DRAFT DECISION
Powerlink transmission determination 2017–18 to 2021–22

Attachment 2 – Regulatory asset base

September 2016

AUSTRALIAN ENERGY REGULATOR

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Note

This attachment forms part of the AER's draft decision on Powerlink's transmission determination for 2017–22. 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

Attachment 9 – Efficiency benefit sharing scheme

Attachment 10 – Capital expenditure sharing scheme

Attachment 11 – Service target performance incentive scheme

Attachment 12 – Pricing methodology

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

2 Regulatory asset base

The regulatory asset base (RAB) is the value of the assets used by Powerlink to provide prescribed transmission services.[1] Our revenue determination specifies the RAB as at the commencement of the regulatory control period and the appropriate method for the indexation of the RAB.[2] The indexation of the RAB is one of the building blocks that form the annual building block revenue requirement for each year of the 2017–22 regulatory control period.[3] We set the RAB as the foundation for determining a TNSP's revenue requirements, and use the opening RAB for each regulatory year to determine the return on capital and return of capital (regulatory depreciation) building block allowances.[4]

This attachment presents our draft decision on the opening RAB value as at 1 July 2017 for Powerlink. It also presents our forecast RAB values for Powerlink over the 2017–22 regulatory control period.

2.1 Draft decision

We do not accept Powerlink's proposed opening RAB of $7237.9 million ($ nominal) as at 1 July 2017.[5] We instead determine an opening RAB value of $7164.7 million ($ nominal) as at 1 July 2017. This is because we have amended Powerlink's proposed roll forward model (RFM) to correct two input errors and made one adjustment. These amendments relate to:

- updating the 2015–16 inflation rate with actual CPI for RAB indexation
- correcting an input error for the movements in capitalised provisions, which are adjusted from actual capex being added to the RAB
- correcting an input error for the benchmark equity raising costs in 2012–13.

These amendments reduced the opening RAB as at 1 April 2017 by $73.2 million (or 1.0 per cent) compared to the proposal.

To determine the opening RAB as at 1 July 2017, we have rolled forward the RAB over the 2012–17 regulatory control period to determine a closing RAB value at 30 June 2017. This roll forward includes an adjustment at the end of the 2012–17 regulatory control period to account for the difference between actual 2011–12 capex and the estimate approved at the 2012–17 determination.[6]

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1 NER, cll. 6A.6.1.
2 NER, cll. 6A.4.2(3A) and (4).
3 NER, cll. 6A.5.4(a)(1) and (b)(1).
4 NER, cll. 6A.5.4(a)(2) and (3).
5 This RAB value is based on as-incurred capex.
6 The end of period adjustment will be positive (negative) if actual capex is higher (lower) than the estimate approved at the 2012–17 determination.

Table 2.1 set out our draft decision on the roll forward of the RAB values for Powerlink over the 2012–17 regulatory control period.

Table 2.1 AER's draft decision on Powerlink's RAB for the 2012–17 regulatory control period ($ million, nominal)

	2012–13	2013–14	2014–15	2015–16 [a]	2016–17 [b]
Opening RAB	6428.8	6847.9	7149.0	7152.5	7142.2
Capital expenditure[c]	464.3	329.1	163.8	166.7	220.6
Inflation indexation on opening RAB[d]	160.9	200.6	95.1	93.7	175.0
Less: straight-line depreciation[e]	206.0	228.7	255.3	270.7	276.6
Closing RAB	6847.9	7149.0	7152.5	7142.2	7261.2
Difference between estimated and actual capex (1 July 2011 to 30 June 2012)					–65.5
Return on difference for 2011–12 capex					–31.1
Opening RAB as at 1 July 2017					**7164.7**

Source: AER analysis.

(a) Based on estimated capex. We will update the RAB roll forward for actual capex in the final decision.

(b) Based on estimated capex provided by Powerlink. We expect to update the RAB roll forward with a revised capex estimate in the final decision, and true-up the RAB for actual capex at the next reset.

(c) As-incurred, net of disposals, and adjusted for actual CPI.

(d) We will update the RAB roll forward for actual CPI for 2016–17 in the final decision.

(e) Adjusted for actual CPI. Based on actual as-commissioned capex.

We determine a forecast closing RAB value at 30 June 2022 of $7402.9 million ($ nominal). This is $259.6 million (or 3.4 per cent) lower than the amount of $7662.5 million ($ nominal) proposed by Powerlink. Our draft decision on the forecast closing RAB reflects the amended opening RAB as at 1 July 2017, and our draft decisions on the expected inflation rate (attachment 3), forecast capex (attachment 6) and forecast depreciation (attachment 5).

Table 2.2 sets out our draft decision on the forecast RAB values for Powerlink over the 2017–22 regulatory control period.

Table 2.2 AER's draft decision on Powerlink's RAB for the 2017–22 regulatory control period ($ million, nominal)

	2017–18	2018–19	2019–20	2020–21	2021–22
Opening RAB	7164.7	7234.4	7293.3	7338.3	7377.7
Capital expenditure[a]	163.1	167.0	170.2	175.9	167.7
Inflation indexation on opening RAB	175.5	177.2	178.7	179.8	180.8
Less: straight-line depreciation	268.9	285.4	303.8	316.4	323.3
Closing RAB	7234.4	7293.3	7338.3	7377.7	7402.9

Source: AER analysis.

(a) As-incurred, and net of forecast disposals. In accordance with the timing assumptions of the post-tax revenue model (PTRM), the capex includes a half-WACC allowance to compensate for the six month period before capex is added to the RAB for revenue modelling.

(b) Based on as-commissioned capex.

We determine that the forecast depreciation approach is to be used to establish the opening RAB at the commencement of the 2022–27 regulatory control period for Powerlink.[7] We consider this approach will provide sufficient incentives for Powerlink to achieve capex efficiency gains over the 2017–22 regulatory control period.

2.2 Powerlink's proposal

Powerlink used our RFM to establish an opening RAB as at 1 July 2017 and our post-tax revenue model (PTRM) to roll forward the RAB over the 2017–22 regulatory control period.

Powerlink proposed an opening RAB value as at 1 July 2012 of 6428.8 million ($nominal).[8] Rolling forward this RAB and using depreciation based on actual capex, Powerlink proposed a closing RAB as at 30 June 2017 of $7237.9 million ($ nominal). Table 2.3 presents Powerlink's proposed roll forward of its RAB during the 2012–17 regulatory control period.

7 NER, cl. S6A.2.2B(a).

8 Powerlink, *Revenue proposal*, January 2016, p. 87.

Table 2.3 Powerlink's proposed RAB for the 2012–17 regulatory control period ($ million, nominal)

	2012–13	2013–14	2014–15	2015–16[a]	2016–17[a]
Opening RAB	6428.8	6847.9	7149.0	7152.5	7217.5
Capital expenditure[b]	464.3	329.1	163.8	167.5	220.6
CPI indexation on opening RAB	160.9	200.6	95.1	168.1	176.8
Straight-line depreciation[c]	206.0	228.7	255.3	270.7	279.5
Closing RAB	6847.9	7149.0	7152.5	7217.5	7335.4
Difference between estimated and actual capex (1 July 2011 to 30 June 2012)					–65.5
Return on difference for 2011–12 capex					–32.1
Opening RAB as at 1 July 2017					**7237.9**

Source: Powerlink, *Roll forward model*, January 2016.

(a) Based on estimated capex.

(b) As-incurred, net of disposals, and adjusted for actual CPI.

(c) Adjusted for actual CPI. Based on as-commissioned capex.

Powerlink proposed a closing forecast RAB as at 30 June 2022 of $7662.5 million ($ nominal). This value reflects its proposed opening RAB, forecast capex, expected inflation, and depreciation (based on forecast capex) over the 2017–22 regulatory control period. Its projected RAB over the 2017–22 regulatory control period is shown in Table 2.4.

Table 2.4 Powerlink's proposed RAB for the 2017–22 period ($ million, nominal)

	2017–18	2018–19	2019–20	2020–21	2021–22
Opening RAB	7237.9	7350.3	7447.4	7528.1	7602.3
Capital expenditure[a]	206.8	207.6	209.6	215.5	208.4
Inflation indexation on opening RAB	177.3	180.1	182.5	184.4	186.3
Less: straight-line depreciation[b]	271.7	290.5	311.4	325.7	334.4
Closing RAB	7350.3	7447.4	7528.1	7602.3	7662.5

Source: Powerlink, *Post-tax revenue model*, January 2016 .

(a) As-incurred, and net of forecast disposals. Inclusive of the half-WACC to account for the timing assumptions in the PTRM.

(b) Based on as-commissioned capex.

