



DRAFT DECISION
AusNet Services
Gas access arrangement
2018 to 2022

Attachment 6 – Capital
expenditure

July 2017

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Note

This attachment forms part of the AER's draft decision on the access arrangement for AusNet Services for 2018-22. 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

Attachment 11 - Reference tariff variation mechanism

Attachment 12 - Non-tariff components

Attachment 13 - Demand

Attachment 14 - Other incentive schemes

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Shortened forms

Shortened form	Extended form
AER	Australian Energy Regulator
ATO	Australian Tax Office
capex	capital expenditure
CAPM	capital asset pricing model
CESS	Capital Expenditure Sharing Scheme
CPI	consumer price index
DRP	debt risk premium
ECM	(Opex) Efficiency Carryover Mechanism
ERP	equity risk premium
Expenditure Guideline	Expenditure Forecast Assessment Guideline
gamma	Value of Imputation Credits
MRP	market risk premium
NGL	National Gas Law
NGO	national gas objective
NGR	National Gas Rules
NPV	net present value
opex	operating expenditure
PTRM	post-tax revenue model
RBA	Reserve Bank of Australia
RFM	roll forward model
RIN	regulatory information notice
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
WACC	weighted average cost of capital
WPI	Wage Price Index

6 Capital expenditure

Capital expenditure (capex) refers to the capital costs and expenditure incurred in the provision of pipeline services.¹ This investment mostly relates to assets with long lives and these costs are recovered over several regulatory periods.

This attachment outlines our assessment of AusNet's proposed conforming capex for 2012–16, which forms part of its opening capital base.² It also outlines our assessment of forecast capex for the 2018–22 access arrangement period, which forms part of its projected capital base.³

6.1 Draft decision

6.1.1 Conforming capital expenditure for 2012–16

We approve \$463.4 million (\$2017) of total net capex for AusNet during the 2012–16 period as conforming capex under the NGR.⁴

Error! Reference source not found. shows our approved capex for 2012–16 by category.

¹ NGR, r. 69.

² NGR, r. 77.

³ NGR, r. 78(b).

⁴ NGR, r. 79(1).

Table 6.1 AER approved capital expenditure by category over 2012–17 (\$million, 2017)

Category	2012	2013	2014	2015	2016	2017(a)
Connections	40.6	33.4	30.8	33.8	45.7	36.1
Mains replacement	20.7	18.6	25.8	22.0	14.8	27.1
Meter replacement	4.0	4.7	3.7	5.2	5.4	5.7
Augmentation	2.5	1.3	3.7	7.6	0.5	4.2
Other capex (inc. SCADA)	3.5	11.3	34.7	12.5	5.4	10.0
IT	15.5	16.5	13.1	8.5	6.3	12.6
Overheads	15.8	15.9	14.6	9.6	7.0	6.9
GROSS TOTAL CAPITAL EXPENDITURE	102.8	101.7	126.4	99.2	85.2	102.6
Contributions	3.0	10.6	29.8	6.4	2.2	5.0
NET TOTAL CAPITAL EXPENDITURE	99.8	91.1	96.6	92.9	83.0	97.6

Source: AER analysis. Totals may not sum due to rounding.

Note: (a) As set out in attachment 2, we have not assessed the 2017 amounts as approved capex under this decision. This is because these values are estimates. We will undertake the assessment of whether the 2017 amounts are conforming capex as part of the next access arrangement determination.

6.1.2 Conforming capital expenditure for the 2018–22 access arrangement period

We approve \$460.0 million (\$2017) of AusNet's proposed \$487.7 million (\$2017) total net capex for the 2018–22 access arrangement period as conforming capex under the NGR.⁵ This is 5.7 per cent less than AusNet's proposed capex. Most of this reduction is because we consider that AusNet has not justified the level of expenditure it proposed for its proposed mains replacement and meter replacement programs.

Table 6.2 shows our approved capex for the 2018–22 access arrangement period by category.

⁵ NGR, r. 79(1).

Table 6.2 AER approved capital expenditure by category over the 2018–22 access arrangement period (\$million, 2017)

Category	2018	2019	2020	2021	2022	Total
Connections	37.4	37.9	38.5	39.2	38.2	191.2
Mains replacement	26.5	24.3	25.8	19.1	18.8	114.5
Meter replacement	5.7	6.2	5.5	5.1	5.7	28.3
Augmentation	6.7	2.9	0.6	2.0	1.0	13.1
Other capex (inc. SCADA)	6.8	7.0	6.4	6.9	7.0	34.0
IT	13.3	14.5	11.8	9.2	6.2	54.9
Escalation	0.5	1.2	1.9	2.7	3.7	10.0
Overheads	6.9	6.9	6.9	6.9	6.9	34.6
GROSS TOTAL CAPITAL EXPENDITURE	103.8	100.8	97.5	91.2	87.5	480.8
Contributions	4.0	4.1	4.1	4.2	4.3	20.8
NET TOTAL CAPITAL EXPENDITURE	99.8	96.7	93.3	87.0	83.3	460.0

Source: AER analysis. Totals may not sum due to rounding.

Table 6.3 shows AusNet's proposed capex compared with our alternative capex estimate for each category. In coming to our draft decision, we assessed AusNet's forecast capex compared with our alternative capex estimate taking into account the available evidence and submissions from stakeholders.

Our assessment revealed that most aspects of AusNet's proposal are consistent with the NGR requirements and this forecast expenditure we included in our alternative estimate. That is, 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 AusNet's proposal, in particular its proposed forecast capex for mains replacement, did not meet the NGR requirements. As such we did not include this forecast expenditure in our alternative estimate.

Table 6.3 Comparison of AER approved and AusNet's proposed capital expenditure over the 2018–22 access arrangement period (\$million, 2017)

Category	Proposed	Approved	Difference (\$millions)
Connections	193.8	191.2	-2.6
Mains replacement	130.6	114.5	-16.1
Meter replacement	32.4	28.3	-4.1
Augmentation	15.2	13.1	-2.1
Other capex (inc. SCADA)	34.0	34.0	0.0
IT	57.0	54.9	-2.1
Escalation	10.6	10.0	-0.6
Overheads	34.6	34.6	0.0
GROSS TOTAL CAPITAL EXPENDITURE	508.4	480.8	-27.6
Contributions ¹	20.7	20.8	0.1
NET TOTAL CAPITAL EXPENDITURE	487.7	460.0	-27.6

Source: AER analysis. Totals may not sum due to rounding.

Note: 1. The minor difference between the proposed and approved customer contributions is due to movement of overhead costs in AusNet's capex model. This is explained in the discussion of customer contributions in Section 6.4.2.

As shown in Table 6.3, the main differences between AusNet's proposed capex and our alternative capex estimate for the 2018–22 access arrangement period concern the following capex drivers:

- Mains replacement

Our draft decision is to include \$114.5 million (\$2017, unescalated direct costs) of mains replacement capex in our alternative capex estimate. This is 12 per cent less than AusNet's forecast capex of \$130.6 million (\$2017, unescalated direct costs). We consider that AusNet did not establish its 82 km per annum target is conforming capex, and assessed that replacing 70km of low pressure mains per annum is the best possible estimate in the circumstances.

- Meter replacement

Our draft decision is to include \$28.3 million (\$2017, unescalated direct costs) of meter replacement capex in our alternative capex estimate. This is a reduction of 13 per cent from AusNet's forecast capex of \$32.4 million (\$2017, unescalated direct costs). We consider that AusNet has not demonstrated that the overall

economic value of its proposed digital metering program is positive. We have also reduced meter replacement capex by assuming that a portion of meters removed from the network will be replaced by refurbished meters.

6.2 AusNet's proposal

2012–17 period

AusNet has proposed net capex of \$561.0 million for the 2012–17 period, where capex in 2017 is an estimate. Without the estimate of capex for 2017, AusNet has proposed \$463.4 million as conforming capex. We accept \$463.4 million as conforming capex for 2012–16, and will assess whether capex incurred in 2017 is conforming in the next review.

For 2012–17 AusNet underspent net capex by 7.3 per cent (\$44.6 million). This includes the 2017 estimate. Without the 2017 estimate, AusNet underspent net capex by 9.2 per cent (\$47.2 million).

Table 6.4 AusNet's proposed capital expenditure by category over 2012–17 (\$million, 2017)

Category	2012	2013	2014	2015	2016	2017(a)
Connections	40.6	33.4	30.8	33.8	45.7	36.1
Mains replacement	20.7	18.6	25.8	22.0	14.8	27.1
Meter replacement	4.0	4.7	3.7	5.2	5.4	5.7
Augmentation	2.5	1.3	3.7	7.6	0.5	4.2
Other capex (inc. SCADA)	3.5	11.3	34.7	12.5	5.4	10.0
IT	15.5	16.5	13.1	8.5	6.3	12.6
Overheads	15.8	15.9	14.6	9.6	7.0	6.9
GROSS TOTAL CAPITAL EXPENDITURE	102.8	101.7	126.4	99.2	85.2	102.6
Contributions	3.0	10.6	29.8	6.4	2.2	5.0
NET TOTAL CAPITAL EXPENDITURE	99.8	91.1	96.6	92.9	83.0	97.6

Source: AusNet reset RIN, response to information request 5, 17 February 2017. Totals may not sum due to rounding.

