



DRAFT DECISION
Australian Gas Networks
Victoria and Albury gas access
arrangement
2018 to 2022

Attachment 5 – Regulatory
depreciation

July 2017

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Note

This attachment forms part of the AER's draft decision on the access arrangement for AGN's Victoria and Albury gas distribution networks for 2018-22. It should be read with all other parts of the draft decision.

The draft decision includes the following documents:

Overview

Attachment 1 - Services covered by the access arrangement

Attachment 2 - Capital base

Attachment 3 - Rate of return

Attachment 4 - Value of imputation credits

Attachment 5 - Regulatory depreciation

Attachment 6 - Capital expenditure

Attachment 7 - Operating expenditure

Attachment 8 - Corporate income tax

Attachment 9 - Efficiency carryover mechanism

Attachment 10 - Reference tariff setting

Attachment 11 - Reference tariff variation mechanism

Attachment 12 - Non-tariff components

Attachment 13 - Demand

Attachment 14 - Other incentive schemes

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Shortened forms

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

5 Regulatory depreciation

When determining the total revenue for AGN, we include an allowance for the depreciation of the projected capital base (otherwise referred to as ‘return of capital’).¹ Regulatory depreciation is used to model the nominal asset values over the 2018–22 access arrangement period and the depreciation allowance in the total revenue requirement.²

This attachment outlines our draft decision on AGN’s annual regulatory depreciation allowance for the 2018–22 access arrangement period. Our consideration of specific matters that affect the estimate of regulatory depreciation is also outlined in this attachment. These include:

- the standard asset lives for depreciating new assets associated with forecast capex³
- the year-by-year tracking approach to depreciating assets in the capital base.

We also discuss the prospect of accelerated depreciation for mains assets that are replaced.

5.1 Draft decision

We approve AGN’s proposal to use the real straight-line method to calculate the regulatory depreciation allowance. We determine a regulatory depreciation allowance of \$238.9 million (\$ nominal) for AGN. This represents an increase of \$4.1 million (or 1.7 per cent) from AGN’s proposed regulatory depreciation allowance of \$234.8 million (\$ nominal). This is mainly because of changes to the application of the year-by-year tracking approach and our draft decisions on components of AGN’s proposal discussed in other attachments which impact on the regulatory depreciation allowance. These include the opening capital base (attachment 2) and the forecast capex (attachment 6).

We accept the standard asset lives proposed by AGN. The standard asset lives are consistent with the approved standard asset lives for the 2013–17 access arrangement period. They are also broadly comparable with the standard asset lives approved in our recent decisions for other gas service providers.⁴ However, AGN did not provide a

¹ NGR, r. 76(b).

² Regulatory depreciation allowance is the net total of the straight-line depreciation (negative) and the annual inflation indexation (positive) on the projected capital base.

³ The term ‘standard asset life’ may also be referred to as ‘standard economic life’, ‘asset life’, ‘economic asset life’ or ‘economic life’.

⁴ For example, *AER: Access arrangement final decision APA GasNet Australia (Operations) Pty Ltd 2013–17 Part 2: Attachments*, March 2013, p. 149; *AER: Final decision Amadeus Gas Pipeline access arrangement attachment 5 – Regulatory depreciation*, May 2016, p. 9. *Final Decision Australian Gas Networks Access Arrangement 2016 to 2021 Attachment 5 – Regulatory depreciation*, May 2016, p.28. *Final decision, Jemena Gas Networks (NSW) Ltd Access Arrangement 2015-20 Attachment 5 – Regulatory depreciation*, June 2015, p10.

standard asset life for equity raising costs. We have determined this asset life for the draft decision.

We also accept AGN's proposed year-by-year tracking approach for depreciating its capital base. However, we have made changes in its application. Our assessment is presented in section 5.4.1.

Further, we accept AGN's proposed accelerated depreciation of mains and services to be replaced over the 2018–22 access arrangement period, as discussed in attachment 6.

Table 5.1 sets out our draft decision on AGN's regulatory depreciation allowance for the 2018–22 access arrangement period.

Table 5.1 AER's draft decision on AGN's regulatory depreciation allowance for the 2018–22 access arrangement period (\$million, nominal)

	2018	2019	2020	2021	2022	Total
Straight-line depreciation	79.5	87.4	98.4	92.0	98.3	455.6
Less: indexation on capital base	39.3	41.2	43.5	45.5	47.2	216.7
Regulatory depreciation	40.3	46.2	54.9	46.5	51.1	238.9

Source: AER analysis.

