ATCO

16 September 2019

Nicola Cusworth
Chair
Economic Regulation Authority
PO Box 8469
Perth Business Centre WA 6849

Lodged online via: www.erawa.com.au/consultation

Dear Ms Cusworth

Re: Woollahra Partners Review of ATCO's AA5 Gas Demand Forecasts

Thank you for the opportunity to comment on Woollahra Partners' Review of ATCO's AA5 Gas Demand Forecasts, as published on 6 September 2019. This letter outlines ATCO's submission in response to the invitation for public submissions.

ATCO reiterates that the 2020-24 Revised Plan is in a form that is approvable by the Authority. This is evidenced by the fact that, for an average consumption residential customer, the annual distribution charge *decreases* by $3 in AA5 compared to AA4. The fact that the Woollahra review supports our detailed demand forecast, is further evidence of the soundness of our Revised Plan.

ATCO has engaged Core Energy to assist it in examining Woollahra Partners' ("Woollahra") Review of the 2020-24 Revised Plan demand forecast. Core Energy's review is attached (see Attachment 07.102). ATCO supports the findings in the detailed response prepared by Core Energy.

Overarching comments

ATCO submits that the Woollahra review has not identified any reasons for the Economic Regulation Authority to not accept ATCO's 2020-24 Revised Plan demand forecast.

Firstly, Woollahra have observed that the demand forecast framework has been reasonably applied by ATCO in the 2020-24 Revised Plan:

> *"The AA5 gas demand forecasting framework is reasonably applied."*[1]

Secondly, the Woollahra forecast of connections and total demand does not vary significantly from ATCO's. ATCO considers that it therefore does not warrant the substitution of Woollahra forecast for ATCO's forecast.

ATCO observes that Woollahra Partners presentation of AA5 forecast connections is on an end of year basis (for example in Table 5.2). In contrast, ATCO's 2020-24 Revised Plan presents connection numbers on the average number of customers during the year basis (table 7.7 of the 2020-24 Revised Plan.

ATCO has calculated, in Table 1, the average customer base from the Woollahra Partners report to enable a like for like comparison with ATCO's Access Arrangement Information:

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[1]   Woollahra Partners, Review of ATCO's AA5 Gas Demand Forecasts, 2 September 2019, pg 3

Table 1: B3 Tariff – AA5 Average Customer Base

|	2020	2021	2022	2023	2024	CAGR*
2020-24 Revised Plan	741,392	750,024	760,302	771,444	782,696	1.4%
Woollahra Partners	740,372	747,882	757,221	769,293	783,000	1.4%
Difference	-1,020 (-0.14%)	-2,142 (-0.29%)	-3,081 (-0.41%)	-2,151 (-0.28%	304 (0.04%)	

*Compound Annual Growth Rate

Source: 2020-24 Revised Plan Table 7.7 and Woollahra Partners Table 5.2

Thirdly, following an investigation on each of the matters raised by Woollahra, Core Energy has not found any reason to vary its forecasting method or its demand forecast over AA5 in response. In summary, our response to the matters raised by Woollahra in its review are:

- **Energy Intensity at the Household and Small Business Level** – It is not appropriate to rely on State-wide energy intensity measures given ATCO's gas demand forecast accounts for less than 3% of the State-wide fuel consumption. The established drivers for energy intensity at the household and small business level are appliance efficiency and dwelling efficiency.

- **Dwelling Completion Data & Application** – Core Energy have correctly provided for non-completions in its forecast and we observe that there is no conclusive evidence that the BIS forecasts have outperformed the HIA forecasts. We are concerned that the BIS forecast incorporates 27% growth in 2022 without an explanation of what is driving this.

- **B3 Cohort Treatment** – ATCO submits that Woollahra have incorrectly applied a weighting of new and existing customer growth for B3 customers without full consideration of the reasons why Core Energy applied a different approach between B2 and B3 customers. Core Energy intentionally used a weighting method for B2 customers as new customer mature demand did not follow a declining trend in all years. However, given the consistent decline in new customer demand for B3 customers, Core Energy modelled new cohorts separately (i.e. not weighted). Woollahra's approach places an upward bias to the B3 demand forecast due to the issues highlighted by Core Energy that will not result in the best forecast. ATCO considers that the growth rate detailed in its 2020-24 Revised Plan has been arrived at on a reasonable basis and represents the best possible forecast in the circumstances.