2.3 Assessment approach

We roll forward the TNSP's RAB during the 2012–17 regulatory control period to establish the opening RAB at 1 July 2017. This value can be adjusted for any differences in the forecast and actual capex, and disposals.[9] It may also be adjusted to reflect any changes in the use of the assets, with only assets used to provide prescribed transmission services to be included in the RAB.[10]

To determine the opening RAB, we developed an asset base RFM that a TNSP must use in preparing its revenue proposal.[11] The RFM rolls forward the RAB from the beginning of the final year of the 2007–12 regulatory control period,[12] through the 2012–17 regulatory control period, to the beginning of the 2017–22 regulatory control period. The roll forward occurs for each year by:

- Adding an inflation (indexation) adjustment to the opening RAB for the relevant year. This adjustment is consistent with the inflation factor used in the annual indexation of the maximum allowed revenue (MAR).[13]
- Adding actual or estimated capex to the RAB for the relevant year.[14] We review a TNSP's past capex and may exclude past capex from being rolled into the RAB where total capex exceeds the regulatory allowance.[15] The details of our assessment approach for capex overspend are set out in the *Capital expenditure incentive guideline*.[16] We note that under the transitional rules, our review of past capex does not apply to Powerlink prior to 1 July 2014.[17] Also, the review of past capex does not include the last two years of the 2012–17 regulatory control period—these will instead be reviewed at the next reset.[18] We check actual capex amounts against audited regulatory accounts data and generally accept the capex reported in those accounts in rolling forward the RAB.[19] However, there may be instances where adjustments are required to the annual regulatory accounts data.[20]

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9 NER, cll. S6A.2.1(f)(3) and (6).

10 NER, cll. S6A.2.1(f)(8) and S6A.2.3.

11 NER, cll. 6A.6.1(b), 6A.6.1(e) and S6A.1.3(5).

12 The roll forward commences in the final year of the 2007–12 regulatory control period to allow us to adjust for the difference between actual 2011–12 capex and the estimated 2011–12 capex used in our 2012 transmission determination. See NER, cl. S6A.2.1(f)(3).

13 NER, cl. 6A.6.1(e)(3).

14 NER, cl. S6A.2.1(f)(4).

15 NER, cl. S6A.2.2A.

16 AER, *Capital expenditure incentive guideline*, November 2013, pp. 12–20.
Under the NER, cl S6A.2.2A(b), the exclusion of inefficient capex could only come from three areas: overspend in capex , margin paid to third party and capitalisation of opex as defined in cll. S6A.2.2A (c), (d) and (e) of the NER.

17 NER, cl.11.63.

18 NER, cl. S6A.2.2(a1). The two year lag ensures that actual capex (instead of estimated capex) is available when the review of past capex commences.

19 We will update any estimated capex with actual capex at the time of the next reset.

20 For example, we make adjustment for movements in provisions if the actual capex amounts reported in the RIN include capitalised provisions.

- Subtracting depreciation from the RAB for the relevant year, calculated in accordance with the rates and methodologies allowed (if any) in the transmission determination for the TNSP's 2012–17 regulatory control period.[21] Depreciation based on forecast or actual capex can be used to roll forward the RAB.[22] For this draft decision, we use depreciation based on actual capex for rolling forward the RAB for Powerlink's 2012–17 regulatory control period.[23]
- Subtracting any gross proceeds for asset disposals for the relevant year, by way of netting from capex to be added to the RAB.[24] We check these amounts against audited regulatory accounts data.

These annual adjustments give the closing RAB for any particular year, which then becomes the opening RAB for the following year. Through this process, the RFM rolls forward the RAB to the end of the 2012–17 regulatory control period. The PTRM used to calculate the annual building block revenue requirement for the 2017–22 regulatory control period generally adopts the same RAB roll forward approach as the RFM although the adjustments to the RAB are based on forecasts, rather than actual amounts.

We also decide whether depreciation for establishing the TNSP's RAB as at the commencement of the 2022–27 regulatory control period is to be based on actual or forecast capex.[25]

The opening RAB for the 2022–27 regulatory control period can be determined using depreciation based either on forecast or actual capex incurred during the 2017–22 regulatory control period. To roll forward the RAB using depreciation based on forecast capex, we would use the forecast depreciation contained in the PTRM for the 2017–22 regulatory control period, adjusted for actual inflation. If the approach to roll forward the RAB using depreciation based on actual capex was adopted, we would recalculate the depreciation based on actual capex incurred during the 2017–22 regulatory control period.

Our decision on whether to use actual or forecast depreciation must be consistent with the capex incentive objective. We have regard to:[26]

- the incentives the service provider has to undertake efficient capex
- substitution possibilities between assets with different lives and the relative benefits of each

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21 NER, cl. S6A.2.1(f)(5).

22 NER, cl. 6A 4.2(a1).

23 The use of actual depreciation is consistent with the depreciation approach established in the 2012–17 transmission determination for Powerlink, which reflected the rules at the time.

24 NER, cl. S6A.2.1(f)(6).

25 NER, cl. S6A.2.2B(a).

26 NER, cl. S6A.2.2B(c).

- the extent of overspending and inefficient overspending relative to the allowed forecast
- the capex incentive guideline
- the capital expenditure factors.

2.3.1 Interrelationships

The RAB is an input into the determination of the return on capital and depreciation (return of capital) building block allowances.[27] Factors that influence the RAB will therefore flow through to these building block components and the annual building block revenue requirement. Other things being equal, a higher RAB increases both the return on capital and depreciation allowances.

The RAB is determined by various factors, including:

- the opening RAB (meaning the value of existing assets at the beginning of the regulatory control period)
- net capex[28]
- depreciation
- indexation adjustment – so the RAB is presented in nominal terms, consistent with the rate of return.

The opening RAB depends on the value of existing assets and will depend on actual net capex, actual inflation outcomes and depreciation in the past.

The RAB when projected to the end of the regulatory control period increases due to both forecast new capex and the indexation adjustment. The size of the indexation adjustment depends on expected inflation (which also affects the nominal rate of return or WACC) and the size of the RAB at the start of each year.

Depreciation reduces the RAB. The depreciation allowance depends on the size of the opening RAB, the forecast net capex and depreciation schedules applied to the assets. By convention, the indexation adjustment is also offset against depreciation to prevent double counting of inflation in the RAB and WACC, which are both presented in nominal terms. This reduces the depreciation building block that feeds into the annual building block revenue requirement.

We maintain the RAB in real terms by indexing for inflation.[29] A nominal rate of return (WACC) is multiplied by the opening RAB to produce the return on capital building

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[27] The size of the RAB also impacts the benchmark debt raising cost allowance. However, this amount is usually relatively small and therefore not a significant determinant of revenues overall.

[28] Net capex is gross capex less disposals. The rate of return or WACC also influences the size of the capex. This is because capex is not depreciated in the year it is first incurred, but added to the RAB at the end of the year. Instead, the capex amount is escalated by half a WACC to arrive at an end of year value. It then begins depreciating the following year.

block.[30] To prevent the double counting of inflation through the nominal WACC and indexed RAB,[31] the regulatory depreciation building block has an offsetting reduction for indexation of the RAB.[32] 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. If the RAB was un-indexed, there would be no need for an offsetting adjustment to the depreciation calculation of total revenue. This alternative approach provides for overall revenues being 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 revenue.[33] The implications of an un-indexed RAB are discussed further in attachment 5.

We received a submission from Consumer Challenge Panel (CCP) members Hugh Grant and David Headberry in relation to our approach to the inflation indexation of the RAB. The CCP members submitted that the return on capital allowance should be calculated based on actual investments rather than the artificially inflated capital bases.[34] We address the CCP members' submission in section 2.4.3 below, and then in more detail in appendix A.

Figure 2.1 shows the key drivers of the change in the RAB over the 2017–22 regulatory control period as proposed by Powerlink. Overall, the closing RAB at the end of the 2017–22 regulatory control period would be 5.6 per cent higher than the opening RAB at the start of that period based on the proposal, in nominal terms. The proposed forecast net capex increases the RAB by about 15 per cent, while expected inflation increases it by about 13 per cent. Forecast depreciation, on the other hand, reduces the RAB by about 21 per cent.

