision on its demand forecasts for the 2016-21 access arrangement period.

ActewAGL accepted our draft decision on Tariff V residential and commercial consumption per connection, where our alternative forecast for all residential consumption per connection was higher than Core Energy's (ActewAGL's consultant) estimate. Our alternative forecast for all commercial consumption per connection was lower than Core Energy's estimate.²

In our draft decision, we accepted ActewAGL's Tariff D demand forecasts.³

ActewAGL revised its new connection numbers for MD/HR dwellings based on a new data set. These numbers support a 71.4 per cent⁴ gas connection rate for MD/HR dwellings over the 2016-21 access arrangement period.⁵ Our draft decision position was a gas connection rate of 36 per cent for that connection type.⁶

¹ Our final decisions on ActewAGL's capex and opex are set out in attachments 6 and 7 to this final decision.

² AER, *Draft decision for ActewAGL Distribution Access Arrangement 2016 to 2021, Attachment 13 - Demand*, November 2016.

³ AER, *Draft decision for ActewAGL Distribution Access Arrangement 2016 to 2021, Attachment 13 - Demand*, November 2016

⁴ ActewAGL's *Response to the AER's draft decision -2016-21 ACT, Queanbeyan and Palerang Gas Network Access Arrangement*, 6 January 2016 stated that it proposed 72 per cent as the gas connection rate to derive new connection forecasts for MD/HR dwellings. However, in light of the errors it identified in its revised demand model (see ActewAGL, *Response to Information request 50* [email to AER], 24 February 2016), where ActewAGL double-counted a small number of cold water meters, ActewAGL's gas connection rate for MD/HR dwellings changed to 71.4 per cent.

⁵ The gas connection rate is calculated as: Number of connections with new dwellings in the ACT, Palerang, and Queanbeyan / number of new dwellings in the ACT. This is higher than the implied gas penetration rate which is 61 per cent for MD/HR dwellings. To calculate the gas penetration rate, we applied Core Energy's approach of scaling up the new dwelling forecasts for the ACT according to the historical change in population in the three regions to obtain a dwelling forecast covering the ActewAGL network. Core Energy applied an upscaling factor of 13.7 per cent but the correct scale factor should be 17.13 per cent (to reflect that it is for the 2011-2014 period, and measured relative to the ACT region).

⁶ The implied gas penetration rate is 31 per cent.

Upon reviewing this data, as well as material provided in response to our information requests, we accept ActewAGL's demand forecasts for MD/HR new connections for the 2016–21 access arrangement period. ActewAGL forecast a total of 6265 new connections for MD/HR dwellings for the 2016–21 access arrangement period, compared to our alternative estimate in the draft decision of 3271 connections. Therefore, our final decision on new connections for MD/HR dwellings is 92 per cent higher compared to the draft decision and 29 per cent lower (8854 connections) compared to ActewAGL's forecast in its initial proposal.

Notwithstanding our acceptance of ActewAGL's revised proposal on new connections for MD/HR, we identified a number of inconsistencies with its modelling assumptions. These relate to ActewAGL's assumed forecast meter configuration for high rise dwellings and associated forecast gas consumption for this dwelling type over the 2016–21 access arrangement period. We have therefore made some modelling adjustments which increase total residential consumption and affect tariffs for most residential connection types.

Table 13.1 and Table 13.2 set out our final decision on ActewAGL's demand forecasts for the 2016-21 access arrangement period.

Table 13.1 Final decision on consumption and consumption per connection for tariff V and tariff D

	2016–17	2017–18	2018–19	2019–20	2020–21
Tariff V total consumption					
Residential	4,852,698	4,750,130	4,669,829	4,610,255	4,551,839
Commercial	1,455,376	1,438,401	1,414,171	1,403,759	1,402,929
Tariff V consumption per connection					
Existing Residential	-	-	-	-	-
New E-to-G	-	-	-	-	-
New Estates	-	-	-	-	-
New Med Density	-	-	-	-	-
Total Residential	34.84	33.39	32.15	31.05	30.06
Existing commercial	-	-	-	-	-
New commercial	-	-	-	-	-
Total commercial ^a	414	398	380	366	355
Tariff D total consumption					
MDQ	7,951	7,956	8,201	8,206	8,211
ACQ (GJ)	1,185,399	1,185,769	1,231,356	1,231,764	1,232,191

Source: AER analysis.

