

Submission to the Australian Energy Regulator (AER)

Consumer Challenge Panel

AGN application regarding Mount Barker

Response to the AER's Draft Decision

Sub-Panel CCP8

David Prins (chair)

Robyn Robinson

23 November 2018

Australian Gas Networks – Future capital expenditure determination – Mount Barker gas network extension

Overview of AGN's application

Australian Gas Networks (AGN) is proposing to construct a high pressure extension and reticulation system to service Mount Barker, as well as industry in Monarto South and Kanmantoo (South Australia).¹

AGN submitted an application seeking an advanced determination with regard to this capital expenditure which will be undertaken 2019-20 and 2020-21 (under rule 80 of the National Gas Rules (NGR)). It is seeking a determination that confirms that the capital expenditure is conforming (under rule 79 of the NGR) so that it will be included in the regulatory asset base as part of its 2021-26 Access Arrangements. Previously the AER considered and rejected the Mount Barker extension when AGN submitted its Access Arrangement for 2016 to 2021.

The application was made within the current access arrangement period (2016-2021). The AER decided to undertake a public consultation before making a determination.

The AER published AGN's application on the AER website and sought submissions by 3 September 2018. Stakeholders identified as having made submissions to the 2016-21 Access Arrangement, and additionally the local Councils of Murray Bridge and Mount Barker, as well as three LNG suppliers in the Mount Barker region were specifically contacted and notified of AGN's application.

Involvement of CCP8

The Consumer Challenge Panel sub-panel CCP8 previously advised the AER on AGN's 2016-21 Access Arrangement.²

This sub-panel was reinstated to provide advice to the AER in relation to the application made by AGN under NGR rule 80 seeking a determination on capex for the Mount Barker Gas Network Extension in South Australia. Consumer Challenge Panel members advising the AER on this application are David Prins and Robyn Robinson.³

On 31 August 2018, Robyn Robinson of CCP8 attended a site visit organised by AGN for stakeholders regarding the Mount Barker Gas Network Extension. We would like to thank AGN for inviting us to this site visit. Our participation assisted us to:

- Understand better the proposal from AGN through first-hand on-site visit and presentation;
- Hear how AGN presented the proposal to stakeholders, and stakeholders' reactions;
- Establish contact with the relevant AGN staff;
- Establish contact with the AER staff who would also be attending; and
- Establish contact and understand perspectives of other key stakeholders, including consumers.

All these were seen to be beneficial to inform and improve the sub-panel's advice to the AER on the Mount Barker project.

¹ See <https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/australian-gas-networks-future-capital-expenditure-determination-mount-barker-gas-network-extension> and <https://www.australiangasnetworks.com.au/our-business/about-us/current-extension-projects>

² See <https://www.aer.gov.au/about-us/consumer-challenge-panel/statements-and-advice/past-statements-and-advice#subpanel-8>

³ See <https://www.aer.gov.au/about-us/consumer-challenge-panel/statements-and-advice#subpanel-8>

Submissions to AGN's application

The AER received and published several submissions to AGN's application, one of which was from CCP8.

Issues considered by CCP8 in its response to AGN's application

Given the limited time available to us, we concentrated our review on AGN's forecasts for residential gas consumption in the extension project, as these are key to whether the proposed capital expenditure is conforming (under rule 79 of the NGR).

The residential gas consumption forecasts are based on the forecast number of residential gas customers – the “penetration rate”, and the gas consumption per connected residential customer. Our submission to AGN's application raised concerns over both those components of AGN's forecasts for residential gas consumption in the extension project. Those concerns remain outstanding. For ease of reference, the concerns we raised in our submission to AGN's application are included as Appendix 1 of this submission.

How the AER's Draft Decision took into account our concerns

The AER published its Draft Decision on 26 October 2018, requesting stakeholder submissions by 23 November 2018. This document is the CCP8 submission to the AER's Draft Decision.

