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

AUSTRALIAN ENERGY REGULATOR

Inquiries about this publication should be addressed to:

Mr Warwick Anderson
General Manager
Network Finance and Reporting
Australian Energy Regulator
GPO Box 520
Melbourne Vic 3001

Tel: 1300 585 165

Email: RateOfReturn@aer.gov.au
AER Reference: 65402

Amendment Record

Version	Date	Pages
2.0	14 October 2021 (for typo in chapter 13 on p.158 and p.159). Some of TransGrid's quotes was previously attributed to QTC.	182

Contents

Shortened forms vii

1 Overview 9

1.1. What do we want to achieve through our working papers? 9

1.2. Why does the rate of return matter? 9

1.3. Next steps 10

1.3.1 Timelines/Process steps 10

2 Process background 12

2.1. What is the rate of return instrument? 12

2.2. What is our 'Pathway to 2022'? 12

2.3. What is the intent of the working papers series? 13

2.4. How does this interact with other working papers? 13

Part A – Term of the rate of return 15

3 Summary 16

3.1. Why this topic? 16

3.2. Our considerations and the 2022 Instrument 16

3.2.1 NPV=0 principle 19

4 Summary of draft working paper 21

4.1.1 Summary of Dr Lally's 2021 report 22

5 What did stakeholders say about the draft paper? 24

5.1. Questions raised in the draft working paper 24

5.1.1 Do the terms need to align between the rate of return and expected inflation? 24

5.1.2 Should the term of equity and debt align? 26

5.1.3 Term of the return on equity 26

5.1.4 Form of the return on debt 32

5.1.5 Term of the return on debt 34

5.1.6 The use of the EICSI and corresponding WATMI in adjusting the benchmark debt term 37

5.1.7 Possible transitional arrangements if a change in debt term is required 39

5.2. Other items arising from stakeholder submissions 40

5.2.1 The regulatory task 40

5.2.2 The AER's comparatively low allowed return on equity 40

5.2.3 Upward bias in the return on equity 41

5.2.4 Aligning the efficient cost of capital with the NEL/NGL and NEO/NGO 41

5.2.5 The NEO/ NGO and the CRG's principles 42

5.2.6 Misinterpretation of the CRG's Inflation Review submission 42

6 AER discussions and positions 43

6.1. Do the terms need to align between equity, debt and expected inflation? 43

6.1.1 Does the term of the rate of return need to align with that of expected inflation? 44

6.1.2 Should the term of equity and debt align? 45

6.2. What is a suitable term for the rate of return? 46

6.2.1 Term of the return on equity 46

6.2.2 Term of the return on debt 60

7 Response to stakeholders' submissions on other issues 65

7.1. The regulatory task 65

7.2. The AER's comparatively low allowed return on equity 65

7.3. Upward bias of the return on equity 67

7.4. Aligning the efficient cost of capital with the NEL/NGL and the NEO/NGO 67

7.5. The NEO/ NGO and the CRG's principles 68
7.6. Revisit 2020 Inflation Review 70
7.7. Misinterpretation of the CRG's Inflation Review submission 71
Part B — Rate of return and cashflows in a low interest rate environment 73
8 Summary 74
8.1. Why this topic? 74
8.2. Our considerations and the 2022 Instrument 74
9 Draft working paper 78
10 What did stakeholders say about the draft paper? 81
10.1 Return on equity 82
10.1.1 Network feedback 82
10.1.2 Consumer feedback 84
10.1.3 Investor feedback 85
10.1.4 Retailer feedback 87
10.2 Return on equity — is the CGS an appropriate proxy for the risk-free rate? 88
10.2.1 Network feedback 88
10.2.2 Consumer feedback 89
10.2.3 Investor feedback 90
10.2.4 Retailer feedback 90
10.3 Financeability 90
10.3.1 Network feedback 90
10.3.2 Consumer feedback 92
10.3.3 Investor feedback 93
10.3.4 Retailer feedback 93
11 Application in the 2022 Instrument Review 95
11.1 Are we in a low interest rate environment? 98

11.2 Is the rate of return appropriate in a low interest rate environment? 99

11.2.1 Return on debt 99

11.2.2 Return on equity 101

11.3 Return on equity — Is the CGS an appropriate proxy for the risk-free rate, and do we need to adjust for convenience yield? 102

11.4 Financeability 107

11.4.1 How NSPs can manage financeability in a low interest rate environment? 110

Part C 115

12 Term of the rate of return stakeholder submissions 116

13 Rate of return and cashflows in a low interest rate environment stakeholder submissions 139

Appendix A: REU Advice 161

Convenience and inconvenience yields on government bonds 161

Shortened forms

Shortened form	Extended form
2018 Instrument	The rate of return instrument published on 17 December 2018
2022 Instrument	The rate of return instrument to be published in December 2022
ACM	Authority for Consumers and Markets (a Dutch regulator)
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
ARERA	Italian Regulatory Authority for Energy, Networks & the Environment
Brattle	The Brattle Group
CAPM	Capital asset pricing model (Sharpe-Lintner CAPM)
CGS	Commonwealth government securities
CMA	Competition and Markets Authority (UK)
CPI	Consumer Price Index
CPIH	Consumer Price Index including owner occupiers' housing costs
DGM	Dividend growth model
FERC	Federal Energy Regulatory Commission (a US regulator)
Instrument	Rate of return instrument
MRP	Market risk premium
NEL	National electricity law
NEO	National electricity objective
NGL	National gas law
NGO	National gas objective
NZCC	New Zealand Commerce Commission
Ofgem	Office of Gas and Electricity Markets (a UK regulator)
Ofwat	Office of Water Services (a UK regulator)
PTRM	Post-tax revenue model
RFR	Risk free rate
SL CAPM	Sharpe-Lintner capital asset pricing model (or just CAPM)

STB	Surface Transportation Board (a US regulator)
UK	United Kingdom
US	United States of America
WACC	Weighted average cost of capital

1 Overview

This working paper is part of a series that we have produced, and will produce, as part of our pathway to the 2022 Rate of Return Instrument (2022 Instrument). The outcomes from these working papers will feed directly in to our 2022 Instrument review process.

The information in this working paper series will assist us to develop a 2022 Instrument that sets a rate of return that contributes to the achievement of the National Gas Objective (NEO) and National Electricity Objective (NGO).[1] These objectives focus on the long term interests of consumers.[2]

In advancing consumers' interests we aim to promote efficient investment in and operation of regulated energy businesses.

This final working paper sets our positions and views on topics in the draft *Term of the rate of return* and *Rate of return and cashflows in a low interest rate environment* working papers after considering stakeholder submissions.

We have separated this final working paper into three parts:

- Part A discusses topics and submissions on the draft Term of the rate of return working paper.
- Part B discusses topics and submissions on the draft Rate of return and cashflows in a low interest rate environment working papers.
- Part C contains a more detailed summary of stakeholder submissions to both draft working papers.

1.1 What do we want to achieve through our working papers?

The aim of this working paper series is to consider technical aspects of the rate of return ahead of the active phase. It is important for stakeholders and ourselves that we make progress toward settling positions through the working papers. Clearly, we cannot bind ourselves ahead of our decision on the 2022 Instrument, but we have an opportunity now to narrow and focus on the issues in play.

1.2 Why does the rate of return matter?

Investors in any business expect to receive an additional return above their initial investment (or capital). We use the phrase 'rate of return on capital'—or just 'rate of return'—to refer to this additional amount when expressed as a percentage of the initial investment.

---

1 NGL, s. 23; NEL, s. 7.

2 The NGO is to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas. The NEO is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interest of consumers of electricity with respect to: price, quality, safety and reliability, and security of supply of electricity; and the reliability, safety and security of the national electricity system.

We estimate the rate of return for regulated energy businesses by combining the returns of two sources of funds for investment: equity and debt. The rate of return provides the business funds to service the interest on its loans and give a return to shareholders.

In our view, the best possible estimate of the expected rate of return—neither upwardly biased nor downwardly biased —will promote efficient investment in, and efficient operation and use of, energy network services.

If the rate of return is set upwardly biased:

- Investors will be over compensated for the risk involved in supplying capital to networks, so will show increased willingness to invest in regulatory assets in comparison with other investments in the economy.
- Networks will have an incentive to over-invest in regulated assets over the longer term, increasing the regulatory asset base above the efficient level.
- Energy consumers will pay inefficiently higher prices, which will distort energy consumption decisions, and downstream investment decisions. This will result in efficiency losses where consumers use less energy network services than otherwise and non-monetary impacts such as disconnection of vulnerable consumers.

If the rate of return is set downwardly biased:

- Investors will be under compensated for the risk involved in supplying capital to networks, so will show reduced willingness to invest in regulatory assets in comparison with other investments in the economy.
- Networks will not be able to attract sufficient funds to be able to make the required investments in the network. Over the longer term there will be declines in quality, reliability, safety and/or security of supply of electricity or gas.
- Consumers of energy will pay lower prices, at least in the short term; but will face the risk of adverse outcomes for quality, reliability, safety and/or security of supply of energy services. Lower prices will also distort energy consumption and downstream investment decisions (though in the opposite direction to the previous case). This new level of downstream investment will be inefficient for the Australian economy.

Hence, an unbiased estimate of the expected efficient return, consistent with the relevant risks involved in providing regulated network services, is necessary to promote efficient prices in the long term interests of consumers.[3]

We consider that the NEO, NGO and the long term interests of consumers are best served through this guiding principle.

1.3 Next steps

1.3.1 Timelines/Process steps

3 AER, *Rate of return and assessing the long term interests of consumers,* May 2021, p. 1.

This working paper marks the end of the formal process for this topic, and there will not be a round of stakeholder submissions for this paper. There are aspects of this paper that we will consult on further as we extend our analysis and approach the 2022 Rate of Return Instrument Review.

Stakeholders will have further opportunities to provide submissions during the 2022 Rate of return Instrument Review. We intend to publish an Information Paper which will summarise and combine content from all of the working papers prepared by the AER in 2020 and 2021. The consultation period on the Information Paper will close shortly after the conclusion of the Concurrent expert evidence sessions. Hence, stakeholders will have an opportunity to include their views on the expert sessions in their submission. Should stakeholders wish to make a submission to the Independent Panel, this submission can also be included as part of their response to the Information Paper. There will be a final opportunity for stakeholders to make a submission on the Draft Instrument in September 2022.

An indicative timeline for our Pathway to 2022 is included below.

Table 1 Timeline for 2021 working papers

	Date
Final Omnibus working paper*	Late November 2021 to early December 2021
Information paper	
Annual update	
Experts conclave	Late January or first week of February 2021
Concurrent expert evidence sessions	10 and 17 February 2022
Submissions on Information Paper close	March 2022
Draft 2022 Rate of Return Instrument released	June 2022
Release of Independent Panel's report	August 2022
Submissions on Draft Instrument close	TBC

* We will publish a single final working paper which will discuss the topics in the *Debt Omnibus*, *Equity Omnibus* and *Overall Rate of return* draft working papers along with stakeholder submissions to those papers.

2 Process background

2.1 What is the rate of return instrument?

The rate of return instrument sets out how we determine the allowed rate of return on capital in regulatory determinations for energy networks. It specifies the mathematical formulae we will use to calculate the rate of return, and how we will obtain inputs for those formulae. It defines some inputs (fixed for the duration of the instrument) and for others states the process by which we will measure market data and use it as an input at the time of a decision.

The current rate of return instrument was published on 17 December 2018 (the 2018 Instrument). In December 2022 we will publish the next rate of return instrument (the 2022 Instrument). This binding instrument will determine the allowed rate of return on capital for the following four-year period.

Estimating the rate of return is a complex task. We estimate the returns required by investors in view of the risks associated with regulated energy network companies compared to their other investment opportunities. We make this judgement by examining a broad range of evidence including financial market data, models of financial returns, the latest investment knowledge and the views of all stakeholders.

2.2 What is our 'Pathway to 2022'?

We use the term 'Pathway to 2022' to describe the process by which we will develop the 2022 Instrument. We consulted with stakeholders about what steps should be included and what role various reference groups should play.[4] We issued a position paper in March 2021 setting out the timeline and content of our upcoming working papers.[5]

The active phase of the 2022 review commenced in mid-2021. Prior to this, our pathway to 2022 includes:

- Rate of return annual updates—to provide information on rate of return data in the years between reviews; particularly updated times series data used in the 2018 Instrument (or used to inform the development of the 2018 Instrument).
- Establishing reference groups—to ensure we hear stakeholder perspectives from consumers, investors and retailers.
- Working papers—such as this paper.

We have published this final paper to cover the topics explored in both the *Term of the rate of return* (Term) and *Rate of return and cashflows in a low interest rate environment* (LIRE) draft papers.[6] The Term draft working paper investigated whether the terms for return on equity, return on debt and the overall rate of return set in the 2018 Instrument are still appropriate. The LIRE draft paper explored whether we are allowing the appropriate

4 AER, *Consultation paper, Pathway to the 2022 rate of return instrument*, November 2019; see also The Brattle Group, *Stakeholder feedback on the AER's process for the 2018 rate of return instrument*, 27 June 2019.

5 AER, *Pathway to the 2022 rate of return instrument, Position paper on 2021 working paper series*, March 2021.

6 AER, *Rate of return and cashflows in a low interest rate environment, Final working paper*, September 2021.

compensation for Network Service Providers (NSPs), and whether there are difficulties in financing new projects under a low interest rate environment.

We also intend to publish a single final *Omnibus* working paper in late November to early December 2021. This will combine and consider topics in the *Equity*, *Debt* and the *Overall rate of return* draft working papers as well as stakeholder submissions to those papers.

2.3 What is the intent of the working papers series?

Our rate of return working papers discuss issues and evidence on key rate of return topics, and allow us to hear from stakeholders in response. We intend that all this material will feed into the main phase of the review, providing a foundation for constructive discussion and helping alleviate time pressure in the active phase.

Each of our draft working papers was usually accompanied by an expert report and followed by a submission period. To facilitate discussion with stakeholders, we also held online meetings. Our experience from the COVID-19-related restrictions in 2020 was that stakeholders welcomed the online format. We then released a final working paper with our response to submissions. These final working papers generally outlined our preferred position/s (or option/s) and identify where further work is required.

In selecting topics for working papers, we have had regard to whether topics could be constructively considered as discrete issues in advance of the active phase of the review.[7] We have also taken into account stakeholder feedback on the topics of interest or importance.[8]

The term of the rate of return was selected as a topic in our working paper because our *2020 Inflation Review* changed the term of expected inflation from ten years to five years to match the length of the regulatory period. Given this change, we considered that we should review the term of the rate of return to check whether our current approach remains appropriate.[9]

The topic of rate of return and cashflows in a lower interest rate environment was chosen as part of the foundational work that could be undertaken before the active phase of 2022 RORI. The foundational work was targeted at discrete and emerging rate of return issues. One of these issues we wanted to assess was whether our rate of return instrument is appropriate in a lower interest rate environment.

2.4 How does this interact with other working papers?

We have published eight working papers thus far in our suite of working papers:

- *Energy network debt data* – This paper explored options for using the Energy Infrastructure Credit Spread Index (EICSI) in the Rate of Return Instrument and recommended a preferred approach.
- *International regulatory approaches to the rate of return* – This paper analysed the decisions of international regulators and how they used different methods and data to

7 AER, *Position paper, Pathway to the 2022 rate of return instrument*, 29 May 2020, pp. 9–10.
8 Ibid, p. 22.
9 AER, *Final position, Regulatory treatment of inflation*, December 2020, p. 23.

set the rate of return. The paper outlined some ways this might influence the rate of return in our decisions.

- *CAPM and alternative return on equity models* – This paper identified our current understanding of various equity models and our preferred options for how they could be used to determine the rate of return.
- *Term of the rate of return* – This draft paper investigated the appropriate term for the return on equity and return on debt. The paper also considered whether the terms for equity, debt and expected inflation should be aligned.
- *Rate of return and cashflows in a low interest rate environment* – This draft paper considered the consequences of lower interest rates and investigated whether we need to adjust our approach to the rate of return.
- *Overall rate of return* – This draft paper provided an overview of our rate of return framework, our decision-making process and our positions to date. It also explored a number of discrete topics that were not captured in the other working papers.
- *Equity Omnibus* – This draft paper explored a number of technical aspects of estimating the expected return on equity. In particular, we wanted to check that the approach we employ is robust in a range of market conditions.
- *Debt Omnibus* – This draft paper discussed the data that is available to allow us to set a return on debt that aligns with the debt costs that network businesses experience.

Part A – Term of the rate of return

3 Summary

3.1 Why this topic?

Estimating the rate of return is difficult and contentious. It requires regulatory judgement to assess the complex and sometimes conflicting evidence; and to engage with finance theory, academic literature and market practice. There is no one 'right answer' to be found.

In this paper, we explore whether we can improve our current approach to estimating the rate of return so that it further contributes to the achievement of the NEO and NGO.

In a commercial context, the term of the required rate of return on an asset relates to the expected investment time horizon. In a regulatory context, the term of the allowed rate of return is related to the time horizon the allowance applies to.

The 2018 Rate of Return Instrument set the term for the rate of return as ten years for both the return on equity and return on debt and we previously determined a ten-year estimate of the expected inflation. However, in the 2020 Inflation Review we decided to match our estimate of expected inflation to the length of the regulatory period (typically five years).[10]

The NPV=0 condition was the key to changing the term of expected inflation in 2020. The NPV=0 condition has been central to our approach to setting the rate of return in the past and remains so. When we reviewed our approach to estimating expected inflation we reconsidered the NPV=0 condition. Dr Lally provided us a report outlining the application of the condition and its implications. He analysed the implication of the NPV=0 condition on the estimate of expected inflation using a stylised model. Dr Lally advised that the term for expected inflation should match the length of the regulatory period to be consistent with the NPV=0 condition.[11] He also commented that the term of the rate of return should match the length of the regulatory period based on his model. Further, he noted that even if a ten-year rate of return was used, there was no reason to use a ten-year estimate of the expected inflation.[12]

We found Dr Lally's 2020 advice compelling, and by moving to a five-year term for expected inflation, we have implicitly endorsed his modelling and approach for applying the NPV=0 principle.

Given this change to the term of expected inflation, we considered we should review the term of the rate of return to check whether our current approach remains appropriate.[13] In particular, we want to check whether the reasoning we applied in our inflation review is also applicable to the rate of return and whether this might evidence a case for change. This has led to the draft Term working paper.[14]

3.2 Our considerations and the 2022 Instrument

10 AER, *Final position, Regulatory treatment of inflation*, December 2020, p. 35.
11 Dr Martin Lally, *Review of the AER's inflation forecasting methodology*, 8 July 2020, p. 3.
12 Dr Martin Lally, *Review of the AER's inflation forecasting methodology*, 8 July 2020, p. 6.
13 AER, *Final position, Regulatory treatment of inflation*, December 2020, p. 23.
14 AER, *Rate of return term of the rate of return draft working paper,* May 2021, p. 23.

We released our draft working paper on the term of the rate of return in May 2021. We remain of the view that the NPV=0 condition is a key concept and should be used to assess the term of the rate of return and expected inflation.

It has been a critical consideration that has underpinned much of our rate of return work over an extended period:

- We have referenced the NPV=0 condition in previous revenue decisions (where we applied the 2013 Guidelines) and the 2018 Instrument.[15]
- Our 2009 WACC review noted that the focus of the NEO is on efficiency. In particular, the promotion of the efficient investment in, and efficient operation and use of, electricity services in the long term interests of end consumers.[16] In section 3.2.1, we noted that this is consistent with the NPV=0 condition.
- The intent of a building block model (the PTRM and RFM taken together are an example of such a model) is to ensure the present value of the allowed revenue equals the present value of the allowed expenditure of a regulated firm. The regulatory asset base is a stock of funds, which reflects the total amount (in present value terms), which must be returned to investors in the future to compensate them for investments made in the past. Taken together, the use of the PTRM/RFM implies the use of the NPV=0 condition in our revenue determinations.[17]

Following assessment of stakeholder submissions to the draft working paper, we note that two key issues remain: term of equity and term of debt. We have decided to leave the two open for further consideration as part of concurrent evidence sessions in 2022. This is because we would like to gather more evidence and hear expert opinions on these issues. Stakeholders will also have a chance to comment on these issues further after the expert sessions.

Given the term topic followed and was motivated by the analysis in the inflation review, the draft working paper also considered whether we can assess the terms for inflation, debt and equity independently of one another.

While we consider the term for inflation and equity can be estimated independently, the choices of term are largely underpinned by the same principles (in particular, the NPV=0 principle). As such, the application of the underlying principle may lead to the same term being chosen for both.

The draft working paper also examined another related issue: the form of the return on debt. Our preferred position is that we should maintain the use of a trailing average for reasons detailed in section 6.2.2.1.

On the term for equity, while this issue remain open, we do offer some further thoughts and considerations in this paper.

---

15 AER, *Final decision AusNet Services distribution determination 2016 to 2020 attachment 3 – Rate of return*, May 2016, pp. 18, 282; AER, *Rate of return instrument Explanatory Statement*, December 2018, p. 35.

16 AER, *Final decision Electricity transmission and distribution network service providers Review of the weighted average cost of capital (WACC) parameters*, May 20019, p. 53.

17 ACCC, Statement of principles for the regulation of electricity transmission revenues – background paper, 8 December 2004, pp. 14–15.

There are typically two options for the term of equity:[18]

- Match to the length of the regulatory period (typically five years).
- Match the underlying asset lives (typically ten years is used as it is considered to better reflect long asset lives).

In our draft working paper, we revisited and reconsidered previous material on the term of equity (and the term of the rate of return) and reviewed reasons in favour of each option. Our thinking in the 2020 Inflation Review reinforced the analytical framework used by Dr Lally that illustrates how the NPV=0 condition holds at each reset of regulatory parameters when the term for expected inflation and term for return on capital matches the regulatory cycle.[19]

While matching the equity term to the length of the regulatory period did not receive strong stakeholder support, we still consider there are merits to this approach. This is for the following reasons:

- It satisfies the NPV=0 condition (see section 6.2.1.2). By contrast, a ten-year year term does not clearly match the NPV=0 condition and may lead to incorrect compensation for investors in regulated networks.
- The valuation problem facing a regulator with a five-year regulatory cycle is different from that of valuing an unregulated business.[20] We set components of expected cash flows for a regulated business. We are also only concerned with estimating efficient costs attributable to a single regulatory period rather than over the entire asset life. This is because we reset the revenue allowance every regulatory period.
- Consistency with the 2020 Inflation Review (see section 6.2.1.5). In that review, we changed the term for expected inflation to match the length of the regulatory period based on the NPV=0 condition and Dr Lally's advice. The same principle when applied to the term of the return on equity would support matching to the length of the regulatory period.

For the term of debt, our thinking remains that a trailing average approach involves a term matching an efficient firm's borrowing. This is also consistent with Dr Lally's advice.

We are collecting actual debt issuance data from regulated businesses. Our debt data working paper indicated a range of eight to eleven years for the weighted average term to maturity at issuance (WATMI). We are further considering how to make use of this information for setting the debt term.[21] The consideration of the actual debt raising practices of the regulated businesses would need to be balanced against the practical considerations. We note that departing from the current ten-year debt term could entail a complex transition or readjustment of the allowed return on debt. Therefore, we believe further assessment is needed, once we collect the necessary data. This assessment will be part of the final *Omnibus* working paper where we undertake a more holistic consideration of estimating the return on debt.

18 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, p. 38.
19 Dr Martin Lally, *Review of the AER's inflation forecasting methodology,* 8 July 2020, p. 3, 6.
20 Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, p. 21.
21 AER, *Rate of return, Energy network debt data, Final working paper*, November 2020, p. 17.

3.2.1 NPV=0 principle

The NPV=0 condition is central to our rate of return work and was an important factor in determining to change the term of expected inflation in 2020. We believe it is useful to provide some background on this condition so stakeholders can better understand our approach for considering the term for the rate of return.

The overarching goal of our decisions (including the rate of return instrument and the term of the rate of return) is that they contribute to achieving the NEO and NGO (the objectives). We must also have regard to the Revenue and Pricing Principles (RPPs) when making the rate of return instrument.[22]

We aim to determine a rate of return and a value for imputation credits that will provide the appropriate investment incentives that will not lead to over or under investment in assets, and achieve an appropriate balance of sustainable long term consumer outcomes in respect of price, quality, safety, reliability and security of supply.

The aim of setting an expected return to promote efficient investment also appears broadly accepted in regulatory literature.[23] This task requires the exercise of judgement looking to future outcomes. The objectives and principles guide our assessment of the evidence.

On this basis, the rate of return needs to reflect the cost of capital of an efficient firm in the supply of regulated energy services. As our regulatory regime is ex-ante, we consider a rate of return that meets the objectives must provide ex-ante compensation for efficient financing costs. This is a zero net present value (NPV) investment condition, which is a forward looking concept that shows a benchmark efficient firm is provided with a reasonable opportunity to recover at least efficient financing costs over the life of its investment (in its RAB).

This condition is vital to the regulation of infrastructure with monopoly characteristics such as the businesses we regulate.[24] Partington and Satchell have described the NPV=0 condition as follows:[25]

> The zero NPV investment criterion has two important properties. First, a zero NPV investment means that the ex-ante expectation is that over the life of the investment the expected cash flow from the investment meets all the operating expenditure and corporate taxes, repays the capital invested and there is just enough cash flow left over to cover investors' required return on the capital invested. Second, by definition a zero

22 NEL, s. 7A; NGL, s. 24.

23 Averch and Johnson show that if a regulatory rate of return exceeds the firm's true cost of capital, it has an incentive to choose too much capital relative to labour. Averch, H, Johnson, L.L., 'Behaviour of the Firm under Regulatory Constraint', *American Economic Review*, Vol. 52, No. 5, December 1962, pp. 1062–1069. Littlechild describes, 'Revenues need to be adequate to cover operating expenses and to ensure finance for necessary investment. They should not be so excessive as to encourage their dissipation on dubious schemes'. Littlechild, S., 'Economic regulation of privatised water authorities and some further reflections, *Oxford review of economic polic*y, Vol. 4, No. 2, summer 1988, p. 47. Cambini and Rondi find the cost of capital is positively correlated with investment under incentive regulation. Cambini, C., Rondi, L., 'Incentive regulation and investment: evidence from European energy utilities, *Journal of Regulatory Economics*, Vol. 38, 2010, p. 18. Greenwald notes that 'less than "fair" rates of return should simply elicit no investment' in Greenwald, B.C., 'Rate base selection and the structure of regulation', *The RAND Journal of Economics*, Vol. 15, No. 1, Spring 1984, p. 85.

24 Marshal, W., Yawitz, J. And Greenberg, E. (1981), 'Optimal Regulation Under Uncertainty', The Journal of Finance, vol 36, pp. 913–914.

25 Partington, G., Satchell, S., *Report to the AER: Discussion of the allowed cost of debt*, 5 May 2016, p. 14.

> NPV investment is expected to generate no economic rents. Thus, ex-ante no economic rents are expected to be extracted as a consequence of market power. The incentive for investment is just right, encouraging neither too much investment, nor too little.

Further, investment results in zero NPV if the present value of the stream of expected future cashflows (the market value of the RAB) is equal to the initial investment (the book value of the RAB):[26]

> By definition, a stream of expected cash flows that allows the current required return on the book value of capital invested, recovers the capital invested and covers other costs, will have a discounted present value that ex-ante is equal to the book value of the investment. Allowing this cash flow for a regulated business, the book value of the RAB will be equal to the market value of the RAB. To put it another way this cash flow gives rise to a zero NPV investment.

Partington and Satchell have previously advised that the rule requirements are consistent with the zero NPV investment condition, stating:[27]

> The national electricity and gas objectives are to achieve efficient investment and efficient operation in the long term interest of consumers, while the revenue and pricing principles allow for the recovery, by the regulated businesses, of efficient costs including a return on capital and having regard for the costs and risks of overinvestment. There is very clear criterion that can be applied to meet these requirements. That criterion is that investment in regulated assets should be a zero NPV activity.

26 Partington, G., Satchell, S., Report to the AER: Discussion of the allowed cost of debt, 5 May 2016, p. 17.

27 Partington, G., Satchell, S., *Report to the AER: Discussion of the allowed cost of debt*, 5 May 2016, p. 14.

4 Summary of draft working paper

The draft working paper analysed the current evidence and investigated what is the appropriate term for the rate of return. As part of this, we examined:

- our previous considerations on the appropriate term for the rate of return
- the rate of return terms adopted by seven Australian regulators and eight international regulators
- previous expert reports on the term of the rate of return and how it should be set
- whether we could improve our current approach to estimating the rate of return so that it further contributes to the achievement of the NEO and NGO.

We considered that meeting the NPV=0 principle is central to the assessment of the rate of return (including the term of the rate of return) because it contributes to the achievement of the NEO and NGO.[28]

Our preliminary view was that the terms for the return on equity, return on debt and expected inflation should be set independently based primarily on the NPV=0 principle.[29] If they are the same value, it should be the result of analysis rather than explicit requirement.

In considering the term for the return on equity, we reviewed our previous analysis, other regulators' approaches and previous expert reports.[30] This suggested that there were reasons supporting both matching the term for the return on equity to the length of the regulatory period and matching it to the underlying asset lives.

On the return on debt, Dr Lally has advised that the term should depend on the form of the return on debt. He offered no view on the best approach to the form of debt and suggested that different criteria favour different approaches. Our preliminary position was to maintain the use of a trailing average return on debt for the following reasons:

- It would provide regulatory certainty and stability for businesses and consumers.[31]
- A trailing average approach would lower cashflow and price volatility for regulated businesses and consumers respectively.[32]
- Professor Davis has previously noted that regulatory judgement may ultimately be required on the form of the return on debt and term of debt.[33]
- Choosing the form of the return on debt depends on a number of factors and the weighting of those factors – there is no clear 'best' answer.[34] We regulate existing businesses and Dr Lally has advised that a trailing average return on debt would 'yield very small divergences from the NPV=0' test for these businesses and would

28 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, p. 40.
29 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, p. 35.
30 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, pp. 41–44.
31 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, p. 47.
32 AER, Better regulation explanatory statement rate of return guideline, December 2013, pp. 108–110; AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, p. 47.
33 Kevin Davis, The debt maturity issue in access pricing, December 2013, pp. 17–19.
34 Dr Martin Lally (Capital Financial Consultants), *The appropriate term for the allowed cost of capital*, April 2021, pp. 32, 39.

satisfy the NPV=0 criterion in terms of matching the allowed and incurred costs of debt.[35]

We also intended to examine the merits of possible modifications to the trailing average approach in our draft Debt Omnibus paper.

We considered whether the term for return on debt should match that of an efficient firm's borrowing. Dr Lally noted that satisfying the NPV=0 condition would require matching the interest rate incurred by a benchmark efficient firm with the regulatory allowance which also entails matching of the term.[36]

We noted that we have been increasingly exploring the use of actual debt information and collecting the relevant data from regulated businesses since the 2018 Instrument. We proposed to consider using the Energy Infrastructure Credit Spread Index (EICSI) and corresponding weighted average term to maturity at issuance (WATMI) to inform the term of debt to better match that of an efficient firm's borrowing.

4.1.1 Summary of Dr Lally's 2021 report

We engaged Dr Martin Lally to provide expert advice on the term of the rate of return as part of the development of the draft working paper. Dr Lally's report provided important information about the term of the rate of return. However, we also considered previous expert reports and other regulatory approaches to determine our views in the draft working paper.

Dr Lally's report highlighted the following key suggestions:

- The term for the return on equity, return on debt and expected inflation can be determined separately by applying the NPV=0 principle.[37]
- The NPV=0 principle implies that the appropriate term for expected inflation is the regulatory cycle, which is typically five years, and also separately implies that the appropriate term for the return on equity is also the regulatory cycle.[38]
- The appropriate debt term is dependent on the form of the return on debt.[39]
- There may be further grounds for the continued use of the trailing average in the return on debt.[40] A transition would be required if the AER elects to switch from the trailing average approach.[41]
- The AER should decompose the total difference between the EICSI and the debt allowance into three parts: credit rating, debt term and the residue.[42] The EICSI should also exclude subordinated bonds to match the majority of technical features in RBA, Bloomberg and Thomson Reuters indexes.[43] Furthermore, the technical

35 Dr Martin Lally (Capital Financial Consultants), The appropriate term for the allowed cost of capital, April 2021, pp. 26, 32.
36 Dr Martin Lally (Capital Financial Consultants), *The appropriate term for the allowed cost of capital*, April 2021, pp. 23–25.
37 Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, pp. 3–4.
38 Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, p. 4.
39 Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, p. 4.
40 Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, p. 40.
41 Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, p. 4.
42 Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, p. 55.
43 Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, pp. 51–52.

features of the three indexes need to match to avoid differences in the debt risk premium estimates that arise purely from differences in such features.[44]

[44] Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, p. 51.

5 What did stakeholders say about the draft paper?

Our draft paper sought stakeholder feedback on the term of the rate of return, whether the terms should match and the use of industry data for adjusting the benchmark debt term. Stakeholders responded by providing their views on these key issues.

However, stakeholders have also provided feedback on a broader range of issues. Some of these broader issues are relevant to our consideration of the term of the rate of return while others are relevant to our overall regulatory framework which is outside the initial intent of this paper.

This section summarises stakeholder views on areas that were raised in the draft paper. We have engaged with wider stakeholder feedback in the following sections.

A more detailed summary of stakeholder submissions can be found in Section 12. In total 15 submissions were received from network, consumer and investor groups.

5.1 Questions raised in the draft working paper

5.1.1 Do the terms need to align between the rate of return and expected inflation?

Network submissions

The majority of network stakeholders supported our preliminary view that the term for expected inflation, return on equity and return on debt do not need to align.[45] However, the APA Group (APA) and the Australian Pipelines and Gas Association (APGA) stated that the CAPM is a single period model with no term structure.[46] Hence, the APA outlined that there is no term for the return on equity to be compared with the term for expected inflation.[47] The

45 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 1; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 15; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 1; Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 1; Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 3; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 3; AusNet Services, *Response to Low interest rate environment and Term of the rate of return draft working papers*, July 2021, p. 1;

46 APA, *APA submission on draft rate of return working papers,* July 2021, p. 6; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 7.

47 APA, *APA submission on draft rate of return working papers,* July 2021, p. 8.

APGA continued to agree with our preliminary view that the terms for expected inflation and the rate of return could match but they should not be required to.[48]

Consumer submissions

Consumers submitted differing views on the alignment between the term for equity, debt and expected inflation. The Major Energy Users Inc (MEU) observed that our decision to use a trailing average cost of debt and a five-year assessment of inflation demonstrated that our apparent need for a common term had disappeared.[49]

The Network of Illawarra Consumers of Energy (NICE) highlighted that the term for expected inflation should stay aligned to the terms used for the rate of return but this was a one-way relationship.[50] It noted that there was no reason why the term for the rate of return should be aligned to the changed term for expected inflation.

The Consumer Reference Group (CRG) referred to its November 2020 submission to the AER on the Inflation Review.[51] In that submission, the CRG noted that the term for expected inflation should match the ten-year term for equity and debt.[52]

The CRG reiterated that different terms for inflationary expectations and the return on equity implied that the AER was holding inconsistent beliefs about the future.[53] The CRG recommended the AER to engage with consumers' concerns about the terms for the rate of return and inflationary expectations, and acknowledge where those concerns have been previously misrepresented.[54] It also suggested that the terms for all elements in the rate of return instrument and inflation should be reviewed together.[55]

Investor submissions

The Network Shareholder Group (NSG) did not consider that the terms for return on equity, return on debt and expected inflation should be aligned.[56]

Investors Mutual Ltd (IML) and the Queensland Treasury Corporation (QTC) did not explicitly comment on this issue.

