DRAFT DECISION
Australian Gas Networks (SA)
Access Arrangement

2021 to 2026

Attachment 5
Capital expenditure

November 2020

AUSTRALIAN ENERGY REGULATOR

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Note

This attachment forms part of the AER's draft decision on the access arrangement that will apply to Australian Gas Networks (SA) ('AGN') for the 2021–2026 access arrangement period. 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 – Regulatory depreciation

Attachment 5 – Capital expenditure

Attachment 6 – Operating expenditure

Attachment 7 – Corporate income tax

Attachment 8 – Efficiency carryover mechanism

Attachment 9 – Reference tariff setting

Attachment 10 – Reference tariff variation mechanism

Attachment 11 – Non-tariff components

Attachment 12 – Demand

Attachment 13 – Capital expenditure sharing scheme

Contents

5 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 access arrangement periods.

This attachment outlines our assessment of AGN's proposed conforming capex for the 2016–21 access arrangement period, which forms part of its opening capital base.[2] It also outlines our assessment of forecast capex for the 2021–26 period, which forms part of its projected capital base.[3]

5.1 Draft decision

5.1.1 Conforming capex for 2015–16 and the 2016–21 period

We approve $402.0 million ($2020–21) of total net capex for AGN for the 2015–16 to 2018–19 regulatory years as conforming capex under the National Gas Rules (NGR).

Table 5.1 shows AGN's actual capex against the AER's allowance for the 2016–21 access arrangement period, by category.

Table 5.1 AGN capex performance against the allowance by category for the 2016–21 access arrangement period ($2020–21, million)

Category	Allowance	Actual / Estimate	Difference
Mains replacement	325.7	280.3	45.3
Meter Replacement	19.1	23.2	-4.0
Augmentation	16.7	11.5	5.2
Growth	96.8	147.7	-50.9
Information technology	62.3	41.8	20.5
Other distribution system assets[(a)]	26.2	44.3	-18.2
Other non-distribution system assets	5.6	3.4	2.2
Capitalised network overheads	59.6	49.3	10.2
GROSS TOTAL	**612.0**	**601.5**	**10.4**
Contribution	3.9	28.4	-24.5
NET TOTAL	**608.1**	**573.1**	**35.0**

Source: AGN, *Response to information request IR021*, Received 19 October 2020. AER analysis. Totals may not sum due to rounding.

1 NGR, r. 69.

2 NGR, r. 77.

3 NGR, r. 78(b).

Note: (a) Telemetry and regulators are included in the other distribution system assets category.

We reviewed AGN's submission and supporting material to assess its proposed capex for the 2016–21 period. This included information on AGN'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 2016–21 period was conforming capex and, in turn, whether that capex should be included in the opening capital base.[4] 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 5.3 below.

We consider the following when determining the opening capital base for the 2021–26 period:

- 2015–16 capex – given that the 2015–16 year was a forecast at the time we made our 2011–16 final decision, we have assessed whether this is conforming capex.[5] We have included conforming capex in the opening capital base for the 2011–16 period[6]
- 2016–17 to 2018–19 capex — since we have actual capex for these years, we have assessed whether this is conforming capex.[7] We have included conforming capex in the opening capital base for the 2021–26 period[8]
- 2019–20 and 2020–21 capex — since we do not yet have actual capex for 2019–20 and 2020–21, we must include an estimate in the opening capital base. We have not assessed AGN's estimate of capex for 2019–20 and 2020–21. We will assess 2019–20 in our final decision for the 2021–26 access arrangement. We will assess actual capex for 2020–21 is in the subsequent (2026–31) access arrangement review.[9]

Table 5.2 shows our approved capex for the 2016–21 period by category.

Table 5.2 AER's approved capex by category over 2015–21 ($2020–21, million)

Category	2015–16	2016–17	2017–18	2018–19	2019–20[(a)]	2020–21[(a)]
Mains Replacement	42.3	47.8	55.1	57.6	62.2	57.6
Meter Replacement	4.0	5.8	4.8	5.7	3.6	3.4
Augmentation	4.3	0.7	2.7	3.8	2.6	1.5
Growth	22.0	26.1	26.6	25.7	21.4	47.9
Information technology	0.7	0.8	3.6	5.3	9.0	23.1
Other distribution system assets	8.4	13.3	8.2	6.0	4.7	12.1

4 NGR, r. 77(2)(b).

5 Ibid.

6 Ibid.

7 Ibid.

8 Ibid.

9 NGR, rr. 77(2)(b), 79.

Category	2015–16	2016–17	2017–18	2018–19	2019–20[a]	2020–21[a]
Other non-distribution system assets	0.5	0.7	0.7	0.3	0.8	0.8
Capitalised network overheads	12.3	10.6	9.8	9.2	9.5	10.2
GROSS TOTAL	**94.5**	**105.9**	**111.7**	**113.6**	**113.8**	**156.6**
Contribution	2.6	9.9	6.8	4.4	4.0	3.4
NET TOTAL[b]	**92.0**	**96.0**	**104.8**	**109.2**	**109.8**	**153.3**

Source: AGN, *Response to information request IR021*, Received 19 October 2020. AER analysis.

Note: (a) We have not assessed the 2019–20 or 2020–21 amounts as approved capex under this decision. This is because these values are estimates. We will undertake an assessment of whether the 2019–20 amounts are conforming capex in our final decision and 2020–21 as part of the next access arrangement decision.

(b) Totals may not sum due to rounding.

5.1.2 Forecast capex for the 2021–26 period

We approve $478.8 million ($2020–21) of AGN's proposed $576.6 million ($2020–21) total net capex for the 2021–26 access arrangement period as conforming capex under the NGR.[10] This is 17.0 per cent less than AGN's proposed capex.

Table 5.3 shows our approved capex for the 2021–26 period by category.

Table 5.3 AER's approved capex by category over the 2021–26 access arrangement period ($2020–21, million)

Category	2021–22	2022–23	2023–24	2024–25	2025–26	Total
Mains replacement	40.8	40.6	38.9	37.7	31.2	189.1
Meter Replacement	3.2	3.1	4.4	3.7	4.3	18.6
Augmentation	5.0	5.4	-	-	-	10.5
Growth	26.6	27.2	27.0	26.0	25.7	132.6
Information technology	2.2	5.0	10.1	10.1	5.4	32.8
Other distribution system assets[a]	7.4	10.4	9.9	9.6	9.3	46.6
Other non-distribution system assets	1.1	1.1	0.8	0.8	0.9	4.6
Capitalised network overheads	9.3	9.4	9.4	9.3	9.1	46.4
GROSS TOTAL	**95.4**	**102.3**	**100.5**	**97.1**	**85.8**	**481.0**
Contribution	-	-	0.7	0.9	0.7	2.3
NET TOTAL	**95.4**	**102.3**	**99.8**	**96.2**	**85.1**	**478.9**

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

Note: (a) Telemetry and regulators are included in the other distribution system assets category.

[10] NGR, r. 79.

We assessed AGN's forecast capex against our alternative estimate of efficient capex, while also having regard to available evidence and submissions from stakeholders. Table 5.4 shows AGN's proposed capex compared with our alternative capex estimate for each category.

Our assessment determined that most aspects of AGN's proposal are conforming capex. These have been included in our alternative estimate.

In contrast, we found that other aspects of AGN's proposal are not conforming capex and we have not included this expenditure in our alternative estimate. Where we have considered capex is not conforming, we have formed our own estimate of conforming capex, which is included in our alternative estimate.

A third part of our alternative is the inclusion of capex as a placeholder. We have included this in certain circumstances where there is insufficient information for us to derive a better alternative estimate. As such, there might be further adjustments in the capex category in our final decision.

Table 5.4 AER's draft decision and AGN's proposal for capex over the 2021–26 access arrangement period ($2020–21, million)

Category	AGN's proposal	AER's draft decision	Difference
Mains replacement	269.5	189.1	80.4
Meter Replacement	19.0	18.6	0.4
Augmentation	10.6	10.5	0.1
Growth	135.1	132.6	2.5
Information technology	33.5	32.8	0.7
Other distribution system assets	58.3	46.6	11.7
Other non-distribution system assets	4.7	4.6	0.1
Capitalised network overheads	48.2	46.4	1.8
GROSS TOTAL	**578.8**	**481.0**	**97.8**
Contribution	2.3	2.3	-
NET TOTAL	**576.6**	**478.8**	**97.8**

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

As shown in Table 5.4, the main differences between AGN's proposed capex and our alternative capex estimate for the 2021–26 period relates to mains replacement and other distribution system.

Our draft decision is to include:

- $189.1 million of mains replacement capex in our alternative capex estimate. This is $80.4 million (29.8 per cent) less than AGN's forecast capex of $269.5 million. We consider that AGN did not provide adequate justification for the speed and scope of its mains replacement program to enable us to form the view it is conforming capex
- $46.6 million for other distribution system capex in our alternative capex estimate. This is $11.7 million (20.1 per cent) less than AGN's forecast capex of $58.3 million. We require further justification on some of AGN's valve replacement and pipeline modification programs to enable us to form the view it is conforming capex
- reduction to the labour component of capex in line with our opex decision (Attachment 6 – Operating Expenditure).

5.2 AGN's proposal

2016–21 access arrangement period

AGN has proposed net capex of $573.1 million ($2020–21) for the 2016–21 access arrangement period, noting that capex in 2019–20 and 2020–21 is estimated.

Removing the estimated capex for 2019–20 and 2020–21, AGN has proposed $310.1 million ($2020–21) as conforming capex (or $402.0 million including the 2015–16 year).

We accept a net capex of $92.0 million ($2020–21) for the 2015–16 year as conforming capex for 2015–16.

We also accept $310.1 million ($2020–21) as conforming capex for the 2016–17 to 2018–19 years, and will assess whether capex incurred in 2019–20 is conforming in our final decision, and whether capex incurred in 2020–21 is conforming at the next (2026–31) access arrangement review.

For 2016–21, AGN underspent net capex by 5.8 per cent ($35.0 million). This includes the estimates for 2019–20 and 2020–21.

Table 5.5 AGN's proposed capex by category over the 2016–21 access arrangement period ($2020–21, million)

Category	2015–16	2016–17	2017–18	2018–19	2019–20[(a)]	2020–21[(a)]
Mains Replacement	42.3	47.8	55.1	57.6	62.2	57.6
Meter Replacement	4.0	5.8	4.8	5.7	3.6	3.4
Augmentation	4.3	0.7	2.9	3.8	2.6	1.5
Growth	22.0	26.1	26.6	25.7	21.4	47.9
Information technology	0.7	0.8	3.6	5.3	9.0	23.1

Category	2015–16	2016–17	2017–18	2018–19	2019–20[(a)]	2020–21[(a)]
Other distribution system assets	8.4	13.3	8.2	6.0	4.7	12.1
Other non-distribution system assets	0.5	0.7	0.7	0.3	0.8	0.8
Capitalised network overheads	12.3	10.6	9.8	9.2	9.5	10.2
GROSS TOTAL	**94.5**	**105.9**	**111.7**	**113.6**	**113.8**	**156.6**
Contribution	2.6	9.9	6.8	4.4	4.0	3.4
NET TOTAL[(b)]	**92.0**	**96.0**	**104.8**	**109.2**	**109.8**	**153.3**

Source: AGN, *Response to information request IR021*, Received 19 October 2020. AER analysis.