2018–22 period

AusNet proposed net total capex of \$487.7 million (\$2017) for the 2018–22 access arrangement period. This represents a real decrease of 8 per cent compared to the amount approved by the AER for the 2013–17 access arrangement period.

Table 6.5 AusNet proposed capital expenditure by category over the 2018–22 access arrangement period (\$million, 2017)

Category	2018	2019	2020	2021	2022	Total
Connections	37.9	38.4	39.0	39.8	38.7	193.8
Mains replacement	30.9	28.2	29.5	21.3	20.6	130.6
Meter replacement	6.2	6.7	6.3	6.6	6.5	32.4
Augmentation	6.7	2.9	0.6	2.0	3.2	15.2
Other capex (inc. SCADA)	6.9	7.0	6.4	6.9	7.0	34.0
IT	13.3	14.4	12.3	10.5	6.6	57.0
Escalation	0.6	1.2	2.1	2.9	3.9	10.6
Overheads	6.9	6.9	6.9	6.9	6.9	34.6
GROSS TOTAL CAPITAL EXPENDITURE	109.3	105.7	103.1	96.8	93.4	508.4
Contributions	4.0	4.1	4.1	4.2	4.2	20.7
NET TOTAL CAPITAL EXPENDITURE	105.2	101.7	99.0	92.6	89.2	487.7

Source: AusNet capex model. Totals may not sum due to rounding.

The major components of forecast gross total capex over the 2018–22 access arrangement period are connections (38 per cent) and mains replacement (26 per cent).

6.3 Assessment approach

We must make two decisions regarding AusNet's capex. First, we are required to assess past capex and determine whether it is conforming capex that we should add to

the opening capital base.⁶ Second, we are required to assess AusNet's forecast of required capex for the 2018–22 access arrangement period to determine whether it is conforming capex. Capex will be 'conforming' if it meets the NGR's new capex criteria.⁷ We have limited discretion when deciding whether capex conforms with the new capex criteria.⁸ This means that we must approve the capex if we are satisfied it complies with the applicable requirements of the NGR and NGL and is consistent with the criteria set out in the NGR or NGL.⁹

The following sections set out our approach and the tools and techniques we employ in forming a view on these two issues. We also need to take into account timing issues associated with the lag between actual capex data being available in the last year of the 2013–17 access arrangement period and the need to forecast the opening capital base for the 2017–22 access arrangement period. We explain this in the next section.

6.3.1 Capex in the 2013–17 access arrangement period

We reviewed AusNet's submission and supporting material to assess its proposed capex for the 2013–17 access arrangement period. This included information on AusNet's reasoning and, where relevant, business cases, responses to information requests and other relevant information. We used this information to identify whether capex over the 2013–17 access arrangement period was conforming capex and, in turn, whether that capex should be included in the opening capital base.¹⁰ Generally, we use the same approach to assess whether both historical and forecast or estimated capex conforms with the new capex criteria. We have set out this approach in more detail in section 6.3.2 below.

We consider the following when determining the opening capital base for 2018–22:

- 2012 capex—when we conducted the previous access arrangement review, we did not yet have actual capex for 2012. Consequently, we need to adjust for the difference between actual and estimated 2012 capex in the capital base.¹¹ Since actual capex for 2012 is now available, we have assessed whether this capex is conforming capex.
- 2013–16 capex— since we have actual capex for these years, we have assessed whether this is conforming capex.¹² We have included conforming capex in the opening capital base for 2018–22.¹³
- 2017 capex—we do not yet have actual capex for 2017 and so must include an estimate in the opening capital base. We have not assessed AusNet's estimate of

⁶ NGR, r. 77(2)(b).

⁷ NGR, r. 79.

⁸ NGR, r. 79(6).

⁹ NGR, r. 40(2).

¹⁰ NGR, r. 77(2)(b).

¹¹ NGR, r. 77(2)(a).

¹² NGR, rr. 77(2)(b), 79.

¹³ NGR, r. 77(2)(b).

capex for 2017. At the next access arrangement review, we will assess whether AusNet's actual capex for 2017 is conforming capex under the NGR, and adjust for any differences between actual and estimated capex.¹⁴

6.3.2 Conforming capital expenditure for 2018–22

We have assessed the key drivers of forecast capex to consider whether AusNet's proposed capex complies with the new capex criteria.¹⁵ In doing so, we relied on the following information:

- the access arrangement submission and access arrangement information, which outline AusNet's capex program and the main drivers of those programs
- AusNet's Mains and Services Strategy, Gas Maintenance Plan, Network Capacity Strategy and associated appendices and reports which provide specific expenditure or technical detail for each capex driver
- business cases that detail the expenditure requirements for specific projects
- AusNet's RIN template response
- AusNet's capex forecast model
- responses to information requests
- engineering advice we commissioned from Zincara to help us assess the prudence and efficiency of selected projects
- submissions from interested parties.

For each category of capex we considered the scope, timing and cost of the proposed capex in order to form a view on whether it complies with the new capex criteria. We also considered whether cost forecasts were arrived at on a reasonable basis and represent the best forecast possible in the circumstances.¹⁶

Our assessment results in an alternative estimate of the business' total capex requirements in the forecast period. If we are satisfied the business' total forecast meets the NGR requirements, we accept the forecast. If we are not satisfied, we substitute the business' forecast with our alternative capex estimate. In making this decision, we take into account the reasons for the difference between our alternative capex estimate and the business' forecast, and the materiality of that difference. We also take into consideration the interrelationships between the capex forecast and other constituent components of our decision such that our decision is likely to contribute to the achievement of the NGO.¹⁷

¹⁴ NGR, rr. 77(2)(b), 79.

¹⁵ NGR, r. 79(1).

¹⁶ NGR, r. 74(2).

¹⁷ NGL, s. 28(1).

6.3.3 Interrelationships

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

- possible trade-offs between capex and opex
- any differences between the capitalisation policies applied in the 2013–17 and 2018–22 access arrangement periods
- the growth in the price of labour forecast for opex and capex.

6.4 Reasons for draft decision

6.4.1 Conforming capital expenditure for 2012–16

AusNet has proposed net capex of \$561.0 million for the 2012–17 period, where capex in 2017 is an estimate. Without the estimate of capex for 2017, AusNet has proposed \$463.4 million as conforming capex. We accept \$463.4 million as conforming capex for 2012–16, and will assess whether capex incurred in 2017 is conforming in the next review.

In reaching this view we have considered the following factors:

- AusNet's capex was \$21.3 million (27 per cent) over the Essential Services Commission approved amount of \$78.5 million (\$2017) for 2012.
- AusNet's capex was \$68.5 million (19 per cent) under the AER approved amount of \$432.1 million (\$2017) for 2013–16.
- The largest underspend in the 2012–16 period occurred in the mains replacement category, where AusNet spent \$27.8 million (\$2017) less than forecast. AusNet also spent \$25.5 million (\$2017) less than forecast on new customer connections.
- The largest overspend in the 2012–16 period occurred in the 'Other capex' category, where AusNet spent \$45.3 million (\$2017) more than forecast. AusNet submitted that the increase in gross capex was due to projects with substantial gifted assets as a result of the Regional Rail Link and Rees Road projects.¹⁸

6.4.2 Conforming capital expenditure for the 2018–22 access arrangement period

The following sets out our analysis of the capex drivers in coming to our decision to approve \$460.0 million (\$2017) of AusNet's proposed \$487.7 million (\$2017) total net capex for the 2018–22 access arrangement period as conforming capex under the NGR.¹⁹

¹⁸ AusNet Services, *Access Arrangement Information 2018-2022*, 21 December 2016, p. 105.

¹⁹ NGR, r. 79(1).

Mains replacement

Distribution mains are the pipes which convey gas to service pipes at each end user point. AusNet's distribution mains replacement program consists of proactive and reactive replacement programs, and involves the replacement of low and medium pressure mains.

We have included \$114.5 million (\$2017, unescalated direct costs) of mains replacement capex in our alternative estimate of total capex. This is 12.3 per cent less than AusNet's proposed forecast of \$130.6 million (\$2017, unescalated, direct costs) for its mains replacement program.

We have undertaken a technical review of the mains replacement program, which has drawn on both internal and external engineering and technical expertise.

For the reasons below, we are not satisfied that AusNet's proposed forecast capex of \$130.6 million for its mains replacement program is conforming capex. In particular, AusNet has not provided sufficient justification to satisfy us that its proposed forecast volume of mains replacement is required to minimise the risk of leaks as far as practicable. Based on the information before us, we have assessed that its forecast is not arrived at on a reasonable basis nor does it represent the best forecast possible in the circumstances.²⁰ We have therefore determined a forecast that we are satisfied is conforming capex and have included this in our alternative estimate of total capex.