---

48 APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 15.

49 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 7.

50 Network of Illawarra Consumers of Energy (NICE), *AER Rate of return instrument 2022–Term and financeability*, July 2021, p. 14.

51 CRG, *Advice to the AER on the regulatory treatment of inflation, Response to the draft position paper on the regulatory treatment of inflation,* November 2020.

52 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, pp. 34–35.

53 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 35.

54 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 36.

55 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, pp. 34–35.

56 NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 12.

5.1.2 Should the term of equity and debt align?

Network submissions

The majority of network stakeholders outlined that there is no requirement for the term of equity to align with the term of debt.[57] They should be separately assessed. The APGA noted that this approach is consistent with Dr Lally's views and some regulators have adopted different terms of debt and equity.[58]

However, the APA and APGA also submitted that the CAPM is a single period model with no term structure.[59] Therefore, the APA stated that the question of whether term for equity should match the term of the rate of return on debt does not arise.[60]

Consumer submissions

Consumer groups outlined different views on matching the term for the return on debt with the term for the return on equity. The NICE stated that the terms for debt and equity should be the same.[61] The MEU noted that there should not be a common term for equity and debt.[62]

Investor submissions

Investors did not comment on this issue.

5.1.3 Term of the return on equity

Network submissions

The majority of network stakeholders outlined that the term for the return on equity should remain at ten years.[63] Their view was supported by the following reasons:

---

57 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 7; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 15; Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 1; Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 3; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 9.

58 APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 15.

59 APA, *APA submission on draft rate of return working papers,* July 2021, p. 6; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 7.

60 APA, *APA submission on draft rate of return working papers,* July 2021, p. 8.

61 Network of Illawarra Consumers of Energy (NICE), *AER Rate of return instrument 2022–Term and financeability*, July 2021, p. 1.

62 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 7.

63 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 3; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 15; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, p. 5; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 1; Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low*

- Precedence and stability
  - The approach in the 2018 Instrument concluded a ten-year term remained appropriate.[64] In the 2018 Instrument, the AER viewed its compliance with the NEO and NGO through the lens of the NPV=0 principle and set the allowed return on equity in a way that it considered to be consistent with the NPV=0 principle.[65]
  - The ACCC and Tribunal have consistently applied a ten-year term since 2003.[66] The AER has consistently used a ten-year term.[67]
  - There has been no change to finance theory or practice since the AER's previous decisions.[68]
  - Stakeholders value stability and predictability.[69] A change would not be consistent with promoting certainty and stability.[70]
  - There is no evidence that network businesses have been overcompensated since the 2018 Instrument when the AER materially cut the equity risk premium and yields on 10 year Commonwealth Government Securities subsequently declined to historical lows.[71]
- Academic, market and regulatory practice
  - A ten-year term is consistent with standard commercial and regulatory practices and that there is no change in finance theory or practice to justify a departure.[72]
  - A ten-year term best reflects well-accepted academic literature.[73]
  - Utilities are long-lived assets and equity investors invest for the long term matching the long asset lives.[74]

---

interest rate environment, July 2021, p. 1; Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 6; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 3.

64 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 3, 25; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 3.

65 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 23.

66 Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 2.

67 Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 2; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 22.

68 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, pp. 3, 6.

69 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, pp. 3, 6.

70 Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 2.

71 Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 2.

72 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 2; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, p. 5; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 1; Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 2; Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 6.

73 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, pp. 3, 6.

74 Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 5.

- Regulatory allowances should be set on what real-world investors require. Real-world market investors determine required returns with reference to a ten-year risk-free rate.[75] A five-year risk-free rate does not reflect the rates in the market for capital finance nor the prevailing market cost of capital.[76] A five-year term would therefore violate the NPV=0 principle.[77]
- AER regulatory decisions affect cash flows over more than just the next regulatory period.[78] Market investors do not stop forecasting cash flows at the end of the regulatory period.[79] There is no evidence that firms and their investors limit their investment making timeframes to the length of the regulatory control period.[80]
- The only rationale for shorter term appears to be from Dr Lally's report and there are a number of limitations with Dr Lally's views.[81] The NPV=0 condition as applied by Lally is not relevant.[82] There is limited or no academic, or judicial support for Lally's application of this principle.[83]
- The evidence shows that a ten-year term for equity aligns with the AER's statement in its LTIC paper.[84]

- Data and considerations
  - Data on risk free rates in Australia is limited to term of up to around ten years. In jurisdictions where longer dated data is available, regulators have used them for estimating the return on equity.[85]
  - The five-year government bond is more thinly traded which raises questions about its suitability as a reliable proxy for the CAPM risk-free rate.[86] The RBA's yield targeting policy would have more effect on shorter-term government bonds and a five-year term may increase the risk of exposure to the RBA's policies.[87]

TransGrid, Endeavour, APA and APGA noted the possibility of estimating the return on equity using a term longer than ten years.[88] APA stated that if the CAPM is used to estimate the return on equity, there is no term for the return on equity to be aligned with either the

75 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 28.
76 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 43; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 3.
77 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 43; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 3.
78 APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 21.
79 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 45.
80 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 2.
81 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, pp. 3, 6.
82 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 2.
83 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 2.
84 Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 5.
85 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 2.
86 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, pp. 33–35.
87 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 22.
88 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 2; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 2; APA, *APA submission on draft rate of return working papers,* July 2021, p. 8; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 8.

regulatory control period or the life of the underlying asset.[89] To the extent that consideration must be given to term, APA considered that the risk free rate must be estimated using extensively traded government bonds with the longest terms to maturity.[90]

Endeavour, APA and APGA mentioned that Australian government bonds with a maturity of 30 years have been traded for approximately a year.[91]

Consumer submissions

The NICE and MEU submitted opposing views on the term for the return on equity whereas the CRG did not arrive at a final position:[92]

- The NICE stated that there is no reason to move away from a ten-year equity term.[93] It also advocated for a trailing average approach to be applied to the cost of equity.[94]
- The MEU considered that there is sufficient economic rationale for the AER to implement a five-year CGS.[95] It stated that the return on equity is reset every five years hence, the investment made by the networks is made for a five-year period.[96]
- The CRG did not arrive at a final position on the term debate and did not believe it is sufficient for the AER to rely solely on an argument of NPV=0 over the regulatory period.[97] The CRG indicated that the AER needed to provide more evidence and assessment to allow consumers and other stakeholders to assess the merits of the AER's proposed changes.[98]

Both the MEU and CRG considered that more reasoning should be provided on the rationale for a five-year equity term.[99] The CRG suggested the following:

---

89 APA, *APA submission on draft rate of return working papers,* July 2021, p. 8.

90 APA, *APA submission on draft rate of return working papers,* July 2021, p. 8.

91 Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, pp. 2–3; APA, *APA submission on draft rate of return working papers,* July 2021, p. 8; *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 8.

92 Network of Illawarra Consumers of Energy (NICE), *AER Rate of return instrument 2022–Term and financeability*, July 2021, p. 13; Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 10; CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 14.

93 Network of Illawarra Consumers of Energy (NICE), *AER Rate of return instrument 2022–Term and financeability*, July 2021, p. 1.

94 Network of Illawarra Consumers of Energy (NICE), *AER Rate of return instrument 2022–Term and financeability*, July 2021, p. 14.

95 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 10.

96 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 6.

97 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 14.

98 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 10.

99 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 6; CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, pp. 19–21.

- A review of how a shorter term would affect the overall treatment of risk in the compensatory arrangements provided by the Instrument.[100]
- How much lower a 5-year risk free rate would be than a 10-year rate and the relationship between the term of the risk-free rate and other parameters, namely the equity beta and the MRP.[101]
- Nothing in the AER's premises would preclude continuation of the current approach, whereby the AER seeks to satisfy the NPV=0 condition over life of long-lived investments.[102]
- The AER should assess the benefits of a shorter equity term.[103]

The MEU noted that the National Electricity and Gas Rules for regulated investments provides a high degree of certainty that any investment made will receive both a full return of and a return on any network investment made.[104] It also noted that more practitioners use the 10-year CGS but that might be more of a hangover from past practices and convenience.[105]

The MEU also noted that the tools are yet to be developed that would provide sufficient certainty as to what the values for MRP and equity beta might be in the ensuing years until the next reset.[106]

The CRG made the following observations:

- The working paper did not explain what prompted the AER to re-interpret its regulatory task and the NPV=0 principle.[107] The AER should consult on what the regulatory task is.[108]
- The Term paper did not address the CRG's principles which were submitted in the submission on the *International regulatory approaches to the rate of return* and *CAPM and alternative return on equity models* draft papers.[109]

---

100 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 25.

101 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, pp. 4, 20.

102 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 15.

103 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 22.

104 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 6.

105 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, pp. 7–8.

106 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 8.

107 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, pp. 15, 17.

108 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 5.

109 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 9; CRG, *Submission to AER, Return on equity*, October 2020, p. 21.

- Individual rate of return parameters, such as 'term', cannot be determined on a 'stand-alone' basis.[110]
- It is unacceptable for consumers if the term for inflationary expectations remains shorter than the term for the return on equity.[111] Should the AER not proceed with its proposal to shorten the term for the return on equity, it will need to revisit its earlier decision, shortening the term for inflation expectations.[112]

Investor submissions

Investors supported a ten-year term for the return on equity for the following reasons:[113]

- Retaining the ten-year term reflects current regulatory practice and market practice.[114]
- A ten-year term is consistent with the long lives of the underlying assets.[115] Investors in a long term infrastructure asset would also expect to retain that investment for a long term.[116]
- Satisfaction of the NPV=0 principle requires consumers to pay no more than necessary for network services over the life of the asset and not just the regulatory period.[117] The AER did not follow Lally's advice on 'term-matching' and NPV=0 condition in 2013 and 2018.[118]
- The assumption that the investor receives an amount equal to the RAB in cash at the end of the five-year regulatory period does not hold in reality.[119]
- From a pricing perspective, the AER assumes that CGS investors are indifferent between committing funds for 5 years or a significantly longer period. This is unlikely to be true in practice. This reasoning is consistent with current market practice.[120]

---

110 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 3.

111 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 37.

112 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 6.

113 Investors Mutual Ltd, *AER consultation on the term of the rate of return*, July 2021, p. 1; Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 2.; NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 11.

114 Investors Mutual Ltd, *AER consultation on the term of the rate of return*, July 2021, p. 3; Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 5; NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 11.

115 Investors Mutual Ltd, *AER consultation on the term of the rate of return*, July 2021, p. 1; Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 5.

116 NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 11.

117 Investors Mutual Ltd, *AER consultation on the term of the rate of return*, July 2021, pp. 2–3; NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 11.

118 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 3.

119 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 3.

120 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, pp. 3–4.

- 'Term-matching' does not hold even if regulated equity is viewed as a very long-term floating rate bond with 5-yearly rate resets.[121] The AER's regulatory task has not changed since the 2018 RORI.[122]
- An upward bias in the return on equity is warranted, as the alternative is a risk of insufficient investment in the face of the AEMO's 2020 ISP, potentially leading to poor consumer outcomes.[123]
- The AER risks creating a biased estimate of the rate of return by reopening this argument at a time in the cycle when the difference between a five and ten-year term is at its greatest.[124]

5.1.4 Form of the return on debt

Network submissions

Network stakeholders supported our preliminary view of maintaining the trailing average approach to estimating the return on debt:[125]

- The trailing average approach aligns with efficient debt financing practices and the standard debt financing practices adopted by firms with long-lived capital assets.[126]

There is no evidence to suggest that the benchmark approach of issuing 10-year debt on a staggered maturity basis has become inefficient since 2018.[127]

- The trailing average approach is easily replicable for networks to manage refinancing risk.[128]

---

121 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 1.
122 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 5.
123 Investors Mutual Ltd, *AER consultation on the term of the rate of return*, July 2021, p. 2.
124 NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 12.
125 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 8; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 16; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, p. 5; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 1; Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 2; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 3; AusNet Services, *Response to Low interest rate environment and Term of the rate of return draft working papers*, July 2021, p. 3; APA, *APA submission on draft rate of return working papers,* July 2021, p. 9.
126 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 8; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 16; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 12.
127 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 10.
128 AusNet Services, *Response to Low interest rate environment and Term of the rate of return draft working papers*, July 2021, p. 3.

- The trailing average approach satisfies the NPV=0 principle at the lowest cost to consumers and that the approach was advocated by Dr Lally.[129] Consumers will also benefit from lower volatility as they are not unduly exposed to market shocks.[130]

Several networks observed that regulated businesses have partially transitioned to a ten-year trailing average approach hence, adopting a different form for the return on debt would not promote regulatory predictability.[131]

Consumer submissions

The CRG, and NICE supported the continued use of the trailing average approach for estimating the return on debt:[132]

- Any change to the ten-year trailing average, particularly as the existing transition process is not yet fully implemented, would be complex and likely to disadvantage consumers.[133]
- The trailing average approach is transparent.[134] A trailing average approach would also lower cashflow and price volatility for businesses and consumers respectively.
- The AER should continue to consider how it can incorporate its analysis of observed debt practices and average debt term of the network businesses.[135]
- Businesses continually roll over debt and increase or decrease debt in relatively small amounts.[136]

The CRG acknowledged that there may be exceptional circumstances where the trailing average might result in sub-optimal outcomes.[137] Therefore, it recommended developing a framework, ex-ante, for deciding when exceptions should apply.[138] The CRG also stated that

---

129 APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 16.

130 Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 4; AusNet Services, *Response to Low interest rate environment and Term of the rate of return draft working papers*, July 2021, p. 3.

131 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 8; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 16; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 13; APA, *APA submission on draft rate of return working papers,* July 2021, p. 9.

132 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 4; Network of Illawarra Consumers of Energy (NICE), *AER Rate of return instrument 2022–Term and financeability*, July 2021, p. 1.

133 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 4.

134 CRG, *Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 4.

135 CRG, *Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 4.

136 Network of Illawarra Consumers of Energy (NICE), *AER Rate of return instrument 2022–Term and financeability*, July 2021, p. 14.

137 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 33.

138 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 27.

trailing average approach must persist through the interest rate cycle for it to be equitable to consumers.[139]

Investor submissions

The QTC outlined that a trailing average approach should be used to determine the cost of debt allowance.[140] It stated that the debt strategy implied by the trailing average approach reflects sound and established financial risk management principles that have not changed since the AER adopted the approach in 2013. Furthermore, the QTC disagreed with the three scenarios in the draft paper which indicated when the current trailing average approach may not be appropriate at the outset.[141] The QTC considered that none would support a move away from a trailing average approach.[142]

5.1.5 Term of the return on debt

Network submissions

Network stakeholders supported the current ten-year term for the return on debt which aligns with an efficient firm's borrowing for the following reasons:[143]

- Using the ten-year term promotes stability and predictability.[144]
- The current approach remains fit-for-purpose, is working well and many networks explicitly target a ten-year term to align with the benchmark.[145]
- The term should match the term that an efficient business seeks when issuing new debt.[146] A ten-year trailing average was adopted in the 2013 review with the support of major energy user and consumer representatives to better match the regulatory allowance to the benchmark efficient costs.[147]

---

139 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 33.

140 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 1.

141 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 6.

142 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 6.

143 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 8; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 16; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, p. 5; Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 1; Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 2; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 48; AusNet Services, *Response to Low interest rate environment and Term of the rate of return draft working papers*, July 2021, p. 3; APA, *APA submission on draft rate of return working papers,* July 2021, p. 9.

144 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, pp. 5–6;

145 Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 4.

146 APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 16; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 4; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, p. 5.

147 Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 4.

- Industry data supports using ten-year term.[148]
- A ten-year term is consistent with standard commercial practice and therefore best reflects the market cost of capital.[149]
- A ten-year term is consistent with standard regulatory practices by other Australian and international regulators and past AER decisions.[150] It is consistent with the long term nature of the energy infrastructure assets financed with debt.[151]
- Changing the debt term in each Instrument would result in a highly complex system of transitions.[152]
- A change from the current ten-year term to (say) a nine-year term would have a very small price impact over the next regulatory period for each network.[153]
- There are at least four reasons why a network might issue debt with term less than ten years and three of them should not warrant changing the term.[154]
- The allowed term of debt should only be changed if there is clear and sufficient evidence to do so.[155] There is no evidence to suggest that the benchmark approach of issuing ten-year debt on a staggered maturity basis has become so imprudent or inefficient since 2018 that a change in approach is warranted.[156]
- There has been no change to the long-lived nature of the assets held by networks nor to the market practice of owners of long-lived capital assets issuing long-term debt on a staggered maturity basis.[157]

---

148 Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 3; TransGrid, *Response to draft rate of return working papers*, July 2021, p. 9; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 3; Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 5; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 48; AusNet Services, *Response to Low interest rate environment and Term of the rate of return draft working papers*, July 2021, p. 3; APA, *APA submission on draft rate of return working papers,* July 2021, p. 9; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, p. 5; TransGrid, *Response to draft rate of return working papers*, July 2021, p. 3.

149 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, pp. 5–6.

150 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, pp. 5–6; TransGrid, *Response to draft rate of return working papers*, July 2021, p. 3; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, p. 5.

151 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 8; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, p. 5.

152 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, pp. 5–6; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, p. 5; TransGrid, *Response to draft rate of return working papers*, July 2021, p. 8.

153 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 19.

154 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 16.

155 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 16.; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 17.

156 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 48.

157 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 48.

TransGrid explained that there may be reasons why some businesses adopt different terms and this does not invalidate the widely held view that longer term debt is better placed to finance longer term investments like those made by energy networks.[158] Similarly, Endeavour outlined that networks' departure from the benchmark debt term is the individual choice of a network and does not cause alone for a change in benchmark.[159]

Consumer submissions

The CRG and NICE supported a benchmark debt term of ten years while the MEU outlined that the term of debt should reflect the most efficient period identified from the market.[160]

The MEU stated that the average term for an efficient portfolio of debt will vary over time.[161] It further explained that the NPV=0 concept requires the cost of debt to reflect the most efficient approach to debt provision.[162] In times of low cost for debt, the efficient provider would tend to seek longer term debt and at times of higher costs for debt, the efficient provider would tend to seek shorter term debt. Therefore, the MEU recommended implementing a debt term that varies according to the market, assuming that the market on average will deliver the most efficient outcome.[163]

Investor submissions

All investors supported a ten-year term for the return on debt which is consistent with the long life of the underlying assets.[164] The QTC and NSG explained that a ten-year term reflects the efficient practice of debt financing and allows a benchmark firm to maintain refinancing risk at an appropriately low level.[165] The QTC also outlined that a ten-year benchmark debt term is consistent with a first principles approach based on sound financial risk management principles, and supplemented by an analysis of actual debt issuance by service providers.[166] The NSG noted that market, analysts and valuation experts all use a term longer than five years for both debt and equity.[167]

The IML emphasised that matching the term of debt with the regulatory period is not required. It stated that consideration of the term for the rate of return should be satisfaction of

---

158 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 8.

159 Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 4.

160 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 4; Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 10; Network of Illawarra Consumers of Energy (NICE), *AER Rate of return instrument 2022–Term and financeability*, July 2021, p. 13.

161 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 9.

162 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 8.

163 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 9.

164 Investors Mutual Ltd, *AER consultation on the term of the rate of return*, July 2021, p. 1; Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 1; NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 11.

165 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 1; NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 11.

166 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 7.

167 NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 11.

the NPV=0 principal whereby consumers should pay no more than necessary for network services.[168] However, this should apply over the life of the asset and not just a regulatory period.

5.1.6 The use of the EICSI and corresponding WATMI in adjusting the benchmark debt term

Network submissions

Network stakeholders submitted varying views on the potential use of the EICSI and corresponding WATMI in adjusting the benchmark debt term.

AusNet Services outlined that an efficient debt term should be set with regard to industry debt data and that subordinated debt should be included in the EICSI. However, the AER should exercise judgement and consider observed efficient financing practices over the long term when using the EICSI.[169]

Endeavour and APA opposed the use of the EICSI and WATMI in adjusting the benchmark debt term.[170] They were concerned with the small sample underpinning the EICSI and stated that a longer term view is required to enhance the reliability of the index.[171] Endeavour explained that using actual debt data would adjust incentives and noted flaws with the EICSI.[172] It suggested excluding New South Wales (NSW) networks from the EICSI because the networks have been recently fully or partially privatised. Furthermore, Endeavour mentioned that the EICSI is not weighted by value or tenor, hence, it is materially and disproportionately impacted by short term debt. Endeavour also outlined that the EICSI cannot be replicated and that judgement during the annual debt cost update process is not permitted under a binding Instrument.[173]

The remaining network stakeholders had reservations about the proposed use of the EICSI and WATMI. TransGrid submitted that care needs to be taken when interpreting the outputs from the EICSI and WATMI while the APGA stated that the EICSI/WATMI should be objectively assessed.[174] The ENA and Ausgrid considered that the WATMI should only be used to adjust the debt term if a material and sustained departure from a ten-year term is evidenced.[175] Furthermore, the ENA outlined that subordinated debt should be included in the EICSI.[176]

---

168 Investors Mutual Ltd, *AER consultation on the term of the rate of return*, July 2021, pp. 2–3.
169 AusNet Services, *Response to Low interest rate environment and Term of the rate of return draft working papers*, July 2021, pp. 1–2.
170 Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 5; APA, *APA submission on draft rate of return working papers,* July 2021, p. 2.
171 Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 5; APA, *APA submission on draft rate of return working papers,* July 2021, p. 9.
172 Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, pp. 4–5.
173 Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 4.
174 TransGrid, *Response to draft rate of return working papers*, July 2021, pp. 8–9; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 17.
175 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 48; Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 5.
176 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 17.

Consumer submissions

The NICE did not support the use of the EICSI and corresponding WATMI in adjusting the benchmark debt term while the CRG indicated that more analysis on this approach is required.[177] The NICE stated that there is a significant evidentiary hurdle to be cleared before any additional changes can be made. It outlined that the case for change has not been made for the EICSI and WATMI especially since the index can be simply used to determine what ten-year series best aligns with the observed debt activity.[178]

The CRG supported the AER in gathering evidence about actual debt practices and opening a discussion about how the data can best be used.[179] However, it noted that the AER's proposed use of the EICSI and WATMI will result in a blending of two approaches namely, the trailing average and revealed costs approaches.[180] The CRG recommended the AER to assess whether blending the two approaches will encourage efficient debt management practices by regulated networks. Furthermore, CRG suggested that the AER should explain how it would monitor and guard against inefficient practices.[181]

Investor submissions

The QTC noted that the WATMI differing from a ten-year term should not automatically be interpreted as a change in the benchmark debt term. This is because service providers need to respond to real-world debt issuance factors and constraints. Service providers are free to depart from benchmark parameters and networks (not consumers) bear the costs or benefits from doing so.[182]

Furthermore, the QTC outlined that if the WATMI was used to determine the benchmark debt term, it is possible the term will change again at subsequent reviews. This may place service providers in an ongoing state of transition as they continually re-adjust their debt portfolios and hedges based on the latest WATMI estimate. The QTC stated that these outcomes are not consistent with maintaining a stable regulatory framework.[183]

The NSG and IML did not explicitly respond to the proposed use of the EICSI and WATMI in determining the benchmark debt term.

---

177 Network of Illawarra Consumers of Energy (NICE), *AER Rate of return instrument 2022–Term and financeability*, July 2021, p. 13; CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 32.

178 Network of Illawarra Consumers of Energy (NICE), *AER Rate of return instrument 2022–Term and financeability*, July 2021, p. 14.

179 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 27.

180 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 32.

181 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 33.

182 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 8.

183 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 8.

5.1.7 Possible transitional arrangements if a change in debt term is required

Network submissions

Four network stakeholders (APGA, ENA, AusNet and APA) stated that transitional arrangements will be required if there is a change in the benchmark debt term. They all noted the complexities with adopting a transition.[184]

TransGrid stated that creating this sort of complexity will confuse consumers and investors.[185] Nor is it clear how it would promote the long-term interests of consumers.[186] AusNet and ENA noted that this would introduce unwarranted complexity and potential additional costs into the regime.[187]

Ausgrid noted that the costs and benefits of implementing a transition should be considered as part of the decision to change the term.[188]

Many network stakeholders explained that regulated businesses are currently transitioning to the trailing average approach which was introduced in 2013.[189] Hence, another transition will be complicated and difficult for an efficient business to replicate.[190] The ENA noted that the additional complexities would hinder the ability of the Instrument to determine a clearly applied benchmark rate of return which is calculated on a consistent basis. There will also be a lack of transparency and clarity for stakeholders around the underlying basis for the allowed returns of individual firms if a transition is adopted.[191]

The ENA and Endeavour indicated that a change in the benchmark debt term may have a minimal impact on the rate of return, hence a transition should be carefully considered.[192]

---

184 APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, pp. 17–18; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 10; AusNet Services, *Response to Low interest rate environment and Term of the rate of return draft working papers*, July 2021, p. 3; APA, *APA submission on draft rate of return working papers,* July 2021, p. 10.

185 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 9.

186 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 9.

187 AusNet Services, *Response to Low interest rate environment and Term of the rate of return draft working papers*, July 2021, p. 3; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 19.

188 Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 5.

189 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 9; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 18; Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 3; AusNet Services, *Response to Low interest rate environment and Term of the rate of return draft working papers*, July 2021, p. 3; APA, *APA submission on draft rate of return working papers,* July 2021, p. 10.

190 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 9; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 4; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 18; AusNet Services, *Response to Low interest rate environment and Term of the rate of return draft working papers*, July 2021, p. 3; APA, *APA submission on draft rate of return working papers,* July 2021, p. 10.

191 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 18.

192 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 19; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 4.

AusNet noted that a change to the term of debt would also be a breach of regulatory certainty which was mentioned in the 2013 AER Rate of return Guidelines Explanatory Statement.[193]

Consumer submissions

The NICE considered that there should be no transitional arrangements while the CRG noted that a transition would be complex.[194] The CRG explained that the existing transition process is not yet fully implemented, therefore any additional transitional arrangements would be complex and likely to disadvantage consumers.[195]

Investor submissions

Investors did not explicitly comment on this issue.

5.2 Other items arising from stakeholder submissions

5.2.1 The regulatory task

The CRG stated that the AER should consult on what the regulatory task is.[196] It noted that the AER currently viewed its regulatory task as satisfying the NPV=0 condition in each regulatory period which contrasted with its past approach where it sought to satisfy the NPV=0 condition across the life of long-lived investments in network infrastructure.[197]

5.2.2 The AER's comparatively low allowed return on equity

The NSG and several networks (Endeavour, Energy Queensland and VPN/SAPN/AGIG) were concerned about the AER's comparatively low allowed return on equity and potential changes that could further reduce the rate of return.[198] Endeavour, NSG and

193 AusNet Services, *Response to Low interest rate environment and Term of the rate of return draft working papers*, July 2021, p. 3; AER, Better Regulation - Explanatory Statement – Rate of return guideline, p.137

194 Network of Illawarra Consumers of Energy (NICE), *AER Rate of return instrument 2022–Term and financeability*, July 2021, p. 13; CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 4.

195 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 4.

196 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 5.

197 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 9.

198 NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, pp. 1, 7; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, pp. 1-2; Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 2; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, pp. 2–3.

VPN/SAPN/AGIG questioned whether the AER's current approach provides an efficient level of investment and is in the long term interests of consumers.[199]

The NSG and Energy Queensland were also concerned that the AER was contemplating making changes that would potentially further reduce the allowed rate of return.[200] Endeavour stated that the AER should reconsider how the options and preliminary positions in the draft paper would contribute towards a stable regulatory environment and an efficient rate of return.[201]

5.2.3 Upward bias in the return on equity

The IML suggested adopting an upward bias in the return on equity to provide positive investment in the AEMO's 2020 Integrated System Plan (ISP).[202] The IML explained that providing a positive investment signal to deploy capital in large, greenfield transmission projects would be critical in meeting consumer expectations. The alternative would be a risk of insufficient investment, potentially leading to poor consumer outcomes.

5.2.4 Aligning the efficient cost of capital with the NEL/NGL and NEO/NGO

The NSG submitted that the AER had not established how the estimated cost of capital was consistent with the NEL/NGL and NEO/NGO while TransGrid stated that the AER should clarify how it would apply its guiding principle.[203]

The NSG outlined that it was critical that the AER gave weight to actual practice of equity analysts, valuation experts and views of equity investors in fulfilling its task of estimating the efficient cost of equity.[204] The NSG also emphasised the importance of measuring impacts and outcomes. Furthermore, the NSG stated that the AER would benefit from additional steps to increase transparency and accountability.

TransGrid stated that the *Long term interests of consumers* position paper did not explain how the AER would apply the principle to determine the methods and assumptions adopted in the 2022 Instrument.[205]

---

199 CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, p. 2; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 1; NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 4.

200 NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 7; Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 2.

201 Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 2.

202 Investors Mutual Ltd, *AER consultation on the term of the rate of return*, July 2021, p. 2.

203 NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 2; TransGrid, *Response to draft rate of return working papers*, July 2021, p. 6.

204 NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 2.

205 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 6.

5.2.5 The NEO/ NGO and the CRG's principles

The CRG noted that AER's working papers focussed on promoting investment efficiency.[206] It considered that this was a simplistic assumption and ignored consumers' behavioural responses to the regulatory framework, and changes to the framework.

The CRG submitted that its five principles were integral to the AER achieving the second part of its statutory objective, namely the promotion of efficient operation and use of energy for the long-term interests of consumers.[207] The CRG considered that the AER should take into account the CRG's five principles when developing regulatory proposals.[208]

5.2.6 Misinterpretation of the CRG's Inflation Review submission

The CRG submitted that the Term paper misrepresented the CRG's position when it claimed the CRG supported a shortening of the term used for estimating the return of equity. It noted that the AER shortened the term for inflationary expectation in its Final Inflation position paper in December 2020 and presumed the CRG's position on the term for the return on equity.[209]

We note the CRG's concern and address this point in section 7.6.

206 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 12.

207 The CRG's five principles were included in their submission on the *International regulatory approaches to the rate of return* and *CAPM and alternative return on equity models* draft papers in 2020; CRG, *Submission to AER, Return on equity*, October 2020, p. 21; CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 12.

208 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 9.

209 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 35.

6 AER discussions and positions

This section sets out our proposed positions on the preliminary views and discussions raised in our draft working paper. We have advanced our thinking and formed positions based on the consultation and engagement process. The options and proposed approaches are summarised in Table 2.

Table 2 Summary of our positions in the draft and final papers

Draft paper positions and thinking	Final paper positions and thinking
The term of rate of return and term for expected inflation should be independently assessed.	Preferred position is to maintain our draft paper view, but we note that the choice of terms for rate of return and inflation is underpinned by the same principles and this may lead to the same term being applied.
The term of equity and the term of debt do not need to align.	Preferred position is to maintain our draft paper view.
Open position on changing the term of equity to match the length of the regulatory period or maintain current practice of matching to the underlying asset lives.	Preferred position is to maintain our draft paper view and not set out a view on the equity term. We will continue to consider and consult on this topic.
Our preliminary position is to maintain the use of a trailing average return on debt.	Preferred position is to maintain the use of a trailing average return on debt.
We propose to match the term of debt to that of an efficient firm's borrowing.	We maintain the view that the debt term should match that of an efficient firm's borrowing. We propose to leave its numerical value open for further consideration in the final *Omnibus* paper.
We propose to consider using the EICSI and corresponding WATMI to inform the return on debt term to better match that of an efficient firm's borrowing.	We propose to leave the use of the EICSI and WATMI open for further consideration in the final *Omnibus* paper.

6.1 Do the terms need to align between equity, debt and expected inflation?

Our preferred view is to maintain our position in the draft paper, which is that the terms for the return on equity, return on debt and expected inflation should be independently assessed. However, we note that common principles underpin the choice of term in each case. We have explored the evidence available to us including stakeholders' submissions. We accept that similar evidence and reasoning might be applicable in each context and this may result in us choosing terms that are consistent between equity, debt and expected inflation.

6.1.1 Does the term of the rate of return need to align with that of expected inflation?

Our preferred view is that the terms for the rate of return and expected inflation should each be determined independently and therefore do not have to be the same value. We note however that these parameter choices are largely underpinned by the same principles (in particular, NPV=0 principle). As such, the application of the underlying principles may well lead to the same terms being chosen.

In the draft paper, we put this view forward and asked stakeholders whether the term for the rate of return and term for expected inflation should align.

In determining the terms for the expected inflation and the rate of return we are guided by the extent to which particular parameter values contribute to achieving the NEO and NGO (the objectives).

In the 2020 Inflation Review, we decided the appropriate term for our estimate of expected inflation should align with the length of the regulatory period. We reached this conclusion because it would:[210]

- satisfy the NPV=0 principle (if a five year rate of return is also used)
- result in expected RAB indexation matching the amount taken out over the regulatory period
- be more responsive to changes in market circumstances
- allow for prices and revenues to continue to move along with inflation and maintain the current indexation of the RAB to allow intergenerational equity between consumers.

However, it is worth noting we considered that continuing to apply a ten-year forecast of inflation would result in an approximately NPV=0 outcome over the life of the assets. If expected inflation is a time series that mean reverts to 2.5 per cent per annum, future expected five- and ten-year inflation expectations across five year periods both equal 2.5 per cent per annum. There is evidence to support expected inflation being a mean reverting series.[211] However, a ten-year inflation expectation estimate would also need to reflect expectations over years six to ten whereas a five-year expectation stops at year five. Dr Lally also noted that reversion back to the 2.5 per cent value was expected to be slow.[212]

Therefore, potentially the key impact of the change was to make the real return more responsive to changes in short term (regulatory period) inflation expectations.

Applying the NPV=0 principle to determine the allowed rate of return provides an opportunity for service providers to recover their efficient costs and contributes to achieving the NEO and NGO.[213] For this reason, just as we did in the 2020 Inflation Review, we place high

---

210 AER, *Final position regulatory treatment of inflation*, December 2020, pp. 28–41.
211 Dr Martin Lally, *Review of the AER's inflation forecasting methodology,* 8 July 2020 p. 3.
212 Dr Martin Lally, *Review of the AER's inflation forecasting methodology,* 8 July 2020 p. 3.
213 Partington, G., Satchell, S., *Report to the AER: Discussion of the allowed cost of debt*, 5 May 2016, p. 14; AER, *Rate of*

importance on satisfying the NPV=0 principle in determining the terms for the rates of return on debt and equity. We also consider other factors to the extent they are likely to contribute to achieving the objectives.

We consider that the application of the NPV=0 condition to the term for return on equity supports using a term for equity that matches the length of the regulatory period. This is because, while we assume inflation expectations are mean reverting, this is not necessarily the case for the return on equity.

The term structure of interest rates appears to be upward sloping on average (that is, on average the ten-year risk free rate is expected to exceed the five-year risk free rate). This means that if a five-year risk free rate gives the correct return (in terms of the NPV=0 condition) over a single regulatory period, a ten-year risk free rate will give incorrect compensation over that single regulatory period and also, in expectation, over the remaining asset life. It would provide expected overcompensation in future regulatory periods because the ten-year risk free rates are expected to exceed the five-year risk free rates in the future.

The CRG noted that it did not support changing to a five-year term for inflation and considered that the term for inflation must be consistent with the term of the rate of return.[214] The mismatch between a ten-year nominal rate of return and a five-year expected inflation is arguably a relevant consideration when determining the term for the rate of return. However, it is not a sole consideration. We place high importance on satisfying the NPV=0 condition. In the context of debt term, we have regard to the efficient borrowing practices of regulated business. We also have regard to our preferred position on retaining the trailing average return on debt and Dr Lally's advice. Therefore, the task of determining the allowed rate of return contributing to the achievement of the NEO and NGO requires regulatory judgement.