Notes: (a) This adjusts for tariff D movements.

Table 13.2 Final decision on total connections, new connections and disconnection numbers

	2016–17	2017–18	2018–19	2019–20	2020–21
Total connections					
Residential	139,287	142,272	145,239	148,473	151,406
Commercial	3,572	3,680	3,792	3,907	4,025
Tariff D	40	40	40	40	40
New connections					
Existing connections from FY2014	128,324	127,271	126,203	125,402	124,583
Electricity to gas ^a	700	700	700	700	700
New estates	2,080	2,043	1,992	1,992	1,802
Medium/high density	1,057	1,294	1,344	1,344	1,249
Commercial	84	126	129	132	136
Disconnections					
Residential ^b	1037	1052	1069	801	819
Commercial	17	17	17	17	17
Tariff D to tariff V movement	3	3	3	3	3
Tariff V to tariff D movement	4	4	4	4	4

Source: AER analysis; ActewAGL revised demand model, in ActewAGL, *Response to information request 50* [email to AER], 26 February 2016.

Notes: (a) This is based on an average over 2010–2014, instead of 2019–14 (used by Core Energy) to be consistent with the review period we have used for other new connection types and disconnections.
(b) Residential disconnection numbers change as disconnections are assumed to be 0.55 per cent of total connections at the beginning of the year.

13.2 ActewAGL's revised proposal

In its revised proposal, ActewAGL accepted our draft decision on Tariff V forecast connections, except for new MD/HR dwelling connections. ActewAGL has adopted a gas connection rate of 71.4 per cent based on revised historical information on its new gas connections over the 2010-11 to 2013-14 period to update its forecast new connections for MD/HR dwellings. This results in a revised overall gas connection rate for new dwellings (including new estates and MD/HR dwellings) of approximately 83.5 per cent. ActewAGL's 'implied penetration rate' for new MD/HR dwellings is 61 per cent, and for all new dwellings is 71.3 per cent.

The concept of gas connection rate differs from the 'implied penetration rate'. A gas connection rate is calculated as the number of new connections to the ActewAGL network relative to number of new dwellings in the ACT region. As the coverage of the

ActewAGL network is broader than the ACT region, the implied penetration rate takes into account connections for new dwellings across the ActewAGL network.⁷

In its initial proposal, ActewAGL proposed a gas penetration rate of 90 per cent to forecast new connections for all new dwellings as well as for each dwelling type (new MD/HR dwellings and new estates). This was not based on actual historical connections but on the total number of houses with gas divided by the total number of blocks within the ACT as at 5 September 2014.⁸ In the draft decision, we stated that this method overestimates the penetration rate given there can be several houses as well as medium density/high rise properties on a block of land.⁹

Thus, in our draft decision, we did not accept ActewAGL's new connections forecast for both new estate and MD/HR dwellings, and based our alternative connection numbers on gas connection rates of 36 per cent (implied penetration rate of 31 per cent) for new MD/HR dwellings, which gave an overall gas connection rate of 62 per cent (implied penetration rate of 53 per cent). The gas connection rate of each dwelling type was measured as the number of new connections within the ActewAGL network (which covers an area broader than the ACT) relative to the number of new dwellings in the ACT for the four years 2011 to 2014. The historical new connections and new dwelling data were sourced from RIN data in the Core Energy demand model and Housing Industry Association housing forecasts, respectively.

ActewAGL accepted our draft decision that its Tariff V forecast consumption per connection for residential and commercial customers was not the best estimate in the circumstances due to a methodological error with Core Energy's forecasting approach¹⁰.

13.3 AER's assessment approach

The NGR require the access arrangement information for a full access arrangement proposal for a distribution pipeline to include usage of the pipeline over the earlier access arrangement period showing:

- minimum, maximum and average demand; and customer numbers in total and by tariff class¹¹
- to the extent that it is practicable to forecast pipeline capacity and utilisation of pipeline capacity over the access arrangement period, a forecast of pipeline

⁷ To take account of the coverage of ActewAGL's network, in our draft decision, we applied a 15.8 per cent scaling factor, which reflects an average for five years 2010 to 2014. In our final decision, we applied a 17.13 per cent scaling factor as the average for four years starting 2011 for consistency with the historical connection data.