Our analysis indicates that a replacement rate of 70 km per annum is conforming capex. We consider this represents an efficient level of forecast expenditure that is necessary to maintain and improve the safety of services and maintain the integrity of services.²¹ This provides a level of capex sufficient to manage current levels of network safety risk consistent with the conforming capex criteria. This is based on our assessment of the efficient level of replacement of main pipes over the 2018–22 access arrangement period and forecast volumes based on the leak rate data provided by AusNet.

We have applied AusNet's unit rates across all categories of mains replacement.

AusNet's proposal

AusNet proposed a forecast mains replacement expenditure of \$130.6 million (\$2017, unescalated direct costs). This is 20.6 per cent higher than the \$108.3 million (\$2017, direct costs) that AusNet incurred in the 2013–17 access arrangement period.²²

The two key components of AusNet's replacement program are:

²⁰ NGR, r. 74(2).

²¹ NGR, rr. 79(1)(b) and 79(2)(c)(i)(ii).

²² AusNet Services, *Access Arrangement Information 2018–2022*, 21 December 2016, p. 120.

- Low pressure mains replacement. AusNet proposed to replace 410 km (82 km per annum) of targeted and prioritised replacement, down from an average of 99 km per annum during the 2013–17 access arrangement period.
- Medium pressure mains replacement. AusNet proposed to replace 55 km (11 km per annum), targeting the replacement of unprotected steel networks and first generation polyethylene mains, down from 16 km per annum in the 2013–17 access arrangement period.²³

Whilst AusNet’s forecast replacement volumes are lower than in the 2013–17 access arrangement period, its average unit rate is higher. According to AusNet, the unit rate is higher because replacing low pressure mains in inner suburban areas and the Geelong CBD involves more complex delivery.²⁴

AusNet submitted that the proactive replacement of ageing/deteriorating gas distribution mains to reduce leakage rates is central to the provision of safe and reliable network services.²⁵ To assess this risk AusNet has considered the leak incidence per kilometre of mains and services.²⁶ In support of its proposal, AusNet provided its:

- mains and services strategy document,
- gas maintenance plan,
- gas safety case summary, and
- in response to information requests, current status of mains replacement in the 2013–17 access arrangement period and unit rate estimates.

Our assessment

In our view, AusNet’s proposed mains replacement capex is justified on the grounds that it is necessary to maintain and improve the safety of services and maintain the integrity of services.²⁷ However, we assess that AusNet’s proposed \$130.6 million (\$2017, unescalated, excluding overheads) is not that which 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 therefore not conforming capex.²⁸

Our forecast for mains replacement capex over the 2018–22 access arrangement period is \$114.5 million (\$2017, unescalated, excluding overheads). This represents our:

²³ AusNet Services, *Access Arrangement Information 2018–2022*, 21 December 2016, p. 120.

²⁴ AusNet Services, *Access Arrangement Information 2018–2022*, 21 December 2016, p. 120.

²⁵ AusNet Services, *Access Arrangement Information 2018–2022*, 21 December 2016, p. 119.

²⁶ AusNet Services, *Access Arrangement Information 2018–2022*, 21 December 2016, p. 119.

²⁷ NGR, rr. 79(1)(b) and 79(2)(c)(i)(ii).

²⁸ NGR, r. 79(1)(a).

- conclusion that forecast replacement volumes for low pressure mains of 350 km (an average of 70 km of low pressure mains replacement per annum), not 410 km as proposed by AusNet, represents the best forecast possible in the circumstances
- acceptance of AusNet's proposed replacement volumes for medium pressure mains of 55 km, and
- acceptance of AusNet's unit rates across all categories of mains replacement.

Volumes

Low pressure to high pressure mains replacement

We reviewed AusNet's historical leak rates from 2002 to 2016.²⁹ The historical leak rates that AusNet submitted reveal that it has generally maintained leak rates on its low pressure network over the period 2002 to 2016. Notably, the data reveals the following:

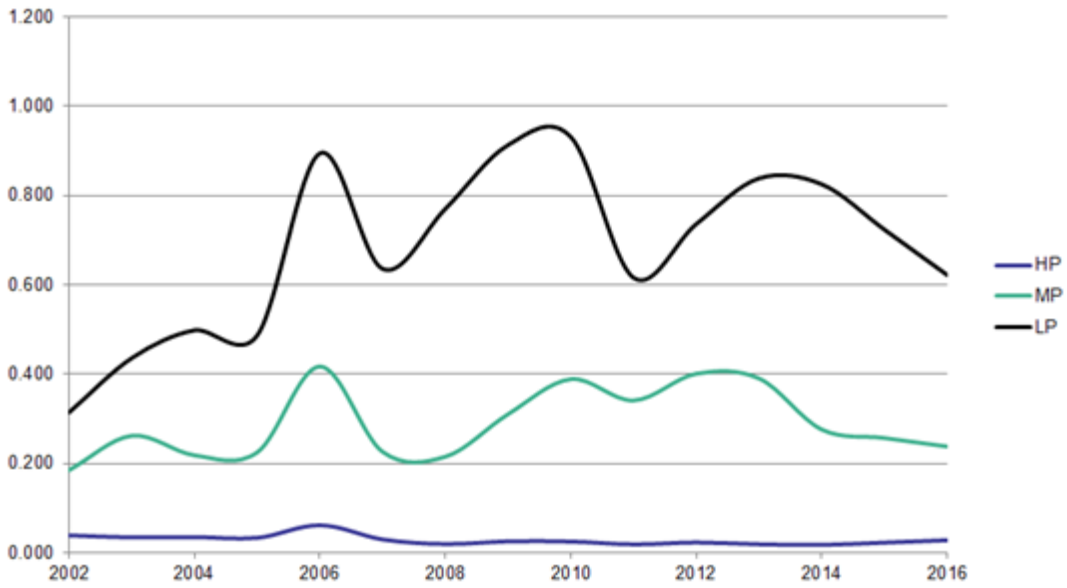
- a 55 per cent reduction in leak rates over the period 2009 to 2016,
- leak rates have improved over the last three years, and
- cast iron pipes have the highest leak rate).³⁰

This is illustrated in Figure 6.1 (leak rates across pressure types), Figure 6.2 (leak rates for the whole network) and Figure 6.3 (leak rates by material type). Figure 6.3 also supports AusNet prioritising the replacement of cast iron mains (followed by un-coated steel mains), over mains of other material types.

²⁹ Initially AusNet provided data from 2002 to 2014, however, in response to our information request AusNet updated its leak data to include 2015 and 2016: AusNet Services, *Response to information request 13*, 11 April 2017.

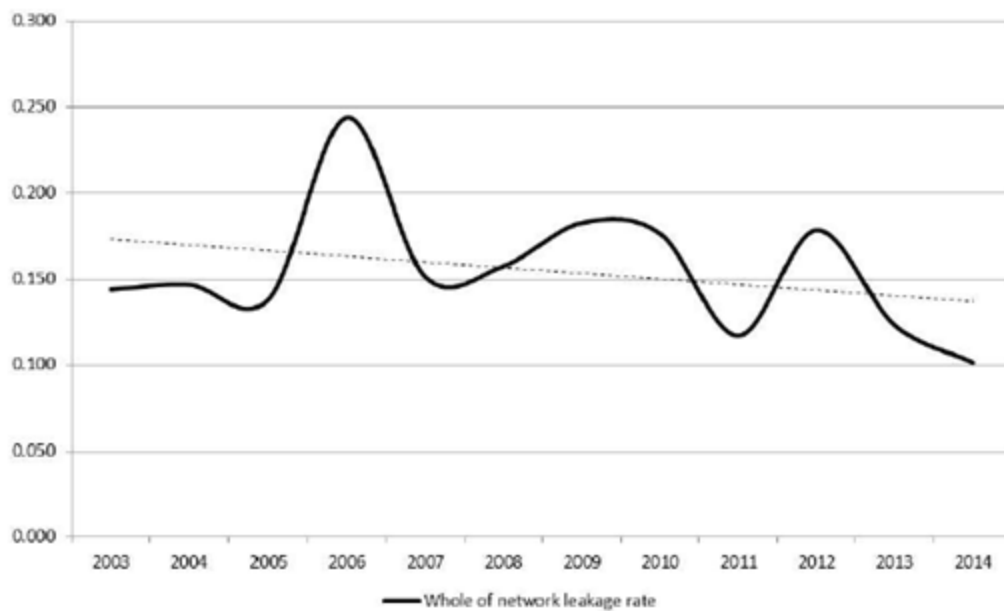
³⁰ AusNet Services, *Access Arrangement Information 2018–2022*, 21 December 2016, p. 121.