- **Incorporation of Gas Discounting** – ATCO submits that Woollahra has incorrectly used the price elasticity co-efficient and maintain that Core Energy have correctly allowed for the retail discount in the gas price through the price elasticity coefficients adopted in the 2020-24 Revised Plan.

In conclusion, ATCO considers that the Woollahra Review has not demonstrated a case to adopt anything other than ATCO's 2020-24 Revised Plan Demand forecast over AA5. ATCO submits that the Woollahra Review supports the conclusion that ATCO's demand forecast has been arrived at on a reasonable basis and represents the best possible forecast in the circumstances.
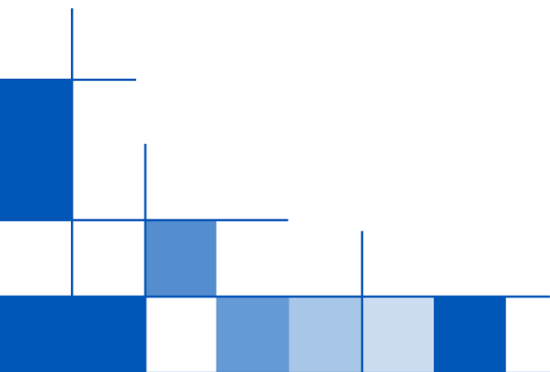
Yours sincerely
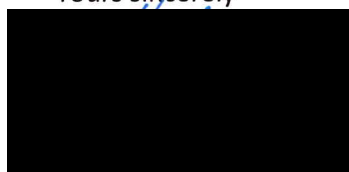
Stevan Green
President, Gas, Australia

Attachment 07.102: Core Energy, MWSWGDS Demand Forecast | Woollahra Partners Forecast Review, September 2019

ATTACHMENT 07.102
MWSWGDS DEMAND FORECAST | WOOLLAHRA PARTNERS FORECAST REVIEW

ATCO 2020-24 REVISED PLAN

EIM # 99623946

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16 September 2019

An appropriate citation for this paper is:

Attachment 07.102
MWSWGDS Demand Forecast | Woollahra
Partners Forecast Review

Our Ref: EIM # 99623946

Contact Person

██████████████
General Manager - Strategy & Regulation
Phone: ████████████
█████████████████████████████████

ATCO Gas Australia

ACN 089 531 975
81 Prinsep Road
Jandakot WA 6164
Phone: +61 8 6163 5000
Website: www.atcogas.com.au

Postal Address

Locked Bag 2
Bibra Lake DC WA 6965

MWSWGDS Demand Forecast | Woollahra Partners Forecast Review

September 2019

Discussion Paper

1.   Woollahra Partners Forecast & Queries

Core Energy Group ("CE") has reviewed Woollahra Partners' 2nd September 2019 Report for Economic Regulation Authority, titled 'Review of ATCO's AA5 Gas Demand Forecasts'. CE's general appraisal is provided in Section 2 along with specific discussion of key issues.

Table 1.1 Key Issues

Key Issue	Raised by
Drivers of autonomous decline in gas intensity	Woollahra, Report pg. 6; 13

Dwelling Completions Data & Application
    >   Use of HIA commencements as a driver of connections;
    >   Penetration Rate
	Woollahra, Report pg. 13; CE model review

Consistent cohort treatment in growth estimates.	Woollahra, Report pg. 13; CE model review
Price elasticity & retail discounting	Woollahra, Report pg. 3; 12

2.   CE Review & Discussion

CE welcomes the opportunity to examine Woollahra Partners' ("Woollahra") analysis of MWSWGDS demand. The Woollahra review has identified many of the same trends and appropriate drivers for demand on the network. It has also noted potential improvements to methodology and/or aspirational datasets which CE generally agrees with. The Woollahra forecast of connections and total demand does not vary significantly from its own. To this end, the question remains as to whether the forecast difference is material enough to warrant a substitution of CE's own forecast. Furthermore, the following discussion suggests the numbers submitted by Woollahra cannot be reasoned as holding improved forecast accuracy.