Appendix 1 of the AER's Draft Decision quoted from our concerns with AGN's forecasts. The Draft Decision noted some of the concerns raised by CCP8 and by the AER's consultant Zincara. However, the AER did not seek to change any of the AGN forecasts in its modelling. Rather it undertook its own sensitivity analysis of the original AGN assumptions.

NGR justifications for the expenditure

AGN justified its capital expenditure as conforming capital expenditure under r. 79 of the NGR based on:

- The overall economic value of the expenditure is positive (r. 79(2)(a)); and
- The present value (PV) of the incremental revenue from the project exceeds the PV of the capital costs incurred in delivering the extension (r. 79(2)(b)).

The AER examined the impacts that each of the key assumptions of the proposal (as set out in section 5.1 of the Draft Decision) has on the models provided by AGN.

Overall economic value of the expenditure (r. 79(2)(a))

AGN engaged Frontier Economics to undertake an analysis to assess if this project is justified under r. 79(2)(a) on the basis that the overall economic value of the expenditure is positive. Frontier Economics concluded that the quantifiable benefits of the Mount Barker extension materially exceed the economic costs.

The AER used the Frontier Economics' model to examine the impact of 15, 30 and 45 per cent reductions in demand to test the model's robustness to lower residential customer penetration rate and average gas usage. It also shortened the NPV period from 30 years, to 20 years and 15 years to test a shorter recovery period given the uncertainties regarding the future of gas.

The AER considered the results, and concluded that it found that AGN's proposed capital expenditure for the Mount Barker extension is justifiable on the grounds set out in r. 79(2)(a) – namely, that the overall economic value of the expenditure is positive.

PV of the incremental revenue from the project vs. PV of the capital costs incurred to deliver that value (r. 79(2)(b))

AGN carried out an incremental revenue test which compares the incremental revenue less operation costs to the capital cost of this project on a cash flow basis. This model showed a positive NPV outcome of \$5 million over 30 years based on AGN's assumptions.

The AER undertook its own sensitivity analysis on the AGN model. The AER found that a 10-15 per cent reduction in the penetration rate, average residential gas usage, residential dwelling numbers or a combination of the three would result in a negative NPV outcome. In addition, a slightly shorter NPV period would also result in a negative NPV outcome.

The AER concluded that it did not believe that this model represents a reasonable base case. The AER does not accept that the outcome of this model demonstrates that the capital expenditure is justifiable on a ground set out in r. 79(2).

Cost recovery for this project

AGN will recover the costs for this project through tariffs levied in regard to existing customers across its network and new customers in the Mount Barker area that become connected.

As noted above, the AER found that AGN's model did not robustly demonstrate that the incremental revenue less operation costs would exceed the capital cost of this project on an NPV cash flow basis.

If the costs exceed the incremental revenue, then existing gas customers in the network will have to pick up the shortfall and will be disadvantaged as a result. This was raised as a concern in the ECCSA MEU joint submission, and is also a concern to CCP8.

It may be that the tariffs proposed by AGN are unrealistically low. This could explain why the AGN model is not robustly showing positive NPV (r. 79(2)(b)), yet the Frontier Economics model is robustly showing overall economic value (r. 79(2)(a)):

- All other things being equal, the higher the (retail) natural gas tariff, the fewer customers will be likely to switch to natural gas, and the lower the cost savings that the customers that do switch will enjoy. This will lessen the overall economic value of the expenditure (r. 79(2)(a)).
- All other things being equal, the higher the (network) natural gas tariff, the higher the incremental revenue from the project *per unit of energy consumed*. However, price elasticity of demand tells us that higher prices will decrease demand. Without doing the detailed calculations, it is not obvious whether a higher natural gas tariff will increase or decrease the NPV of the project (revenues minus costs) (r. 79(2)(b)).

The assumptions underlying the modelling

Besides issues that we have raised in our previous submission and above, we note that the base case in the Frontier Economics modelling as stated by AGN is that "the energy mix of the average residential customer under the base case is LPG for cooking and hot water, and electricity for space heating".