5.2 AGN's proposal

AGN used the AER's post-tax revenue model (PTRM) to calculate the forecast depreciation for the 2018–22 access arrangement period. Its proposed regulatory depreciation for the 2018–22 access arrangement period is set out in table 5.2.

AGN proposed the year-by-year tracking approach to depreciation, which implements the straight-line method.⁵ It also proposed accelerated depreciation of its mains and services assets (distribution pipelines) it plans to replace.⁶ Besides these changes, its approach to depreciation is proposed to be the same as the current access arrangement.

⁵ AGN - *Final Plan - Access Arrangement Information for our Victorian and Albury natural gas distribution networks 2018-2022* - 20161222, pp.104-105.

⁶ AGN - *Final Plan - Access Arrangement Information for our Victorian and Albury natural gas distribution networks 2018-2022* - 20161222, p.105.

Table 5.2 AGN’s proposed regulatory depreciation for the 2018–22 access arrangement period (\$million, nominal)

	2018	2019	2020	2021	2022	Total
Straight-line depreciation	80.1	88.0	93.3	90.0	96.3	447.7
Less: indexation on capital base	38.6	40.4	42.6	44.7	46.4	212.8
Regulatory depreciation	41.5	47.6	50.7	45.2	49.9	234.8

Source: AGN - *Final Plan - Access Arrangement Information for our Victorian and Albury natural gas distribution networks 2018-2022* - 20161222, p. 112.

5.3 Assessment approach

In its access arrangement proposal, AGN must provide a forecast of depreciation for the 2018–22 access arrangement period, including a demonstration of how the forecast is derived on the basis of the proposed depreciation method.⁷

The depreciation schedule sets out the basis on which the pipeline assets constituting the capital base are to be depreciated for the purpose of determining a reference tariff. The depreciation schedule may consist of a number of separate schedules, each relating to a particular asset or class of asset.⁸ In making a decision on the proposed depreciation schedule, we assess the compliance of the proposed depreciation schedule with the depreciation criteria set out in the NGR.⁹ We must also take into account the NGO and the revenue and pricing principles.¹⁰

Our discretion under the depreciation criteria is limited.¹¹ The depreciation criteria state that the depreciation schedule should be designed:

- so that reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services¹²
- so that each asset or group of assets is depreciated over the economic life of that asset or group of assets¹³

⁷ NGR, r. 72(1)(c)(ii).

⁸ NGR, rr. 88(1), 88(2).

⁹ NGR, r. 89.

¹⁰ NGL, s 28; NGR r. 100(1). The NGO is set out in NGL, s. 23. The revenue and pricing principles are set out in NGL, s. 24.

¹¹ NGR, rr. 89(3) and 40(2). The example provided in r. 40(2) states: The AER has limited discretion under r. 89. Rule 89 governs the design of a depreciation schedule. In dealing with a full access arrangement submitted for its approval, the AER cannot, in its draft decision, insist on change to an aspect of a depreciation schedule governed by r. 89 unless the AER considers the change is necessary to correct non-compliance with a provision of the Law or an inconsistency between the depreciation schedule and the applicable criteria. Even though the AER might consider change desirable to achieve more complete conformity between the depreciation schedule and the principles and objectives of the Law, it would not be entitled to give effect to that view in the decision making process.

¹² NGR, r. 89(1)(a).

- so as to allow, as far as reasonably practicable, for adjustment reflecting changes in the expected economic life of a particular asset, or a particular group of assets¹⁴
- so that (subject to the rules about capital redundancy), an asset is depreciated only once¹⁵
- so as to allow for the service provider's reasonable needs for cash flow to meet financing, non-capital and other costs.¹⁶

The depreciation criteria also provide that a substantial amount of depreciation may be deferred.¹⁷

The rules also require that any forecast must be arrived at on a reasonable basis and must represent the best forecast or estimate possible in the circumstances.¹⁸

The regulatory depreciation allowance is the net total of the real straight-line depreciation less the annual inflation indexation on the projected capital base. Our standard approach is to employ a straight-line method for calculating depreciation. We consider that the straight-line method satisfies the NGR's depreciation criteria.¹⁹ This is because the straight-line method smooths changes in the reference tariffs, promotes efficient growth of the market, allows assets to be depreciated only once and over its economic life, and allows for a service provider's reasonable needs for cash flow.