Figure 6.1 Mains leak incidence rate by pressure classification (leaks per kilometre)



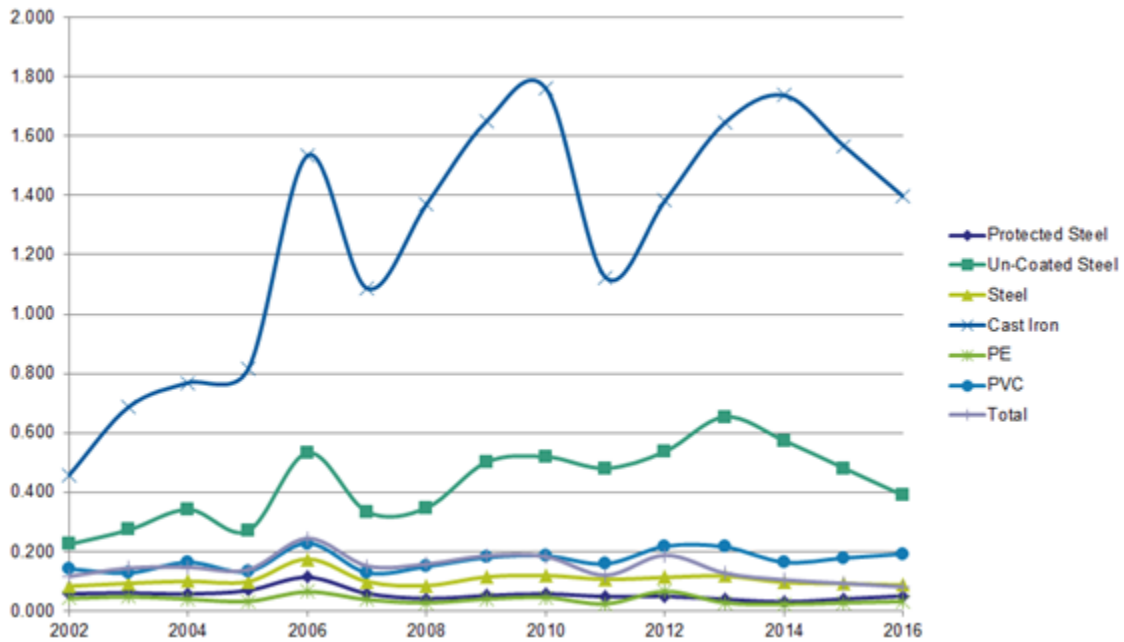
Source: AusNet Services, *Response to information request 13*, 11 April 2017.

Figure 6.2 Mains leak rate, whole network (leaks per kilometre)



Source: AusNet Services, *Response to information request 13*, 11 April 2017.

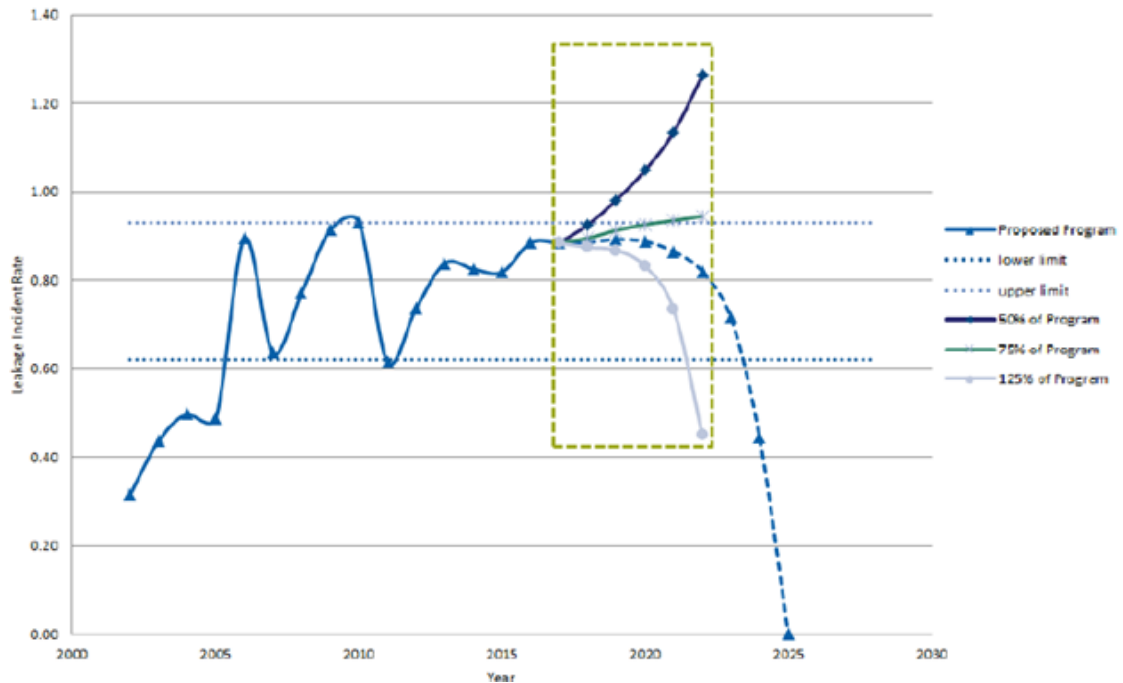
Figure 6.3 Mains leakage rate by material type



Source: AusNet Services, *Response to information request 13*, 11 April 2017.

Figure 6.4 shows the leak rate from four low pressure mains replacement volumes.

Figure 6.4 Proposed low pressure replacement profile



Source: AusNet Services, *Appendix 6E - Mains and services strategy*, 21 November 2016, p. 24 (updated in AusNet Services, *Response to information request 13*, 11 April 2017).

Figure 6.4 also shows AusNet's lower and upper limit leakage incident rate and that its proposed program noticeably reduces leakage incidents. It also shows the sensitivity of leakage incidents to different volumes of replacement.

Our consultant, Zincara assessed that if AusNet proceeded with a replacement rate of 70 km per annum (equating to 350 km over the 2018–22 access arrangement period) it would be able to maintain the safety risk of the network.³¹

We consider a replacement volume that maintains the current leakage rate provides a reasonable basis on which to forecast replacement. The information provided to us indicates that Zincara's assessment of a replacement rate of 70 km per annum is the best possible estimate of the level of forecast conforming capex required to manage current levels of network safety risk. We therefore have adjusted the forecast to reflect what 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. In our view, this equates to 350 km over the 2018–22 access arrangement period.³²

Medium pressure mains replacement

AusNet submitted that its proposed medium pressure mains replacement addresses relatively higher risk assets than its low pressure mains replacement program. This is because the riskiest medium pressure mains exhibit similar leak rates to the low pressure network and, due to the high volume of gas released in a leak, the consequences of such leaks are higher.³³ Figure 6.5 below shows AusNet's relative risk weighting by pressure and material type.

³¹ Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. TBC.

³² Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. TBC.

³³ AusNet Services, *Access Arrangement Information 2018–2022*, 21 December 2016, p. 125.

Figure 6.5 Mains risk weighting by pressure and material type

Pressure Tier	Material	Length (km)	Ave Annual LIR (leaks / km)	Gas Flow Ratio	Risk Weighting
High Pressure	Steel Protected	2289	0.02	11.95	0.24
	PE	7055	0.02	11.95	0.24
Medium Pressure	Steel Protected	305	0.09	4.01	0.36
	Steel Unprotected	147	0.76	4.01	3.05
	PE	204	0.05	4.01	0.20
	Class 250 PE (P4)	39	0.95	4.01	3.81
Low Pressure	Steel Unprotected	70	0.46	1.00	0.46
	Cast Iron	266	1.07	1.00	1.07
	PVC	420	0.14	1.00	0.14
	PE	18	0.07	1.00	0.07

Source: AusNet Services, *Appendix 6E - Mains and services strategy*, 21 November 2016, p. 22.

Based on this weighting, AusNet's medium pressure mains identified for replacement must exhibit a leakage rate of two leaks per section of main over a four-year period.³⁴ AusNet noted that 27 per cent of its medium pressure network is made up of unprotected steel or class 250 polyethylene mains which exhibit the highest risk weighting of all mains.³⁵ Further, AusNet identified 24 km of medium pressure mains that are the worst performing mains on its network.³⁶

For its medium pressure mains replacement program AusNet proposed to replace 55 km of mains with:

- 18 km as part of a like with like approach, and
- 37 km as part of a block renewal approach, with 7 km related to the worst performing mains.

In response to an information request, AusNet submitted that applying its block renewal approach (which includes replacing mains that pose less of a safety risk) is more efficient than for AusNet to replace only the 24 km of worst performing mains. Specifically, AusNet explained that the bulk replacement approach aims to both

³⁴ AusNet Services, *Access Arrangement Information 2018–2022*, 21 December 2016, p. 128.

³⁵ AusNet Services, *Access Arrangement Information 2018–2022*, 21 December 2016, p. 129.

³⁶ AusNet Services, *Access Arrangement Information 2018–2022*, 21 December 2016, p. 129.

remove the identified high risk mains, as well as target the surrounding high risk first generation polyethylene mains Class 250 PE.³⁷

AusNet also explained that it identifies high-risk mains (two leaks on a main in four years) before determining the most efficient program delivery to replace the mains. In this case, AusNet provided the results of an NPV analysis that concluded that the block replacement approach is more cost effective than maintaining these assets through maintenance activities.³⁸ Zincara reviewed the NPV analysis and agrees with this conclusion.³⁹

On the basis of the information before us, AusNet’s proposed forecast replacement volumes of 55 km for medium pressure mains is arrived at on a reasonable basis and represents the best forecast possible in the circumstances.⁴⁰

Unit rates

To forecast unit rates, AusNet undertook an analysis at the individual post code level taking into account location conditions such as traffic and ground conditions. Table 6.6 shows AusNet's forecast unit rates for its low pressure and medium pressure programs.