2.1.   Energy Intensity at the Household and Small Business Level

Woollahra:

> **"***Ideally, the optimal estimate of gas demand sensitivities will capture the dynamics of the evolving energy mix: including the concise interaction of heating / cooling and gas intensity at the household level, changes in the composition of existing dwellings and new dwellings over time…"*

> *"… a better approach would entail analysing whether there is an omitted variable problem with the model."*

> *"As figure 1 shows there are occurrences where energy intensity dynamics change, and under these circumstances, gas demand declines may become more gradual to that implied by the trend."*

CE Response:

The first statement is correct although CE has reservations about statements two and three.

▪ CE has searched extensively but was unable to identify reliable and recent quantitative evidence for appliance and dwelling trends in WA. CE has summarised qualitative evidence and older quantitative evidence in Appendix A5 of its report.

▪ CE cannot advise relying on State-wide energy intensity measures but notes the Woollahra forecast draws on this for context rather than a modelling input. The MWSWGDS accounts for less than 3% of State-wide fuel consumption so to impose energy intensity trends based on the other 97% (including mining, transport, electricity generation) would introduce irrelevant variables.

▪ Although energy intensity across these major sectors is generally moving in the same direction as household energy, the established drivers for MWSWGDS demand per connection are appliance efficiency and dwelling efficiency. These variables are not major contributors to the state-wide trend which is driven more by the resources sector, electricity sector and transport sector.

▪ Energy intensity in the context of a B1, B2 or B3 connection means:

> Appliance efficiency: which is driven by the switch out rate and technology gains associated with new water, cooking and space heating appliances.

> dwelling efficiency: more advanced building codes, construction methods and building materials which result in dwellings that require less energy to heat/maintain temperature. Growth in high and medium density dwellings are generally smaller and associated with lower heating costs.

- Omitted variable bias would only be an issue if these efficiency trends are correlated with EDD (i.e. does knowing the prevailing weather conditions in a given period influence the level of appliance and dwelling efficiency). EDD fluctuates randomly year to year meaning there is no such correlation.[1]

2.2. Dwelling Completion Data & Application

2.2.1. Third Party Data Inputs : Commencements vs Completions

Woollahra:

"*ATCO use a 1-year lag of housing starts (commencements) to proxy for housing completions. However, evidence suggests not all commencements reach completion. To this end, independent housing completions forecasts should be used where available and these are obtained from BIS Oxford Economics ('BIS').*"

CE Response:

CE agrees that not all houses reach completion and prior analysis of ABS data suggests this is generally around 10% (i.e. completions in year t+1 have a high correlation with commencements in year t.) Furthermore, this rate of non-completion has been stable.
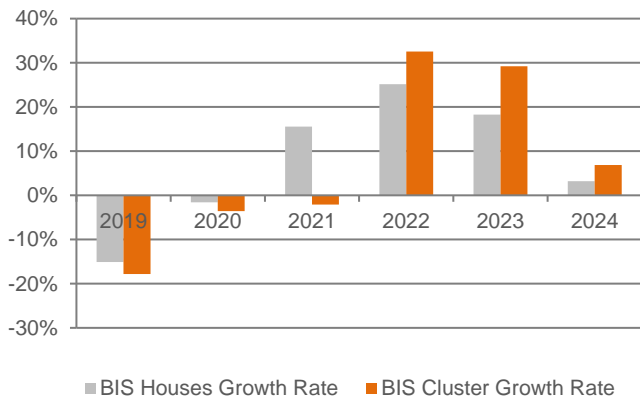
The forecast uses the penetration rate trend relative to historical commencements and applies this going forward-therefore the historical rate and the projected rate are both calculated with the non-completions in the series. A bias on the forecast would only occur if the incidence of non-completion was varying significantly over time and CE has not detected such a trend.