In assessing AGN's proposed regulatory depreciation allowance, we have analysed AGN's proposed inputs to the PTRM for calculating depreciation for the 2018–22 access arrangement period. These inputs include:

- the depreciation associated with the opening capital base as at 1 January 2018—calculated in a separate year-by-year tracking depreciation model
- the forecast net capex in the 2018–22 access arrangement period
- the standard asset life for each asset class—used for calculating the depreciation of new assets associated with forecast net capex in the 2018–22 access arrangement period
- the indexation adjustment—based on the forecast capital base and expected inflation rate for the 2018–22 access arrangement period.

Our decisions affecting the opening and forecast capital base (attachment 2), expected inflation (attachment 3) and forecast net capex (attachment 6) are discussed elsewhere. Our decision on the required amendments to AGN's proposed regulatory depreciation allowance reflects our determinations on these building block

¹³ NGR, r. 89(1)(b).

¹⁴ NGR, r. 89(1)(c).

¹⁵ NGR, r. 89(1)(d).

¹⁶ NGR, r. 89(1)(e).

¹⁷ NGR, r. 89(2).

¹⁸ NGR, r. 74(2).

¹⁹ NGR, r. 89.

components. Our assessment approach on the remaining inputs in the above list is set out below.

In general, we consider that consistency in the standard asset life for each asset class across access arrangement periods will allow reference tariffs to vary smoothly over time. This will promote efficient growth in the market for reference services.²⁰ We usually depreciate a service provider's existing assets in the PTRM by using remaining asset lives at the start of an access arrangement period. Our standard method for determining the remaining asset lives is the weighted average method.²¹ The weighted average method rolls forward the remaining asset life for an asset class from the beginning of the earlier access arrangement period. This method reflects the mix of assets within that asset class. It also reflects when the assets were acquired over that period and the remaining asset lives of existing assets at the end of that period. The remaining values of all assets are used as weights at the end of the period.²² AGN's proposal, however, has adopted the year-by-year tracking method to calculate depreciation. We have assessed whether this change of approach would meet the depreciation criteria of the NGR, as discussed in section 5.4.

5.3.1 Interrelationships

The regulatory depreciation allowance is a building block component of the annual building block revenue requirement.²³ Higher (or quicker) depreciation leads to higher revenues over the access arrangement period. It also causes the capital base to reduce more quickly (assuming no further capex). This reduces the return on capital allowance, although this impact is usually smaller than the increased depreciation allowance in the short to medium term.²⁴

Ultimately, however, a service provider can only recover the capex it has incurred on assets once. The depreciation allowance reflects how quickly the capital base is being recovered and is based on the remaining and standard asset lives used in the depreciation calculation. It also depends on the level of the opening capital base and the forecast capex. Any increase in these factors also increases the depreciation allowance.

²⁰ NGR, r. 89(1)(a).

²¹ We consider this depreciation method to be a generally superior approach. The reasons are outlined in our decision on the roll forward model for electricity transmission network service providers. See AER, *Explanatory statement, Proposed amendment, Electricity transmission network service providers, Roll forward model*, August 2010, pp. 5–6.

²² See AER, *Final decision - amended transmission roll forward model*, December 2010, pp. 5–6 for further explanation.

²³ Under our standard approach, the distinction is made between straight-line depreciation and regulatory depreciation. The difference being that regulatory depreciation is the straight-line depreciation minus the indexation adjustment.

²⁴ This is generally the case because the reduction in the capital base amount feeds into the higher depreciation building block, whereas the reduced return on capital building block is proportionate to the lower capital base multiplied by the WACC.

Our standard approach is to maintain the capital base in real terms, meaning the capital base is indexed for expected inflation. The return on capital building block has to be calculated using a nominal rate of return (WACC) applied to the opening capital base.²⁵ The total revenue requirement is calculated by adding up the return on capital, depreciation, opex, and tax building blocks. Because inflation on the capital base is accounted for in both the return on capital—based on a nominal rate—and the depreciation calculations—based on an indexed capital base—an adjustment must be made to the revenue requirement to prevent compensating twice for inflation.