Note: (a) We have not assessed the 2019–20 or 2020–21 amounts as approved capex under this decision. This is because these values are estimates. We will undertake an assessment of whether the 2019–20 amounts are conforming capex in our final decision and 2020–21 as part of the next access arrangement decision.

(b) Totals may not sum due to rounding.

2021–26 access arrangement period

AGN proposed forecast net capex of $576.6 million ($2020–21) for the 2021–26 access arrangement period, which is $3.5 million (0.6 per cent) lower than its actual net capex for the 2016–21 period.[11]

Table 5.6 AGN's proposed capex by category over the 2021–26 access arrangement period ($2020–21, million)

Category	2021–22	2022–23	2023–24	2024–25	2025–26	Total
Mains Replacement	53.5	53.7	56.5	57.3	48.5	269.5
Meter Replacement	3.2	3.1	4.5	3.8	4.4	19.0
Augmentation	5.1	5.5	-	-	-	10.6
Growth	26.8	27.6	27.6	26.7	26.4	135.1
Information technology	2.2	5.1	10.3	10.4	5.5	33.5
Other distribution system assets	8.8	12.8	12.7	12.1	11.8	58.3
Other non-distribution system assets	1.1	1.1	0.8	0.8	0.9	4.7
Capitalised network overheads	9.5	9.7	9.8	9.7	9.5	48.2

[11] AGN's capex for both 2019-20 and 2020-21 are estimates only.

Category	2021–22	2022–23	2023–24	2024–25	2025–26	Total
GROSS TOTAL	**110.1**	**118.7**	**122.3**	**120.8**	**107.0**	**578.8**
Contribution	-	-	0.7	0.9	0.7	2.3
NET TOTAL[(a)]	**110.1**	**118.7**	**121.6**	**119.9**	**106.3**	**576.6**

Source: AGN, *Response to information request IR021*, Received 19 October 2020. AER analysis.

Note: (a) Totals may not sum due to rounding.

The major components of forecast gross total capex over the 2021–26 period are mains replacement (47 per cent), connections growth (23 per cent) and other distribution system (10 per cent).

5.3 Assessment approach

We must make two decisions when assessing AGN's capex.

First, we are required to assess past capex and determine whether it is conforming capex that should be added to the opening capital base.[12]

Second, we are required to assess AGN's forecast of required capex for the 2021–26 access arrangement period to determine whether it is conforming capex. Capex will be 'conforming' if it meets the NGR's new capex criteria.[13]

The following sections set out our approach and the tools and techniques employed 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 2016–21 period and the need to forecast the opening capital base for the 2021–26 period. We explain this in the next section.

5.3.1 Capex in the 2016–21 access arrangement period

We reviewed AGN's submission and supporting material to assess its proposed capex for the 2016–21 access arrangement period. This included information on AGN'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 2016–21 period was conforming capex and, in turn, whether that capex should be included in the opening capital base.

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 5.3.2 below.

12 NGR, r. 77(2)(b).

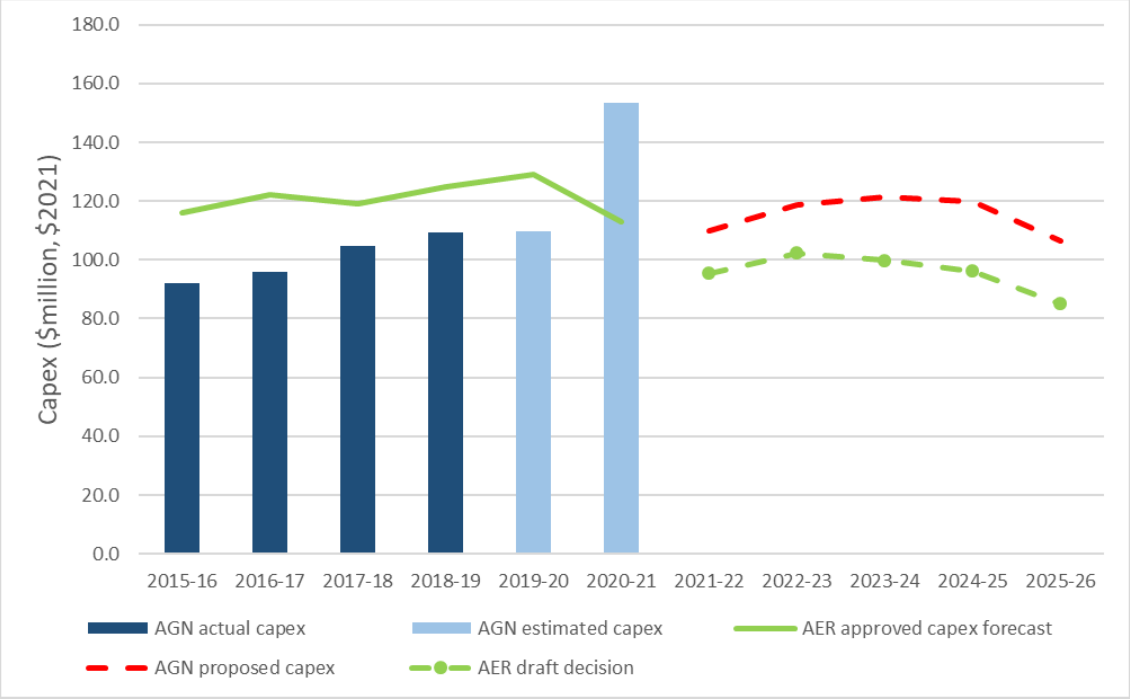
13 NGR, r. 79.

For the purpose of our draft decision, we have focused our resources on specific areas where there are significant overspends between our approved forecast and the expected actual capex.

5.3.2 Conforming capex for the 2021–26 access arrangement period

Figure 5.1 compares AGN's past and proposed forecast capex, and the forecasts approved by us in our previous 2016–21 decision and this 2021–26 draft decision.

Figure 5.1 AER's draft decision compared to AGN's past and proposed capex ($million, 2020–21)



Source: AER analysis.

We have assessed the key drivers of forecast capex to consider whether it complies with the new capex criteria.[14] In doing so, we relied on the following information:

- the access arrangement submission and access arrangement information, which outline AGN's capex program and the main drivers of those programs
- business cases that detail the expenditure requirements for specific projects
- AGN's RIN responses
- AGN's capex forecast model
- responses to information requests

[14] NGR, r. 79(1).

- engineering advice we commissioned from Zincara to help us assess the prudency 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.[15]

Our assessment results in an alternative estimate of the business's total capex requirements in the forecast period. If we are satisfied the business's total forecast meets the NGR requirements, we accept the forecast. If we are not satisfied, we substitute the business's forecast with our alternative estimate. In making this decision, we take into account the reasons for the difference between our alternative estimate and the business's 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 National Gas Objective (NGO).[16]

5.3.3 Interrelationships

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

- possible trade-offs between capex and opex
- consistencies between demand and customer forecasts (Attachment 12 – Demand)
- differences between the capitalisation policies applied in the 2016–21 and 2021–26 access arrangement periods.

5.4 Reasons for draft decision

5.4.1 Conforming capex for the 2016–21 access arrangement period

Conforming capex for 2015–16

AGN has proposed net capex of $92.0 million ($2020–21) for the 2015–16 year. We accept $92.0 million as conforming capex for 2015–16 as it is less than the approved allowance of $116.2 million.

15 NGR, r. 74(2).

16 NGL, s. 28(1).

Conforming capex for the 2016–21 access arrangement period

AGN has proposed net capex of $573.1 million ($2019-20) for the 2016–21 period, where capex in 2019–20 and 2020–21 is estimated.

Without the estimated capex for 2019–20 and 2020–21, AGN has proposed $310.1 million as conforming capex.

We accept $573.1 million ($2019–20) as conforming capex for 2016–21, noting that:

- the overspend in Growth capex of $50.9 million can be attributed to the approval of the Mount Barker project by the AER and higher connection volumes which are driven by exogenous factors; and
- we will assess whether capex incurred in 2019–20 is conforming in our final decision, and whether capex incurred in 2020–21 is conforming in AGN's next (2026–31) access arrangement. As such, AGN's proposed 2019–20 and 2020–21 expenditures are considered to be place holders.

5.4.2 Mains replacement

Mains replacement relates to the replacement of mains (and associated services) that have significantly deteriorated with an increasing number of reported gas leaks. The replacement program manages old and deteriorating pipes so that the network is operated safely, reliably and affordably. The proposed mains replacement plan consists of proactive and reactive replacement programs.

We have included $189.1 million ($2020–21, direct cost) of mains replacement capex in our alternative estimate in this draft decision. This is 29.8 per cent less than AGN's proposed forecast of $269.5 million ($2020–21, direct cost). In making this decision we have had regard to technical advice from our consultant Zincara.

For the reasons set out below, we are not satisfied that AGN's proposed forecast capex of $269.5 million for its mains replacement program is conforming capex that complies with the NGR.[17]

AGN's proposal

AGN submitted that its mains replacement program is the single most important activity they undertake to ensure public safety.

AGN proposed expenditure of $269.5 million ($2020–21, direct cost) for the 2021–26 access arrangement period. In the current period (2016–21), AGN will have replaced a total of 1,059kms of mains, at a total expected cost of $272 million ($2019–20, direct cost) which is 18% ($58 million) less than the AER's final decision of $330 million.[18] The savings in the current period are a result of achieving lower forecast rates across multiple

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17 NGR, r. 79(1).

18 AGN, *2021-26 Access Arrangement Proposal, Attachment 8.3 Distribution Mains and Service Integrity Plan*, July 2020, p. 8.

replacement programs, and a lower than forecast (and historical average) volume of various replacement projects.

AGN adopted a four step approach to develop the mains replacement program for the 2021–26 access arrangement period, which identifies and assesses different categories of assets based on risk drivers and mitigation options. The options are then considered to achieve the target level of risk at an efficient cost.[19]

In the 2021–26 access arrangement period, AGN plans to replace 870km of mains, undertake inline camera inspections and reinforcement of 316kms of high density polyethylene (HDPE) mains, and replace 457 of the highest priority multi-user services (MUS). By June 2026, AGN's program is expected to eliminate all remaining high risk mains.

AGN provided additional information to us in response to information requests and meetings between key staff. The additional information included squeeze off failure data, cracks and breaks data, unit rates and communications with the Office of Technical Regulator on the development of the mains replacement program.

Our assessment

We accept that mains replacement is justified on the grounds that it is necessary to maintain and improve the safety of services and to maintain the integrity of services.[20] Our forecast for mains replacement capex over the 2021–26 access arrangement period of $189.1 million ($2020–21, direct cost) reflects our analysis and review of the mains rehabilitation projects.

