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Draft decision on proposed revisions to the access arrangement for the Western Power Network 2022/23 – 2026/27

Attachment 5: Return on regulated asset base

9 September 2022

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Note

This attachment forms part of the ERA's draft decision on proposed revisions to the access arrangement for the Western Power Network for the fifth access arrangement period (AA5). It should be read with all other parts of the draft decision.

The draft decision includes the following attachments:

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Attachment 1 – Price control and total revenue requirement

Attachment 2 – Regulated asset base

Attachment 3A – AA4 capital expenditure

Attachment 3B – AA5 capital expenditure

Attachment 4 – Depreciation

Attachment 5 – Return on regulated asset base (this document)

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1. Return on regulated asset base

This attachment sets out the Economic Regulation Authority's (ERA) considerations on the return on the regulated asset base and draft decision for Western Power's fifth access arrangement (AA5).

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2. Access Code requirements

Section 2.1 of the Electricity Networks Access Code 2004 (Access Code) sets out the Code Objective, which is to promote efficient investment in, and efficient operation and use of, services of networks in Western Australia for the long-term interests of consumers in relation to:

- Price, quality, safety, reliability and security of supply of electricity.
- The safety, reliability and security of covered networks.
- The environmental consequences of energy supply and consumption, including reducing greenhouse gas emissions, considering land use and biodiversity impacts and encouraging energy efficiency and demand management.

Section 6.4 of the Access Code requires that the price control in an access arrangement must (among other things) enable the service provider to earn sufficient revenue to cover its forward-looking and efficient costs of providing covered services, including a return on investment commensurate with the commercial risks involved.

The rate of return provides a service provider with the funding to pay interest on any loans and give a return on equity to investors. The rate of return is expressed as a weighted average cost of capital (WACC).

Section 6.64 of the Access Code requires that an access arrangement sets out the WACC for a covered network, which must be in accordance with any determination made by the ERA pursuant to section 6.65 in effect or, if no determination is in effect, calculated consistent with the methodology in section 6.66.

Under section 6.65 of the Access Code, the ERA may publish a determination of the preferred methodology for calculating the WACC in access arrangements.

As no determination is in effect, the WACC for Western Power in AA5 must be estimated in a manner consistent with section 6.66 of the Access Code.

Section 6.66 of the Access Code requires that a WACC calculation:

- Must represent an effective means of achieving the Code Objective and the objectives in section 6.4.
- Must be based on an accepted financial model such as the Capital Asset Pricing Model (CAPM).

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3. Western Power's proposal

Western Power proposed an average nominal post-tax WACC of 4.73 per cent for the AA5 period, compared with 5.87 per cent approved in AA4.

Western Power's proposed WACC for AA5 was developed in 2021 in a low interest rate environment and these market conditions resulted in a WACC that was forecast to be lower than during AA4. The reduction in returns from the low interest rate environment contemplated by Western Power is partially offset by increases resulting from Western Power's proposed changes to the WACC approach used to calculate the WACC.

Western Power used placeholder values as of 30 June 2021 in its proposal to calculate the average nominal post-tax WACC of 4.73 per cent. These placeholder values are intended to be replaced with the most current values at the time of the ERA's final decision.

Western Power broadly maintained the approach used for AA4 to determine most WACC parameters for AA5. Western Power proposed to apply a rate of return method broadly consistent with the methodology in the ERA's 2018 Rate of Return Guidelines.[1] [2]

Western Power proposed the following changes from the approach applied in AA4 and the ERA's 2018 Rate of Return Guidelines:

- An alternative approach to estimate the cost of debt.
- An increase in the term of the risk free rate to 10 years, up from a term of five years.

Western Power commissioned Frontier Economics to review the existing rate of return allowance and provide supporting arguments for Western Power's proposed approach to estimating the rate of return.[3]

Table 1 details the individual rate of return components proposed by Western Power for AA5 compared to the existing rate of return components approved in the ERA's final decision for AA4.

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[1]   Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 230.

[2]   The National Gas Law requires the ERA to produce rate of return instrument that sets out the methods the ERA will use to estimate the allowed rate of return on debt and equity and value of imputation credits for gas transmission and distribution service providers. The current version of the rate of return instrument is the Final Rate of Return Guidelines (2018), published by the ERA on 18 December 2018 (2018 Rate of Return Guidelines).

[3]   Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 231.

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Table 1: **Western Power's rate of return estimate**

Component	AA4 actual	AA5 proposed
Return on debt (%)		
5-year interest rate swap (effective yield)	2.59	N/A
Debt risk premium (10 year average)	2.487	N/A
Debt issuing cost	0.100	0.100
Debt hedging cost	0.114	N/A
Return on debt (10 year bond yield)	N/A	3.80*
Nominal return on debt	*5.29*	*3.90**
Return on equity		
Nominal risk free rate (%)	2.37	1.53
Market risk premium (%)	6.0	6.0
Equity beta	0.7	0.7
Nominal return on equity (%)	*6.57*	*5.73*
Other parameters		
Debt proportion (%)	*55*	*55*
Inflation rate (%)	1.84	2.03
Corporate tax rate (%)	30	30
Franking credits	50	50
Nominal after-tax WACC (%)	**5.87**	**4.73***
Real after-tax WACC (%)	3.95	2.64*

Source: ERA analysis; Western Power, Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period, 1 February 2022, pp. 236-237.

*Five year average over the AA5 period.

The ERA notes that market conditions have changed significantly since 2021 when Western Power developed its AA5 proposal. Western Power's AA5 proposal used values and estimated its rate of return as at 30 June 2021 as a placeholder. The ERA's consideration and estimates of the WACC parameters in this draft decision, is as at 30 June 2022 to reflect the market conditions at the time of making this draft decision. It is proposed that in the ERA's final decision, these will be replaced with the most current values at the time.

The following sections detail the ERA's consideration of each of the rate of return parameters and the ERA's draft decision on the return on the regulated asset base for AA5.

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4. Public submissions

The ERA published an issues paper on 4 March 2022 and invited stakeholder submissions on Western Power's proposed rate of return.

Seventeen submissions were received in response to the ERA's issues paper on Western Power's AA5 proposal. Seven submissions commented on the rate of return, from:

- Australian Energy Council (AEC)
- Alinta Energy
- Change Energy
- Perth Energy
- Synergy
- Western Australian Council of Social Service (WACOSS)
- WA Expert Consumer Panel.

4.1 Overall rate of return

Three submissions provided high-level comments on WACC.

Change Energy considered that Western Power is a regulated government-owned utility with minimal risk. Western Power's return on assets should reflect this level of risk.[4]

Perth Energy noted that return on capital represents approximately 20 per cent of Western Power's proposed target revenue. Changing any WACC parameters would potentially have a significant effect on end-use tariffs.[5]

WA Expert Consumer Panel submitted that Western Power's proposed method of calculating the rate of return contributed to a higher rate in the short term. WA Expert Consumer Panel considered that the ERA should examine Western Power's proposal in detail to ensure it would not lead to windfall gains for Western Power.[6]

4.2 Cost of debt approach

AEC, Alinta Energy, Synergy, WACOSS and the WA Expert Consumer Panel commented on Western Power's proposed cost of debt approach.[7,8,9,10,11]

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[4]   Change Energy, *Submission to Western Power AA5 Issues Paper*, April 2022, p. 6.

[5]   Perth Energy, *Submission to Western Power AA5 Issues Paper*, April 2022, p. 3.

[6]   WA Expert Consumer Panel, *Submission to Western Power AA5 Issues Paper: Attachment 1,* May 2022, p. 16.

[7]   Australian Energy Council, *Submission to Western Power AA5 Issues Paper,* April 2022, p. 9.

[8]   Alinta Energy, *Submission to Western Power AA5 Issues Paper,* April 2022, pp. 3-4.

[9]   Synergy, *Submission to Western Power AA5 Issues Paper: Target Revenue and Price Control,* April 2022, pp. 33-35.

[10] The Western Australian Council of Social Service, *Submission to Western Power AA5 Issues Paper,* April 2022, p. 7.

[11] WA Expert Consumer Panel, *Submission to Western Power AA5 Issues Paper: Attachment 1,* May 2022, p. 16.

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AEC, Alinta Energy, Synergy and WACOSS supported the ERA's current hybrid trailing average approach to estimate the cost of debt. Stakeholders considered that the approach in the 2018 Rate of Return Guidelines was consistent with the following requirements of the Access Code in relation to price control and the structure of reference tariffs:

- Allows a return on investment commensurate with the commercial risks involved and meets the forward-looking and efficient costs of providing covered services (sections 6.4(a)(i)).

- Enables a user to predict the likely annual changes in target revenue during the access arrangement period (section 6.4(b)).

- Minimises, as far as reasonably possible, variance between expected and target revenue for the last pricing year in the access arrangement period (section 6.4(c)).

- Each reference tariff must be based on the forward-looking efficient costs of providing the reference service to the customers currently on that reference tariff (section 7.3(G)).

- The revenue expected to be recovered from each reference tariff must reflect: (a) the service provider's total efficient costs of serving the customers that are currently on that reference tariff; (b) permit the service provider to recover the expected revenue for the reference services in accordance with the service provider's access arrangement; and (c) minimises distortions to the price signals for efficient usage (section 7.3(H)).

AEC and Synergy considered that under Western Power's proposed approach, the target revenue would be subject to greater change each year within the access arrangement period compared to the approach in AA4.[12] Synergy also considered it would be difficult to assess the variance between the expected and target revenue over the AA5 period.[13]

WA Expert Consumer Panel noted that Western Power's proposed cost of debt method may be more consistent with its actual debt structure. The WA Expert Consumer Panel submitted that the ERA should examine whether moving to a calculation that more closely mirrors Western Power's debt structure, and whether a 10 year trailing average would better serve the long-term interests of consumers.[14]

4.3   Term for equity

AEC, Synergy and WACOSS commented on the term for equity. All of these stakeholders submitted that the ERA should maintain a five year term for equity as Western Power's proposed change to a 10 year term would increase revenue for equity costs (AEC and WACOSS)[15,16] and would be inconsistent with the Code Objective (Synergy).[17]

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[12]   Australian Energy Council, *Submission to Western Power AA5 Issues Paper,* April 2022, p. 9.

[13]   Synergy, *Submission to Western Power AA5 Issues Paper: Target Revenue and Price Control,* April 2022, pp. 34-35.

[14]   WA Expert Consumer Panel, *Submission to Western Power AA5 Issues Paper: Attachment 1,* May 2022, p. 16.

[15]   Australian Energy Council, *Submission to Western Power AA5 Issues Paper,* April 2022, p. 9.

[16]   The Western Australian Council of Social Service, *Submission to Western Power AA5 Issues Paper,* April 2022, pp. 7-8.

[17]   Synergy, *Submission to Western Power AA5 Issues Paper: Target Revenue and Price Control,* April 2022, p. 35.

5. ERA's considerations

The ERA adopts a standard rate of return approach for its heavily regulated energy networks, which means that general WACC approaches and parameters are the same across energy networks.

The National Gas Law requires the ERA to produce a rate of return instrument that sets out the methods the ERA will use to estimate the allowed rate of return on debt and equity and value of imputation credits for gas transmission and distribution service providers. The current version of the rate of return instrument is the 2018 Final Rate of Return Guidelines.

The ERA considers that:

- The Access Code and National Gas Rules are similar, which means the rate of return method contained in the rate of return guidelines can be applied to network service providers in electricity and gas.

- Network service providers in the gas and electricity industries are subject to a similar degree of risk, which means that the same benchmark efficient entity can be used.

By adopting a standard rate of return method for regulated energy networks, the ERA's consideration of WACC approaches and parameters are largely similar across regulated gas pipelines and covered electricity networks.

For this draft decision, the ERA has not simply applied the 2018 Rate of Return Guidelines. As required by the National Gas Law, the ERA is currently undertaking a periodic review of the 2018 Rate of Return Guidelines and a new instrument is required to be published by December 2022. A draft version of the new instrument, the 2022 Draft Gas Rate of Return Instrument (Draft 2022 Rate of Return Instrument) and explanatory statement have been published by the ERA.

In developing the Draft 2022 Rate of Return Instrument, the ERA has considered a range of information, including stakeholder submissions, academic literature, market data and developments and stakeholder feedback.[18]

Submissions on the 2022 Rate of Return Instrument and explanatory statement closed on 2 September 2022.

The ERA has considered both the 2018 Rate of Return Guidelines and the information and submissions it has received as part of developing the Draft 2022 Rate of Return Instrument. The ERA's specific considerations are set out in this draft decision.

Where the ERA has applied elements of the Draft 2022 Rate of Return Instrument it is because the ERA considers that it is the most appropriate option. However, the ERA has not published a final version of the document and so stakeholders should not take the ERA's application of parts of the Draft 2022 Rate of Return Instrument as representing the ERA's conclusion on the matter in the review of the 2018 Rate of Return Guidelines.

Further, given that the review of the 2018 Rate of Return Guidelines has not been finalised, the ERA's views may change in its final decision for AA5 to reflect any decision on the 2022 Rate of Return Instrument where it is appropriate and consistent with section 6.4 of the Access Code and the Code Objective.

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[18]   ERA, *Explanatory statement for the 2022 draft gas rate of return instrument*, 17 June 2022.

The ERA notes that Western Power has broadly applied the ERA's 2018 Rate of Return Guidelines as the basis for its method of estimating the rate of return for the AA5 period.

As a high level summary, the ERA accepts and considers that the following parameters of Western Power's proposed rate of return satisfy the requirements set out in section 6.4 of the Access Code and the Code Objective:

- credit rating
- gearing ratio
- term of debt
- term for equity
- equity beta
- forecast inflation, updated for current data
- value of imputation credits (gamma)

The ERA has made changes to the following parameters of Western Power's proposed rate of return to ensure that it is based on current data:

- the market risk premium
- debt raising and hedging costs.

The ERA has considered Western Power's proposal to change the term for equity from five years to 10 years. The ERA has accepted Western Power's proposed 10 year term for equity. This change aligns the assumed term for equity with common investor practice, where investors in long-lived assets consider cash flows over a long time horizon exceeding the access arrangement period. The ERA considers a 10 year term for equity still allows for efficient rates of return, is consistent with private market practice and the change supports the delivery of efficient forward-looking rates.

The ERA has considered Western Power's proposed change to the cost of debt approach to a 10 year trailing average approach. The ERA does not approve Western Power's proposed approach to calculating the cost of debt and requires the hybrid trailing average approach to estimate the cost of debt for the AA5 period for the following reasons:

- Western Power has not justified its proposed move to a 10 year trailing average approach to debt.
- The hybrid trailing average approach better aligns with Western Power's debt management, given that Western Power does not solely issue fixed rate bonds and has approximately a third of its debt portfolio as floating rate borrowings.
- Maintaining the hybrid trailing average approach would promote regulatory certainty within the regulatory period and better meet the requirements of Chapter 6 of the Access Code and the Code Objective.

The following sections detail the ERA's consideration of each of the rate of return parameters as proposed by Western Power and the ERA's draft decision on the rate of return for AA5.

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6. Gearing

Gearing is the proportion of a business' assets financed by debt and equity. Gearing is defined as the ratio of the value of debt to total capital (that is, the sum of debt and equity) and is generally expressed as follows:

$$\text{Gearing} = \frac{\text{Debt}}{\text{Debt} + \text{Equity}}$$

Equation 1

The ERA uses the gearing ratio to weight the costs of debt and equity when the WACC is determined.

In addition to weighting the expected returns on debt and equity, the gearing ratio is used:

- To re-lever asset betas to estimate the equity beta of regulated firms.
- As a factor in determining an appropriate credit rating to derive the debt risk premium.
- To determine interest and tax expenses in a post-tax revenue model.

This section outlines the ERA's draft decision and reasoning for gearing.

6.1 Western Power's proposal

Western Power proposed a gearing of 55 per cent, consistent with the gearing ratio for Western Power applied in AA4 and the ERA's 2018 Rate of Return Guidelines.[19]

6.2 Public submissions

No submissions to the issues paper provided stakeholder comments on gearing.

6.3 ERA draft decision

The ERA accepts Western Power's proposed gearing ratio of 55 per cent.