We have examined the evidence available to us including expert views related to this topic. We note that approximately half of the domestic regulators we reviewed in the draft paper set different terms for the rate of return and expected inflation.[215] We consider that stakeholders have not provided additional information to that considered in the draft working paper.

On that basis our preferred position is to maintain the view that the terms for the rate of return and for the expected inflation should be independently assessed, although we accept both decisions would use similar reasoning and must be reconcilable.

6.1.2 Should the term of equity and debt align?

Our preferred view is that the terms for the return on equity and return on debt do not necessarily need to be the same. We propose to independently assess them.

Our draft working paper noted the views of various experts on this topic. Dr Lally and the Competition Economists Group (CEG) stated that the terms for equity and debt do not need

return instrument, Explanatory statement, December 2018, p. 35 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, pp. 32–34.

214 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 27.

215 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, p. 35.

to be the same.[216] Furthermore, submissions have not provided additional evidence to that considered in the draft working paper.

Many stakeholders supported our preliminary view in the draft paper which stated that the terms of equity and debt do not need to match (see section 5.1.2).

The NICE submitted that the trailing average approach with the same term should be used for return on debt and return on equity, therefore the terms for equity and debt should be the same.[217] While there might be merit to matching the terms of debt and equity were we to adopt a trailing average approach for both, we do not consider stakeholders have provided persuasive evidence in favour of adopting trailing average for equity at this time.

The CRG indicated that without additional evidence from the AER, stakeholders cannot genuinely assess the merits of the AER's proposed changes.[218] As discussed in Section 6.2.1.1, we decided to defer our view on the term of equity to later in the 2022 process to take advantage of any additional information and evidence that may become available via submissions to the information paper and concurrent evidence sessions. At the same time, we do not consider this precludes us from forming a view on whether term for equity and debt should match. As discussed in section 6.1.1, we place high importance on the NPV=0 principle. Applying the NPV=0 principle and other relevant considerations independently to the terms for equity and debt would not necessarily lead to the two values being the same.

6.2 What is a suitable term for the rate of return?

In Section 6.1, we considered that the terms for the return on equity, return on debt and expected inflation did not need to align, but the choice is informed by common principles. We consider the suitable term for equity and term for debt below.

6.2.1 Term of the return on equity

6.2.1.1 AER view

We have not reached a view on the appropriate term for the return on equity at this stage and we are considering this issue to be open.

There are typically two options for the term of equity:[219]

- Match to the length of the regulatory period (typically five years).
- Match the underlying asset lives (typically ten years is used as it is considered to better reflect long asset lives).

---

216 CEG, *WACC estimation a report for South East Queensland water businesses*, February 2011, p. 2; Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, p. 4.

217 Network of Illawarra Consumers of Energy (NICE), *AER Rate of return instrument 2022–Term and financeability*, July 2021, pp. 1, 14.

218 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 10.

219 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, p. 38.

Our draft working paper explored and sought submissions on which option would be more appropriate.[220] We revisited and reconsidered previous material on the term of equity (and the term of the rate of return) and reviewed reasons in favour of each option.

Our thinking in the 2020 Inflation Review reinforced the analytical framework used by Dr Lally. Using a stylised model Dr Lally illustrated how the NPV=0 condition would hold when the terms of the expected inflation and rate of return matched the length of the regulatory period. We found Dr Lally's 2020 advice on the expected inflation term compelling, and by moving to a five-year term for expected inflation, we have implicitly endorsed his modelling and approach for applying the NPV=0 principle. We also indicated that we would review the term of the rate of return in light of these advances in our thinking as part of our 2022 Rate of Return Instrument review.[221]

While matching the equity term to the length of the regulatory period did not receive strong stakeholder support, we still consider there are merits to this approach. This is for the following reasons (which are discussed in their respective sections below):

- It satisfies the NPV=0 conditions (section 6.2.1.2). By contrast, a ten-year term does not clearly match the NPV=0 condition and may lead to incorrect compensation for investors in regulated networks.
- Our allowed return on equity differs from market practitioners' use (section 6.2.1.4).
- Consistency with the 2020 Inflation Review (section 6.2.1.5).

We are mindful that the CRG and MEU have requested more evidence on the option of matching the term of equity to the length of the regulatory period. [222] We also note that network and investors stakeholders supported maintaining the current practice of matching to the underlying asset lives. [223]

We believe a more holistic approach to considering the term of equity should be undertaken so that stakeholders have more information to guide their views. We have already carried out some preliminary work on the effect of matching the equity term to the length of the regulatory period on historical excess returns. We have also published an Excel workbook which allows stakeholders to undertake their own scenario analysis. These are discussed in more detail in section 6.2.1.5.

---

220 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, p. 38.

221 AER, *Final position regulatory treatment of inflation*, December 2020, p. 23.

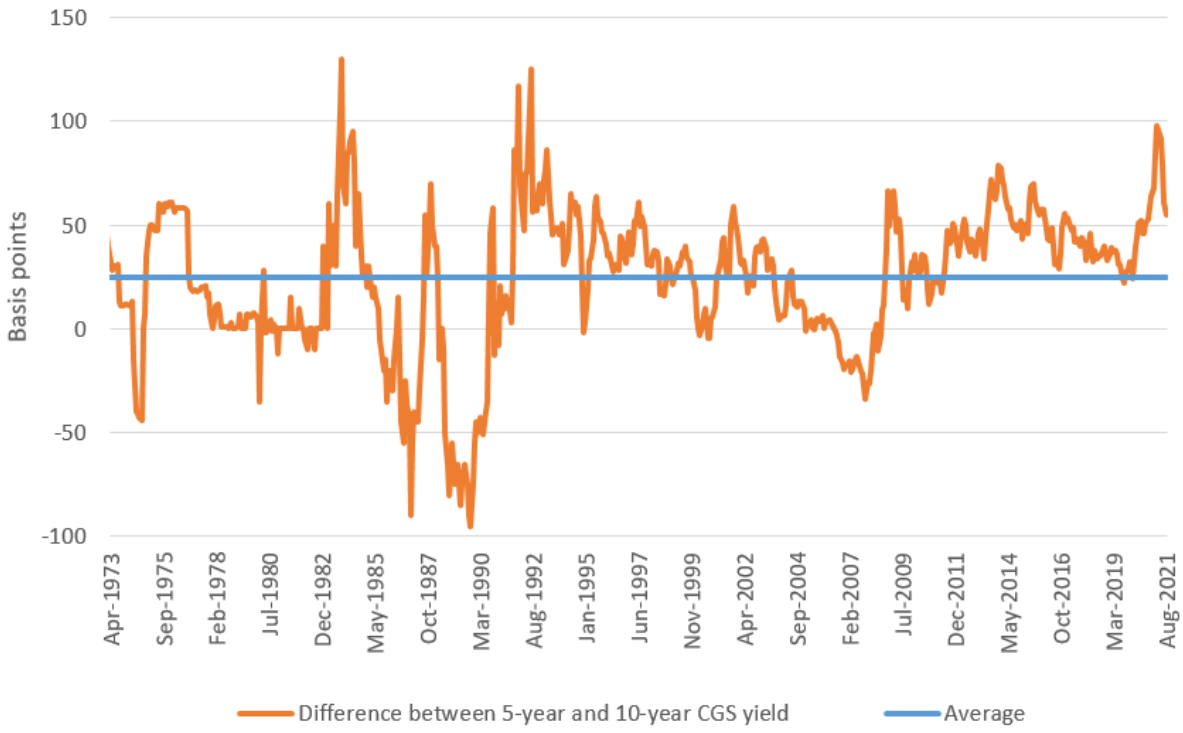
222 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 6; CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, pp. 19–21.

223 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 3; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 15; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, p. 5; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 1; Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 1; Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 6; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 3; Investors Mutual Ltd, *AER consultation on the term of the rate of return*, July 2021, p. 1; Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 2.; NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 11.

Therefore, we will continue to consider and consult on this topic as part of our 2022 review and will include it as a topic for discussion at the concurrent expert evidence sessions for the following reasons:

- We note that (new) evidence on the term of equity (and the broader term of the rate of return) in the regulatory context can be sparse, especially outside of reports written by expert advisors. We would like more opportunities to gather evidence and hear expert opinions (particularly from the concurrent expert sessions) before reaching a view.
- The concurrent expert sessions would provide more material for all stakeholders to consider. We have also conducted some preliminary work on the effect of changing the term of equity to match to the length of the regulatory period. The submissions to our draft working paper have provided some useful guidance on questions for the sessions.
- The difference between the yield on five-year and ten-year CGS was recently approaching historic highs (Figure 1). RBA data suggest that, historically, the average difference between five and ten-year CGS is around 25 basis points. However, recent data indicated a difference of 98 basis points before declining to around 55 basis points in August 2021. This difference would be partially offset by an increase in the MRP estimate in the resulting allowed rate of return. In these circumstances, the difference in the allowed rate of return due to the difference between the five- and ten-year equity terms is likely to be material. We consider it prudent to defer our view on the term of equity to later in the 2022 process to take advantage of any additional information and evidence that may become available via submissions to the information paper and concurrent evidence sessions. Stakeholders will have an opportunity to further comment on the term of equity in their submission on the Draft Instrument in September 2022.

Figure 1 Difference between Australian Government five and ten year bonds (April 1973 to August 2021)



Source: RBA

6.2.1.2 Theoretical foundation of matching the equity term to the length of the regulatory period

In this section we briefly outline the theoretical foundations of matching the term for equity to the length of the regulatory period.

In our building block model, with the allowed rate of return on equity being reset at the beginning of each regulatory period, an equity term that matches the length of the regulatory period would satisfy the NPV=0 principle at the time of each such reset.

Dr Lally and Professor Davis have demonstrated that the term of the return on equity should match the length of the regulatory period to avoid excess returns to asset owners.[224] Further, in our 2016 AusNet decision we also illustrated mathematically that, under the on-the-day approach to return on debt, matching the term of the return on capital to the length of the regulatory period delivers NPV=0.[225] We also recognised that using a ten-year term would lead to overcompensation, which was not likely to be material at that point of time.[226] The

224 Kevin Davis, *Risk-free interest rate and equity and debt beta determination in the WACC, Prepared for the ACCC*, August 2003, p. 10; Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, pp. 11–12.

225 AER, *Final decision AusNet Services distribution determination 2016 to 2020 Attachment 3 – Rate of return*, May 2016, p. 300.

226 AER, *AusNet Services distribution determination, Final decision*, May 2016, Attachment 3 pp. 300–301, including footnote 1187.

2020 Inflation Review adopted Dr Lally's modelling and approach to applying the NPV=0 principle, which also supported matching the equity term to the length of the regulatory period.

Our regulatory framework sets revenue requirements for the length of the regulatory period (typically five years). Our allowed rate of return on equity is fixed for the length of the regulatory period. That is, during a regulatory period, regulated businesses are allowed to receive a sequence of cash flows based on the fixed allowed return on equity. Then, the allowed return on equity is reset for the next regulatory cycle (typically, five years), and so on.

In this regulatory framework, the appropriate term for equity should then match the length of the regulatory period. Otherwise, the NPV=0 condition would be violated.

When the term of equity exceeds the length of the regulatory period, there would typically be excess returns for owners of the regulated assets.[227] That is, a ten-year term for the return on equity would be expected to result in over-compensation, unless the return on equity is reset every ten years, rather than every regulatory period. In this framework, if the allowed return on equity were reset every N years, then the NPV=0 condition would be satisfied when the term for equity is set at N years. We note that in our return on debt allowance, each of the ten return on debt tranches is reset once in ten years and has a ten-year term.

In the context of the 2020 Inflation Review, the NSG suggested that any estimate of costs expected to be incurred in future periods is irrelevant for the estimate of efficient costs over the regulatory period, since the costs and revenue are reset in the next regulatory period.[228] While the comment was made with regards to the term of expected inflation, we consider this reasoning equally applies to all cost categories, including cost of capital. That is, estimates of opportunity cost of capital expected over future regulatory periods should not be relevant to the estimate of efficient costs (and hence the allowed revenue) over the current regulatory period, because the regulatory revenues are reset in the next period.

A simple illustrative example may be a five-year fixed rate home loan.[229] A borrower may end up refinancing with the same lender or repaying the loan in full either in five years or earlier, but, regardless, until then they will be paying a five-year interest rate on the value of their five-year loan. Even if the borrower ends up refinancing their loan repeatedly over the next thirty year period, their interest rate on the five-year fixed rate loan will not be a thirty-year rate. The lender and borrower would agree to a five-year rate to compensate for expected risk over the corresponding five-year period. Otherwise, market competition would ensue until equilibrium is reached and a five-year rate prevails.

Dr Lally also advised that the valuation problem confronting a regulator with a five-year regulatory cycle is different from that of valuing an unregulated business.[230] The difference is due to the regulatory revenue allowances being reset at the start of each regulatory cycle.

---

227 Kevin Davis, *Risk-free interest rate and equity and debt beta determination in the WACC, Prepared for the ACCC*, August 2003, p. 10.

228 NSG, *Re: Draft position on the regulatory treatment of inflation*, November 2020, p. 2.

229 Note that we are not proposing that there likeness between a home loan and a regulatory allowance. Rather, this example aims to illustrate the idea that a term of an interest rate or a required rate of return is related to the period over which it is set and collected, rather than the life of an underlying physical asset.

230 M. Lally, *The appropriate term for the allowed cost of capital*, April 2021, p. 21.

This affects the way in which these revenues should be discounted. Dr Lally likened the valuation problem of a regulator to valuing a floating rate bond with a coupon rate reset every five years.[231] We further explore some aspects of Dr Lally's advice and address stakeholders' comments in section 6.2.1.4.

6.2.1.3 Submissions to the draft working paper

We note submissions to our draft working paper did not raise substantively new arguments on whether to match the term for the return on equity to the length of the regulatory period or the underlying asset lives. They were similar to the material considered in our previous rate of return reviews in 2013 and 2018 and revenue determinations. However, since our thinking and analytical framework evolved since 2018, we consider it important to review and respond afresh to the issues raised in the submissions. Further, our considerations would inform the expert discussions at the concurrent evidence sessions.

We discuss the key points of the submissions to the draft Term working paper below.

6.2.1.4 Response to network and investor submissions

Network and investor stakeholders supported matching the term for return on equity to the underlying asset lives. Their arguments can be distilled into the following key points:

- Using a ten-year term is consistent with market, academic and regulatory practice
- It would be supported by regulatory precedence and stability
- Dr Lally's advice has limitations

We respond to each of these points below.

Is a ten-year equity term consistent with market practice and academic literature?

The ENA and other industry stakeholders submitted that a ten-year term for the return on equity should be maintained because it is consistent with standard market practice, consistent with the theory of SL CAPM and best reflects well-accepted academic literature.[232] In the 2018 RORI explanatory statement we also stated that the ten-year term reflects the actual investor valuation practices and academic works and is consistent with the theory of the SL CAPM.[233]

---

231 M. Lally, *The appropriate term for the allowed cost of capital*, April 2021, p. 21; B. Tuckman, *Fixed income securities: tools for today's market*, 2nd ed., Wiley Finance, pp. 374–376.

232 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 3;TransGrid, *Response to draft rate of return working papers*, July 2021, p. 3; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 15; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, p. 5; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 1; Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 1; Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 6.

233 AER, *Rate of return instrument, Explanatory statement*, December 2018, p. 126.

The two academic references we used in 2013 and 2018 rate of return reviews are excerpts from an academic article and a popular finance textbook.[234] Both extracts discuss practical considerations of selecting discount rates (and their risk free components) – in particular, in the context of business valuations.

They suggest that it is a common market practice to use the same rate to discount expected net cash flows for different years in business valuations.[235] This is a 'practical compromise' rather than the 'purist' (theoretically more accurate) solution of matching the rate to the timing of the cash flow.[236] It is a pragmatic solution, since refining rates to make them year-specific 'may not be worth the effort' when performing business valuations.[237]

In the context of valuing going-concern businesses and long-term investments, use of long-term government bonds as the risk-free security and estimating the ERP in relation to those 'represents a realistic, simplifying assumption and is consistent with the CAPM'.[238]

Actual investor valuation practices appear to be consistent with using long-term government bonds.[239] In case of Australia these are ten-year Commonwealth Government Securities.[240]

We do not, however, estimate the allowed rate of return to be used as a discount rate for a business valuation. In our building block model, by construction, the market value of a regulated business is equal to its book value, RAB, as long we ensure NPV=0. We estimate the allowed rate of return in order to be able to evaluate the return on capital building block and then the maximum allowed revenue of a regulated business. In other words, we estimate components of expected cash flows for a regulated business. When present value is computed, cash flows go into the numerator and discount rates – into the denominator of a formula. Moreover, at any regulatory determination we only estimate a 'snapshot' of cash flows – revenue allowances for a single regulatory period, rather than cash flows for an entire asset life.

That is, our exercise is different from that faced by a market practitioner performing a business valuation. Therefore, while using ten-year CGS yields in market valuations is supported by both academic works and market evidence, it is not clear that the same evidence provides support for using ten-year term for the allowed return on equity in our regulatory context.

Regulatory precedence and stability

Several network and investor stakeholders indicated that maintaining the ten-year term for equity is supported by regulatory precedence and stability argument.

---

234 Aswath Damodaran, '*What is the risk free rate? A search for the basic building block*', December 2008; Shannon Pratt and Roger Grabowski, Cost of Capital: Applications and Examples, 4th ed. Hoboken: Wiley, 2010.

235 Aswath Damodaran, *What is the risk free rate? A search for the basic building block*, December 2008, p. 8.

236 Aswath Damodaran, *What is the risk free rate? A search for the basic building block*, December 2008, pp. 6–10.

237 Aswath Damodaran, *What is the risk free rate? A search for the basic building block*, December 2008, p. 8.

238 Shannon Pratt and Roger Grabowski, *Cost of capital: Applications and examples, 4th Ed. Hoboken: Wiley, 2010*, p. 120.

239 AER, *Rate of return instrument, Explanatory statement*, December 2018, p. 127; Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, p. 5; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 28; Investors Mutual Ltd, *AER consultation on the term of the rate of return*, July 2021, p. 1; Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 5; NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 11.

240 AER, *Rate of return instrument, Explanatory statement*, December 2018, p. 127.

We note that we need to make decisions that contribute to the achievement of the NEO and NGO and must have regard to the RPPs when setting the rate of return instrument. Regulatory precedence and stability inform our views to the extent these considerations align with the achievement of the NEO and NGO.

Despite adopting the ten-year term for expected inflation in our past decisions, we have moved away from our previous position in our 2020 Inflation Review because the evidence before us indicated a change was justified.[241] Many of the investor and network stakeholders supported our decisions, even though the considerations of regulatory stability would suggest maintaining the status quo. In our 2020 Inflation Review, we relied on applying the NPV=0 principle and the related analytical framework employed by Dr Lally. We considered these would allow us to make decisions that better contribute to achieving the NEO and NGO. We thought, and think, that it is important to consider the term of the rate of return in the context of the same framework to allow consistency in our decisions and better contribute to achieving the NEO and NGO.

Based on our thinking from the inflation review, our further review of previous material and the 2021 Lally report, we consider matching the term of return on equity to the length of the regulatory period would satisfy the NPV=0 principle each period and thus may better contribute to achieving the NEO and NGO. This is also consistent with the precedent we set in the inflation review.

Dr Lally's advice and its limitations

The QTC, TransGrid, Endeavour and ENA considered that Dr Lally's advice focused overtly on the regulatory period and were critical of his floating bond example:

- Dr Lally's advice on matching to the length of the regulatory period assumes investor receives an amount equal to the RAB in cash at the end of the five-year regulatory period does not hold in reality.[242]
- Dr Lally's example of a perpetual bond with a coupon that is reset every five years for the term of equity is incorrect.[243]
- The NPV=0 condition as applied by Dr Lally is not relevant. There is no evidence that firms and their investors limit their investment making timeframes to the length of the regulatory control period, rather they clearly are concerned with the present value of cash flows expected after that period ends.[244]

ENA submitted that the assumption that the market value of the firm at the end of each regulatory period was known with certainty at the beginning of each regulatory period was critical to Dr Lally's conclusion on the equity term and without this assumption Dr Lally's key

241 AER, *Final position, Regulatory treatment of inflation*, December 2020, p. 48.
242 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 3; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 41.
243 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 3; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 41.
244 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 2.

conclusion would not be obtained.[245] ENA appears to infer that Dr Lally makes such an assumption based on equation (4) in his 2021 report.[246]

Dr Lally's report has clarified some of these points. Dr Lally noted that the term of equity would need to match the length of the regulatory period to satisfy the NPV=0 condition.[247] He confirmed that no assumption of asset book value recovery in cash at the end of the first regulatory period was made.[248] He further observed that his analysis was performed in terms of expected revenues and did not assume the value of the regulated assets at the end of the current regulatory period was known for certain.[249]

We have reviewed Dr Lally's derivations and point out that equation (4) in Lally's report does not mean that the market value of the firm at the end of the first regulatory period is always known with certainty. Rather, the derivations on pages 7 and 8 and equations (1) to (4) suggest that a regulator should be able to set the allowed rate of return so as to ensure that the expected market value of the firm at the end of the first regulatory period is equal to its asset book value. Setting the regulatory allowance in this way would allow the regulator to achieve NPV=0.

Naturally, the model made simplifying assumptions and Dr Lally was open about them. However, he did not make the assumption that the ENA submitted. The formula defining the market value at the end of the first regulatory period is equation (1). Only if the regulator chooses the second period return on capital regulatory allowance to match the discount rate for that period does equation (1) become equation (4).

On Dr Lally's example of a floating rate bond, QTC submitted that AER was effectively viewing regulated equity as a long-term floating rate CGS with a coupon that is reset every five years to equal the prevailing five-year CGS yield plus an equity risk premium. Based on that QTC suggested that to mean that CGS investors are indifferent between committing funds for 5 years or a significantly longer period of time.[250] QTC then appeared to conclude that because of the (currently) upward sloping CGS term structure, if the coupon were set to equal the prevailing 5-year risk-free rate at each reset, the expected outcome over the life of the asset would be NPV<0.[251]

Firstly, while we used Dr Lally's analogy of a sequence of regulatory allowance being like a floating rate bond, we did not contemplate it being a long-term floating rate CGS. Rather, just like floating rate bonds in Australia use 180 day Bank Bill Swap Rate (BBSW) as a benchmark, we contemplated a long-term floating rate bond that used a five-year CGS yield as a benchmark for the risk free rate in the CAPM with the CAPM equity risk premium added to the benchmark.[252]

---

245 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 37.
246 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, pp. 38–39.
247 Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, p. 3.
248 Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, p. 8.
249 Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, p. 9.
250 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 3.
251 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 4.
252 https://www.fiig.com.au/research-and-education/fixed-income-education/bbsw-and-bbsy; https://www2.asx.com.au/connectivity-and-data/information-services/benchmarks/benchmark-data/conventions-and-calculation-methodologies.

Secondly, we were not proposing that investors were indifferent between committing their funds for 5 years or a much longer period of time. Indeed, the term structure of interest rates (including CGS yields) tends to be, on average, upward sloping. Further, just like with any long-term floating rate bond, the investors could choose to hold their asset to maturity or sell it at an earlier date. None of this, however, suggests that long-term investors in a floating rate bond that receive coupons based on five-year rates would expect to receive NPV<0. Standard finance textbooks suggest that the market value of a floating rate bond depends on the short-term rate over the period leading up to the next coupon reset (rather than the rate over the entire bond term). Further, ex-coupon value of a floating rate bond on all coupon reset dates is its par value.[253] This is analogous to how the market value of regulated assets would equal to their book (par) value at each regulatory reset for the correctly set parameter values.

6.2.1.5 Response to consumer submissions

A key theme of consumer submissions is that more evidence should be provided on the rationale for a five-year equity term.[254] The CRG has also framed this around the following four questions:

- What are the circumstances that necessitate a re-interpretation of the AER's regulatory task?
- What are the theoretical foundations of the AER's alternative approach?
- What are the practical implications of implementing the alternative approach?
- What are the consequences of adopting the alternative approach?

We explored the theoretical foundations of matching the equity term to the length of the regulatory period in section 6.2.1.2 above. Below we respond to each of the three remaining questions.

Circumstances surrounding re-interpretation of regulatory task

As stated in our draft working paper, we are exploring the term of equity (along with the broader term of the rate of return) because we advanced our thinking and approach to the term of expected inflation in the 2020 Inflation Review. In particular, to arrive at our decision, we relied on applying the NPV=0 principle and the related analytical framework employed by Dr Lally. We have further refined the analysis of the NPV=0 requirement which has led to stronger support for the alignment of the equity term to the length of the regulatory period. We considered this would better contribute to achieving the NEO and NGO. We thought, and think, that it is important to consider the term of the rate of return in the context of the same framework so that we have consistency in our decisions.

---

253 B. Tuckman, *Fixed income securities: tools for today's market*, 2nd ed., Wiley Finance, pp. 374–376; M. Choudhry, *Fixed-income securities and derivatives handbook, Analysis and Valuation*, Bloomberg Press, Princeton, p. 228; R. Brealey, S. Myers, F. Allen, *Corporate Finance*, 12th ed., McGrawHill Education, New York, p. 600.

254 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 6; CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, pp. 19–21.

Further, we previously noted that the difference in the overall rate of return between the five- and ten-year equity terms was unlikely to be material.[255] Given the current divergence in the five-year and ten-year CGS yields (see Figure 1), we think it is now important to review which option is more appropriate.

Consequences and practical implications of changing the term for equity

The draft Term working paper took a relatively stand-alone approach, focused primarily on that parameter, to assess the term of equity. Based on the CRG's submission, we consider that a more holistic approach is needed so that stakeholders have more information to form their views.

We have already conducted preliminary work on the impact on other rate of return parameters from changing the term of equity as the CRG has suggested. [256]

Our draft Equity omnibus working paper outlined this impact when estimating historical excess returns (HER). Our current approach is based on deducting the historical ten-year risk free rate from historical total market returns.[257] A five-year term entailed using a five-year risk free rate which led to higher HER estimates holding all other factors constant (see table below).

Table 3 HER - Example differences between five and ten year estimates

Time period	MRP (Geometric) 10 year	MRP (Arithmetic) 10 year	MRP (Geometric) 5 year	MRP (Arithmetic) 5 year	Difference (Geometric 5 year – 10 year)	Difference (Arithmetic 5 year – 10 year)
1972-2020	4.1%	6.5%	4.3%	6.7%	0.2%	0.2%
1980-2020	4.5%	6.6%	4.8%	6.9%	0.3%	0.3%
1988-2020	4.8%	6.3%	5.1%	6.6%	0.3%	0.3%

Sources: RBA, ATO, S&P Dow Jones

We calculate historical excess returns using data dating back to the 1880s. A five-year risk free rate would limit data to that starting from 1972 although we placed importance on post-1988 data in 2018.[258] We considered that post 1988 data was most relevant to our estimation of a forward looking MRP as it was most representative of recent market trends including the introduction of imputation credits and higher levels of integration with international markets.[259]

255 AER, *Better regulation, Explanatory statement, Rate of return guideline*, December 2013, p. 49.
256 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 3; AER, *Rate of return, Equity Omnibus, Draft working paper*, July 2021, pp. 23, 43–44.
257 AER, *Rate of return instrument, Explanatory statement*, December 2018, p. 220.
258 AER, *Rate of return instrument, Explanatory statement*, December 2018, p. 241.
259 AER, *Rate of return instrument, Explanatory statement*, December 2018, pp. 90–91.

We consider the impact on equity beta would be unclear. This is because it would relate to whether there is a change in investors' perception of the systematic risk of the regulated businesses. The MEU has also noted the challenges of quantifying these changes.[260]

The CRG noted that we should consider the impact of changes on consumers. We have published an Excel workbook which allowed stakeholders to undertake their own scenario analysis alongside our draft working paper on the *Overall Rate of return*.[261] Stakeholders are able to use this workbook to examine the modelled impact on regulated revenue and customer bills from different rate of return (including return on equity) parameters.

6.2.1.6 Concurrent expert sessions

We note that evidence on the term of equity (and the broader term of the rate of return) in the regulatory context is sparse. Further, stakeholder submissions have noted that more (holistic) evidence is needed. Therefore, we will include the term of equity in the concurrent expert sessions.

We believe it will be useful for experts to discuss the merits of matching to the length of the regulatory period and matching to the underlying asset lives for estimating the allowed return on equity. This will allow us, and all stakeholders, to gather more evidence and hear more thinking before arriving at views.

We note the CRG has raised the following points which will be useful to hear the experts' views on:

- A review of how a shorter term would affect the overall treatment of risk in the compensatory arrangements provided by the Instrument.[262]
- How much lower a 5-year risk free rate would be than a 10-year rate and the relationship between the term of the risk-free rate and other parameters, namely the equity beta and the MRP.[263]
- Nothing in the AER's premises would preclude continuation of the current approach, whereby the AER seeks to satisfy the NPV=0 condition over life of long-lived investments.[264]
- The AER should assess the benefits of a shorter equity term.[265]

6.2.1.7 AER assessment criteria

---

260 Major Energy Users, *Rate of return, Term of the rate of return, Cashflows in a low interest rate environment, Draft working papers*, July 2021, p. 8.

261 AER, *AER – WACC-Sensitivity of regulated revenue to the rate of return.xlsm*, July 2021.

262 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 25.

263 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 4, 20.

264 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 15.

265 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 22.

In our *Overall Rate of return* draft working paper, we set out the criteria we use to assess and inform our regulatory judgement on rate of return matters.[266] We have assessed the two options against the criteria in Table 4 to better inform stakeholders on the two options for the term of equity ahead of the concurrent expert session.

Compared to our past decisions, we now revisited and reconsidered previous material on the term of equity (and the term of the rate of return) and reviewed reasons in favour of each option. Our thinking in the 2020 Inflation Review reinforced the analytical framework used by Dr Lally that illustrates how the NPV=0 condition holds at each reset of regulatory parameters.[267] Because of this, we considered we should review the term of the rate of return using this analytical framework to check whether our current approach remains appropriate.

Further, while the difference between the yield on five year and ten-year CGS was not material in the past, it currently appears material.

Table 4 Assessing the term of the return on equity against the information criteria

Criteria	Matching the equity term to the length of the regulatory period	Matching the equity term to the underlying asset lives
Reflective of economic and finance principles and market information	Dr Lally's model uses standard tools of corporate finance and applies them in a context of a building block model.[268] Professors Davis and Partington and Satchell outlined that the NPV=0 condition ensured that the regulated asset was fairly priced and that the incentive for investment was just right, encouraging neither too much investment, nor too little.[269] Dr Lally and Professor Davis stated that matching the term to the length of the regulatory period satisfied the NPV=0 principle.[270]	Common market practice is to use the same rate to discount expected net cash flows for different years in business valuations. This is consistent with corporate finance literature on the issue.[271] Use of long-term government bonds as the risk-free security and estimating the ERP in relation to those 'represents a realistic, simplifying assumption and is consistent with the CAPM'. In Australia 10-year nominal CGS bond is such a security. The relevance of the above theory and practice to the regulatory context of determining the

266 AER, *Rate of return, Overall rate of return, Draft working paper*, July 2021, pp. 21–23.
267 Lally, Dr Martin Lally, *Review of the AER's inflation forecasting methodology,* 8 July 2020, p. 3, 6.
268 Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, pp. 7–21.
269 Kevin Davis, *Risk-free interest rate and equity and debt beta determination in the WACC, Prepared for the ACCC*, August 2003, p. 7; Partington, G., Satchell, S., *Report to the AER: Discussion of the allowed cost of debt*, 5 May 2016, p. 14.
270 Dr Martin Lally, *The appropriate term for the allowed cost of capital*, April 2021, pp. 3, 19; Kevin Davis, *Risk-free interest rate and equity and debt beta determination in the WACC, Prepared for the ACCC*, August 2003, p. 9.
271 Shannon Pratt and Roger Grabowski, *Cost of Capital: Applications and Examples, 4th ed. Hoboken: Wiley*, 2010, p. 120, Aswath Damodaran, '*What is the risk free rate? A search for the basic building block*', December 2008.

		maximum allowed revenue using a building block model is unclear.
Fit for purpose	The approach is based on Lally's and Davis' work developed specifically in the context of a building block model with regulatory allowance reset in regular intervals. NPV=0 principle is highly relevant to the achievement of the NEO/NGO.	The approach is linked to the literature and practice related to business valuations, which is arguably not the same context.
Implemented in accordance with good practice	Requires the use of yields from five-year Commonwealth Government Securities (CGS) to calculate the risk free rate. This dataset is readily available from the RBA website. Hence, this process is robust, transparent and replicable. The yield on CGS is the best proxy for the risk free rate in Australia, as supported by the Reserve Bank of Australia (RBA).	Requires the use of ten-year CGS to calculate the risk free rate. This dataset is readily available from the RBA website. Hence, this process is also robust, transparent and replicable. The yield on CGS is the best proxy for the risk free rate in Australia, as supported by the Reserve Bank of Australia (RBA). Common practice in market valuations. Used by many regulators in Australia and internationally.
Models are based on quantitative modelling that is sufficiently robust and avoids arbitrary filtering	We set the risk free rate based on CGS yields sourced from the RBA using an averaging period, which satisfies the requirements in the Rate of return Instrument. Our approach to calculating the risk free rate does not include adjustment of data and hence is not unduly sensitive to errors in inputs estimation. However, adopting a five-year term for the risk free rate may require adjustments to the estimation of the MRP.	
Market data is credible, verifiable, comparable, timely and clearly sourced	Five-year CGS yields is sourced from the RBA in a credible and timely manner. We find that there continues to be appropriate high levels of turnover in the CGS market hence, new information will be reflected in regulatory outcomes.[272]	Ten year-CGS yields is sourced from the RBA and is credible and verifiable. We find that there continues to be appropriate high levels of turnover in the CGS market hence, new information will be reflected in regulatory outcomes.[273]
Flexible to allow changing market	The return on equity is updated at the beginning of the regulatory period and reflects the prevailing market	The return on equity is updated at the beginning of the regulatory period and reflects the prevailing market rates at that time. It

[272] AER, *Rate of return and cashflows in a low interest rate environment, Draft working paper*, May 2021, p. 25.
[273] AER, *Rate of return and cashflows in a low interest rate environment, Draft working paper*, May 2021, p. 25.

conditions and new information	rates at that time. It remains constant within the regulatory period.	remains constant within the regulatory period.
Materiality	The difference between the yield on five year and ten-year CGS currently appears material. Although this difference has been smaller over the long term, it was approaching historic highs as demonstrated in Figure 1. Adopting a five-year term would also result in a small increase in the value of historical excess return.	
Longevity or sustainability of new arrangements	A five-year equity term would achieve the NPV=0 condition. No evidence yet that a five-year term on equity will not contribute to achieving the NEO and NGO over each future regulatory period. Therefore, it appears sustainable.	A ten-year term is consistent with regulatory precedence, stability and predictability because we have adopted it since the 2009 WACC Review.

6.2.2 Term of the return on debt

Our preferred view is to maintain the use of a trailing average approach.

We propose to leave the exact value of the benchmark debt term and the use of the EICSI and WATMI open to further consideration. We consider that further analysis is warranted and we will expand on this in our final *Omnibus* working paper.

6.2.2.1 Form of the return on debt

In the draft working paper, we proposed to retain the trailing average approach after investigating the three forms of the return on debt typically considered by Australian regulators.