While we support AGN's aim to get as much use out of the mains as possible, our analysis shows that there are opportunities to further extend asset lives, and extend the mains replacement program into the subsequent access arrangement period (2026–31).

Our assessment was informed by analysis of the mains replacement plan by our consultant, Zincara, submissions from stakeholders, and our own review of the proposal. In this section we provide an overview for each category of the metering replacement program. Detailed information of each mains category can be found in the Zincara report

Cast Iron (CI) and Unprotected Steel (UPS)

In the 2021–26 access arrangement period, AGN has proposed to significantly increase the block replacement of low pressure CI/UPS mains from 288km to 520kms. A review of the asset condition shows that the remaining cast iron assets are gradually deteriorating with age, and will need to be replaced over time. However, the information provided in the proposal does not appear to support a significant increase in level of mains replacement currently occurring. In particular, historic crack and break data indicates a downward trend in the number of reported incidents, which can be attributed to the removal of the high risk

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19 AGN, *2021-26 Access Arrangement Proposal, Attachment 8.3 Distribution Mains and Service Integrity Plan*, July 2020, p. 11.

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

sections of CI and UPS mains. As a result, we are proposing 405kms of block replacement, which is consistent with the total CI/UPS program in the current access arrangement period, along with the 38km mains replacement program in North Adelaide.

The unit rate proposed by AGN is considered to be reasonable for CI/UPS block replacement. However, we consider that the unit rate proposed by AGN for the North Adelaide mains replacement program, which is based on the work undertaken in the Adelaide CBD, would have the potential to over price the North Adelaide mains replacement works. We consider a revised unit rate consisting of the 3-year weighted average unit rate and an additional allowance for premium costs associated with the CBD works, is more likely to reflect the costs in the North Adelaide mains replacement program. In arriving at this position, we have considered the expert advice of Zincara.

HDPE 250

In the current access arrangement period, AGN replaced 291kms of HDPE mains, resulting in there only being 14kms of medium pressure HDPE 250 mains remaining in the network, which AGN is proposing to replace in the 2021-26 access arrangement period. This program is considered prudent, given that this is in an ongoing program and with only a small volume remaining to be replaced.

The unit rate proposed by AGN is considered to be reasonable for the HDPE 250 mains replacement program.

HDPE 575 DN40 HP – insert

AGN proposed to replace 198kms of high pressure HDPE 575 DN40 mains by insertion in the next access arrangement period. Squeeze off failure rate data has been analysed, showing 40 failures since 2005, of which five have been reported on mains laid after 1990 (with the most recent being reported in 2016). The failure history supports reprioritisation of the mains replacement program for high pressure DN40. It is therefore considered that this program should focus on the replacement of mains laid prior to 1991, totalling 150kms.

The unit rate proposed by AGN is higher than the range the AER allows for the current period. However, as the unit rate is based on competitively tendered pricing, we consider the unit rate to be reasonable for the HDPE 575- DN40 HP insert program.

While we accept the unit rate proposed for this program is efficient, we note that the insertion method of addressing poor asset performance can be viewed as an asset reinforcement or modification rather than a like for like replacement. This distinction would influence our regulatory depreciation decision in terms of whether or not the existing assets are subject to accelerated depreciation post insertion (Attachment 4 – Regulatory Depreciation). In its revised proposal, we expect AGN to clarify whether the existing assets will not be providing any ongoing services to consumers post insertion as well as further information on key assumptions used in Incenta's mains replacement analysis.[21]

[21] AGN, *2021-26 Access Arrangement Proposal, Attachment 9.1 Incenta replacement of low pressure mains*, July 2020.

HDPE 575 DN40 MP – direct

AGN proposed to replace 90kms of medium pressure HDPE 575 DN40 mains by direct burial in the 2021–26 access arrangement period, and the remaining 159kms in the following period. Squeeze off failure data shows that there were three failures reported for the medium pressure DN40 mains between 2005 and 2011, and that no further failures have since been reported. This data does not suggest an ongoing or recurrent problem with respect to squeeze off failure in this category. As the direct burial option proposed by AGN is the most expensive method of mains replacement, we consider that the proposal to mitigate risk in this category is disproportionate to the risk being managed, and therefore our alternate proposal is for the whole program to be deferred until the 2026–31 access arrangement period and no capex to be allocated for this work in the 2021–26 period.

AGN's proposed unit rate has been developed through a bottom up analysis, as there are no historical unit rates and no competitive tender processes for this category of the mains replacement program. Additional information was sought from AGN regarding the unit rates for this program, as the schedule of rates used in developing the unit rate would typically only apply to small sections of work, rather than the 90kms proposed by AGN. Our analysis shows that it is reasonable to apply a volume discounted rate to the schedule of rates, in the range of 10-15%, when the scale of the program of work is considered. As a result, we have applied a 10% discount to the schedule of rates, resulting in an alternate unit rate for the HPDE 575 DN40 MP direct replacement program.

HDPE 575 DN50 – inspection

AGN is proposing to inspect and reinforce approximately 316kms of mains in the 2021–26 access arrangement period, consisting of 57kms of high pressure and 259kms of medium pressure. A similar amount of work was undertaken in the current period (310kms) and AGN anticipates that reinforcement of the mains should extend the operational life of the mains by about 10 years. We consider that this program is effective in enabling effective management of the mains, and that it represents a prudent program.

The unit rate proposed by AGN is considered to be reasonable for the HDPE 575- DN50 camera inspection and reinforcement program.

Multi-user services – priority group 1

There are currently 2,471 multi-user services in the AGN network that were not replaced as part of the mains replacement program pre-2012. In the current access arrangement period, AGN has undertaken an assessment of the MUS, and categorised them according to replacement priority. AGN is proposing to replace 457 priority 1 MUS in the 2021–26 access arrangement period, with 1,653 priority 2 MUS being considered for replacement in the following period. Additional information was sought from AGN relating to the determination of the priorities, which demonstrated that risk was determined based on desktop reviews and site surveys. We are satisfied with the methodology used to prioritise the replacement of priority 1 MUS.

The cost of replacing assets at each multi-user site varies depending on the number of individual delivery points associated with each service. In determining unit rates for MUS replacement, AGN has developed an average unit for a range of delivery points based on

historical costs, and have used the weighted average to forecast given the variability of the work and relatively low volumes. We accept the unit rate proposed by AGN to be reasonable.

Non-AMRP service replacement

AGN proposes the replacement of 2,450 services in the 2021-26 access arrangement period, which is a decrease from the 2,740 reactive service replacements undertaken in the current period. The forecast has been determined based on historical replacement levels of 490 replacements per year. We accept this forecast as being reasonable.

AGN has proposed a unit rate which is higher than the 3-year weighted average unit rate. While the labour component of the current year appears reasonable as a forecast, we consider that the materials/other component for the current actual year is not reflected in previous years, and it is therefore not likely to reflect the forecast for the next access arrangement period. As a result, we are proposing a unit rate which combines the current actual labour rate with the 3-year materials/other rate.

Submission from the SA Minister and discussions with Office of the Technical Regulator (OTR)

We received a submission from the Hon Dan van Holst Pellekaan MP, South Australian Minister for Energy and Mining, raising concerns about the size and speed of AGN's proposed mains replacement program. The Minister submitted:

> The AER should examine whether the volume of the accelerated program is still necessary and whether the continued proposed high capital expenditure of $294 million in 2021-26 is prudent. […] There is no doubt that mains replacement will be a continued activity to ensure the ongoing safety of the gas network, however, the expenditure on mains replacement in any given period should reflect reductions in risk already achieved.[22]

The submission also states:

> It should also be noted the AGN's Distribution Mains and Service Integrity Plan – South Australia was not reviewed by the South Australian Office of the Technical Regulator prior to the proposal. Given the time limitations to undertake a detailed review of all the relevant documents submitted as part of the proposal, further clarity is appreciated on the amount of cast-iron and unprotected steel mains and other materials mains that still require replacement.[23]

In response to the submission from the Minister, AER staff have had meetings with the Office of the Technical Regulator to gain further understanding of the concerns about AGN's mains replacement program. At the time of this draft decision, the AER has not been formally notified of the OTR's support for AGN's mains replacement program. As such, the alternate estimate has been developed with the support of Zincara. The AER

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[22] *SA Minister for Energy and Mining – Submission on AGN Access Arrangement*, 3 August 2020, p. 2.

[23] *SA Minister for Energy and Mining – Submission on AGN Access Arrangement*, 3 August 2020, p. 2.

will continue to work with AGN and the OTR through the revised proposal and Final decision to clarify areas of concern about the mains replacement program.

AER's Alternate estimate

Based on the above analysis, we are proposing an alternate estimate forecast for the mains replacement program of $189.1 million ($2020-21, direct cost). Table 5.7 outlines the AER's alternate estimate forecast for the mains replacement program.

Table 5.7 Mains replacement capex forecast ($2020–21, million, direct cost)

Mains Replacement Asset Category	AGN's 2021-26 Plan	AER draft decision 2021-26	Variance
Mains replacement – CI/UPS	162.8	128.8	34.0
Mains replacement - HDPE	94.4	48.7	45.8
Service renewal (sites)	12.3	11.6	0.6
Total	**269.5**	**189.1**	**80.4**

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

5.4.3 Meter replacement

Meter replacement is an ongoing capex activity that covers all metering types that require replacement either as part of a planned program or when found to be defective. AGN has regulatory obligations to manage the integrity of meters and ensure they operate within the prescribed tolerance band for metering accuracy.

Table 5.8 shows AGN's proposed meter replacement capex for both the 2016–21 and 2021–26 periods.

Table 5.8 Metering allowance, actual and forecast expenditure 2016–21 to 2021–26 access arrangement periods ($2020–21, million, direct cost)

	Allowance 2016–21	Actual / Estimate 2016–21	AGN forecast 2021–26	AER draft decision 2021-26
Metering Replacement	19.1	23.2	19.0	18.6

Source: AGN, *Response to information request IR021*, Received 19 October 2020. AER analysis. Totals may not sum due to rounding.

AGN forecast metering expenditure of $19.0 million ($2020–21, direct cost) to replace more than 93,000 over the 2021–26 period. In the current period (2016–21), AGN expects to replace more than 140,000 meters at a total cost of $23.2 million.

The decrease in volumes for the next period can be attributed to installing domestic meters that have a longer 18-year life, undertaking more field life extension (FLE) tests for smaller meter families, and extending the life of more meters.

Based on all the information before us, we are satisfied AGN's capex forecast of $18.6 million ($2020–21, direct cost) for meter replacement is conforming capex.[24] This comprises of $17.2 million for the domestic meter replacement program, and $1.5 million for the I&C meter replacement program.

Our assessment of these projects is set out below.

