DRAFT DECISION
Murraylink transmission determination
2018 to 2023

Attachment 5 – Regulatory depreciation

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AUSTRALIAN ENERGY REGULATOR

Inquiries about this publication should be addressed to:

Australian Energy Regulator
GPO Box 520
Melbourne Vic 3001

Tel: (03) 9290 1444
Fax: (03) 9290 1457

Email: AERInquiry@aer.gov.au

Note

This attachment forms part of the AER's draft decision on Murraylink's transmission determination for 2018–23. It should be read with all other parts of the draft decision.

The draft decision includes the following documents:

Overview

Attachment 1 – Maximum allowed revenue

Attachment 2 – Regulatory asset 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

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Attachment 10 – Capital expenditure sharing scheme

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Attachment 13 – Pass through events

Attachment 14 – Negotiated services

Contents

Shortened forms

Shortened form	Extended form
AARR	aggregate annual revenue requirement
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ASRR	annual service revenue requirement
augex	augmentation expenditure
capex	capital expenditure
CCP	Consumer Challenge Panel
CESS	capital expenditure sharing scheme
CPI	consumer price index
DMIA	demand management innovation allowance
DRP	debt risk premium
EBSS	efficiency benefit sharing scheme
ERP	equity risk premium
MAR	maximum allowed revenue
MRP	market risk premium
NEL	national electricity law
NEM	national electricity market
NEO	national electricity objective
NER	national electricity rules
NSP	network service provider
NTSC	negotiated transmission service criteria
opex	operating expenditure
PPI	partial performance indicators
PTRM	post-tax revenue model
RAB	regulatory asset base
RBA	Reserve Bank of Australia
repex	replacement expenditure
RFM	roll forward model
RIN	regulatory information notice

Shortened form	Extended form
RPP	revenue and pricing principles
SLCAPM	Sharpe-Lintner capital asset pricing model
STPIS	service target performance incentive scheme
TNSP	transmission network service provider
TUoS	transmission use of system
WACC	weighted average cost of capital

5 Regulatory depreciation

Depreciation is the allowance provided so capital investors recover their investment over the economic life of the asset (return of capital). In deciding whether to approve the depreciation schedules submitted by Murraylink, we make determinations on the indexation of the regulatory asset base (RAB) and depreciation building blocks for Murraylink's 2018–23 regulatory control period.[1] The regulatory depreciation allowance is the net total of the straight-line depreciation less the indexation of the RAB.

This attachment sets out our draft decision on Murraylink's regulatory depreciation allowance. It also presents our draft decision on the proposed depreciation schedules, including an assessment of the proposed standard and remaining asset lives used for forecasting depreciation.

5.1 Draft decision

We do not accept Murraylink's proposed regulatory depreciation allowance of $26.7 million ($ nominal) for the 2018–23 regulatory control period. Instead, we determine a regulatory depreciation allowance of $23.2 million ($ nominal) for Murraylink. This represents a decrease of $3.6 million (or 13.3 per cent) on the proposed amount. In coming to this decision:

- We accept Murraylink's proposed straight-line method and standard asset lives used to calculate the regulatory depreciation allowance.
- We consider that Murraylink's proposed standard asset lives for its existing asset classes are consistent with those approved at the 2013–18 transmission determination and comparable to the standard asset lives used for other TNSPs in respect of similar asset classes. However, we did not retain the proposed standard asset life of 10 years for the 'Test equipment' asset class in the PTRM. This is because we have not approved the proposed capex allocated to this asset class, as discussed in attachment 6 and therefore no standard asset life is required for this asset class. Accordingly, we consider the standard asset lives approved in this draft decision would lead to a depreciation schedule that reflects the nature of the assets over their economic lives[2] (section 5.4.1).
- We accept Murraylink's proposed weighted average method to calculate the remaining asset lives as at 1 July 2018. This is because the proposed method applies the approach as set out in the AER's roll forward model (RFM). In accepting the weighted average method, we have updated Murraylink's remaining asset lives as at 1 July 2018 to reflect our amendments to the RAB roll forward for the 2013–18 regulatory control period (attachment 2).

