

Attachment 4

Frontier Economics Modelling Update

November 2018

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Economic costs and benefits of Mt Barker extension – updated modelling

A NOTE PREPARED FOR AUSTRALIAN GAS NETWORKS – NOVEMBER 2018

Introduction

Australian Gas Networks (AGN) has identified the Mt Barker region as suitable for natural gas reticulation, and proposes to construct gas pipelines and associated infrastructure to connect the region to natural gas (the Mt Barker extension).

Frontier Economics has been engaged by AGN to assess whether the proposed Mt Barker extension is justifiable under clause 79(2)(a) of the NGR; that is, whether the overall economic value of the capital expenditure for the proposed Mt Barker extension is positive.

We have previously provided a report to AGN¹ that sets out our conclusion that the quantifiable benefits of the Mt Barker extension exceed the economic costs of the Mt Barker extension. Indeed we found that the quantifiable benefits materially exceed the economic costs: the net present value of the quantifiable benefits over the period 2019/20 to 2049/50 under our preferred approach is approximately \$70 million and the net present value of the economic costs of the Mt Barker extension over the same period is approximately \$40 million. The result is a quantified net economic benefit of approximately \$30 million. We also noted that there are a number of likely, or potential, economic benefits that we have not quantified in this report such as ‘new’ gas demand and reduced carbon emissions.

We have now been asked by AGN to update our modelling, based on updated input assumptions. Our updated modelling results is a higher estimate of the quantified net economic benefit. The results for our updated modelling are summarised in **Table 1**. **Table 1** also sets out the equivalent results from our previous report, for the purposes of comparison.

Table 1: Summary of results

	NPV FROM UPDATED MODELLING (\$2017/18)	NPV FROM PREVIOUS REPORT (\$2017/18)
Economic costs	\$71,578,548	\$40,187,193
Quantifiable benefits	\$134,063,868	\$70,069,527
Net economic benefit	\$62,485,319	\$29,882,334

¹ Frontier Economics, *Economic costs and benefits of the Mt Barker extension*, A report prepared for Australian Gas Networks, December 2017.

Our updated modelling

Our previous report to AGN was based, among other things, on forecasts of gas connections and gas demand in the Mt Barker region in the event that the Mt Barker extension proceeds. AGN also provided forecasts of capital and operating costs associated with the forecast number of connections and the forecast demand for gas.

AGN has now asked us to update our analysis to account for a revised set of forecasts of gas connections and gas demand, as well as a revised set of forecasts of capital and operating costs. Our understanding is that these revised forecasts of gas connections and gas demand reflect the following:

- Ongoing growth in gas connections and gas demand beyond 2039/40 (while our previous report was based on a set of forecasts out to 2039/40 which we then held constant until the end of the modelling period in 2049/50).
- Forecasts of gas connections and gas demand for new apartment developments in Mt Barker (while our previous report did not account for apartment developments).
- Forecasts of gas connection and gas demand for three additional industrial customers at Monarto South.
- Forecasts of gas connections and gas demand for *existing* residential and commercial customers within Mt Barker (while our previous report was based on a set of forecasts for new development areas in Mt Barker).
- Forecasts of gas connections and gas demand for residential and commercial customers in Littlehampton and Nairne (while our previous report dealt only with Mt Barker).

Other key input assumptions have remained unchanged, including the following:

- Retail prices for electricity, gas and LPG. Our review of current electricity and gas prices indicates that there has been only a very slight change in electricity retail prices and no change in gas retail prices.
- The assumptions about the alternative sources of energy for customers in the absence of the Mt Barker extension (a mix of electricity and LPG for residential customers and LPG for commercial and industrial customers).

Our updated results

As a result of the updated forecasts of gas connections and gas demand – which entail materially higher connections and demand – our modelling suggests that both benefits and costs increase relative to our previous report, but the increase in benefits is greater than the increase in costs so that we see an increase in the net present value of the quantifiable benefits.