Given the high cost of LPG, it is not obvious that the average residential customer would connect to LPG. We could not find anything in the available documentation telling us:

- What is the take-up of LPG in new developments in the Mount Barker area where LPG is already available?
- What is the assumption in the base case regarding take-up of LPG, and on what evidence is that assumption based? Was the base case set knowing actual LPG take-up to date, and how was that taken into account?

As such, we are unable to verify the base case assumptions or results or their limits of accuracy.

Moving from Draft Decision to Final Decision

The AER's Draft Decision states: "We urge AGN to provide commentary, on its current and future tariff strategies, to mitigate concerns raised by stakeholders." We would go further than this. It seems to us that the AER's Draft Decision has not fully considered the effects of different tariff levels on either set of modelling (in regard to r. 79(2)(a) and r. 79(2)(b)). It is our view that sensitivity analysis of both of those models should:

- (a) Start from more realistic base values for penetration rate, forecast average use of gas, and growth rates for residential development than those assumed by AGN;
- (b) Consider different NPV periods; and
- (c) Consider tariffs in tandem with gas usage forecasts, to ensure that the models are fairly based on outcomes that might be expected, rather than on tariffs that are on the low side combined with gas usage forecasts that are on the high side.

Positive outcomes from such sensitivity analysis should be a pre-requisite to AER acceptance in its Final Decision that capital expenditure by AGN for the Mount Barker extension will meet the new capital expenditure criteria set out in r. 79 of the NGR.

Appendix 1: Concerns with AGN's forecasts that were raised in the CCP8 submission dated 8 October 2018

Given the limited time available to us, we concentrated our review on AGN's forecasts for residential gas consumption in the extension project, as these are key to whether the proposed capital expenditure is conforming (under rule 79 of the NGR).

The residential gas consumption forecasts are based on the forecast number of residential gas customers – the “penetration rate”, and the gas consumption per connected residential customer.

Forecast penetration rate

The reason why the AER did not previously accept the proposed capital expenditure for AGN's gas network extension to Mount Barker as conforming capex related to the **forecast penetration rate** for new residential connections in Mount Barker.

AGN 2016-17 to 2020-21 Access Arrangements revised proposal (January 2016)

The AGN 2016-17 to 2020-21 Access Arrangements revised proposal (January 2016) included the Mount Barker extension proposal as growth assets. Among the factors that were in AGN's revised proposal was a forecast penetration rate of 95% for new residential connections in Mount Barker.

AER Final Decision (May 2016)

The AER's Final Decision (May 2016) noted in Attachment 6, section 6.4.2.5 Growth assets:

We are not satisfied that this capex is conforming capex on the basis that it is likely that the expected incremental revenue will not exceed the present value of the capex. In determining the incremental revenue, AGN has relied on a forecast penetration rate of 95 per cent for both the Two Wells and Mount Barker extensions. AGN's proposed penetration rate is based on data from the Sunday Estate development, Aldinga. We are not satisfied that this penetration rate is the best forecast or estimate possible. This is because we consider that the penetration rate is likely to be lower than the 95 per cent penetration rate that AGN used in its NPV analysis for these extension projects for the following reasons:

- The Sunday Estate data is outdated and unlikely to reflect current trends in the demand for gas connections. This estate was commissioned in a number of stages over a six-year period from 2005 to 2010. AGN submitted that the penetration rate achieved in this estate is a reasonable proxy because it is a similar new residential development on Adelaide's suburban fringe and represents the most recent example of such development with audited penetration data. However, we note that there has been a significant reduction in the network wide penetration rate from 2011 onwards that is not properly captured in the Sunday Estate penetration rate.*
- Further, the reduced competitiveness of gas relative to electricity—the driver of the downwards trend of network wide connections—remains a relevant influence on the penetration rates for the Two Wells and Mount Barker extensions. The network average penetration rate for new dwellings is the best estimate in the circumstances because on the information available, it best reflects current trends in gas connections.*
- AGN's proposed penetration rate is based on a single small sample of one suburb with 705 dwellings. We consider this sample size is too small from which reliable inferences can be drawn.*
- The reasons that AGN provided in support of the penetration rate for new growth areas likely being materially higher than its network average penetration rate for new dwellings in established areas are not compelling. Those reasons are:*