⁸ AER, *Information request to ActewAGL no. 16*, 31 July 2015, p. 1.

⁹ AER, *AER draft decision on ActewAGL 2016-21 access arrangement, Attachment 13 - Demand*, November 2015, p. 13-12.

¹⁰ Core Energy prepared ActewAGL's demand forecasts in its initial proposal. See ActewAGL, *Access Arrangement Information: Appendix 3.02 Core Energy demand forecast model*, July 2015.

¹¹ NGR, r. 72(1)(a)(iii).

capacity and utilisation of pipeline capacity over that period and the basis on which the forecast has been derived.¹²

The NGR also require that forecasts and estimates:¹³

- are arrived at on a reasonable basis
- represent the best forecast or estimate possible in the circumstances.

We consider that there are two important considerations in assessing whether demand forecasts are arrived at on a reasonable basis and whether they represent the best forecasts possible in the circumstances.¹⁴ These are:

- the appropriateness of the forecast methodology – this involves consideration of how the demand forecast has been developed and whether or not relevant factors have been taken into account.
- the application of the forecasting methodology – this involves consideration of the accuracy of data and assumptions on each of the input parameters.

To determine whether ActewAGL's proposed demand forecasts are arrived at on a reasonable basis and are the best possible forecasts in the circumstances, we reviewed the data used by Core Energy to implement the forecasting methodology. We also reviewed:

- information provided by ActewAGL as part of its proposed access arrangement, specifically, its consultants' report on demand forecasts, demand forecast spreadsheets, access arrangement information and responses to the regulatory information notice (RIN)
- additional information provided by ActewAGL in response to our information requests.

13.3.1 Interrelationships

We have considered the relevant interrelationships between different components of ActewAGL's access arrangement as part of our analysis.

Several interrelationships exist. These include the effect of forecast demand on the efficient amount of capex and opex and tariffs in the 2016–21 access arrangement period. In particular, the demand forecasts impact on:

- approved connections capex, given the number of new connections affects the amount of approved connections capex
- the following opex items:

¹² NGR, r. 72(1)(d).

¹³ NGR, r. 74(2).

¹⁴ NGR, r. 74(2).

- unaccounted for gas (UAFG) expenditure, which is forecast as a fixed proportion of the forecast of total throughput¹⁵
- Utilities Network Facilities Tax (UNFT) is charged on 'total service length', given ActewAGL's forecast of total services length is based on the forecast growth in customer numbers¹⁶
- Energy Industry Levy (EIL), which is based partly on forecast consumption¹⁷
- output growth rate, given the variables that constitute the opex rate of change, namely the number of total connections and the gas demand (consumption), is used to determine the change in outputs. This is an element of the rate of change which is applied to the base opex.
- tariff prices, given they depend on forecast demand (consumption) per connection. Changes in these forecasts will change tariff prices. In simple terms, tariff prices are determined by cost divided by quantity (where quantity is measured by demand per connection). This means that an increase in forecast quantity has the effect of reducing the tariff price.

13.4 Reasons for final decision

We accept ActewAGL's revised proposal on Tariff V new residential connections for medium density/high rise (MD/HR) dwellings. We are satisfied that the application of a gas connection rate of 71.4 per cent to forecast new connections for MD/HR for the 2016–21 access arrangement period would result in the best estimate in the circumstances.

Notwithstanding our acceptance of ActewAGL's revised proposal on new connections for MD/HR dwellings, we identified a number of inconsistencies with its modelling assumptions. These relate to ActewAGL's assumed forecast meter configuration for high rise dwellings and associated forecast gas consumption for this dwelling type over the 2016–21 access arrangement period. We have therefore made some modelling adjustments which increase total residential consumption and affect tariffs for most residential connection types.

Assessment of ActewAGL's revised connection numbers

Our acceptance of ActewAGL's revised connection numbers for MD/HR dwellings results in a 92 per cent increase in MD/HR connection numbers compared to our alternative estimate in the draft decision.