AGN's proposal

AGN states that the aim of its metering program guided by strict standards for the installation of meters, relating to accuracy, safety and testing. The business is obligated to replace meters when they have reached the end of their field life, have failed, or if testing shows their accuracy falls outside the requirements of the Metering Code.[25]

AGN states the forecast capex builds on the efficiencies identified in the current period, in particular due to improvements in asset life extension strategies and in-field service testing, which have resulted in a decrease in meter replacement volumes.

Meter categories, and current and forecast expenditure is set out in Table 5.9.

Table 5.9 Meter replacement capex ($2020–21, million, direct cost)

	Allowance 2016–21	Actuals/estimate 2016–21	AGN's forecast 2021–26
Meter replacement	**19.1**	**23.2**	**19.0**

Source: AGN, *2021-26 Access Arrangement Proposal Attachment 8.4 Meter Replacement Plan*, July 2020. AER analysis. Totals may not sum due to rounding.

Our assessment

Our assessment was informed by analysis of the meter replacement plan by our consultant, Zincara, and our own review of the proposal. Detailed analysis for each metering category can be found in the Zincara report, while in this section we provided an overview for each category of the metering replacement program.

Domestic meters

Domestic meters are tested in accordance with Australian Standards to identify the accuracy and leak tightness of meters. This involves statistical sample testing of meter families.

AGN's program includes replacing meters in low meter families (where it is not cost effective to sample test for FLE), end-of life meters that have been refurbished a number of times, undertaking initial in-service compliance testing (within 3 to 5 years), FLE family sample testing to determine further field life, and failed FLE test families. For the 2021–26

[24] NGR, r. 79.

[25] AGN, *2021-26 Access Arrangement Proposal Attachment 8.4 Meter Replacement Plan*, July 2020, p. 2.

period, AGN is forecasting to replace 90,474 meters in its domestic meter replacement program.

AGN's approach is typical of good industry practice, its forecast of domestic meter replacement volumes and unit rates are considered reasonable and the capex is considered prudent and efficient.

The unit rate proposed by AGN for the domestic meter replacement program is higher than the AER allowance in the current period. We note that AGN's current period actual unit rate has been above the AER allowance for each year. The higher unit rates can be attributed to increases in FLE, and therefore fewer meters available for refurbishment, and changes in field requirements resulting in additional ancillary works such as replacing or sealing the meter box and changing regulators. Additional information provided by AGN in response to questions from the AER showed the breakdown costs associated with the ancillary works, and as a result, we consider the proposed unit rate to be reasonable.

Industrial and commercial meters

Industrial and commercial meters (I&C) are tested in accordance with Australian Standards to identify the accuracy and leak tightness of meters. I&C meters are deemed to have an initial service life of 10 years, although AGN is considering whether this period could be extended to 15 years.

AGN's forecast includes that a higher proportion of I&C meters will need to be replaced in the 2021-26 period. For the 2021–26 period, AGN is forecasting to replace 2,995 meters in its industrial and commercial meter replacement program.

AGN's approach is typical of good industry practice, its forecast of I&C meter replacement volumes and unit rates are considered reasonable and the capex is considered prudent and efficient.

We consider the unit rate proposed by AGN for the I&C meters replacement program to be reasonable.

Overall

Our revised forecasts for meter replacement are consolidated in Table 5.10.

Table 5.10 Meter replacement capex for the 2021–26 access arrangement period, AGN's forecast and AER's draft decision ($2020–21, million, direct cost)

	AGN's forecast 2021–26	AER's draft decision 2021–26	Variance
Meter replacement	**19.0**	**18.6**	**0.4**

Source: AER and Zincara analysis.
Variance between AGN proposed and draft decision is the result of labour cost escalations (see section 5.4.11)

5.4.4 Augmentation

Network augmentation capex is directed at increasing the capacity of the existing network to meet the demands of existing and future customers. Augmentation capex is required to maintain gas pressure and minimise the risk of gas outages.

Based on all the information before us, we accept AGN's proposed augmentation forecast of $10.5 million ($2020–21, direct cost) for the 2021–26 access arrangement period. The capex forecast consists of:

- $7.3 million ($2020–21, direct cost) for the Northern Metro HP main and Gawler Gate Station project; and
- $3.2 million ($2020–21, direct cost) for the Southern Metro HP augmentation project.

Our assessment of these projects is set out below.

AGN's proposal

AGN states that it is always monitoring the pressure and performance of its network to ensure there is no deterioration in pressure and performance as the number of connections to the network grows.[26] AGN is proposing two augmentation projects for the 2021–26 access arrangement period to support the continued growth of the network and ensure service levels are maintained for existing customers in growing areas.

AGN has proposed $10.5 million ($2020–21, direct costs) in capex for augmentation in the 2021–26 access arrangement period. It includes building a new high-pressure main and gate station in the northern suburbs of Adelaide, which will increase the capacity of the northern network to support continued growth in the area, and a duplication of a high pressure main from McLaren Vale to Aldinga, providing increased capacity for the growing southern network.

Business cases were submitted for both projects which demonstrate the options that had been considered to address increase in demand for network services, and presented a preferred option.

Our assessment

Our assessment for augmentation consist of reviewing the reasonableness of the following core elements that makes up each project:

- the need for the investment given forecast demand[27]
- the efficient planning and asset scope associated with meeting the capacity shortfall which includes the exploration of various feasible planning options and the quantum of

[26] AGN, *Final Plan: Five year plan for our South Australian network, 2021–26*, July 2020, p. 95.

[27] NGR, r. 79(1)(a).

assets required under each option based on known route length and other network constraints[28]

- the unit rates associated with each asset type including a reasonable assessment and adjustment based on expected site conditions[29]
- an assessment either in the form of an overall economic value that is positive, or having the expected incremental revenue exceeding the capital costs in present value terms, as required under rule 79(1)(b) of the NGR.

Our assessment was informed by analysis of the augmentation business cases by our consultant, Zincara, and our own review of the proposal. Detailed analysis for each augmentation business case can be found in the Zincara report, while in this section we provided an overview for each augmentation project.

Gawler Gate Station

The northern suburbs of metropolitan Adelaide continue to be one of the major residential growth areas, with three large residential developments near Gawler (in Springwood, Roseworthy and Concordia) expected to be connected to the network within the next five years. Without augmentation, AGN expects extremity pressures to fall below the minimum acceptable pressure of 90 kPa by 2023.

AGN assessed a number of proposals to address this issue, with the preferred option being the installation of a new gate station off the SEA Gas transmission pipeline to the east of Gawler, and to lay 1.3kms of steel DN250 high pressure trunk main to connect with the existing Gawler trunk main by 2023.

The cost of the project is $7.3 million, and is considered to be consistent with good industry practice. The cost estimate is based on similar projects and the gate station costing provided by SEA Gas appears to be reasonable.

Seaford Aldinga High Pressure augmentation

The southern suburbs of Adelaide also represent a major residential growth area, with customer connections growing at a rate of 498 new residential connections per year on average for the past 5 years. Historical residential growth in the area has decreased the amount of spare capacity in the Seaford Aldinga network, resulting in a need for augmentation work to be undertaken to maintain customer supply pressure levels. Similar to forecasts in the northern part of the network, AGN estimates pressure is likely to fall below the minimum acceptable pressure of 90 kPa by 2023.

AGN assessed a number of proposals to address this issue, with the preferred option being to augment the Seaford to Aldinga network during 2021–22 by installing 2.8km of trunk main, from the end of the existing DN280 trunk in McLaren Vale south to Aldinga. This option is preferred as it reduces the amount of capex required for the current access

[28] Ibid.

[29] Ibid.

arrangement period, while setting an efficient platform for further augmentation in the future.

The business case also seeks an additional 2.2kms of trunk duplication along Main South Road to support expected growth in Sellicks Beach. Our analysis supports AGN's assessment that this secondary augmentation ($2.4 million) should be deferred until the next access arrangement period.

We therefore accept $3.2 million for the 2.8km duplication project as being consistent with good industry practice and prudent in order to maintain supply pressure above minimum levels.

Overall

We accept AGN's proposed capex of $10.5 million ($2020–21, direct cost).

Table 5.11 AER's augmentation capex draft decision ($2020–21, millions, direct cost)

Project	2021–22	2022–23	2023–24	2024–25	2025–26	Total
Gawler Gate Station	1.9	5.4	-	-	-	7.3
Seaford Aldinga High Pressure augmentation	3.2	-	-	-	-	3.2
Total	**5.0**	**5.4**	**-**	**-**	**-**	**10.5**

Source: AER and Zincara analysis. Totals may not sum due to rounding.
Variance between AGN proposed and draft decision is the result of labour cost escalations (see section 5.4.11).

5.4.5 Growth

Distribution businesses have a regulatory obligation to make a connection offer to residential and commercial/industrial customers making applications to connect to its distribution network.[30]

Connections capex is usually forecast by categorising connections into Tariff V (residential customers, and small commercial and industrial (I&C) customers[31]) and Tariff D (large I&C customers[32]).[33] Residential customers can be disaggregated further into existing homes, new estates, and medium/high density (or multi-user) dwellings. [34]

Connections capex covers mains along streets, services to homes and businesses, and meters to measure gas consumption for new:

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

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

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

33 For clarity, I&C volume customers equate to small business customers in the Demand forecast while large I&C demand customers equate to industrial customers in the Demand forecast.

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

- low density dwellings (new homes)
- medium density and high-rise housing
- electricity to gas conversions
- commercial sites
- industrial and large commercial sites.

We approve $132.6 million ($2020–21, direct costs) of connections capex for the 2021–26 access arrangement period.

We have assessed whether AGN's forecast connection volumes and unit rates have been calculated on a reasonable basis and represent the best forecasts possible in the circumstances as part of our assessment of conforming capex in this draft decision.

AGN's proposal

For the 2016–21 period, AGN's capex is expected to be $147.7 million ($2020–21, direct costs) against an allowance of $96.8 million.[35] This is an overspend of $50.9 million or 52.6 per cent of the allowance, which can be attributed to the approval of the Mount Barker project and higher than forecast connections. Offsetting this capex are capital contributions of $28.4 million, against an allowance of $3.9 million.

We accept a net capex of $119.3 million ($2020–21, direct costs), being $147.7 million, less $28.4 million capital contributions, as a placeholder and request further information from AGN in its revised proposal over the future of the Mount Barker project.

For connection types, excluding I&C demand, connections capex is derived by multiplying the forecast unit rate for the connection type by the forecast volume of new connections. I&C demand is a simple average of historical costs.[36]

AGN proposed $135.1 million ($2020–21, direct costs), as shown in Table 5.12, in capex for new connections in the 2021–26 period. It includes connections capex for meters, services, mains, and growth in new areas.

Table 5.12 AGN's proposed connections capex for the 2021–26 access arrangement period ($2020–21, millions, direct cost)

	2020–21	2021–22	2022–23	2023–24	2024–25	Total
Meters	1.9	2.5	2.7	2.8	2.8	12.5
Services	11.2	13.1	14.2	15.3	15.2	69.0
Mains	3.3	4.3	4.6	4.8	4.8	21.8
Growth new areas	10.5	7.8	6.3	3.9	3.7	32.2

[35] AGN, AGN, *Response to information request IR021*, Received 19 October 2020.