The ERA considers that the gearing should be determined from observations of the gearing levels of firms in a benchmark sample of Australian energy networks. The gearing levels of Australian energy networks will, in the ERA's opinion, most closely reflect the regulatory and commercial risks involved in Western Power providing regulated services.

The gearing method involves observing gearing over the last five year period.[20] The ERA does not forecast directional movements of debt relative to equity that may occur. For example, the ERA does not consider factors such as market capitalisation forecasts and debt issuance constraints.

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[19] Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 236.

[20] ERA, *Explanatory Statement for the 2022 draft gas rate of return instrument*, June 2022, p. 48.

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To calculate the gearing ratio, the ERA uses the following assumptions:

- Using comparator firms in its benchmark sample of firms.

- Using a market-based gearing level to reflect efficient financing.

- Gearing is observed over a 10 year period.

- Gearing estimates are observed on an annual basis from financial statements and market data.

- The market value of equity is equal to a firm's market capitalisation, which is equal to the share price multiplied by volume of shares issued.

- As the availability of market value of debt is limited, the book value of debt is used as a proxy. The book value of debt is calculated from current and non-current borrowings from financial statements.

- Debt is taken at a gross level. That is, no deduction is made for cash or marketable securities. Gross debt is used as it is not possible to determine whether cash equivalents are used to repay debt or pay dividend.[21] In addition, an efficient network business would have some cash as part of its optimal asset mix.

- Debt is adjusted to incorporate a firm's investments in associates and those associates' debt, which may not be reported on the firm's balance sheet. Associates' debt is added to parent debt in line with proportional ownership. For example, Spark Infrastructure is adjusted for its investments in South Australia Power Networks, Victoria Power Networks and TransGrid.

- Hybrid securities which have equity characteristics are removed from debt.

The ERA has updated its gearing ratio estimate using current data.

Table 2 details the ERA's gearing ratio estimate for benchmark entities based on observable data from comparable firms.

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[21]   Dr Lally,M., *Review of the AER's views on gearing and gamma*, May 2018, p. 4.

Table 2: **ERA market value gearing ratio estimates (%)**

Year	APA Group (APA)	AusNet Services (AST)	DUET Group (DUE)	Spark Infrastructure Group (SKI)	Average
2012	47	59	72	59	59
2013	46	57	71	62	59
2014	45	58	64	55	55
2015	50	59	62	56	57
2016	49	57	51	54	52
2017	49	52	N/A	52	51
2018	46	56	N/A	57	53
2019	45	55	N/A	60	53
2020	45	59	N/A	60	55
2021	49	57	N/A	60	55
Five year average	**47**	**56**	**N/A**	**58**	**53**
10 year average	**47**	**57**	**64**	**57**	**55**

Source: Annual reports, Bloomberg, ERA Analysis.

The ERA's analysis estimates that the five year average gearing ratio for the energy network sample is 53 per cent, or 55 per cent over a 10 year average.

The ERA notes that three of the sample firms have been delisted, including AusNet Services and Spark Infrastructure in 2022. However, the ERA considers that past market information still provides a useful reference.

If the analysis is extended to include the last observable five years for DUET, where DUET's five year average gearing is 64 per cent, the five year average of the sample will increase to 56 per cent.

The Australian Energy Regulator's (AER) recent analysis has shown that gearing ratio levels based on market values are 52 per cent over a five year average or 55 per cent over a 10 year average.[22]

For this draft decision, the ERA has used a gearing ratio of 55 per cent when rounding to the closest five percentage points to determine the rate of return.

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[22]   AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, p. 75.

7.   Return on debt

The WACC includes a component for the return on debt. The return on debt is the return that debt holders require from a firm to compensate them for the risk they take in providing debt financing.

This section outlines the ERA's reasoning and draft decision on the return on debt parameter of the rate of return.

7.1   Western Power's proposal

Western Power proposed a departure from the approach used in AA4 to estimate the return on debt and the approach for estimating the return on debt contained in the 2018 Rate of Return Guidelines.

The approach used in AA4 to estimate the return on debt was a hybrid trailing average approach. Under the hybrid trailing average approach:

- The benchmark entity enters into the assumed benchmark efficient debt strategy. This strategy is assumed to be a staggered portfolio of 10 year fixed-rate BBB+ debt with 10 per cent being refinanced each year.

- The benchmark entity uses derivative arrangements to adjust the efficient debt portfolio and lock in a risk free rate over the access arrangement period.

- A 10 year trailing average debt risk premium is updated annually through the tariff variation mechanism.

Western Power has proposed using a 10 year trailing average debt approach to estimate the return on debt for AA5 that has removed the need to fix the risk free rate. Under Western Power's proposed approach:[23]

- Consistent with the approach in the 2018 Rate of Return Guidelines, the benchmark entity enters into the assumed benchmark efficient debt strategy. This strategy is assumed to be a staggered portfolio of 10 year fixed-rate BBB+ debt with 10 per cent refinanced each year.

- A 10 year trailing average total debt cost is updated annually through the tariff variation mechanism.

Western Power submitted that the proposed 10 year trailing average debt approach to estimating the return on debt is efficient. In its advice to Western Power, Frontier Economics considered that the return on debt should be set using the full trailing average approach.[24]

- Western Power stated that "the current approach to the allowed return on debt reflects a financing strategy that a business would be unlikely to consider adopting, other than to replicate the allowance provided to it under the current approach."[25]

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[23]   Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, pp. 234-235.

[24]   Frontier Economics, *Considerations for the regulatory rate of return allowance – Report for Western Power*, 20 December 2021, pp. 33-34.

[25]   Western Power, Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period, 1 February 2022, p. 234.

- The 10 year trailing average debt approach is now used by all other Australian regulators. These regulators do not consider that the NPV=0 principle prevents them from adopting the full trailing average approach.[26]

- Western Power stated that the proposed full trailing average approach best reflects its own (prudent and efficient) approach to managing its debt portfolio.[27]

Western Power did not propose any transitional arrangements for the move from the current hybrid trailing average approach to its proposed approach.

In proposing changes to the return on debt approach, Western Power notes that in the low-rate environment any trailing average approach would likely start the AA5 period relatively 'high' and decrease over the period. From a revenue and price outcome perspective, Western Power considers that this would mean that initial projections of revenue and price outcomes would be overstated and each annual update to the WACC (and hence revenue and price) would likely be a downward adjustment.[28]

Western Power proposed to maintain a term of debt of 10 years consistent with AA4 and the 2018 Rate of Return Guidelines.[29]

Western Power proposed to maintain a benchmark credit rating of BBB+, consistent with AA4 and the ERA's 2018 Rate of Return Guidelines.[30]

Western Power has not proposed any debt risk free rate or debt risk premium estimates, as this is not required under its proposed approach for estimating the return on debt.

7.2 Public submissions

Five of the submissions to the issues paper commented on the return on debt.

Four submissions supported maintaining the hybrid trailing average approach for the return on debt.[31,32,33,34]

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[26] Frontier Economics, *Considerations for the regulatory rate of return allowance – Report for Western Power*, 20 December 2021, p. 27.

[27] Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 235.

[28] Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 235.

[29] Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 234.

[30] Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 235.

[31] Australian Energy Council, *Submission to Western Power AA5 Issues Paper,* April 2022, p. 9.

[32] Alinta Energy, *Submission to Western Power AA5 Issues Paper,* April 2022, pp. 3-4.

[33] Synergy, *Submission to Western Power AA5 Issues Paper: Target Revenue and Price Control,* April 2022, pp. 33-35.

[34] The Western Australian Council of Social Service, *Submission to Western Power AA5 Issues Paper,* April 2022, p. 7.

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The Australian Energy Council (AEC) considered that: [35]

- Western Power's proposal meant that the target revenue would be subject to greater change each year than the change under the ERA's current approach. It would also be difficult to assess the variance between expected and target revenue over the AA5 period.

- The hybrid trailing average approach better serves clauses 6.4(b) and 6.4(c) of the Access Code. This approach is also consistent with the ERA's existing method for calculating the cost of debt. AEC noted that the ERA has proposed maintaining the hybrid trailing average approach in the Draft 2022 Rate of Return Instrument.

Alinta Energy did not support Western Power's proposed approach and considered that it was not consistent with the ERA's current approach for estimating the cost of debt in the 2018 Rate of Return Guidelines and the requirements of 6.4(b) and 6.4(c) of the Access Code. [36]

Synergy did not support Western Power's proposed return on debt approach: [37]

- Synergy did not agree with Western Power's assertion that the ERA's current approach reflected a financing strategy that a business would be unlikely to consider adopting, other than to replicate the allowance provided to it under the current approach. Firstly, in Synergy's view, any generic benchmark maturity profile employed by a regulator to estimate the cost of debt will entail simplification of real-world debt management practices. Secondly, the combination of 'on-the-day' bond rates and historical bond rates is an appropriate approach to offsetting refinancing risk and potential revenue and price volatility.

- Using a hedging strategy to manage the volatility of input prices over a multi-year period is a common business practice. Synergy considered that locking in a fixed rate at the commencement of a regulatory period would be prudent in the current environment of expected interest rate increase.

- Synergy considered that the 10 year trailing average cost of debt proposed by Western Power did not realistically represent an efficient debt management strategy, particularly given the current market conditions and was therefore inconsistent with sections 6.4(a)(i), 7.3G and 7.3H of the Access Code.

- Synergy noted that Western Power did not propose to implement a trailing average approach for the risk-free rate at the beginning of AA4, when the prevailing cost of debt at the start of that regulatory period was trending down. Given that the prevailing cost of debt had fallen well below the trailing average, Western Power appeared to have changed its preference in favour of a trailing average approach.

- Allowing Western Power to change the cost of debt calculation approach in response to market conditions does not satisfy the Code Objective. This is because it would provide Western Power with an incentive to propose the option that maximises its allowed cost of debt for its business interests rather than the long-term interests of customers. This change would also risk inflating target revenue above costs over the business cycle and would therefore be inconsistent with the Code Objective and sections 6.4(a)(i), 7.3G and 7.3H of the Access Code.

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[35] Australian Energy Council, *Submission to Western Power AA5 Issues Paper,* April 2022, p. 9.

[36] Alinta Energy, *Submission to Western Power AA5 Issues Paper,* April 2022, pp. 3-4.

[37] Synergy, *Submission to Western Power AA5 Issues Paper: Target Revenue and Price Control,* April 2022, pp. 33-35.

- Synergy disagreed with Western Power's view that its proposed approach for estimating the cost of debt in AA5 was used by all other Australian regulators. Synergy understood that the Office of the Tasmanian Economic Regulator, for example, used an approach that was an average of on-the-day and an historical average, weighted towards the present, for the entire cost of debt.

- Western Power's proposal to use a cost of debt calculated each year rather than for a five year period, meant that revenue adjustments would be subject to greater variability in each year of the access arrangement. When compared to the current assumption that hedging was used to lock in a risk-free rate over the regulatory period, Western Power's proposed method would make it more difficult to assess the variance between the expected and actual target revenue over AA5. Therefore, Western Power's proposed method was inconsistent with the price control objective defined under section 6.4(c) of the Access Code.

WACOSS considered that the current hybrid trailing average approach remained appropriate. WACOSS did not support Western Power's proposed 10 year trailing average approach for the following reasons:[38]

- WACOSS did not consider that Western Power presented sufficient justification for departing from the ERA's current approach.

- It was not apparent that the proposal would be in the long-term interests of consumers and instead might overstate the cost of debt.

- As stated in the Consumer Reference Group submission for the ERA's 2022 Gas Rate of Return Instrument Review, the hybrid trailing average approach:

  - Recognised that, in practice, not all debt was refinanced on a single day.

  - Recognised the role of current risk free rates in the period immediately before the regulatory decision for the particular regulatory period in providing efficient investment signals.

  - Satisfied the NPV=0 condition.

The WA Expert Consumer Panel noted that the Western Power's proposed method may be more consistent with its actual debt structure, and that the effect of higher rates at present could result in lower rates in the future. Specifically:[39]

- The WA Expert Consumer Panel requested that the ERA examine whether moving to a calculation that more closely mirrors Western Power's debt structure and whether a 10 year trailing average would better serve consumers' long-term interests.

- While there are concerns that the method results in a higher rate of return at present, the ERA should consider whether this method will 'lock in' the most recent period of low interest rate as we move forward.

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[38] The Western Australian Council of Social Service, *Submission to Western Power AA5 Issues Paper,* April 2022, p. 7.

[39] WA Expert Consumer Panel, *Submission to Western Power AA5 Issues Paper: Attachment 1,* May 2022, p. 16.

7.3   ERA draft decision

7.3.1   *Method for estimating the return on debt*

The ERA has considered the method for estimating the return on debt for Western Power's AA5. The ERA does not approve Western Power's proposed method for estimating the return on debt and maintains the hybrid trailing average approach to estimate the return on debt as this promotes regulatory certainty within the regulatory period and better meets the requirements of the Access Code.

The ERA recognises that significant changes to debt markets have occurred since 2021 and this will mean that debt costs will be higher than those included in Western Power's proposed AA5. The size of the increases in debt costs, and how they are recovered over time, is affected by the method used to estimate the return on debt.

The ERA has considered the following approaches on the return on debt:

- A full trailing average for the total cost of debt, with annual updating (as proposed by Western Power).

- The hybrid trailing average approach for estimating the debt risk premium, with annual updating (the approach used in AA4 and current ERA approach as contained in the 2018 Rate of Return Guidelines).

The ERA welcomes stakeholder feedback on the method for estimating the return on debt. The ERA will consider this feedback when finalising its position on its return on debt estimation approach for the Western Power AA5 final decision.

Consistent with the price control objectives in section 6.4 of the Access Code, the ERA considers that the service provider should be provided with a reasonable opportunity to recover at least the efficient costs that the service provider incurs. The ERA considers that the NPV=0 principle also helps ensure that investors are compensated at a level that encourages efficient investment, so that the present value of the future stream of expected cash flows of a firm is equal to the regulated asset base.

To consider the different approaches of estimating return on debt it is necessary to also consider how the financial risks of debt financing are addressed including:

- Interest rate risk – the risk of differences arising between the allowed return on debt costs and the actual cost of debt. Interest rate risk can be managed using interest rate swap contracts.

- Refinancing risk – the risk of rolling over debt and the cost of debt at the time of issuing new debt. Refinancing risk can be managed by having multiple sources of debt, issuing longer term debt and staggering debt over different periods.

The ERA's consideration of the two different methods of estimating the return on debt are detailed below.

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7.3.1.1   Full trailing average approach

A full trailing average approach measures the return on debt as a trailing average of the total cost of debt. Generally, this approach applies a 10 year term of debt and a simple weight of 10 per cent for each year of the trailing average. This assumes that all debt is contracted for 10 years and 10 per cent of the total debt portfolio is refinanced each year. Under this approach, all debt is issued at a fixed rate.

The strengths of a full trailing average approach include:

- It recognises that most capital is sunk.

- It reflects a general infrastructure asset approach, where long-term fixed debt is issued and is regularly refinanced.

- It is effective in addressing refinancing risk. This assumes that the weights for the trailing average are reasonable estimates for what the benchmark entity employs and the assumed 10 year term of debt actually applies.

- It is more consistent with how regulated firms refinance their debt in practice.

- It achieves the NPV=0 principle, as it can be implementable so that debt costs are able to match the debt allowance included in regulated revenues.

- It reduces volatility of the cost of debt and the resulting volatility for regulated services. This is possible due to the smoothing effect of the 10 year trailing average.

- It can take account of extreme events that affect both the risk free rate and the debt risk premium. The smoothing effect spreads any volatile result over time.

- It minimises price volatility at the start of an access arrangement.

- It is simpler than the hybrid trailing average approach and has no requirement for incorporating hedging costs into the total debt portfolio.

- It is used by other regulators across Australia.

The weaknesses of a full trailing average approach include:

- It does not incorporate a forward looking efficient component, as a trailing average of the total cost of debt only reflects past debt costs.

- It may deliver higher costs of debt to regulated entities as firms may exploit the typical upward sloping yield curve to issue debt at lower cost. This is achieved by issuing debt at shorter maturities than the assumed 10 year tenor.

- Compared to other debt approaches, it leads to the greatest volatility of the cost of debt within an access arrangement period, including the greatest difference between forecast cost of debt and actual cost of debt in the last year of an access arrangement.