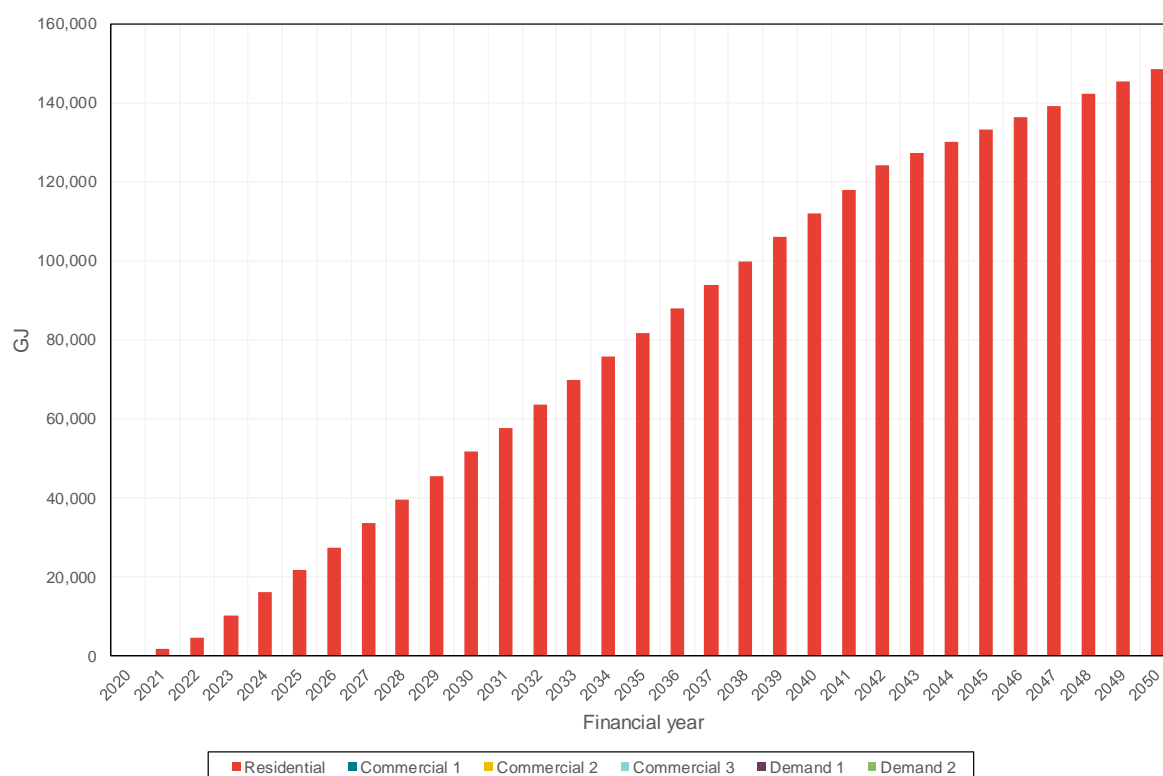
We find that the quantifiable benefits materially exceed the economic costs: the net present value of the quantifiable benefits over the period 2019/20 to 2049/50 under our preferred approach is approximately \$134 million and the net present value of the economic costs of the Mt Barker extension over the same period is approximately \$72 million. The result is a quantified net economic benefit of approximately \$62 million (compared with a quantified net economic benefit of approximately \$30 million in our previous report).

Figure 1 through **Figure 5** are updated versions of key figures in our previous report, highlighting key results from our modelling.

Figure 1 is an updated version of Figure 7 in our previous report, which shows the amount of forecast gas consumption in the Extension Case that represents switching from electricity to gas. This switching reflects switching of electric space heating to gas space heating by residential customers.

Figure 2 is an updated version of Figure 8 in our previous report, which show the amount of forecast gas consumption in the Extension Case that represents switching from LPG to gas. This reflects a combination of LPG to gas switching by all customers.