CE does not believe a change to BIS forecasts will improve forecast accuracy, and the fact that it adjusts for non-completions doesn't enhance the forecast for reasons described above. If there was conclusive evidence that BIS forecasts had outperformed HIA in the past, then this would provide a sound rationale for substituting HIA data, but CE does not believe this is the case.

The BIS forecast has a sharp movement in 2022 for cluster connections. After negative growth in 2021, BIS is anticipating over 30% growth the following year. Historical data suggests such sharp movements are possible but CE questions what is driving this and would not recommend including such an input until the reasons for this movement are well understood and reviewed.

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[1] CE agrees that energy intensity is an explanatory variable for gas demand per connection. However, not including a variable does not create omitted variable bias unless there is a strong correlation between that variable and other explanatory variable(s).

Figure 2.1 Dwelling Completion Growth by Dwelling Type | %

■ BIS Houses Growth Rate   ■ BIS Cluster Growth Rate

2.2.2. Network Penetration Rate

Woollahra's forecast has retained the penetration rates estimated using historical HIA data but then applied those rates to the BIS forecast series. The following charts show that the implied penetration rates using BIS data are higher than those used for the forecast (which were calculated using HIA data, a dataset that includes ~10% of non-completions in the series). CE advises that the penetration rates it estimated (shown in red below) should only be applied to its forecast of completions. Penetration rates relevant to the BIS series should be used if BIS data is indeed the preferred input (which CE refutes in turn).

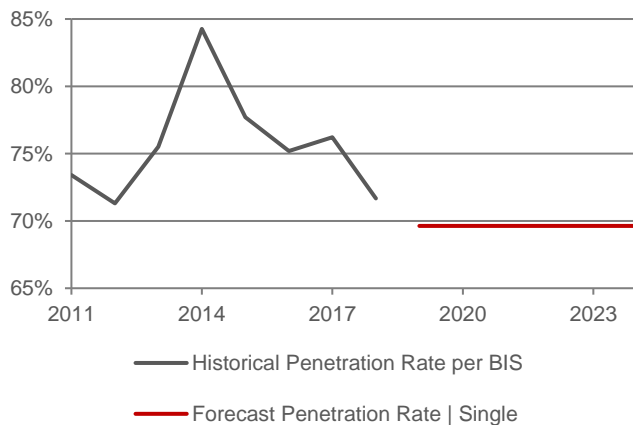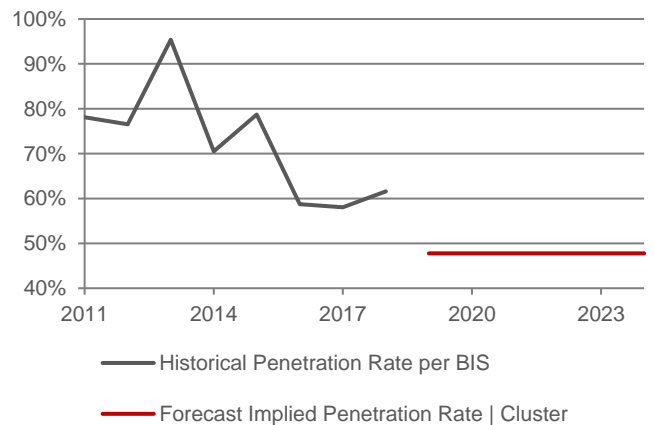**Figure 2.2 Penetration Rate | Single Dwellings, %**

——— Historical Penetration Rate per BIS

——— Forecast Penetration Rate | Single

Figure 2.3 Penetration Rate | Cluster Dwellings, %

——— Historical Penetration Rate per BIS

——— Forecast Implied Penetration Rate | Cluster

Similarly, BIS forecast contains a split/share between houses and attached dwellings. Woollahra forecasts have retained the forecast share of completions from the HIA-derived calculations made by CE which creates inconsistencies with its reliance on BIS data elsewhere in its forecast.