To avoid this double compensation, we make an adjustment by subtracting the annual indexation gain on the capital base from the calculation of total revenue. Our approach is to subtract the indexation of the opening capital base—the opening capital base multiplied by the expected inflation for the year—from the capital base depreciation. The net result of this calculation is referred to as regulatory depreciation.²⁶ Regulatory depreciation is the amount used in the building block calculation of total revenue to ensure that the revenue equation is consistent with the use of a capital base, which is indexed for inflation annually.

This approach produces the same total revenue requirement and capital base as if a real rate of return had been used in combination with an indexed capital base. Under an alternative approach where a nominal rate of return was used in combination with an un-indexed (historical cost) capital base, no adjustment to the depreciation calculation of total revenue would be required. This alternative approach produces a different time path of total revenue compared to our standard approach. In particular, overall revenues would be higher early in the asset's life (as a result of more depreciation being returned to the service provider) and lower in the future—producing a steeper downward sloping profile of total revenue.²⁷ Under both approaches, the total revenues being recovered are in present value neutral terms—that is, returning the initial cost of the capital base.

Figure 5.1 shows the recovery of revenue under both approaches using a simplified example.²⁸ Indexation of the capital base and the offsetting adjustment made to depreciation results in smoother revenue recovery profile over the life of an asset than if the capital base was un-indexed.

The relative size of the inflation indexation and straight-line depreciation, and their impact on the capital base using AGN's proposal is shown in the capital base

²⁵ NGR, cl. 87(4)(b).

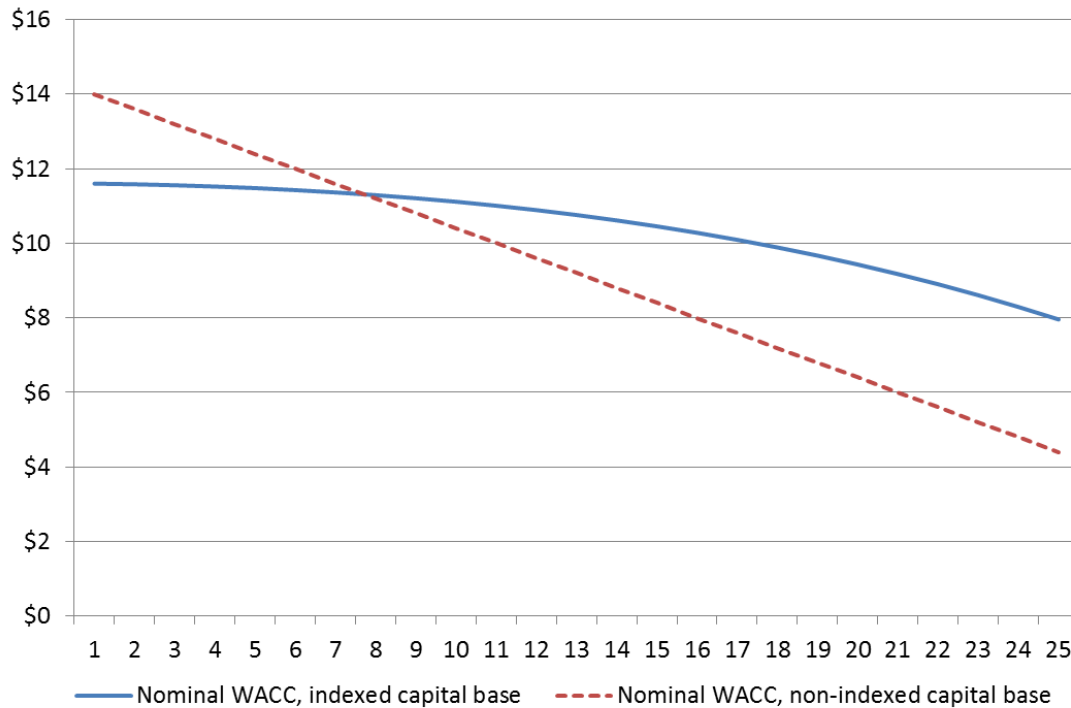
²⁶ If the asset lives are extremely long, such that the capital base depreciation rate is lower than the inflation rate, then negative regulatory depreciation can emerge. The indexation adjustment is greater than the capital base depreciation in such circumstances

²⁷ A change of approach from an indexed capital base to an un-indexed capital base would result in an initial step change increase in revenues to preserve NPV neutrality.