Our preferred position is to maintain a trailing average approach for return on debt for the following reasons:

- Maintaining a trailing average approach would provide certainty and stability for businesses and consumers.[274]
    - The 2013 Guidelines introduced the trailing average approach and the 2018 Instrument continued this approach. Regulated businesses would have faced and likely acted upon incentives to match the trailing average approach.
    - The industry will still be part way through its transition to the ten-year trailing average return on debt when the 2022 Instrument begins application. It is arguably appropriate to wait at least until businesses have finished transitioning before considering whether a different return on debt approach should apply.

[274] More detail on this point is available from our draft paper; AER, *Rate of return, Term of the rate of the rate of return, Draft working paper*, May 2021, p. 47.

    - We have been collecting and considering more actual debt information from regulated businesses to inform our decisions. Regulated businesses will still be transitioning during the 2022 Instrument and we believe more time is needed to collect information under a trailing average return on debt before considering whether to change from this approach.

- A consistent application of either the on-the-day or the trailing average approach over the life of a regulated asset would, on average, result in an allowed return on debt commensurate with the efficient financing costs of a benchmark efficient entity.[275] A trailing average return on debt, accompanied by a full transition from an on-the-day approach, would also be consistent with the NPV=0 condition over the life of the asset.[276] We did note previously that a trailing average return on debt is different from the prevailing cost of capital, which SFG indicated may distort investment decisions.[277] To the extent such a distortion exists, it is likely to be more important in situations where a business is contemplating a significant new investment. We will examine this issue and the related issue of weighting trailing average in our final Omnibus paper.
- A trailing average approach would lower cashflow and price volatility for regulated businesses and consumers respectively.[278]

Professor Davis and Dr Lally have noted that regulatory judgement may ultimately be required on the form of the return on debt.[279] The draft working paper noted three instances where the trailing average return on debt may not be appropriate at the outset:[280]

- A new market entrant with new assets where all of its debt would likely be raised at the outset and at the same time to finance the asset purchase.
- Existing businesses with future capital projects (or new assets) that would make up a significant proportion of their RAB. Our current trailing average may not be appropriate (at least at the start) because it assumes a moderate amount of capital projects (and hence RAB growth) each year.
- Businesses conducting asset sales and presumably using their proceeds to repay the debt that was financing those assets. A trailing average return on debt would no longer appropriately reflect the ongoing actual costs of the business.

We note the QTC considered that none of these scenarios would support moving away from a trailing average approach.[281] The CRG also suggested we develop a framework for

---

275 AER, *Final decision SA Power Networks determination 2015–16 to 2019–20 Attachment 3 – Rate of return*, October 2015, p. 176.

276 AER, *Final decision SA Power Networks determination 2015–16 to 2019–20 Attachment 3 – Rate of return,* October 2015, p. 182

277 SFG Consulting, *Preliminary analysis of rule change proposals report for AEMC*, 27 February 2012, p. 41.

278 AER, *Better regulation explanatory statement rate of return guideline*, December 2013, pp. 108–110.

279 Kevin Davis, *The debt maturity issue in access pricing*, December 2013, pp. 17–19; Dr Martin Lally (Capital Financial Consultants), *The appropriate term for the allowed cost of capital*, April 2021, pp. 32, 39.

280 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, pp. 48–49.

281 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 6.

deciding when exceptions (to the trailing average return on debt) should apply and when they should not.[282]

We clarify that our view in draft working paper was in the context of an immediate application of the trailing average to these circumstances.

Our draft *Debt Omnibus* paper sought views on weighting the trailing average calculation by capex spending.[283] This approach should address the concern of large RAB growth due to the actionable ISP.[284] The final *Omnibus* paper will consider the possibility of implementing a framework for dealing with scenarios where a trailing average approach may not be appropriate. However, this does raise questions about the return on debt estimation and the extent it should reflect business specific factors.

6.2.2.2 Term of the return on debt

We remain of the view that a trailing average approach involves a term matching an efficient firm's borrowing. This is based on Dr Lally's advice.[285]

We currently apply a ten-year term for the return on debt. However, we have been collecting actual debt issuance data from regulated businesses to inform the EICSI during, and since, the 2018 Instrument. We are considering how to make use of this information for setting the return on debt (including the debt term). We do note that the 2020 Network debt data working paper mentioned the WATMI (borne from the EICSI) can range from eight to eleven years depending on the scenario modelled.[286]

We believe further assessment is needed. Such an assessment will be part of the final *Omnibus* working paper where we will undertake a more holistic consideration of estimating the return on debt.

We do have some reservations about departing from the current ten-year debt term (at least for the 2022 Instrument) for the following reasons:

- We have adopted a ten-year benchmark term over several regulatory cycles and regulated networks seeking to minimise interest rate risk have an incentive to match debt issuance to this ten-year term.[287] Maintaining the current approach would promote regulatory certainty in light of the current transition to a ten-year trailing average approach for debt.
- Regulated businesses would not have finished transitioning to the ten-year trailing average return on debt during the period over which the 2022 Instrument applies. Retaining a ten-year debt term would potentially avoid the scenario of a transition upon the current transition to the ten-year trailing average return on debt.

---

282 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 27.
283 AER, *Rate of return, Draft Debt Omnibus paper*, July 2021, p. 25.
284 AER, *Rate of return, Draft Debt Omnibus paper*, July 2021, p. 23.
285 Dr Martin Lally (Capital Financial Consultants), *The appropriate term for the allowed cost of capital*, April 2021, p. 4.
286 AER, Rate of return, Energy network debt data, Final working paper, November 2020, p. 17.
287 AER, *Explanatory statement rate of return instrument*, December 2018, p. 299.

- The majority of the domestic regulators that we reviewed in the draft paper implemented a ten-year debt term.[288] We clarify that the ERA uses a hybrid return on debt approach for gas businesses. A five-year bank bill swap rate is used for setting the base rate and a ten-year trailing average is used for the debt risk premium.[289] The ERA also includes an allowance for debt raising costs and hedging costs in its return on debt.
- Regulated businesses are still transitioning to the ten-year trailing average return on debt and we are collecting more industry data to inform our decisions. More time would be needed to collect information about businesses' actual debt practices under a ten-year trailing average return on debt before considering whether to change from this approach.
    - The majority of stakeholders also did not oppose a ten-year debt term in their submissions.

6.2.2.3 Use of the EICSI and WATMI to determine the benchmark debt term

Our draft paper proposed to consider using the EICSI and corresponding WATMI to inform the return on debt term to better match that of an efficient firm's borrowing.[290] We noted that an efficient firm's borrowing is likely to be best approximated by an industry-wide measure such as the WATMI which would remove idiosyncratic decisions pertaining to a particular business.

The majority of stakeholders expressed reservations and concerns with the use of the EICSI and WATMI for informing the debt term:

- Four stakeholders (APA, Endeavour, NICE and QTC) opposed the use of the EICSI and WATMI in setting the debt term.[291]
- Endeavour and APA were concerned about the small sample underpinning the EICSI and stated that a longer term view is required to enhance the reliability of the index.[292]
- The QTC mentioned that service providers may be in an ongoing state of transition as they continually re-adjust their debt portfolios and hedges based on the latest WATMI estimate.[293]
- Four stakeholders (the ENA, Ausgrid, AusNet and QTC) also noted that real world factors can constrain businesses' ability to issue debt.[294]

---

288 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, p. 19.

289 Economic Regulation Authority Western Australia, *Final gas rate of return guidelines, Explanatory statement, Meeting the requirements of the National Gas Rules*, December 2018, pp. 91–92.

290 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, p. 49; AER, *Rate of return, Energy network debt data, Final working paper*, November 2020, p. 36.

291 APA, *APA submission on draft rate of return working papers,* July 2021, p. 2; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 5; Network of Illawarra Consumers of Energy (NICE), *AER Rate of return instrument 2022–Term and financeability*, July 2021, p. 13; Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 1.

292 Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 5; APA, *APA submission on draft rate of return working papers,* July 2021, p. 9.

293 Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 1.

294 ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 16; Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, pp. 4–5; AusNet Services, *Response to Low interest rate environment and Term of*

- Ausgrid and Endeavour raised concerns about the transparency of the EICSI and WATMI because they cannot be replicated.[295]

Given stakeholders' concerns, we believe more assessment is needed on the use of the EICSI and WATMI. Professor Davis has previously outlined that businesses' incentives to choose a debt structure which minimises the cost of debt financing may be open to question if their actual debt practice is used to inform regulatory decisions.[296] The CRG also noted we need to be aware of the dangers of using actual debt data to inform our debt term (and by extension our return on debt approach).[297] Therefore, we will leave the use of the EICSI and WATMI open for further consideration in the final *Omnibus* paper.

6.2.2.4 Transitional arrangements

When stakeholders commented on possible transitional arrangements arising from a change in the debt term, most raised concerns about the complexities of implementing such arrangements if there is a change in the debt term.[298]

The final *Omnibus* working paper will set out our view on the current ten-year benchmark debt term. We consider that, if a change is warranted, we will carefully evaluate any transitional arrangements including their impact on contributing to the achievement of the NEO and NGO. We are also likely to follow considerations in the 2013 Guideline and subsequent revenue determinations, which commenced the transition to a ten-year trailing average return on debt, when assessing transitional arrangements.[299]

---

the rate of return draft working papers, July 2021, p. 1; Queensland Treasury Corporation, *Term of the rate of return, Submission to the draft working paper*, July 2021, p. 1.

295 Ausgrid, *Ausgrid submission*, *Term of the rate of return*, July 2021, pp. 4–5; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 4.

296 Kevin Davis, *The debt maturity issue in access pricing*, December 2013, p. 6.

297 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, pp. 31–33.

298 TransGrid, *Response to draft rate of return working papers*, July 2021, p. 9; APGA, *APGA submission to the AER, Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, July 2021, p. 18; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, p. 4; ENA, *The term of the rate of return, Response to Draft AER working paper*, July 2021, p. 18; AusNet Services, *Response to Low interest rate environment and Term of the rate of return draft working papers*, July 2021, p. 3; APA, *APA submission on draft rate of return working papers,* July 2021, p. 10; CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 4.

299 AER, *Better regulation, Explanatory statement, Rate of return Guideline*, December 2013, pp. 120–125.

7 Response to stakeholders' submissions on other issues

This section outlines our response to additional matters raised by stakeholders in their submissions.

7.1 The regulatory task

The CRG submitted that the AER should engage with stakeholders on the question 'What is the regulatory task?'[300]

We note that our regulatory task is to make decisions for regulated businesses that contribute to achieving the NEO and NGO.[301] In making the rate of return instrument, we must also have regard to the revenue and pricing principles and other information we consider appropriate.[302] We have had regard to these principles in making our 2018 Instrument and as part of the 2022 review.[303]

The draft paper noted that the rate of return needs to reflect the ex-ante cost of capital of an efficient firm in the supply of regulated energy services.[304] This is a zero net present value (NPV) investment condition (also known as NPV neutral (NPV=0) condition).[305] We also recognise that we set regulated revenue over the length of a regulatory period (typically five years).

In May 2021, we published a position paper on the *Rate of return and assessing the long term interests of consumers*.[306] The paper set out our views around what the NEO and NGO mean in the context of setting the expected rate of return. In forming our position, we took into account the views expressed on this topic by the CRG and ENA.[307] We stated that for the 2022 Instrument to advance the NEO and NGO to the greatest degree, the expected rate of return should be an unbiased estimate of the expected efficient return, consistent with the relevant risks involved in providing regulated network services.[308]

We do not consider further consultation on our regulatory task would be beneficial at this stage.

7.2 The AER's comparatively low allowed return on equity

300 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 26.
301 NEL, 16(1); AER, *Rate of return instrument explanatory statement*, December 2018, pp. 29, 220; NEL, 18I (3), 18I (5)(a),
302 AER, *Rate of return instrument explanatory statement*, December 2018, pp. 29, 220; NEL, 18I (3), 18I (5)(a),
303 AER, *Rate of return instrument explanatory statement*, December 2018, p. 30.
304 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, p. 40.
305 Partington, G., Satchell, S., *Report to the AER: Discussion of the allowed cost of debt*, 5 May 2016, p. 14.
306 AER, *Rate of return, Assessing the long term interests of consumers, Position paper*, May 2021.
307 CRG, *Re: The long term interests of consumers and the regulated rate of return*, April 2021; ENA, *Rate of return Instrument and long-term interests of consumers, Initial network sector perspectives, AER Network Committee discussion*, March 2021.
308 AER, *Rate of return, Assessing the long term interests of consumers, Position paper*, May 2021, p. 12.

We note the NSG and several network stakeholders were concerned about our comparatively low allowed return on equity.[309] They also noted we were considering potential changes which could further reduce the rate of return.[310]

We acknowledge that under our current approach, our allowed return on equity has fallen as interest rates have declined. However, we have not received compelling evidence, which suggests that our rate of return estimate is downwardly biased.

In the *Rate of return and cashflows in a low interest rate environment* draft working paper, we noted that the overall rate of return would move with changes in interest rates through the risk free rate and return on debt.[311]

We also observed that our return on debt has declined significantly but so have the costs of securing debt.[312] Therefore, the reduction in our return on debt estimate has been in line with movements in the broader market for debt and aligns with the costs the regulated businesses face. We noted that at a broad theoretical level, debt and equity were substitutable and it could be argued that as debt costs decrease, there would be some fall in the expected return for equity.[313]

Therefore, the fact that our allowed return is low does not necessarily imply that our estimate is downwardly biased.

Furthermore, we observed the following acquisition and proposed acquisition related to TransGrid and Spark Infrastructure:

- On 19 July 2020, TransGrid announced that Ontario Municipal Employees Retirement System (OMERS) of Canada acquired a 19.99% stake in TransGrid from Wren House Infrastructure Management.[314]
- On 15 July 2021, Spark Infrastructure advised that it had received two conditional and non-binding indicative proposals from a consortium led by the Ontario Teachers' Pension Plan Board (OTPP) and Kohlberg Kravis Roberts & Co (KKR).[315] Under the initial and revised proposals, OTPP and KKR would acquire all of the ordinary stapled securities in Spark Infrastructure for a cash consideration of A$2.70 and A$2.80 per

---

309 NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, pp. 1, 7; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, pp. 1-2; Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 2; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, pp. 2–3.

310 NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, pp. 1, 7; Endeavour Energy, *Draft working paper: Term of the rate of return*, July 2021, pp. 1-2; Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 2; CitiPower, Powercor, United Energy, SA Power Networks, Australian Gas Infrastructure Group, *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, July 2021, pp. 2–3; Energy Queensland, *Pathway to rate of return 2022 – Term of the rate of return, Rate of return and cashflows in a low interest rate environment*, July 2021, p. 2.

311 AER, *Rate of return and cashflows in a low interest rate environment, Draft working paper*, May 2021, p. 24.

312 AER, *Rate of return and cashflows in a low interest rate environment, Draft working paper*, May 2021, p. 4.

313 AER, *Rate of return and cashflows in a low interest rate environment, Draft working paper*, May 2021, p. 5.

314 TransGrid, *TransGrid welcomes Omers to its ownership group*, 19 July 2021, available at https://www.transgrid.com.au/news-views/news/2020/Pages/TransGrid-welcomes-Omers-to-its-ownership-group.aspx

315 Spark Infrastructure, *Spark Infrastructure receives conditions and non-binding indicative proposal*, 15 July 2021, p. 2.

stapled share respectively. However, Spark Infrastructure concluded that the prices offered to them in both proposals were undervalued.

- On 28 July 2021, Spark Infrastructure announced that it had received a further revised proposal from OTPP and KKR for an all cash consideration of A$2.95 per stapled security.[316] Spark Infrastructure decided to provide the OTPP and KKR with the opportunity to conduct a due diligence on a non-exclusive basis.
- On 23 August 2021, there was news that Spark Infrastructure's Board has agreed to the takeover. [317]

We note that Spark Infrastructure has a 49% and 15% interest in SA Power Networks and TransGrid respectively.[318] Therefore, news of the TransGrid and Spark Infrastructure acquisitions would appear to indicate that regulated networks are still attractive assets to investors (at the reported prices).

7.3 Upward bias of the return on equity

The IML stated that there should be an upward bias in the return on equity to provide positive investment in the AEMO's 2020 ISP projects.[319] However, we consider that the best possible estimate of the expected rate of return — neither upwardly biased nor downwardly biased — will promote efficient investment in, and efficient operation and use of, energy network services.[320] Furthermore, an unbiased estimate of the expected efficient return, consistent with the relevant risks involved in providing regulated network services, is necessary to promote efficient prices in the long term interests of consumers.[321]

Therefore, we disagree with adding a margin to our rate of return (or to individual parameters) to allow a high side bias. A high side bias would be expected to lead to inefficient overinvestment in regulated assets relative to other investments in the economy. This would not be consistent with NEO or NGO.

7.4 Aligning the efficient cost of capital with the NEL/NGL and the NEO/NGO

The NSG submitted that the AER has not established how the estimated cost of capital is consistent with the NEL/NGL and NEO/NGO while TransGrid stated that the AER should clarify how it will apply its guiding principle.[322]

We are required to make a Rate of Return Instrument under the NEL and the NGL. We may make an instrument only if satisfied the instrument will, or is most likely to, contribute to the

316 Spark Infrastructure, *Spark Infrastructure receives further revised conditional and non-binding indicative proposal*, 28 July 2021, p. 2.
317 https://www.afr.com/companies/infrastructure/spark-infrastructure-accepts-5-2-billion-takeover-20210823-p58l0l
318 Spark Infrastructure, *Annual report 2020, Infrastructure for the future,* February 2021, p. 3.
319 Investors Mutual Ltd, *AER consultation on the term of the rate of return*, July 2021, p. 2.
320 AER, *Rate of return, Overall rate of return, Draft working paper,* July 2021, p. 64.
321 AER, *Rate of return and assessing the long term interests of consumers*, May 2021, p. 1.
322 NSG, *Re: Response to AER RORI 2022 working papers*, July 2021, p. 2; TransGrid, *Response to draft rate of return working papers*, July 2021, p. 6.

achievement of the national energy objectives to the greatest degree.[323] We consider that the NEO and NGO are best served by estimating an unbiased expected efficient return, consistent with the relevant risks involved in providing regulated network services.

Our draft paper on the *Overall Rate of return* outlined the criteria we consider when making judgement.[324] The overall criteria provide a framework through which we are able to exercise our regulatory judgement in respect of evidence before us, while allowing sufficient flexibility to make decisions in changing market circumstances.

The criteria were first implemented in the 2013 Guidelines. They continued to be used in the 2018 Instrument as stakeholders expressed valuing stability. We have reviewed these criteria and think they remain useful for the current review. We consider that this approach will enhance transparency, predictability and will support the legislative objectives. Where change is under consideration, based on new evidence put to us, we are of the view that these criteria provide a lens through which we can assess alternative estimation methods, financial models, market data and other evidence to which we must have regard in our decision-making.

7.5 The NEO/ NGO and the CRG's principles

The CRG stated that the AER's working papers focused on promoting investment efficiency and considered that the AER should take into account the CRG's five principles when developing regulatory proposals.[325]

We note that statutory requirements are founded on the NEO and NGO. We are required to assess our decisions against the NEO and NGO and must have regard to the RPPs when setting the rate of return instrument.

The objectives are to promote efficiency in the investment in, and operation and use of, energy services for the long term interests of consumers.[326] The RPPs states that regulated businesses should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs.[327]

The 2018 Instrument noted that achieving the objectives requires both efficient investment in energy networks and efficient use of energy network services.[328] An allowed rate of return that is upwardly biased (downwardly biased) will, all else equal, contribute to prices that are too high (low). This effect on prices may discourage (encourage too much) use of network services.

To assess the efficiency of prices, and consequently the efficient use of network services, there are three aspects of economic efficiency to consider: allocative efficiency, productive efficiency, and dynamic efficiency.

---

323 NEL, s. 18I—AER to make rate of return instrument; NGL, s. 30D—AER to make rate of return instrument.

324 AER, *Rate of return, Overall rate of return, Draft working paper,* July 2021, pp. 21–23.

325 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, pp. 9, 12.

326 NEL, s.7.

327 NEL, s.7(2).

328 AER, *Rate of return instrument explanatory statement*, December 2018, p. 40.

In economic theory allocative efficiency is achieved when prices are set to reflect costs. Productive efficiency is achieved if those costs are the lowest possible costs. Dynamic efficiency is achieved if productive and allocative efficiency are maximised over time.

The rate return, or cost of capital, is one cost of operating an energy network and therefore a component that contributes to a network's overall cost. If this component is too high or too low then efficiency may suffer.

However, the instrument does not address how a particular cost level is recovered from consumers through the structure of prices. The structuring of prices to reflect costs is instead addressed through other parts of our regulatory framework. In this context, for the allowed rate of return to contribute to the achievement of the legislative objectives it should reflect the efficient cost of capital. If it does, then it will (all else equal) promote both efficient investment in, and efficient use of, energy network services.

The CRG first provided their principles in its submission to our *Rate of return, CAPM and alternative return on equity models* draft working paper in 2020:[329]

- Promote behaviours that engender consumer confidence in the regulatory framework
- Test against consumer impacts on prices
- Test against impacts on service standards
- Risks are borne by those best placed to manage them; and
- There should be a high bar to change.

We explicitly considered the CRG's principles in the 2020 Inflation Review.[330]

We noted that the CRG's role was to bring consumer perspectives to the inflation and rate of return reviews that we might not otherwise hear and we were open to further submissions on our processes and assessment to build trust.[331] It was also important that the regulatory framework remains contemporary to circumstances and changing evidence, and where we think changes are needed to protect the long-term interest of consumers then we should make those changes.

As noted above, we have legislated objectives that guide our decision making. Whilst our legislative objectives must take primacy, additional principles can be useful in helping us apply the primary objectives.

We see overlap between the CRG's consumer principles and the way we currently look to implement the NEO and NGO and RPPs. Our *Overall Rate of Return* draft working paper set out the assessment criteria we will use to assess (new) evidence in front of us. We believe there is substantial overlap between the CRG's principles, with our assessment criteria and our regulatory framework (Table 5).

Table 5 Overlap between CRG principles and AER assessment criteria and regulatory framework

329 CRG, *Submission to AER return on equity*, 9 October 2020, p. 4.
330 AER, *Final position, Regulatory treatment of inflation*, December 2020, p. 21.
331 AER, *Final position, Regulatory treatment of inflation*, December 2020, p. 21.

Consumer principles	AER assessment criteria	AER considerations
• Promote behaviours that engender consumer confidence in the regulatory framework AND • There should be a high bar to change	Reflective of economic and finance principles and market information Fit for purpose Implemented in accordance with good practice Models are based on quantitative modelling that is sufficiently robust and avoids arbitrary filtering. Market data is credible, verifiable, comparable, timely and clearly sourced Flexible to allow changing market conditions and new information Materiality Longevity or sustainability of new arrangements	Our assessment criteria were, and are, used to assess (new) evidence in front of us. They assess evidence terms of theoretical foundation, implementation, suitability and data. We believe they are consistent with promoting consumer confidence in our framework and a high bar to change.
• Test against consumer impacts on prices AND • Test against impacts on service standards	N/A	As noted above, the rate return, or cost of capital, is one component of a network's overall cost. It does not address how a particular cost level is recovered from consumers through the structure of prices. The structuring of prices to reflect costs is instead addressed through other parts of our regulatory framework.
Risks are borne by those best placed to manage them	N/A	We aim to set an efficient rate of return that contributes to the achieving of the NEO and NGO, and have regard to the RPPs. Regulated businesses bear any cost (or benefit) of exceeding (or beating) this value. This is consistent with the CRG's principle.

7.6 Revisit 2020 Inflation Review

The CRG stated that we would need to revisit our decision to shorten the term for expected inflation if we do not shorten the term for equity.[332] We note that the CRG did not submit substantively new material to that considered in the inflation review. We consider that the term of expected inflation does not necessarily need to be of the same value as the term for the rate of return (and by extension, the return on equity) as noted in section 6.1.1. They should be independently assessed using the NPV=0 principle.

An important reason for changing the term for expected inflation was to remove the 'mismatch' issue between forecast inflation and indexation of the asset base.[333]

The mismatch occurred because service providers primarily receiving compensation for inflation through the rate of return and through the indexation of the asset base. Inflation is thus accounted for in both returns on and of capital. To avoid double compensation for inflation we adjust our initial estimate of the nominal rate of return by removing a best estimate of expected inflation. We subtract this amount from the building block revenue. Previously, we used a ten-year term for expected inflation while the indexation of the asset effectively used a five-year term.[334]

7.7 Misinterpretation of the CRG's Inflation Review submission

The CRG submitted that our draft paper misinterpreted their submission on the 2020 Inflation Review as noted in section 5.2.6.[335]

We clarify that the CRG's position in the 2020 Inflation Review was that if the AER was to review and (potentially change) the term of expected inflation, this should be done together with its consideration of the rate of return instrument.[336]

In that submission, the CRG noted that 'The "best estimates" of expected inflation can only be determined by having regard to consistent assumptions across all relevant parameters in the rate of return instrument'.[337] It expanded later in its submission that:

> 'The NER and NGR provides a broad discretion to the AER for deciding how various parameters will be determined, including how it determines the "best estimates" of expected inflation. This approach allows the AER to consider all its estimation methodologies in their totality. Put simply, it assumes the AER will adopt a consistent approach across all its estimation methodologies. These methodologies, individually and collectively, must be consistent with NEO/NGO's focus on the long-term.'[338]

---

332 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 6.

333 AER, *Final position, Regulatory treatment of inflation*, December 2020, p. 35.

334 AER, *Draft position, Regulatory treatment of inflation*, October 2020, pp. 46–47.

335 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 35.

336 CRG, *Advice to the AER on the regulatory treatment of inflation response to the draft position paper on the regulatory treatment of inflation*, 6 November 2020, p. 13.

337 CRG, *Advice to the AER on the regulatory treatment of inflation response to the draft position paper on the regulatory treatment of inflation*, 6 November 2020, p. 2.

338 CRG, *Advice to the AER on the regulatory treatment of inflation response to the draft position paper on the regulatory treatment of inflation*, 6 November 2020, p. 10.

We acknowledge that our paraphrasing did not capture the intent of the CRG's inflation submission. The draft Term working paper stated that:

> 'in the 2020 Inflation Review, our Consumer Reference Group (CRG) made a submission that we should employ a consistent approach to term across our inflation and rate of return estimates and therefore we should also change the term for our rate of return'.[339]

Our intent was that the CRG's view (from the inflation review) supported a consistent approach across our estimation methodologies. We believe a consistent approach would entail the same priority on the NPV=0 principle and Dr Lally's framework across the term for expected inflation and the term for the rate of return. Therefore, if the term for the rate of return needs to be changed as a result of our assessment, it would be consistent with the CRG's (earlier) view.

We note the CRG did not support the change to a five-year term for inflation. It considered (in its inflation review submission) that the term for inflation had to be consistent with the term of the ten-year commonwealth government securities and the term of the commercial bonds.[340]

We note the CRG reiterated its view from the 2020 Inflation Review that 'applying different terms for inflationary expectations and the return on equity implied the AER was holding inconsistent beliefs about the future, that is, the AER would be acting irrationally'.[341]

As indicated in section 3.1, this was one reason why the term of the rate of return was chosen as a working paper topic. We wanted to consider, and consult on, whether our existing practice remained appropriate in light of our approach from the inflation review.

339 AER, *Rate of return, Term of the rate of return, Draft working paper*, May 2021, p. 3.

340 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 27.

341 CRG, *Advice to the Australian Energy Regulator on the Term of the Rate of return, CRG Response to the AER's Draft working paper on the term of the rate of return*, July 2021, p. 35.

Part B — Rate of return and cashflows in a low interest rate environment

8 Summary

8.1 Why this topic?

Based on stakeholder feedback, in the Pathway to 2022 paper we set out the working papers (discrete and emerging rate of return issues) we would undertake as part of our work before the active phase of the 2022 RORI. The purpose of these working papers were to start discussion early, narrow and potentially settle on options before the 2022 Instrument.

One emerging rate of return issue was whether we are setting the appropriate rate of return and cashflows in a low interest rate environment. Interest rates paid on debt by government and corporate issuers have substantially declined over the past decade. Such declines have been wide spread, occurring for both shorter term debt (for example, debt maturing in less than a year) and for longer term debt (for example, those maturing in 5-10 years).

Such changes in interest rates are important to the AER, the networks we regulate and their customers. Changes in interest rates affect both the level of revenues and prices that we allow the regulated networks to charge. Also affected are the costs that the networks face in providing services and ultimately the prices consumers pay.

8.2 Our considerations and the 2022 Instrument

As part of our draft working paper, we asked three broad questions. For each of these questions (see below), we outlined our draft position, what stakeholders have said, and our final position.

Question one: Are we in a low interest rate environment?

There has been a sustained downward trend in real and nominal interest rates since the 1980's/early 1990's. Thus, in both draft and final working papers, our preferred position is that we are currently in a low interest rate environment. Both consumers and networks agreed that we are in a low interest rate environment.

However, the CRG questioned why we are considering this issue now, and whether we would open up this topic in a high interest rate environment. In response, we consider the topic of low interest rates is an important foundational topic for our 2022 Instrument. There has been a change in market conditions since the 2018 rate of return instrument. Therefore, we thought it is important to consider whether the reduction in interest rates might indicate that changes in our approach are warranted. We think it is prudent to test our approach to any change in market conditions.

Question two: What are the consequences of interest rates being low?

In both draft and final working papers, we acknowledge that lower interest rates have impacted the revenues and cashflows of regulated networks. The lower interest rates flow through to our estimates of the return on debt and equity parameters. This reduced overall revenues, and impacted cash flows (financeability) metrics such as Net profit after tax (NPAT) and Funds from operations (FFO) to net debt. Stakeholders did not dispute our

findings, and there appears to be a general consensus around the consequences of lower interest rates.

Question three: Does this suggest that there is something that needs to be addressed?

We asked whether the current changes to allowed revenues and cashflows are appropriate, and are in line with achieving the National Electricity and Gas Objectives. In both draft, and final working papers, we consider the appropriateness of our return on debt and equity approach, and whether we need to take into account financeability considerations.

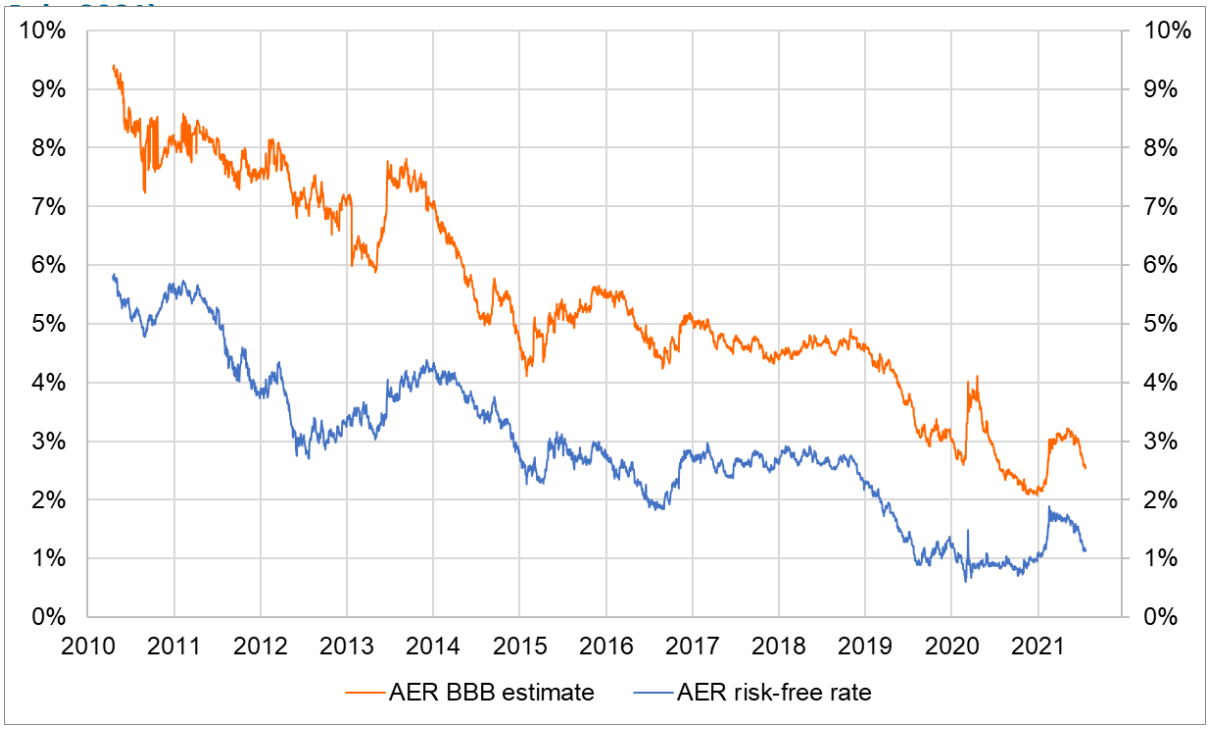
The CRG raised concerns about our regulatory review of return on equity parameters. We agree with the CRG on the importance of clear evidentiary thresholds before a rate of return parameter input is changed. Our overall rate of return draft working paper sets out our assessment criteria for the 2022 rate of return instrument which is reproduced in section 11.

Return on debt

Unlike the cost of equity, the cost of debt is more observable. We observe that our return on debt estimates have declined in line with the decrease in interest rates (see

Figure 2). Thus, in both draft and final working papers, our preferred position is that our current approach to estimating the return on debt remains appropriate in a low interest rate environment. This is a view shared by the NSPs and the AEC.

Figure 2 Comparison of AER BBB estimate and AER risk free rate (May 2010 to



Sources: RBA; Bloomberg; AER

In our debt working paper we are considering whether we might refine our estimate of the return on debt. However, this is part of our ongoing review of our estimates rather than impacts of the low interest environment.

Return on equity

We received substantial feedback from stakeholders on our return on equity approach. Networks and investors are concerned that the return on equity allowance we set is too low. They suggested we consider a framework where the rate of return can respond to changing market conditions. Moreover, they suggested that we revisit our approach to the MRP, and the risk-free rate. At the same time, the CRG submitted that we need to demonstrate that proposed changes to the framework are enduring, rather than merely reacting to current environmental factors.

As noted in our draft working paper, we intend to explore these issues in the rate of return omnibus paper. One aspect of the return on equity that we expressed a view on was the appropriate proxy for the risk-free rate. In the draft paper, our preferred position was that Commonwealth Government Securities (CGS) is an appropriate proxy for the risk-free rate.

Our draft paper noted that almost all market practitioners use CGS as a proxy for the risk free rate, and that CGS can be bought on the open market and held to achieve the stated return to maturity. While, factors such as additional demand from the Central Bank or additional supply produced by the Federal Government to enable stimulus may affect the price, it does not change the underlying characteristics of the CGS as an effective proxy. However, some submissions did not agree with our position in the draft paper.

The ENA questioned whether the prevailing CGS yield is an appropriate proxy for the CAPM risk-free rate because the true risk-free rate may be above the yield on government bonds by the amount of a 'convenience yield'. The ENA submitted that a convenience yield includes 'money like' convenience properties such as safety and liquidity which is not relevant to the risk-free rate used in the CAPM. Therefore, they proposed we adjust for the convenience yield, or adopt an alternative proxy for the risk-free rate.