Table 6.6 Low pressure and medium pressure unit rates (\$2017)

	2018	2019	2020	2021	2022
Low pressure	\$284	\$266	\$276	\$235	\$223
Medium pressure	\$303	\$283	\$299	\$361	\$499

Source: AusNet Services, *Appendix 6E: Mains and services strategy*, 21 December 2016, p. 38 (updated in AusNet Services, *Response to information request 3*, 21 February 2017).

AusNet proposed a unit rate profile for its low pressure mains replacement that increases in the first few years of the period and then decreases. This is due to the proposed completion of complex inner suburban postcodes. Once these complex postcodes are complete AusNet submitted that its unit rates will decrease as the program moves into regional towns. However, compared to the block renewal approach, AusNet submitted that it expects medium pressure unit rates to increase as it moves to the more expensive like for like replacement.⁴¹

³⁷ AusNet Services, *Response to information request 13*, 11 April 2017, p. 6.

³⁸ AusNet Services, *Response to information request 13*, 11 April 2017, p. 6.

³⁹ Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. 52.

⁴⁰ NGR, r. 74(2).

⁴¹ AusNet Services, *Appendix 6E: Mains and services strategy*, 21 November 2016, p. 31.

AusNet's unit rates are based on historical data where replacements have been undertaken recently. Where no historical data is available, AusNet estimates unit rates taking into account local complexities.⁴² In response to an information request, AusNet:

- submitted further information about its new low pressure mains replacement contracts and additional calculations on how it estimated unit rates,
- clarified that its medium pressure unit rate for 2022 should be \$499 per metre instead of \$338 per metre⁴³ and,
- provided updated contract information which reflected negotiations that took place after it submitted its initial proposal and potential new tendered unit rates (which were not reflected in its initial proposal).

We expect the outcomes of any new tendered unit rates to be reflected in AusNet's revised access arrangement proposal.

Zincara advised that AusNet's proposed unit rates are reasonable. On the basis of Zincara's advice and the other information before us, we consider AusNet's forecast unit rates represent the best forecast possible in the circumstances.⁴⁴

Connections

Distribution businesses have a regulatory obligation to make a connection offer to residential and commercial/industrial customers making application to connect to its distribution network.⁴⁵

Connections capex is usually forecast by categorising connections into Tariff V (residential customers, and small commercial and industrial (I&C) customers⁴⁶) and Tariff D (large I&C customers⁴⁷). Residential customers can be disaggregated further into existing homes⁴⁸, new estates, and medium/high density (or multi-user) dwellings.

For each connection type (overall residential, new home, I&C etc.), connections capex is derived by multiplying the forecast unit rate for that connection type by the forecast volume of new connections.

We have included \$191.2 million (\$2017, unescalated direct costs) of connections capex in our alternative estimate. We consider that this amount is conforming capex.⁴⁹ This is lower than AusNet's forecast capex of \$193.8 million (\$2017, unescalated direct

⁴² AusNet Services, *Appendix 6E: Mains and services strategy*, 21 November 2016, pp. 31-33.

⁴³ AusNet Services, *Response to information request 3*, 21 February 2017, p. 12.

⁴⁴ NGR, r. 74(2).

⁴⁵ NGR, r. 119S, for basic and standard connections and NGR, r. 119V, for negotiated connections.

⁴⁶ I&C customers are generally classified under Tariff V if they consume less than 10 TJ of gas per year.

⁴⁷ I&C customers are generally classified under Tariff D if they consume more than 10 TJ of gas per year.

⁴⁸ Connections to existing homes are sometimes referred to as an 'electricity-to-gas' connections, whereby households be replace electric appliances with gas equivalents and require connection to the gas distribution network.

⁴⁹ NGR, r. 79(1).

costs). Our reduction of 1.4 per cent reflects that we have approved total opex that does not include AusNet's proposed forecast opex for its marketing program.

We have assessed whether AusNet's proposed forecast connection volumes and unit rates are reasonable and the best forecasts possible in the circumstances as part of arriving at our position on conforming capex in this draft decision.⁵⁰

Volumes

Based on all the information before us, including a review from our consultant ACIL Allen, we accept the methodology used to forecast connection volumes on AusNet's network.⁵¹ However, we do not accept the additional connection volume associated with AusNet's proposed marketing program.

AusNet engaged the Centre for International Economics (CIE) to forecast connection volumes on its network. Attachment 13 sets out CIE's forecasting methodology for Tariff V connection volumes. The attachment also sets out the reasons for accepting CIE's methodology.

In summary, AusNet forecasts an increase in total net residential and I&C connections of 2.11 and 0.97 per cent per annum respectively.⁵² These forecast growth rates are similar to the 2.09 per cent (residential) and 1.01 per cent (I&C) growth experienced during the current access arrangement period.

While forecast net connections are relevant for demand forecasting purposes, forecast gross connections (that is, net connections plus disconnections) are used to determine connections capex.⁵³ We are satisfied that CIE's methodology for forecasting gross connections using an average of the historical disconnection rate is arrived at on a reasonable basis.

Figure 6.6 shows the historical trend and forecasts of AusNet's residential and I&C connections. Residential connections make up the vast majority of total connections, and are forecast to steadily increase over the 2018–22 access arrangement period, only to fall marginally in 2022. I&C connections are expected to remain stable at approximately 280 connections per year.

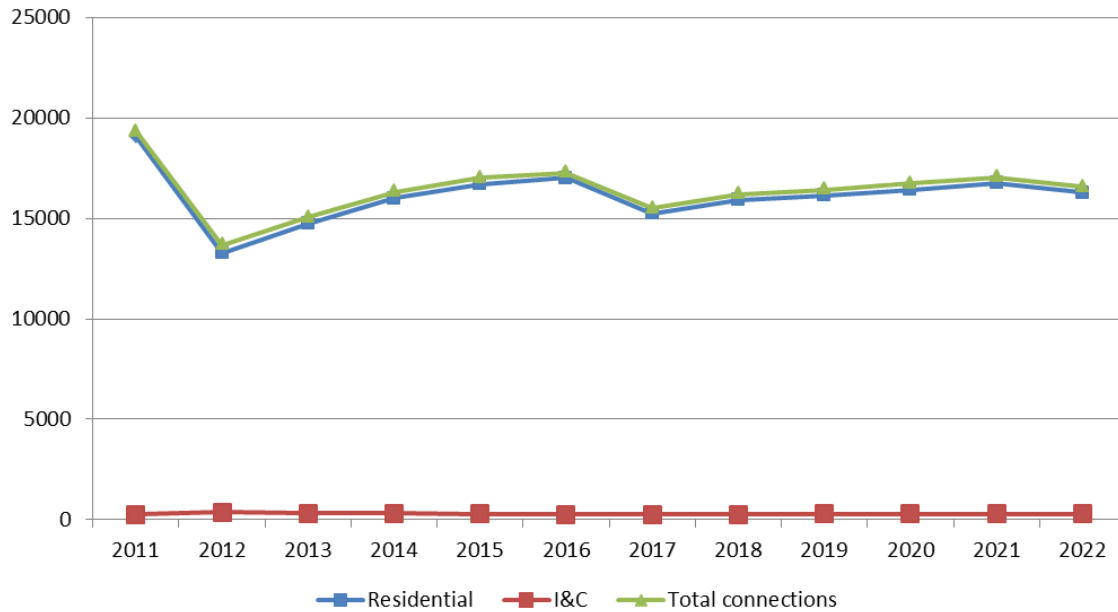
⁵⁰ NGR, r. 74(2).

⁵¹ ACIL Allen, *Review of demand forecasts for AusNet Services*, May 2017, p. 16.

⁵² AusNet Services, *Access Arrangement Information 2018-2022*, 21 December 2016, p. 52; AER Analysis of AusNet's reset RIN.

⁵³ AusNet makes a post-model adjustment to its net customer growth forecast to calculate gross connections. CIE calculates this by adding the number of disconnections to net customer growth. Forecast disconnections are derived using the average disconnection rate from the last three years. See AusNet Services, *Access Arrangement Information 2018-2022*, 21 December 2016, pp. 60-61.

Figure 6.6 AusNet's historical and forecast Tariff V connection volumes



Source: AusNet Services, *Response to information request 1*, 1 February 2017; AER analysis.