2.3. B3 Cohort Treatment

There is a different weighted-cohort approach applied to B1 and B2 connections which Woollahra has then implemented for the B3 group. The discussion below outlines:

1. why CE used different treatment for these connection groups,

2. why the weighted approach is not appropriate for the B3 group, and why the weighted approach was also incorrectly applied in the B3 review forecast.

Reminder:

- a cohort refers to a group of connections that all join in the same year. E.g. 2010 cohort are all the connections that joined the network at some point within the 2010 year

- On average, connections ramp-up over several years. The first calendar year is associated with a part-year of consumption as connections join at some point during the year. The first full year has a ramping/ maturing volume and the second full year represents a stable 'mature' volume for that cohort.

Different treatment for B1, B2

- New cohorts for B1 and B2 connections exhibit demand per connection that fluctuates. In some years, the group of joining connections has demand per connection considerably higher than the previous cohort whereas some years this demand drops significantly.

- In some years, new B1 connections were larger than the average existing connection (figure 2.4 below; years 2013 and 2014).

- B2 new demand per connection was close to half the size of the existing pool in 2014 but over several years this gap closed (figure 2.5 below).

- Conversely, B3 connections have always joined with a mature demand per consumption that is lower than previous cohorts and lower than the existing pool. This has steadily trended downwards over the historical series (figure 2.6 below).

- Accordingly, there was a requirement for different growth rates to be implemented within the forecast:

  > The B1 and B2 growth rates capture the trend in the pre-2008 and post-2008 mature volume, and how this changes as a combined group over time.

  > The new B3 group was the only cohort with a consistent growth trend and no years which dragged average demand per connection away from this trend. The methodology for the combined pre-2018 group carries forward the historical trend rate of existing connections only, as all pre-2018 connections can be considered 'existing' relative to the forecast period. There was no need to capture variable growth rates or consumption that varied significantly from previous cohorts.

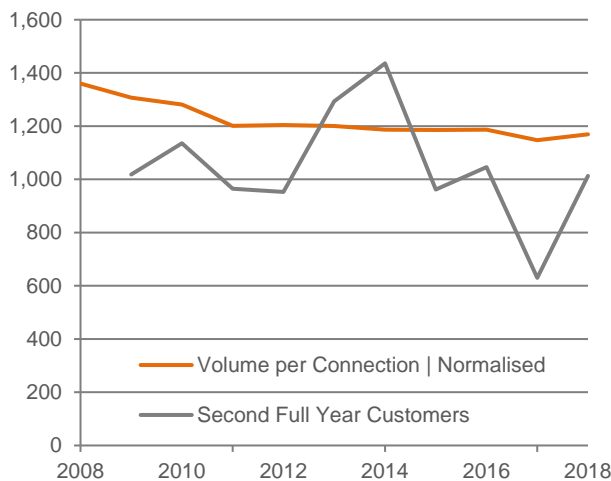**Figure 2.4 B1 New Mature Demand per Connection (versus total connection group) | GJ p.a.**

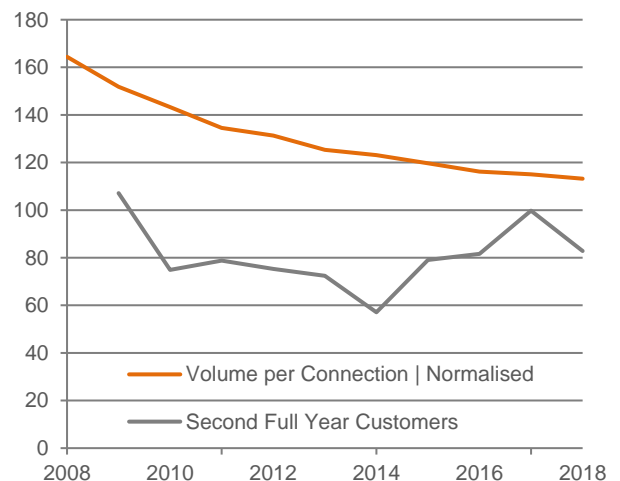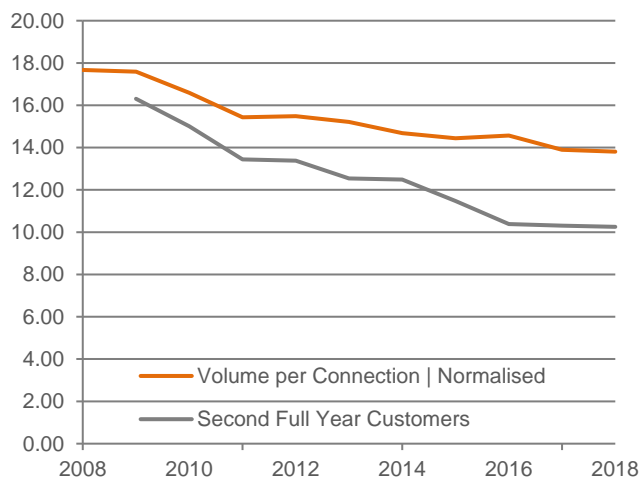**Figure 2.5 B2 New Mature Demand per Connection (versus total connection group) | GJ p.a.**