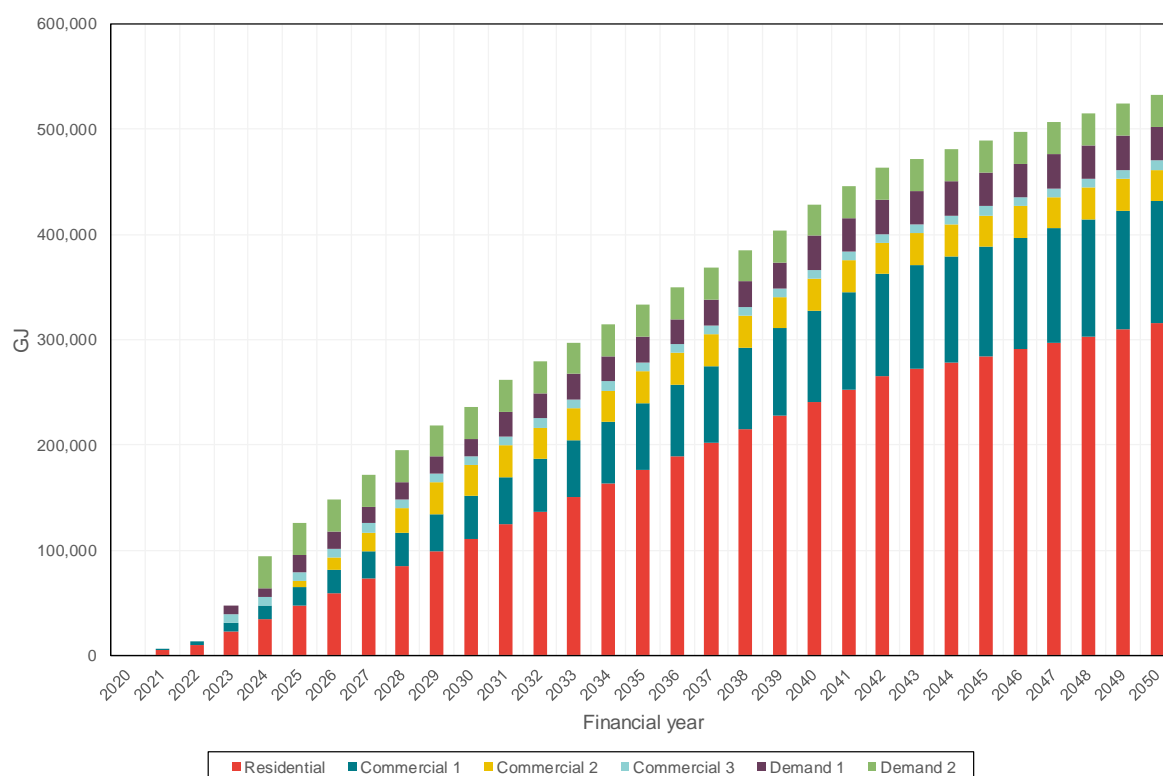
Figure 1: Gas consumption that represents switching from electricity



Source: Frontier Economics analysis

Note: shows only residential customers, as AGN does not expect any other customer class to use electricity.