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1 NER, cll. 6A.5.4(a)(1) and (3).

2 NER, cl. 6A.6.3(b)(1).

- We made determinations on other components of Murraylink's proposal that also affect the forecast regulatory depreciation allowance—the opening RAB as at 1 July 2018 (attachment 2), expected inflation rate (attachment 3) and forecast capital expenditure (attachment 6).

Table 5.1 sets out our draft decision on the annual regulatory depreciation allowance for Murraylink's 2018–23 regulatory control period.

Table 5.1 AER's draft decision on Murraylink's depreciation allowance for the 2018–23 regulatory control period ($million, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Straight-line depreciation	6.7	7.0	7.3	7.7	9.5	38.3
Less: inflation indexation on opening RAB	2.9	2.9	3.1	3.2	3.1	15.1
Regulatory depreciation	**3.9**	**4.1**	**4.3**	**4.5**	**6.4**	**23.2**

Source: AER analysis.

5.2 Murraylink's proposal

For the 2018–23 regulatory control period, Murraylink proposed a forecast regulatory depreciation allowance of $26.7 million ($ nominal). Murraylink applied the straight-line depreciation method employed in the AER's post-tax revenue model (PTRM) to calculate the depreciation allowance.[3]

Murraylink stated that it has used the same standard asset lives as those used for the RAB roll forward for calculating the forecast regulatory depreciation.[4] In addition, Murraylink proposed a standard asset life of 10 years for a new 'Test equipment' asset class. It also applied the weighted average remaining asset lives as at 30 June 2018 derived from the RFM to calculate the forecast depreciation of existing assets.

Table 5.2 sets out Murraylink's proposed depreciation allowance for the 2018–23 regulatory control period.

[3] Murraylink, *Revenue proposal*, January 2017, pp. 107–108.

[4] Murraylink, *Revenue proposal*, January 2017, p. 107.

Table 5.2 Murraylink's proposed depreciation allowance for the 2018–23 regulatory control period ($million, nominal)

	2018–19	2019–20	2020–21	2021–22	2022–23	Total
Straight-line depreciation	6.7	7.1	7.5	7.8	10.0	39.1
Less: inflation indexation on opening RAB	2.3	2.3	2.5	2.7	2.6	12.4
Regulatory depreciation	**4.4**	**4.8**	**4.9**	**5.2**	**7.4**	**26.7**

Source: Murraylink, *Revenue proposal – Attachment 10.1 – PTRM,* 31 January 2017

5.3 Assessment approach

We determine the regulatory depreciation allowance using the post-tax revenue model (PTRM) as a part of a TNSP's annual building block revenue requirement.[5] The calculation of depreciation in each year is governed by the value of assets included in the RAB at the beginning of the regulatory year, and by the depreciation schedules.[6]

Our standard approach to calculating depreciation is to employ the straight-line method as set out in the PTRM. Regulatory practice has been to assign a standard asset life to each category of assets that represents the economic or technical life of the asset or asset class.[7] We must consider whether the proposed depreciation schedules conform to the following key requirements:

- The schedules depreciate using a profile that reflects the nature of the assets or category of assets over the economic life of that asset or category of assets.[8]
- The sum of the real value of the depreciation attributable to any asset or category of assets must be equivalent to the value at which that asset or category of assets was first included in the RAB for the relevant transmission system.[9]

To the extent that a TNSP's revenue proposal does not comply with the above requirements, we must determine the depreciation schedules for calculating the depreciation for each regulatory year.[10]

The regulatory depreciation allowance is an output of the PTRM. We therefore have assessed Murraylink's proposed regulatory depreciation allowance by analysing the proposed inputs to the PTRM for calculating that allowance. The key inputs include:

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5 NER, cll. 6A.5.4(a)(3) and 6A.5.4(b)(3).