²⁸ The example is based on the initial cost of an asset of \$100, a standard economic life of 25 years, a real WACC of 7.32%, expected inflation of 2.5% and nominal WACC of 10%. Other building block components such as opex, tax and capex are ignored for simplicity as they would affect both approaches equally.

attachment 2. A ten per cent increase in the straight-line depreciation causes revenues to increase by about 3.9 per cent.

Figure 5.1 Revenue path example – indexed vs un-indexed capital base (\$ nominal)



Source: AER analysis.

5.4 Reasons for draft decision

In our assessment of AGN's proposal, we focused on the following aspects:

- year-by-year tracking of depreciation
- accelerated depreciation of replaced mains and services
- standard asset lives.

Each of these is discussed in turn in the following subsections.

5.4.1 Year-by-year tracking

AGN proposed the year-by-year tracking approach to implement straight-line depreciation. This represents a change from the current depreciation approach to determining remaining asset lives at the end of each access arrangement period. Our preferred option (as noted above) is a weighted average remaining life (WARL) approach. We consider that year-by-year tracking is administratively more complex and costly than a WARL approach and can increase revenue fluctuations as depreciation depends more on when individual assets expire. A change of approach

can also cause revenue (and price spikes) which may not be helpful to efficient development in the market for reference services.

We accept that the year-by-year tracking approach can meet the criterion of having the depreciation schedule reflect the asset's economic life, where it tracks the asset's technical life. However, we must also assess the approach against the other criteria in the NGR, in particular, whether the approach leads to efficient development in the market for reference services. Under this criterion we also need to consider the impact of the change in the long run and any significant disruption in the short to medium term from a change in previous practice. The proposed change to year-by-year tracking does increase depreciation (and prices) over short to medium term, other things being equal. The CCP also raised this potential impact as a concern in its submission.²⁹ However, our analysis suggests the impact in this case to be modest and therefore unlikely to have a significant impact on the efficient growth in the market for reference services. Accordingly, we accept AGN's proposal in this regard.

However, we do require changes to how the future depreciation profile of depreciation is determined. AGN based it on the forecast capex previously approved, which bears no relationship to the assets actually entering the capital base. We consider the future depreciation profile should be based on actual capex that reflects the asset's economic life. Therefore, our draft decision is to base AGN's year-by-year tracking depreciation on actual capex incurred over the 2013–17 access arrangement period.

5.4.2 Accelerated depreciation

AGN proposed accelerated depreciation over five years on assets to be replaced through its mains replacement programs over the 2018–22 access arrangement period. We accept this proposal. We have reviewed the information and are satisfied that the amount proposed for accelerated depreciation reflects the expected kilometres of mains to be replaced over the 2018–22 access arrangement period, as discussed in attachment 6. The assets that are forecast to be replaced will therefore reach the end of their economic life in the 2018–22 access arrangement period.

5.4.3 Standard asset lives

AGN did not propose any changes to the standard asset lives applied to new capex from that used during the 2013–17 access arrangement period. We consider the standard assets lives remain an appropriate reflection of the expected life of newly acquired assets. We therefore accept AGN's proposal to continue to apply these lives in determining the depreciation on new assets. We are satisfied the proposed standard asset lives reflect the requirements of r. 89(1) of the NGR.

²⁹ Consumer Challenge Panel (CCP 11) - *Response to proposals from AGN, AusNet and Multinet for the 2018-2022 Access Arrangements* - 3 March 2017, p. 53.

However, AGN did not provide a standard asset life for equity raising costs. We have determined this asset life for the draft decision based on our standard approach of using the weighted average standard asset lives of the opening capital base.

Table 5.3 sets out our draft decision on the standard asset lives for AGN over the 2018–22 access arrangement period.

Table 5.3 AER's draft decision on AGN's standard asset lives (years)

	Standard asset life
Mains & services	60
Meters	15
Buildings	50
SCADA	15
Computer equipment	5
Other assets	15
Equity raising costs	55.1

Source: AER analysis.

Note: These asset classes are used for both the Victorian and Albury networks. The same standard asset lives are used on both networks.

5.5 Revisions

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

Revision 5.1:	Make all necessary amendments to reflect this draft decision on the regulatory depreciation allowance for the 2018–22 access arrangement period, as set out in Table 5.1.
Revision 5.2:	Make all necessary amendments to reflect this draft decision on the standard asset lives, as set out in Table 5.3.