- It introduces complexity through annual updating.

- It does not reflect the variable nature of Western Power's debt portfolio.

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7.3.1.2   Hybrid trailing average approach

The hybrid trailing average approach combines elements from the on-the-day and the full trailing average approaches. Under the hybrid trailing average approach for estimating the return on debt:

- The benchmark entity enters into the assumed benchmark efficient debt strategy, assumed to be a portfolio of 10 year fixed-rate debt with 10 per cent refinanced each year (the same debt portfolio as the full trailing average approach).

- The benchmark entity uses derivative arrangements to adjust rates from the efficient debt portfolio to lock in five year interest rate swaps rates, set on the day at the start of the regulatory period.

- The 10 year trailing average debt risk premium is updated annually.

The strengths of the hybrid trailing average approach include:

- It recognises that most capital is sunk, while accounting for the regulatory period.

- It incorporates a forward-looking efficient component into estimating the return on debt.

- It minimises price volatility within an access arrangement period.

- It achieves the NPV=0 principle, as it can be implementable so that debt costs are able to match the debt allowance included in regulated revenues.

- It reduces the ability of firms to exploit the slope of the yield curve.

- It reduces refinancing risk. Refinancing risk provides justification for adopting some form of trailing average method.

- Compared to a full trailing average approach, it better minimises interest rate risk by linking revenues to a five year risk free rate, which is reset at the end of the access arrangement period.

- It avoids the effect of recovering current low (or high) interest rates in the next regulatory period.

- It better reflects the variable nature of Western Power's debt portfolio.

The weaknesses of the hybrid trailing average approach include:

- It can increase variability between access arrangement periods.

- Compared to a full trailing average approach, it creates greater variability at the start of an access arrangement. It can produce high volatility in environments when there are large swings in interest rates.

- It is not applicable to an unregulated entity in a competitive environment.

- It introduces complexity through annual updating.

- It imposes additional hedging costs on top of a benchmark efficient debt strategy.

Since 2015, the ERA has applied the hybrid trailing average approach for estimating the return on debt for all Western Australia's regulated gas pipelines and Western Power through access arrangement determinations.[40]

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[40]   ERA, *Final Decision on Proposed Revisions to the Access Arrangement for the Western Power Network – Appendix 5 Return on Regulated Capital Base*, September 2018, p. 66.

7.3.1.3   Western Power's debt management

Western Power stated in its proposal that the full trailing average approach best reflects its own (prudent and efficient) approach to managing its debt portfolio.[41]

WA Expert Consumer Panel's submission queried whether the full trailing average approach would better reflect Western Power's debt structure and serve the long-term interests of consumers.[42]

The ERA considers that the efficient benchmark entity does not need to reflect the actual financial practice of a service provider. Instead, the benchmark efficient entity should reflect an attainable and efficient means of financing to deliver the reference services. This provides an incentive for the firm to move towards efficient benchmark financing.

If regulated allowances provided the actual costs of the firm, a firm would not be incentivised to become efficient.

An implication of adopting the efficient benchmark entity is that the actual decisions of a service provider may differ (and often will differ) from the benchmark entity. However, under incentive regulation the regulator does not compensate the regulated service provider for its actual decisions but compensates it as if it were operating efficiently.

The ERA has reviewed Western Power's debt management approach and found:

- Western Power's borrowings are all provided by the Western Australian Treasury Corporation (WATC).[43]

- WATC charges government-owned corporations a loan guarantee fee above the rate the State can borrow at.

- Western Power targets a debt portfolio duration that aligns with a 10 year trailing average. That is, a debt portfolio that has rolling debt maturities.

- Approximately a third of Western Power's debt portfolio consists of floating rate borrowings.[44] Not all of Western Power's debt is fixed and it has some exposure to changing interest rates.

The ERA notes that the 10 year trailing average approach is delivered through issuing fixed rate 10 year bonds, with the cost of debt being a simple weight of 10 per cent for each year of the trailing average. This assumes that all debt is contracted for 10 years and 10 per cent of the total debt portfolio is refinanced each year through fixed rate bonds.

While Western Power appears to deliver a rolling portfolio of debt that aligns with a 10 year trailing average, Western Power does not solely issue fixed rate bonds and has approximately a third of its debt portfolio as floating rate.

Based on Western Power's debt management approach and borrowing arrangements, the ERA considers the hybrid trailing average approach to estimating the return on debt more closely aligns with Western Power's debt management approach.

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[41]   Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 235.

[42]   WA Expert Consumer Panel, *Submission to Western Power AA5 Issues Paper: Attachment 1,* May 2022, p. 16.

[43]   Western Power, *Annual Report 2021*, p. 90.

[44]   Western Power, *Annual Report 2021*, pp. 86, 88.

7.3.1.4   Changes to market conditions

The ERA notes that Western Power developed its AA5 proposal in a low interest rate environment. Western Power's proposal used June 2021 values as a placeholder. Based on conditions in June 2021, the hybrid trailing average approach produced lower debt costs than the full trailing average approach.

Market conditions have changed significantly since the AA5 proposal was developed.

Figure 1 illustrates the two cost of debt approaches and how conditions have changed since Western Power developed its AA5 proposal.

Figure 1:   AA5 nominal cost of debt comparison*
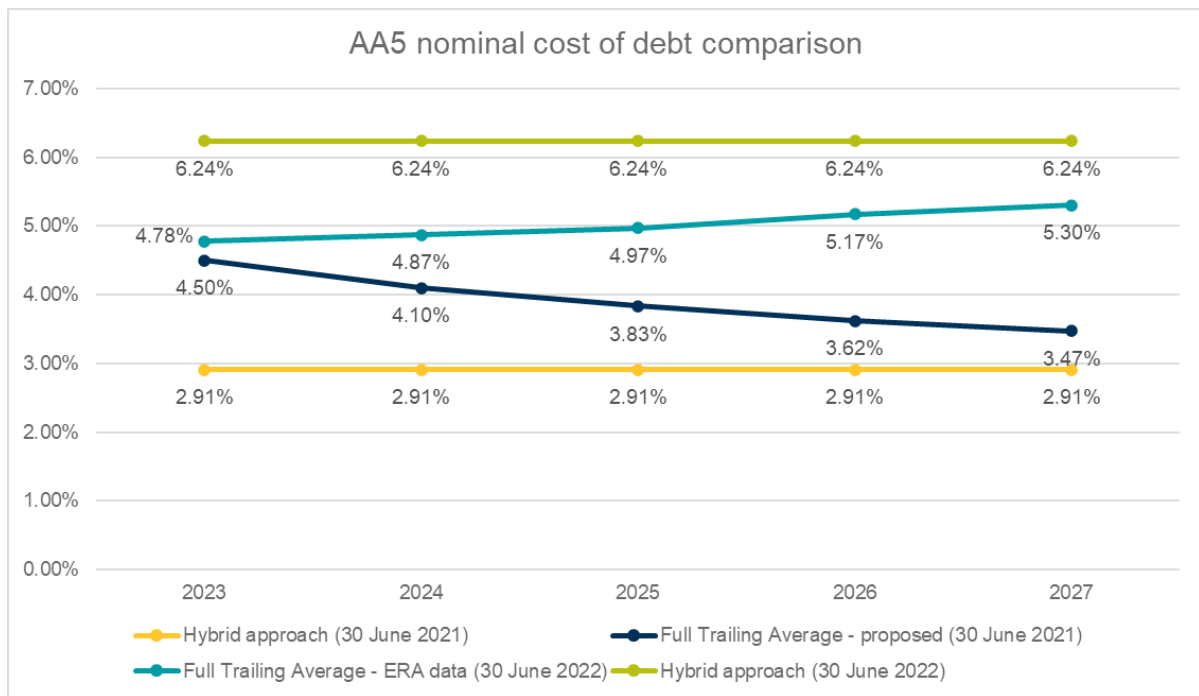
*   *Cost of debt estimates for the 20 trading day period.*

Figure 1 shows that the cost of debt estimates under either return on debt method has increased significantly since 30 June 2021.

Given its variable and forward-looking risk free rate, the cost of debt estimates under the hybrid trailing average approach has increased most significantly compared to the full trailing average approach.

However, the full trailing average approach produces costs of debt that increases over time as the present higher debt costs are reflected in the 10 year trailing average.

The ERA notes that as the full trailing average approach gets updated annually to reflect all changes for actual debt costs, the debt amounts that are incorporated in revenues could change significantly over time from the estimate for period to 30 June 2022 (see the teal line from the Figure 1). This will result in increased price variability over time.

Under a full trailing average approach, current high debt costs will have an ongoing effect on the next regulatory period in Western Power's AA6.

7.3.1.5   Maintaining the hybrid trailing average approach

Western Power's AA5 proposal to change to a 10 year full trailing average debt approach contrasts with its AA4 proposal. Western Power had previously supported the hybrid trailing average approach to estimate the cost of debt based on the reasons below: [45]

- There was broad consensus among regulators and network businesses that the trailing average or the hybrid trailing average approach was preferrable as it reflected replicable and efficient debt management practices.

- The full trailing average approach reflected Western Power's debt portfolio more closely than the hybrid approach, but its application would significantly increase Western Power's revenue requirement over the AA4 period.

In addition, Western Power's AA4 proposal considered that the hybrid trailing average approach satisfied the Code Objective for the following reasons:[46]

- It was replicable and allowed a network, where efficient to do so, to hedge the risk free rate at the start of the regulatory period.

- It reflected the fact the debt risk premium component cannot be hedged and must be based on a historical trailing average.

- It promoted economically efficient investment in and operation and use of the network in order to promote competition in upstream and downstream markets.

- It provided Western Power with an opportunity to recover efficient costs, including a return commensurate with the commercial risks involved.

Dr Martin Lally provided new advice on return on debt approaches as part of the review of the 2018 Rate of Return Guidelines.[47] Dr Lally's advice included the following:

- With respect to the cost of debt, the appropriate debt term is dependent on the form of the return on debt. The different forms for established firms include the trailing average and hybrid approaches, and for a new firm it could be something different that is more reflective of on-the-day rates. The NPV=0 principle requires that the allowed cost of debt matches that incurred by the benchmark efficient firm.[48]

- Both the full trailing average approach and hybrid trailing average approach satisfy the NPV=0 principle, as both approaches allowed firms to align their borrowing arrangements with the regulatory allowance.[49]

- With respect to the hybrid trailing average approach, the appropriate term for the allowed debt risk premium would be historical and equal to the term for which the benchmark efficient entity borrows, while the appropriate term for the allowed risk free rate within the cost of debt would be the future term of the regulatory period.[50]

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[45]   Western Power, *Access Arrangement Information: Access Arrangement revisions for the fourth access arrangement period*, 2 October 2017, pp. 202-203.

[46]   Western Power, *Access Arrangement Information: Access Arrangement revisions for the fourth access arrangement period*, 2 October 2017, pp. 202-203.

[47]   Dr Lally, M., *The appropriate term for the allowed cost of capital*, April 2021.

[48]   Dr Lally, M., *The appropriate term for the allowed cost of capital*, April 2021, p. 53.

[49]   Dr Lally, M., *The appropriate term for the allowed cost of capital*, April 2021, p. 53.

[50]   Dr Lally, M., *The appropriate term for the allowed cost of capital*, April 2021, p. 40.

The ERA notes that a number of other regulated energy network businesses have supported the ERA's approach in the 2018 Rate of Return Guidelines to use the hybrid trailing average approach for debt and one stakeholder, the Australian Gas Infrastructure Group considers it is an approach which can be replicated adequately to match regulated revenues.[51]

The ERA notes that stakeholder submissions to the ERA's issues paper supported maintaining the hybrid trailing average approach and argued that the approach better delivered on the requirements of the Access Code.[52,53,54,55]

The ERA considers that the hybrid trailing average approach is efficient and implementable, and has the benefit of incorporating forward-looking rates. In addition, the current hybrid trailing average approach better reflects the variable nature of Western Power's debt portfolio.

The hybrid trailing average approach does provide efficient signals as it incorporates an efficient forward-looking component into debt costs. While the ERA recognises the current market conditions have increased debt financing costs, recognising these costs in a forward-looking way provides efficient economic signals.

The ERA notes that under the hybrid trailing average approach, the variability of the forward-looking risk free rate has increased the cost of debt estimate at the start of the AA5 period. This compares to the cost of debt estimation under the full trailing average approach which increases over time as the higher debt costs are reflected in the 10 year trailing average, with 10 per cent of debt being refinanced each year.

As the full trailing average cost of debt gets updated annually to reflect changes for actual debt costs, this creates more volatility within an access arrangement period, particularly at the end of the period. As there is naturally a lag with the cost of debt estimated under the full trailing average approach, it may lead to a higher cost of debt compared to the hybrid trailing average approach, in the event that market conditions stabilise in the AA6 period.

The ERA considers that the hybrid trailing average approach is an efficient and implementable debt strategy for a long-term asset. The ERA considers that the use of derivative arrangements to adjust rates to lock in a five year bill swap at the start of the access arrangement period appropriately aligns the cost of debt in the regulatory context.

The ERA considers that the hybrid trailing average approach to estimating return on debt best approximates the NPV=0 principle while also recognising interest rate risk, refinancing risk and the staggered nature of debt portfolios.

The ERA notes that while the hybrid trailing average approach may be more variable at the commencement of an access arrangement period, this reflects the movement of efficient forward-looking costs at that time.

The ERA considers maintaining the current hybrid trailing average approach to estimating the return on debt would promote regulatory certainty within the regulatory period and better meet the requirements in section 6.4 of the Access Code.

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[51]   ERA, *Explanatory statement for the 2022 draft gas rate of return instrument,* June 2022, p. 52.

[52]   Australian Energy Council, *Submission to Western Power AA5 Issues Paper,* April 2022, p. 9.

[53]   Alinta Energy, *Submission to Western Power AA5 Issues Paper,* April 2022, pp. 3-4.

[54]   Synergy, *Submission to Western Power AA5 Issues Paper: Target Revenue and Price Control,* April 2022, pp. 33-35.

[55]   The Western Australian Council of Social Service, *Submission to Western Power AA5 Issues Paper,* April 2022, p. 7.

The ERA does not approve Western Power's proposed revised approach to estimate the return on debt and requires the current hybrid trailing average approach to estimating the return on debt to be used.

The ERA recognises that both the current hybrid trailing average and proposed trailing average approaches to the cost of debt have pros and cons. With the current rapid tightening in financial conditions, the ERA is interested in stakeholder views on:

- supporting possibly higher, but relatively certain, debt costs over the AA5 period as afforded by the current hybrid trailing average approach

- supporting possibly lower, but more uncertain, debt costs over the AA5 period (with the higher costs carried over to AA6) as afforded by the proposed trailing average approach.

The ERA considers that regulatory certainty is not supported if a return on debt approach is selected contingent upon market conditions. Furthermore, it may not be in consumers' long-term interests for an entity to pick and choose the debt approach based on market conditions. In the long-term, changing debt approaches that depend on financial conditions would likely lead to under or over-compensation of the service provider and be inconsistent with the objective of an efficient rate of return over the life of the asset.

7.3.2 Return on debt components

The estimate of the return on debt under the hybrid trailing average approach will comprise a risk premium above the risk free rate, plus an additional margin for administrative and hedging costs:

$$Return\ on\ debt = Risk\ free\ rate\ + Debt\ risk\ premium\ + Debt\ raising\ costs\ + Hedging\ costs$$

Equation 2

The risk free rate is the rate of return of a hypothetical investment with no risk of financial loss, over a given period of time.

The debt risk premium is the margin above the risk free rate of return required to compensate holders of debt securities for the risk in providing debt finance. The debt risk premium is compensation for investors who tolerate the extra risk, compared to that of a risk free asset.

Debt raising and hedging costs are the administrative costs and other charges incurred by businesses in raising and hedging finance.

The individual debt components are further discussed below.

7.3.3 Debt risk free rate

The risk free rate is the return an investor would expect when investing in an asset with no risk.

The risk free rate is the rate of return an investor receives from holding an asset with a guaranteed payment stream (that is, where there is no risk of default). Since there is no likelihood of default, the return on risk free assets compensates investors for the time value of money.