6 NER, cl. 6A.6.3(a).

7 This is the standard practice for the AER, as well as other jurisdictional regulators. See for example, IPART, *Cost building block model template*, 20 June 2014, Table 1; ERAWA, *Final Decision on Proposed Revisions to the Access Arrangement for the Western Power Network*, September 2012, Appendix 2: Target Revenue Calculation (Revenue Model).

8 NER, cl. 6A.6.3(b)(1).

9 NER, cl. 6A.6.3(b)(2).

10 NER, cl. 6A.6.3(a)(2)(ii).

- the opening RAB as at 1 July 2018
- the expected inflation rate for the 2018–23 regulatory control period
- the forecast net capex in the above period
- the standard asset life for each asset class—used for calculating the depreciation of new assets associated with forecast net capex in the above period
- the weighted average remaining asset lives for each asset class—used for calculating the depreciation of existing assets.

Our draft decision on Murraylink's regulatory depreciation allowance reflects our determinations on the opening RAB as at 1 July 2018, expected inflation and forecast capex (the first three building block components in the above list).[11] Our determinations on these components of Murraylink's proposal are discussed in attachments 2, 3 and 6 respectively.

In this attachment, we assess Murraylink's proposed standard asset lives against:

- the approved standard asset lives in the transmission determination for Murraylink for the 2013–18 regulatory control period
- the standard asset lives of comparable asset classes approved in our recent transmission determinations for other TNSPs.

We use our standard approach for depreciating a TNSP's existing assets in the PTRM by using the remaining asset lives at the start of a regulatory control period as determined in the RFM. The proposed RFM uses our preferred weighted average method to establish a remaining asset life for each asset class. This method rolls forward the remaining asset life for an asset class from the beginning of the 2013–18 regulatory control period. We consider this method reflects the mix of assets within the 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. Murraylink's proposal has adopted the weighted average method to calculate its remaining asset lives as at 1 July 2018.

5.3.1 Interrelationships

The regulatory depreciation allowance is a building block component of the annual building block revenue requirement.[12] Higher (or quicker) depreciation leads to higher revenues over the regulatory control period. It also causes the RAB to reduce more quickly (excluding the impact of further capex). This reduces the return on capital

[11] Our final decision will update the opening RAB as at 1 July 2018 for revised estimates of actual capex and inflation.

[12] The PTRM distinguishes between straight-line depreciation and regulatory depreciation, the difference being that regulatory depreciation is the straight-line depreciation minus the indexation adjustment.

allowance, although this impact is usually smaller than the increased depreciation allowance in the short to medium term.[13]

Ultimately, however, a TNSP can only recover the capex it has incurred on assets once. The depreciation allowance reflects how quickly the RAB 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 RAB and the forecast capex. Any increase in these factors also increases the depreciation allowance.

The RAB has to be maintained in real terms, meaning the RAB must be indexed for expected inflation.[14] The return on capital building block has to be calculated using a nominal rate of return (WACC) applied to the opening RAB.[15] As noted in attachment 1, the total annual building block revenue requirement is calculated by adding up the return on capital, depreciation, opex, tax and revenue adjustments building blocks. Because inflation on the RAB is accounted for in both the return on capital—based on a nominal rate—and the depreciation calculations—based on an indexed RAB—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 RAB from the calculation of total revenue.[16] Our standard approach is to subtract the indexation of the opening RAB—the opening RAB multiplied by the expected inflation for the year—from the RAB depreciation. The net result of this calculation is referred to as regulatory depreciation.[17] 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 RAB, which is indexed for inflation annually.