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

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

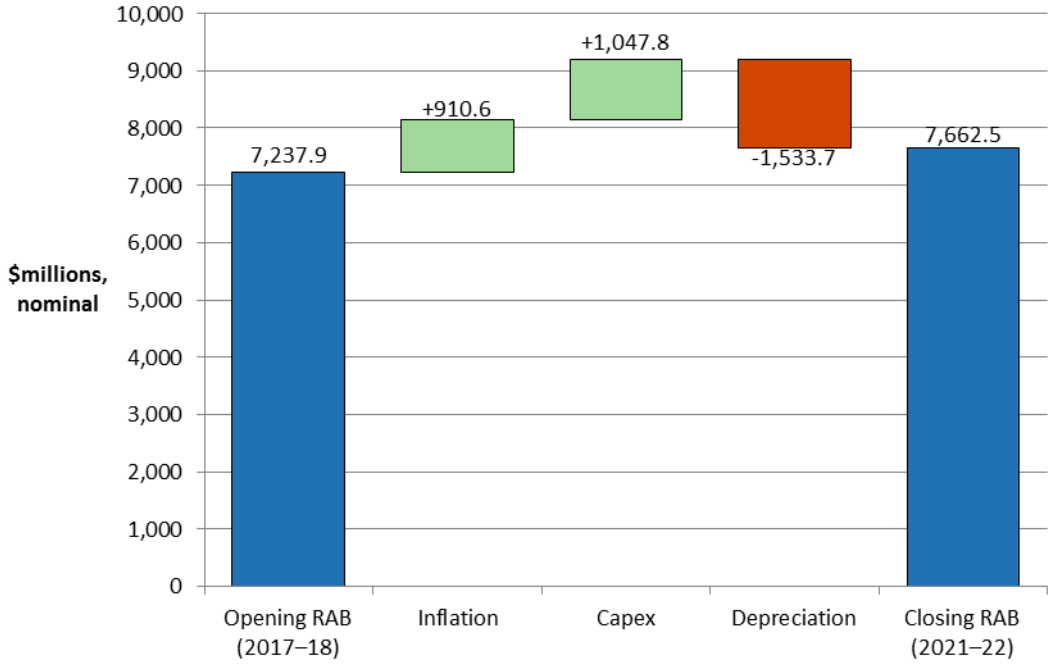
31 NER, cl. 6A.5.4(b)(1)(ii).

32 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. Please also refer to section 5.3.1 of attachment 5 of this draft decision for further explanation of the offsetting adjustment to the depreciation.

33 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.

34 CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 Revenue Proposal*, 20 June 2016, p. 3.

Figure 2.1 Key drivers of changes in the RAB ($ million, nominal)



Source: Powerlink, *Post-tax revenue model*, January 2016.

Powerlink forecast depreciation of $1533.7 million ($ nominal). We have accepted Powerlink's depreciation proposal, subject to some updates, as it satisfies the requirements of the NER in terms of the assigned asset lives. This is discussed in attachment 5. The depreciation amount largely depends on the opening RAB (which in turn depends on capex in the past). Forecast net capex is a significant driver of the increase in the RAB. We are not satisfied Powerlink's proposed total forecast capex of $1047.8 million ($ nominal) for the 2017–22 regulatory control period reasonably reflects the capex criteria. We have therefore rejected Powerlink's proposed capex and have substituted our estimate of $844.0 million ($ nominal) for the 2017–22 regulatory control period.[35] Refer to attachment 6 for the discussion on forecast capex

A ten per cent increase in the opening RAB causes revenues to increase by about 3.5 per cent. However, the impact on revenues of the annual change in RAB depends on the source of the RAB change, as some drivers affect more than one building block cost.[36]

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[35] These capex values are consistent with those used for the RAB roll forward and include a half-WACC adjustment to take the values to end of year terms.

[36] If capex causes the RAB increase—return on capital, depreciation, and debt raising costs all increase too. If a reduction in depreciation causes the RAB increase, revenue could increase or decrease. In this case, the higher return on capital is offset (perhaps more than offset) by the reduction in depreciation allowance. Inflation naturally increases the RAB in nominal terms. However, the real impact from changing the inflation forecast is inconsequential as revenues are updated annually by actual inflation and the X factor, which is generally unaffected by the assumed forecast inflation rate.

2.4 Reasons for draft decision

We determine an opening RAB value for Powerlink of $7164.7 million ($ nominal) as at 1 July 2017, a reduction of $73.2 million ($ nominal) or 1.0 per cent from the proposed value. We forecast a closing RAB value of $7402.9 million by 30 June 2022. This represents a reduction of $259.6 million, or 3.4 per cent compared to Powerlink's proposal. The reasons for our draft decision are discussed below.

2.4.1 Opening RAB at 1 July 2017

We do not accept Powerlink's proposed opening RAB of $7237.9 million ($ nominal) as at 1 July 2017.[37] We instead determine an opening RAB value of $7164.7 million ($ nominal) as at 1 July 2017. This represents a reduction of $73.2 million (or 1.0 per cent).

To determine the opening RAB as at 1 July 2017 we have rolled forward the RAB over the 2012–17 regulatory control period to determine a closing RAB value as at 30 June 2017. In doing so we reviewed the key inputs of Powerlink's proposed RFM, such as actual inflation, rate of return, gross capex values, asset disposal values and asset lives. We found these were generally correct and they reconcile with relevant data sources such as ABS data, regulatory accounts and the 2012–17 decision models.[38] However, we consider there should be three adjustments made to Powerlink's proposed RFM inputs:

1. Updating Powerlink's estimate of inflation for 2015–16 with actual CPI for this period, as it is now available.[39]
2. Correcting a minor input error in relation to the movements in capitalised provisions, which are adjusted from actual capex being added to the RAB.[40]
3. Correcting for a minor input error for the benchmark equity rising costs in 2012–13.[41]

We also consider the extent to which our roll forward of the RAB to 1 July 2017 contributes to the achievement of the capital expenditure incentive objective.[42] We received one submission from Cotton Australia raising concerns with the size of the proposed RAB by Powerlink.[43] We note that under the transitional rules, in making this transmission determination, the review of past capex does not apply to Powerlink prior

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37 This RAB value is based on as-incurred capex.

38 At the time of this draft decision, the roll forward of Powerlink's RAB includes estimated capex values for 2015–16 and 2016–17. We will update the 2015–16 estimated capex with actuals in the final decision. We may also update the 2016–17 estimated capex with a revised estimate in the final decision.

39 In our final decision we will update the estimate for 2016–17 expected inflation with actual CPI. The March quarter CPI is used as a proxy for the June financial year in Powerlink's 2012–17 regulatory control period.

40 This involves an upward adjustment of $5180 to gross actual capex in 2014–15.

41 This involves an upward adjustment of around $2800 to gross actual capex in 2012–13.

42 NER, cl. 6A.14.2(b).

43 Cotton Australia, *Powerlink electricity transmission revenue proposal 2017–2022*, 2 May 2016, pp. 2–3.

to 1 July 2014.[44] Given this, the review period for this transmission determination is limited to 2014–15 capex.[45] Powerlink's actual capex incurred in 2014–15 is below the forecast allowance set at the previous transmission determination. Therefore, the overspending requirement for an efficiency review of past capex is not satisfied.[46] Accordingly, the capex incurred in that year is regarded as prudent and efficient, and included in the RAB—this is discussed further in appendix E of capex attachment 6.

Further, for the purposes of this draft decision, we have included Powerlink's estimated capex in 2015–16 and 2016–17 in the RAB roll forward to 1 July 2017. At the next reset, the 2015–16 and 2016–17 capex will form part of the review period for whether past capex should be excluded for inefficiency reasons.[47] Our RAB roll forward applies the incentive framework approved in the previous transmission determination, which included the use of an actual depreciation approach.[48] As such, we consider that the 2012–17 RAB roll forward contributes to an opening RAB (as at 1 July 2017) that includes capex that reflects prudent and efficient costs, in accordance with the capital expenditure criteria.[49]

However, we do have concerns with the size of the forecast capex, the largest driver of the increase in the RAB over the 2017–22 regulatory control period, proposed by Powerlink. In this draft decision we have reduced Powerlink's proposed forecast capex by $203.8 million ($ nominal), or 19.4 per cent over the 2017–22 regulatory control period. Powerlink's proposal stated that the Queensland Government's strategic review may affect the assets in its RAB.[50] However, we note no such policy changes have occurred at the time of this draft decision.

2.4.2 Forecast closing RAB at 30 June 2022

We forecast a closing RAB value of $7402.9 million by 30 June 2022 for Powerlink, which represents a reduction of $259.6 million (or 3.4 per cent) to Powerlink's proposal. This reduction reflects our draft decision on the inputs for determining the forecast RAB in the PTRM. We note the submission from Cotton Australia on the proposal raised concerns with the increase to the size of Powerlink's RAB over the 2017–22 regulatory control period.[51] The change in the size of the RAB depends on our assessment of its various components. Inflation and capex increase the RAB, while depreciation reduces it. To determine the forecast RAB value for Powerlink, we amended the following PTRM inputs:

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44 NER, cl. 11.63.

45 NER, cl. S6A.2.2A(a1).

46 NER, cl. S6A.2.2A(c).

47 Here, 'inefficiency' of past capex refers to three specific assessments (labelled the overspending, margin and capitalisation requirements) detailed in NER, cl. S6A.2.2A. The details of our ex post assessment approach for capex are set out in AER, *Capital expenditure incentive guideline*, November 2013, pp. 12–20.