Consistent with the hybrid trailing average approach, the ERA considers the prevailing five year interest rate swaps should be used to determine the risk free rate to estimate the return on debt.

The interest rate swap rate is referred to as the base rate in the return on debt calculation. It incorporates a spread to the rate of Commonwealth Government Security bonds and is available at specified terms from data providers such as Bloomberg.

The rationale for using a swap rate is that it is difficult to hedge government bonds and the swap rate is easier to hedge.

For the purpose of determining the return on debt, the use of interbank swap rate is also more convenient for businesses and regulators. Use of the swap rate further simplifies the calculation of the debt risk premium.

Historically, the ERA has adopted a five year interest rate swap rate for its energy network regulatory determinations.[56,57]

The ERA considers that the use of the interest rate swap rate:

- Provides a strong means to hedge and manage risk.
- Simplifies the calculation of the debt risk premium.
- Produces a closer match between the allowed cost of debt and the cost actually incurred by the firm.

The ERA considers that maintaining the use of the interest rate swap rate for the risk free rate to estimate the return on debt best achieves an efficient forward-looking rate of return in the long-term interests of consumers.

Consistent with the hybrid trailing average debt approach, the ERA considers the prevailing five year interest rate swaps for the risk free rate should be used in estimating the return on debt. The ERA will determine the interest rate swap rate at the start of a regulatory access arrangement period. The estimate will be fixed for the duration of the access arrangement period.

For estimating the risk free rate in the return on debt, the ERA considers the five year swap mid-rate, as published on Bloomberg (Last Price), over the relevant averaging period is the most appropriate measure.

For this draft decision, the ERA has applied a risk free rate of 4.07 per cent for the 20-day averaging period to 30 June 2022, as a placeholder to determine the return on debt. This rate is an indicative value only, and it will be updated in the final decision for an appropriate final averaging period closer to the date of the final decision.

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[56]   ERA, *Final Rate of Return Guidelines (2018)*, December 2018, p. 20.

[57]   ERA, *Final Decision on Proposed Revisions to the Access Arrangement for the Western Power Network – Appendix 5 Return on Regulated Capital Base*, September 2018, p. 66.

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7.3.4   Term for debt

To estimate a return on debt, a regulator needs to set a benchmark term for debt.

It is standard Australian regulatory practice to use a 10 year term for debt. [58,59,60,61,62,63,64]

The ERA recently considered the term for debt as part of its review of the 2018 Rate of Return Guidelines and currently considers that a 10 year term for debt aligns with the term generally used by energy network businesses.[65]

The ERA also reviewed Western Power's debt strategy and found that this aligned with a 10 year term for debt.

The ERA considers that Western Power's proposal to maintain the term of debt as 10 years is appropriate.

For this draft decision, the ERA has applied a benchmark efficient debt strategy as a portfolio of 10 year fixed-rate debt with 10 per cent refinanced each year to determine the return on debt.

7.3.5   Benchmark credit rating

The benchmark credit rating is an input required to estimate the debt risk premium.

The credit rating is defined as the forward-looking opinion provided by a ratings agency of an entity's credit risk. Credit ratings provide a broad classification of a firm's probability of defaulting on its debt obligations. Therefore, credit ratings represent the risk present in holding a debt instrument.

Credit ratings provide a broadly uniform measure of default risk. Firms with the same credit rating at a particular point in time should have similar levels of default risk.

To estimate the efficient benchmark entity's credit rating, the ERA uses a median credit rating approach. Under this approach, a benchmark sample of comparator firms must be constructed.

The ERA has considered the benchmark credit rating to be used as an input to estimate the debt risk premium as part of its review of the 2018 Rate of Return Guidelines and currently considers that a BBB+ credit rating remains appropriate.[66] As part of the review, other regulators' decisions were considered by the ERA including the AER's draft 2022 rate of return instrument which proposes a benchmark credit rating of BBB+.[67]

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[58]   ESCOSA, *SA Water Regulatory Determination 2016, Final Determination*, June 2016, p. 122.

[59]   IPART, *Review of our WACC Method, Final Report*, February 2018, p. 25.

[60]   ERA, *Final Rate of Return Guidelines (2018)*, December 2018, p. 17*.*

[61]   ESC, *Western Water Determination 1July 2020 – 30 June 2023*, 10 June 2020, p. 29.

[62]   AER, *Overall Rate of Return, Equity and Debt Omnibus: Final working paper*, December 2021, p. 87.

[63]   QCA, *Final Report: Rate of Return Review*, November 2021, p. 39.

[64]   OTTER, *Investigation into TasWater's Prices and Services for the Period 1 July 2022 to 30 June 2026 Draft Report*, February 2022, p. 70.

[65]   ERA, *Explanatory statement for the 2022 draft gas rate of return instrument*, June 2022, pp. 63-66.

[66]   ERA, *Explanatory statement for the 2022 draft gas rate of return instrument*, June 2022, pp. 68-71.

[67]   AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, p. 216.

The ERA considers that Western Power's proposal to maintain a benchmark credit rating of BBB+ is appropriate.

For this draft decision, the ERA has applied a benchmark credit rating of BBB+ to determine the return on debt.

7.3.5.1   State government ownership

Change Energy submitted that the WACC should recognise Western Power's status as a monopoly State-owned entity with minimal risk. The submission suggests that this fact results in a lower commercial risk profile and access to lower borrowing costs.[68]

The ERA does not consider that it is appropriate to recognise Western Power's State government ownership for the purpose of estimating the cost of capital for the reasons set out below.

The Western Australian State Government's credit rating reflects its ability to raise revenue from taxpayers. The ERA considers Western Power's return on capital should reflect the level of risk inherent in its operations. The difference in the return on debt to the Western Australian Government and Western Power acts as a premium on credit insurance for taxpayers in the event that there is a Western Power default. Eliminating this premium through providing debt to Western Power at the Western Australian Government's credit rating leaves taxpayers uncompensated against the risk of a default.

Western Power's return on capital should not be lowered to reflect the benefit of Western Australian Government ownership and should instead be commensurate with the risks Western Power would face without such ownership. To ensure competitive neutrality and reflect risk more appropriately, the Western Australian Government charges government-owned corporations a loan guarantee fee over and above the rate that the State can borrow at.

A credit rating that is inconsistent with efficient market outcomes distorts investment decisions in upstream and downstream markets as investment decisions made in those markets would be based on artificially low or high prices stemming from an artificial credit rating and lead to inefficient investment.

A credit rating that is inconsistent with efficient market outcomes also creates the potential for the network service provider to undertake inefficient levels of capital investment; i.e. over-investment if the rating is too low.

The WACC must accurately reflect the level of risk embodied in the network service provider's operations to constrain the potential for inefficient investment. Therefore, regulators across Australia that regulate energy networks owned by state governments determine rates of return, independent of that ownership.

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[68]   Change Energy, *Submission to Western Power AA5 Issues Paper,* April 2022, p. 6.

7.3.6   Debt risk premium

The debt risk premium is the return above the risk free rate that lenders require to compensate them for the risk of providing debt funding to a benchmark business. The debt risk premium compensates holders of debt securities for the possibility of default by the issuer.

Consistent with the hybrid trailing average debt approach and a benchmark efficient debt strategy, the ERA's approach in the 2018 Rate of Return Guidelines uses a 10 year term to estimate the debt risk premium.

The ERA considers the revised bond yield approach should be used to determine the debt risk premium.

Estimating the debt risk premium involves the following steps:

- Step 1: Determining the benchmark sample
  Identifying a sample of relevant domestic and international corporate bonds that reflect the credit rating of the benchmark efficient entity.

- Step 2: Collecting data and converting yields to Australian dollar equivalents
  Converting the bond yields from the sample into hedged Australian dollar equivalent yields inclusive of Australian swap rates.

- Step 3: Averaging yields over the averaging period
  Calculating an average AUD equivalent bond yield for each bond across the averaging period.

- Step 4: Estimating curves
  Estimating yield curves on this data by applying the Gaussian Kernel, Nelson-Siegel and Nelson-Siegel-Svensson techniques.

- Step 5: Estimating the cost of debt
  Calculating the simple average of the three yield curves' 10 year costs of debt to arrive at a market estimate of the 10 year cost of debt.

- Step 6: Calculating the debt risk premium
  Calculating the debt risk premium by subtracting the 10 year interest rate swap rate from the 10 year cost of debt.

These steps determine the debt risk premium at a point in time, being the date of calculation.

The ERA publishes debt risk premium process documents and accompanying tools for stakeholders on the revised bond yield approach. These documents and tools provide technical steps and details necessary for stakeholders to estimate the debt risk premium.[69]

To determine the debt risk premium that should be used to calculate the return on debt, the ERA constructed a 10 year trailing average debt risk premium. This consists of a debt risk premium for the current year and a debt risk premium for each of the nine prior years.

The debt risk premium is then calculated for each year in the 10 year term, to work out an average value to be applied for AA5.

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[69]   Technical documents and tools to estimate the ERA's revised bond yield approach can be found on the ERA's website.

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Table 3 details the ERA's estimated trailing average debt risk premium for this draft decision.

Table 3:   ERA draft decision estimated trailing average debt risk premium for AA5

Year	Debt risk premium (%)
2013/14	2.768
2014/15	2.634
2015/16	1.640
2016/17	2.352
2017/18	1.656
2018/19	1.241
2019/20	1.724
2020/21	1.497
2021/22	1.219
2022/23	2.103*
Trailing average debt risk premium	**1.883**

Debt risk premium estimate for 20-day averaging period to 29 June 2022, is a placeholder only.

Source: ERA analysis; ERA, Final decision on proposed revisions to the Access Arrangement for the Western Power Network – Appendix 5: Return on Regulated Capital Base, 20 September 2018, p. 76.

The historical annual debt risk premium estimates that applied in AA4 in Table 3 are unchanged for AA5. The debt risk premium for the 2022/23 financial year was updated for the 20-day averaging period to 29 June 2022, as a placeholder.

For this draft decision, the ERA considers a debt risk premium of 1.883 per cent for 2022/23 (the first year of AA5) as a placeholder only, based on the 20-day averaging period to 29 June 2022. This rate is an indicative value only, and it will be updated in the final decision for an appropriate final averaging period closer to the date of the final decision.

8. Debt raising and hedging costs

Debt raising and hedging costs are the administrative costs and other charges incurred by businesses when obtaining and hedging debt financing.

Historically the ERA has allowed these costs to be included as part of the return on debt.

8.1 Western Power's proposal

Western Power has proposed debt issuing costs of 10 basis points per annum, consistent with the costs applied in AA4 and the ERA's 2018 Rate of Return Guidelines.[70]

The alternative debt approach in Western Power's proposal did not require debt hedging costs, and therefore Western Power did not propose an allowance for debt hedging costs.[71]

8.2 Public submissions

No submissions to the issues paper included comments on debt raising and hedging costs.

8.3 ERA draft decision

For this draft decision, the ERA has applied:

- debt raising costs of 0.165 per cent per annum
- debt hedging costs of 0.123 per cent per annum.

8.4 Debt raising costs

Regulators across Australia have typically included allowances to account for the costs of obtaining finance (debt raising) in their regulatory decisions. Regulators take different approaches to the recovery of these financing costs through either the rate of return, operating expenditure or the capitalisation of these costs.

Many Australian regulators use benchmark estimates to determine debt-raising costs to derive an estimate of the cost of obtaining finance that reflects the costs that would be incurred by a well-managed efficient benchmark entity operating in a competitive market.

The ERA considers that the recovery of debt-raising costs through the rate of return should only include the direct cost components recommended by the Allen Consulting Group in its 2004 report to the ACCC.[72] The approach set out in this report has largely been adopted by Australian regulators.

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[70] Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 235.

[71] Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 235.

[72] The Allen Consulting Group, *Debt and Equity Raising Transaction Costs: Final Report*, December 2004.

The ERA considers that direct debt-raising costs can be recompensed in proportion to the average annual issuance, and cover:

- Gross underwriting fees: This includes management fees, selling fees, arranger fees and the cost of an underwriter for the debt.

- Legal and roadshow fees: This includes fees for legal documentation and fees involved in creating and marketing a prospectus.

- Company credit rating fees: A credit rating is generally required for the issue of a debt raising instrument. A company is charged annually by the credit rating agency for the services of providing a credit rating.

- Issue credit rating fees: A separate credit rating is obtained for each debt issue.

- Registry fees: The maintenance of the bond register.

- Paying fees: Payment of a coupon and principal to the security holder on behalf of the issuer.

The ERA does not consider indirect debt-raising costs should be included and considers that they cannot be compensated or recovered.

The ERA and other comparable Australian regulators have adopted estimates of debt raising costs ranging from 8.0 to 15.0 basis points per annum in previous regulatory decisions (see Table 4).

Table 4:   Debt raising costs in Australian regulatory decisions

Regulator	Year	Allowance (bppa)
ESCOSA[73]	2016	12.5
IPART[74]	2018	12.5
ERA[75]	2018	10.0
AER[76]	2021	8.2
ESC[77]	2021	15.0
QCA[78]	2021	10.0
OTTER[79, 80]	2022	8.0

Source: ERA analysis

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[73]   ESCOSA, *SA Water Regulatory Determination 2016, Final Determination*, June 2016, p. 122.

[74]   IPART, *Review of our WACC Method, Final Report*, February 2018, p. 24.

[75]   ERA, *2018 Final Rate of Return Guidelines*, December 2021, p. 35.

[76]   AER, *Final Decision: Jemena Distribution Determination 2021-2026 Attachment 3 Rate of Return*, April 2021, p. 10.

[77]   ESC, *2023 Water Price Review: Guidance paper*, 26 October 2021, p. 40.

[78]   QCA, *Final Report – Rate of Return Review*, November 2021, p. 51.

[79]   OTTER, *Investigation into TasWater's Prices and Services for the Period 1 July 2022 to 30 June 2026 Draft Report*, February 2022, p. 67.

[80]   OTTER rate was informed by the AER's decisions on debt raising costs.

The ERA engaged Chairmont to review debt raising costs for a regulated benchmark energy network that operates efficiently as part of the ERA's review of the 2018 Rate of Return Guidelines.[81]

Chairmont found that the allowance for debt raising costs should be increased from 0.100 per cent to 0.155 per cent per annum. Chairmont considered that an increase was needed to reflect higher offshore issuance costs and the inclusion of costs for a second credit rating and annual surveillance.[82]

In considering the advice from Chairmont, the ERA also considered an alternative method to calculate an underwriter/arranger fee which had been proposed by CEG, an expert economic consultant.[83]

In considering debt raising costs, the ERA recognised the merits and limitations of each of the methods used by Chairmont and CEG in estimating the debt raising costs. These include that:

- CEG used market data from Bloomberg to estimate the arranger fee, both in its previous report to South Australia Power Networks and recent report to ATCO.

- Chairmont undertook informal interviews with several financial market intermediaries and service providers to assist with determining the debt raising costs.

In developing the Draft 2022 Rate of Return Instrument, the ERA considered that the Bloomberg analysis provides an additional source of public data on the arranger fee estimate that may help to supplement Chairmont's debt raising cost analysis. The ERA considered that the market data from Bloomberg indicates a higher arranger fee than the Chairmont estimate by approximately 2.6 basis points per annum. However, this estimate is based on a bond sample comprising a broad range of firms, credit ratings and industries. On this basis, the ERA currently considers that a notional increase of one basis point per annum on the arranger fee proposed by Chairmont is warranted for a benchmark debt raising cost allowance.[84]

In the Draft 2022 Rate of Return Instrument, the ERA has proposed an allowance of 0.165 per cent per annum for debt raising costs.[85]

For this draft decision, the ERA applied a debt raising cost allowance of 0.165 per cent per annum to determine the return on debt.

The debt raising cost allowance will be added to the return on debt.

8.5   Debt hedging costs

Interest rate swaps are derivative contracts, which typically exchange – or swap – fixed-rate interest payments for floating-rate interest payments. They provide a means to hedge and manage risk, but also have a cost.

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[81]   Chairmont consulting, *Debt Raising and Hedging Costs*, 21 December 2021.

[82]   Chairmont consulting, *Debt Raising and Hedging Costs*, 21 December 2021, p. 2.

[83]   ERA, *Explanatory statement for the 2022 draft gas rate of return instrument*, June 2022, p.185.