[36] Zincara, *AER Access Arrangement 2019 AGN Capital Expenditure,* November 2020, p. 43.

	2020–21	2021–22	2022–23	2023–24	2024–25	Total
Total	**26.8**	**27.6**	**27.6**	**26.7**	**26.4**	**135.1**

Source: AER analysis, based on AGN data. Totals may not sum due to rounding.

Our assessment

Our assessment was informed by analysis of the connections forecast data by our consultant, Zincara, and our own review of the proposal. Detailed analysis for each connections forecast category can be found in the Zincara report, while in this section we provided an overview for each augmentation project.

Volume forecast

AGN is forecasting new connections of 39,061 for the 2021–26 access arrangement period. Core Energy's forecast is used as the basis of AGN's connections forecast, although it is noted that Core Energy's forecast does not include Mount Barker.

Mount Barker was not included in the Core Energy forecast as it is a new extension with no historical demand data. The forecast for Mount Barker shows 2,504 new connections in the 2021-26 access arrangement period, consisting of 2,436 residential connections and 68 commercial connections.

As the long term impacts of the COVID-19 pandemic are not yet clear it is expected that AGN will update connections forecast data prior to the AER's final decision. It is our understanding that there is uncertainty over the future of the Mount Barker reticulation project. Subject to additional information being provided on both of these issues prior to the AER's final decision, AGN's connections forecast for the 2021–26 access arrangement period is accepted.

Unit rates

AGN has used current year actuals as the basis for its proposed forecast for all categories apart from I&C <10TJ, where it has applied the weighted 3-year historical average. While using the 3 year weighted average is the preferred methodology of the AER for forecasting unit rates, we note that applying this change to all growth forecast categories does not have a material difference in reducing connections capex. Zincara estimates a reduction in capex of approximately $4.6 million, consisting of reductions for mains ($1.4 million) and services ($3.2 million), with no material change for meters. When considered alongside additional information provided by AGN in response to questions about the use of current year actuals rather than weighted average, Zincara is of the opinion that the proposed rates have been arrived at on a reasonable basis.

The proposed unit rates for all categories in the connections capex proposal are supported.

Step out projects

AGN has identified three step out projects during the 2021–26 access arrangement period. Step out projects are network extensions at the extremities to expand the existing network into new growth areas.

The Concordia reticulation project is a greenfield development in a rural area north of Adelaide. It is forecast that 1,143 domestic connections and five I&C connections will occur during the 2021–26 period. As a greenfield development, AGN is forecasting a 95% penetration rate, with a 25 year NPV of $18.7 million (with a positive return in 16 years).

The Kingsford regional industrial estate is located 46kms north of Adelaide, and has been identified as a key area for industrial growth. It is forecast that five I&C connections will occur during the 2021-26 period. NPV analysis forecasts a positive return within 16 years, with a 25 year NPV of $1.8 million.

The Mount Barker project, approved by the AER in 2018, is forecast to provide 2,504 connections during the 2012–26 period, consisting of 2,436 new residential connections and 68 I&C connections. The total new connections capex for the 2021-26 period is $24.97 million. As discussed earlier in this section, we are still waiting for confirmation from AGN about whether the Mount Barker project is progressing, and will make a final determination once additional information is provided prior to our final decision.

Summary

Overall, we accept AGN's proposed connections capex of $132.6 million ($2020–21, direct cost) for the 2021–26 access arrangement period, subject to further information regarding the impact of COVID-19 and the progression of the Mount Barker project prior to our final decision.

Table 5.13 Connections capex for the 2021–26 access arrangement period, AGN's forecast and AER's draft decision ($2020–21, million, direct cost)

	AGN's forecast 2021–26	AER's draft decision 2021–26	Variance
Growth capex	135.1	132.6	2.5
Total	135.1	132.6	2.5

Source: AER and Zincara analysis. Totals may not sum due to rounding.
Variance between AGN proposed and draft decision is the result of labour cost escalations (see section 5.4.11).

5.4.6 Information technology

We accept AGN's proposed forecast expenditure $33.5 million ($2020–21, direct costs) for information technology in the 2021–26 access arrangement period.

In reviewing IT capex, we undertook a bottom up analysis, followed by a top down review using historical Regulatory Information Notice (RIN) data. AGN has split its capex into recurrent and non-recurrent expenditures (Table 5.15). This allocation seems broadly consistent with our approach to IT assessment.

AGN's proposal

AGN estimates it will underspend the 2016–21 IT allowance by $20.5 million ($2020–21, direct cost) or 33.0 per cent.[37] AGN's proposed 2021–26 IT capex is $33.5 million or 19.9 per cent less than its' estimated spend in the current period and 46.2 per cent less than the current period allowance.

Table 5.14 Current access arrangement period IT capex — allowance and actual/estimate ($2020–21, million, direct cost)

	2016–21 Allowance	2016–21 Actual/Estimate
Information technology	62.3	41.8

Source: AGN, *Response to information request IR021,* Received 19 October 2020.

AGN's proposed IT expenditure of $33.5 million ($2020–21, direct cost) for the 2021-26 access arrangement period is classified as either maintaining the current levels of IT services (recurrent) $14.6 million ($2020–21), or efficient and effective service delivery (non-recurrent) $18.9 million ($2020–21), as shown in Table 5.15. The $8.3 million ($2020–21) reduction from the current access arrangement period is the result of the completion of a large transformation program, as well as lower levels of recurrent investment.

Table 5.15 AGN's forecast of current and next access arrangement period IT capex – recurrent and non-recurrent ($2020–21, million, direct cost)

	2016-21		2021-26
	Allowance	Actual/Estimate	Proposed
Recurrent	41.6	24.3	14.6
Non-recurrent	20.6	17.4	18.9
Total capex	**62.3**	**41.8**	**33.5**

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

The current access arrangement period has seen variances in certain IT categories. The most significant of these are in applications renewal, business intelligence, GIS and AGIG strategy roadmap as shown in Table 5.16.

[37] AGN, *SA Final Plan July 2021 – June 2026 Attachment 8.6 IT Investment Plan – South Australia*, July 2020, p. 20.

Table 5.16 AGN's forecast of current access arrangement period IT capex – recurrent and non-recurrent ($2020–21, million, direct cost)

		Allowance	Actual/Estimate	Variance
Geospatial Information System (GIS)	Recurrent	16.8	14.1	-2.7
Applications Renewal	Recurrent	19.9	6.9	-12.9
SCADA & Historian systems upgrade	Recurrent	3.8	3.0	-0.8
Infrastructure renewal	Recurrent	1.2	0.3	-0.9
Business intelligence	Non-recurrent	9.6	3.1	-6.6
Mobility integration	Non-recurrent	10.1	10.7	0.7
Develop digital capability	Non-recurrent	1.0	0.8	-0.2
AGIG strategy & roadmap	Non-recurrent	-	2.4	2.4
Life support data solution	Non-recurrent	-	0.4	0.4
Total capex		**62.3**	**41.8**	**-20.5**

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

AGN advises that the underspend in the current period has been driven by:

- a reduction in the number of upgrades required to maintain systems[38]
- the application lifecycle achieving greater optimisation than forecast[39]
- efficiencies achieved as a result of engaging with new providers, consolidating existing service providers, as well as negotiating preferable procurement dates[40]
- AGIG strategy and roadmap was not forecast at the last access arrangement.

AGN's application renewal program of $14.5 million ($2020–21) for the 2021–26 access arrangement period consists of nine projects, including metering & billing systems, middleware, mobility/planning & scheduling applications, licences and GIS. National Australian Gas Network's recurrent IT costs have been allocated to AGN based upon customer numbers, with the exception of the Enterprise Historian system which has been allocated according to the number of telemetered data points.

AGN's non-recurrent expenditure for the 2021-26 access arrangement period is comprised of three projects totalling $18.9 million ($2020–21) as listed in Table 5.17, the most significant being the AGIG IT strategy & roadmap, $13.5 million.

38 AGN, *SA Final Plan July 2021 – June 2026 Attachment 8.6 IT Investment Plan – South Australia*, July 2020, p. 20.

39 AGN, *SA Final Plan July 2021 – June 2026 Attachment 8.6 IT Investment Plan – South Australia*, July 2020, p. 20.

40 AGN, *SA Final Plan July 2021 – June 2026 Attachment 8.6 IT Investment Plan – South Australia*, July 2020, p. 20.

Table 5.17 AGN's forecast of 2021–26 IT Capex – Recurrent and non-recurrent ($2020–21, million, direct cost)

Category	Recurrent	Non-recurrent	Total
Applications renewal	14.5		14.5
Infrastructure Renewal	0.15	-	0.15
Advanced asset investment planning and management (AIPM) tool	-	2.5	2.5
Customer Digital Services – new	-	2.3	2.3
AGIG IT strategy & roadmap	-	14.1	14.1
Proposed capex	**14.6**	**18.9**	**33.5**

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

Our assessment

We approve conforming capex of $0.7 million ($2020–21, direct cost) in the 2015–16 year and $9.6 million ($2020–21, direct cost) for the 2016–17 to 2018–19 years.[41] We will assess 2019–20 actual data as part of the final decision, and 2020–21 as part of the next (2026–31) access arrangement.

Our top down review excluded Corporate Systems and GIS due to significant programs in these areas over the current (2015–20) period. We have not been able to reconcile data provided in AGN's RIN to its IT investment plan.

AGN provided an updated forecast as at September 2020, in which it expected to only complete about $30.4 million in current period (50.4% of allowance for period). $10.4 million of the reduction was largely driven by Mobility Integration $5.6 million and GIS $4.4 million, which occur across 2019/20 and 2020/21 years.

AGN states that the IT investments in its plan are designed to maintain the existing IT environment and services whilst reducing a range of IT safety and security risks.[42] Though there is a transformational aspect to the AGIG IT Strategy & Roadmap, the primary focus of IT investments over the next AA period is on laying a strong foundation for further improvement.[43]

In assessing AGN's proposed IT capex program for the 2021–26 access arrangement period, we have analysed the information provided in AGN's proposal, including business cases, additional material provided in response to information requests, and RIN data. A summary of the business cases follows.

41 NGR, r. 79.

42 AGN, *SA Final Plan July 2021 – June 2026 Attachment 8.6 IT Investment Plan – South Australia*, July 2020, p. 4.

43 AGN, *SA Final Plan July 2021 – June 2026 Attachment 8.6 IT Investment Plan – South Australia*, July 2020, p. 4.

SA117 – Applications renewal and upgrades

During the 2021–26 access arrangement period, several IT systems critical to the operation and monitoring of a safe and efficient network are due to be upgraded. The systems are integral to effective and efficient management of the South Australian network, as well as ensuring AGN meets its regulatory obligations under the NGR, NGL and the Retail Market Procedures.