48 The use of actual depreciation is consistent with the depreciation approach established in the 2012–17 transmission determination for Powerlink, which reflected the rules at the time.

49 NER, cll. 6A.5A(a), 6A.6.7(a), 6A.6.7(c) and 6A.14.2(b).

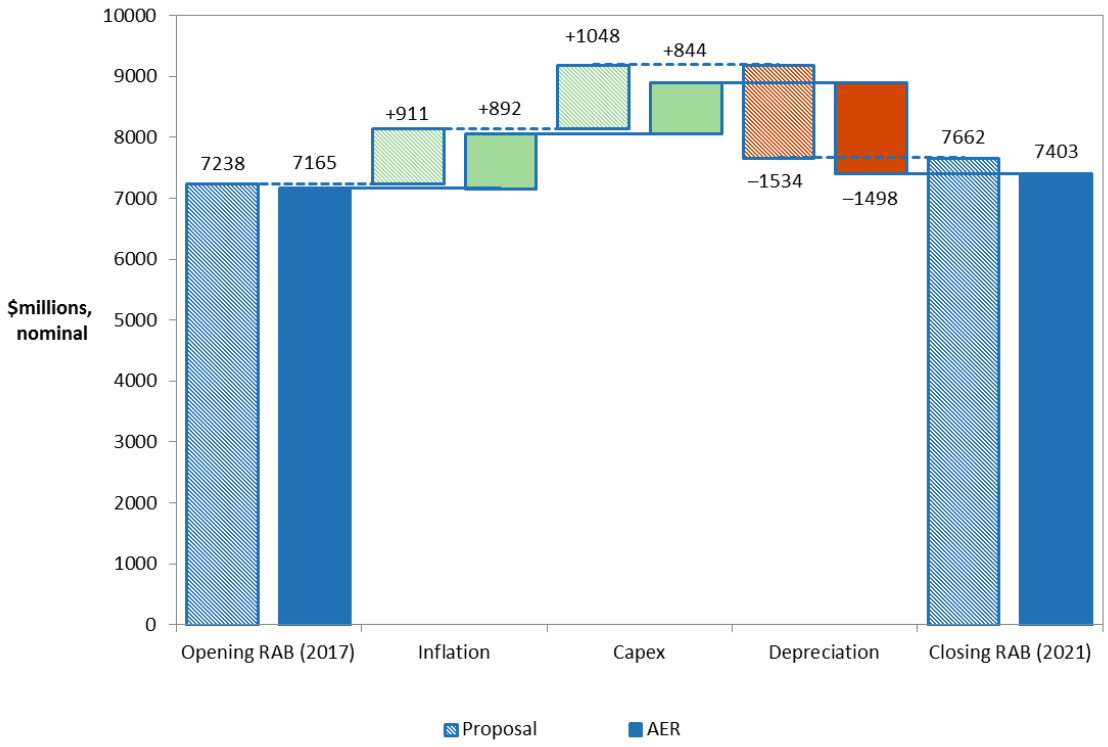
50 Powerlink, *Regulatory proposal*, January 2016, p.86.

51 Cotton Australia, *Powerlink electricity transmission revenue proposal 2017–2022*, 2 May 2016, p. 3.

- We reduced Powerlink's proposed opening RAB as at 1 July 2017 by $73.2 million or 1.0 per cent (section 2.4.1).
- We reduced Powerlink's proposed forecast capex for the 2017–22 regulatory control period by $203.8 million ($ nominal) or 19.4 per cent (attachment 6).
- We reduced Powerlink's proposed forecast depreciation for the 2017–22 regulatory control period by $36 million or 2.3 per cent (attachment 5).

Figure 2.2 shows the key drivers of the change in Powerlink's RAB over the 2017–22 regulatory control period for this draft decision. Overall, the closing RAB at the end of the 2017–22 regulatory control period is forecast to be 3.3 per cent higher than the opening RAB at the start of that period, in nominal terms. The approved forecast net capex increases the RAB by about 11.8 per cent, while expected inflation increases it by about 12.4 per cent. Forecast depreciation, on the other hand, reduces the RAB by about 20.9 per cent.

Figure 2.2 Key drivers of changes in the RAB ($ million, nominal)



Source: AER analysis.

2.4.3 CCP members' submissions

At the stakeholder forum on 15 March 2016, CCP member Hugh Grant presented some preliminary perspectives on a variety of issues, including:[52]

- the consistency of the AER's return on capital estimate with the approach to RAB indexation
- Powerlink's actual level of gearing compared to benchmark gearing
- the overall profitability of Powerlink.

Subsequently, on 20 June 2016, CCP members Hugh Grant and David Headberry provided a late submission that addressed these points in detail.[53]

We do not agree that the issues raised by the CCP members' submissions require any associated changes to Powerlink's proposal. The issues are discussed in detail in the appendix A to this attachment. In summary, and in response to each of the issues above, we note:

- The RAB is indexed for inflation in order to maintain its real value as required by the NER.[54] An offsetting adjustment of equivalent size to the indexation amount is removed from the depreciation allowance.[55] A nominal rate of return (WACC) is multiplied by the opening RAB to produce the return on capital allowance.[56] We do not consider using the inflation indexed RAB in this calculation will result in an inflated revenue allowance as suggested by the CCP members' submission.[57] The approach is net present value (NPV) neutral over the life of the assets in the RAB.[58] In contrast, the CCP members' proposed approach is not NPV neutral, as it suggests a rate of return be earned on only part of the RAB. Our discussion of the interactions between capital allowances is in section A.1 of appendix A below.
- The gearing used to determine the rate of return on capital for Powerlink is based on benchmarking. Powerlink's actual gearing may differ, but we do not consider this invalidates the benchmarking approach. Business may have higher or lower gearing depending on their circumstances and may benefit or be penalised as a result. Privately owned businesses form the basis of the benchmark gearing assessment of the benchmark entity. Powerlink is Government owned and is therefore not directly comparable to the benchmark entity. However, the use of private businesses in determining the benchmark affords Powerlink the opportunity

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52 CCP (Hugh Grant), *Preliminary perspectives, Powerlink's 2018–22 revenue proposal*, 15 March 2016 (presentation slides).

53 CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 revenue proposal*, 20 June 2016.

54 NER, cl. 6A.6.1(e)(3).

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

56 NER, cl. 6A.6.2(a).

57 CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 revenue proposal*, 20 June 2016, p. 3.

58 This is also discussed in attachment 5.

to earn a commercial return. We consider such an opportunity to be consistent with the objectives of the NEL to promote efficient investment in, and efficient operation and use of, electricity services.[59]

- The CCP members presented analysis of Powerlink's 'actual' return on equity over recent years using Powerlink's statutory accounts. The CCP members submitted that the 'extraordinary profitability levels' show that the AER's approach is incorrect.[60] We do not consider that this analysis demonstrates that the AER approach is incorrect.[61] Although we do not agree with the CCP members' analysis, we do agree that there is some merit to the analysis of profitability outcomes. However, we recognise that there are factors that need to be addressed when implementing this analysis, including problems obtaining reliable data. Our discussion of the profitability analysis is in section A.2 of appendix A below.

2.4.4 Application of depreciation approach in RAB roll forward for next reset

Powerlink did not propose a depreciation approach to roll forward the RAB for the commencement of its 2022–27 regulatory control period.

We consider that the depreciation approach based on forecast capex (updated for actual inflation) should be used. This approach was signalled in the AER's *Framework and approach*.[62] As discussed in attachment 10, Powerlink is not currently subject to a capital expenditure sharing scheme (CESS) but we will apply the CESS to Powerlink over the 2017–22 regulatory control period. We consider this scheme will provide sufficient incentives for Powerlink to achieve capex efficiency gains over that period. We are satisfied that the use of a forecast depreciation approach in combination with the application of the CESS and our other ex post capex measures are sufficient to achieve the capex incentive objective.[63]

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59 NEL, cl. 7.

60 CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 revenue proposal*, 20 June 2016, p. 41.

61 Given the late receipt of these submissions, our analysis is ongoing.

62 AER, *Final decision: Framework and approach for Powerlink*, June 2015, pp. 11–12.

63 Our ex post capex measures are set out in the capex incentives guideline, AER, *Capital expenditure incentive guideline for electricity network service providers*, November 2013, pp. 13–19, 20–21. The guideline also sets out how all our capex incentive measures are consistent with the capex incentive objective.

A Response to the CCP submissions

The CCP made a number of submissions on Powerlink's revenue proposal.[64] At the stakeholder forum on 15 March 2016, CCP member Hugh Grant presented some preliminary perspectives on the overall profitability of Powerlink, and a number of material capital allowance issues, including:[65]

- the consistency of the AER's return on capital estimate with the approach to RAB indexation
- Powerlink's actual level of gearing compared to benchmark gearing
- the growth of Powerlink's RAB over recent regulatory control periods.