[84]   ERA, *Explanatory statement for the 2022 draft gas rate of return instrument*, June 2022, p. 187.

[85]   ERA, *Explanatory statement for the 2022 draft gas rate of return instrument*, June 2022, p. 182.

For this draft decision, the ERA applied the hybrid trailing average approach to estimate the cost of debt. Under this approach, the benchmark entity uses derivative arrangements to adjust rates from the efficient debt portfolio to lock in five year interest rate swaps rates, set on the day at the start of the access arrangement period.

The ERA engaged Chairmont to review debt hedging costs for a regulated benchmark energy network that operates efficiently as part of the ERA's review of the 2018 Rate of Return Guidelines. Chairmont proposed an increase of the debt-hedging cost allowance from 0.114 per cent to 0.123 per cent per annum. The higher estimate of hedging costs includes the addition of an allowance for the costs involved in negotiating an International Swaps Dealers Agreement (ISDA) as part of one-off operational expenses.[86]

In the Draft 2022 Rate of Return Instrument, the ERA has proposed an allowance of 0.123 per cent per annum for debt hedging costs was appropriate.[87]

For this draft decision, the ERA applied a debt hedging cost allowance of 0.123 per cent per annum to determine the return on debt.

The debt hedging cost allowance will be added to the return on debt.

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[86]   Chairmont Consulting, *Debt Raising and Hedging Costs*, 21 December 2021, p. 2.

[87]   ERA, *Explanatory statement for the 2022 draft gas rate of return instrument*, June 2022, p. 194.

9. Return on equity

The return on equity is the return that investors require from a firm to compensate them for the risk they take by investing their capital.

There are no readily observable proxies for the expected return on equity. While estimates of the cost of debt can be obtained by observing debt instruments, financial markets do not provide a directly observable proxy for the cost of equity, for either individual firms or for the market.

Estimating a forward-looking return on equity – sufficient to enable regulated firms to recoup their prevailing equity financing costs – requires the use of models.

The model most used by Australian regulators for quantifying the return on equity has been the Sharpe-Lintner Capital Asset Pricing Model (CAPM).

This section outlines the ERA's draft decision and reasoning on Western Power's proposed return on equity.

9.1 Western Power's proposal

Western Power proposed a departure from the approach used in AA4 for calculating the return on equity and the approach for estimating the return on equity in the 2018 Rate of Return Guidelines.

Western Power's proposal broadly maintains the approach for estimating the return on equity in the 2018 Rate of Return Guidelines.

However, Western Power proposed that for AA5 the term for estimating the return on equity should be changed from five to 10 years.[88]

In its advice to Western Power, Frontier Economics considered that a 10 year term for equity was supported for the following reasons:[89]

- The use of a 10 year term reflects the standard practice adopted by market investors, valuation professionals and academics.

- The net present value (NPV)=0 principle requires that the regulatory allowance is set to match the return that investors require – which is based on a 10 year term for equity.

- All other Australian regulators use a 10 year term for equity, matching the regulatory approach with the approach adopted by market investors.

Western Power considered Frontier Economics' analysis and found that there was no compelling basis for maintaining a five year risk free rate.

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[88] Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 232.

[89] Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 232.

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Western Power also noted that the ERA's final decision on the Pilbara networks rate of return adopted a 10 year term for estimating the return on equity.[90]

Therefore, Western Power proposed that the risk-free rate should be set on the basis of the yield on 10 year Commonwealth government bonds, as opposed to the AA4 approach of using a five year term for the risk-free rate.[91]

Western Power engaged Frontier Economics to review the market risk premium but proposed no change.

Western Power proposed to maintain an equity beta of 0.7. The proposed equity beta was consistent with Western Power's AA4 and the ERA's 2018 Rate of Return Guidelines.[92]

9.2   Public submissions

Three of the submissions to the ERA issues paper commented on the return on equity, specifically the proposed change in the term for estimating the return on equity.

These submissions supported the 'term matching approach' for estimating the return on equity as utilised for AA4 – that is a five year term consistent with the term of the access arrangement period. [93,94,95]

AEC considered that Western Power's proposed changes to a 10 year term would substantially increase its revenue from equity and supported the approach in the 2018 Rate of Return Guidelines using a five year term for equity. The AEC also noted the recent report by Dr Martin Lally supported its findings.[96]

Synergy considered that the ERA's five year term for equity approach best approximated the present value principle which sets the term for equity to match the length of the access arrangement period. Synergy submitted that the movement from the five to 10 year rate would potentially violate the present value principle. Synergy indicated its concern that Western Power's proposal might arbitrarily increase the assumed cost of capital which would inflate target revenue above costs and would be inconsistent with the Code Objective.[97]

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[90]   Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 232.

[91]   Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 232.

[92]   Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 232.

[93]   Australian Energy Council, *Submission to Western Power AA5 Issues Paper,* April 2022, p. 9.

[94]   Synergy, *Submission to Western Power AA5 Issues Paper: Target Revenue and Price Control,* April 2022, pp. 33-35.

[95]   The Western Australian Council of Social Service, *Submission to Western Power AA5 Issues Paper,* April 2022, pp. 7-8.

[96]   Australian Energy Council, *Submission to Western Power AA5 Issues Paper,* April 2022, p. 9.

[97]   Synergy, *Submission to Western Power AA5 Issues Paper: Target Revenue and Price Control,* April 2022, pp. 33-35.

WACOSS supported the five year term for estimating the return on equity approach for the following reasons: [98]

- WACOSS considered that Western Power's proposed 10 year term risk free rate for equity was not justified by the evidence provided.

- As stated in the Consumer Reference Group submission for the ERA's 2022 gas rate of return instrument review, with a five year regulatory cycle, prices are reset every five years and the relevant return on equity was the return on equity at the commencement of each regulatory period. The risk free rate and expected market risk premium at the time should reflect prevailing conditions expected over the five year timeframe.

- As outlined in the ERA's issues paper, Western Power's proposal on the risk free rate would increase the revenue for equity costs by approximately $215 million over the AA5 period. WACOSS considered that the approach in the 2018 Rate of Return Guidelines using a five year term for the risk free rate remained appropriate and served the long-term interests of consumers.

9.3 ERA draft decision

9.3.1 Term for equity

When determining a cost of equity, it is necessary to consider the term used for estimating the return on equity.

For AA4 a term for five years was used. At the time of publishing the AA4 final decision, the ERA viewed that setting the term for equity equal to the length of the access arrangement period best satisfied the NPV=0 principle, which was considered important for providing economically efficient investment signals.[99]

The term used for estimating the return on equity has been an ongoing matter of contention amongst regulators and regulated infrastructure providers. Different views exist, amongst stakeholders and between regulators, on the appropriate time horizon for estimating the return on equity.

The ERA has further considered the term for estimating the return on equity and the following approaches:

- A five year term based on the 'term matching approach', consistent with what applied in AA4 and the ERA's 2018 Rate of Return Guidelines.

- A long-term approach of 10 years, proposed by Western Power.

The ERA has also recently undertaken a detailed review of the term for estimating the return on equity as part of its review of the 2018 Rate of Return Guidelines. As part of the review the ERA has given further consideration to the term for equity in light of: [100]

- The new regulatory work on the term for the return on equity.

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[98] The Western Australian Council of Social Service, *Submission to Western Power AA5 Issues Paper,* April 2022, pp. 7-8.

[99] ERA, *Final Decision on Proposed Revisions to the Access Arrangement for the Western Power Network – Appendix 5 – Rate of Return,* September 2018, p. 12.

[100] ERA, *Explanatory statement for the 2022 draft gas rate of return instrument*, June 2022, pp. 92-99.

- Submissions received in response to the ERA's explanatory statement for the Draft 2022 Rate of Return Instrument.

- The AER's concurrent evidence sessions.

- New advice from Dr Lally commissioned by the ERA in response to submissions received for the review of the 2018 Rate of Return Guidelines.

As part of the review of the 2018 Rate of Return Guidelines, the ERA currently considers a change in its approach to the term for equity is warranted to ensure that the rate of return continues to deliver efficient forward-looking rates. In the Draft 2022 Rate of Return Instrument, the ERA has proposed the term for equity is changed from five years to 10 years. This change is proposed to align the assumed term for equity with common investor practice, where investors in long-lived assets consider cash flows over a long-time horizon exceeding the regulatory period. A 10 year term for equity still allows efficient rates of return and is consistent with private market practice.

Consistent with the Access Code, the ERA considers that the service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider requires. For this draft decision, the ERA accepts Western Power's proposed change to a 10 year term for equity to determine the rate of return.

The ERA's consideration of the term for equity is detailed below.

9.3.1.1   *Regulatory work*

In 2020, the AER conducted a review of the regulatory treatment of inflation and decided to match its estimate of expected inflation to the length of the relevant regulatory period.[101] The AER had previously been using a 10 year term for expected inflation.

Given the change to the term of expected inflation, the AER considered that it should review the term used in determining the rate of return to check whether its current approach remained appropriate.[102]

The AER engaged Dr Martin Lally as part of its review of the appropriate term for the rate of return.[103] Dr Lally's advice included the following:

- The valuation problem facing a regulator with a five year regulatory cycle is different from that of valuing an unregulated business.[104]

- The terms for the return of equity, return on debt and expected inflation do not need to align and these terms can be determined separately by applying the NPV=0 principle.[105]

- In respect of the cost of equity, the NPV=0 principle implies that the term must match the regulatory cycle. The valuation problem for a regulator is like that for a business terminating in five years' time, or a floating rate bond whose coupon rate is reset every five years.[106]

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[101]   AER, *Final Position: Regulatory Treatment of Inflation,* December 2020, p. 35.

[102]   AER, *Final Position: Regulatory Treatment of Inflation,* December 2020, p. 23.

[103]   Dr Lally, M., *The appropriate term for the allowed cost of capital*, April 2021.

[104]   Dr Lally, M., *The appropriate term for the allowed cost of capital*, April 2021, p. 21.

[105]   Dr Lally, M., *The appropriate term for the allowed cost of capital*, April 2021, pp. 3-4.

[106]   Dr Lally, M., *The appropriate term for the allowed cost of capital*, April 2021, p. 52.

In December 2021, the AER published an information paper that expressed an open position for the term for the return on equity as part of its concurrent evidence sessions in 2022.[107] In the paper, the AER:

- Adopted a preferred position that the terms for the return on equity, return on debt and expected inflation should be independently assessed. However, the AER noted that common principles underpin the choice of term in each case (in particular the NPV=0 principle) which may lead to the same term being applied.[108]

- Outlined that there are typically two choices for the term for the rate of return:

    - Match to the length of the regulatory periods (typically five years).

    - Match to the underlying asset lives (typically 10 years, reflecting long asset lives).

In November 2021 the Queensland Competition Authority (QCA) finalised its rate of return review. In this review the QCA considered that it was reasonable to use a term of 10 years for the return on equity. The QCA considered that this approach reflects the requirements of investors who, in relation to long-lived infrastructure assets, will deploy equity over the entire life of the asset, rather than over any given regulatory period.[109]

The QCA noted that it had changed from its previous term-matching approach:[110]

> In the last decade, we have estimated the risk-free rate using an interpolated term-matched bond term. However, in our most recent reviews, we have reverted to using a 10-year bond term, as we considered that it would better provide for an overall return that was commensurate with the commercial and regulatory risks associated with investment for the life of the asset.

9.3.1.2 Concurrent evidence sessions

One of the AER's concurrent evidence sessions specifically considered the term for equity.[111] These concurrent evidence sessions assembled experts on the rate of return and its components. These experts were tasked with considering how best to estimate the rate of return.

There was a consensus view among the experts that NPV=0 was the correct principle for determining the term for equity.

However, the experts' views on how best to achieve the NPV=0 condition for the return on equity diverged between two methods:

- The regulatory approach: The term for the return on equity should be set to the term of the regulatory period. Notably, this was the view advocated by Dr Lally. Dr Lally provided mathematical proofs as support for this view.[112]

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[107] AER, *Rate of Return Information Paper and Call for Submissions,* December 2021, pp. 16-17.

[108] See also AER, *Rate of Return – Term of the Rate of Return & Rate of Return and Cashflows in a Low Interest Rate Environment – Final Working Paper,* September 2021, pp. 43-44.

[109] Queensland Competition Authority, *Final report – Rate of return review,* November 2021, pp. 83-84.

[110] Queensland Competition Authority, *Final report – Rate of return review,* November 2021, p. 83.

[111] AER, *Rate of Return Instrument Concurrent Evidence Session 2 of 4*, February 2022.

[112] Dr Lally, M., *Notes for the Expert Sessions 10 February 2022: Term of the Rate of Return*, February 2022.

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- The competitive approach: The term for the rate of return should be set to provide NPV=0 over the life of the regulated asset, which would entail using the discount rate based on the longest feasible discount rate (the 10 year rate). The reasoning for this approach is that equity investors receive their cashflows over multiple regulatory periods and therefore a longer term rate is needed. The experts who advocated this view considered it is more closely aligned with capital budgeting and investment practice and therefore provides more efficient investment incentives relative to other investment opportunities with similar risk.

Experts noted that any change to the term for the risk free rate would have some offsetting effect on the market risk premium. That is, a move from a five year to a 10 year risk free rate would reduce the market risk premium.

9.3.1.3   Advice commissioned from Dr Lally

In their submissions to the ERA as part of the review of the 2018 Rate of Return Guidelines, energy network businesses were critical of Dr Lally's approach and advice on the term for equity. Energy networks submitted that:[113,114,115,116,117]

- Dr Lally's approach did not reflect the required returns of investors.

- There were critical flaws in Dr Lally's proof, in particular that investors assume that the market value of the network is equal to the regulated asset base at the end of regulatory periods and therefore investors do not need to consider longer-term cashflows.

- Dr Lally's comparison between the valuation of regulatory cash flows and the valuation of a floating rate bond whose coupon rate is reset every five years was inaccurate.

- A rate set below what an investor reasonably expected would result in a negative NPV outcome.

The ERA commissioned Dr Lally to review the appropriate term for the allowed cost of equity and review the submissions received by the ERA.[118]

Dr Lally continued to support the use of a five year term for equity and considered that it ensures that the NPV=0 principle is satisfied. Dr Lally considered that this was supported by his mathematical proofs. Dr Lally considered that the NPV=0 principle was the primary consideration for choosing the term for the cost of equity.[119]

Dr Lally considered that:[120]

- None of the critiques in the submissions received by the ERA contradicted his mathematical proof that term-matching satisfies the NPV=0 principle.

- No alternative proof was presented for a 10 year term for equity.

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[113]   Australian Gas Infrastructure Group, *Submission to Discussion Paper*, February 2022, pp. 11-15.

[114]   ATCO, *Submission to Discussion Paper*, February 2022, pp. 5-11.

[115]   Energy Networks Australia, *Submission to Discussion Paper*, February 2022, pp. 2-3.

[116]   Goldfields Gas Transmission Pty Ltd, *Submission to Discussion Paper*, February 2022, pp. 4-10.

[117]   Frontier Economics, *Considerations for the regulatory rate of return allowance,* December 2021, pp. 7-26.

[118]   Dr Lally, M., *The Appropriate Term for the Cost of Equity*, April 2022.

[119]   Dr Lally, M., *The Appropriate Term for the Cost of Equity*, pp. 4-16.

[120]   Dr Lally, M., *The Appropriate Term for the Cost of Equity*, April 2022, pp. 16-31.

9.3.1.4 10 year term for equity

In making this draft decision on the term for equity, the ERA considered the opposing stakeholder views in submissions received, the approach of other Australian regulators and the advice and opinion from experts as outlined in this section 9.

The ERA considers that the term for equity depends on what rate a regulator is setting:

- A regulatory rate: A rate that provides required returns according to regulatory settings and principles, and recognises resets for every regulatory or access arrangement period. Application of such a rate reflects one view of efficient costs under a resetting regulatory framework.

- A competitive market rate: A rate that provides the expected returns of equity investors according to market conditions and practices for infrastructure assets, which is generally a long-term rate with a term exceeding the length of the regulatory or access arrangement period. Application of such a rate reflects one view that regulated assets have long lives and investors are concerned with cashflows over the life of the asset. This rate also uses the longest term generally available (10 years) for a proxy that investors would use to discount cashflows.