Figure 2.6 B3 New Mature Demand per Connection (versus total connection group) | GJ p.a.

Why the weighted approach used in the review is not appropriate for B3

CE cannot endorse the weighting of B3 demand per connection that has been applied in the reviewer's forecast.

- Woollahra has calculated a weighted growth rate which combines the separate trends of:

    > existing connections (pre-2006 join), and

    > new connections (post-2006 join).

- The volume per connection of this combined group grew initially as new connections reached mature level and each new joining cohort became a progressively smaller overall share of the total new connection pool (i.e. in 2009 there are two ramping cohorts and one mature cohort whereas in 2014 there are two ramping cohorts and five mature cohorts. Comparing overall growth per connection between these two points is biased by the ratio of new part-year connections to mature connections).

> > 2008-2018 connections will not continue to ramp up once mature so to apply this impact going forward is placing an upward bias on demand per connection

> > The ramp-up impact is still relevant to new cohorts and hence is applied to the new cohorts in the forecast (post-2018 connections) so there is no requirement to retain this adjustment in the pre-2018 connections.

- Please refer *MWSWGDS_AA5 Summary Workbook_DDR (CONFIDENTIAL).xlsx,* tab 'MWSWGD Historical', rows 93-116.

CE strongly recommends reverting to the B3 growth rates it had calculated in its submission.

2.4. Incorporation of Gas Discounting

Woollahra:

"The ERA should consider adopting price elasticity estimates based on available WA information to account for real gas retail discounting impacts."

"Real evidence of competitive gas retail discounting also works against the (autonomous energy intensity) decline."

CE Response:

Woollahra is correct in its assertion that any retail discount in gas prices will have a price elasticity impact on demand per connection. This impact is already captured within the model via established price elasticity coefficients and a forecast of final retail bills in WA. Woollahra does not offer a superior forecast of final retail bill (and any reasons for difference), nor does it provide a reliable alternative elasticity coefficient to be used. Accordingly, CE notes the aspiration of these comments but cannot identify any alternatives to the methodology and price elasticity forecast that it has used.

Real gas retail discounting is not a phenomenon unique to WA and the price elasticity coefficients coming from stablished literature have been assessed using empirical evidence in other relevant energy retail markets. CE notes several other price factors in WA including gazetted price caps and significant movements in network tariff. Real gas discounting has not had a significant impact in final retail bills over the last few years. A moderate adjustment is made in the forecast period for increased retail discounting.

2.5. Other

Woollahra has substituted declining volumes into the calculation of retail price changes (forecast period only). There are two issues associated with this:

- This volume interfaces with the elasticity coefficient which is structured around price response- not a measure of response to the total spend.

- If this is a superior elasticity methodology (CE believes it is not) then the same adjustment should have been made to the cross-elasticity inputs and the historical gas inputs also rather than just forecast gas prices.

CE's calculation of retail bill used a constant volume across historical and forecast periods. The purpose of this is to capture the change in retail prices: elasticity coefficients are estimated based on price changes not total bill changes.

CE recommends reinstating its original retail bill estimates.