Having reviewed the ENA's and other submissions on this issue in detail, we continue our preferred position that the CGS is an appropriate proxy for the risk free rate, and do not agree that an adjustment for a convenience yield is appropriate or required because:

- We consider the safety property of the CGS is a relevant feature of the risk-free asset in the SL-CAPM.
- Convenience yield estimates are highly sensitive to the chosen sample period, and the proxy chosen for the 'true' risk free rate. There is evidence to suggest there is an inconvenience yield since 2015.
- Market practitioners commonly use the CGS as a proxy for the risk-free rate.
- Finance literature continues to support the use of the CGS as a proxy for the risk-free rate.
- We do not consider that RBA interventions in the longer term CGS market affects the appropriateness of using the CGS as the proxy for the risk-free rate.

It is the role of central banks to intervene in the financial market. While the RBA has generally targeted the cash rate (conventional monetary policy) and not the longer term rates (or the term structure), the intention of this monetary policy is to change the time value of money over longer periods (and the term structure of interest rates).

Financeability

In both draft and final papers, our preliminary positon is that we should not directly use measures of financeability when setting the rate of return. Given the overlap of papers, we will consider financeability metrics as a cross check in our final overall rate of return working paper.

We note that the total return equity holders receive is the return on equity and not NPAT. Although NPAT can be negative over the short run, return on equity and long run NPAT are positive. While investors may be making a loss for taxation purposes, investors are not making losses after taking into account indexation of the regulatory asset base and are making a positive total return on their investment.

We consider that it is generally desirable where practical for NSPs to bear the risks associated with their financing choices and any consequences of their actions. This provides them with the incentive to manage these risks.

9 Draft working paper

In the draft working paper we considered three broad questions:

1. Are we in a low interest rate environment?
2. If we are, what are the consequences of lower interest rates?
3. Does this suggest that there is something that needs to be addressed?

Question one: Are we in a low interest rate environment?

We said there are two measures of interest rates that are most relevant for this working paper. First, interest rates charged that are representative of those on debt instruments issued by the businesses we regulate are important as they indicate an efficient regulated firm's cost of debt. Second, the interest rates of Commonwealth Government Securities which are commonly used as proxies for interest rates on risk free assets when pricing other riskier assets.

We noted that the concept of low interest rates is subjective — we asked 'low compared to what?', and whether these measures are low compared to historical interest rates. It was noted that recent interest rates and large movements in interest rates are not without precedent. However, we observed that there has been a prolonged decline in interest rates and key measures of interest rates are lower than they have been for some time. As such, we agreed that we are in a low interest rate environment.

Question two: What are the consequences of interest rates being low?

We outlined the impact of changes in real and nominal interest rates have on the revenues of regulated networks.

The rate of return is calculated by combining estimates of the return on debt with the return on equity, using an estimated gearing level. Under our approach declines in interest rates reduce the rate of return through changes in our estimates of the return on debt and equity parameters.

In line with the general lower observed interest rates, our estimates of returns to corporate debt have declined over the past decade. This has been incorporated into our estimates of the appropriate return on debt and has also been observed in our estimates of networks' actual debt costs.

Our estimates of return on equity have also declined over this period as they are directly linked to the interest on Commonwealth Government Securities. As a result, our estimates of the total rate of return have also fallen.

This lower estimate has also had a flow on impact onto the networks' cash flows. As revenues have declined, so have measures related to cash flows such as Net profit after tax (NPAT) and Funds from operations (FFO) to net debt. This can be attributed to lower estimates of return on equity and our RAB indexation adjustments to cash flows.

Question three: Does this suggest that there is something that needs to be addressed?

We asked whether the current changes to allowed revenues are appropriate and are in line with achieving the National Electricity and Gas Objectives. As part of this, we took into consideration:

- Our approach to return on debt. In the draft working paper, we considered that our return on debt allowance has moved broadly consistent with movements in the networks' cost of debt.
- Our approach to return on equity.
- Whether a regulatory response to financeability was necessary.

In terms of return on equity, we concluded that it is more difficult to make an assessment. No direct observation can be made of expected equity returns and as a result, an assessment of a range of indicators needs to be made. At a broad theoretical level, debt and equity are substitutable and it can be argued that as debt costs decrease there would be some fall in the expected return for equity.

For our draft working paper, we did not form a view on how much the return on equity will move in response to a change in interest rate. We were aware that there are differing views on return on equity and whether it moves with interest rates (these can be considered in real and nominal terms).

One view is that the expected return on equity moves on average with interest rates. Another view is that the expected return on equity on average may not change with movements in interest rates (these can be considered in real and nominal terms). There are also a range of possibilities between these two extremes, or it may even be the case that expected returns on equity could decline, on average, by more than interest rates.

We signalled that this relationship would be investigated as part of the return on equity working paper. We also noted that any approach we adopt must be capable of being implemented in a manner that is sufficiently robust, transparent and evidence based to be suitable for regulatory purposes.

One area we were more firm on was that the Commonwealth Government Securities remain an appropriate proxy for the risk free rate. We observed that this is a common approach used by almost all market practitioners. Furthermore, we noted that these securities can be bought on the open market and held to achieve the stated return to maturity. This does not change:

- If additional demand is introduced from the Central Bank,
- If there is additional supply produced by Federal Government to enable stimulus or
- From increased demand due to Basel III liquidity requirements.

These factors may impact the price but they do not change the underlying characteristics of Commonwealth Government Securities as an effective proxy for the risk free rate. We also observed a high level of liquidity in the Commonwealth Government Securities market.

In terms of financeability, our preliminary position was that financeability considerations should not be used to directly adjust our rate of return parameters. We also noted, that we remain of the view that decisions about how to manage cash flows and financeability, such as the level of gearing, are primarily for the individual networks to manage.

This was consistent with the advice we obtained from the ACCC Regulatory Economics Unit (REU), and with the position we expressed in the Australian Energy Market Commission (AEMC) review of the TransGrid and ElectraNet rule changes. Furthermore, the AEMC rejected the proposal to bring forward cash flows in order to improve financeability metrics, and concluded that the regulatory framework does not create a barrier to financing large projects.

We also queried whether regulated network service providers ability to raise capital is impacted in a manner that requires a regulatory response. While financial metrics considered by credit rating agencies are impacted by lower interest rates, these changes do not of themselves indicate a regulatory framework problem. This is because:[342]

- The overall rate of return is relatively invariant to the gearing used and we have observed NSPs typically carrying less gearing than our 60 per cent benchmark.
- NSPs are free to deviate from the benchmark and in particular they can deviate from the benchmark gearing assumption of 60 per cent.
- Credit rating agencies consider a wide range of qualitative and quantitative factors when determining the overall credit rating.

Rather it may reflect that a greater proportion of the return on equity is recovered via a capital gain rather than income. We also pointed out that the NSPs' actual financeability is substantially impacted by the practices and choices made by the NSPs. NSPs can, and do, engage in a range of practices specific to managing their own operations.

[342] AER, *Rate of return and cashflows in a low interest rate environment, Draft working paper*, May 2021, p.45

10 What did stakeholders say about the draft paper?

We asked stakeholders three key questions in our draft working paper. Both consumers and networks in response to question 1, agreed that we are in a low interest rate environment.[343] There also appears to be a general consensus around the consequences of lower interest rates, in response to question 2 of the draft working paper. However, in response to question 3, stakeholders did not agree whether a regulatory response was needed as a response to lower interest rate.

The CRG questioned why we are considering this issue now, and wondered whether we would open up this topic in a high interest rate environment.[344] They submitted that we need to clearly define the evidentiary thresholds to be satisfied before we accept the need for a regulatory review of parameters.[345] The CRG also emphasised that we need to demonstrate that proposed changes to the framework are enduring, rather than merely reacting to current environmental factors. [346]

One of the feedback from the CRG's survey with consumer representatives is that we should take a longer-term view of the business cycle, and not be overly focussed on the current conditions in the market place.[347]

In terms of debt, the feedback we received indicates that the allowance we set for return on debt is appropriate. The ENA agreed that low interest rates lead to lower debt financing costs, and that our approach to return on debt remains appropriate.[348] Likewise, the AEC noted that the costs of securing debt along with our return on debt allowance have declined significantly.[349]

Unlike debt, there was disagreement among stakeholders on whether the return on equity we set is appropriate. Networks and investors submitted that our return on equity allowance is too low. They submitted that our MRP, and risk free rate estimates are inappropriate. Consumers on the other hand have mostly not formed a view on the return on equity. If any changes are required, they wanted to see evidence that proposed changes are in the long term interest of consumers.[350]

---

343 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 15; NICE, *AER Rate of Return Instrument 2022 — Term and Financeability*, July 2021, p. 14; APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 18; ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 4.

344 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 15.

345 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 2.

346 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 4.

347 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 34.

348 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 16.

349 AEC, *Rate of return and cashflows in a low interest rate environment*, 3 July 2021, p. 1.

350 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 32.

Similarly, there was also disagreement among stakeholders on whether we need to consider financeability as part of setting our rate of return instrument. Networks and investors recommended that we consider financeability, while consumers and the AEC are strongly against it.

10.1 Return on equity

10.1.1 Network feedback

Networks are concerned that the return on equity allowance we set is too low. They noted that the Brattle report concluded that our return on equity allowance is lower than what is allowed by international regulators. The ENA added that a recent report by Morgan Stanley Research identified real return on equity allowances of regulated energy networks in Australia as being the lowest available in any market studied, with the exception of India.[351]

While APA did not agree that our return on equity allowance is appropriate, they did note that the returns expected by equity investors have declined as rates of return on other investment opportunities have fallen.[352]

The ENA submitted that the allowed return on debt is based on evidence of the returns that real-world investors require for providing debt finance to the regulated firm. For the same reasons, the ENA argued that the allowed return on equity should be based on evidence of the returns that real-world investors require for providing equity finance to regulated firms.[353]

Hence, the feedback we received on the return on equity from the networks was that we should:

- Produce the best estimate of the rate of return at the time of each regulatory decision.[354]
- Incorporate more forward looking evidence in our MRP estimate.[355]
- Consider a relationship, but rule out the positive relationship between the MRP and risk free rate.[356]
- Reconsider the appropriate proxy for the risk-free rate (see section 10.2.1).

The networks suggested that we consider a framework where the rate of return can respond to change in market conditions. They submitted that the current low interest rate environment has exposed more clearly the inability of some aspect of our existing rate of return approach to produce the best estimate at the time of each regulatory decision.[357]

The ENA considered that 'unbiased' should be interpreted with respect to the available evidence at the time of a decision, rather than in terms of a long-run average.[358] The ENA

---

351 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 20.
352 APA, *APA submission on draft rate of return working papers*, 2 July 2021, p. 2.
353 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 17.
354 APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 10; ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 8.
355 APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 12; ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 3.
356 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 38.
357 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 4.
358 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 11.

argued that this is how we interpreted 'unbiased' in the inflation review, and suggested that we clarify this. [359] Therefore, networks suggested that we follow Brattle's recommendation, and update all the parameters of the cost of equity parameters at the time of decision.[360]

The networks agreed with Brattle's recommendation that we incorporate more forward looking evidence such as the DGM in our MRP estimation.[361] The ENA argued that this will result in a superior MRP estimate because it will reduce the bias inherent in the mean historical excess returns (HER) estimate and will also reduce the volatility in the allowed return on equity. [362]

The ENA also submitted that Damodaran's recent work suggests that the MRP should not be estimated using the mean historical excess return estimates without adjustment.[363] They agreed with Dr Lally's observation that the true MRP varies over time and that the mean historical excess return estimate is upwardly biased in some market conditions and downwardly biased in others. [364] Furthermore, the ENA considered it is inconsistent to adopt the mean historical excess return estimates, and then apply a mechanism to update the MRP to account for changes in the risk-free rate during the Rate of Return Instrument period. [365]

TransGrid proposed options for setting a more forward looking return on equity and MRP: [366]

- A smoothed approach whereby the return on equity only changes by a proportion of the change in the risk-free rate.
- An MRP that varies over time with the risk-free rate in some automated way.
- Caps and collars (i.e. upper and lower bounds) around the MRP that limit potential volatility in MRP changes.

In terms of the relationship between the MRP and risk free rate, networks suggested that we rule out the approach of increasing or decreasing the MRP one for one with the CGS yields — positive relationship. [367] The ENA suggested we give no weight to Li (2006) and Kim and Lee (2008) academic papers because neither of these papers use a CAPM framework. Moreover, the ENA submitted that 'both papers arrive at the same conclusion—that the MRP could be procyclical—while adopting antithetical starting assumptions'. [368]

Furthermore, networks noted that Damodaran's 2012 paper has been updated, and no longer showed a positive relationship. Instead, Damodaran's 2021 paper found a negative relationship between the MRP and risk-free rate in the USA since 2008.[369] Brattle was also quoted that 'MRP commonly increases as the risk-free rate declines and vice versa'.[370]

---

359 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 8.
360 APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 10.
361 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 3.
362 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 34.
363 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 40.
364 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 6.
365 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 6.
366 TransGrid, *RE: Response to draft rate of return working papers*, 2 July 2021, p. 5.
367 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 6.
368 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 6.
369 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 39.
370 APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 10; ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 36.

The APGA submitted that it is only appropriate to retain the same MRP if there were strong evidence that market returns moved in lock step with interest rates.[371] Furthermore, the APGA argued that the MRP estimated in the 2018 Instrument should be the starting point if we believe the estimate was correct in 2018. The APGA then submitted that since interest rates are now lower, the MRP will need to be:[372]

- Lower if market movements are greater than risk-free rate movements.
- Higher if market movements are smaller than risk-free rate movements.

The APGA noted that 'the first case above leads to more volatile prices for consumers and the second to less volatile prices'.[373]

10.1.2 Consumer feedback

The feedback we received from consumers on the return on equity allowance were:

- The CGS remain the best proxy for the risk-free rate (see section 10.2.2)
- They have not form a view on the relationship between the MRP, and the risk-free rate.
- We provided insufficient information for them to comment on the MRP if we move to a 5 year term.
- We need to consider the CAPM as a whole rather than each parameters individually.

While the NICE did not believe the CGS rates to be artificial, it considered that negative real interest rates to potentially defy logical explanation. The NICE submitted that negative real interest rates are not consistent 'with the underlying theory of interest, that consumers have a time preference for current consumption'.[374] Therefore, the NICE suggested that we set a floor on the real risk-free rate use to estimate the return on equity.[375]

Generally, consumers required more information to form a view on our return on equity approach. The MEU noted we provided insufficient information to comment on the MRP and equity beta.[376] Similarly, the CRG noted the relationship between the CGS and MRP may be different depending on whether we use a 5 year or 10 year risk free rate.[377] Furthermore, the CRG expect a clear weight of new academic and/or empirical evidence to open up debates on relationship between the risk free rate and CAPM components.[378]

---

371 APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 11.

372 APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 12.

373 APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 12.

374 NICE, *AER Rate of Return Instrument 2022 — Term and Financeability*, July 2021, p. 15.

375 NICE, *AER Rate of Return Instrument 2022 — Term and Financeability*, July 2021, p. 16.

376 MEU, *Term of the rate of return cashflows in a low interest rate environment draft working paper*, 29 June 2021, p. 8.

377 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 21.

378 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 30.

The CRG argued that we should: [379]

- Explain and consult on its intended approach to assessing relationships between inputs to its rate of return model.
- Explain how a finding of any such relationships would affect the theoretical foundations of its approach to estimating the rate of return.

The CRG considered that the SL-CAPM will no longer hold if there was any relationship between the parameters, because it is based on the assumption that formula inputs (risk-free, beta, MRP) are independent. [380]

Nonetheless, consumers emphasised that we need to have a long term focus, and to consider the CAPM as a whole. The NICE recommended that we should not regard any position on a component as final until we have made a decision on the whole instrument. [381]

The MEU does not think MRP and equity beta values estimate over a short period will provide a reflection of the need of a return over the life of the assets.[382] They considered that values of MRP and equity beta in more recent times are more likely to be reflective of the future movements in these parameters.[383] The MEU also thinks a longer focus will provide greater stability of the return needed for assets which have a 50-60 year life'.[384] The CRG also submitted 'regulatory stability' is valued by consumers. [385]

10.1.3 Investor feedback

Like the NSPs, network investors are concerned that the rate of return we set is too low. [386] In particular, the NSG is concerned that our working papers imply that we may be contemplating 'further reductions in the 2022 RORI based on selective changes to the determination of various parameters'.[387]

The NSG noted that investors operate in international financial markets, and a lower rate of return allowance is likely to reduce investors' willingness to invest in Australian regulated energy networks. [388] The NSG submitted 'there is already considerable evidence' to suggest that the rate of return set in the 2018 RORI was too low to attract the necessary investment.

379 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 4.
380 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 22.
381 NICE, *AER Rate of Return Instrument 2022 — Term and Financeability*, July 2021, p. 7.
382 MEU, *Term of the rate of return cashflows in a low interest rate environment draft working paper*, 29 June 2021, p. 8.
383 MEU, *Term of the rate of return cashflows in a low interest rate environment draft working paper*, 29 June 2021, p. 8.
384 MEU, *Term of the rate of return cashflows in a low interest rate environment draft working paper*, 29 June 2021, p. 8.
385 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 9.
386 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 3.
387 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 7.
388 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 7.

[389] Thus, the NSG argued that government intervention in the form of underwriting and financing support was needed for some largescale infrastructure investments. [390]

Concurrently, the NSG emphasised that we need to be consistent and have a long term focus.[391] The NSG considered it to be important because the rate of return instrument applied now will underpin energy infrastructure investments that will last the next 40-50 years. They added that the long term interests of consumers will only be achieved if today's investment decisions relating to long term infrastructure assets are appropriate.[392] Therefore, the NSG submitted that 'change in methodology should only occur where they better reflect cost and not occur in a biased manner'.[393]

The NSG considered that we have 'paid insufficient attention to the risk of under investment in energy networks caused by a rate of return that is too low.' [394] Hence, the feedback we received on the return on equity from the network investors was that we should give more weight to market practices.[395] The NSG submitted that we should give more weight to market practice because 'relying on a theoretical approach does not attract actual capital'. [396] As part of this, we should:

- Consider a long term or blend (mixture of long and short term) risk-free rate, or adjust the MRP upwards.
- Consider a negative relationship between MRP and the risk-free rate.[397]

The NSG provided insights on how some market practitioners estimate the required return on equity. The market practitioners quoted by the NSG were Mr Ilan Sadeh (then with Hastings Funds Management), Mr Rob Koh (Morgan Stanley), and Mr David Johnson (QTC).

Mr IIan Sadeh were quoted in the 2018 concurrent evidence sessions that over the past 20 years he 'haven't seen the two major independent valuation firms in Australia change their number on MRP by a dot'.[398] The NSG added that Mr Sadeh indicated that independent valuers have typically applied an MRP over a long term average risk free rate, which is consistent with applying a MRP of 6.5 per cent on the spot rate.[399]

Mr Rob Koh (Morgan Stanley) was quoted of using a MRP of 6% matched with a mix of spot and long term average risk free rate. The long term average risk-free that he referred to have a tenor that matched investments of 30-40 years. The NSG submitted that Mr Koh was not aware of anyone that uses a spot risk free rate without making an adjustment to beta or risk premium.[400]

---

389 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 4.
390 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 4.
391 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 2.
392 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 2.
393 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 12.
394 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 4.
395 QTC, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p.1
396 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 2.
397 QTC, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, pp. 2-3; NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 13.
398 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 14.
399 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 14.
400 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 14.

Based on market practice, the NSG suggested that we use a long term or blend (mixture of long and short term) risk-free rate. The NSG also argued that the upward adjustment in the risk free rate is to reflect the anomalously low CGS yields, and increased volatility in the risk-free rate. [401]

The NSG considered that the 'current yields are unlikely to be maintained in the long term and are not necessarily reflective of a long term risk-free rate for estimating an appropriate cost of equity'.[402] Similarly, Investors Mutual showed a survey where some analysts used a combination of the spot 10 year rate with historical averaging. [403] In Investors Mutual's view, this was likely to account for the fact current rates are artificially low. [404]

The NSG noted that David Johnston provided a KPMG survey of valuation practices which found that Australia has the highest market cost of equity of the selected developed economies at 8.8 per cent. [405] The NSG argued that this is not consistent with a theory that equity returns have fallen one-for-one with bond rates.[406]

Therefore, the NSG submitted that adopting an inverse relationship is consistent with experts, market practice and estimates of the cost of equity.[407] This is a view shared by QTC. QTC submitted that 'there are sound theoretical and empirical reasons' that explained why the expected return on equity have not declined point-for-point with the CGS rate.[408]

In terms of academic studies, QTC noted the 2021 updated version of Damodaran's paper eliminated the positive relationship between the U.S Treasury bond yields and the MRP.[409] QTC also reviewed the Campell, Pfueger and Viceria (CPV) paper about the systematic risk of nominal fixed-rate bonds. [410] QTC submitted that CPV's finding is consistent with the expected return on equity being more stable than the risk-free rate. [411]

QTC also submitted that 'the hedging properties of sovereign bonds is a factor that reduces the yield on sovereign bonds but not the expected return on equity'.[412] Therefore, QTC suggested we give further consideration to these findings in our review of the relationship between the MRP and the risk-free rate. [413]

10.1.4 Retailer feedback

We receive no feedback from retailers on the return on equity.

401 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 13.
402 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 14.
403 Investors Mutual, *AER consultation on the term of the rate of return,* July 2021, p. 2.
404 Investors Mutual, *AER consultation on the term of the rate of return,* July 2021, p. 2.
405 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 14.
406 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 14.
407 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 13.
408 QTC, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 1.
409 QTC, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 2.
410 QTC, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 2.
411 QTC, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 2.
412 QTC, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 3.
413 QTC, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 3.

10.2 Return on equity — is the CGS an appropriate proxy for the risk-free rate?

10.2.1 Network feedback

The ENA questioned whether the prevailing CGS yield is an appropriate proxy for the CAPM risk-free rate as:[414]

- There is regulatory precedent (UK Competition and Markets Authority/CMA) for recognising these issues and adopting a CAPM risk-free rate above the prevailing government bond yield.
- Academic literature recommends adopting a CAPM risk-free rate above the prevailing government bond yield.
- Equity analysts, independent experts, and survey respondents adopt a risk-free rate above the prevailing government bond yield.
- Standard textbooks recognise these issues and note that market practitioners tend to adopt a CAPM risk-free rate above the prevailing government bond yield.

In the UK, the ENA UK's consultant Oxera observed that government bonds tend to have low yields for two reasons: [415]

- They are effectively risk-free.
- They possess special safety and liquidity characteristics compared to other securities (also known as convenience yield).

The ENA and Oxera argued that the convenience yield is not relevant to the CAPM risk-free rate. [416] They submitted that investors are able to borrow at the CAPM risk-free rate but they cannot borrow at the prevailing government bond yield.[417] Oxera suggested that this might explain 'why the prevailing government bond yield may be a downwardly biased estimate of the CAPM risk-free rate'.[418]

The ENA and Oxera noted academic papers found convenience yields in US treasury.[419] The papers cited were: [420]

- Feldhutter and Lando (2008) which found the convenience yield to varied from 30-90 basis points.
- Krishnamurthy and Vissing-Jorgensen (2012) which estimated the average of the liquidity component of the convenience yield to be 46 basis points from 1926 to 2008.
- Van Binsbergen et al (2021) which estimated the convenience yield of about 40 basis points.

414 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 5.
415 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 23.
416 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 23.
417 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 22.
418 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, pp. 24-25.
419 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 24.
420 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 24.

The ENA noted the CMA recently considered this issue in their process. [421] The CMA recognised that a CAPM based on the government bond rate alone may understate the return required by equity investors. [422] Therefore, the CMA set the prevailing government yield as the lower bound for the risk-free rate, and considered the yield on AAA-rated non-government bonds to be suitable proxy.[423]

The ENA also submitted that market practitioners adopt a risk-free rate above the prevailing government bond yield. The ENA noted the 2019 KPMG Corporate Finance Survey, and Fernandez surveys indicated that respondents on average adopted a risk-free rate that is above the prevailing government bond yield.[424] Furthermore, the ENA submitted that this observation was made in the most recent edition of Berk and DeMarzo (2020).

Finally, the ENA suggested it may be inappropriate to use the CGS as an appropriate proxy for the risk-free rate because of the RBA's intervention in the government bond market.[425] The ENA observed that the RBA's intervention in financial market in response to the COVID pandemic has been unprecedented.[426] They noted that the RBA anticipate that it would hold 30 per cent of Australian government bonds by September.[427]

The ENA argued that our current approach assume that the required return on all equity has been equally reduced by the RBA interventions.[428] This is a concern because it rules out the possibility that the RBA intervention has had a greater effect on CGS yields than on the required return on equity.[429] The ENA submitted that RBA interventions may understate the risk-free rate by approximately 30 basis points.[430]

Therefore, as part of the 2022 RORI process, the ENA proposed that we consider:

- Whether the prevailing government bond yield is an appropriate proxy for the Capital Asset Pricing Model (CAPM) risk-free rate.[431]
- What impact recent monetary interventions by the RBA have had on observed government bond yields? [432]
- How a best unbiased estimate of the required return on equity should be determined in circumstances where central bank interventions have driven government bond yields lower than the level that would be determined by the market.[433]

10.2.2 Consumer feedback

421 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, pp. 27-28.
422 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, pp. 27-28.
423 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, pp. 27-28.
424 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, pp. 26-27.
425 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, pp. 29-33.
426 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 30.
427 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 30.
428 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 33.
429 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 33.
430 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 6.
431 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 3.
432 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 3.
433 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 3.

Both the CRG and NICE submitted that the CGS yields remain the best proxy for the risk-free rate. [434] The NICE does not consider these rates to be artificial because the risk-free rate is still determined by market forces — supply and demand characteristics. [435]

Furthermore, the NICE noted that the RBA was given a remit to target an inflation band. As part of this the RBA targets an interest rate and participates in the market to achieve that outcome. [436] Therefore, it submitted that the recent RBA intervention to be no different to previous RBA interventions to bring inflation back to the target band.[437]

10.2.3 Investor feedback

While network investors did not agree with how we estimate the CGS rate in the SL-CAPM, they did not comment on whether the CGS is an appropriate proxy for the risk-free rate. However, in their discussion about the MRP and the risk-free rate, QTC stated that the hedging properties of sovereign bonds has been observed by the RBA and the US Federal Reserve. [438]

Furthermore, the NSG submitted that 'most valuation practitioners adopt the yield on government bonds of a term matching the cash flow projection period as a proxy' of the risk-free rate.[439] Similarly, Investors Mutual showed that all six of the analysts it surveyed used the CGS as a proxy for the risk-free rate.[440]

10.2.4 Retailer feedback

We receive no feedback from retailers on whether the CGS is an appropriate proxy for the risk-free rate.

10.3 Financeability

The main stakeholder feedback we receive on financeability is on its use as a cross check for overall rate of return, and its relationship to low interest rates. Overall, networks service providers and investors supported financeability testing. On the other hand, consumers and the AEC did not supported the introduction of financeability tests as part of setting the rate of return.

10.3.1 Network feedback

NSPs are concerned about financeability, and considered that we need to take into account financeability considerations when setting our rate of return instrument. The ENA and the joint submission (by AGIG, SAPN, and the Victorian power networks) claimed that the Project Energy Connect (PEC) was not financeable under the existing regulatory arrangements, and would not have proceeded under the existing regulatory framework if it

434 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 30; NICE, *AER Rate of Return Instrument 2022 — Term and Financeability*, July 2021, p. 16.
435 NICE, *AER Rate of Return Instrument 2022 — Term and Financeability*, July 2021, p. 15.
436 NICE, *AER Rate of Return Instrument 2022 — Term and Financeability*, July 2021, p. 15.
437 NICE, *AER Rate of Return Instrument 2022 — Term and Financeability*, July 2021, p. 15.
438 QTC, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 2.
439 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 14.
440 Investors Mutual, *AER consultation on the term of the rate of return,* July 2021, p. 2.

was not for Government support.[441] The joint submission also claimed that the AGIG Mt Barker expansion will not proceed because it is not economically viable given the current level of allowed returns.

Similarly, a number of NSPs did not agree that a negative NPAT is not a financeability problem. Endeavour Energy submitted rate of return cannot be set on the assumption that a period of under compensation will be offset by some future period of over compensation.[442] While, Ausgrid is concerned about the negative NPAT because 'future capital gains are not included in debt and credit metrics which are impacted by the factors that affect NPAT'.[443] Ausgrid suggested that we build into the PTRM the credit metric calculations used by credit rating agency.[444]

The NSPs proposed that a financeability assessment has an important role to play in assessing the overall allowed return, and should be performed as one of a number of other crosschecks of the AER's allowed return on capital.[445] In their view, this is 'particularly important given the high degree of imprecision, uncertainty and methodological debate about each parameter, and the degree of regulatory judgment that is required in arriving at a final allowed return'.[446] They also noted that many regulators undertake financeability assessments as part of their regulatory process.[447]

In their view, financeability assessments offer two clear benefits for consumers:[448]

- Keeping prices down by keeping the required return on debt low. That is, a financeability assessment would provide an 'early warning' sign of potential future credit rating downgrades, which could have the effect of increasing the allowed return on debt.
- Supporting efficient and prudent investment. If a deterioration in credit quality results in networks having to raise new debt at a premium over the allowed rate of return, then efficient and prudent investments may not proceed commercially.

Furthermore, the NSPs did not interpret financeability as a test of whether a particular firm might become insolvent. The ENA claimed that a recent example of regulatory 'financeability' being interpreted incorrectly is the Project Energy Connect.[449] The NSPs submitted that financeability should be whether an NSP can continue to raise debt at a cost that is commensurate with the benchmark credit rating assumed by the regulator.[450] They noted this is how other regulators construct their financeability tests.

---

441 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 51; Joint report (VPN, SAPN, AGIG), *Submission in response to the AER's working papers on Term of the Rate of Return and Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 3.

442 Endeavour Energy, *Draft working paper: rate of return and cashflows in a low interest rate* environment, 2 July 2021, p. 3.

443 Ausgrid, *Rate of return and cashflows in a low interest rate environment*, July 2021, p. 3.

444 Ausgrid, *Rate of return and cashflows in a low interest rate environment*, July 2021, p. 6.

445 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 3; APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 13.

446 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 5; APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 13.

447 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 49; APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 13.

448 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 51.

449 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 46.

450 APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 14; ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 45.

The NSPs submitted that financeability assessment would have two key purposes:[451]

- To ensure that the regulatory determination was internally consistent such that the allowed return was sufficient to support the credit rating that was assumed when deriving it.
- To ensure that the regulatory determination is robust to potential changes in future financial market conditions. The ENA stated that it would provide an 'early warning' sign of potential future credit rating downgrades. [452]

The ENA suggested that financeability assessment 'should not be applied in a mechanistic way to adjust regulatory allowances'.[453] Allowed returns should not be set by increasing or decreasing the regulatory allowance until the point where some definition of financeability is satisfied. Instead, financeability assessment should be one of the relevant information we have regard to when making revenue determinations. The APGA also submitted that the AER is not bound to accept the results of any financeability assessment.[454]

Overall, NSPs found it 'difficult to conceive of any reason why the determination of the allowed return on equity would be made less reliable by the consideration of relevant evidence such as a financeability assessment'.[455]

10.3.2 Consumer feedback

The CRG, MEU and NICE did not supported the introduction of financeability testing as part of setting the rate of return instrument.[456] However, there was a disagreement between the CRG and NICE on the appropriate regulatory response to financeability, if it was an issue.

The CRG submitted that financeability should be principally managed by NSPs, and noted that networks have provided little evidence to support their claims. In contrast to the NSPs claim of financeability problems, the CRG noted: [457]

- That they are not aware of any evidence of a decline in reliability of the networks since 2018 (other than due to extreme climate events).
- Network's capital expenditure proposals to the AER does not indicate any hesitancy to undertake capital investments.

---

451 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 43; APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 13.

452 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 44.

453 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 47.

454 APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 13.

455 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 7; APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 4.

456 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 30; MEU, *Term of the rate of return cashflows in a low interest rate environment draft working paper*, 29 June 2021, p. 2; NICE, *AER Rate of Return Instrument 2022 — Term and Financeability*, July 2021, p. 1.

457 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 28.

The CRG also questioned why we reopened financeability when there was a lack of 'real world' evidence, and when the AEMC already considered this in their process.[458]

The NICE supported accelerated depreciation in order to manage financeability issues. [459] They disagreed with us that allowing firms to accelerate depreciation will result in worsening financeability metrics in future years and intergenerational equity issues.[460]

10.3.3 Investor feedback

Investors and NSPs had a number of similar views on financeability, and these were:

- Financeability assessment has an important role to play in assessing the overall allowed return.
- Without government support, PEC would have been unable to proceed.
- A regulated business adopting benchmark assumptions should achieve and maintain the credit rating we assumed in setting the return on debt allowance.
- Disagreed that a negative NPAT is an accounting concept and not a problem.[461]

The NSG questioned why we have rejected the use of financeability assessments so strongly when other regulators use them either by choice or by law.[462]

The NSG submitted that it is not acceptable if networks don't get the credit rating we assumed because it requires networks to draw on capital from their un-regulated business. The NSG claimed that this is inconsistent with the revenue and pricing principles, and contravenes one of the ring fencing principle.[463] Furthermore, if a regulated business is required to change gearing to achieve the rate of return instrument, the NSG argued that we should use the same gearing in our rate of return instrument. [464]

The NSG also claimed that it is inappropriate and inconsistent with the regulatory framework, if a NSP adopting the benchmark financing assumptions has to reduce dividends to finance investments. [465] The NSG argued this action will result in investors receiving an equity return that is less than the investors' cost of capital, and the equity return set out in the rate of return instrument.[466]

10.3.4 Retailer feedback

458 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 3.
459 NICE, *AER Rate of Return Instrument 2022 — Term and Financeability*, July 2021, p. 16.
460 NICE, *AER Rate of Return Instrument 2022 — Term and Financeability*, July 2021, p. 16.
461 QTC, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 3.
462 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 15.
463 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 16.
464 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 16.
465 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 16.
466 NSG, *Re: Response to AER RORI 2022 working papers*, 2 July 2021, p. 16.

The AEC shared the same view as the consumers in that financeability should be principally managed by the regulated firm.[467] In the AEC's view, the arguments put forward by the NSPs could lead to the 'cherry picking' of the regulatory model for higher returns.[468]

First, the AEC noted that financeability was already considered in the AEMC rule change process in which the AEMC rejected bringing cashflow forwards, and concluded that the regulatory framework does not create a barrier to financing large projects.[469] The AEC submitted that the NSPs was also unable to provide evidence of any financeability problems during that process. [470]

Second, the AEC is concerned that the NSP's have not provided evidence:[471]

- They cannot efficiently raise capital
- Their capital structures are sufficiently constrained to make regulatory investments not financeable.
- They have been unable to manage their capital structure and cash flows to maintain investment grade credit ratings.
- They are unable to raise capital in the current low risk free rate environment.

Third, they noted that the NSPs' actual financeability is substantially impacted by the practices and choices made by the NSPs.[472]

467 AEC, *Rate of return and cashflows in a low interest rate environment*, 3 July 2021, p. 2.
468 AEC, *Rate of return and cashflows in a low interest rate environment*, 3 July 2021, p. 2.
469 AEC, *Rate of return and cashflows in a low interest rate environment*, 3 July 2021, p. 1.
470 AEC, *Rate of return and cashflows in a low interest rate environment*, 3 July 2021, p. 1.
471 AEC, *Rate of return and cashflows in a low interest rate environment*, 3 July 2021, p. 1.
472 AEC, *Rate of return and cashflows in a low interest rate environment*, 3 July 2021, p. 2

11 Application in the 2022 Instrument Review

In this working paper, we explore whether the rate of return and cashflows we set are appropriate in a low interest rate environment. We intend to discuss, narrow and potentially settle on options before the 2022 Instrument making phase of the review. Furthermore, our consultation and engagement on developing this working paper gave stakeholders an opportunity to influence our thinking and formulation of views at an early stage of the review process.