The ERA recognises that it has historically set a regulatory rate for the term for equity when determining the return on equity and this has supported its past practice of term matching to the five year access arrangement period.

The ERA's historic position has been supported by Dr Lally's theoretical proof that term matching for the cost of equity best meets the NPV=0 principle.

Dr Lally in his most recent advice to the ERA has continued to rely on his theoretical proof to support his position for a five year term for equity in response to issues raised by stakeholders. Dr Lally's theoretical proof:

- Applies standard finance practice of setting the term of the discount rate equal to the period of cashflows being considered.

- Assumes that at the end of the regulatory access period (in the ERA's case five years) the asset market value is equal to the value of the regulated asset base (RAB).

- Assumes, therefore, that there is no need to consider future cashflows beyond the regulatory period because of the resetting nature of the regulatory periods.

- Sets regulatory revenues based on a five year term and then discounting over that five year term produces NPV=0.

- Details that setting regulatory revenues based on a 10 year term and then at the same time constraining the discount rate to five years achieves a positive NPV outcome.

The ERA has some concerns with the limitations of Dr Lally's theoretical proof for the term for equity. The ERA has also considered concerns raised by stakeholders in respect of Dr Lally's advice. In considering the term for equity the ERA recognises that investors' expectations may not align with Dr Lally's theoretical proof and the practical application of the proof breaks down. The ERA's concerns with Dr Lally's proof are:

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- Dr Lally's theorem cannot identify the expected rate of return that investors actually need. It identifies that NPV=0 is met when the allowed return incorporated into regulatory revenues is equal to the discount rate used by investors. However, this would support that an indeterminate number of allowed returns exist, from which the regulator must select the rate that it considers is the true discount rate used by investors.

  - For example, NPV=0 can be achieved by applying a high 10 per cent return on equity to regulatory revenues and then discounting by that same rate. Applying a low two per cent rate in the same manner also achieves NPV=0.

- Energy network investors hold these assets over multiple regulatory periods. Other regulators such as the QCA have noted that a longer-term perspective more likely reflects the requirements of investors who in relation to these infrastructure assets "deploy equity over the entire life of the asset, rather than over any given regulatory period".[121]

- Investors consider long-term cashflows when making decisions. Infrastructure assets in particular have higher duration, compared to non-infrastructure assets. Comparing the stream of cashflows and their relative value over time, it is reasonable to believe that infrastructure assets (and equity more generally as an infinitely lived asset) have the majority of their present values contained in the future, not the present. This longer duration implies that when considering valuations or budgeting, investors are likely to utilise longer term discount rates to better match the timing of distant cashflows.

- Dr Lally relies on the assumption of investor expectations of certainty that assets' market value will equal the RAB at the end of the regulatory period. However, equity investors are unlikely to assume that the market value of the network is equal to the regulated asset base at the end of a regulatory period.

- Unlike bonds, residual value is not returned in cash at the end of the period, but comprises a value whose recovery remains at risk from future regulatory decisions and changes in the market (both technological changes and changes to customer preferences). The market value of equity in the business is not certain to equal the equity's share of the ending RAB value at the end of the regulatory period, but will instead reflect the present value (at that time) of all expected future cashflows.

- The allowed return on equity is not provided as a series of cashflows during the regulatory period. Part of the return is provided to equity holders during the current regulatory period and the remainder is provided over the remaining life of the assets (future regulatory periods). Thus, the value of the firm always depends on the long-run expected future cash flows. This means:

  - Over an access arrangement period equity investors receive equity returns in the form of cash (residual cashflows) and non-cash returns (RAB escalation). The nature of regulatory revenues, and a post-tax revenue model that targets real rates of return, mean that equity investors receive both cash and non-cash returns over a regulatory period.

  - Cash returns received by equity investors are the proceeds from the real WACC minus the nominal cost of debt. These cash returns deliver equity investors with residual returns which are lower than the real return on equity. Non-cash returns are received in the form of an escalation of the RAB. Equity investors then recover the increased RAB over multiple regulatory periods.

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[121] Queensland Competition Authority, *Rate of return review: Final report*, November 2022, p. 83.

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- As equity investors do not sell the energy network at the end of each regulatory period, equity investors are only able to realise their expected returns over the long-run.

Consistent with standard finance practice the term of the discount rate for investors is equal to the period of the cashflows being considered. Therefore, if investors do consider cashflows over the long-term (or even beyond the regulatory period) they will discount those cashflows with a long-term discount rate. This means:

- If regulated revenues are set with reference to a 10 year term for equity and equity investors discount cashflows with a 10 year term this ensures that NPV=0 is maintained.

- However, if regulated revenues are set with reference to a five year term of equity and equity investors require a 10 year term, this will produce negative NPV outcomes.

The ERA has considered submissions regarding investor expectations from the Global Infrastructure Investor Association (GIIA) and Network Shareholders Group (NSG):

- GIAA stated that its investors in long-term regulated infrastructure assets use longer term rates due to the "long-lived nature of energy infrastructure assets and standard commercial practice".[122]

- NSG stated that equity investors value regulated businesses as the present value of cashflows over the long-term horizon. Equity investors do this because the regulatory framework sets out those cashflows over the life of the investment.[123]

- NSG rejected the notion that equity investors value their assets as five years of regulatory cashflows and the ending RAB. NSG submitted that there is no evidence that investors assume that the RAB is recovered at the end of the regulatory period. Further, NSG stated that all investors that they represent use a 10 year term when valuing their equity investments in regulated energy networks, with none using Dr Lally's valuation approach.[124]

The ERA notes that other Australian and international regulators have set a long-term rate when setting the return on equity seeking to match common market approaches for long-lived assets.

Having assessed both approaches, the ERA now considers that the weight of the evidence requires that it change its approach to match common market practice for long-lived assets and support a longer term market rate when determining the return on equity.

The ERA considers that a 10 year term for equity provides the following advantages:

- It recognises that efficient and prudent infrastructure companies require a long-term rate to reflect the long-term cashflows of their networks.

- It is consistent with standard practice adopted by market investors, valuation professionals, academics and practitioner textbooks.

- Recognises the reality of regulatory cashflows and returns being realised by equity investors over the life of the asset.

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[122] Global Infrastructure Investor Association, *Response to AER Final Omnibus Paper*, March 2022, pp. 2-3.

[123] Network Shareholders Group, *Response to the AER Rate of Return Information Paper and Omnibus Final Working Paper*, March 2022, p. 3.

[124] Network Shareholders Group, *Response to the AER Rate of Return Information Paper and Omnibus Final Working Paper*, March 2022, p. 7.

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- Does not disadvantage regulated assets which have to compete for funding with unregulated infrastructure with similar risk. Regulated infrastructure investments must compete for equity capital with similar unregulated investments, for which the required return is typically based on a 10 year term for equity.

- Meets the NPV=0 principle. If the goal is to match the regulatory allowance to the market cost of capital (i.e. the return that investors require) the term should be set to match the practices of investors. A 10 year term for equity supports efficient financing costs over multiple regulatory or access arrangement periods.

- The use of a 10 year term for equity is widely applied by Australian and international regulators. Regulators have generally accepted the argument that the term of equity should be a proxy for the life of the regulated asset. Given the long-term nature of infrastructure asset investment, regulators generally consider that a long-term rate better reflects the expectations of investors rather than a shorter term.

Therefore, the ERA considers that investors consider long-term cashflows across multiple regulatory periods and expect to receive returns consistent with this perspective.

The ERA considers that should investors expect a longer-term return on equity, a shorter-term will lead to negative NPV outcomes. Setting a short-term rate would not best meet the NPV=0 principle, nor would it support efficient signals for network owners or consumers.

On the basis of the above, the ERA accepts Western Power's proposal for a 10 year term for equity to determine the rate of return.

The ERA considers that the terms across equity, debt and inflation do not need to match and they should be separately set to best achieve an efficient weighted average return. This is a position that is supported by a number of experts. The ERA considers that the terms for debt and inflation are separate issues and these are discussed in the respective sections of this draft decision. In summary:

- The ERA considers that regulated assets have long lives and investors are concerned with cashflows over the long term. Using the longest term generally available (10 years) reflects investors' efficient costs and efficient financing in a competitive market. A 10 year term for equity ensures that regulated revenues match the requirements of efficient investors and best approximates the NPV=0 principle.

- The ERA also considers its hybrid trailing average approach best approximates the NPV=0 principle while also recognising interest rate risk, refinancing risk and the staggered nature of debt portfolios. This recognises that energy networks enter into long-term debt arrangements to fund long-term assets, while also allowing for the use of derivatives to partially align with the regulatory cycle. This is an implementable strategy and thus ensures NPV=0.

- The ERA considers that the term of expected inflation should be five years, consistent with the length of the access arrangement. This allows the revenue model to take the best estimate of the five year inflation forecast out (of the nominal WACC) and add back the actual inflation over the five year access period (through the indexation of the RAB). Not aligning the inflation term to the regulatory cycle would create a present value error.

9.3.2   Return on equity components

The ERA adopts the Sharpe-Lintner Capital Asset Pricing Model (CAPM) to estimate the return on equity. This model is commonly used by Australian regulators for quantifying the return on equity.

The ERA determines a single point estimate for the return on equity using the Sharpe-Lintner CAPM, applying the following formula:

$$R_i = R_f + \beta_i (R_M - R_f)$$

Equation 3

where:

R_i is the required rate of return on equity for the asset, firm or industry in question

R_f is the risk free rate

β_i is the equity beta that describes how a particular portfolio i will follow the market which is defined as $\beta_i = cov(R_i, R_M)/var(R_M)$

$(R_M - R_f)$ is the market risk premium.

To estimate the return on equity the ERA separately estimates:

- the risk free rate

- the market risk premium

- the equity beta.

The individual equity components are further discussed below.

9.3.3   Equity risk free rate

The risk free rate is the return an investor would expect when investing in an asset with no risk.

The risk free rate is the rate of return an investor receives from holding an asset with a guaranteed payment stream (that is, where there is no risk of default). Since there is no likelihood of default, the return on risk free assets compensates investors for the time value of money.

To determine the best estimate of the risk free rate for equity, the ERA has considered:

- The most appropriate term for the risk free rate.

- The most appropriate choice of proxy instrument.

Western Power has proposed a 10 year Commonwealth Government Security bond to estimate the equity risk free rate for AA5.

As discussed above, the ERA considers that the term for equity which would yield the best estimate of the efficient cost of equity is 10 years.

The ERA considers that 10 years is the most appropriate term for the equity risk free rate as it is the longest feasible term that can be reliably estimated from observed data. While Commonwealth Government Security bonds with maturities of greater than 10 years do exist, these bonds are not as liquid as the 10 year bond.

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Regarding the most appropriate proxy instrument for the risk free rate for equity, the ERA considers that observed yields from Commonwealth Government Security bonds are the best proxy for risk free assets in Australia as they are:

- essentially free from default risk

- relatively liquid

- transparently and regularly reported.

Commonwealth Government Security bonds are also commonly used by other Australian regulators and market practitioners to determine the risk free rate.

The ERA notes that Commonwealth Government Securities yields have shown some volatility and have recently risen, as shown in Figure 2.

Figure 2   10 year Commonwealth Government Securities yields

Source: ERA analysis, based on Reserve Bank of Australia F2 statistical tables.

The near-term risk free rate has been volatile and uncertain as the economy recovers from the COVID-19 pandemic, and there is increasing uncertainty around central bank monetary policy.

Inflation expectations in the market have recently increased, but there is ongoing uncertainty as to whether this will be transitory or more permanent. Other external factors such as the conflict in Ukraine have added to the uncertainty of the inflationary environment.

The RBA has been progressively increasing the cash rate:

- A 25 basis point increase to 0.35 per cent on 4 May 2022, the first such increase since 2010.[125]

- A 50 basis point increase to 0.85 per cent on 7 June 2022.[126]

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[125] RBA, *Media Release - Statement by Philip Lowe, Governor: Monetary Policy Decision*, 3 May 2022.

[126] RBA, *Media Release - Statement by Philip Lowe, Governor: Monetary Policy Decision*, 7 June 2022.

- A 50 basis point increase to 1.35 per cent on 5 July 2022.[127]

The risk free rate may continue to be volatile prior to the commencement of the AA5 period.

For this draft decision, the ERA accepts Western Power's proposal and has determined the risk free rate for equity by:

- Using observed yields from 10 year Commonwealth Government Security bonds.

- Using linear interpolation of observed yields of Commonwealth Government Security bonds.

The ERA will use this yield to set the risk free rate for equity at the start of the AA5 period. This rate will be fixed for the duration of AA5.

For this draft decision the ERA estimates a risk free rate for the cost of equity of 3.82 per cent for the 20-day averaging period to 30 June 2022, as a placeholder to determine the rate of return. This equity risk free rate is an indicative value only, and it will be updated in the final decision for an appropriate final averaging period closer to the date of the final decision.

9.3.4 Market risk premium

The market risk premium is a parameter of the Sharpe-Lintner CAPM.

The market risk premium is the expected rate of return in excess of the risk free rate that investors require to invest in a fully-diversified portfolio. *Ex-ante*, investors always require a rate of return above the risk free rate to invest in a risky asset, therefore the expected market risk premium is always positive. *Ex-post*, the realised return to the market portfolio may be negative. To establish the cost of capital, the *ex-ante* market premium is relevant.

The market risk premium compensates an investor for the systematic risk of investing in a fully diversified portfolio. Systematic risk is risk that cannot be diversified away by investors because it affects all firms in the market.[128] This is a forward-looking concept.

The market risk premium is calculated as follows:

$$MRP = R_M - R_F$$

Equation 4

where:

R_M is the expected market return on equity observed in the Australian stock market

R_F is the risk free rate of return.

This section outlines the ERA's draft decision for the market risk premium.

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[127] RBA, *Media Release - Statement by Philip Lowe, Governor: Monetary Policy Decision*, 5 July 2022.

[128] The foundation of the Sharpe-Lintner CAPM is the proposition that adding an asset to a portfolio reduces risk via the diversification effect but not beyond the risks that the assets in a portfolio share in common, that is, their systematic risk. At the limit, when one has invested in all available assets in the market portfolio, there is only systematic risk left. An important assumption of the CAPM is that assets are priced as though it is only their systematic risk that is relevant to investors.

Western Power proposed a market risk premium of 6.0 per cent, consistent with AA4 and the ERA's 2018 Rate of Return Guidelines.[129]

As a market-wide parameter, the ERA considers that the methodology for estimating the market risk premium will be the same for all regulated energy networks.

In developing the Draft 2022 Rate of Return Instrument, the ERA considered the market risk premium. Through this process the ERA has proposed to simplify and refine its approach to calculating the market risk premium in the 2018 Rate of Return Guidelines and update the market risk premium based on current market information. The ERA has proposed a market risk premium of 6.2 per cent in the Draft 2022 Rate of Return Instrument.[130]

The ERA notes that whilst Western Power commissioned a Frontier Economics report that advised on market risk premium matters, they were not adopted in Western Power's proposal. The ERA considered the matters raised by Frontier Economics in developing the Draft 2022 Rate of Return Instrument.

For this draft decision, the ERA considers it appropriate to update the market risk premium and applies 6.2 per cent as its best estimate of the market risk premium to determine the rate of return.

9.3.4.1 Refined and updated market risk premium

The ERA has considered a range of information including expert views, academic literature, market data, stakeholder submissions and other information to inform its review of the rate of return instrument and determine how best to estimate the rate of return, including the market risk premium.

As detailed in the Draft 2022 Rate of Return Instrument, the ERA's proposed approach to estimating the market risk premium broadly maintains the approach in the 2018 Rate of Return Guidelines and applied in AA4. The ERA has proposed to simplify and refine its current approach to calculating the market risk premium and updated the market risk premium based on current market information.[131]

The ERA's proposed refinements in the Draft 2022 Rate of Return Instrument include:

Estimation of the historic market risk premium

- Only considering market risk premia post-1958 given the data quality issues and representativeness of returns of the 1883-1958 period.
- Including an additional subperiod (2000 onwards).
- Solely relying on the BHM dataset.
- Refining the use of the arithmetic and geometric means.

Estimation of the dividend growth model

- Averaging the dividend growth model estimates over six months.