CCP member Jo De Silva authored the CCP's initial submission, which was received before the close of submissions on 28 April 2016 but did not address these issues.[66] Subsequently, on 20 June 2016, CCP members Hugh Grant and David Headberry provided a late CCP submission that addressed these points in detail.[67] This June 2016 submission is the primary focus of this appendix. CCP member Hugh Grant also provided two brief explanatory notes in July 2016 as a follow up to the main submission.[68] The CCP material also referenced another document published by Hugh Grant that was not directly submitted to the Powerlink reset process.[69]

The issues raised by CCP members Hugh Grant and David Headberry centre on the capital allowances arising from and relating to the RAB. For this reason, we have addressed these aspects of the CCP members' submissions together in this appendix to the RAB attachment.[70]

A.1 The CCP members' submissions on capital allowances

This section addresses the CCP members' submissions on particular capital building block inputs or assumptions. Specifically, it addresses:

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64 The three CCP members with specific responsibility for responding to the Powerlink proposal were Jo De Silva, Hugh Grant and David Headberry.

65 CCP (Hugh Grant), *Preliminary perspectives, Powerlink's 2018–22 revenue proposal*, 15 March 2016 (presentation slides).

66 CCP (Jo De Silva), *Submission to the Australian Energy Regulator on Powerlink's Regulatory Proposal 2017–22*, 28 April 2016.

67 CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 revenue proposal*, 20 June 2016.

68 CCP (Hugh Grant), *Addressing the RAB/WACC disconnect issues within the current rules*, 18 July 2016; and CCP (Hugh Grant), *The methodology for the comparison of the electricity networks' return on equity with the returns of ASX 50 companies—in the context of the Powerlink/Telstra comparison*, 26 July 2016.

69 ResponseAbility (Hugh Grant, Executive Director), *Assets or liabilities?, The need to apply fair regulatory values to Australia's electricity networks*, 5 May 2016.

70 CCP comments that are not directly related to these core capital issues are addressed in the relevant areas of our draft decision attachments.

- The compatibility of an indexed RAB with the AER's approach to return on capital
- The impact of benchmarks on the rate of return
- The CCP members' proposed approach
- Regulatory depreciation.

A.1.1 The compatibility of an indexed RAB with the AER's approach to return on capital

This section addresses the CCP members' submissions about the compatibility between our approach to indexing the RAB, and our use of observed rates of return from capital markets.

Specifically, CCP panel members Hugh Grant and David Headberry submitted that:[71]

> The AER's methodology for determining the networks' return on capital allowances does not appropriately consider the impacts of RAB indexation.
>
> The AER's methodology for estimating the required percentage returns (for both equity and debt) is based on the returns that investors require on their ***actual*** investments. However, the AER calculates its 'return on capital' allowances by multiplying those percentage returns to artificially inflated capital bases.
>
> This is resulting in the AER providing return on capital allowances well above the required levels—e.g. it is resulting in the AER providing 'return on equity' allowances to Powerlink of around 4 times the required level.

We do not agree with this submission. Specifically:

- The approach in our decisions of using an indexed RAB with a benchmark rate of return produces identical revenue in net present value (NPV) terms to the use of an unindexed RAB multiplied by a benchmark rate of return. We discuss this in detail in this section.
- The returns on equity and debt do reflect the expected returns that investors require for their actual investments. However, both equity and debt are set based on benchmarks which reflect a degree of risk similar to the regulated service provider. Generally, this has the impact of materially lowering the rates of return compared to investors in other companies. We also discuss this in more detail in this section.
- The analysis of the resulting 'actual' returns compared to required levels appears to include several errors, which we discuss in section A.2 on profitability analysis.

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[71] CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 revenue proposal*, 20 June 2016. p. 3.

- The CCP members' proposed resolution to this issue violates the NPV=0 principle.[72] It therefore appears to be inconsistent both with the rate of return objective, and with the NEO more generally.

To illustrate this point, we can consider the following example:

1. A service provider spends $100 million to build an asset, and that this amount of initial capital is raised with 50 per cent debt and 50 per cent equity. To simplify, we ignore the effects of depreciation and capex, so the RAB remains constant.
2. The service provider raises debt at 5 per cent per annum and promises equity holders 15 per cent returns per annum—that is, the WACC is 10 per cent.
3. The $100 million is the original value of the investment. For each year that its debt is outstanding and it has equity holders, the service provider pays $2.5 million to debtors ($100 million × 50 per cent × 5 per cent) and $7.5 million ($100 million × 50 per cent × 15 per cent) to equity holders.
4. Consider that CPI is 2 per cent in year 1. In nominal terms, the indexed RAB would now be worth $102 million.
5. However, the service provider's debt and equity payments would not increase to reflect the indexed RAB. They would continue to be based on the original value of the RAB.
6. In contrast, under the building block approach set out in the NER, the return on capital allowance does increase to reflect inflation, because we multiply our WACC components by the indexed RAB. Looking at the rate of return in isolation, this appears to result in excess revenue by the proportion that the indexed RAB exceeds the original value of the RAB.

To this point, the CCP members reasonably characterises a difference between the building block regime and unregulated companies. However, this apparent anomaly is resolved once we take into account the corresponding effect of depreciation.

The choice of RAB modelling approach, including or excluding indexation, impacts on the two key building blocks: the return on capital (WACC × RAB) and the return of capital (depreciation). Between these two allowances, service providers are compensated for:

1. the principal value of their investment (depreciation)
2. the ongoing costs required by investors to provide the capital for the investment (return on capital).

The CCP members correctly identified that we use a nominal rate of return based on market rates. However, importantly, we make an offsetting adjustment that reduces

[72] For background on the NPV=0 principle and why it is important for meeting the rate of return objective and NEO, see Graham Partington and Stephen Satchell, *Report to the AER: Discussion on the allowed cost of debt*, 5 May 2016, p. 14.

straight-line depreciation by the level of inflation indexation on the RAB. We discuss this in detail in the depreciation attachment. For convenience, we have repeated this explanation in section A.1.4.

Most importantly, what the CCP members' analysis does not address is that if we had not indexed the RAB, service providers would have recovered substantially higher revenue through depreciation in the earlier part of the RAB's life.

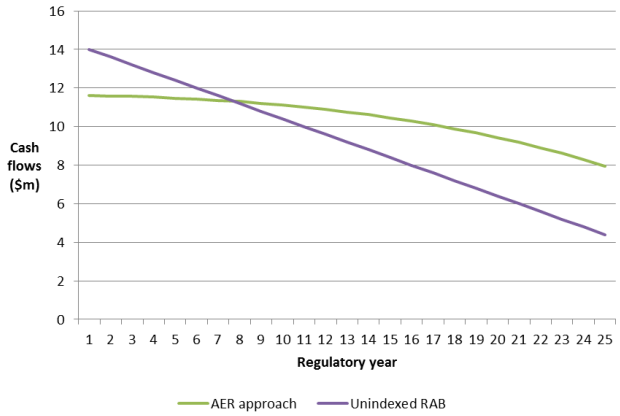
More generally, if the alternative approaches are adopted over the entire life of the RABs, there is no difference in revenue (in NPV terms) between an approach with or without indexation of the RAB. However, the two approaches do result in materially different paths for the revenue recovery over time. Figure 2.3 below includes several charts that illustrate the interaction between the capital building blocks and their impact on revenue. They are based on a simplified example of:

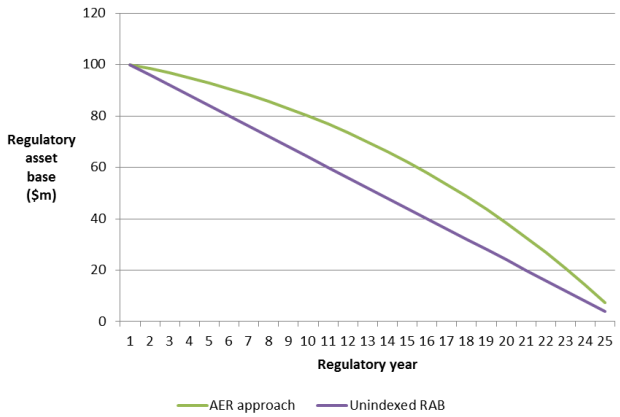
- an asset that starts at $100 million
- a standard asset life of 25 years
- a nominal WACC of 10 per cent
- inflation of 2.5 per cent per year.