Our draft paper considered three broad questions (see chapter 9). Based on these questions, our preferred positions were:

- We are currently in a low interest rate environment.
- The reduction in our return on debt has been in line with movements in the broader market for debt and the costs the regulated businesses face.
- Commonwealth Government Securities are an appropriate proxy for the riskless investment for our purposes.

We also formed the preliminary position that measures of financeability are not used directly when setting the rate of return.

In response to our draft paper, stakeholders provided substantial feedback on financeability, and our approach to return on equity. Since there is an overlap between this working paper and the omnibus working paper, not all of this feedback is addressed in this working paper. Where we have not responded to stakeholder's feedback, we will consider them in our future working papers where they are more relevant.

Further considerations on why we picked this topic

The Consumer Reference Group (CRG) submitted that we need to clearly define the evidentiary thresholds to be satisfied before we accept the need for a regulatory review of parameters.[473] Also we need to demonstrate that proposed changes to the framework are enduring, rather than merely reacting to current environmental factors.

We are cognisant of the CRG's concerns about the basis for opening up an issue/parameter for review. We also note the CRG's comments that consumer confidence in a review process would be enhanced by the AER explaining its intended approach to assessing relationships of inputs in its rate of return methodology.[474]

The CRG has raised an issue that we consider important. Following the 2018 RORI we undertook a review of process and published a Consultation paper in November 2019.[475] To enhance the process, in that Consultation paper we noted that we wanted to make some changes to the 2018 process which included bringing forward foundational work that might

473 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 2.

474 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p. 21.

475 AER, *Pathway to the 2022 rate of return instrument, Consultation paper*, November 2019

be constructively undertaken before the active phase of 2022 RORI. The foundational work was targeted at discrete and emerging rate of return issues.[476]

Whilst we recognise that submissions on that Consultation paper closed before the current CRG was constituted, we took on board all stakeholder feedback and developed our Pathway to the 2022 rate of return instrument.[477] Based on stakeholder feedback, in the Pathway to 2022 paper we set out the Working papers (discrete and emerging rate of return issues) we would undertake as part of our work before the active phase of the 2022 RORI. Rate of return and cashflows in low return conditions was one of the papers identified in May 2020.[478]

More recently, we reiterated that: [479]

> *The aim of this working paper series is to explore the key issues relating to the rate of return, and identify new theoretical and empirical evidence since the previous review. They are also a focal point for stakeholder consultation. From these working papers, we establish positions on issues and lay a foundation for the development of the 2022 Instrument.*

We also noted that the working papers are where we discuss, narrow and potentially settle on options before the 2022 Instrument and it is an important opportunity to influence our thinking and formulation of views at an early stage. Further, we noted that these working papers have allowed us to explore a large number of issues across the breadth of rate of return and has provided an important to check that we have not missed any key aspects requiring consideration and potential change.[480]

We are acutely aware of the importance of consumer confidence in our review process and note the CRG's consumer survey findings which might suggest that consumers view our approach as being unbalanced in favour of issues raised by Networks. The approach we have followed to engage with all stakeholders starting in 2019 was targeted to capture discrete and emerging rate of return issues. In that context, we were genuinely looking for issues that might be impacted by new theoretical and empirical evidence since the previous review. We consider our topics were framed by all stakeholder's feedback and correctly targeted and not biased towards anyone one group of stakeholders.

It is important to note that whilst topics are being explored through our working paper series, inclusion in a working paper does not equate to having achieved an evidentiary threshold towards changing that particular rate of return parameter.

We agree with the CRG on the point it makes about the importance of clear evidentiary thresholds before a rate of return parameter input is changed. We acknowledge that with multiple working papers being developed concurrently, there is inevitably some overlap in the issues being considered. Hence, whilst we provided some preliminary exploration on the potential of a relationship between the risk free rate and MRP in our draft working paper this

476 AER, *Pathway to the 2022 rate of return instrument, Consultation paper*, November 2019, p. 4.
477 AER, *Pathway to the 2022 rate of return instrument*, *Position paper*, May 2020.
478 AER, *Pathway to the 2022 rate of return instrument*, *Position paper*, May 2020, p.8.
479 AER, *Overall rate of return, Draft working paper*, July 2021, p.1.
480 AER, *Overall rate of return, Draft working paper*, July 2021, p.19.

topic will be substantially developed on our return on equity omnibus paper. Hence, while we note the comments and issues raised by the CRG relating to the theoretical underpinnings of SL– CAPM, and any findings of a relationship between its input parameters, those matter will be addressed in our Rate of return final omnibus paper.[481]

For our final paper, we have set out our discussion according to the three broad questions we asked in the draft paper. Furthermore, we have accessed stakeholder submissions that asked for change against our assessment criteria for the 2022 rate of return instrument.

Assessment Criteria

When we prepared the 2018 Instrument, we informed our decisions by applying detailed criteria that we previously set out in the 2013 Rate of Return Guidelines (2013 Guidelines). These contribute to the NEO and NGO and support the legislative objectives. We have reviewed these criteria and think they remain useful for the current review. In particular, they provide transparency and predictability about how we will undertake our role. A number of stakeholders have told us this is important for them.

For the 2022 review, we have adopted an additional criteria — see dot point '7' below. Our assessment criteria for the 2022 RORI are: [482]

1. Where applicable, reflective of economic and finance principles and market information
    a. Estimation methods and financial models are consistent with well-accepted economic and finance principles, and informed by sound empirical analysis and robust data
2. Fit for purpose
    a. The use of estimation methods, financial models, market data and other evidence should be consistent with the original purpose for which it was compiled and have regard to the limitations of that purpose
    b. Promote simple over complex approaches where appropriate
3. Implemented in accordance with good practice
    a. Supported by robust, transparent and replicable analysis that is derived from available credible datasets
4. Where models of the return on equity and debt are used these are
    a. Based on quantitative modelling that is sufficiently robust as to not be unduly sensitive to errors in input estimation
    b. Based on quantitative modelling which avoids arbitrary filtering or adjustment of data, which does not have a sound rationale
5. Where market data and other information is used, this information is
    a. Credible and verifiable

[481] We intend to consolidate our draft omnibus papers on the overall rate of return debt and equity into one final rate of return omnibus paper.

[482] AER, *Overall rate of return, Draft working paper*, July 2021, pp. 21-22.

b. Comparable and timely

c. Clearly source

6. Sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.
7. The materiality of any proposed change, and the longevity or sustainability of new arrangements.

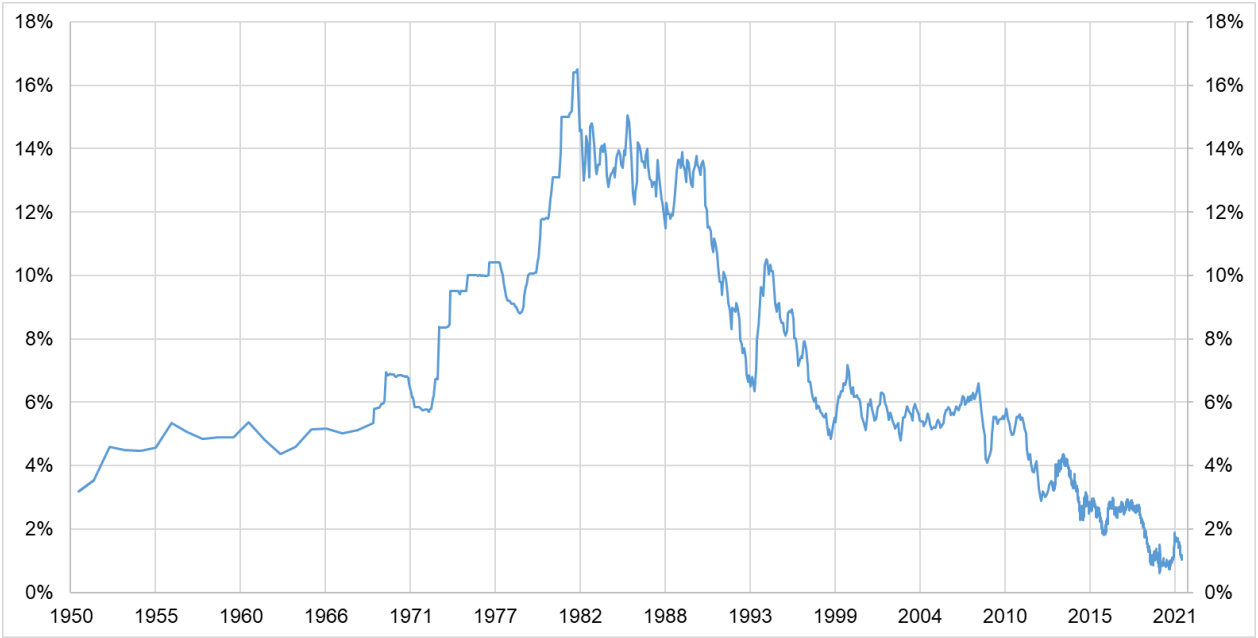
11.1 Are we in a low interest rate environment?

Consistent with the view we expressed in our draft working paper and most stakeholder submissions, our preferred position is that we are currently in a low interest rate environment.

Over the past decade, Australia and many other advanced economies have experienced historically low interest rates. The Reserve Bank of Australia (RBA) has attributed this to a number of structural changes, including demographic changes, a decline in potential output growth and changes in households' and firms' risk appetite.[483]

While in this working paper we do not define a specific threshold to characterise a 'low interest rate environment', we agree that key measures of interest rates are lower than they have been for some time. This is particularly true for the 10 year CGS rate we use in our cost of equity estimation — see Figure 3.

Figure 3 Historic Australian interest rates on 10 years government bond yields



Source: RBA

483 Guttmann, Lawson & Rickards, *The Economic Effects of Low Interest Rates and Unconventional Monetary Policy*, 17 September 2020, https://www.rba.gov.au/publications/bulletin/2020/sep/the-economic-effects-of-low-interest-rates-and-unconventional-monetary-policy.html.

11.2 Is the rate of return appropriate in a low interest rate environment?

The rate of return is calculated by combining estimates of the return on debt with the return on equity, using an estimated gearing level. In this working paper, we look at whether our rate of return is appropriate in a low interest rate environment.

11.2.1 Return on debt

We continue to hold the view expressed in our draft working paper that our current approach to estimating the return on debt remains appropriate in a low interest rate environment. This is a view shared by the NSPs and the AEC. In our debt working paper we are considering whether we might refine our estimate of the return on debt but this is part of our ongoing review of our estimates rather than because of impacts of the low interest environment.

Under the 2018 Instrument, the return on debt is calculated using an average of observed corporate bond yields from third-party providers (RBA, Bloomberg and Thompson Reuters) with a term of 10 years and a credit rating of BBB+.[484]

Unlike the required return on equity, the required return on debt is more observable. Thus, we estimate the yields directly where possible rather than building up from a foundational model. This allows the return on debt to vary more or less one-for-one with changes in Commonwealth Government Securities.

Our return on debt estimates can be split into:

- Spot rates, which are the return on debt observed in an averaging period for that particular regulatory year.
- Trailing average rates, which is a weighted average of spot rates from (up to) the previous 10 regulatory years. The trailing average rate is the return on debt the networks receive each year.

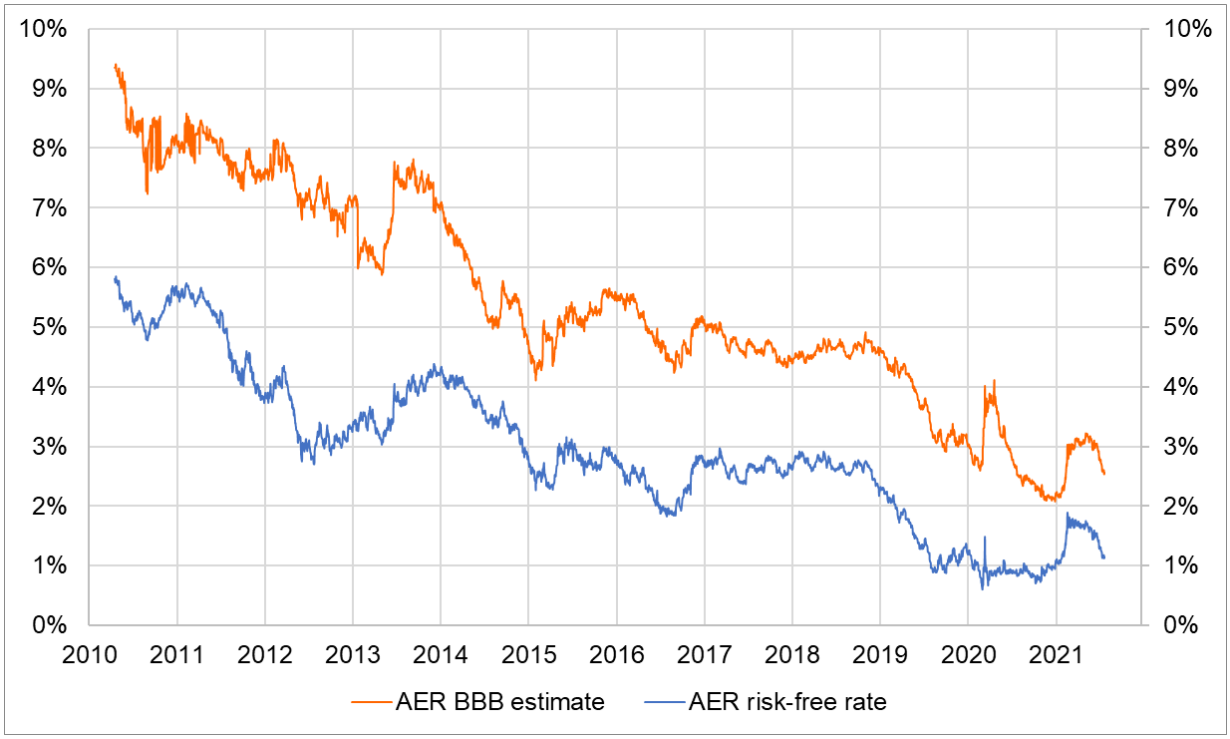
These estimates have different responses to current changes in the risk-free rate.

Spot rate

We observed that our BBB estimates do not move one-for-one with the risk-free rate — see Figure 5. However, Figure 4 shows that our return on debt proxies have declined as interest rates have fallen. We used a narrower time horizon because data on debt representative of the networks we regulate is less available than that of CGS.

484 As these providers do not produce 10 year curves with a credit rating of BBB+, a 2/3 BBB 10 year and 1/3 A 10 year blend is used to match a BBB+ credit rating.

Figure 4 Comparison of AER BBB estimate and AER risk-free rate (May 2010 to July 2021)



Sources: RBA; Bloomberg; AER

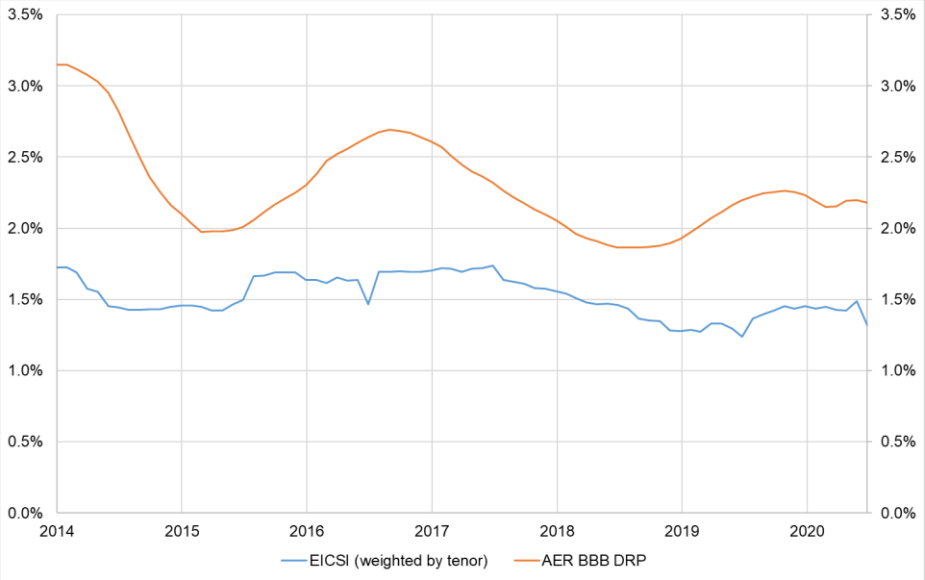
Figure 5 shows the difference between our BBB estimate and the risk-free rate. We observe the difference between the two estimates varies over-time, and has narrowed over the past decade.

Figure 5 AER BBB debt risk premium (May 2010 to July 2021)

Sources: RBA; Bloomberg; AER

In Figure 6 we estimate the debt risk premium using electricity and gas Networks' actual debt cost. This estimate is based on primary market data and to create the estimate smoothing is applied using a yearly-average of issuance. The graph suggests that network debt costs may vary in a more one-for-one manner with CGS than our third party estimates in Figure 4. However, more analysis would be necessary to determine if there are other drivers for this.

Figure 6 Energy Infrastructure Credit Spread Index (EICSI), weighted by tenor vs. AER BBB debt risk premium (January 2014 to June 2020)



Sources: RBA; Bloomberg; AER

Trailing average

As noted above, we use a trailing average approach for our return on debt. Historical debt spot rates makes up 90 per cent of our trailing average of return on debt. Thus, the trailing average is less sensitive than return on equity, and the debt spot rate to changes in the risk free rate.

The trailing average provides a dampening effect to changes in the risk free rate or the debt risk premium as it is a moving average of historical rates. Previous years' interest rates were also a lot higher than they are today. Therefore, the prevailing low interest rates are not fully reflected in our return on debt allowance. More-over, using the trailing average gives a higher return on debt estimate.

11.2.2 Return on equity

Whilst we provided some initial considerations on the relationship between the risk free rate and of return on equity in our draft working paper, we noted therein, that we will substantively consider the issue in the return on equity omnibus paper.

We are aware that networks and investors have a number of concerns about the return on equity we set. At the same, we are aware of a number of concerns raised by consumers. In

particular, the CRG's emphasis of the importance of establishing, ex-ante, the evidential threshold for change via consultation with consumers and other stakeholder.[485]

We will consider the concerns raised about our return to equity approach (except for the appropriate proxy for the risk-free rate — see section 11.3) in the final equity omnibus working paper. Our preliminary views on the return on equity parameters were outlined in our draft equity omnibus working paper — released July 2021.

Nonetheless, there is one important clarification we want to make. When we estimated the forward-looking MRP in the 2018 Instrument, we took into consideration survey evidence and DGMs. Compared to the 2013 Guideline, we gave less weight to dividend growth models in 2018 because we had diminished confidence in the estimates from dividend growth models.[486]

11.3 Return on equity — Is the CGS an appropriate proxy for the risk-free rate, and do we need to adjust for convenience yield?

Our preferred position in the draft paper was that the CGS remain an appropriate proxy for the risk-free rate. While market practitioners may not use the current CGS spot rate, almost all used the CGS as a proxy for the risk-free rate.

In stakeholder submissions, NSPs questioned whether the CGS is an appropriate proxy for the risk-free rate (see section 10.2.1). ENA submitted there are regulatory precedent, academic literature, market practice and standard text books to suggest that the CGS is not an appropriate proxy for the risk-free rate. The NSPs explained that government bonds tend to contain a convenience yield, which is not relevant to the CAPM risk-free rate. Thus, they proposed we adjust for the convenience yield, or adopt an alternative proxy for the risk-free rate.

We sought and received expert advice from the ACCC, Regulatory Economic Unit (REU) on the appropriate proxy for the risk-free rate, and the convenience yield. Please see appendix A for the REU's advice.

Furthermore, we have assessed the Networks' proposal to change our risk free rate proxy or adjust it for a convenience yield against our decision-making framework.[487]

Our preferred position is that the CGS remains an appropriate proxy for the risk-free rate, and that we should not adjust for an estimated convenience yield. Key reasons for this conclusion are:

- The literature is far from settled, and it is not a well-established practice to adjust the CGS rate for an estimated convenience yield. (Not consistent with well-accepted economic and finance principles, and informed by sound empirical analysis and robust data).

485 CRG, *Advice to the Australian Energy Regulator on the Rate of Return and Cashflows in a Low Interest Rate Environment*, 2 July 2021, p.2

486 AER, *Draft Rate of Return Guideline — explanatory statement, July 2018*, p. 200 & p. 216.

487 AER, *Overall rate of return draft working paper*, July 2021, p.19

- The risk free asset in the SL CAPM possesses the safety property. It is not a feature of the convenience yield.
- Any convenience yield is very difficult to estimate. The estimate of a convenience yield is only as accurate and robust as the proxy for the alternative and 'true' risk-free rate. Moreover, we would also have to adjust the historical excess returns for an estimated convenience yield in our MRP estimation. (Not fit for purpose because it does not promote simple over complex approaches where appropriate).
- It is not supported by robust analysis that convenience yields exist in Australia, or that they can be reliably estimated. Recent evidence suggest there might be an inconvenience yield since 2015. Furthermore, it is common practice to use the CGS as a proxy for the risk-free rate. (Not implemented in accordance with good practice).
- Any convenience yield is highly time varying, and it will be very difficult for us to estimate it in a timely manner. (Not sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes).

In view of these challenges and difficulties we do not consider it is viable to adjust the SL CAPM estimate to incorporate an estimated convenience yield or to adopt an alternative proxy for the risk-free rate. Any of these actions are likely to lead to an inferior estimate rather than an improvement.

What is the SL-CAPM risk-free rate?

The risk free rate is a key parameter within the Sharpe-Lintner CAPM, our foundation model for estimating the return on equity. The risk free rate is the return an investor would receive from a 'riskless' investment. Sharpe (1964) defines the risk-free rate in the CAPM as the 'price of time'.[488] We must choose a proxy for the riskless investment, in practice there is no perfectly riskless investment.

In choosing a proxy, we have to consider which investments have the minimum amount of risk and the appropriate term. The risk free rate has a number of assumed properties in the SL CAPM:

- Borrowing and lending can occur at that rate
- It has zero return variance
- There is zero correlation of risk free rate with the return on any risky asset or portfolio (zero beta).[489]
- It is an exogenous variable.[490]
- Trade is liquid since capital markets are assumed to be perfect and frictionless.

Typically government bonds are used as proxies for the risk-free rate. However, government bonds may possess certain other properties aside from those of the true (unobservable) risk free asset. For example, they may contain a convenience yield.

---

488 William Sharpe (1964), 'Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk', *Journal of Finance*, XIX(3), p. 425.

489 Seth Armitage (2005), The Cost of Capital Intermediate Theory, Cambridge, p. 43.

490 Haim Levy (2011), The Capital Asset Pricing Model in the 21st Century, Cambridge, p. 135.

The convenience yield on government bonds corresponds to the (positive) difference between the 'true' risk free rate defined in the SL CAPM and the yield on government bonds used as a proxy for the risk free rate. The ENA submits that a convenience yield includes 'money like' convenience properties such as safety and liquidity.[491] We do not agree with ENA's definition of the convenience yield which suggested that the liquidity (and also safety) property of government bonds is incompatible with the CAPM, implying either an adjustment to the government bonds for a convenience yield or consideration of an alternative proxy for the risk free asset.

We consider the safety property of CGS is a relevant property of the true risk free asset in the SL CAPM. An asset which can default has non-zero variation of its return, violating the SL CAPM assumption of zero variation. Therefore, the safety property of CGS is not a property of the convenience yield.

Sensitivity of convenience and inconvenience yield

The REU have reviewed six academic papers (see table A.1 of appendix A) on convenience yields. The literature is far from settled. There are numerous proxies for an alternative 'true' risk free rate used to estimate the convenience/inconvenience yield in the surveyed papers (see Appendix A for a non-exhaustive list).

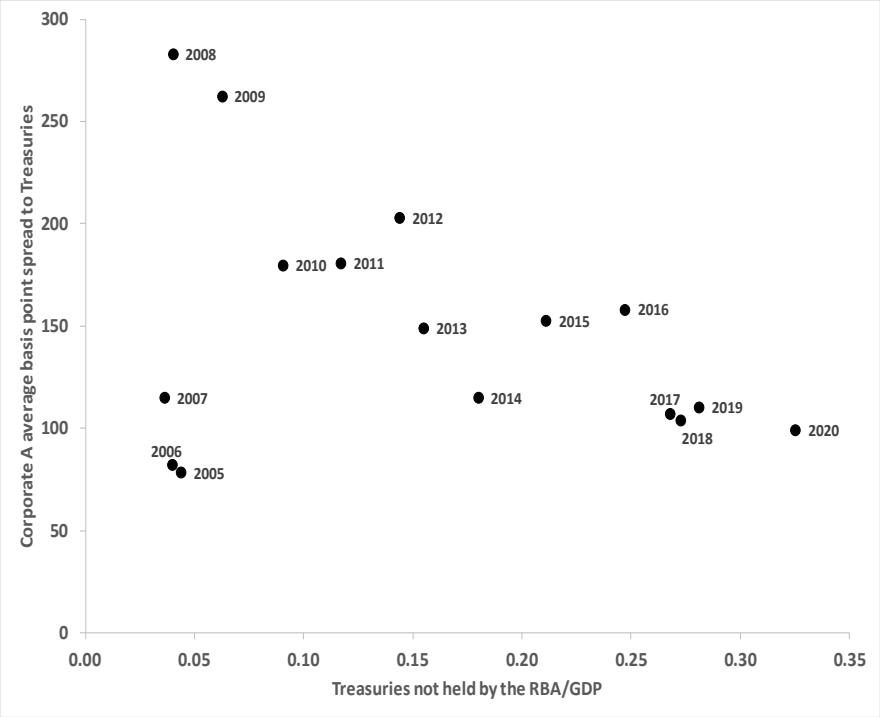
The REU's key finding is that the estimate of the convenience and inconvenience yields is highly sensitive to the chosen sample period, and the proxy chosen for the 'true' risk free rate. The estimate of the convenience yield is only as accurate and robust as the proxy for the alternative and 'true' risk-free rate.

In its report to the ENA, and on the basis of Krishnamurthy and Vissing-Jorgensen's earlier working paper, NERA (2007) submitted that the same relationship held for CGS.[492] NERA submitted the convenience yield falls to zero when the supply of CGS is sufficiently high.[493] Figure 7 shows that since 2007 the supply of CGS not held by the RBA and as a share of GDP has increased from approximately 4 per cent to approximately 33 per cent in 2020. Similarly, the corporate bond spread has also fallen.

Based on ENA/NERA's argument, the convenience yield, to the extent that it exists in CGS yields, may now be negligible or even fall to zero. However, the REU does acknowledge that there may be many other explanations for the spread aside from the supply of CGS and a possible 'convenience yield' (the small spread pre-GFC is a case in point).

491 ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 23.
492 NERA (2007), *Bias in Indexed CGS Yields as a Proxy for the CAPM Risk Free Rate: A report for the ENA*, March, p. 37.
493 NERA (2007), *Bias in Indexed CGS Yields as a Proxy for the CAPM Risk Free Rate: A report for the ENA*, March, p. 37.

Figure 7 Corporate bond spread and Treasury bonds not held by RBA/GDP



Source: RBA, AOFM, REU estimates

Increasingly, there is empirical evidence that the convenience yield in the US Treasury bonds may have switched sign since 2015. This is an observation made by Klingler and Sundaresan (2020), He et al. (2020), and Fleckenstein and Longstaff (2021).[494] They suggested an 'inconvenience yield' that may be related to the strong growth in the supply of government bonds.

What proxy do others use for the risk-free rate?

The ENA makes reference to the UK Competition & Markets Authority (CMA) use of AAA-rated non-government bonds as a suitable input into the estimate of the risk free rate.[495] However, we note that the OFGEM in its recent decisions did not follow the CMA approach but based its decision only on index linked gilts.[496]

OFGEM considered that AAA-rated non-government bonds to be quite illiquid and contain some element of default risk.[497] They also noted the use of the AAA rated non-government

---

494 Sven Klingler and Suresh Sundaresan (2020), Diminishing Treasury Convenience Premiums: Effects of Dealers' Excess Demand at Auctions, Working Paper, 23 October; Zhiguo He, Stefan Nagel and Zhaogang Song (2020), 'Treasury inconvenience yields during the COVID-19 crisis', *NBER*, Working Paper No 27416; Zhiguo He, Stefan Nagel and Zhaogang Song (2021), 'Treasury inconvenience yields during the COVID-19 crisis', Journal of Financial Economics, available May 2021; Matthias Fleckenstein and Francis Longstaff (2021), 'Treasury Richness', *NBER*, Working Paper 29081.

495 ENA (2021), Rate of Return and cashflows in a low-rate environment: Initial network sector views, AER Stakeholder Forum, 23 June 2021, Pathway to 2022 Rate of Return Instrument.

496 Ofgem, *RII0-2 Final Determination — Core Document*, 8 December 2020, p. 201.

497 Ofgem, *Anglian Water Service Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations: Provisional Findings*, 29 October 2020, p. 7.

bonds yields for the risk-free rate would be a departure from past regulatory practice and the overwhelming majority of academic, practitioner and reference based finance textbooks.[498]

Therefore, OFGEM considered that the recent CMA decision for the cost of equity:[499]

> *Could be perceived as altering the balance of risk and return in UK regulated sectors, in favour of investors, to a level beyond what is reasonable based on market evidence. The result is likely to be a substantial transfer of value from consumers to investors in the water sector, without clear benefits in terms of deliverable outputs and standards of service.*

OFGEM's decision was appealed by the networks to the CMA. Based on the CMA's summary of provisional determination, we understand that it has provisionally upheld OFGEM's decision.[500]

We note that mainstream finance theory such as Armitage (2005),[501] Brealey et al. (2017),[502] Cochrane (2005)[503], Danthine and Donaldson (2015)[504] and Pratt and Grabowski (2014)[505] consider government bonds/bills as the best proxy for the risk-free rate.

This is also supported by the Berk and DeMarzo (2014) textbook cited by Oxera. The authors noted that practitioners sometimes use rates from the highest quality corporate bonds' as a proxy for the risk-free rate. However, the authors do not consider that this is the best proxy because they generally determine the risk-free rate using government yields.[506]

Furthermore, we do not consider that RBA interventions in the longer term CGS market affects the appropriateness of using the CGS as the proxy for the risk-free rate. We agree with the NICE that interest rates are determined by market forces, and are not artificial.

It is the role of central banks to intervene in the financial market. While the RBA has generally targeted the cash rate (conventional monetary policy) and not the longer term rates (or the term structure), the intention of this monetary policy is to change the time value of money over longer periods (and the term structure of interest rates).[507]

Investors are well aware of the RBA's role and its current use of monetary policy, and they continue to use the CGS as a proxy for the risk-free rate — as evidenced by the NSG and Investors Mutual submissions. The majority of the 5000 practitioners (in 81 countries)

---

498 Ofgem, *Anglian Water Service Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations: Provisional Findings*, 29 October 2020, p. 8.

499 Ofgem, *Anglian Water Service Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations: Provisional Findings*, 29 October 2020, p. 2.

500 Available at: https://www.gov.uk/cma-cases/energy-licence-modification-appeals-2021#summary-of-provisional-determination

501 Seth Armitage (2005), *The Cost of Capital Intermediate Theory*, Cambridge, pp. 278-281.

502 Richard Brealey, Stewart Myers and Franklin Allen (2017), *Principles of Corporate Finance, 12th Edition*, McGraw-Hill, p. 206 and other page references.

503 John Cochrane (2005), *Asset Pricing Revised Edition*, Princeton University Press, p. 21; p. 392; p. 456.

504 Jean-Pierre Danthine and John Donaldson (2015), *Intermediate Financial Theory: Third Edition*, p. 470; p. 485.

505 Shannon Pratt and Roger Grabowski (2014), *Cost of Capital: Applications and Examples*, Wiley, Chapter 7.

506 Jonathan Berk and Peter DeMarzo (2014), *Corporate Finance Third Edition*, Pearson, p. 404; Jonathan Berk and Peter DeMarzo (2020), *Corporate Finance Fifth Edition*, Pearson, p. 447; Oxera (2020), *Are sovereign yields the risk-free rate for the CAPM? Prepared for the Energy Networks Association*, 20 May, p. 2.

507 Reserve Bank of Australia, Education - Unconventional Monetary Policy, p2: https://www.rba.gov.au/education/resources/explainers/pdf/unconventional-monetary-policy.pdf

surveyed by Fernandez et al. (2020)[508] used the government bonds as the proxy for the risk-free asset. There was also no mention that any of the 37 Australian respondents reported the use of a risk free asset other than government bonds.

We are also not aware of another Australian regulator using a proxy other than the CGS for the risk-free rate. Fundamentally, we see no reason or evidence to indicate monetary policy in Australia has altered the evidence for using the CGS as the risk free asset proxy. We consider the RBA's intervention has simply reduced the price of risk free money over longer time periods.

11.4 Financeability

Our preliminary position set out in our draft working paper is that we should not directly use measures of financeability when setting the rate of return. Stakeholder submissions support us continuing this position. Following consideration of submissions on the draft working paper, we continue to hold this view. Generally, we note:

- Financeability is a cash flow measure and the rate of return is only one input into cash flows. Hence, a particular financeability metric of itself does not indicate the rate of return is incorrect.
- Financeability metrics are dependent on assumptions used when calculating them, particularly the gearing assumption. While we use 'benchmark' assumptions for calculation the rate of return, including the gearing ratio, these parameters use goes no further than this task. They do not mean individual regulated businesses will, or even can, achieve these individual parameters at a given point in time.
- The 60 per cent gearing ratio used in the 2018 rate of return instrument was above the average gearing ratio of the firms we regulate when this instrument was made and a reduction would have reduced the overall allowed rate of return. Regulated businesses generally opposed a reduction in this ratio at the time.
- In determining how we set the rate of return under the Rate of Return Instrument we aim to provide all regulated businesses a reasonable opportunity to recover their efficient costs. However, this does not require a given businesses (or even the industry average) cost structure to exactly reflect the benchmarks we use for setting the rate of return (e.g. to have the same debt to equity capital ratio as we use for setting the rate of return in the rate of return instrument).

However, in response to the draft working paper, NSPs and network investors considered financeability assessment has an important role to play in assessing the overall allowed return. They considered it is good regulatory practice (as an internal consistency check and as an early warning tool), and in the long term interest of consumers to consider financeability as part of setting the rate of return instrument. On the other hand, the CRG, consumer groups and retailers did not support the introduction of financeability testing as part of setting the rate of return instrument.

NSP and investors pointed to potential credit downgrades, government support for ISP projects, and the negative NPAT as evidence that there is a financeability problem. Whereas,

508 Pablo Fernandez, Eduardo de Apellaniz and Javier Acin (2020), Survey: Market Risk Premium and Risk-Free Rate used for 81 countries in 2020, IESE Business School.

CRG and the AEC pointed to a lack of evidence that financeability is causing serious capital constraints or reliability concerns.