AGN forecast capex expenditure of $14.5 million ($2020–21) to upgrade these critical IT applications on a regular basis, consistent with its application lifecycle management methodology. The business case presented a range of options for undertaking the work, with the preferred option being selected as it represents the most efficient way to reduce risks associated with outdated and unsupported IT applications, which is consistent with good industry practice. The work is being undertaken in accordance with a national application upgrade plan for all AGN networks across Australia, and the cost to AGN is allocated on the basis of customer numbers in the respective network.[44]

The scope of proposed work, and the approach of using current material and labour rates to determine cost, is considered to be a reasonable approach.

Table 5.18 Recommended Applications renewal and upgrades capex ($2020–21, million)

	2020–21	2021–22	2022–23	2023–24	2024–25	Total
Applications renewal	1.0	2.9	3.0	4.2	3.4	14.5

Source: AER analysis, based on AGN data. Totals may not sum due to rounding.

SA121 – Asset investment planning & management tool

In the supporting business case, AGN is proposing the implementation of an asset investment planning and management tool to digitise processes that are currently undertaken manually, and to consolidate all asset management information into one place.

AGN forecast capex of $2.5 million ($2020–21) for the 2021–26 access arrangement period to deliver an advanced tool that provides additional predictive analytical tools and portfolio management capabilities. In addition, consolidating systems and digitising manual tasks is likely to deliver savings of approximately $4 million over the next 10 years. The work is being undertaken in accordance with a national application upgrade plan for all AGN networks across Australia, and the cost to AGN is allocated on the basis of customer numbers in the respective network.[45]

[44] As of 31 December 2019, South Australia accounts for 35.8% of AGN's total customer numbers AGN, *SA Final Plan Attachment 8.8 Capex Business Cases*, p. 286.

[45] As of 31 December 2019, South Australia accounts for 35.8% of AGN's total customer numbers AGN, *SA Final Plan Attachment 8.8 Capex Business Cases*, p. 286.

The scope of proposed work, and the approach of using current material and labour rates to determine cost support by a quote from a leading global AIPM provider, is considered to be a reasonable approach.

Table 5.19 Recommended Asset investment planning & management tool ($2020–21, million)

	2020–21	2021–22	2022–23	2023–24	2024–25	Total
AIPM development	-	-	2.5	-	-	2.5

Source: AER analysis, based on AGN data. Totals may not sum due to rounding.

SA137 - Digital Customer Experience

The supporting business case shows that AGN communication with customers is currently a highly manual and paper based process, with the phone and email correspondence being the predominate way that customers interact with AGN. The Digital Customer Experience project aims to enhance two-way communication between the business and its customers, through the installation of a customer relationship management system and improved website functionality.

AGN forecast capex of $2.2 million ($2020–21) for the 2021–26 access arrangement period to implement a customer relationship management system to improve customer experience, and uplift self service capabilities on its website. The preferred option was selected as it represents the most prudent and efficient level of investment, to respond to changes in customer and regulatory expectations.

We note that there is an opex component to this project, which is assessed in Attachment 6.

The volume of proposed work, and the approach of using typical vendor market rates, published licence fees and standard implementation costs in determining the cost, is considered to be a reasonable approach.

Table 5.20 Recommended Digital customer experience capex ($2020-21, million)

	2020–21	2021–22	2022–23	2023–24	2024–25	Total
Digital customer experience	0.4	1.2	0.4	0.3	-	2.3

Source: AER analysis, based on AGN data. Totals may not sum due to rounding.

SA138 - AGIG IT Strategy & Roadmap

In 2019, AGIG developed an IT Strategy and Roadmap for all its businesses, creating a clear technology road map for the following 5 year period. To support the implementation of the IT Strategy & Roadmap across the business, a two stage program was developed.

Stage 1 seeks to implement systems that ensure effective use of collaboration, appropriate management of cyber risk and leveraging of economies of scale, while also

implementing the initial stages of improved reporting capabilities. Stage 2 builds on the work of Stage 1, while also implementing a business wide enterprise resource planning system, which will mitigate substantial risks associated with individual finance systems.

AGN forecast capex of $14.2 million ($2020–21) for the 2021–26 access arrangement period to implement the majority of the activities associated with Stage 1. The remainder of Stage 1 and Stage 2 will be implemented in the following access arrangement period. The preferred option was selected as it allows AGN to undertake foundational and transitional work in line with the roadmap.

The scope of proposed work, and the approach of using an independent expert to develop cost estimates, supported by market and vendor quotes, industry norms and historical costing to determine project cost, is considered to be a reasonable approach.

Table 5.21 Recommended AGIG IT Strategy & Roadmap capex ($2020–21, million)

	2020–21	2021–22	2022–23	2023–24	2024–25	Total
Foundational and transformational initiatives	0.8	1.0	4.5	5.8	2.1	14.1

Source: AER analysis, based on AGN data. Totals may not sum due to rounding.

SA139 - IT infrastructure renewal

AGN is proposing the proactive upgrade of desktop, telephone and network infrastructure in the 2021–26 access arrangement period. The replacement of IT infrastructure is in line with the asset lifecycle of the devices and equipment (which typically range from 3 to 7 years), and will ensure that critical business systems are not exposed to higher cybersecurity risks, or be prone to greater risk of failure or prolonged outages.

The proposed forecast capex is $0.2 million ($2020–21) for the 2021–26 access arrangement period, and the preferred option is considered to be the most cost effective way of managing risk associated with outdated and unsupported infrastructure. The project is considered to be in line with good industry practice, and industry standard application lifecycle management methodology has implemented in planning upgrade timelines and priorities.

The scope of proposed work, and the approach of using quotes of similar style hardware from a current service provider to determine cost, is considered to be a reasonable approach.

Table 5.22 Recommended IT infrastructure renewal capex ($2020–21, million)

	2020–21	2021–22	2022–23	2023–24	2024–25	Total
Proactive upgrade	0.02	0.01	0.04	0.03	0.06	0.15

Source: AER analysis, based on AGN data. Totals may not sum due to rounding.

Summary

We are satisfied AGN's capex forecast for information technology is required conforming capex that complies with rule 79.[46] We have included $32.8 million ($2020–21, direct costs) of information technology expenditure in our alternative capex forecast.

Table 5.23 IT capex for the 2021–26 access arrangement period, AGN's forecast and AER's draft decision ($2020–21, million, direct cost)

	AGN's forecast 2021–26	AER's draft decision 2021–26	Variance
Recurrent IT services	14.6	14.3	0.3
Non-recurrent IT services	18.9	18.5	0.4
Total	**33.5**	**32.8**	**0.7**

Source: AER analysis based on AGN data. Totals may not sum due to rounding.
Variance between AGN proposed and draft decision is the result of labour cost escalations (see Section 5.4.11).

5.4.7 Telemetry

Telemetry systems are used by distribution businesses to monitor network conditions in real time and, in some cases, for the remote control of gas flows and pressures to optimise system performance and maximise safety. Improvements in these systems will reduce the risk of major supply interruption (NGR, rule 79(2)(c)(i)) and provide more accurate, reliable and timely pressure data to better inform network capacity models (NGR, rule 79(2)(c)(ii)).

AGN's proposal

AGN is proposing 2 telemetry projects, totalling $1.8 million ($2020–21, direct costs), to assist with replacing end of life Supervisory Control and Data Acquisition (SCADA) equipment and to install additional pressure monitoring points. The projects will enable AGN to ensure it can collect appropriate pressure information from its network as it grows and changes.

Table 5.24 AGN's proposed telemetry capex for the 2021–26 access arrangement period ($2020–21, millions, direct cost)

	2021–22	2022–23	2023–24	2024–25	2025–26	Total
4G incompatible modems	0.1	-	-	-	-	0.1
Obsolete SCADA equipment	0.3	0.3	0.3	0.3	0.3	1.3
Additional network pressure monitoring	0.2	0.1	0.1	0.1	-	0.4
Total	**0.5**	**0.4**	**0.4**	**0.3**	**0.3**	**1.8**

[46] NGR, r. 79(2)(c)(i), 79(2)(c) (ii).

Source: AER analysis, based on AGN data. Totals may not sum due to rounding.

The first project will replace SCADA equipment that is technically obsolete (in line with manufacturer's recommendations of approximately 10 years) to reduce the risk of significant system failure. During the 2021–26 access arrangement period, this project will seek to replace:

- 50 remote telemetry units (RTU) used to collect and code data into a format that is transmittable and transmit the data back to a central station
- 67 data loggers used to remotely measure and record flow and pressure at strategic facilities in the network
- 11 electronic flow correctors used to measure and record pressure and calculate a correction factor to convert actual volumes recorded by the meter to the standard billing volume.[47]

Additionally, during the next access arrangement period, all 3G modems will need to be replaced, as the 3G network is due to be phased out by all providers in 2024. AGN has identified 60 modems that will need to be replaced and upgrade to 4G capable modems.

The second project will install 13 additional pressure monitoring sites across the AGN network in South Australia, at strategic sites at the fringes of the network, providing adequate pressure monitoring of the network, and therefore ensuring capacity and supply requirements can continue to be met.[48]

The locations have been identified through a review of the need for pressure monitoring sites across the network, and are located in expanding areas of the network with expected growth in demand over the next 1-5 years (such as new developments and estates), and where there is considerable distance between the area and the DRS supplying the network.[49]

Our assessment

We are satisfied AGN's capex forecast for telemetry is required conforming capex that complies with rule 79.[50] We have included $1.8 million ($2020–21, direct costs) of telemetry expenditure in our alternative capex forecast.

The businesses cases for both projects set out a range of options for addressing the identified issues, and provided strong analysis for why the preferred option was chosen

The business cases are considered to be prudent and represent good industry practice in monitoring the performance of the network.

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47 AGN, *Access Arrangement, Attachment 8.8 Capex business cases July 2020*, SA110 – SCADA equipment replacement, July 2020, p. 168.

48 AGN, *Access Arrangement, Attachment 8.8 Capex business cases July 2020, SA111 – Additional network pressure monitoring*, July 2020, p. 181.

49 AGN, *Access Arrangement, Attachment 8.8 Capex business cases July 2020, SA111 – Additional network pressure monitoring*, July 2020, p. 181.

50 NGR, r. 79(2)(c)(i), 79(2)(c) (ii).

Table 5.25 Telemetry capex for the 2021–26 access arrangement period, AGN's forecast and AER's draft decision ($2020–21, million, direct cost)

	AGN's forecast 2021–26	AER's draft decision 2021–26	Variance
4G incompatible modems	0.1	0.1	
Obsolete SCADA equipment	1.3	1.3	0.0
Additional network pressure monitoring	0.4	0.4	0.0
Total	**1.8**	**1.8**	**0.0**

Source: AER and Zincara analysis. Totals may not sum due to rounding. Variance between AGN proposed and draft decision is the result of labour cost escalations (see section 5.4.11).