AusNet's proposal incorporates additional capex associated with its proposed joint marketing program for an additional 264 connections per year above CIE's forecast.⁵⁴

As set out in Attachment 7, our position in this draft decision is that the total opex we approve does not include AusNet's forecast opex for its proposed marketing program. We have assessed the impact of the proposed marketing campaign on AusNet's forecast connection volumes and associated capex. Consistent with our opex decision, we have removed the additional connections from our alternative estimate, which lowers our forecast capex by \$2.6 million (\$2017, unescalated). We are satisfied that AusNet's connections forecast, absent the additional connections associated with the marketing program, is arrived at on a reasonable basis and represents the best forecast possible in the circumstances, and is consistent with the conforming capex criteria.⁵⁵

Unit rates

We have reviewed AusNet's forecast methodology and proposed unit rates for residential of \$2,033 and I&C connections of \$23,296 (\$2017, including escalation) and

⁵⁴ AusNet Services, *Access Arrangement Information 2018-2022*, 21 December 2016, pp.75-76; AusNet Services, *Appendix 7D: Axiom Economics - Consistency of Victorian gas distribution businesses joint marketing campaign with rule 91 of the NGR*, 20 December 2016, p. 60.

⁵⁵ NGR, rr. 74(2) and 79(1).

are satisfied that they are arrived at on a reasonable basis and represent the best forecasts possible in the circumstances.⁵⁶

To forecast its unit rates, AusNet applied a four-year weighted average of its actual and expected unit rates for the years 2013 to 2016. From May 2015, AusNet deployed a new Enterprise Resource Planning system and classified contractor support costs as direct costs rather than as overheads.⁵⁷ Its reported actual unit rates prior to 2016 have therefore been normalised to include the historical support costs in direct capex, which have increased these historical unit rates.⁵⁸ AusNet submitted that its proposed unit rates for residential and I&C connections are in line with the average normalised unit rates from 2013–16 of \$2,029 and \$23,509 (\$2017, including escalation) respectively.⁵⁹

We reviewed AusNet's normalisation methodology and its use of a historical four-year average. We are satisfied that its historical unit rates have been normalised appropriately and recognise that the proposed unit rates reflect the most recent awarded contract for laying mains and service installation. Further, we also took account of the following:

- the historical unit rates used to derive forecast unit rates reflect the rates achieved by Downer, AusNet's connections contractor. Downer was appointed in 2013 following a competitive tendering process that commenced in 2011⁶⁰
- Zincara's advice that:
 - the higher unit rates in 2016 should be included in the averaging period because they are explained by the connection of new estates with a large supply mains and rocky conditions, conditions that are expected to reoccur in the 2018–22 access arrangement period⁶¹
 - AusNet's overall residential connection unit rate is lower compared to AGN and Multinet⁶²
- as AusNet submitted, unit rates based on a three, five or six-year average do not materially differ from the proposed four-year averaged approach⁶³
- AusNet's forecast unit rates are lower than the historical (2013–17) unit rate we approved,⁶⁴ once the change in contractor support cost allocation is accounted for.

⁵⁶ NGR, r. 74(2); AusNet Services, *Access Arrangement Information 2018-2022*, 21 December 2016, p. 136.

⁵⁷ AusNet Services, *Access Arrangement Information 2018-2022*, 21 December 2016, p. 115.

⁵⁸ AusNet Services, *Access Arrangement Information 2018-2022*, 21 December 2016, p. 136. As per our discussion on overheads below, AusNet's overheads forecast is significantly lower than current period levels as a consequence of the change in allocation of contractor support costs.

⁵⁹ AusNet Services, *Access Arrangement Information 2018-2022*, 21 December 2016, p. 136.

⁶⁰ AusNet Services, *Response to information request 1*, 1 February 2017, p.4.

⁶¹ Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. 39.

⁶² Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. 40.

⁶³ AusNet Services, *Response to information request 1*, 1 February 2017, p.4.

⁶⁴ AER – *AusNet final decision capex model (Confidential)*, 15 March 2013.

Contributions

We are satisfied that AusNet's forecast of customer contributions of \$20.8 million (\$2017), which includes contributions from I&C users (both Tariff V and D) and for major alterations, is arrived at on a reasonable basis and the best forecast possible in the circumstances.⁶⁵

AusNet submitted that it assumes that the customer will contribute 100 per cent of the project costs for a large project that the customer initiates.⁶⁶ These projects are Tariff D user connections or major alterations to the existing network (for example, requests from government). We consider that this assumption is reasonable.

AusNet assumes that Tariff V I&C customers will contribute 25 per cent of the cost of connection.⁶⁷ This is calculated by rounding up the four-year average of historical contributions from 2012 to 2015 of 22.6 per cent.⁶⁸ We queried AusNet on the use of a longer multi-year average unit rate, but accept that the differences between a four-year or longer average are immaterial. We are therefore satisfied that a four-year average of historical contributions from 2012 to 2015 is reasonable in estimating Tariff V I&C customer contributions over the 2018–22 access arrangement period.

Information and communication technology

We are not satisfied that AusNet's proposed \$57.0 million (\$2017, unescalated direct costs) for ICT capex is conforming capex. Our decision is to include \$54.9 million (\$2017, unescalated direct costs) in our alternative capex estimate of conforming capex.⁶⁹ Our alternative estimate does not include AusNet's proposed digital metering ICT costs but includes all of AusNet's other ICT projects.

AusNet's ICT program focuses on lifecycle replacement to keep existing systems operating. The program comprises the following seven 'domains':

- network management, to maintain network reliability and performance through automation of monitoring and responses, and performance visualisations; data consolidation; and safety;
- information management, to ensure robust management of networks and assets through improved data and analytics capabilities;

⁶⁵ Due to the structure of AusNet's capex model, any reduction of direct expenditure to any particular category shifts the allocation of total overhead costs to other categories. Consequently, our alternative forecast I&C (tariff V and D) connections capex inclusive of overheads is higher than AusNet's proposal. The customer contributions forecast is also affected by this modelling. Our draft decision approved customer contributions is therefore marginally higher than AusNet's proposal of \$20.7 million (\$2017, unescalated).

⁶⁶ AusNet Services, *Access Arrangement Information 2018-2022*, 21 December 2016, p. 149.

⁶⁷ AusNet Services, *Access Arrangement Information 2018-2022*, 21 December 2016, p. 149.

⁶⁸ AusNet Services, *Response to information request 1*, 1 February 2017, p.7.

⁶⁹ NGR, r. 79(1).

- metering and customer services, to meet customer demand for information and communication through a centralised customer relationship management solution and enhanced digital capabilities;
- works and asset management, to maintain network reliability by leveraging the EAM/ERP investment to rationalise, consolidate and optimise business processes;
- information security, to protect the distribution network, and customer and business information through enhanced 'protect and detect' capabilities;
- corporate, to leverage the EAM/ERP solution including providing a secure and consistent view of data throughout the organisation; and
- information technology, lifecycle refreshes of storage, enterprise server, desktop and laptop fleets; corporate network and communications; and investments in storage and visualisation enablement.⁷⁰

AusNet submitted that it has developed its ICT strategy for both its electricity and gas distribution and electricity transmission networks.⁷¹ We previously approved this ICT strategy in AusNet's electricity distribution and transmission determinations.⁷²

Further, we note five projects only concern AusNet's gas distribution network. Four projects are recurrent and one is non-recurrent which concerns digital metering. In response to an information request, AusNet provided its cost allocation between its three networks and cost benefit analysis for these projects.⁷³ These allocations are consistent with AusNet's electricity determinations.

The recurrent projects are consistent with AusNet's strategy of refreshing its operating systems. Our assessment of these projects and their associated business cases is that they constitute conforming capex. However, this is not the case for AusNet's proposed digital ICT metering project, which we consider is not prudent and efficient and does not constitute conforming capex. Our assessment of digital metering is discussed in our metering assessment below.

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. AusNet stated that its augmentation capex is necessary under the NGR because the Victorian Gas Distribution System Code (GDSC) mandates minimum pressure limits, and therefore the capex is required in order to comply with a regulatory obligation or requirement.⁷⁴

⁷⁰ AusNet Services, *Access Arrangement Information 2018–22*, 21 December 2016, p. 143.

⁷¹ AusNet Services, *Access Arrangement Information 2018–22*, 21 December 2016, p. 142.

⁷² AER, *Final decision AusNet Services distribution determination 2016–20 – Attachment 6 – Capital expenditure*, May 2016, p. 20.

⁷³ AusNet Services, *Response to information request 2*, 6 February 2017.

⁷⁴ NGR, r. 79(2)(c)(iii).

We are not satisfied AusNet's proposed capex for augmentation is conforming capex.⁷⁵ We have included \$13.1 million (\$2017, unescalated direct costs) of the proposed \$15.2 million for augmentation capex in our alternative capex forecast. As we discuss further below, we consider that the following is justified as conforming capex (\$2017, unescalated direct costs):

- \$4.6 million for the Waurrn Ponds augmentation
- \$2.0 million for the Werribee augmentation
- \$4.3 million for all other mains reinforcement projects
- \$2.1 million for upgrades to existing facilities.

However, we are not satisfied AusNet's proposed \$2.1 million (\$2017, unescalated direct costs) for the St Leonards augmentation is conforming capex, because it will not be required in the 2018–22 access arrangement period.

We assessed AusNet'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 is that which a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services would incur.⁷⁶ We also sought advice from Zincara and further information from AusNet. Specifically, we considered:

- the capacity shortfall and/or projected growth demonstrating the requirement for the augmentation
- whether AusNet 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.