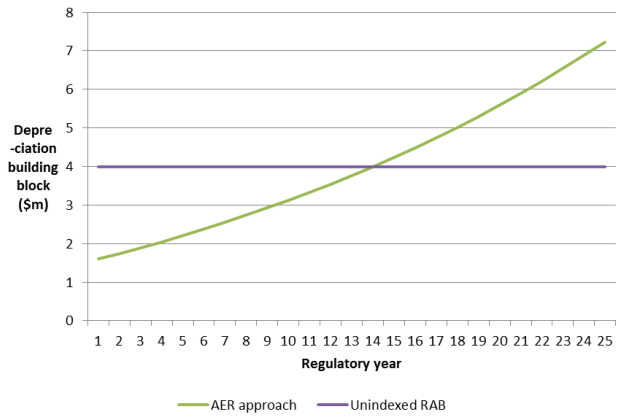
Throughout Figure 2.3, the purple line illustrates the cash flows and path of the RAB if we never add indexation to the asset base. In contrast, the green line shows the cash flows and the path of the RAB using the AER's approach. Aside from indexation of the RAB, all other underlying assumptions are identical for the two examples. Importantly, we note that our approach (indexed RAB) is required under the NER.[73] We also adopt this approach consistently in gas determinations where indexation is not specified under the NGR.

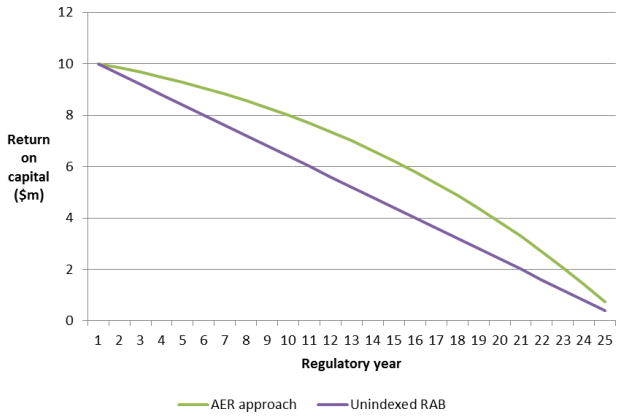
[73] NER cl. 6A.5.4(b)(1) and 6A.6.1(e)(3).

Figure 2.3 Indexed RAB compared against unindexed RAB approaches ($ million, nominal)









The relative differences between the two approaches can be summarised as follows:

- In the early years of an asset's life, the capital building block revenues are lower under the AER's approach. At a point during the life of the assets there is a cross over, and in subsequent periods the revenues are lower under the unindexed RAB approach.
- Importantly, the lower revenues earlier in the asset's life have a higher impact in net present value (NPV) than lower revenue later in the asset's life.[74] This is set out in Table 2.5, below. This is why the AER's approach with a shorter but earlier period of lower revenue is neutral in NPV terms with the longer but later period of lower revenue under the unindexed RAB approach.
- At all points in the asset's life, the RAB—and as a consequence the rate of return allowance—is lower under the unindexed RAB approach. This is consistent with the CCP members' analysis.
- However, this is the result of a materially higher depreciation allowance earlier in the asset's life under the unindexed RAB approach. This leads to higher overall revenue early in the assets life.

Table 2.5 sets out the cash flows from the above example for the two approaches. It presents the cash flows both in nominal terms and after being discounted for their net present value. It demonstrates that:

- The NPV of cash flows is the same whether we consistently use the AER approach or the unindexed RAB approach. This means that service providers do not recover excess revenue where these approaches are adopted consistently.
- It also demonstrates that the NPV of the cash flows is equal to $100 million, which is precisely the initial value of the investment. This demonstrates that either approach adopted consistently will achieve the 'NPV=0 principle'.

[74] This is because a dollar today, if it is not spent, can be invested and generate a return. If we assume the WACC is 10 per cent, as per this example, a $1 investment today is worth $1.10 next year. Holding other things constant, this means that investors are indifferent between $1 today and $1.10 tomorrow. When comparing two streams of cash flows, it is necessary to account for this difference.

Table 2.5 Comparing the cash flows of the indexed RAB and unindexed RAB approaches ($ million)

Year	AER cash flows (nominal)	Unindexed RAB cash flows (nominal)	AER cash flows (discounted for NPV)	Unindexed RAB cash flows (discounted for NPV)
1	11.6	14.0	10.5	12.7
2	11.6	13.6	9.6	11.2
3	11.6	13.2	8.7	9.9
4	11.5	12.8	7.9	8.7
5	11.5	12.4	7.1	7.7
6	11.4	12.0	6.5	6.8
7	11.4	11.6	5.8	6.0
8	11.3	11.2	5.3	5.2
9	11.2	10.8	4.8	4.6
10	11.1	10.4	4.3	4.0
11	11.0	10.0	3.9	3.5
12	10.9	9.6	3.5	3.1
13	10.8	9.2	3.1	2.7
14	10.6	8.8	2.8	2.3
15	10.5	8.4	2.5	2.0
16	10.3	8.0	2.2	1.7
17	10.1	7.6	2.0	1.5
18	9.9	7.2	1.8	1.3
19	9.7	6.8	1.6	1.1
20	9.4	6.4	1.4	1.0
21	9.2	6.0	1.2	0.8
22	8.9	5.6	1.1	0.7
23	8.6	5.2	1.0	0.6
24	8.3	4.8	0.8	0.5
25	8.0	4.4	0.7	0.4
Total	260.2	230.0	100.0	100.0

Source: AER analysis.

To consider this point in practice, Table 2.6 shows the total building block revenue for Powerlink's 2012–17 final decision if we had ceased indexing the RAB at the beginning of the regulatory control period.

Table 2.6 Comparison of building block revenue for Powerlink against a zero CPI approach ($ million, nominal)

	AER final decision	CPI set to 0 per cent
Return on capital	3234	3087
Return of capital (regulatory depreciation)	372	1243
Opex	1025	1024
Efficiency carryover	–4	–4
Tax	70	164
Total building block revenue requirement (unsmoothed)	**4697**	**5515**
Closing RAB	8812	8012

Source: AER analysis.

The examples illustrate two important impacts of indexation:

- In the initial period where indexation is not applied, the upward impact on the depreciation allowance results in higher total revenue. This means that consumers pay more in the short term. Therefore, compared to an indexed RAB approach, the unindexed RAB approach is less smooth over time.
- However, this faster rate of depreciation means that the RAB is smaller at the end of the period. This ultimately translates to lower costs for consumers in the later years of the asset's life.

For these reasons, we are not persuaded by the CCP members' submission about the revenue impact of an indexed RAB when combined with a nominal rate of return. In particular, the CCP members' approach will violate the NPV principle which is central to the building block revenue framework.

A.1.2 The impact of benchmarks on the rate of return

For the reasons set out in the previous section, we are not persuaded that our estimates of the returns on debt and equity are incompatible with the requirements of the NER, and more specifically with the rules governing indexation of the RAB. However, in addition to these reasons, we consider the CCP submissions from panel members Hugh Grant and David Headberry have not addressed the implications of

benchmark characteristics on the rate of return.[75] In particular, these submissions have not addressed the impact of:

- Return on equity—our return on equity approach employs the Sharpe-Lintner CAPM as a foundation model.[76] In the Sharpe-Lintner CAPM, the market risk premium reflects the expected level of market portfolio returns, but this is adjusted by the equity beta. The equity beta captures the covariance of the benchmark equity or portfolio with the market returns. In the case of regulated service providers, our benchmark equity beta sample is based on close comparators to these service providers. This results in equity beta observations of less than 1, meaning that our ultimate estimated return on equity is lower than the average equity in the market holding the term of expected returns constant.
- Return on debt—the return on debt is set with regard to a benchmark credit rating. Credit ratings are a measure of the creditworthiness of investments, reflecting the likelihood of debt defaulting and the probable loss in the event of default. Where credit ratings are relatively stronger, issuers of debt would generally be expected to borrow more cheaply. Importantly, relatively high levels of gearing would typically result in lower credit ratings. However, due to the security provided by the regulatory regime, regulated service providers are typically able to carry higher than average levels of gearing to maintain a particular credit rating. Because debt is cheaper than equity, this results in a lower estimated overall rate of return than an average company in the market at the same term and credit rating.[77] For example, S&P observes that:[78]

  > S&P does consider balance sheet leverage, or gearing, as part of its rating of network utilities, however such balance sheet leverage is not typically considered as important for a network utility's financial risk profile as the cashflow metrics described above under 'Cashflow Adequacy'.
  >
  > Tightly regulated transmission and distribution utilities generally face limited business risk—this translates into stable revenues. As a result, they can operate with... high leverage.

In one submission, the CCP members have set out estimates of Powerlink's and Energex's actual gearing.[79] They calculated these levels of gearing based on analysis

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75 CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 revenue proposal*, 20 June 2016; and CCP (Hugh Grant), *The methodology for the comparison of the electricity networks' return on equity with the returns of ASX 50 companies—in the context of the Powerlink/Telstra comparison*, 26 July 2016.