5.4.8 Other distribution system assets

This capex category relates to work to be undertaken on approximately 200kms of metropolitan steel Transmission Pressure (TP) pipeline, which delivers gas to over 450,000 customers, as well as upgrading of regulators throughout the network

AGN's proposal

AGN's proposed $56.4 million ($2020–21) other distribution system capex in the 2021–26 access arrangement period. This is made up of 11 discreet projects relating to work on the transmission pipeline, and regulator replacement work. Some of the key projects include:

- $33.4 million ($2020–21) for TP modifications of inline inspections
- $5.3 million ($2020–21) for regulators
- $5.2 million ($2019–20) for the replacement of valves
- $2.6 million ($2019–20) for I&C overpressure risk reduction
- $1.8 million ($2019–20) for additional emergency isolation valves.

Our assessment

Our assessment was informed by analysis of the other distribution system capex business cases by our consultant, Zincara, and our own review of the proposal. Detailed analysis for each other distribution system business case can be found in the Zincara report, while in this section we provided an overview for each other distribution system project.

Transmission pressure pipeline projects

SA101 – Dig up and repair TP pipeline locations with multiple DCVG indications of <15%

AGN conducts Direct Current Voltage Gradient (DCVG) surveys to identify areas where there are coating defects on transmission pressure pipelines. The data provided by AGN shows that to date there have been 79 excavations undertaken where the reading was <15%, with 63 occurring in the current access arrangement period.

There have been 68 sites that have been identified for the 2021–26 access arrangement period. These sites have been prioritised as a result of the surveys where there have been multiple indications of readings of <15% recorded, and the proposed work will

reduce the risk on the transmission pressure pipelines to an acceptable level. The project is forecast to cost $1.26 million ($2019–20) during the 2021–26 access arrangement period.

The volume of proposed work, and the approach of using historical costs to determine the excavation cost, is considered to be a reasonable approach.

SA103 - Replacement of valves

AGN has 1,207 steel valves in the South Australian network, 238 of which are located on transmission pressure pipelines, which have been installed to isolate sections of the network for emergency works or planned maintenance.

AGN has identified 32 valves that are currently inoperable or have had leaks repaired but are in a deteriorated state. AGN considered three options for replacing the valves, with Option 1 (replacement of all valves in the 2021–26 access arrangement period) being the preferred option.

While we agree from a safety perspective that valves should be replaced when they are inoperable (or frozen), we also consider that AGN's valve maintenance program should be able to monitor the operation of leaking valves that have been repaired.

Therefore our preferred approach is Option 2, which is to only replace the 16 inoperable valves, and to continue to monitor the other 16 valves. Our revised capex proposal for this program is $2.8 million ($2020–21).

Table 5.26 Recommended replacement of valves capex ($2020–21, million)

	2020–21	2021–22	2022–23	2023–24	2024–25	Total
Replacement of valves	0.6	1.0	1.1	-	-	2.8

Source: AER analysis, based on AGN data. Totals may not sum due to rounding.

SA104 - M53 Offtake replacement.

The M53 TP pipeline was originally a 7.9km pipeline commissioned in 1975, and through surveys and excavations significant pitting corrosion beneath the dis-bonded heat shrink sleeves. AGN has been replacing sections of the pipeline since 2013, with 4.06km being replaced in the current access arrangement period.

AGN is proposing to replace the final 800m DN100 offtake pipeline during the 2021–26 access arrangement period with new polyethylene HP distribution trunk main at a cost of $1.6 million ($2019–20).

We support AGN's proposal to replace this final section of the pipeline. Since AGN submitted its final plan, additional information has been provided that shows the South Australian Department for Planning, Transport and Infrastructure has agreed to fund the capital for the replacement of this portion of the M53. As a result, the funding for the project is no longer required.

For the purpose of our draft decision, the additional information arrived too late to include in our alternative estimate. We will be removing this program in our final decision when we can confirm its impact to capital contribution.

SA105 – Pipeline modification for inline inspection

AGN currently monitors corrosion on the 200kms of TP pipeline in the network through DCVG surveys, and a proposing to move to inline inspections using an intelligent pigs for its ongoing corrosion inspection. In order to be able to undertake inline inspections pipelines need to be modified to allow the intelligent pigs to pass through, especially in older pipelines that have inconsistent diameters or tight bends.

AGN's preferred option for undertaking this project is to conduct physical FEED studies on the four highest priority TP pipelines, and undertake one high priority inline modification project that will be indicative of the costs and challenges for future works. The project is forecast to cost $32 million ($2019–20) in the 2021–26 access arrangement period.

We support the modification of the one pipeline for inline modification. However we do not support the need to undertake FEED studies for those pipelines that are not being modified in the 2021–26 access arrangement period. As a result, we are proposing a revised estimate of $23.88 million ($2019–20) for this project.

Table 5.27 Recommended Pipeline Modification Capex ($2020–21, million)

	2020–21	2021–22	2022–23	2023–24	2024–25	Total
Pipeline modification for inline inspection	3.3	5.2	5.4	5.4	5.2	24.5

Source: AER analysis, based on AGN data. Totals may not sum due to rounding.

SA107 - Isolation Valves

AGN has 1,207 steel valves in the South Australian network, 238 of which are located on TP pipelines, which have been installed to isolate sections of the network for emergency works or planned maintenance. As the network has grown, the number of customers connected to a section of the pipeline has changed.

Through a review of its metropolitan TP pipeline system, AGN has identified a number of locations where it is possible to reduce the number of customers that would be impacted should it be necessary to isolate sections of the pipeline, with some of the locations having more than 10,000 customers. AGN is proposing to install a number of new inline valves in the 2021–26 access arrangement period, to reduce the potential number of customers impacted by supply outage risk, at a cost of $1.77 million ($2019–20).

The volume of proposed work, and the approach of using historical costs to determine the cost, is considered to be reasonable.

SA108 – Refurbishment of Industrial and Commercial meter sets

AGN has approximately 2,000 elevated pressure meter sets with large regulators, filter, pilots and over pressure shut off valves fitted to assist monitoring the 33,030 Industrial and Commercial metering sites in the network.

AGN has identified 250 I&C meter sets that need refurbishment to address corrosion and inhibit further deterioration. They propose to undertake these refurbishments during the 2021-26 access arrangement period, at a cost of $1.34 million ($2019–20), which is line with historical refurbishment volumes of around 50 per annum.

The volume of proposed work, and the approach of using historical costs to determine the cost, is considered to be a reasonable approach.

SA112 - CP Asset Replacement

AGN installs corrosion protection (CP) units on its transmission and distribution steel pipelines, to provide protection of the buried pipes against corrosion. There are two types of CP units used within the Adelaide metropolitan gas network – galvanic sacrificial anodes and impressed current cathodic protection (ICCP).

AGN has identified 696 sacrificial anodes and 3 ICCP units that will reach end of life within the next access arrangement period, and seven areas where they consider it to beneficial to replace sacrificial anodes with ICCP units. The project is forecast to cost $1.65 million ($2019–20) in the 2021–26 access arrangement period.

The volume of proposed work, and the approach for determining cost, is considered to be a reasonable approach.

SA126 - CP remote monitoring

AGN installs corrosion protection (CP) units on its transmission and distribution steel pipelines to protect against corrosion.

AGN is proposing to install 242 monitoring units on its CP units so that data from test points can be send to the SCADA system, enabling early detection of CP defects, reduction in cost of monitoring equipment, and significantly reducing the risk of undetected accelerated corrosion. The cost of the project is forecast at $0.48 million ($2019–20) for the 2021–26 access arrangement period.

The volume of proposed work, and the approach for determining cost, is considered to be a reasonable approach.

SA 127 - Isolated Steel Sections from CP

There are currently 70 short isolated sections of steel pipeline in various areas of the Adelaide metropolitan and regional network that have no cathodic protection.

AGN is proposing to protect 47 sections of CP isolated steel pipe with anodes and replace the remaining 23 sections with PE pipeline in the 2021-26 access arrangement period, at a forecast cost of $1.17 million (2019–20). AGN provided additional justification for its approach to the project in response to an AER request, including that some of the 47 sections where anodes were being installed required more than one anode.

The volume of proposed work, and the approach for determining the cost, is considered to be a reasonable approach.

SA129 – Industrial & Commercial overpressure risk reduction

Since 2016, AGN has been installing a regulator on the bypass line for new I&C customers, which reduces the risk of the customers' equipment becoming over-pressurised when the bypass is used for maintenance. Regulators have been installed in 153 of the meter sets, leaving 533 large I&C meters with unregulated bypass.

AGN is proposing to install 250 regulators in the 2021–26 access arrangement period, at a forecast cost of $2.46 million (2019–20), with the remaining regulators to be installed in the following period. Additional cost breakdown information was provided which supported the installation of the regulators.

The volume of proposed work, and the approach for determining cost, is considered to be a reasonable approach.

SA131 - Slab Sensitivity TP

AGN is required to comply with Section 4.9 of AS 2885, which requires pipelines that traverse areas which are classified as high consequence sensitive areas be designed to ensure that rupture is not a credible failure mode.

AGN has identified short sections of TP pipeline, totalling 603m, which require the installation of additional physical protection to comply with the requirements. The project is forecast to cost $0.27 million ($2019–20) during the 2021–26 access arrangement period.

The volume of proposed work, and the approach for determining cost, is considered to be a reasonable approach.

Regulator replacement projects

AGN has proposed $5.3 million ($2020–21) for the replacement of end of life regulators across the network.

SA106 – DRS Overpressure Risk Reduction

There are 91 transmission direct regulator stations throughout the SA network, which have a service bypass line to allow for maintenance. Since 1998, these bypass lines have been fitted with a valve and a regulator to prevent over-pressurization on the network and prevent customer disruption when maintenance is being undertaken.

AGN has identified 36 direct regulator stations that have unregulated bypass lines, and are proposing the replace 18 in the 2021–26 access arrangement period, and the remaining 18 in the following period. The project is forecast to cost $3.1 million ($2019–20)[51] during the 2021–26 access arrangement period.

[51] Zincara, *AER Access Arrangement 2019 AGN Capital Expenditure,* November 2020, p. 85.

The volume of the proposed work, and the approach for determining cost, is considered to be a reasonable approach.

SA109 – DRS Operability Risk Reduction

Many of the direct regulator stations in the AGN network are located in enclosed pits, as was common practice when they were constructed in the 1970s and 1980s. These pits are covered with concrete manhole lids, which present a health and safety risk for technicians as it makes access to and from the pits difficult.[52]

AGN is proposing to replace 25 fully enclosed concrete manhole lids with butterfly style lids, which will increase the accessibility of the pits, and ensure compliance with the requirements of the Work Health and Safety (Confined Spaces) Code of Practice 2015. The project is forecast to cost $1.97 million ($2019–20)[53] during the 2021–26 access arrangement period.

The volume of the proposed work, and the approach for determining cost, is considered to be a reasonable approach.

Summary

Overall, we propose an alternate estimate for other distribution system capex of $44.8 million ($2020–21), which is a reduction of $11.7 million (or 21 per cent) from AGN's proposal.