Figure 2: Gas consumption that represents switching from LPG



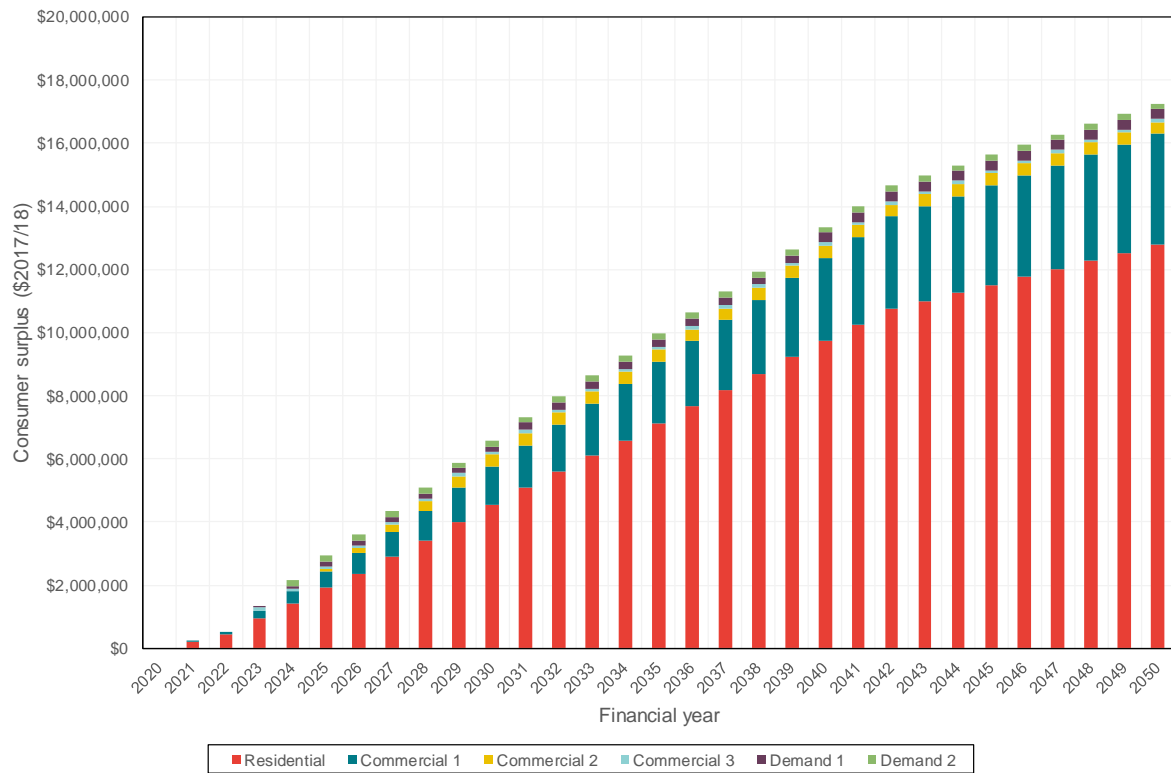
Source: Frontier Economics analysis

Figure 3 is an updated version of Figure 9 in our previous report, which shows the composition of the increase in consumer surplus by customer type over time.

Figure 4 is an updated version of Figure 10 in our previous report, which shows the breakdown of the costs of the Mt Barker extension by type over the period of our assessment.

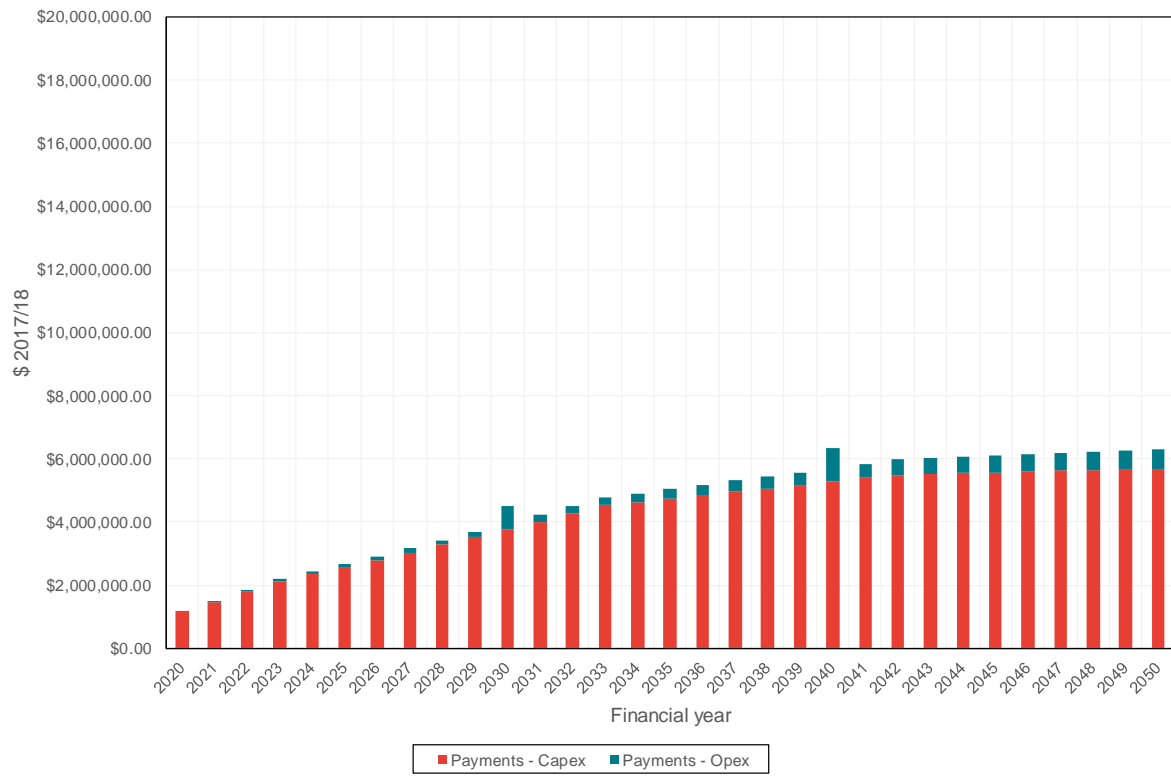
Figure 5 is an updated version of Figure 11 in our previous report, which shows our quantification of the net economic benefits which would occur due to the Mt Barker pipeline extension. **Figure 5** is simply the combination of the increase in consumer surplus shown in **Figure 3** and the costs shown in **Figure 4**. We have also added in a line to indicate the net annual benefits.