76 Our approach to the return on equity is detailed in attachment 3.

77 To expand, this is because a higher proportion of the rate of return is made up by relatively cheaper debt when compared against other companies at the same credit rating.

78 Australia Ratings, *Assessment of implied credit ratings arising from the Australian Energy Regulator's draft decision on access arrangements for APA GasNet Australia (Operations) Pty Ltd for 2013–17*, November 2012, p. 21.

79 CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 revenue proposal*, 20 June 2016, pp. 36–37.

of Powerlink's and Energex's actual levels of equity and debt investment. The CCP members then compared these to the 60 per cent benchmark gearing estimate that we determined in the rate of return guideline and have consistently adopted. Specifically:

- the CCP members estimated that Powerlink's actual gearing is approximately 84 per cent debt (and 16 per cent equity)
- the CCP members estimated that Energex's actual gearing is approximately 80 per cent debt (and 20 per cent equity).

Having regard to the CCP members' analysis, we are not persuaded that we should depart from the benchmark gearing established in the rate of return guideline. We have reached this conclusion for the following reasons:

- Our estimate of benchmark gearing is based on observed market information for a sample of close benchmark comparators,[80] most of which are regulated network service providers.[81]
- It is in the nature of a benchmark that some firms will deviate from the benchmark level. This is a necessary feature of an incentive regime. By using a benchmark, service providers can benefit by outperforming the benchmark in the short term. Then, by regularly collecting and reviewing data on our benchmarks, we can incorporate this outperformance in our estimates and share the benefits with customers.
- To the extent that the benchmark sample systematically adopts higher gearing than the benchmark level, this would likely lead us to reflect that change in the benchmark gearing estimate. The CCP members' submission has not been specific about whether it considers we should set individual gearing levels for individual companies. This appears to be the implication of its proposed approach for Powerlink. This is inconsistent with a benchmark approach.
- However, in further correspondence, CCP member Hugh Grant has clarified that he considers we should adopt an average gearing of all businesses in the NEM.[82] This is not consistent with the proposed approach in the main CCP members' submission, which is based exclusively on calculations of Powerlink's gearing.[83] However, this proposed NEM-wide average would include service providers that are not a close fit to the benchmark efficient service provider with respect to raising capital.

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[80] Specifically, Alinta, AGL, APA Group, Diversified Utility and Energy Trusts (DUET), Envestra Ltd, GasNet, Hasting Diversified Funds, SP AusNet and Spark Infrastructure.

[81] Specifically, we estimate benchmark gearing as 1 – market value of equity/(market value of equity + book value of debt). Ideally we would also use the market value of debt, but since this information is not observable we use the book value of debt as a proxy.

[82] CCP (Hugh Grant), *Addressing the RAB/WACC disconnect issues within the current rules*, 18 July 2016, p. 3.

[83] We have had limited time to review the CCP members' calculations underlying the estimate of Powerlink's actual gearing because this submission was provided late. CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 revenue proposal*, 20 June 2016, pp. 36–37.

- Importantly, neither Powerlink nor Energex are part of our benchmark sample for gearing. Due to their government ownership, these service providers are not directly comparable to the benchmark efficient entity in this respect. As concluded by the AEMC:[84]

> If state-owned businesses issued their own bonds, without a government guarantee, they would face materially similar borrowing costs to privately-owned service providers. In the absence of competitive neutrality provisions, electricity consumers are unlikely to be better off from defining a separate benchmark for state-owned service. The most appropriate benchmark to use in the regulatory framework for all service providers, regardless of ownership in general, is the efficient private sector service provider.

A.1.3 The CCP members' proposed approach

CCP members Hugh Grant and David Headberry have proposed that we should address the issues with the rate of return by:

- applying a market return on equity to 10 per cent of Powerlink's RAB
- applying a market return on debt to 55 per cent of Powerlink's RAB.[85]

In total, this results in a weighted average cost of capital applying to 65 per cent of Powerlink's RAB.

This approach violates the NPV=0 principle. On this basis, we consider the CCP members' proposed approach is inconsistent with good regulatory practice, and with the NER.

To demonstrate this conclusion, we have replicated the examples from above, and included an example of the CCP members' approach for comparison. Specifically, the CCP members' approach in the following examples is calculated as follows:

- we adopt the same starting assumptions as the example in section A.1.1
- we allow the CCP members' approach to follow the AER's approach for the first two regulatory control periods in the example (10 years). This is to make the example more realistic, given our approach is already underway for Powerlink. The choice of when the CCP members' approach is introduced has some impact on the specific estimated NPV, but it does not change the ultimate conclusion under any chosen 'start-date' during the 25 year asset life in the example.
- starting in year 11, we:
    - apply the same return on equity to 10 per cent of the RAB
    - apply the same return on debt to 55 per cent of the RAB

---

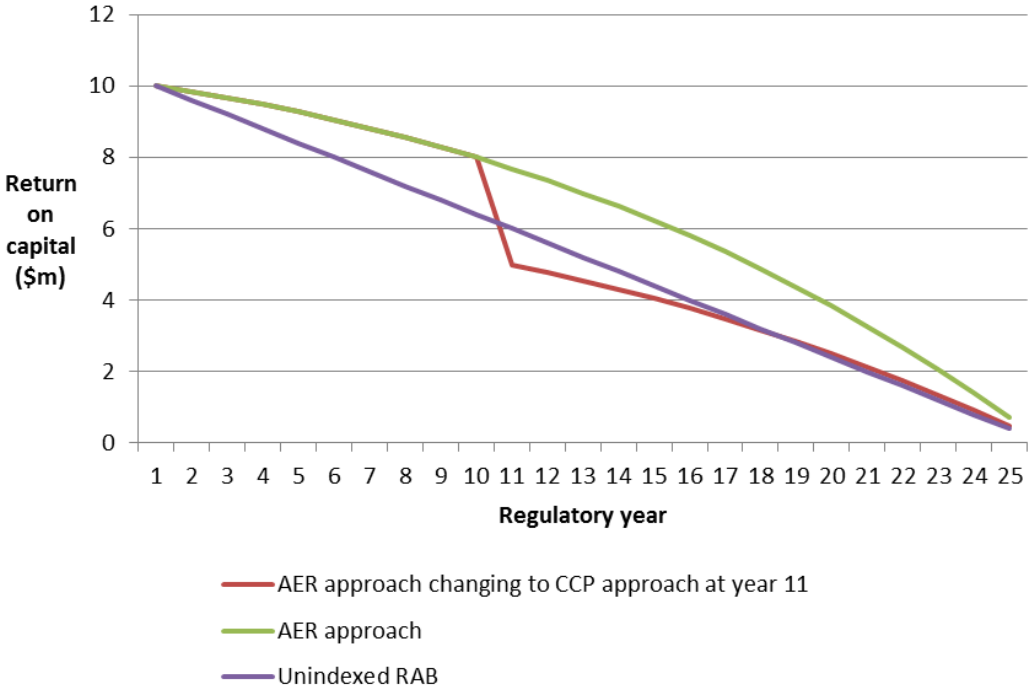
[84] AEMC, *Final rule change determination*, November 2012, p. 72.

[85] CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 revenue proposal*, 20 June 2016, p. 3.

- leave depreciation unchanged, as the CCP members' submission is silent on the impact of their approach on depreciation.

Figure 2.4 shows the impact of this approach on the return on capital. The depreciation allowance and RAB values remain consistent with the AER approach.

Figure 2.4 Rate of return comparison under the CCP members' proposed approach ($ million, nominal)



Source: AER analysis.

Table 2.7 sets out the cash flows for the example and the impact on the NPV of the investment. It illustrates that either an indexed or unindexed RAB will satisfy the NPV=0 principle if it is applied consistently, but the CCP members' proposed approach does not achieve this requirement.

Table 2.7 Impact of the CCP members' approach on net present values ($ million)

Year	AER cash flows (nominal)	Unindexed RAB cash flows (nominal)	CCP approach cash flows (nominal)	AER cash flows (discounted for NPV)	Unindexed RAB cash flows (discounted for NPV)	CCP approach cash flows (discounted for NPV)
1	11.6	14.0	11.6	10.5	12.7	10.5
2	11.6	13.6	11.6	9.6	11.2	9.6
3	11.6	13.2	11.6	8.7	9.9	8.7
4	11.5	12.8	11.5	7.9	8.7	7.9
5	11.5	12.4	11.5	7.1	7.7	7.1
6	11.4	12.0	11.4	6.5	6.8	6.5
7	11.4	11.6	11.4	5.8	6.0	5.8
8	11.3	11.2	11.3	5.3	5.2	5.3
9	11.2	10.8	11.2	4.8	4.6	4.8
10	11.1	10.4	11.1	4.3	4.0	4.3
11	11.0	10.0	8.3	3.9	3.5	2.9
12	10.9	9.6	8.3	3.5	3.1	2.7
13	10.8	9.2	8.3	3.1	2.7	2.4
14	10.6	8.8	8.3	2.8	2.3	2.2
15	10.5	8.4	8.3	2.5	2.0	2.0
16	10.3	8.0	8.3	2.2	1.7	1.8
17	10.1	7.6	8.2	2.0	1.5	1.6
18	9.9	7.2	8.2	1.8	1.3	1.5
19	9.7	6.8	8.1	1.6	1.1	1.3
20	9.4	6.4	8.1	1.4	1.0	1.2
21	9.2	6.0	8.0	1.2	0.8	1.1
22	8.9	5.6	8.0	1.1	0.7	1.0
23	8.6	5.2	7.9	1.0	0.6	0.9
24	8.3	4.8	7.8	0.8	0.5	0.8
25	8.0	4.4	7.7	0.7	0.4	0.7
Total	260.2	230.0	236.0	100.0	100.0	94.4

Source: AER analysis.