In our draft decision, we used RIN data in Core Energy's demand model to derive our alternative estimate, as ActewAGL indicated that the market expansion (ME) capex unit rate model could not be relied upon for forecasting purposes. In particular, we note

¹⁵ ActewAGL, *2016–21 Access Arrangement Information*, June 2015, p. 24.

¹⁶ ActewAGL, *2016–21 Access Arrangement Information*, June 2015, p. 24.

¹⁷ ActewAGL, *2016–21 Access Arrangement Information*, June 2015, p. 24.

ActewAGL's statement during our assessment of its initial proposal that "...the data in the market expansion unit rate model does not reflect the total number of historical new connections."¹⁸ Further, ActewAGL stated that "[t]he historical data from the demand forecast model [RIN data] is more appropriate for determining historical penetration rates."¹⁹ Based on the information before us, that is using RIN data from the Core Energy model, we estimated a historically revealed gas connection rate of 36 per cent for MD/HR dwellings and an overall gas connection rate for all new dwellings of 62 per cent. In coming to this position, we compared our gas connection rate estimates against those using historical data in ActewAGL's market expansion (ME) capex unit rate model, and found these to be similar.²⁰

In its revised proposal, to derive its revised forecast connection numbers for MD/HR dwellings, ActewAGL applied a historically revealed gas connection rate for MD/HR dwellings of 71.4 per cent over the 2010–11 to 2013–14 period. The historical connection numbers are contained in ActewAGL's revised ME capex unit rate model, the same model submitted in support of ActewAGL's ME capex for the 2016-21 access arrangement period.

In response to our information request, ActewAGL explained that its revised ME capex unit rate model provides a revised set of historical new connection numbers based on the number of customers connected, regardless of whether the customers are connected with a gas meter and/or a hot water meter.²¹

ActewAGL submitted that although the ME capex unit rate model submitted in its initial proposal reported historical connection numbers based on the number of gas meters, it has since identified that this does not capture high rise customers who are only connected with a hot water meter and not connected to a gas meter. ActewAGL submitted that only the high rise subset of the medium density and high rise market segment is affected since all connections in other market segments generally include a gas meter.²² The inclusion of those high rise connections with only a hot water meter connection increases its historical connections for MD/HR dwellings over 2010–11 to 2013–14 by about 49.7 per cent (from 4145 to 8244 connections).²³

In coming to our position, we liaised extensively with ActewAGL to properly understand its revised ME capex unit rate model and the underlying data and the forecast methodology it applied to derive its new connection numbers for the 2016–21 access arrangement period. With minor changes, for the following reasons, we accept ActewAGL's estimated gas connection rate of 71.4 per cent for MD/HR dwellings (implied penetration rate of 61 per cent):

¹⁸ AER, *Information request no. 33*, 23 September 2015, p. 3.

¹⁹ AER, *Information request no.33*, 23 September 2015, p. 3.

²⁰ AER, *Draft decision for ActewAGL Distribution Access Arrangement 2016 to 2021, Attachment 13 - Demand*, November 2016, pp. 13-12 to 13-13.

²¹ ActewAGL, *Response to information request 43* [email to AER], 22 January 2016, p.2.

²² ActewAGL, *Response to information request 43* [email to AER], 22 January 2016, p.2.

²³ ActewAGL, *Response to information request 43* [email to AER], 22 January 2016, p. 1.

- our review of ActewAGL's revised ME capex model did not find any double counting of customers connected with gas meter and hot water meter;
- the revised new historical connection numbers are measured in terms of delivery point identifiers (DPI) and are consistent with the measure of total customer connections reported in the annual reset RIN;
- the updated historical data addresses, to some extent, the data inconsistency concerns that we raised in our draft decision, particularly the 'unbalance/unreconciled' item for year-to-year movements in total connection numbers in the Core Energy demand model.²⁴

We have also made a minor change to Electricity to Gas (E to G) connections. ActewAGL submitted that data within the revised ME capex unit rate model has been extracted from the GASS+ system to ensure consistency with other datasets. ActewAGL acknowledges that "[t]he change in the use of invoice data to the GASS+ system also results in some small changes to other market segments."²⁵ Notably, in reviewing ActewAGL's revised demand model, the historical E to G new connection numbers are reduced from 768 to 700 per annum. We have therefore adjusted the forecasts for E to G new connections to reflect this change in the historical connection numbers for that connection type.