Figure 3: Breakdown of increase in consumer surplus by customer type (\$2017/18)



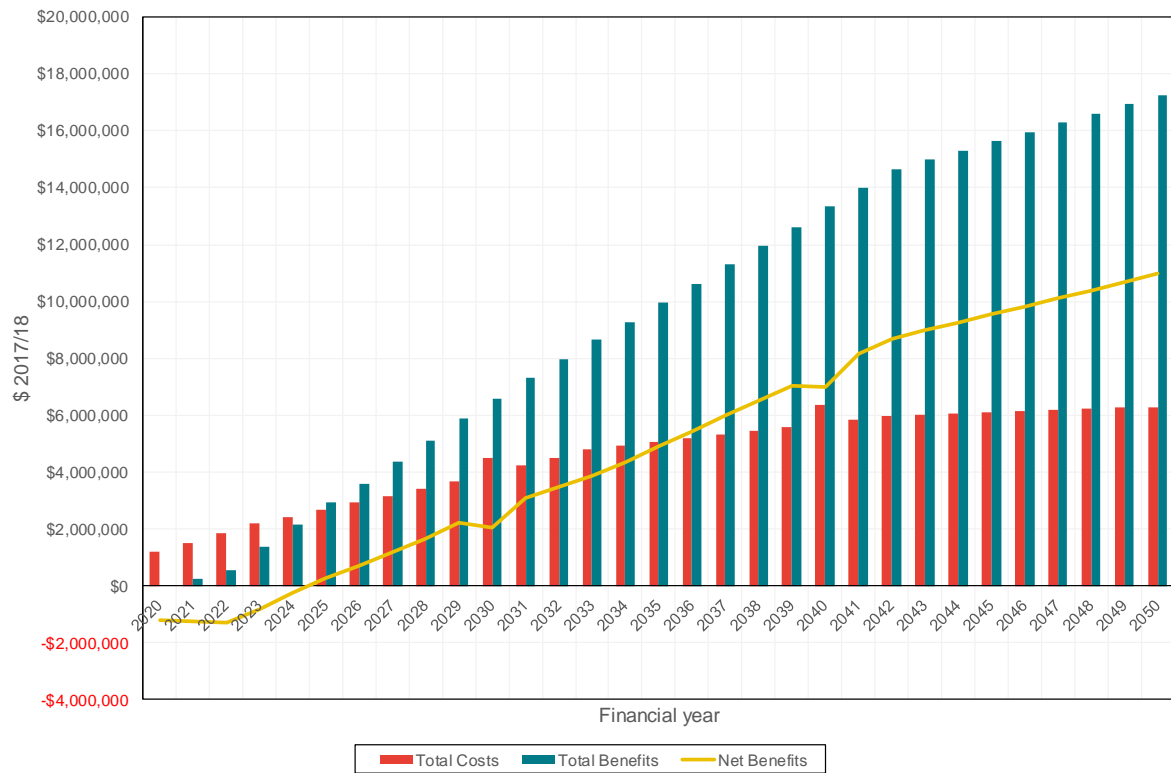
Source: Frontier Economics analysis

Figure 4: Breakdown of costs by type (\$2017/18)



Source: Frontier Economics analysis

Figure 5: Net benefits (\$2017/18)



Source: Frontier Economics analysis

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