Essentially, the key issue raised by stakeholders is whether we should use financeability to cross check our overall rate of return. In our draft working paper we stated that: [509]

> *While we considered submissions on financeability in making the 2018 Instrument, our final decision was to not use it to inform our rate of return. However, we will reconsider any role for financeability in our Overall rate of return paper*

In our Draft overall rate of return working paper we discussed possible cross checks and identified financeability metrics as one of them and stated that our preliminary view is to explore the possibility of using financeability tests as an overall cross check on the rate of return.[510] Given the overlap of papers, we will consider financeability metrics as a cross check in our final overall rate of return working paper.

For clarity, we note that our position remains the same as the one we expressed recently as part of the AEMC's TransGrid and ElectraNet rule change process.[511] The AEMC rule change process rejected the proposal to bring forward cash flows in order to improve financeability metrics, and concluded that the regulatory framework does not create a barrier to financing large projects. [512]

Whilst we acknowledge the examples raised by NSPs and investors as evidence of financeability concerns, we agree with the AEMC that the regulatory framework does not create a barrier to financing large projects. In that context, we do not consider the example of the PEC project receiving funds from the Clean Energy Finance Corporation (CEFC) as evidence of financeability issues.

There could be a multitude of reasons why the project sought and/or CEFC provided funds. The reasons and details of the funding have not been provided to us and clearly linked to financeability concerns and set out how those reasons might be addressed via the rate of return. It is unclear to us whether the CEFC funding arrangement was consequent to the NSPs' inability to raise capital from the market in the current low risk free rate environment.

However, we note that one of the PEC project partners (Spark Infrastructure) which is largely invested in regulated energy network assets has recently received and recommended acceptance of a takeover at a price around 1.45 time its asset base. This takeover and its price appears to imply no lack of efficient capital available to regulated businesses under the current regulatory framework and its current settings.

We continue to define financeability as a NSP's ability to meet its financing requirement and to efficiently raise new capital.[513] We note submissions that suggest our definition appears

---

509 AER, *Rate of return and cashflows in a low interest rate environment, Draft working paper*, May 2021, p.48

510 AER, *Overall rate of return, Draft working paper*, July 2021, p.57

513 AER, *rate of return and cashflows in a low interest rate environment draft working paper*, May 2021, p. 35.

incorrect and that it should be defined by whether an NSP can continue to raise debt at a cost that is commensurate with the benchmark credit rating assumed by the regulator. [514]

As noted in our Draft overall rate of return working paper, the difference is a matter of use and context. We noted that in the regulatory context, it often refers to the service provider's ability to achieve the benchmark credit rating applied in the estimation of the rate of return.[515] However, we note that there is no one definitive measure of financeability amongst regulators and credit rating agencies. Measuring financeability is a subjective process that involves considering a wide range of qualitative and quantitative factors.

NSPs are in a far better position than a regulator to manage financeability issues as they arise. There are a number of sources of funding available to a NSP to efficiently meet its financing requirements, and they have an incentive to choose the most efficient option if they are required to manage the associated risks.

NSPs can, and do, engage in a range of practices specific to managing their own operations. This includes adopting individual financing and capital structure decisions to accommodate circumstances and management choices. To the extent we consider it necessary, noting we consider the overall rate of return relatively invariant to capital structure (i.e. gearing), we will pick up changes in capital structure in future rate of return reviews when we set the benchmark gearing.

Finally, we note that it is generally desirable where practical for NSPs to bear the risks associated with their choices and any consequences of their actions. This provides them with the incentive to manage these risks.

The submissions we received have not convinced us to move away from our draft decision position on financeability, which noted that:

- A reduction in the credit metric FFO/Net Debt does not imply an imminent credit downgrade. When forming a view on credit ratings, credit rating agencies take into account a wide range of quantitative and qualitative factors beyond FFO/Net Debt.[516] For example, Moody's assigns a 12.5 per cent weighting to the FFO/Net Debt ratio.[517]
- The regulatory framework does not require NSPs to be able to achieve the benchmark assumptions used in making and applying the RORI at all times. We consider sector benchmarks rather than firm specific details in making the RORI and that the NSPs have flexibility in their capital structure decisions and employ this accordingly.[518]
- Bringing forward cash flows via increasing the return of capital building block to improve current financeability metrics may cause financeability issue in the future given future revenue is lower. Further, bringing cash flows forward may create intergenerational wealth transfers.[519]

---

514 APGA, *Draft working papers on term of the risk-free rate and the rate of return and cash flows in a low interest rate environment*, 2 July 2021, p. 14; ENA, *Rate of return and cashflows in a low interest rate environment*, 2 July 2021, p. 45.
515 AER, *Overall rate of return draft working paper*, July 2021, p. 54.
516 AER, *rate of return and cashflows in a low interest rate environment draft working paper*, May 2021, p. 45.
517 CEPA, *Financeability of ISP Projects*, 27 January 2021, p. 24.
518 AER, *rate of return and cashflows in a low interest rate environment draft working paper*, May 2021, p. 47.
519 AER, *rate of return and cashflows in a low interest rate environment draft working paper*, May 2021, p. 48.

- NSPs are best placed to manage financeability.[520]

11.4.1 How NSPs can manage financeability in a low interest rate environment?

In the draft working paper we demonstrated that the net profit after tax (NPAT) and FFO/Net Debt are impacted by the lower interest rate environment. All else equal, a lower interest rate results in lower NPAT and FFO/Net Debt. NSPs may be concerned about this, but there are options available to them to address this concern. They can:

- Improve NPAT and FFO/Net Debt by lowering gearing (see scenario 1).
- Improve FFO by maintaining or increasing gearing (see scenario 2).

It is viable for networks to adopt a gearing different to our gearing assumption because the return on capital is relatively invariant to changes in gearing. We will also pick up changes in actual gearing in future rate of return instrument reviews.

In particular, NSPs are concerned about negative NPAT. We do not consider negative NPAT is an issue. NSPs can obtain a positive NPAT in a low interest rate environment by adopting a lower gearing ratio. Alternatively, there are options available for NSPs to finance the negative NPAT (shortfall). It can issue:

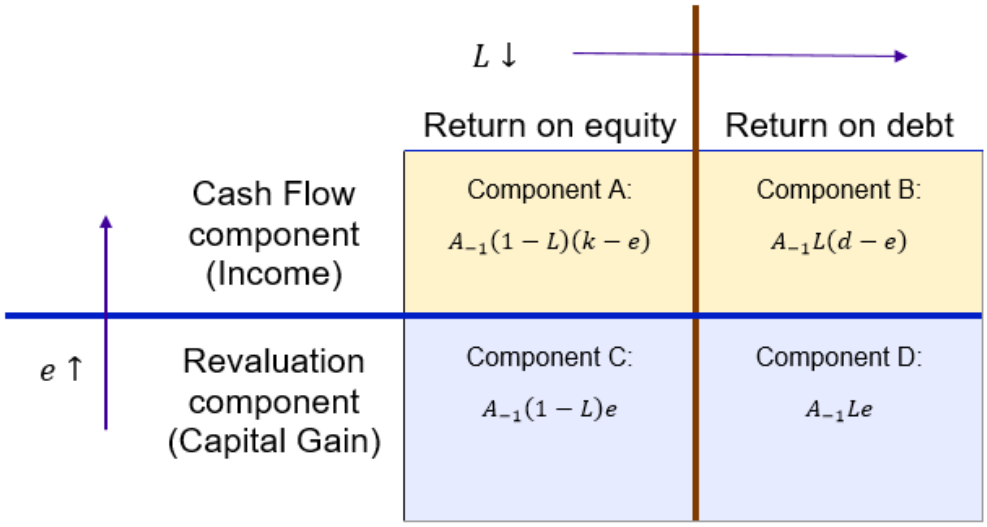
- Equity, which will gradually lower gearing and improve NPAT — see scenario 1.
- Debt, which will also gradually lower gearing. If gearing is maintained, there will be enough cash remaining to pay dividends — see scenario 2.

Investors would not be worse off by adopting a different gearing. Under either scenarios, investors will receive the return on capital allowance we set.

The figure below shows the components of the return on capital. It also shows that the total return equity holder receive is the return on equity and not NPAT. Although NPAT can be negative over the short run, return on equity and long run NPAT are positive. While investors may be making a loss for taxation purposes, investors are not making losses taking into account indexation of the regulatory asset base and are making a positive total return on their investment.

[520] AER, *rate of return and cashflows in a low interest rate environment draft working paper*, May 2021, p. 48.

Figure 8 Components of the return on capital



Where: A = RAB
L = Gearing
e = Inflation
k = return on equity
d = return on debt

The return on equity is made of two component which consist of an income component (NPAT) and a capital gain component (RAB indexation). Investors gets the entire RAB indexation (capital gains component) because debt holders receive 100 per cent of their return in the form of interest payments. Mathematically this is equivalent to:

Total Equity Return = Return on equity * RAB * Gearing = NPAT + RAB indexation

Where NPAT = Component A – Component D. Investors have to pay debt holders for the debt component of the RAB indexation (which they received as capital gain) as part of their interest payments.

While RAB indexation = Component C + Component D

Therefore, Total Equity Return can be simplify to Component A + Component C

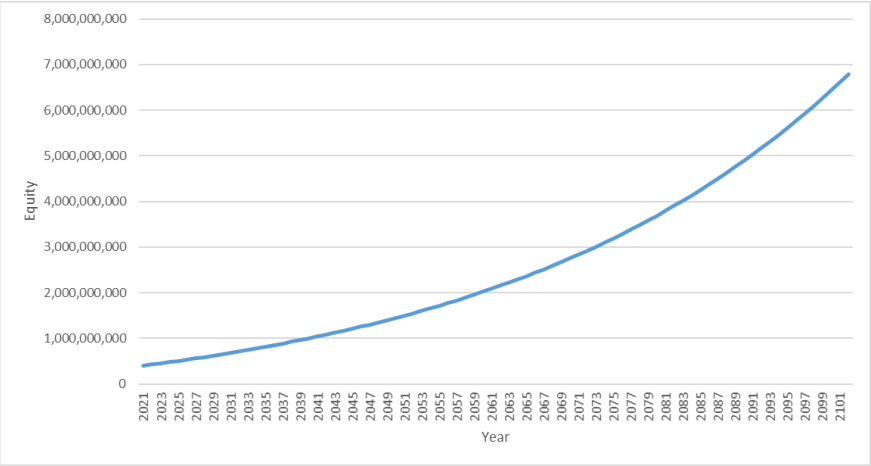
Scenario 1: Improve NPAT and FFO/Net Debt by lowering gearing

In this scenario, we made the following assumptions:

- There are no incentive schemes, and actual operating expenditure equals operating expenditure allowance.
- Capital expenditure equals depreciation.
- Debt is issued to refinance expiring debt.
- Equity is raised to finance the negative NPAT.

In this scenario, the equity value is growing over time — see Figure 9. This growth is coming from the RAB indexation. As mentioned above, the equity holders get 100 per cent allocation to the RAB inflation adjustment while debt holders get 0 per cent as all of their return is in the form of interest payments.

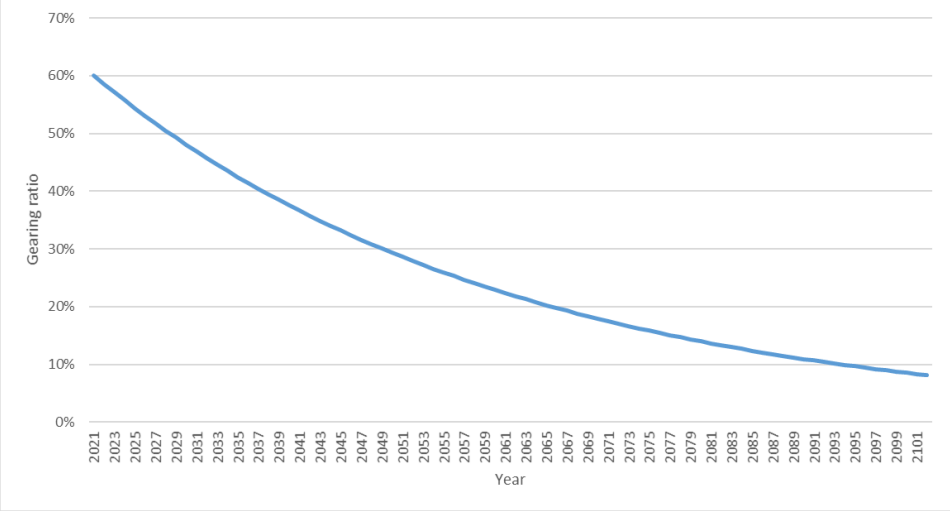
Figure 9 Equity value over time



Source: AER analysis

Therefore, the gearing of the firm would decrease over time as the amount of debt is constant while the equity component of the RAB is growing — see Figure 10.

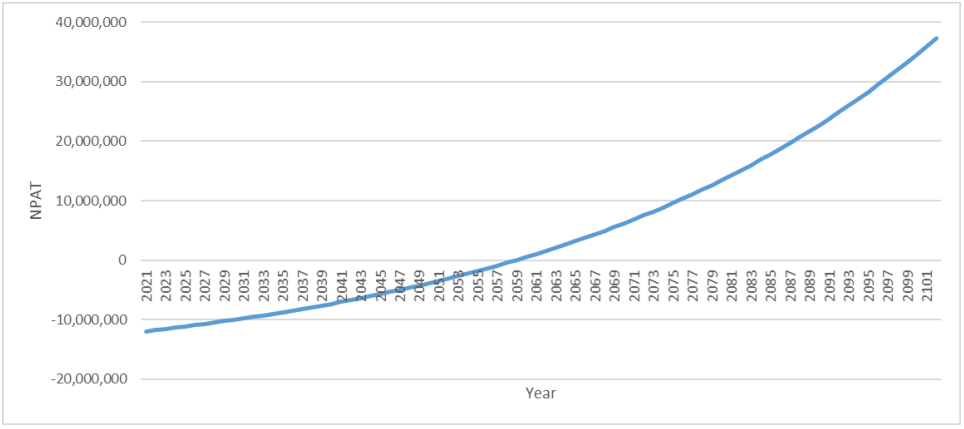
Figure 10 Gearing over time



Source: AER analysis

As a result, NPAT will improve over time, and eventually become positive — see Figure 11. The NPAT becomes positive as a higher RAB and lower gearing means the cash return on capital to equity holders will increase overtime, while the debt costs remain constant.

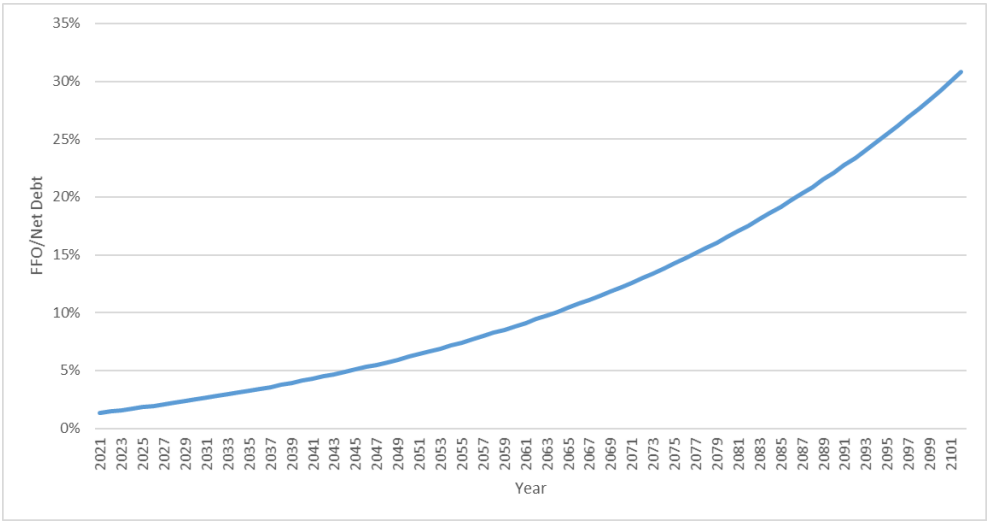
Figure 11 NPAT over time



Source: AER analysis

At the same time, the FFO/Net Debt ratio is also improving over time — see Figure 12.

Figure 12 FFO/Net Debt over time



Source: AER analysis

We note the FFO/Net Debt ratio can be higher, and the NPAT can become positive earlier than indicated above by further lowering the gearing ratio. This is an option available to NSPs. They can raise more equity than assumed in this scenario to reduce existing debt, and to lower gearing. If this is deem desirable, we will pick this up in our future rate of return instrument review.

Scenario 2: Improve FFO by maintaining or increasing gearing

In this scenario, we made the following assumptions:

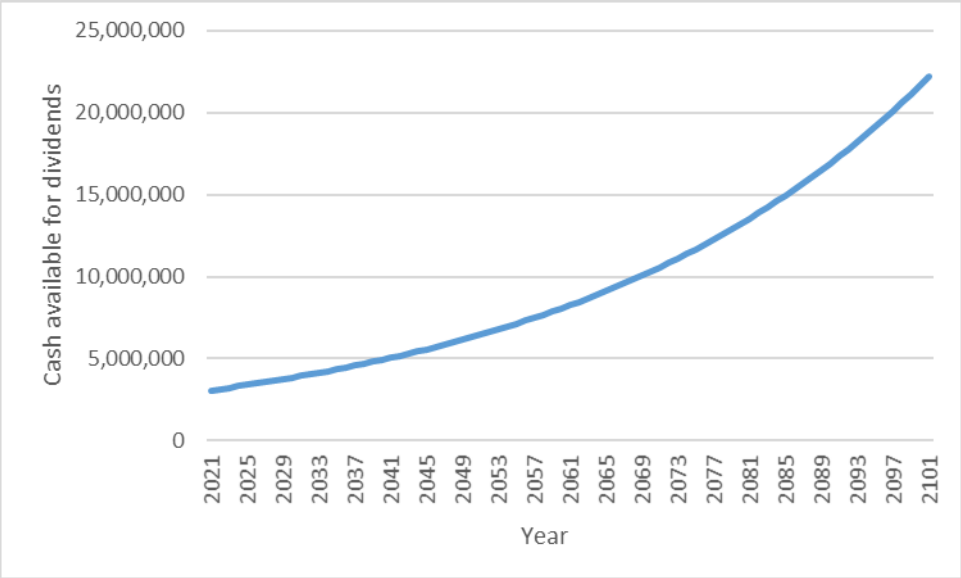
- There are no incentive schemes, and actual operating expenditure equals operating expenditure allowance.
- Capital expenditure equals depreciation.
- Maintain existing gearing at 60 per cent

If NSPs consider that it is not desirable to raise more equity but wants to improve FFO, then they can maintain or increase the existing gearing ratio. In this scenario, NPAT is still negative but the cash inflow from debt issuance exceeds the cash outflow from debt retirement and negative NPAT. Mathematically the FFO can be expressed as this:

NPAT + cash inflows from new debt issues – cash outflows from debt retirement.

This scenario will generate higher FFO than scenario 2, and more than enough to cover the negative NPAT. In fact, there will be cash available to pay as dividends if NSPs maintain the existing gearing ratio of 60 per cent — see Figure 13.

Figure 13 Cash available for dividends



Source: AER analysis

We emphasise that under either scenarios, the NSPs will receive the return on equity we provided them.

Part C

12 Term of the rate of return stakeholder submissions

This section provides additional feedback from each of the 15 submissions the AER received on the draft *Term of the rate of return* working paper. Refer to each submission individually for further information. Page references are supplied.

Category	Feedback	Page No.
APA Pipeline Limited (APA Group)		
Link between expected inflation term and rate of return term	In the case of equity, there is no term for the rate of return on equity when that rate is estimated using the CAPM; there is no term for the rate of return on equity to be compared with the term for expected inflation.	8
Link between equity term and debt term	There is no term for the rate of return on equity when that rate is estimated using the CAPM, and the question of whether the term for equity should match the term of the rate of return on debt does not arise.	8
Equity term	If the CAPM is used to estimate the rate of return on equity, there is no term for the return on equity to be aligned with either the regulatory control period, or the life of the underlying asset.	8
	To the extent that consideration must be given to term, it is in the context of the appropriate term to maturity of the issued bonds used to estimate the risk free rate. Risk free rate estimation must use extensively traded government bonds with the longest terms to maturity.	8
	The risk free rate does not vary over time (does not vary over the period of the model), and does not vary across states of nature. The yield curve for the return on the risk free asset is flat: it is neither upward sloping nor downward sloping. The return on the risk free asset does not have a term structure, which might then be imparted to an expected rate of return on equity estimated using the CAPM.	4–5
	A term structure to equity should not be arbitrarily imported into the CAPM through estimation of the risk free rate of return. If equity returns are to have a term structure, the foundation model – the CAPM – must be abandoned, and replaced with a much more complex asset pricing model.	6
Form of the return on debt	APA concurs with Dr Lally's finding that an N years trailing average estimate of the rate of return on debt (N to be specified) satisfies, or approximately satisfies, the NPV = 0 principle.	8
	APA sees no strong argument for now changing from the current trailing average estimation of the rate of return on debt.	9

	There has been only a partial transition to a ten years trailing average estimate of the rate of return on debt, and limited opportunity to gain experience with the last change of method.	
Debt term	APA sees no reason for change: the appropriate term of debt, given the use of a trailing average, continues to be the benchmark of ten years.	9
EICSI and WATMI	The EICSI, and the corresponding WATMI, should not be used to adjust the benchmark ten years debt term.	2
	In a small sample, like the sample which underpins the EICSI, credit spreads will differ, not because service providers fail to expend effort on minimising those spreads, but because the underlying risks of the businesses are different, lender perceptions of those risks (based on specific inquiry) are different, and there are different options available for managing them.	9
Debt transition	APA is of the view there should be no change in the term of debt. However, if a change in term is implemented, transitional arrangements will be required. Those arrangements will necessarily be complicated by the transition out of a regime into which a transition has only been partially implemented.	10
Australian Pipelines and Gas Association (APGA)		
Link between expected inflation term and rate of return term	The terms could match, but they should not be required to. The APGA agrees with the AER's preliminary view on this.	15
Link between equity term and debt term	There is no intrinsic reason why the terms on debt and equity should be the same. They should each be determined on their own merits, including so that they reflect efficient financing practices for debt and equity respectively. This is also consistent with Lally's views. Some regulators have adopted different terms of debt and equity. This can occur where regulators have access to data on longer-term government debt with sufficient liquidity (e.g. in the US and UK).	15
Equity term	The term of equity should remain at ten years.	15
	Lally's advice supports a preliminary position that the term of equity should match the length of the regulatory period. In the AGPA's view, that advice is flawed because it: • is inconsistent with the SL CAPM, which is a single period model, • relies on assumptions that do not hold in reality	6
	Lally advises that the NPV = 0 principle means that the term of equity must match the length of the regulatory period. To form this view, Lally assumes the existence of a term structure. This is inconsistent with the	7

	SL CAPM – the AER's current foundation model – which is a single period model with no term structure.	
	Given the long-term nature of energy networks, it may also mean that longer-term Commonwealth Government Securities could be used to estimate the risk-free rate where these are available, such as the recently issued 30-year government bonds.	8
	AER regulatory decisions affect cash flows over more than just the next regulatory period.	21
	The Tribunal ruled in 2003 that a ten-year term was appropriate.	25
	Although the NZCC matches the term of equity to the length of the regulatory period it uses a different cost of equity model than the AER, namely the Brennan-Lally CAPM. It also makes an upward adjustment to its allowed rate of return. The NZ High Court is a foreign court. In the past, the AER has (understandably) been cautious when relying on foreign legal precedent.	26
Form of the return on debt	The trailing average remains the most appropriate form. The trailing average approach: • aligns with efficient debt financing practice, where an efficient long-lived infrastructure owners would hold a debt portfolio with staggered maturity dates • allows services providers to manage interest rate risk without exposing themselves to substantial refinancing risk – giving them a reasonable opportunity to recover efficient financing costs • satisfies the NPV = 0 principle and does so at the lowest costs to consumers	16
	Most gas and electricity network service providers are still transitioning to a trailing average following the 2013 rate of return guideline. It would be premature to move to an alternative form of debt when the trailing average is only just starting to apply.	16
	Lally has also advised the AER that it is appropriate to retain the trailing average when estimating the return on debt	16
Debt term	The term of debt should be ten years and match the term that an efficient business seeks when issuing new debt.	16
	The data suggests that Australian energy networks are targeting ten years.	16
	The AER should only depart from the current ten year term where there is sufficient evidence to do so (i.e. there is a clear departure from ten years across most energy networks).	17

EICSI and WATMI	The quality and usefulness of the EICSI and WATMI should be objectively assessed before it is used to inform the return on debt.	17
	APGA are concerned that: • using the WATMI is inconsistent with previous rate of return guidelines and instruments where the role of independent data curves was considered superior to use of actual data • there was insufficient information or clarity for us to assess the usefulness of the EICSI and WATMI for determining the return on debt • using the EICSI and WATMI to determine the return on debt would mark a 'strategic change' that could affect the incentives networks face when raising debt	17
Debt transition	If there were a clear case to adopt a different tenor, then it may be appropriate to adopt a transition equivalent to that used to arrive at the ten year trailing average reflected in the 2018 RORI. However, it is not clear how such a transition would work.	17–18
	Applying a new transition to an energy network that is already part way through a transition would be complicated and potentially costly for an efficient business to replicate.	18
	If the term were to change every time that the RORI were updated (e.g. because average terms change over time), then it is conceivable that the return on debt would constantly be transitioning from one average to another. This situation should be avoided by targeting what is considered efficient debt financing practice rather than simply aligning the debt term to the average debt tenor that may be observed from time to time.	18
Ausgrid		
Link between expected inflation term and rate of return term	Agree with AER preliminary position that the terms do not need to match. The estimate of inflation is used to adjust revenues within a five year regulatory period, so it is appropriate that this is based on a five year term. The rate of return should be based on the efficient return required by investors for long term assets.	3
Link between equity term and debt term	Agree with AER preliminary position that the terms do not need to match. Terms for both debt and equity should be based on the efficient return required by investors for debt funding long term assets and equity funding long term assets.	3
Equity term	Ausgrid supports maintaining a ten year term.	6
	The overwhelming majority of comparable regulators use a ten year or greater risk free rate as demonstrated by tables 1 and 2 in the working paper.	6

	The most obvious evidence is that utilities are long-lived assets and utilities equity investors invest for the long term matching the long asset lives.	5
	Dr Lally's analysis remains flawed in the context of application in the real world for a number of reasons which are detailed in the ENA submission.	5
Form of the return on debt	The AER's preliminary position is to maintain a trailing average, and Ausgrid supports this view. This was implemented with a very strong evidentiary basis in 2013 and remains the most appropriate methodology based on management of an efficient debt portfolio.	4
Debt term	Ausgrid supports at least maintaining the ten year terms for both debt and the risk free rate	2
EICSI and WATMI	Ausgrid considers that the WATMI is a useful tool to observe whether the ten year term remains a reasonable estimate of the efficient debt term. However, it should only be used to change the debt term if it shows a material and sustained departure from a ten year term over several years.	5
	While some calculation methods have improved based on feedback from industry, three key issues remain: • Factors affecting actual debt outcomes • Circularity • Transparency	4–5
Debt transition	Based on Ausgrid's view that the term should not change, there would not be a transition issue to consider. The costs and benefits of implementing a transition, which would add complexity and administrative burden for both businesses and the AER, should be considered as part of the decision to change the term.	5
Benchmark index	Whilst it is not part of this submission, Ausgrid would welcome the opportunity to provide feedback on the appropriate benchmark index for the efficient debt portfolio.	4
AusNet Services		
Link between expected inflation term and rate of return term	AusNet agrees with the AER that the terms of the expected inflation, debt and equity parameters do not need to align and can be separately determined.	1
Form of the return on debt	AusNet agrees with the AER's initial position to maintain the trailing average approach to the return on debt, with annual updating.	3
	The AER's implementation of this customer-led approach ensures that customers pay smoother prices, aligns to efficient debt costs, and are not unduly exposed to market shocks. It is also a benchmark approach that	3

	networks can – and do – replicate, to manage refinancing risk. This assists networks to attract high quality investment and keep prices low.	
Debt term	Given that industry data does not support a sustained change to the efficient debt term at issuance (and indeed AusNet's weighted average debt term at issuance is increasing), the evidence suggests that a ten year term remains efficient.	3
EICSI and WATMI	In relation to debt, AusNet submits the efficient debt term should be set with regard to industry debt data. The AER should exercise judgement and consider observed efficient financing practices over the long term. Transient factors, such as networks issuing shorter, or longer term, debt as a result of market conditions, or networks' debt practices varying after transactions, should not be considered as they are not relevant to benchmark efficient financing practices.	1
	AusNet continues to consider that the AER should include subordinated debt in its Energy Infrastructure Credit Spread Index (EISCI) analysis to provide a complete picture of industry debt costs.	2
Debt transition	Any change to the term of debt in the 2022 RORI would necessitate an additional transition to reflect the change in the debt benchmark. This would introduce unwarranted complexity and potential additional costs into the regime. A change to the term of debt would also be a breach of regulatory certainty.	3
Consumer Reference Group (CRG)		
Link between equity term and debt term	The submission does not advocate for or against changes to the term of the rate of return. Rather, the Term paper fails to provide a critical assessment of reasons for any proposed change. Without any evidence from the AER that it has undertaken a critical assessment, consumers and other stakeholders cannot genuinely assess the merits of the AER's proposed changes.	10
Equity term	The CRG has not come to a final position on the term debate, but the CRG does not believe it is sufficient for the AER to rely solely on a theoretical (but disputed) argument of NPV=0 over the regulatory term.	14
	The Term paper does not explain what prompted the AER to re-interpret its regulatory task after almost 20 years. The CRG, in line with consumers, expect the AER to openly and transparently 'make the case' for change.	15
	The Term paper (and the Final position paper on inflation, December 2020) clearly relies heavily on Lally's views. The CRG is deeply concerned that the AER has failed to engage in such a debate or explain its decision to stakeholders.	18
	The Term paper provides no information about how the AER intends to estimate investors' short-term, forward-looking, expectations about the return on equity they might earn in each regulatory period.	19

	It is disappointing the Term paper does not provide any quantitative information or analysis on how much lower a five-year risk free rate would be than a ten-year rate.	20
	While the five-year and ten-year yields generally appear to track in the same direction, the five-year rate is usually between 0.5 and 1.5 per cent lower. At face value, this suggests a more favourable financial outcome for consumers, though more detailed analysis is warranted.	20
	The Term paper provides no evidence of any other form of harm to consumers that would be avoided by altering the term for estimating the return on equity. Conversely, it provides no evidence of additional benefits from adopting a shorter term.	22
	The CRG maintains that the AER should not be held hostage to precedent, but it is accountable for abandoning a precedent of its own making	23
	At a minimum, the AER should publish a model that allows consumers to explore how shortening the return on equity term will affect the revenues that networks can expect to collect from consumers, and the prices consumers can expect to pay.	24
	There is a possibility the AER will withdraw its proposal to shorten the term for the return on equity. Such a decision would present an unacceptable outcome for consumers if the term for inflationary expectations remains shorter than the term for the return on equity.	37
Form of the return on debt	The CRG supports the AER's conclusion that it is appropriate to continue applying the ten- year trailing average for the cost of debt.	4
	The CRG reserves its judgement on the AER's proposed approach to determining the debt. In particular, the CRG's position depends on further detail to be released by the AER in its Debt Omnibus paper in July 2021.	30
	For the trailing average approach to be equitable for consumers, it must persist through the interest rate cycle. Consumers would be rightly concerned if the eventual rise of interest rates led to the AER introducing an asymmetric treatment of risk when it determines an allowed Debt.	33
	The CRG acknowledges there may be exceptional circumstances in which a trailing average debt might result in sub-optimal outcomes. The CRG expects the AER to consult on and implement targeted methodologies for dealing with network claims that they face special circumstances.	33
Debt term	The CRG supports the AER's conclusion that it is appropriate to continue applying the ten- year trailing average for the cost of debt.	4
EICSI and WATMI	The CRG also supports the AER in first, gathering evidence about actual debt practices and second, opening a discussion on how best this	27

	information could be used while retaining the ten-year trailing average approach.	
	The AER's proposal in the Term paper represents a blending of two approaches for determining regulated revenue allowances namely, the trailing average and revealed costs approaches. The consequences of blending a trailing average approach with a revealed cost approach are not obvious, nor are they explored in the Term paper.	32
Debt transition	The CRG considers that any change to the ten-year trailing average, particularly as the existing transition process is not yet fully implemented, would be complex and likely to disadvantage consumers.	4
Consumer advocate feedback	On 9 June 2021, the CRG held a two-hour online workshop using MSTeams with eleven invited consumer representatives to provide an overview of the AER's Term paper and LIRE paper and seek their initial reaction to the AER's papers.	38
	Consumer representatives are not convinced of the need for change.	38
	Advocates were clearly concerned about what seems to be arbitrary changes to long standing approaches by the AER, changes that go against the AER's own regulatory criteria of transparency, stability and predictability.	39
CRG's inflation submission	The CRG's position on regulatory inflation was misrepresented in the Terms paper. The CRG did not support the change to a five-year term for inflation, as they considered the term for inflation must be consistent with the term of the ten-year CGS and the term of the commercial bonds.	27
	The Term paper fundamentally misrepresents the CRG's position when it claims the CRG supported a shortening of the term used for estimating the return of equity. Because the AER shortened the term for inflationary expectation in its Final Inflation position paper in December 2020, it simply presumed the CRG's position on the term for the return on equity.	35
CRG's principles	The Term paper fails to address all five of the CRG's principles.	9
	The laws make clear that the efficiency objective includes both efficient investment in and the efficient operation and use of electricity/gas and these represent two distinct requirements for the AER to consider. In the CRG's view, the AER continues to treat the second part of the energy objectives as redundant by simply asserting its equivalence with the first part.	12
	The CRG's five principles are integral to the AER achieving the second part of its statutory objective, namely the promotion of efficient operation and use of energy for the long-term interests of consumers.	12
Overall comments	The CRG does not agree with the AER's statement that individual rate of return parameters, such as 'term', can be determined on a 'stand- alone' basis. Any changes to the term of the risk-free rate (in the return on	3

	equity SL-CAPM model) must also include an assessment of the impact on other equity parameters, such as equity beta and the market risk premium.	
	The CRG concludes at this stage, the AER has not provided sufficient evidence of the need for such a change and the impact of such a change on consumer prices and services.	3
Endeavour Energy		
Link between expected inflation term and rate of return term	There is no need for consistent term assumptions across inflation, cost of debt and the cost of equity. Endeavour Energy supports this view as the term should reflect the role of each parameter in the regulatory framework.	1
Equity term	Endeavour Energy supports the continued use of a ten year term for the risk-free rate in accordance with standard market and regulatory practice.	1
	All Australian regulators (other than ERA) use a ten year term and international regulators often use longer rates where available.	2
	Whilst Endeavour Energy does not submit that a 30 year bond be adopted as the proxy for the risk free rate, Endeavour Energy suggests that this change has more merit than a five year term and that future RORI's could consider this further once additional data is available.	2–3
	A five year risk-free rate is not consistent with NPV=0 where required returns are actually determined in the market on the basis of a ten year risk free rate.	3
	Dr Lally's argument is that the known end of period RAB represents the expected present value (as at that time) of all future cash flows. This is clearly violated in practice and implausible in the face of an overwhelming amount of evidence that demonstrates regulated firms are not valued in this way.	3
Form of the return on debt	Endeavour Energy supports the maintenance of a ten-year trailing average of BBB+ debt on the basis of both the evidence and practical considerations provided herein.	1
	Customers have, and will continue to, benefit from the lower volatility in the debt allowance and current low rates under this approach.	4
EICSI and WATMI	Endeavour Energy sees no reason to depart from the current approach and consider using the WATMI to set the term of debt would not promote the long term interests of customers.	5
	Using actual debt data would distort incentives. Adjusting the benchmark principle potentially shifts risk of debt financing strategies to customers.	4
	Many networks explicitly target a ten year term to align with the regulatory benchmark. A longer term view is required rather than basing	4

	critical regulatory decisions on 12 month snapshots of an unrefined dataset.	
	If the EICSI and WATMI is to be relied upon in any substantive manner then the NSW networks should be excluded. The EICSI is not weighted by value or tenor meaning it is materially and disproportionately impacted by short term debt. The EICSI excludes materially relevant debt costs and subordinated debt despite including the senior debt that the excluded subordinated debt supports	4
	It cannot be replicated, is complex and non-transparent. In particular, the debt data is confidential (which is appropriate) and it is not clear which instruments are included or the weight they receive.	4
	It is unclear how an EICSI could operate under a binding RORI where judgment during the annual debt cost update process is not permitted	4
Debt transition	A transition would be complex and impractical. A new benchmark would require either a payment to retire debt before maturity or a transition over ten years.	4
	A transition would mean the new debt would have little impact over a single regulatory period as the trailing average of ten year debt would form the majority of the average.	4
	As WATMI changes and moves (which it invariably will) it follows that a new term would be set in the next RORI review. This would necessitate a new transition but networks would only be part way through the 2022 RORI transition, so a third nested transition would be required.	4
Overall comments	Endeavour Energy considers that the term paper would benefit from a more direct consideration on how the individual preliminary positions in the paper will collectively better advance the National Electricity Objective (NEO) compared to the status quo approach.	1
	Endeavour Energy strongly urges the AER to reconsider how the options and preliminary positions in the term paper will contribute to promoting a stable regulatory environment and deliver an overall allowed return that is efficient given the international comparisons and historically low prevailing returns.	2
Energy Networks Australia (ENA)		
Link between expected inflation term and rate of return term	ENA agrees that the terms for expected inflation and for the returns on debt and equity capital should be assessed independently and do not need to align with each other.	3
	Rather, the term should reflect the role of each parameter within the AER's regulatory framework.	8