This approach produces the same total revenue requirement and RAB as if a real rate of return had been used in combination with an indexed RAB. Under an alternative approach where a nominal rate of return was used in combination with an un-indexed (historical cost) RAB, 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 TNSP) and lower in the future—producing a steeper downward sloping profile of total

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

14 NER, cll.6A.5.4(b)(1) and 6A.6.1(e)(3).

15 NER, cll. 6A.6.2(a) and 6A.6.2(d)(2).

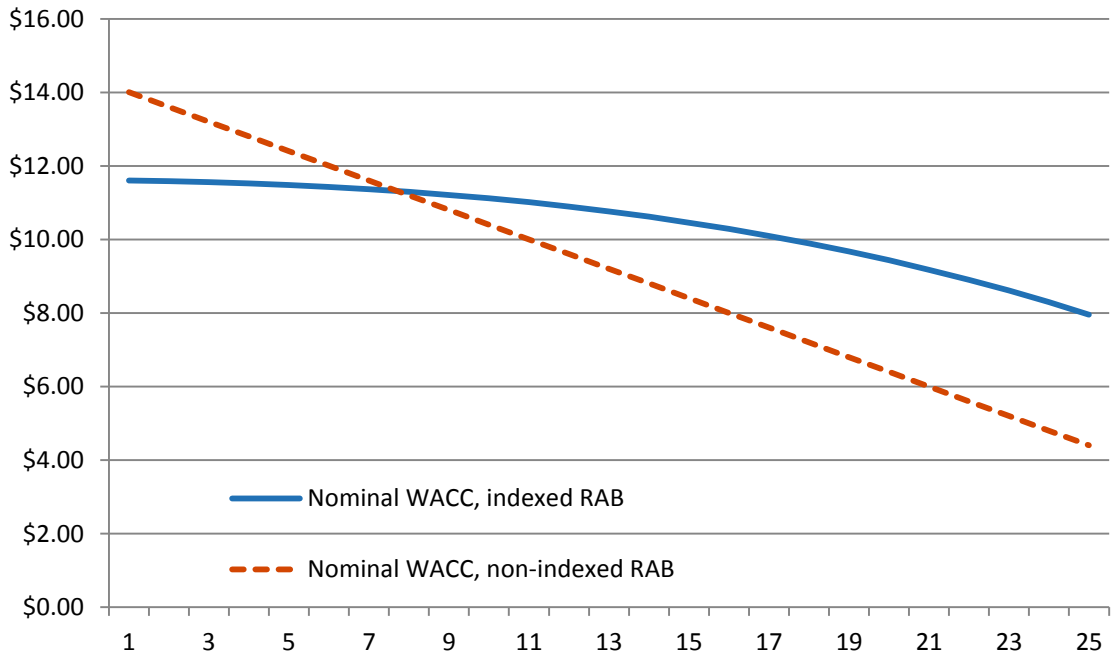
16 NER, cl. 6A.5.4(b)(1)(ii).

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

revenue.[18] Under both approaches, the total revenues being recovered are in present value neutral terms—that is, returning the initial cost of the RAB.

Figure 5.1 shows the recovery of revenue under both approaches using a simplified example.[19] Indexation of the RAB and the offsetting adjustment made to depreciation results in smoother revenue recovery profile over the life of an asset than if the RAB was un-indexed.

Figure 5.1 Revenue path example – indexed vs un-indexed RAB ($ nominal)



Source: AER analysis.

Figure 2.1 in attachment 2 shows the relative size of the inflation and straight-line depreciation, and their impact on the RAB based on Murraylink's proposal. A ten per cent increase in the straight-line depreciation causes revenues to increase by about 4.9 per cent.

5.4 Reasons for draft decision

We accept Murraylink's proposed straight-line depreciation method for calculating the regulatory depreciation allowance as set out in the PTRM. However, we reduced

[18] A change of approach from an indexed RAB to an un-indexed RAB would result in an initial step change increase in revenues to preserve NPV neutrality.

[19] 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.

Murraylink's proposed forecast regulatory depreciation allowance for the 2018–23 regulatory control period by $3.6 million (or 13.3 per cent) to $23.2 million. This amendment reflects our determinations regarding other components of Murraylink's revenue proposal that affect the forecast regulatory depreciation allowance—the opening RAB as at 1 July 2018 (attachment 2), expected inflation rate (attachment 3) and forecast capital expenditure (attachment 6).