The key results in this table can be established by comparing the total revenues of the different approaches in the columns with labels referring to 'discounted for NPV':

- Under either the AER's approach (indexed RAB, nominal WACC, depreciation offset) or the unindexed RAB approach (unindexed RAB, nominal WACC, zero depreciation offset) the NPVs are the same and are equal to the starting value of the investment ($100 million).
- However, under the CCP members' proposed approach, the total of cash flows in NPV terms is lower, and specifically is below the initial value of the investment.

A.1.4 Regulatory depreciation

The regulatory depreciation allowance is a building block component of the annual building block revenue requirement.[86] 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 allowance, although this impact is usually smaller than the increased depreciation allowance in the short to medium term.[87]

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.[88] The return on capital building block has to be calculated using a nominal rate of return (WACC) applied to the opening RAB.[89] 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.[90] Our standard approach is to subtract the indexation of the opening RAB—the opening RAB

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86 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.

87 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.

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

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

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

multiplied by the expected inflation for the year—from the RAB depreciation. The net result of this calculation is referred to as regulatory depreciation.[91] 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 revenue.[92] Under both approaches, the total revenues being recovered are in present value neutral terms—that is, returning the initial cost of the RAB.

A.2 The CCP members' analysis of profitability outcomes

In addition to identifying specific issues with building block revenue inputs, CCP members Hugh Grant and David Headberry submitted analysis on Powerlink's 'actual' return on equity. In particular, the CCP members submitted that:[93]

> - Powerlink achieved actual return on equity levels of 18% to 75%, which amounted to 1.5–8.1 times the AER's theoretical return on equity levels. …
> - By comparison, most ASX50 companies have struggled to achieve annual return on equity levels of 5% over that period. …
>
> This demonstrates the deficiencies with the AER's return on capital determination methodology and how the AER is inappropriately providing *guaranteed returns on **artificial** investments*. (emphasis in original)

The CCP members submitted that the 'extraordinary profitability levels' show that the AER's approach is incorrect.[94]

After review of the CCP members' late submissions on these issues, we do not consider that this analysis demonstrates that the AER approach is incorrect.[95] Although

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91 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

92 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.

93 CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 revenue proposal*, 20 June 2016, p. 38.

94 CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 revenue proposal*, 20 June 2016, p. 41.

we do not agree with the CCP members' analysis, we do agree that there is some merit to the analysis of profitability outcomes.[96] However, we recognise that there are factors that need to be addressed when implementing this analysis. The most significant of these issues is the value of the initial equity investment in Powerlink. We consider that the CCP members have underestimated the value of this initial equity stake, and so overestimated the 'actual' return on equity and relative profitability of Powerlink.

Outperformance and incentive regulation

At the highest level, the CCP members' analysis attempts to draw conclusions about the regulatory regime based on a limited set of observed market 'outperformance'. However, there are a number of important conceptual reasons why this might not lead to the conclusion that the regulatory regime was systematically overcompensating service providers:

- Some amount of outperformance is to be expected in an incentive regime. By design, if the service provider can outperform the regime within a regulatory control period, we can then use its outturn performance to inform our revenue decision for the next regulatory control period. Over time, this should encourage service providers towards efficiency and share benefits of the outperformance with customers.
- Even where market outperformance (*ex post*) is observed, this does not mean that the outperformance was guaranteed in advance (*ex ante*) and may simply reflect an outcome towards the high end of the spread of possible outcomes.
- We cannot readily observe the commensurate level of *ex ante* risk associated with outperformance, which is observed *ex post*. For example, a business adopting an above-benchmark gearing level accepts a higher level of risk than the benchmark.[97] We would expect to observe, on average, higher returns as a consequence of this higher risk strategy.

The CCP members' submission does not address these issues.

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95 Given the late receipt of these submissions, our analysis is ongoing. CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 revenue proposal*, 20 June 2016, pp 31–47; and CCP (Hugh Grant), *The methodology for the comparison of the electricity networks' return on equity with the returns of ASX 50 companies—in the context of the Powerlink/Telstra comparison*, 26 July 2016.

96 However, as we explain below, such an analysis needs to be carefully interpreted with due regard to the framework for incentive regulation, the characteristics of the regulated benchmark, and any differences between the available data and this benchmark.

97 The CCP members submitted that, based on an 'optimised' RAB, Powerlink has gearing around 84 per cent, above the benchmark 60 per cent gearing. CCP (Hugh Grant and David Headberry), *Submission to the AER, Powerlink Queensland 2018–22 revenue proposal*, 20 June 2016, p. 36.

Characteristics of the regulated benchmark

Another difficulty when undertaking profitability analysis is that available real-world examples differ in many ways from the (unobservable) theoretical regulated benchmark. Therefore, a key underlying principle is to consider the differences between the available data and the benchmark, and make adjustments where possible to ensure an 'apples to apples' comparison. Where adjustments are not possible, we must have regard to the materiality of the differences before drawing any conclusions.

We consider that any comparison against the AER's regulated return on equity should be on a like-for-like basis, excluding one–off and unregulated revenue. However, the CCP members' submissions appear to include one–off and unregulated revenue for Powerlink.[98] This causes overestimation of Powerlink's profitability relative to the regulated benchmark.

Obtaining accurate data

This issue relates to availability of reliable data as an input to the analysis of profitability outcomes. This is best illustrated with regard to a specific example in the CCP members' analysis.

The value of initial shareholder equity is a key determinant of the actual return on equity under the CCP members' approach. Conceptually, this should reflect the actual capital investment in the network by the Queensland Government as it built the network over many decades.[99] However, this historical data is not readily available.[100] Instead, the CCP members start their analysis as at 30 June 2000 using figures taken from Powerlink's oldest available financial report.[101] This is problematic because the book value of share capital ($401 million) is used without adjusting for the time that has passed between the initial investment and the valuation date.[102] Further, Powerlink's asset revaluation reserve ($620 million as at 30 June 2000) is excluded, on the grounds that this is 'commonly accepted' when valuing businesses. We do not accept this is the case. If the valuation is to use balance sheet values as at June 2000 (because this is the best available proxy for the market value of equity), reserves

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98 For example, the CCP members included Powerlink's April 2013 special interim dividend of $339.2 million ($nominal) even though it is a one-off event; and included unregulated revenue in the net profit after tax each year.

99 It is also necessary to adjust cash flows for the time value of money.

100 Older data may be difficult to obtain because there was no separate reporting of state government investment in the electricity networks. Powerlink was established as a government owned corporation in January 1995, but only became an independent entity in 1997. Powerlink Queensland, *Working together, Annual report 04/05*, 7 September 2005, p. 3.

101 The earliest annual report on the Powerlink website is for 2001–02; this report contains figures for the previous financial year (2000–01).

102 The CCP members value the initial equity at $427 million, comprised of $401 million in share capital and $26 million in retained earnings. CCP (Hugh Grant), *The methodology for the comparisons of the Electricity Networks' return on equity with the returns of ASX 50 companies - in the context of the Powerlink/Telstra comparison*, 26 July 2016, p. 1.

should be included in the calculation of shareholder's equity,[103] in accordance with commonly accepted valuation practices.[104]

The net effect of undervaluing and misdating the initial investment in Powerlink is that the return on equity for Powerlink is overstated. This is a large effect—doubling the initial equity investment approximately halves the reported return on equity. The absence of reliable data on initial shareholder equity means it is difficult to accept the CCP members' profitability analysis.

[103] Powerlink noted that its treatment of revaluation reserves was consistent with the relevant Australian Accounting Standards. Powerlink, *Letter re: Powerlink 2019–22 revenue proposal – AER public forum*, 28 April 2016, p. 2

[104] Richard Brealey, Stewart Myers, Graham Partington and David Robinson, *Principles of Corporate Finance*, 2007 (First Australian Edition), pp. 834–835, 846–848,