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[129] ERA, *Proposed revisions to the access arrangement for the Western Power Network 2022/23 – 2026/27 – Issues paper*, March 2022, p. 38.

[130] ERA, *Explanatory statement for the 2022 draft gas rate of return instrument,* June 2022, pp. 104-140.

[131] ERA, *Explanatory statement for the 2022 draft gas rate of return instrument,* June 2022, pp. 104-140.

The ERA also proposes in the Draft 2022 Rate of Return Instrument that the market risk premium will be estimated consistent with a 10 year term for equity.

All things equal, compared with a five year term for equity approach, this generally results in lower estimates for both the historic and dividend growth model methods. This difference is due to the extent that a term premium exists for Commonwealth Government Securities. However, the ERA notes that the market risk premium will also be affected by developments in financial markets and economic conditions alongside the term for equity.

In determining a point estimate for the market risk premium the ERA in the Draft 2022 Rate of Return Instrument continues to consider historic estimates, dividend growth model estimates and conditioning variables.

The ERA's proposed approach to determining a market risk premium in the Draft 2022 Rate of Return Instrument is summarised in Figure 3.

Figure 3: **ERA's approach to determining a market risk premium point estimate**
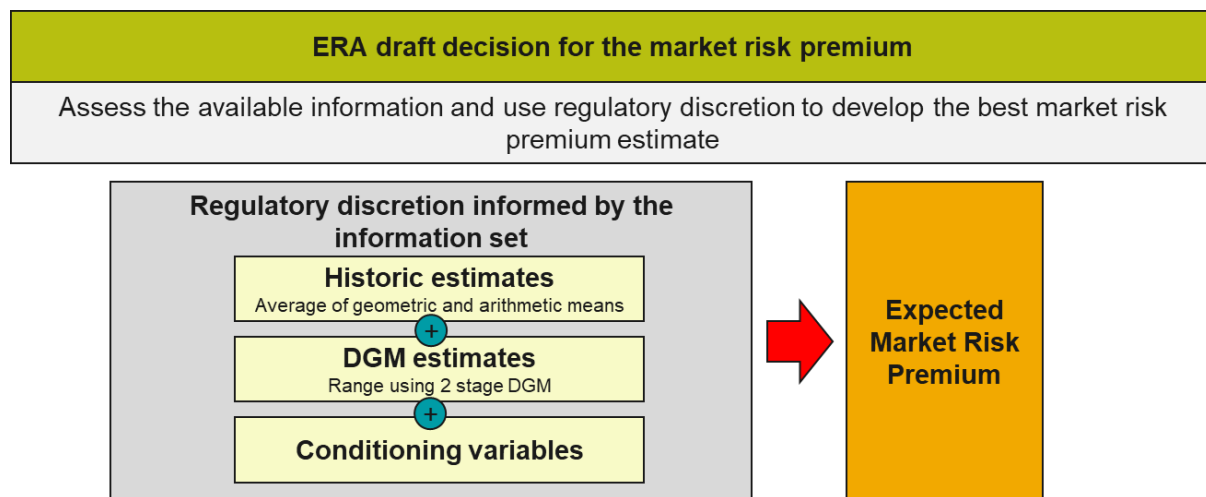
The ERA has maintained its preference for the historic market risk premium approach in the Draft 2022 Rate of Return Instrument as it accords with a plausible model of investor behaviour, where investor expectations are shaped by past information (realised returns) and current practices (adopted methods). The historic market risk premium estimate can be considered as an unconditional estimate that informs the determination of the expected market risk premium.

It is consistent Australian regulatory practice that historical returns are considered when estimating the expected market risk premium. This also appears to be a consistent investor, market and academic practice.

The dividend growth model receives less weight due to the ongoing concerns the ERA had about the proper implementation of the dividend growth model given the issues surrounding input assumptions, forecasts and variability of outputs. Until these matters are resolved the ERA will continue to put more weight on the historic market return estimates. The dividend growth model estimate can be considered to be a conditional estimate that helps inform the determination of the expected market risk premium.

The ERA also uses conditioning variables to assist in determining the point estimate of the expected market risk premium.

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The historical market risk premium estimate (6.0 per cent) and the dividend growth model estimate (6.9 per cent) forms the information base for the exercise of the ERA's regulatory discretion. The ERA considers that the conditioning variables are currently at their historic averages and support a market risk premium at the midpoint of its range.

In the Draft 2022 Rate of Return Instrument, the ERA proposed a market risk premium of 6.2 per cent.

Further detail on the ERA's market risk premium can be found in the explanatory statement to the Draft 2022 Rate of Return Instrument.[132]

For this draft decision, the ERA rejects Western Power's proposed market risk premium and applies a market risk premium of 6.2 per cent consistent with the Draft 2022 Rate of Return Instrument to determine the rate of return.

9.3.5   Equity beta

Risk is the degree of uncertainty about an event, for example the uncertainty around an investment's expected returns. This is a forward-looking concept. The risk-return trade off in finance theory provides that a risk averse investor will want a higher expected return when faced with higher risk.

The risk of an asset is typically thought of as the variance in asset returns. Total risk consists of systematic and non-systematic risk. Systematic risk is that part of total risk in a firm's returns that stems from the economy and markets more broadly. Systematic risk cannot be eliminated through diversification. Non-systematic risk is the risk stemming from unique attributes of the firm, which may be eliminated by an investor through diversification. For this reason, only systematic risk is compensated by the return on equity.

The equity beta is a parameter that measures the systematic risk of a security or a portfolio in comparison to the market as a whole.

Equity beta is the slope parameter β_i in the Sharpe-Lintner CAPM. The slope parameter β_i correlates a specific asset's return in excess of the risk free rate of return, to movements in the return on the market portfolio.

Two risk factors are generally considered to estimate the value of equity beta for a particular firm:

- The type of business, and associated capital assets, that the firm operates measured by asset or "un-levered" beta.

- The amount of financial leverage (gearing) employed by the firm which levers or "amplifies" the asset beta to arrive at equity beta.

This section outlines the ERA's draft decision for the equity beta.

Western Power proposed maintaining an equity beta of 0.7, consistent with the value applied in AA4 and the ERA's 2018 Rate of Return Guidelines.[133]

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[132]   ERA, *Explanatory statement for the 2022 draft gas rate of return instrument,* June 2022, pp. 104-140.

[133]   ERA, *Proposed revisions to the access arrangement for the Western Power Network 2022/23 – 2026/27 – Issues paper*, March 2022, p. 38.

In developing the Draft 2022 Rate of Return Instrument, the ERA has recently considered equity beta estimates.

The ERA proposed to maintain an equity beta estimate of 0.7 for the Draft 2022 Rate of Return Instrument. While the equity beta estimate is unchanged, the delisting of some of the remaining Australian energy networks and current market volatility has meant that the ERA has had to refine its approach to estimating equity beta. The ERA will now consider both domestic and international comparator firms and different timeframes.[134]

For this draft decision, the ERA considers it appropriate to accept Western Power's proposal to maintain an equity beta of 0.7 to determine the rate of return.

9.3.5.1 Refined and updated equity beta estimate

The ERA's review of the 2018 Rate of Return Guidelines has been a multiple round review of how best to estimate the rate of return, including equity beta. Throughout the review, the ERA has considered a range of information including expert views, academic literature, market data, stakeholder submissions and other information.

The Draft 2022 Rate of Return Instrument does not propose a change to the equity beta estimate of 0.7. However, the proposed approach to estimating the market risk premium broadly maintains the approach in the 2018 Rate of Return Guidelines which was used for AA4. The ERA has proposed refinements in the approach to estimating equity beta to account for market developments and to simplify the methodology to aid reproducibility.[135]

In developing the Draft 2022 Rate of Return Instrument, the ERA recognised the equity beta estimates may be affected by the following market developments since 2018:[136]

- The ERA's AA4 benchmark sample included the DUET Group, Spark Infrastructure, AusNet Services and the APA Group. The sample of live Australian energy networks has reduced, with DUET already being delisted and Spark Infrastructure and AusNet Services being delisted in 2022.

- Since the AA4 final decision Australian markets have been affected by the COVID-19 pandemic and the conflict in the Ukraine. These market developments have affected the three remaining listed energy networks. As the equity beta measures the correlation of a firm to the broader market, both changes in the returns of a firm and the returns to the market can affect an estimate of beta.

- All firms in the Australian energy network sample have been the subject of takeover offers, or have been part of takeover bids. Besides reducing the number of live firms through delisting a company, an acquisition transaction may affect the informativeness of returns around the announcement window and towards close of transaction.

Given these market developments the ERA undertook consultation and sought expert views on how to develop a benchmark sample and best estimate equity beta in developing the Draft 2022 Rate of Return Instrument.

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[134] ERA, *Explanatory statement for the 2022 draft gas rate of return instrument,* June 2022, pp. 141-175.

[135] ERA, *Explanatory statement for the 2022 draft gas rate of return instrument,* June 2022, pp. 141-175.

[136] ERA, *Explanatory statement for the 2022 draft gas rate of return instrument,* June 2022, pp. 169-172.

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In the Draft 2022 Rate of Return Instrument, the ERA has proposed applying a similar equity beta estimation to the approach in the 2018 Rate of Return Guidelines and proposed adjustments for the:

- consideration of five and 10 year beta estimates
- consideration of international comparator firms.

Sample period

To estimate equity beta the ERA must select an estimation window. That is, the time horizon over which the returns of firms and the market are observed.

The length of the estimation window involves a trade-off between relevance of the data and statistical robustness:

- Longer periods can include behaviour in the data that is no longer relevant due to changing economic and market conditions.
- Shorter periods may produce estimates that are less statistically robust.

For AA4 the ERA considered that a five year period with weekly data balanced these trade-offs.

The ERA notes that the current five year window includes market shocks such as COVID-19 and the conflict in the Ukraine. The ERA also notes that the current five year window includes merger and acquisition activity for domestic energy networks, both currently listed or recently delisted.

Five year rolling equity beta for each of the Australian energy networks is provided in Figure 4.

Figure 4:   Rolling raw beta estimates for the Australian energy network sample
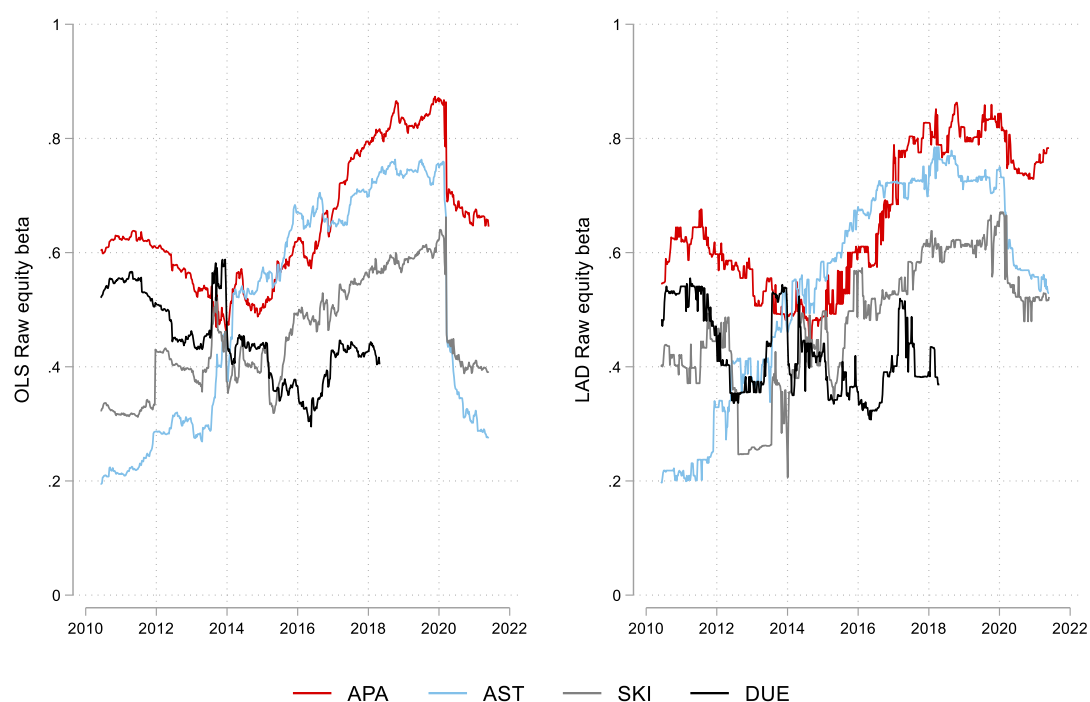
Source: ERA analysis, Bloomberg.

The ERA has analysed equity beta stability for the domestic sample by examining rolling beta estimates. Realised equity betas have generally not been stable for the last decade, but the impact of the COVID-19 pandemic is obvious and has resulted in observed betas dropping significantly.

To the extent that external factors such as COVID-19 pandemic do not represent permanent changes to systematic risk and bias equity beta estimates, the consideration of a longer window can moderate the impact of these shocks. Therefore, the ERA will expand its considerations to include the 10 year window.

Selection of the benchmark sample

The ERA has some concerns with the use of the current small sample, including that:

- A forward-looking equity beta requires live firms that can incorporate information into prices, where historical estimates cannot incorporate information due to being delisted.

- A sample that is largely reflective of one firm deviates from a benchmark approach to an actuals approach.

- A small sample may be overly affected by the idiosyncratic position of one firm and its changes over time.

- A sample largely reflective of one firm also may be statistically unreliable.

However, the ERA considers that a small domestic sample may still provide useful and reliable equity beta estimates given the nature of energy network service providers.

The ERA has considered how the benchmark sample needs to change due to current market developments.

The ERA considered the use of a combined domestic energy network sample and the incorporation of international comparators that are similar to electricity network service providers.

The ERA notes that international comparators are commonly used by other regulators to estimate equity beta:

- IPART uses a broad selection of stocks that includes international firms as it considered that it is likely to be "more objective, more likely to yield statistically reliable estimates, and more resistant to problems caused by companies dropping out of the sample over time."[137]

- The QCA stated that there is not "a sufficient number of listed Australian firms for us to draw upon in order to determine reasonable betas" and any country-specific effects on beta estimates can "be limited by using a sample of relevant firms from a cross-section of countries where possible." [138, 139]

Regarding regulatory characteristics, the ERA looks to countries where energy networks operate under similar regulatory, legal and other institutional arrangements to those in Australia.

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[137]   IPART, *Review of our WACC method*, February 2018, p. 7.

[138]   QCA, *Final Report: Rate of Return Review*, November 2021, p. 71.

[139]   QCA, *Final Report: Rate of Return Review*, November 2021, p. 72.

Regarding market factors, the ERA looks to countries with capital markets that are sufficiently deep, liquid, large and informationally efficient.

On this basis the ERA considers that Commonwealth countries such as the United Kingdom, Canada and New Zealand are close matches to Australia. The ERA considers that the United States of America is also comparable.

With input from stakeholders, the ERA has developed an international comparator sample of 58 firms. The ERA considers that these firms are sufficiently comparable to the benchmark firm to contribute to the development of a robust estimate of equity beta for the purpose of AA5.

The ERA considers that the international sample option has the following advantages:

- An extended sample size results in equity beta estimates that are more reliable and less sensitive to individual equity beta estimates of the Australian energy network sample.

- Using international samples is a more robust approach over time, given that there is currently only one listed Australian energy network.

- Other regulators have been using international comparators for their equity beta estimation, largely driven by the difficulty in finding a sufficient number of comparable businesses to estimate equity beta using a purely domestic sample.

The ERA considers that market circumstances necessitate the examination of international energy networks in the benchmark sample. Filters are used to identify comparators with a similar degree of risk to the benchmark firm, to the closest extent possible given market realities.

On balance, given the smaller and increasingly historical Australian domestic sample, the ERA has examined both domestic and international listed energy networks when estimating the equity beta for Australian energy networks.

Equity beta point estimate

The ERA's approach to determining an equity beta point estimate for the AA5 period is summarised in **Figure 5**.