Three projects make up \$8.8 million (or 58 per cent) of AusNet's augmentation capex forecast of \$15.2 million. Our assessment of these projects is set out below.

Waurrn Ponds

We are satisfied that the proposed capex for the Waurrn Ponds augmentation is conforming capex.

AusNet proposed \$4.6 million (\$2017) to install a city gate and reinforce the transmission network at Waurrn Ponds. AusNet submitted that this will ensure that system pressures are maintained above 140 kPa as required by the GDSC.⁷⁷ We

⁷⁵ NGR, r. 79(2)(c).

⁷⁶ NGR, r. 79(1)(a).

⁷⁷ AusNet Services, *Response to information request 3*, 21 February 2017.

previously approved this in the 2013–17 access arrangement. AusNet forecasts it will spend a further \$1.5 million (\$2017) on the main and city gate in 2017.

In response to a request for further information, AusNet provided an augmentation project analysis that included winter testing and real-time SCADA data.⁷⁸ This revealed that fringe pressures will continue to deteriorate due to the projected growth around Torquay and Jan Juc. AusNet also submitted that this project depends on APA VTS extending the South-West Pipeline by 15 km (which we are satisfied constitutes conforming capex).⁷⁹

Zincara advised that the proposed augmentation is prudent in light of the previous expenditure approved for the project, the benefits in terms of security of supply at the southern fringe and the additional capacity it will provide for the Geelong network. Zincara also advised that the proposed \$4.6 million is efficient and in line with that which was previously approved.⁸⁰ Based on the available information and Zincara's advice, we are satisfied that this project is justified on the grounds of maintaining the integrity and safety of services.⁸¹

Werribee

We are satisfied that the proposed capex for the Werribee augmentation is conforming capex.

AusNet proposed \$2.0 million (\$2017) to install a city gate and a large-diameter supply main at Werribee.⁸² AusNet submitted that this is required to ensure pressures in the Werribee and western suburbs growth area comply with GDSC requirements.⁸³ This will also increase capacity for 1 160 customers located at the fringes of the network and the western growth corridor.

In response to a request for further information, AusNet provided an augmentation project analysis that included fringe winter testing undertaken in 2016 and network modelling showing areas of poor supply.⁸⁴ Zincara advised that ensuring pressures comply with the required minimums is prudent, and the network modelling indicates that these requirements will not be met in 2018. Zincara also advised that the proposed \$2.0 million is within the range of a small city gate and is efficient.⁸⁵ Based on the available information and Zincara's advice, we are satisfied that this project is justified on the grounds of maintaining the integrity and safety of services.⁸⁶

⁷⁸ AusNet Services, *Response to information request 1*, 1 February 2017.

⁷⁹ AER, *Draft decision APA Victorian Transmission System 2018–22 – Attachment 6 – Capital expenditure*, July 2017.

⁸⁰ Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. 32.

⁸¹ NGR, rr. 79(1)(b), 79(2)(c)(i) and 79(2)(c)(ii).

⁸² AusNet proposed \$1 million (\$2017) of additional capex for the new city gate in 2017.

⁸³ AusNet Services, *Response to information request 3*, 21 February 2017.

⁸⁴ AusNet Services, *Response to information request 1*, 1 February 2017.

⁸⁵ Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. 20.

⁸⁶ NGR, rr. 79(1)(b), 79(2)(c)(i) and 79(2)(c)(ii).

St Leonards

We are not satisfied that the proposed capex for the St Leonards augmentation is conforming capex.

AusNet proposed \$2.1 million (\$2017) to install a new city gate and large diameter supply main to provide additional capacity to St Leonards. AusNet submitted that will ensure pressures to around 750 customers are maintained above GDSC requirements.⁸⁷

In response to a request for further information, AusNet provided an augmentation project analysis that included winter testing and real-time SCADA data.⁸⁸ This revealed that pressures below 100kPa were experienced during the winter of 2016.

Zincara advised that AusNet has not proposed to reinforce the network until 2022, when its network modelling indicates network pressures of 141kPa would be reached (marginally above that specified in the GDSC). This is later than Zincara would have expected given pressures experienced in the winter of 2016. However, Zincara also advised that this project is not necessary in the 2018–22 access arrangement period because the predicted pressures in 2022 are above the minimum pressures required by the GDSC.⁸⁹ Based on the available information and Zincara's advice, we are not satisfied that this project is justified on the grounds of maintaining the integrity and safety of services.⁹⁰

Other projects

AusNet proposed several other augmentation projects. This includes \$4.3 million for mains reinforcements in Bendigo, Craigieburn, Sunbury, Warrnambool, Bacchus Marsh, Sunshine, and the Macedon Ranges, and \$2.1 million to upgrade existing facilities in Werribee, Point Henry and Melton.

In response to a request for further information, AusNet provided for each proposed project, network planning reports and risk assessments.⁹¹ Zincara reviewed this information and advised that the proposed costs are prudent and efficient.⁹² Based on the available information and Zincara's advice, we are satisfied that these projects are justified on the grounds of maintaining the integrity of services.⁹³

⁸⁷ AusNet Services, *Response to information request 3*, 21 February 2017.

⁸⁸ AusNet Services, *Response to information request 1*, 1 February 2017.

⁸⁹ Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. 29.

⁹⁰ NGR, rr. 79(1)(b), 79(2)(c)(i) and 79(2)(c)(ii).

⁹¹ AusNet Services, *Response to information request 3*, 21 February 2017.

⁹² Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. 34.

⁹³ NGR, rr. 79(1)(b), 79(2)(c)(i) and 79(2)(c)(ii).

Meter replacement

Meter replacement is an ongoing activity which is necessary to ensure that gas meters in the field are replaced when they fail to accurately read data. AusNet has regulatory obligations to manage the integrity of meters and ensure they operate within the prescribed tolerance band for metering accuracy.⁹⁴

AusNet calculated meter replacement expenditure for two general classes of meters: domestic meters, and industrial and commercial meters. It derived expenditure using forecast unit rates and volumes. AusNet also proposed to undertake a digital metering program.

Based on all the information before us, we are not satisfied AusNet's proposed \$32.4 million for meter replacement is conforming capex.⁹⁵ We have included \$28.3 million (\$2017, unescalated direct costs) of meter replacement expenditure in our alternative capex forecast. Most of AusNet's proposal is conforming capex and we are satisfied that the proposed unit rates for industrial and commercial meter replacement and volumes of meter replacements are arrived at on a reasonable basis and represent the best forecasts possible in the circumstances. However:

- the proposed unit rates for domestic meter replacements are not acceptable because AusNet can incur lower costs by using new and refurbished meters. We have therefore not included in our alternative capex estimate \$2.4 million (\$2017, unescalated direct costs) of capex proposed by AusNet for meter replacement.
- the proposed capex for the digital metering program is not conforming capex. We have therefore not included in our alternative capex estimate \$1.7 million (\$2017, unescalated direct costs) of capex proposed by AusNet for meter replacement.

Our assessment of these projects is set out below.

Meter replacement programs

Using information on the age of its meter fleet, the types of meters and the most recent test results, AusNet estimated that 169 158 domestic meter replacements and 3 333 commercial meter replacements will be required in the 2018–22 access arrangement period. AusNet proposed to smooth its meter replacement program to avoid resourcing pressures and significant variations in unit rates.⁹⁶

Zincara advised that AusNet's meter replacement program is in accordance with good industry practice and in line with historical performance.⁹⁷ Based on Zincara's advice, we are satisfied that AusNet's forecast volume of meter replacements is arrived at on a reasonable basis and represents the best forecast possible in the circumstances.

⁹⁴ Under the *National Measurement Act 1960* (Commonwealth) and the *Victorian Gas Distribution System Code*.

⁹⁵ NGR, r. 79.

⁹⁶ AusNet Services, *Appendix 6G – Meter Management Strategy*, 22 November 2016, p. 28.

⁹⁷ Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. 75.

AusNet submitted that it only uses refurbished meters at industrial and commercial sites, where the cost savings outweigh any additional whole of life costs associated with refurbished meters. All domestic meters that are removed from the field are replaced with new meters and not refurbished. AusNet submitted this is driven by results from whole of life cost analysis that compares the cost of a new and refurbished meter over several replacement cycles.⁹⁸

The sensitivity analysis submitted by AusNet demonstrates that over the 'whole of life' refurbished meters are more expensive than new meters, other than when:

- a 20 or 25 year time period is considered (1 meter replacement) – AusNet submitted that this period is not representative of the replacement lifecycle in understanding "real" whole of life costs; or
- a more aggressive failure rate for refurbished meters is considered (failures with no extensions after 15 years) – AusNet submitted that this is unlikely based on current meter performance.⁹⁹

Zincara advised that the sensitivity analysis is inconclusive because of the many underlying variables and assumptions involved. Zincara considered that there is a capex impact in the short term, and certainly during the next access arrangement period, which increases the material costs of all programs where domestic meter replacements occur.¹⁰⁰

Based on Zincara's advice, a 20 or 25 year time period is enough to assess meter replacement costs. Gas customers should also not be paying more than is necessary for a potential future benefit that depends on several unpredictable assumptions. Further, a lower average unit rate can be achieved by using a combination of new and refurbished meters. We are therefore not satisfied that AusNet's forecast of unit rates for domestic meter replacements is arrived at on a reasonable basis nor does it represent the best forecast or possible in the circumstances.¹⁰¹

Using AusNet's sensitivity analysis and its current and forecast meter costs, we have determined that refurbished meters are cheaper than new meters, and have accordingly calculated lower unit rates. By applying the new unit rates to 55 per cent of meters (the proportion of meters refurbished in AusNet's 2015 meter replacement program) we have included in our alternative estimate, meter replacement forecast capex that is \$2.4 million (\$2017) less than AusNet's proposal. We are satisfied that this amount is conforming capex.