Inconsistencies with modelling assumptions

In reviewing ActewAGL's revised proposal, we identified a number of inconsistencies with its modelling assumptions. These relate to ActewAGL's assumed forecast meter configuration for high rise dwellings and associated forecast gas consumption for this dwelling type over the 2016–21 access arrangement period.

In reviewing the revised ME capex unit rate model, we found that for the historical period 2011 to 2014 most high rise developments are connected to hot water only and only a small number of high rise buildings have both a gas meter and hot water connection. ActewAGL agreed with this observation.²⁶ We would expect that ActewAGL would apply this historically revealed metering trend to the forecast period. Instead, ActewAGL assumes that 50 per cent of high rise buildings have a hot water only connection and 50 per cent of these buildings have a hot water and gas meter connection. In response to our information request, ActewAGL explained that the 50/50 split assumption was due to uncertainty around forecasting developers' future preferences in high rise buildings.²⁷ In particular, while the Boundary Code²⁸ may move

²⁴ AER, *Draft decision for ActewAGL Distribution Access Arrangement 2016 to 2021, Attachment 13 - Demand*, November 2016, p. 13-16.

²⁵ ActewAGL, *Response to information request 43 [email to AER]*, 22 January 2016, p.3.

²⁶ Information request no. 50, 24 February 2016, p. 3.

²⁷ ActewAGL, *Response to Information request 50 [email to AER]*, 24 February 2016, p.3.

²⁸ The Boundary Code (specifically clause 3.3.2) which applied to new industrial, commercial gas meter sets and high rise residential installations, states that 'ActewAGL's gas meter set installations, which were installed after the Gas Service & Installation Rules Code, was introduced, must be placed external to a customer's building.'

developers away from gas cooking and heating, ActewAGL's new volume-boundary reference tariff may encourage developers to connect to gas for cooking and heating. Further, given the small sample size of high rise developments in Canberra, ActewAGL cautions from drawing any inferences from four years of high rise data.²⁹ Given the uncertainty around likely high rise meter configuration in the forecast period, we accept ActewAGL's reasons to apply a 50/50 split assumption.

However, the revised historical data raises an inconsistency relating to ActewAGL's assumed reduction of 5.58GJ in residential consumption per connection in the forecast period due to Boundary Code changes. We accepted this assumption in our draft decision, based on Core Energy's argument that high rise dwellings will only have gas hot water connections due to the significantly higher cost imposed by the Boundary Code change on developers to offer gas heating and cooking connections. However, we consider that the assumption of a reduction to average consumption per connection for that connection type appears unnecessary, in light of the updated data on MD/HR connection numbers provided by ActewAGL. In particular, as noted above, most of the high rise developments covered in the historical period are connected with hot water only, and only 50 per cent of the high rise developments in the forecast period are assumed to be connected with hot water only.

Thus, for this final decision, we do not accept that applying a reduction of 5.58GJ in consumption per connection would result in the best estimate in the circumstances. Accordingly, in this final decision we have:

- not adjusted the overall rate of decline in average consumption for all residential customers. This increases total residential consumption forecasts, relative to ActewAGL's revised forecast;
- changed tariffs demand to reflect the increase in total residential consumption. All residential tariff categories are affected, roughly on a pro rata basis, other than that applied to new high rise dwellings with boundary-metered gas for cooking (that is, where high rise dwellings connect to gas for gas cooking and heating - the Volume Boundary reference tariff category).³⁰

We also note for completeness that ActewAGL submitted a further revised demand model on 26 February 2016 as it identified a misalignment between its forecasts of high rise connections in the capex and demand forecast models.³¹ Our review of the model indicates the further revision better aligns the demand forecasts, including their allocation to the proposed tariff categories, with the updated assumptions.

²⁹ ActewAGL, *Response to Information request 50* [email to AER], 24 February 2016, p.3.

³⁰ This is because tariff demand forecast for the Volume Boundary reference category is based on an estimate of consumption per connection independent of this assumption.

³¹ ActewAGL, *Response to information request 50* [email to AER], 24 February 2016, p. 2.