Figure 5: **ERA's approach to determing an equity beta point estimate**

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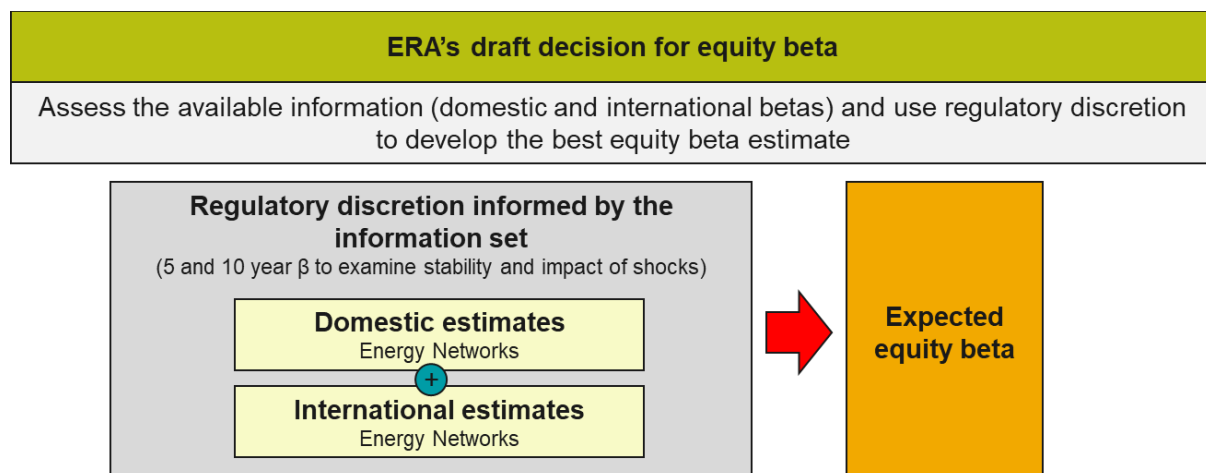
To determine a point estimate for equity beta the ERA:

- Uses domestic and international comparator firms.

- Considers five year and 10 year data periods.

- Mechanically estimates equity beta using the method described in the 2022 Draft Gas Rate of Return Instrument, including the use of OLS and LAD estimators.

- Pools beta estimates by country.

- Examines the distribution of equity betas.

- Exercises regulatory discretion to determine the best point estimate.

In the Draft 2022 Rate of Return Instrument, the ERA has proposed an equity beta of 0.7 that was informed by the domestic and international energy network comparators detailed in Appendix 4 of the explanatory statement to the Draft 2022 Rate of Return Instrument.

For the purpose of this draft decision, the ERA used a five year (January 2016 to December 2021) and 10 year (January 2011 to December 2021) sample period.

As the ERA is considering international comparators, the ERA has examined equity beta on a country-by-country basis.

To arrive at an estimate of equity beta, the ERA used its discretion informed by the estimates from all examined countries and timeframes.

The Australian domestic energy sample estimates are detailed in Table 5 and Table 6.

Table 5: **Australian five year equity beta estimates at benchmark leverage**

	Assets					Portfolios			
Estimator	APA	AST	DUE	SKI	**Average of Assets**	Equal Weighted	Value Weighted	Average of Portfolios	**Average of Assets and Portfolios**
OLS	0.76	0.25	0.44	0.40	**0.46**	0.52	0.49	**0.51**	**0.48**
LAD	0.88	0.47	0.43	0.49	**0.57**	0.68	0.70	**0.69**	**0.63**
Mean All Methods	**0.82**	**0.36**	**0.44**	**0.45**	**0.52**	**0.60**	**0.60**	**0.60**	**0.56**

Source: ERA analysis

Table 6: **Australian 10 year equity beta estimates at benchmark leverage**

	Assets					Portfolios			
Estimator	APA	AST	DUE	SKI	**Average of Assets**	Equal Weighted	Value Weighted	Average of Portfolios	**Average of Assets and Portfolios**
OLS	0.76	0.39	0.38	0.42	**0.49**	0.53	0.50	**0.52**	**0.50**
LAD	0.84	0.54	0.32	0.49	**0.55**	0.60	0.60	**0.60**	**0.58**
Mean All Methods	**0.80**	**0.47**	**0.35**	**0.46**	**0.52**	**0.57**	**0.55**	**0.56**	**0.54**

Source: ERA analysis.

The Australian energy network sample produces a range of individual firm beta estimates from 0.3 to 0.9. The average beta estimate from the Australian energy network sample is 0.5.

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A summary of the domestic and international energy sample estimates is detailed in Table 7. Detailed beta estimates are provided in Appendix 5 of the explanatory statement to the Draft 2022 Rate of Return Instrument.

Table 7:   Domestic and international equity beta estimates at benchmark leverage

Estimator	AUS	US	CAN	UK	NZ	Mean of all countries
Panel A: 5 year estimates						
OLS	0.48	1.08	0.95	0.95	0.64	**0.82**
LAD	0.63	0.76	0.86	0.82	0.58	**0.73**
Mean All Methods	**0.56**	**0.92**	**0.90**	**0.88**	**0.61**	**0.78**
Panel B: 10 year estimates						
OLS	0.50	0.96	0.96	0.93	0.59	**0.79**
LAD	0.58	0.74	0.88	0.80	0.51	**0.70**
Mean All Methods	**0.54**	**0.85**	**0.92**	**0.86**	**0.55**	**0.75**

Source: ERA analysis.

The ERA considers that the domestic energy sample provides a range of equity beta estimates from 0.5 to 0.6. When international comparators are examined, this provides a range of estimates from 0.5 to 1.1. The average beta estimate across all countries is 0.77.

To select a point estimate for equity beta, the ERA considers all available information and uses its discretion to select a point estimate. Given the imprecision in the estimation process, the ERA will continue its practice of rounding to the nearest first decimal place.

The ERA considers 0.7 as the best estimate for equity beta for the benchmark energy network. This number has been selected as being below the international estimates to recognise that Australian equity beta estimates are generally lower than international estimates.

Further detail on the ERA's equity beta can be found in the explanatory statement to the Draft 2022 Rate of Return Instrument.[140]

For this draft decision, the ERA has applied an equity beta of 0.7 consistent with the Draft 2022 Rate of Return Instrument to determine the rate of return.

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[140]   ERA, *Explanatory statement for the 2022 draft gas rate of return instrument,* June 2022, pp. 141-175.

10. Inflation

Inflation is the rate of change in the general level of prices of goods and services.

To invest, debt and equity investors require compensation for inflation.

A nominal rate of return incorporates the real rate of return, compounded with a rate that reflects expectations of inflation.

The expected rate of inflation is required:

- For the roll forward of the regulated asset base and for indexing purposes to determine annual depreciation allowances.
- To back out the expected inflation underpinning the nominal building block allowances in the tariff variation mechanism, to allow accounting for subsequent actual inflation.

The forecast of the expected rate of inflation also allows stakeholders to observe the real rates of change in tariffs and in the real rate of return, which are important contributors to changes in tariffs.

10.1 Western Power's proposal

Western Power proposed an approach for calculating the forecast inflation rate using the Treasury bond implied inflation approach.

The Treasury bond implied inflation approach uses the Fisher equation and the observed yields of:[141]

- Five year Commonwealth Government Securities, which reflect a market-based estimate of the nominal risk free rate.
- Five year Treasury indexed bonds, which reflect a market-based estimate of a real risk free rate.

This approach is the same method used in AA4 and is consistent with the 2018 Rate of Return Guidelines.[142]

10.2 Public submissions

No submissions to the issues paper provided stakeholder comments on the forecast inflation rate.

10.3 ERA draft decision

The ERA accepts Western Power's proposed methodology for calculating the forecast inflation rate.

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[141] The formal Fisher equation is: $1 + i = (1 + r)(1 + \pi^e)$ where: i is the nominal interest rate, r is the real interest rate and π^e is the expected inflation rate.

[142] Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 236.

The ERA considers the Treasury bond implied inflation approach for estimating expected inflation should be applied as follows:

- Using the yields on five year Commonwealth Government Securities bonds.

- Using linear interpolation to derive the daily point estimates of both the nominal five year risk free rate and the real five year risk free rate, for use in the Fisher equation.

The ERA considers that recent increases in inflation and current inflation uncertainty underscores the need for a method for estimating expected inflation that is responsive to shifting and potentially volatile economic conditions and market expectations.

The ERA considers that the Treasury bond implied inflation approach provides the best estimate of inflation expectations for an access arrangement period because:

- It is a market-based approach. The rationale for using a market-based approach is that market prices reflect the aggregation of expectations of diverse market participants that invest and commit money. The forecasts of many different market participants are considered to contain more information and be more relevant than any one particular forecast model or method.

- The method is a dynamic market measure that is updated daily.

- The method is consistent with market forecasts built into other WACC parameters.

The ERA considers that the Treasury bond implied inflation approach is likely to result in the best estimate of inflation expectations for the AA5 period.

The ERA considers that the term of expected inflation should be five years, consistent with the length of the access arrangement period as it offers the best estimate of what inflation is expected to be over the access arrangement period.

The revenue model takes the best estimate of the five year inflation forecast out (of the nominal WACC) and puts back in the actual inflation over the five year access period (through the indexation of the RAB).

For this draft decision, the ERA used a 20-day averaging period to 30 June 2022 as a placeholder to provide a forecast inflation rate of 2.96 per cent to determine the rate of return. This forecast inflation rate is an indicative value only, and it will be updated in the final decision for an appropriate final averaging period closer to the date of the final decision.

11. Value of imputation credits (gamma)

The imputation tax system prevents corporate profits from being taxed twice. Under the Australian imputation tax system, franking credits are distributed to investors at the time that dividends are paid and provide an offset to those investors' taxation liabilities.

The gamma parameter accounts for the reduction in the effective corporate taxation that is generated by the distribution of franking credits to investors. Generally, investors who can use franking credits will accept a lower required rate of return, before personal tax, on an investment that has franking credits, compared with an investment that has similar risk and no franking credits.

The ERA factors the value of imputation credits into its regulatory determination allowances via adjustments to the taxation building block and market risk premium.

11.1 Western Power's proposal

Western Power proposed a gamma of 0.5, consistent with the benchmark gamma applied in AA4 and the 2018 Rate of Return Guidelines.[143]

11.2 Public submissions

No submissions to the issues paper provided stakeholder comments on the estimation of gamma.

11.3 ERA draft decision

The ERA accepts Western Power's proposed gamma of 0.5.

The approach to gamma in the 2018 Rate of Return Guidelines is based on:

- Contemporary Australian Competition Tribunal and Federal Court judicial reviews, which supported the use of the utilisation approach.

- Consideration of available data, including reviewing the limitations of Australian Taxation Office data for the estimation of gamma.

- Expert reports and analysis in respect of calculations of gamma.

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[143] Western Power, *Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period*, 1 February 2022, p. 236.

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The ERA has used a gamma of 0.5 for its most recent rate of return determinations, and has proposed no change to the gamma in the Draft 2022 Rate of Return Instrument.[144, 145, 146, 147, 148]

The ERA's estimate of gamma is derived by applying the Monkhouse formula, where gamma is estimated as the product of the distribution rate and the utilisation rate.

$$\text{Gamma} = \text{Distribution rate} \times \text{Utilisation rate}$$

Equation 5

The ERA has separately estimated the distribution rate and utilisation rate.

The distribution rate represents the proportion of imputation credits created that is expected to be distributed to investors. The ERA considers that the distribution rate is a firm-specific parameter, rather than market-wide.

The ERA's estimate of the distribution rate is 0.9. This is based on Dr Lally's estimate of the distribution rate based on the financial reports of the 50 largest ASX-listed firms (0.887), rounded to one decimal place.[149] Further, the ERA considers that Dr Lally's finding that the distribution rate may be slightly higher with the removal of foreign operations supports the view that the distribution rate should be at least 0.9.[150]

The utilisation rate is the weighted average of the utilisation rates of individual investors. Investors who are able to fully use the credits have a rate of one and those unable to use them have a rate of zero. The ERA considers that the utilisation rate was a market-wide parameter, rather than firm-specific.

The ERA's estimate of the utilisation rate is derived using the equity ownership approach to determine the value-weighted percentage of domestic investors in the Australian equity market.

The ERA considers it appropriate to base its estimate of the utilisation rate on listed equity due to the different considerations regarding dividend policy in listed and unlisted businesses.

Dr Lally found that many unlisted companies are sole traders that have incorporated to reduce their tax rate (but only if they retain rather than distribute their profits), and many others are closely-held entities with dividend policy considerations quite different to those for listed companies.[151]

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[144] ERA, *Final decision on proposed revisions to the Dampier to Bunbury Natural Gas Pipeline access arrangement 2021 to 2025*, April 2021, p. 312.

[145] ERA, *Final decision on proposed revisions to the Goldfields Gas Pipeline Access Arrangement for 2020 to 2024,* December 2019, p. 154.

[146] ERA, *Final decision on proposed revisions to the Mid-West and South-West Gas Distribution Systems access arrangement for 2020 to 2024,* November 2019, p. 296.

[147] ERA, *Final determination 2018 and 2019 Weighted Average Cost of Capital for the Freights and Urban Networks and Pilbara Railways*, August 2019, Chapter 9.

[148] ERA, *2022 Draft Gas Rate of Return Instrument*, June 2022, p. 21.

[149] Dr Lally, M., *Estimating the Distribution Rate for Imputation Credits for the Top 50 ASX Companies,* June 2021, p. 3.

[150] Dr Lally, M., *Estimating the Distribution Rate for Imputation Credits for the Top 50 ASX Companies,* June 2021, pp. 3-4.

[151] Dr Lally, M., *Gamma and the ACT Decision*, May 2016, p. 26.

The ERA's estimated utilisation rate is from the national accounts of the ABS, based on a five year average to March 2021 and rounded to the first decimal point.[152] The ERA considers the ABS data is the best available data to estimate the utilisation rate.

The ERA's estimate of the utilisation rate is 0.6.

The ERA determines gamma as a product of the ERA's estimate of the distribution rate and the utilisation rate which provides a gamma of 0.5, consistent with Western Power's proposal.

For this draft decision, the ERA has applied a gamma of 0.5 to determine the rate of return.

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[152]   ABS, *Australian National Accounts: Finance and Wealth, Catalogue 5232.0*, Tables 48 and 49.

12. Draft decision on rate of return

For the purpose of this draft decision, the ERA has used the 20 trading days to the end of June 2022 as a placeholder to estimate the rate of return.

Based on the ERA's assessment and draft decision in respect of each of the rate of return parameters as proposed by Western Power, the ERA has calculated the rate of return using the parameters it considers most appropriate in Table 8.

For this draft decision:

- The ERA determines that the nominal after tax cost of equity as 8.16 per cent.

- The ERA determines that the nominal cost of debt as 6.24 per cent.

- The ERA determines a nominal after tax rate of return of 7.10 per cent.

These determined percentages are indicative values only based on the value of the parameters as at 30 June 2022 and will be updated to determine the rate of return in the final decision for an appropriate final averaging period closer to the date of the final decision.

The ERA does not approve Western Power's proposed average nominal post-tax WACC of 4.73 per cent for the AA5 period and requires Western Power to amend the nominal post-tax WACC to 7.10 per cent based on the parameters set out in Table 8 and the reasoning detailed in this draft decision.

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Table 8: **ERA's draft decision indicative rate of return for AA5**

Component	Western Power proposed	ERA Draft decision
Averaging period	*30 June 2021*	*30 June 2022*
Return on debt (%)		
5-year interest rate swap (effective yield)	N/A	4.070
Debt risk premium (10 year average)	N/A	1.883
Debt issuing cost	0.100	0.165
Debt hedging cost	N/A	0.123
Return on debt (10 year bond yield)	3.80*	N/A
Nominal return on debt	*3.90**	*6.241*
Return on equity		
Nominal risk free rate (%)	1.53	3.82
Market risk premium (%)	6.0	6.2
Equity beta	0.7	0.7
Nominal return on equity (%)	*5.73*	*8.16*
Other parameters		
Debt proportion (%)	55	55
Inflation (%)	2.03	2.96
Corporate tax (%)	30	30
Franking credit	50	50
Nominal after-tax WACC (%)	**4.73***	**7.10**
Real after-tax WACC (%)	2.64*	4.03

Source: ERA analysis; Western Power, Access Arrangement Information: Access Arrangement revisions for the fifth access arrangement period, 1 February 2022, pp.236-237.

*Five year average over the AA5 period.

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