5.4.1 Standard asset lives

We accept Murraylink's proposed standard asset lives for its existing asset classes. These asset lives are consistent with the approved standard asset lives in the determination for Murraylink's 2013–18 regulatory control period and are largely comparable with the standard asset lives approved in our recent transmission determinations for other TNSPs in respect of similar asset classes.[20] As Murraylink is an interconnector, not all its asset classes and standard asset lives are comparable with the other TNSPs. However, for some asset classes (such as control systems, other operating assets and office equipment), Murraylink's proposed asset lives are similar to those used by other TNSPs.

We did not retain Murraylink's proposed standard asset life of 10 years for the 'Test equipment' asset class in the PTRM. This is because we do not approve the proposed forecast capex allocated to this asset class for the 2018–23 regulatory control period. This is discussed further in attachment 6. Therefore, we are not required to assess the proposed standard asset life for this asset class for depreciation purposes.

Table 5.3 sets out our draft decision on Murraylink's standard asset lives for the 2018–23 regulatory control period. We are satisfied the standard asset lives approved in this draft decision would lead to a depreciation schedule that reflects the nature of the assets over the economic lives of the asset classes. Further, the sum of the real value of the depreciation attributable to the assets would be equivalent to the value at which the assets was first included in the RAB for Murraylink.[21]

5.4.2 Remaining asset lives

We accept Murraylink's proposed weighted average method to calculate the remaining asset lives as at 1 July 2018. The proposed method applies the approach as set out in our RFM. In accepting the weighted average method, we have updated Murraylink's remaining asset lives to reflect our adjustments to the proposed RFM. As discussed in attachment 2, we corrected minor inputs and modelling errors in Murraylink's proposed

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[20] AER, *Final decision: Powerlink transmission determination 2017–22, Overview*, April 2017, p. 24; AER, *Final decision: AusNet Services transmission determination 2017–22, Attachment 5 – Regulatory depreciation*, April 2017, p. 14; AER, *Final decision: ElectraNet transmission determination 2013–18*, April 2013, p. 149; AER, *Draft decision: TasNetworks transmission determination 2015–19, Attachment 5: Regulatory depreciation*, November 2014, p. 14; AER, *Final decision: TransGrid transmission determination 2015–16 to 2017–18*, *Attachment 5 – Regulatory depreciation*, April 2015, p. 8.

[21] NER, cll. 6A.6.3(b)(1)–(2).

RFM and accordingly updated the remaining asset lives as at 1 July 2018. This is because some of the inputs in the RFM, such as actual capex values, affect the calculation of the remaining asset lives as at 1 July 2018.

Table 5.3 sets out our draft decision on the remaining asset lives as at 1 July 2018 for Murraylink.

Table 5.3 AER's draft decision on Murraylink's standard and remaining asset lives as at 1 July 2018 (years)

Asset class	Standard asset life	Remaining asset life as at 1 July 2018[a]
Switchyard	40.0	25.6
Transmission line	40.0	25.3
Easements	n/a	n/a
Ancillary 15 - control systems	15.0	13.9
Ancillary 30	30.0	28.7
Ancillary 7 - pressure vessel testing and inspection	7.0	4.2
Other operating assets	5.0	4.9
Office machines	3.0	1.0

Source: AER analysis; Murraylink – *Attachment 10.1 – PTRM* – 20170131

n/a: not applicable. We have not assigned a standard/remaining asset life to certain asset classes because the assets allocated to those asset classes are not subject to depreciation or have no existing value.

(a) The 2016–17 and 2017–18 capex values are used to calculate the weighted average remaining asset lives in the RFM. At the time of this draft decision, the capex values for 2016–17 and 2017–18 are based on estimates. For the final decision, we will update the 2016–17 estimated capex values with the actual values and may update the 2017–18 estimated capex with revised estimates. Therefore, for the final decision we will recalculate Murraylink's remaining asset lives as at 1 July 2018 using the method approved in this draft decision.