Table 5.28 Other distribution system capex for the 2021–26 access arrangement period, AGN's forecast and AER's draft decision ($2020–21, million, direct cost)

	AGN's forecast 2021–26	AER's draft decision 2021–26	Variance
DCVG Dig Up and Repair TP (SA101)	1.3	1.3	0.0
Replacement of Valves (SA103)	5.2	2.8	2.3
TP M53 Replacement (SA104)	1.6	1.6	0.0
Pipeline Mod for ILI (SA105)	33.4	24.5	9.0
Additional emergency isolation valves (SA107)	1.8	1.8	0.0
I and C Meter Set Refurbishment (SA108)	1.4	1.4	0.0
CP Assets Replacement (SA112)	1.7	1.7	0.0
CP Remote Monitoring (SA126)	0.5	0.5	0.0
Isolated Steel Sections from CP (SA127)	1.2	1.2	0.0
I&C Overpressure risk reduction (SA129)	2.6	2.5	0.0

[52] AGN, *SA Final Plan July 2021 – June 2026 Attachment 8.8 Capex business cases – South Australia*, July 2020, p. 154.

[53] Zincara, *AER Access Arrangement 2019 AGN Capital Expenditure,* November 2020, p. 87.

Slab Sensitive TP Areas (SA131)	0.3	0.3	0.0
Regulators (SA106 and SA109	5.3	5.2	0.1
Total	**56.4**	**44.8**	**11.7**

Source: AER and Zincara analysis. Totals may not sum due to rounding.
Variance between AGN proposed and draft decision is the result of labour cost escalations (see section 5.4.11)

5.4.9 Other non-distribution system assets

This category captures remaining capex that does not fall into the categories discussed above.

AGN's proposal

AGN's proposed conforming capex for the 2016–21 and 2021–26 periods is shown in Table 5.29.

Table 5.29 Other capex ($2020–21, million, direct cost)

	2016–21			2021–26
	Allowance	Actual/Estimate	AGN's proposal	AER's draft decision
Other capex	5.6	3.4	4.7	4.6

Source: AGN, *Response to information request IR021*, Received 19 October 2020.
AER analysis. Totals may not sum due to rounding.

Current period actual/estimated other capex relates to small plant and equipment, and vehicles.

AGN's 2021–26 proposed other capex includes:

- $2.1 million ($2019–20, direct cost) on small plant and equipment[54]
- $1.6 million ($2019–20, direct cost) for vehicle replacement[55]
- $0.8 million ($2019–20, direct cost) for hot tap and stoppling including cranes.[56]

Our assessment

AGN's actual/estimates for other capex for the 2016–21 period was $3.4 million ($2020–21, direct cost) against an allowance of $5.6 million, which is a $2.2 million or a 39.5 per cent underspend.

[54] AGN, *SA Final Plan July 2021 – June 2026 Attachment 8.8 Capex business cases – South Australia*, July 2020, p. 224.

[55] AGN, *SA Final Plan July 2021 – June 2026 Attachment 8.8 Capex business cases – South Australia*, July 2020, p. 224.

[56] AGN, *SA Final Plan July 2021 – June 2026 Attachment 8.8 Capex business cases – South Australia*, July 2020, p. 224.

For the purpose of the draft decision, we allow the 2016–21 capex of $3.4 million ($2020–21, direct costs).

AGN provided the justification of its proposed $4.7 million ($2020–21, direct cost) for other capex for the 2021–26 period in confidential business case.[57] Our assessment of AGN's proposed capex involved a bottom up analysis of projects, followed by a top down check.

AGN proposed capex of $2.15 million ($2019–20, direct cost) to replace small plant and equipment is based on continuing investment at historical levels, to allow for maintaining the quantity and performance of plant, equipment and tools. Examples of the plant and equipment purchased during the current period include PE squeeze-off equipment, compaction tools, low noise power generators, concrete cutting devices, and underground cable location equipment. Historical data indicates AGN spends $0.43 million ($2019–20) replacing small plant and equipment.

AGN proposed capex of $1.59 million ($2019–20, direct cost) to replace 15 vehicles using a combination of kilometres travelled and when they reach the end of their engineering design life (12 years). AGN is proposing to replace all vehicles purchased between September 2009 and November 2013, as they will reach their end of design life during the 2021-26 period. The vehicle replacement program includes replacing four Medium Pantech trucks, three long premium Pantech trucks, three long tipper trucks and two long premium tipper trucks. The cost of replacing the vehicles has been determined through a combination of quotes and recent actual purchase costs.

AGN proposed capex of $0.78 million ($2019–20, direct cost) to replace high pressure flow stoppling work equipment that has, or is expected to reach, end of life during the 2021-26 period. The current equipment was purchased in the 1980s, and is used to stop the flow of gas on high pressure steel pipelines during maintenance work. Purchase of two cranes is also required to be able to handle the stoppling equipment. The cost of equipment and cranes has been determined through quotes from various suppliers.

Based on the available information, we are satisfied that the proposed capex of $4.5 million ($2019–20, direct cost) for small plant and equipment, vehicles, and high pressure flow stopping is conforming capex under the NGR.[58]

Table 5.30 Other non-distribution system capex for the 2021–26 access arrangement period, AER's draft decision ($2020–21, million, direct cost)

	2020–21	2021–22	2022–23	2023–24	2024–25	Total
Small P&E	0.5	0.4	0.4	0.4	0.4	2.2
Vehicles	0.3	0.3	0.3	0.3	0.3	1.6

[57] AGN, *SA Final Plan July 2021 – June 2026 Attachment 8.8 Capex business cases – South Australia*, July 2020, pp. 223–228.

[58] NGR, r. 79(2).

	2020–21	2021–22	2022–23	2023–24	2024–25	Total
Hot tap and stoppling, including cranes	0.3	0.3	-	-	0.1	0.8
Total	**1.1**	**1.1**	**0.8**	**0.8**	**0.9**	**4.6**

Source: AER analysis, based on AGN data. Totals may not sum due to rounding.

5.4.10 Capitalised overheads

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

According to the RIN, it is our understanding that AGN only capitalises network overheads and disaggregates its capitalised overheads into the following subcategories/functions:

- operations and maintenance
- planning and system design
- procurement and fleet
- technical assurance
- network engineering
- general support.

Table 5.31 Capitalised overheads allowance, actual and forecast 2016–21 and 2021–26 access arrangement periods ($2020–21, million)

	2016–21		2021–26	
	Allowance	**Actual**	**AGN proposed**	**AER draft decision**
Capitalised overheads	59.6	49.3	48.2	46.4

Source: AGN, *Response to information request IR021*, Received 19 October 2020. AER analysis. Totals may not sum due to rounding.

In the 2016–21 period, AGN have proposed $49.3 million ($2020–21, direct cost) of capitalised overheads. This is 17.3 per cent less than our approved $59.6 million ($2020–21, direct cost). Given the level of underspend, and no evidence of inefficient expenditure, we accept AGN's $49.3 million ($2020–21, direct cost) of capitalised overheads in the 2016–21 period as conforming capital expenditure. [59]

Table 5.32 Proposed capitalised overheads in 2021–26 ($2020–21, million)

	2021–22	2022–23	2023–24	2024–25	2025–26	Total
Capitalised overheads	9.5	9.7	9.8	9.7	9.5	48.2

[59] NGR, r.79(2).

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

AGN's proposed forecast methodology for capitalised overheads is principally consistent with our previous decisions, which is to weight its overhead functions based on a fixed and variable component. Under this methodology, the variable portion will increase or decrease depending on the relative difference between the total historical direct cost and the total forecast direct cost. We accept AGN's proposal to adopt a similar approach in its forecast.

However, while we have historically accepted a 75 per cent fixed and 25 per cent variable split, AGN has proposed a higher fixed component of 79.4 per cent. Based on the information before us and its materiality, we accept this higher fixed component on the basis that AGN has provided further details at the subcategory level and has used reasonable assumptions in determining the weighted averages of both its fixed and variable components.

Table 5.33 Allowed capitalised overheads for the 2021–26 access arrangement period ($2020–21, millions)

	AGN Proposed	AER Draft decision
Capitalised Overheads	48.2	46.4

Source: AER and Zincara analysis. Totals may not sum due to rounding.
Variance between AGN proposed and draft decision is the result of labour cost escalations (see section 5.4.11).

We accept the forecast capitalised overheads of $46.4 million as conforming capex.[60]

5.4.11 Cost escalation and reconciliation

In our draft decision for the 2021–26 access arrangement period, we have considered the following inputs in regards to inflation and labour real cost escalation for the purpose of our capex draft decision:

- actual inflation prior to 2020–21 and forecast inflation for 2020–21
- labour real cost escalators based on Deloitte Access Economics (DAE) forecast (Attachment 6 – Operating expenditure).

As AGN has based its forecast on historical inputs and presented the inputs in 2019–20 and 2020–21 dollar terms in its capex model, we have reviewed actual rates of inflation prior to 2020–21 and forecast inflation for 2020–21.

We accept AGN's proposed inflation for the purpose of our capex decision on the basis that it aligns with its proposed roll forward model (RFM) and our capital base decision (Attachment 2 – Capital Base). It is worth noting that our final decision will likely reflect actual inflation for 2020–21.

[60] NGR, r.79(1).

In terms of labour real cost escalators, we consider the differences between AGN proposed escalators and our alternatives to be material in terms of its impact to total capex. As such, we have made adjustments for each capex category based on our alternative estimate. We estimate that the total impact between AGN proposed escalators and our alternatives to be $8.5 million ($2020–21, direct cost) which is reflected in each of the sections above.

In addition, we will seek further information before our final decision on the 59.7 per cent labour weighting that AGN uses for its capex forecast. In particular, additional information will be sought regarding the split between internal and external labour, the primarily skillsets of each labour type, as well as the appropriateness of using the same labour cost escalators for each labour type.

5.5 Revisions

We require the following revisions to make the access arrangement proposal acceptable:

Table 5.34 AGN's capex revisions

Revision	Amendment
Revision 5.1	Make all necessary amendments to reflect our draft decision on conforming capex for the 2021–26 access arrangement period, as set out in Table 5.3.

Shortened forms

Shortened form	Extended form
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AGN	Australian Gas Networks
AIPM tool	Advanced asset investment planning and management tool
capex	Capital expenditure
CI	cast iron
CP units	corrosion protection units
DAE	Deloitte Access Economics
FLE	field life extension
GIS	Geographic Information Systems
HDPE	High density polyethylene
I&C	Industrial and commercial
ICCP	impressed current cathodic protection
IT	Information technology
MUS	multi-user services
NGL	National Gas Law
NGO	National Gas Objective
NGR	National Gas Rules
NPV	Net present value
opex	Operating expenditure
OTR	Office of the Technical Regulator
RFM	Roll forward model
RIN	Regulatory Information Notice
RTU	remote telemetry units
SCADA	Supervisory Control And Data Acquisition
TJ	Terajoules
TP pipeline	Transmission pressure pipeline
US	unprotected steel
Zincara	Zincara Pty Ltd