- *customers are not disrupted by installation works before houses are built*
- *there are general benefits of gas as a cleaner, more reliable, less intrusive energy source*
- *the new South Australian residential water heater installation requirements will encourage greater take up of gas connection as it is the least cost compliant option and is favoured by customers and developers.*

The latter two reasons apply to any new dwelling connection on the network and do not justify a conclusion that a materially higher penetration rate for the new growth area connecting prior to a house being built.

AGN's current business case

In its current (June 2018) proposal business case, AGN accepted that the key issue had been the penetration rate:

The AER did not accept our proposed capital expenditure in its final decision as there was insufficient information to convince it the relevant requirements of the NGR had been satisfied. The key assumption that led to this conclusion was the proposed penetration rate.

The AER assumed a value of 65%, which is the South Australian statewide average forecast of connection penetration for 2021 (and therefore includes areas where our gas network is not present). We had proposed 95%, which reflected the actual penetration rate achieved in new housing developments most similar in size and scope to those in Mount Barker.

AGN further states that it is now addressing this matter:

Given this was late in the AA review process, there was not enough time to rectify the lack of information available to reconcile the differing penetration rate estimates. Since then we have undertaken further, and more detailed, analysis of the viability of the extension. This includes overall economic value analysis, independent connection and demand forecasts, additional analysis of the forecast penetration rate and further engagement.

AGN presents its penetration rate and the assumptions behind it in some detail in its Mount Barker Extension Business Case section 2.1.1.1, including also raw penetration data by suburb in an Excel spreadsheet in Attachment 6A.

Core Energy's attachment to AGN's current business case

Attachment 4A from AGN contains Core Energy's forecasts to support AGN's business case. Core Energy's report deals with penetration rate with a single paragraph and a single table in section 2.2.1.2. Core Energy has apparently simply accepted what AGN told it, and has not done any separate analysis of penetration rate of its own. Core Energy's presentation in its report is a fraction of the supporting evidence supplied by AGN in its Business Case.

CCP8 views on the forecast penetration rate

Is 95% the correct opening value when comparing historic penetration rates in other suburbs?

We question why the average penetration rate that AGN is proposing (at 95%) is so much higher than the overall average of 74% (Attachment 6A, tab 1.5). We accept that some of the lower numbers may be because only part of the suburb is covered by the gas network or for other reasons (as shown in tab 1.6 of AGN's Attachment 6A spreadsheet), but does that account fully for the difference?

We find it key that AGN has selected those suburbs whose **growth in gas customers** over the 2011/12 to 2016/17 period falls within the top 10% of all suburbs (Mount Barker Extension Business Case, page 16).

This we feel may have biased the results upwards, as against selecting those suburbs with the highest number of new dwellings in that period.

We question whether the number of gas customers is counted properly. The spreadsheet AGN Attachment 6A refers to counting the number of MIRNs, but doesn't specify whether all these are actually consuming gas with a retailer in place and working gas appliances. Might it be possible that a MIRN has been generated in the development stage but gas is not actually being used at the premise? That might also overstate the number of customers using gas?

AGN has used Mount Gambier as the basis to estimate gas consumption per customer. That being the case, it might have been appropriate and consistent for AGN to use the Mount Gambier penetration rate, which is 71%.⁴ Or alternatively to use the annual usage rate of the suburbs on which the penetration rate is based.

No analysis of the penetration rate for the existing LPG gas supply service in newer Mount Barker developments has been provided. Examination of this data may also provide guidance on the appropriate penetration rate to be used for the proposed network extension.

What will be the trend in penetration rates over the medium to longer term?

AGN is forecasting that the penetration rate of 95% will remain unchanged throughout the period 2021 to 2040. Whatever value is used as the starting value in 2021 (and as stated above we believe 95% may be too high), should that starting value remain unchanged throughout the period 2021 to 2040?