⁹⁸ AusNet Services, *Appendix 6G – Meter Management Strategy*, 22 November 2016, p. 17.

⁹⁹ AusNet Services, *Response to information request 1*, 1 February 2017.

¹⁰⁰ Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. 76.

¹⁰¹ NGR, r. 74(2).

Digital metering program

AusNet proposed \$1.7 million (\$2017) to undertake a digital metering program and \$2.2 million of associated IT capex. AusNet submitted that to optimise performance and understand the full implications of introducing a digital metering fleet, an investigation is proposed to test the capability of the new metering technology.¹⁰²

AusNet considered three potential options before undertaking a trial, namely:

- leveraging existing smart meter communications infrastructure and technology solutions
- retrofitting the existing meter fleet
- gradual replacement of the existing meter fleet with smart meter alternatives.

AusNet submitted that the forecast capex for the digital metering program is justified because it has the potential to result in long-term improvements in operational efficiency and, hence, will achieve the lowest sustainable cost of providing metering services. AusNet also submitted that it may justify future investment that is necessary to maintain and improve the safety of services.¹⁰³

In response to an information request about this proposal, AusNet provided a discussion paper titled "Smart Gas Meter considerations and prospective trials". Whilst the paper listed a number of potential benefits associated with digital gas meters, the only quantifiable benefit it referred to was the cost savings associated with eliminating manual meter readings.

Zincara advised AusNet's proposal is not sufficiently advanced to warrant a field trial during the 2018–22 access arrangement period. Based on the available information and Zincara's advice, we are not satisfied that AusNet's proposal constitutes conforming capex.¹⁰⁴ We have therefore not included \$1.7 million (\$2017) in our alternative capex forecast.

Other capex

AusNet proposed \$34.0 million (\$2017, unescalated direct costs) for other capex which includes:¹⁰⁵

- \$5.9 million for major network alterations initiated by third parties;
- \$12.8 million for consumer regulator replacement programs;
- \$7.7 million for heater and network regulator replacement programs;
- \$5.7 million for SCADA and cathodic protection capital works;

¹⁰² AusNet Services, *Access Arrangement Information 2018–22*, 21 December 2016, p. 138.

¹⁰³ AusNet Services, *Response to information request 1*, 1 February 2017.

¹⁰⁴ NGR, r. 79.

¹⁰⁵ AusNet Services, *Access Arrangement Information 2018–22*, 21 December 2016, p. 144.

- \$1.9 million for general non-network expenditure (e.g. motor vehicles, telecommunications equipment, etc.).

We are satisfied that AusNet's proposal constitutes conforming capex and have included \$34.0 million in our alternative capex forecast. Our assessment of this capex is set out below.

Major alterations

AusNet initially proposed \$11.1 million (\$2017, unescalated direct costs) for major alterations, then subsequently revised this to \$5.9 million to correct a modelling error.¹⁰⁶ AusNet submitted that it assumes these costs will be recovered through customer contributions, and therefore this proposal does not affect has no effect on reference tariffs.

Consumer regulators

AusNet proposed \$12.8 million (\$2017, unescalated direct costs) for consumer regulators. This relates to both the proactive and reactive replacement of domestic regulators and industrial and commercial regulator stations, which AusNet submitted is required to maintain network safety.¹⁰⁷

Zincara advised that AusNet's proposal is prudent and efficient. Zincara also advised that AusNet should closely monitor the new domestic regulator replacement program to determine its effectiveness in reducing leakage rates, and this program should be reassessed in the future.¹⁰⁸ Based on the available information and Zincara's advice, we are satisfied that this project is justified on the grounds of maintaining the integrity and safety of services.¹⁰⁹

Network regulators

AusNet proposed \$7.7 million (\$2017, unescalated direct costs) for network regulators. This relates to the replacement of field regulators, city gates and heaters, as outlined in AusNet's Network Regulator Strategy. As with consumer regulators, AusNet submitted this is required to maintain network safety.¹¹⁰

Zincara advised that AusNet's identification of the equipment to be replaced is targeted and prudent and the proposed costs are efficient.¹¹¹ Based on the available information and Zincara's advice, we are satisfied that this project is justified on the grounds of maintaining the integrity of services.¹¹²

¹⁰⁶ AusNet Services, *Response to information request 8*, 2 March 2017.

¹⁰⁷ AusNet Services, *Appendix 6F – Consumer Regulators Strategy – Public*, 23 November 2016, p. 7.

¹⁰⁸ Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. 69.

¹⁰⁹ NGR, rr. 79(1)(b), 79(2)(c)(i) and 79(2)(c)(ii).

¹¹⁰ AusNet Services, *Appendix 6D – Network Regulator Strategy – Public*, 23 November 2016, p. 8.

¹¹¹ Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. 63.

¹¹² NGR, rr. 79(1)(b), 79(2)(c)(i) and 79(2)(c)(ii).

SCADA and cathodic protection

AusNet submitted that the SCADA system is required to monitor and control assets across its network from the transmission system to the network fringe. The system provides data on the real-time performance of the assets and to evaluate gas demand and network performance to identify potential system deficiencies in the long-term.¹¹³

AusNet proposed \$3.7 million (\$2017, unescalated direct costs) for SCADA projects. In response to our information request, AusNet provided further information on its proposed volumes and unit rates.¹¹⁴ Zincara advised that each of the SCADA projects is prudent and efficient.¹¹⁵

Taking this information into account, we are satisfied that AusNet's proposed volumes and unit rates are arrived at on a reasonable basis and the best forecasts possible in the circumstances.¹¹⁶ We are also satisfied that AusNet's proposal is justified on the grounds of maintaining the safety and integrity of services and therefore constitutes conforming capex.¹¹⁷

AusNet proposed \$2.0 million (\$2017, unescalated direct costs) for cathodic protection upgrades, relating to corrosion protection and surge protection.¹¹⁸ AusNet submitted further details of its proposed works program in its Corrosion Protection Strategy.¹¹⁹ This is a routine activity and we are satisfied it is justified on the grounds of maintaining the safety and integrity of services and constitutes conforming capex.¹²⁰

Non-network expenditure

AusNet proposed \$1.9 million (\$2017, unescalated direct costs) for other non-network expenditure. This proposal is in line with historical expenditure. We are satisfied it is justified on the grounds of maintaining the safety and integrity of services and constitutes conforming capex.¹²¹

Overheads

Overheads are costs that are not directly attributable to the output of distribution businesses but are necessary to support their operations. Examples of overhead costs include network planning, procurement and human resources.

¹¹³ AusNet Services, *Access Arrangement Information 2018–22*, 21 December 2016, p. 147.

¹¹⁴ AusNet Services, *Response to information request 11*, 24 March 2017.

¹¹⁵ Zincara, *AER Access Arrangement 2017 – AusNet*, June 2017, p. 87.

¹¹⁶ NGR, r. 74(2).

¹¹⁷ NGR, r. 79.

¹¹⁸ AusNet Services, *Access Arrangement Information 2018–22*, 21 December 2016, pp. 148-149.

¹¹⁹ AusNet Services, *Appendix 6H – Corrosion Protection Strategy – Public*, 23 November 2016.

¹²⁰ NGR, r. 79.

¹²¹ NGR, r. 79.

We are satisfied AusNet's capex forecast for overheads is conforming capex. We have included \$34.6 million (\$2017, unescalated direct costs) of overheads expenditure in our alternative capex forecast.

AusNet forecasts fixed capitalised overheads amounts for network and IT capex based on its average overheads between the years 2013 to 2016. These amounts have been converted into network and IT overhead rates using the forecasts of network and IT capex, which have then been applied to the respective direct capex forecasts.

The overheads forecast is significantly lower than the overheads AusNet incurred during the 2013–17 access arrangement period. AusNet also submitted that in April 2015, it deployed a new Enterprise Resource Planning system which classifies contractor support costs as direct costs. Prior to that time, these costs were allocated to overheads. In response to an information request about how this classification impacted its overheads forecast, AusNet provided the historical costs of its key contractor. AusNet has removed contractor costs from its historical costs for the purpose of forecasting capex overheads.

We are therefore satisfied that AusNet's forecast overheads are arrived at on a reasonable basis and the best estimate possible in the circumstances.¹²² We consider the proposed overheads capex is conforming capex.¹²³

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 2018–22, as set out in Table 6.2.
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¹²² NGR, r. 74(2).

¹²³ NGR, r. 79.