We believe that penetration rates may start to reduce, for reasons that include:

- Availability of gas supply which may affect the pricing and hence take-up of gas.
- Changes in the economics, efficiency and effectiveness of domestic appliances, such as induction cooktops, solar hot water units and electric heating and cooling, which may be used in preference to gas appliances.
- Adoption of new technology, such as solar voltaic cells and batteries.

We would expect AGN to have made some acknowledgement that the above factors could affect the penetration rate, and make some attempt at justifying a slower take-up rate at a point in time, and that it would be reasonable for AGN to comment on the changing energy environment and reflect that in its analysis.

We also note the latest research by ATA (<http://www.ata.org.au/news/all-electric-solar-homes-save-thousands-over-gas-report>, June 2018):

New homes that are all-electric and have solar power will save their owners thousands of dollars compared to new homes with dual fuel (gas and electric) and no solar, according to a new report by the Alternative Technology Association (ATA).

The Household Fuel Choice in the National Electricity Market report found owners will be between \$9,000 – \$16,000 better off over 10 years if they establish their new home as all-electric with a 5-kilowatt solar system rather than gas-electric with no solar.

New homes with efficient electric appliances like heat pump hot water systems, split-system air-conditioners and LED lighting working with large solar systems make sense economically, according to report co-author and ATA energy analyst Dean Lombard.

"There is just no reason economically for new homes to be built with both electricity and gas," Mr Lombard said.

⁴ This figure of 71% for the penetration rate in Mount Gambier has been derived from AGN's Attachment 6A, Tab 1.5, row 414, by dividing the number of MIRNs (8509) by the number of NMIs (12036).

The findings of the ATA report may also affect take-up rates in Mount Barker, to the extent that residential customers in Mount Barker make fully informed rational decisions.

We understand that the ATA promotes sustainable solutions, and gas is not part of the ATA's vision. We have not been through the ATA report in detail or compared its findings against the AGN Business Case, but it is concerning if gas solutions are being proposed for new homes if that is not the best economic solution.

In contrast, AGN's business case is supported by Attachment 10 from Frontier Economics which suggests savings to customers from using gas rather than electricity. We have not fully analysed the discrepancy between Frontier Economics' findings and the ATA's findings. It may be that the discrepancy arises from the ATA including solar electricity in its calculations which Frontier Economics has not. It may be worthwhile for AGN or the AER to revisit the economic analysis with 'electricity and solar' as a counter factor to gas, to test the economic basis for gas for residential customers.

Forecast usage per residential connected customer

Regarding forecast usage per residential customer, we have reviewed the report from Zincara to the AER (23 September 2018).

We concur with Zincara's view (page 4):

The gas consumption per customer proposed by AGN for Mount Barker is 27.3 GJ/annum which is the average gas consumption in Mount Gambier from 2012 to 2016. Mount Gambier has been used due to its similar environmental conditions to Mount Barker. However, as can be seen in Table 4, the gas consumption per customer in Mount Gambier has been declining from 30.2 GJ/annum in 2012 to 25.3 GJ/annum in 2016. Given the trend, Zincara believes that the latest year gas consumption per customer (i.e. 2016) should be used and not the average. This is further supported by Oakley Greenwood's report "Gas Price Trends Review 2017". The report showed that gas consumption per customer in South Australia (Figure 5) has been in decline from 22.1 GJ/annum in 2005 to 15.5 GJ/annum in 2016.

On that basis, a figure declining annually from 2016 from 15.5 GJ/annum (the state-wide average in 2016) or from 25.3 GJ/annum (the Mount Gambier average in 2016) may be a more realistic estimate of annual gas usage per customer in Mount Barker.

We also concur with Zincara's comments (page 5):

CE has also used constant annual gas consumption per customer for the period 2021 to 2036 and then a 1% drop in gas consumption due to appliance efficiency. What is the basis for this assumption?