	There is no link between the efficient cost of capital in financial markets and the mechanics of the AER's treatment of regulatory inflation within the PTRM.	8–9
Link between equity term and debt term	ENA considers that there is no requirement for the allowed return on equity and the allowed return on debt to be based on the same term. In both cases, the term that is adopted should reflect the efficient market cost of capital.	9
Equity term	ENA proposes that a ten-year term should be maintained for the risk-free rate.	3
	A departure from a ten-year risk free rate may increase the risk of future AER rate of return determinations being affected by the ongoing effect of such RBA policies. The unprecedented RBA intervention is expected to have an ongoing effect throughout the entire period of the 2022 RORI.	22
	The AER has adopted a ten-year risk-free rate in every decision it has made to date, citing consistency with market practice as one of the reasons for adopting that term.	22
	In the 2018 RORI, the AER viewed its compliance with the NEO and NGO through the lens of the NPV=0 principle and set the allowed return on equity in a way that it considered to be consistent with the NPV=0 principle.	23
	The adoption of a ten-year risk-free rate, reflecting the approach that investors take when determining their required return on long-lived investments, is consistent with the AER's definition of the NPV=0 principle.	25
	ENA also notes that trading in the five-year government bond has a number of features that raise questions about its suitability as a reliable proxy for the CAPM risk-free rate.	33
	ENA disagrees with the proposition that the allowed return on equity is akin to a floating rate bond with five-yearly re-sets.	44
Form of the return on debt	ENA agrees that the trailing average approach reflects efficient debt financing practice, and that this approach should be retained.	12
	ENA notes that the practice of issuing long-term debt on a staggered maturity basis is the standard approach adopted by firms with long-lived capital assets.	12
Debt term	ENA submits that there is no evidence to suggest that the benchmark approach of issuing ten-year debt on a staggered maturity basis has become so imprudent or inefficient since 2018 that a change in approach is warranted.	48
	There has been no change to the long-lived nature of the assets held by networks nor to the market practice of owners of long-lived capital assets issuing long-term debt on a staggered maturity basis.	48

	ENA submits that the weighted average term to maturity index (WATMI) currently indicates an average term at issuance of close to ten years among networks regulated by the AER.	48
	The AER has also committed to retain the ten-year benchmark term for the duration of the transition to the trailing average approach.	13
EICSI and WATMI	ENA submits that adjusting the credit rating, where the reason for the adjustment is a perceived difference between the observed term and the ten-year benchmark, results in a benchmark debt management approach that is not viable and therefore should not be used.	11
	A debt management strategy that no network could, or would, ever adopt would not be an appropriate regulatory benchmark – because that approach would inevitably result in a disparity between the regulatory allowance and the benchmark efficient cost.	11
	The allowed term of debt should only be changed if there is clear evidence that the currently adopted term no longer represents the efficient steady-state financing practice.	16
	ENA considers that the appropriate use of the WATMI data is to identify whether the actual term of debt issued by networks differs from the allowed term in a significant and sustained way. If a significant and sustained difference is documented, the AER should then investigate the credible potential reasons for such a difference.	16
	Subordinated debt should be included in the analysis. This would be internally consistent as the AER has historically included subordinated debt when setting benchmark gearing.	17
	The short-term debt that is issued temporarily as part of transaction financing should be excluded from the analysis.	17
Debt transition	Under the AER's trailing average framework, every change to the debt term would require a new transition mechanism to be put in place.	10
	The unfortunate result of this potential complexity would be: • Departure from the objective of the RORI setting a single clearly applied benchmark rate of return calculated on a consistent basis • A lack of transparency and clarity for stakeholders around the underlying basis for the allowed returns of individual firms	18
	ENA also notes that a change from the current ten-year term to (say) a nine-year term would have a very small price impact over the next regulatory period for each network.	19
CRG framework	ENA has considered the CRG's framework as it applies to the working paper positions on term for the allowed return on debt and term for the allowed return on equity.	50–51
Energy Queensland		

Link between expected inflation term and rate of return term	Energy Queensland agrees with the AER that the term for expected inflation and term for rate of return should be independently assessed.	1
Link between equity term and debt term	The term for the return on equity (or the risk-free rate) and the term for the return on debt should also be separately assessed.	1
Equity term	Energy Queensland considers that a ten year term should be maintained for both the return on equity and return on debt.	1
	It is concerning that the AER is contemplating making changes to the term for the rate of return that will potentially further reduce the rate of return and network revenues.	2
	Use of ten year term (or longer) is the predominant approach of jurisdictional and international regulators.	2
	No new evidence or developments in academic literature, finance theory, market practice or other regulators' practice have triggered the AER's preliminary view of a five year term.	2
	The most recent change in relation to the term for the return on equity has been the Queensland Competition Authority moving away from the previous practice of matching the term of return on equity to the regulatory period and adopting a ten year term.	2
	The AER's role is to estimate the return on equity required by real-world investors. Market practice, which is to use a ten year term, should therefore inform the AER's task.	2
Debt term	Energy Queensland considers that a ten year term should be maintained for both the return on equity and return on debt.	1
	Industry data on the weighted average term at issuance (WATMI) indicates a term ranging from eight to 11 years. This suggests that the current ten year term for the return on debt remains appropriate.	3
Debt transition	Given that all network businesses are still transitioning to a ten year trailing average, changing the term would necessitate further complex transitional arrangements.	3
Investors Mutual Ltd (IML)		
Equity term	The term for the return on equity should remain at ten years which is consistent with the long lives of the underlying assets and promote regulatory stability and predictability.	1
	As far as we're aware, in Australasia, only the ERA and the NZCC use a five year bond for the term of the risk free rate. IML notes that the QCA,	1

	which had used a five year term, decided to revert to using a ten year bond.	
	AEMO's 2020 Integrated System Plan (ISP) foreshadows the likely need for billions of dollars of additional transmission investment. To meet this objective, an upward bias in the return on equity is warranted, as the alternative is a risk of insufficient investment, potentially leading to poor consumer outcomes.	2
	IML has also conducted a survey of financial professionals (equity research analysts) who value assets across the utilities and infrastructure landscape in Australia and New Zealand to gauge how they assess these assets. All of the survey participants use the ten year bond (or longer in the case of Forsyth Barr) for the term of the risk free rate.	2
	If the regulator were to take an alternative approach, it would likely to reduce the value of investing in regulated assets, widening the gap between regulated returns and market required returns.	3
Debt term	The term for the return on debt should also reflect the long life of the underlying assets. There should be no requirement for the term of debt and equity to match the regulatory period.	1
Major Energy Users Inc (MEU)		
Link between expected inflation term and rate of return term	The key issues of concern identified for retaining a ten year horizon were that there should be a common term for equity, debt and inflation. In its decisions to use a trailing average cost of debt, and a five-year assessment of inflation, the AER clearly demonstrates that this apparent need for a common term has disappeared.	7
Equity term	While the MEU continues to be supportive of moving to a five-year horizon, the MEU is very concerned that the AER has provided little supportive reasoning for its apparent change to a five-year horizon.	3
	The MRP might change if five-year CGS were used. The MEU accepts that the MRP would need to be adjusted. This is not a reason not to implement a more economically correct term for the risk-free rate.	5
	The MEU considers that the five-year term for calculating the return in equity is more logical than using data based on a ten-year horizon. While it is accepted that the assets the networks provide have up to 50-60 years of life, because the return on equity is reset each five years, notionally the investment made by the networks is made for a five-year period.	6
	Despite agreeing with the working paper on the view that there should be a move to using a five-year CGS as the risk free rate, the MEU considers that the AER must explain better why its thinking has changed (other than an "evolution of thinking"), in order to substantiate the need for change.	6

	What does not seem to have been addressed by the 2021 CRG is there is a change from the advice provided in the past in that Lally (2021) has further developed his arguments for the term of the risk-free rate should match the term of the regulatory period.	6
	If a ten-year CGS was deemed to be the risk-free rate, then perhaps the return on equity set on the basis of a ten-year CGS should apply for two consecutive regulatory periods as this better reflects the value of the ten-year CGS and meets the NPV=0 criterion.	7
	While the MEU supports there being stability in the processes, the processes themselves must be robust and soundly based on economic theory. Further, the networks themselves have been prepared in the past to accept more volatility if the outturn delivered a greater return to them.	8
	The MEU considers that there is sufficient economic rationale for the AER to move to implementing five-year CGS as the basis for setting the risk-free rate for use in the setting of the rate of return on equity.	10
Debt term	The NPV=0 concept requires the cost of debt to reflect the most efficient approach to debt provision. This effectively means that the term of efficient debt portfolio will vary over time.	8
	The MEU agrees that the term of debt should not be arbitrarily tied to any fixed timeframe but be allowed to "float" reflecting what the market is doing, assuming that the market (on average) will deliver the most efficient outcome.	9
	The term of debt should reflect the most efficient period identified from the market.	10
Network of Illawarra Consumers of Energy (NICE)		
Link between expected inflation term and rate of return term	The use of the same term as the estimate of expected inflation is preferable but this is less important than alignment of the terms for both forms of capital.	1
	It was the NICE's position that the term for expected inflation should stay aligned to the terms used rate of return. However, this was a one-way relationship. There is no reason at all why the term for rate of return should be aligned to the changed term for expected inflation.	14
Link between equity term and debt term	The terms used for the underlying series used to develop return on equity and debt should be the same.	1
Equity term	There is no reason to move away from the ten-year term and the ten-year trailing average approach for return on debt, and therefore ten years should continue to be used for return on equity.	1

	Businesses are primarily engaged in capital management not raising new investments for new network investment. Accordingly, the NICE believes the trailing average approach used for cost of debt should also be applied to cost of equity and the same term used for both, which we have previously argued should remain ten years.	14
Form of the return on debt	There is no reason to move away from the ten-year term and the ten-year trailing average approach for return on debt.	1
	The business is continually rolling over debt and increasing or decreasing debt in relatively small amounts. This justifies the trailing average approach to the cost of debt.	14
Debt term	Ten years is the appropriate term of debt given the form of the return on debt.	13
	Since the introduction of the trailing average approach to the cost of debt, the NICE believes there is a significant evidentiary hurdle to be cleared before any change can be made to this arrangement, especially the term. The NICE doesn't think that case has been made especially since the EICSI and the WATMI can equally well be used simply to determine what ten-year series best aligns with the observed debt activity.	14
Debt transition	There should be no transitional arrangements.	13
Overall comments	The AER is using a series of Working Papers to analyse some of the 'sometimes conflicting' evidence and various theories by breaking up the decision into a series of component parts. This approach presents a significant risk. How the AER decides on the use of a model, for example, has implications for other issues that can be raised.	7
	The NICE notes that the AER refers to the need of the regulated businesses to raise new capital to finance investment. This is misleading. The regulated businesses are not really making decisions about raising new capital for new investments, they are mostly making ongoing marginal decisions about capital management.	9
Network Shareholder Group (NSG)		
Link between expected inflation term and rate of return term	The NSG does not consider that the terms for return on equity, return on debt and expected inflation should be aligned. The objective of the inflation forecast is to ensure that the value of the Regulatory Asset Base (RAB) that is taken out matches the value of the RAB that is put back in at the end of the period. The term for forecasting inflation is independent of the term used for estimating returns on debt and equity.	12
Equity term	An appropriate term for estimating the return on debt and equity has not changed since the 2018 RORI and remains at ten-years.	11

	The relevant NPV period for estimating equity returns is the life of the investment rather than the five-year regulatory period – Investors in long term infrastructure assets expect to retain that investment for a long term.	11
	There is no evidence to suggest that equity investors adopt a shorter term when estimating the cost of equity for long life energy network investments. Market, analysts and valuation experts all typically use a longer term.	11–12
	As noted by the AER, the reasons typically afforded by domestic regulators for adopting a ten-year term for both the return on debt and the return on equity are to provide a reasonable proxy using available data in the market, and to promote investment.	12
	The AER risks creating a biased estimate of the rate of return by reopening this argument at a time in the cycle when the difference between a five and ten-year term is at its greatest and is therefore likely to have the greatest downward impact on the rate of return estimate.	12
Debt term	It is appropriate that the term used for debt reflects the efficient practice of debt financing – that is, a longer-term portfolio of debt.	11
	Market, analysts and valuation experts all use a term longer than five years for both debt and equity.	11
Long term interests of consumers	The NSG supports the principle that the AER should be seeking to estimate the expected efficient return consistent with the relevant risks involved in providing regulated network services. The AER should consider additional principles to build confidence in the regulatory process and decisions such as consistency, stability, transparency, predictability and demonstrating accountability and independence.	3
	To date the AER's focus appears to have been dominated by the need to avoid the risk of over investment in energy networks. However, the NSG believes that the AER has paid insufficient attention to the risk of under investment in energy networks caused by a rate of return that is too low.	3–4
	A further concern is the demonstrable evidence that investment in electricity networks is falling and the correlation between this investment trajectory and falls in regulated returns.	4
	The Network Shareholders Group is concerned that the AER's working papers imply that it may be contemplating further reductions in the 2022 RORI based on selective changes to the determination of various parameters.	7
Overall comments	The AER's process and approach must be unbiased – the NSG is concerned that the issues and approaches being considered by the AER in its various papers favour a reduction in the rate of return.	1

	The AER also appears to be seeking precision on individual issues rather than focusing on relationships between parameters and overall outcomes.	1
	Impacts and outcomes need to be measured – the AER is yet to establish how it will assess and demonstrate that its estimate of the efficient cost of capital is consistent with the Law and the NEO/NGO.	2
	Transparency of the regulator's decision and process are paramount – as an effective review process is not in place, the AER would benefit from additional steps to increase transparency and accountability rather than current plans to remove established processes that improve these outcomes.	2
Queensland Treasury Corporation (QTC)		
Equity term	QTC supports a ten-year risk-free in the allowed return on equity.	2
	A key problem with term-matching is the assumption that the investor receives an amount equal to the residual regulated asset base (RAB) in cash at the end of the five-year regulatory period. In practice, there is no cash flow equal to (or related to) the residual RAB at the end of each regulatory period.	3
	The QTC does not consider the long-term floating rate bond analogy to be suitable or practical way to determine the risk-free rate in the return on equity. In the QTC's view, the return on equity approach should be consistent with the way real-world investors value regulated and non-regulated infrastructure assets in competitive, real-world capital markets.	5
	The Draft Working Paper shows that the vast majority of Australian and international regulators use a ten-year risk free rate or longer regardless of the length of the regulatory period.	5
Debt form	A ten-year trailing average that applies to the total ten-year cost of debt should be used to determine the cost of debt allowance.	1
	The debt strategy implied by the trailing average approach reflects sound, established financial risk management principles that have not changed since the trailing average was first adopted in the 2013 Rate of return Guideline and reconfirmed in the 2018 Rate of return instrument.	1
	The QTC disagrees with the three scenarios outlined in the draft working paper where the current trailing average approach may not be appropriate.	6
Debt term	The current ten-year benchmark debt term is appropriate as it allows a benchmark firm with 60 per cent gearing to keep refinancing risk at an appropriately low level.	1

	The appropriate benchmark term should be consistent with a first principles approach based on sound financial risk management principles, and supplemented by an analysis of actual debt issuance by service providers. Both approaches support a benchmark debt term of ten years.	7
EICSI and WATMI	The weighted average term to maturity at issuance (WATMI) will differ from the ten-year benchmark for periods of time as service providers respond to real-world debt issuance factors and constraints. This should not automatically be interpreted as a change in the benchmark term.	1
	Even during normal market conditions, there will often be differences between the preferred debt term for the borrower and the investors.	8
	Periods of market stress such as the global financial crisis in 2008, the sovereign debt crisis in 2012 and the impact of COVID-19 in 2020, can constrain a service provider's ability to issue ten-year debt.	8
	Under incentive-based regulation, service providers are free to depart from benchmark parameters they (not consumers) bear the costs or benefits from doing so. These active debt management strategies will be reflected in an industry-wide estimate of WATMI, however they are not indicative of a change in the benchmark debt term.	8
Debt transition	If the WATMI is used to determine the benchmark debt term in the 2022 RORI, it is possible that the term will change again at subsequent RORI reviews. This may place service providers in an ongoing state of transition as they continually re-adjust their debt portfolios and hedges based on the latest WATMI estimate.	1
TransGrid		
Link between expected inflation term and rate of return term	TransGrid agrees with the AER that the terms of forecast inflation, return on debt, and return on equity should be determined independently.	1
	There is no clear rationale why the term for expected inflation should match that for the rate of return.	7
	Expected inflation is used in the AER's post-tax revenue model to project indexation of the regulatory asset base over the regulatory period, but not subsequent periods. As such, it is appropriate to set the term of expected inflation to match the regulatory period. The same does not apply to the rate of return.	7
Link between equity term and debt term	There is no clear rationale why the term for equity should match the term for debt.	7
Equity term	Where firms invest in infrastructure assets, the relevant risk-free rate is one which matches the life of the assets.	2

	The term of any regulatory control mechanism is irrelevant to determining the cost of capital of the regulated firm simply because such a mechanism would not exist in a workably competitive market.	2
	The NPV=0 condition as applied by Lally is not relevant. There is limited or no academic, or judicial support for Lally's application of this principle.	2
	There is no evidence that firms and their investors limit their investment making timeframes to the length of the regulatory control period, rather they clearly are concerned with the present value of cash flows expected after that period ends.	2
	Data on risk free rates in Australia is limited to a term of up to around ten years.	2
	TransGrid endorses the ENA's position that there are strong grounds for retaining the ten year term for the return on equity, with no obvious reason for reducing this to match the length of the regulatory period.	3
Debt form	TransGrid supports retaining the trailing average approach. This is consistent with how long-lived infrastructure owners generally finance themselves. It is also consistent with the justification used by the AER to support the transition to the trailing average approach in the first approach – as outlined in the Explanatory Statement to the 2013 Rate of Return Guidelines.	8
	Having almost transitioned to a ten-year trailing average over the prior and current regulatory periods, TransGrid would be concerned if there were a change to another form for the return of debt. Transitioning to something else would just not be sensible.	8
Debt term	The principle of setting the allowed return on debt to match the efficient financing costs of the BEE is widely accepted.	3
	Retaining a ten year term for debt is consistent with past AER practice and decisions by other Australian and international economic regulators and is consistent with the long term nature of the energy infrastructure assets financed with debt.	3
	Although there may be reasons why some businesses adopt shorter or longer terms (e.g. COVID-19 impacts, changes in corporate control etc), this does not invalidate the widely held view that longer term debt is better placed to finance longer term investments like those made by energy networks.	8
	There would also be obvious difficulties estimating the return on debt if the assumed term of debt were adjusted every time the RORI were reset.	8
	A far simpler and more astute approach is to focus instead on first principles – namely, that it makes more sense to finance long term assets with long term debt. An assumed term of ten years satisfies that principle and is generally consistent with observed debt issuance by long term infrastructure owners in Australia.	8

	Ten years remains the appropriate term for the return on debt.	8
EICSI and WATMI	Care needs to be taken when interpreting the outputs from the EICSI and WATMI: • subordinate debt should be included as it remains an important source of debt financing for infrastructure investors • debt raised by the NSW networks that have been subject to large transactions in recent years as these networks are part way through a transition to a steady state debt portfolio Adjusting for both of the items leads to WATMI estimates that appear consistent with a ten year term.	8–9
Debt transition	It is not clear what if any transitional arrangements would be required if there were a change to the debt term.	9
	Transitions between terms will likely be complex and potentially lead to transitions within transitions for those networks that are partway through the transitions adopted in the 2013 Rate of Return Guideline. TransGrid's concern is that creating this sort of complexity will only serve to confuse consumers and investors alike.	9
Long term interests of consumers	The Position Paper does not, however, explain how the AER will apply the principle to determine the methods and assumptions adopted in the 2022 RORI.	6
	TransGrid encourages the AER to provide further clarification on how it intends to apply its guiding principle, and would welcome the opportunity to provide input.	6
	For instance, it remains unclear how the AER will assess: • whether a method or assumption produces unbiased estimates or not (and, what the AER means by 'unbiased') • whether consumers' long term interests are promoted or not by a given method or assumption, and • what is a 'best' estimate possible in the circumstances	6
Victoria Power Networks (VPN), SA Power Networks (SAPN) and Australian Gas Infrastructure Group (AGIG)		
Equity term	The businesses support the current approach of adopting a ten-year term for the risk-free rate. That approach is consistent with market and regulatory practice and best represents the approach used in determining the market cost of equity.	5
	This approach can be 'locked away' at this stage of the process. The businesses caution against a change which has so little support in theory or in regulatory practice around the world.	5

Debt form	The businesses support the ten-year trailing average approach.	5
Debt term	The businesses support the current approach to the return on debt because it matches the regulatory allowance to the (efficient) market cost of debt.	5
	The businesses particularly caution against an approach that adjusts the benchmark credit rating to reflect a perceived issue in relation to the term of debt. This would produce a regulatory allowance that could not be replicated by any network. It cannot be the case that a debt management approach that cannot be implemented in practice best represents the market cost of debt.	5
Long term interests of consumers	The long-term interests of consumers are best served by setting the regulatory allowance to reflect the efficient cost of debt and equity finance required by real-world investors at the relevant time.	1–2
	Networks will invest a significant amount of capital to support Australia's transition towards a lower-emissions energy sector. It is these new types of investments that must now be looked at, and the incentives that support their timely deployment.	2
	It is not clear whether the allowed rates of return stemming from the 2018 RORI will be sufficient to provide incentives for this new investment in a timely fashion. This raises questions about whether the current approach to the allowed return on equity gives the best possible estimate of the market cost of capital and is in the long term interests of consumers, or whether, other approaches should be considered that give rise to an allowance which is more robust to fluctuations in bond yields.	2
	The businesses consider it to be important that, throughout the 2022 RORI review, stakeholders engage fully with the Brattle material, conclusions and recommendations.	3
RFR and MRP	The 2018 RORI embeds an assumption that the required return on equity rises and falls one-for-one with any change in the prevailing government bond yield. Thus, the recent decline in government bond yields to historical lows has the consequence of also reducing the allowed return on equity to historical lows.	4
	The starting point of this consideration is a discussion about how to relax the assumption of a one-for-one relationship between the allowed return on equity and the prevailing government bond yield. Brattle recommend having some regard to forward-looking evidence and the ENA submission also contains some recommendations.	4
	A move away from the AER's current approach of adopting a fixed historical average MRP in all market conditions would also have the effect of reducing volatility in the allowed return on equity.	4
	The businesses suggest that a key focus of the forthcoming Return on Equity consultation process should be on how the MRP will be estimated	4–5

	in the 2022 RORI. This will then determine whether the MRP should be updated (in an internally-consistent way) at the time of each determination conducted under that RORI.

13 Rate of return and cashflows in a low interest rate environment stakeholder submissions

This section provides additional feedback from each of the 16 submissions the AER received on the draft *rate of return and low interest rate environment* working paper. Refer to each submission individually for further information. Page references are supplied.

Category	Feedback	Page No.
Australian Energy Council (AEC)		
Rate of return and financeability	Accepts that overseas regulators are currently setting return on equity allowances that are materially higher than those set by the AER. However, evidence that Australian regulated network service providers' ability to raise capital is impacted in a manner that requires a similar regulatory response to overseas was not visible.	1
	Arguments put forward by the NSPs could lead to the 'cherry picking' of the regulatory model for higher returns.	2
Return on debt	Whilst return on debt has declined significantly, so have the costs of securing debt.	1
	The case for change appears to be supported by the hypothesis that the cost of debt allowance is too low, and this is making the NSP's financially unsustainable. The AER is prudent to require more validation of this claim.	
Financeability	Agree with the AER that: • The AER should not use measures of financeability directly when setting the rate of return. • They should not adjust the return on equity or the parameters that inform return on equity in proportion to movements in any financeability measures. • Changes to estimating depreciation are unwarranted in order to address financeability issues. Broadly support the AER's apparent conclusions that: • Financeability should be principally managed by the regulated firms; • The financing challenges NSPs face on large investments are not unique. Any capital-intensive long-lived asset enterprise will face comparable challenges in the current market; • In response, regulated firms can vary their capital structures to meet need, and; • Change to the regulatory model is not required.	2

	The AEMC rule change process rejected the proposal to bring forward TNSP cash flows in order to improve financeability metrics, concluding that the regulatory framework does not create a barrier to financing large projects.	1
	The AEC query whether regulated network service providers ability to raise capital is impacted in a manner that requires a regulatory response. The AEC also notes that evidence of any such impacts or outcomes were not presented during the AEMC's recent process.	1
	The AEC remain concerned that the NSP's have not provided: • Evidence they cannot efficiently raise capital. • Evidence their capital structures are sufficiently constrained to make regulatory investments un-financeable. • Evidence they have been unable to manage their capital structure and cash flows to maintain investment grade credit ratings. • Evidence they are unable to raise capital in the current low risk free rate environment.	1
	As the AER notes, the NSPs' actual financeability is substantially impacted by the practices and choices made by the NSPs.	2
	Question if there is a single AER regulated NSP that is actually geared at or below the assumed 60% debt to RAB. But if NSPs choose to leverage their assets more aggressively, that's their business.	2
Long term focus	Changing the regulatory model to reflect what may well turn out to be short term effects requires careful investigation, and an incorrect decision by the AER could have serious consequences on the long term interests of consumers. The AEC supports the AER's view that at this stage they are not minded to make changes to address dynamic financeability scenarios.	1-2
APA		
Return on debt	Agrees with the AER that interest rates on the debt of government and corporate issuers have substantially declined over the last decade. APA has observed, as has the AER, that, as rates have fallen, the cost of the debt which we use to finance our business has also fallen.	2
Return on equity	APA has seen a decline in the returns expected by equity investors as rates of return on other investment opportunities have fallen, although we do not see this decline as being properly reflected in calculations of the rate of return on equity made using the CAPM.	2
	In this environment, the relationship between interest rates and equity returns (the rate of return on the market) might be reviewed to better inform rate of return on equity estimation.	2

Financeability	APA's view is that a financeability test is useful, and will be important as regulated businesses respond, through the investments they make, to climate change and the transition to renewables. However, in these circumstances, the role of the test will extend beyond its use solely as a cross-check on the allowed rate of return.	3
	The substantial decline in interest rates may, however, be masking other changes taking place in the financing of energy infrastructure, and in particular, in the financing of gas transmission pipelines. They are: • The pricing of carbon transition risk into the returns equity investors require from companies with higher direct and indirect levels of carbon emissions • The pricing in carbon transition risk into debt	2
APGA		
Are we in a low interest environment?	The APGA agrees that we are in a low interest rate environment.	18
Return on debt	Agree with the AER that low interest rates lead to lower debt financing costs.	18
Return on equity	The AER should reconsider its approach to the return on equity. The low interest environment has revealed just how fragile it is to assume that the return on equity is a fixed mark-up on the risk-free.	19
	The 2018 RORI contains an approach to estimating the return on equity that automatically updates one parameter — the risk-free rate — but leaves all other parameters unchanged. This creates a real risk that automatic updating does not capture the true changes in returns required by equity investors	10
	If not designed appropriately, there is a real risk that this approach — similar to the 2018 RORI — will not produce an outcome which does not reflect efficient financing costs at the time of a regulatory decision.	10
	Now that we are in a low interest rate environment, retaining the same MRP in the 2022 RORI would be appropriate if there was strong evidence that market returns moved in lock step with interest rates. If this evidence does not exist, then —relative to the MRP adopted in the 2018 RORI – the MRP adopt for the 2022 RORI would need to be: • Larger if the evidence suggests that market movements are smaller than movements in the risk-free rate, or • Smaller if the evidence suggest that market movements are greater than movements in the risk-free rate	10-11
Financeability	The APGA encourages the AER to reconsider (financeability) because:	13

	• Financeability affects whether regulated energy networks can fund – and therefore undertake– efficient investment that promotes the long-term interests of consumers • There is no obvious downside to at least considering financeability before finalising the 2022 RORI – the AER is not bound to accept the results of any financeability assessment • Other regulators see the benefit in undertaking financeability assessments – they see it as prudent to use such assessments to check their regulatory decisions before finalising them. Financeability assessments should be one of the cross-checks that the AER uses to test whether the methods and assumptions proposed for the RORI are producing sensible results.	
	If the allowed rate of return calculated using a given set of methods and assumptions reflected the true opportunity cost of capital, then there would be no need to consider financeability.	13
	Judgement is used to select among imperfect methods and imprecise assumptions or parameters. And although individually each selection may be reasonable, there is a risk that when combined they produce outputs that do not reflect the true opportunity cost of capital. It is this risk that cross-checks such as financeability assessments can help to mitigate.	13
	The AER could use financeability cross-checks to assess whether the RORI outcomes can sustain – for a representative or benchmark entity – the credit metrics adopted by rating agencies under various interest rate scenarios.	14
	If the cost of equity moves differently to debt in relation to the risk-free rate, we disagree with the AER that a fall in the cost of debt if not matched by a fall in the cost of equity would lead to an increase in gearing. The AER's proposition assumes that networks can in fact increase debt easily and without limit.	19
Ausgrid		
Are we in a low interest environment?	The working paper concludes that we are experiencing a low rate environment based on historical data. Ausgrid agrees with this conclusion.	3
Return on debt	Debt in a low rate environment is of less concern because interest rates are observable and are updated annually.	3
Return on equity	Return on equity under the 2018 RORI is extremely low, both in absolute terms and in comparison to other regulated utilities.	3
	If the AER concludes that there is a relationship between risk free rate and MRP it would be inconsistent to maintain the HER only approach to estimating the MRP. The appropriate outcome would be to give weight to more forward-looking evidence in the estimate, because it would	4

	cause the MRP to move lower or higher in accordance with actual market conditions, inverse to movement in the risk free rate.	
Return on equity — risk-free rate	The APGA considers that the impact of RBA interventions should be considered by the AER. Equity holder expectations have not decreased to the same extent as government bonds, and this has been exacerbated by government bond rates being lower than the level an efficient market would otherwise have reached.	4
Financeability	We do not propose that financeability be used to back-solve a rate of return or to be used to set any parameters. Our proposal is that it would serve as a cross-check for internal consistency of the RORI.	5
	The credit metric calculations, which are based on published material from at least one rating agency, could be built into the PTRM. The AER would assess all metrics and determine whether the quantitative score aligns with the levels generally used for the credit rating of the BEE.	6
	We recognise that rating agencies use judgement and wider knowledge of the longer-term outlook for and management of companies when giving ratings. However, it is possible for the AER to make a reasonable assessment as evidenced by implementation of financeability testing by other regulators, including Ofgem and IPART.	6
	The AER's analysis of the impact of low rates, provided by the REU, is driven by economic theory whereas we believe that financial realities are at least equally, if not more, important.	3
	Negative NPAT is not considered to be an issue in the working paper because over the life of an asset the expected NPAT is positive due to some of the return being delivered through future capital gains. Unfortunately, future capital gains are not included in debt and credit metrics which are impacted by the factors that affect NPAT.	3
	We are concerned that the AER has misrepresented how immediate expensing of capex has impacted NPAT. This does not materially affect the AER's conclusions, however it is important that stakeholders are provided correct information.	6
	We agree that business can choose to operate with parameters that vary from the benchmark allowance, and that sometimes actual business, as opposed to the benchmark efficient entity (BEE), may choose to vary their capital management to manage credit ratings/financeability.	5
	Comparisons to specific companies or other sectors which have been raised in this working paper and the inflation review do not take account of how financing works for network businesses.	3
AusNet		
Financeability	AusNet supports the introduction of a financeability check both at the time of the RORI and in individual determinations.	3

	This is a prudent practice adopted by many international and Australian regulators. Internally inconsistent decisions (whereby inadequate cashflows are provided to support the assumed benchmark credit rating) could lead to industry-wide credit rating downgrades over time. Which in turn would increase prices for customers.	3-4
Consumer Reference Group (CRG)		
Are we in a low interest environment?	Supports the AER's conclusion that the Australian economy is currently in a low interest rate environment.	2
Process	The AER should: • Define and consult on the evidentiary thresholds that need to be satisfied before it reviews the 'environment' in which a regulatory review is being conducted; and • Having established those thresholds, demonstrate that proposed changes to the framework are enduring rather than merely reacting to the current environmental factors.	4
	The AER could enhance consumer confidence in the regulatory framework: • If networks were not seen to be 'calling the shots' for the regulatory agenda; and • The AER demanded a clear standard of compelling evidence before it responded to networks' concerns.	4
	To uphold consumers' confidence in the regulatory framework, the AER should: • Require networks advocating the changes to the RORI to demonstrate the benefits accruing to consumers as part of those proposed changes; and • Reflect the value consumers place on regulatory stability, by clearly demonstrating the benefits for consumers from changes to its methodology for estimating the rate of return.	5
	The LIRE paper does not explain, the matters the AER considered when determining if such a review was required. The CRG questions: • Would the AER initiate a review if consumers (or other stakeholders) were concerned about a high interest rate environment? • What would constitute a high interest rate environment? • If unemployment had soared as initially expected following the onset of the pandemic, would the AER have reviewed the "environment"?	15

Return on equity	The AER should: • Explain and consult on its intended approach to assessing relationships between inputs to its rate of return model; and • Explain how a finding of any such relationship would affect the theoretical foundations of its approach to estimating the rate of return.	24
	Economic relationships, such as the one described by the CAPM formula, assume the formula's inputs are independent. If the CAPM formula was contracted from three independent inputs to only two or one independent inputs, it would no longer be the CAPM formula on which the entire regulatory framework is predicated.	22
	AER endorsed the ongoing use of the CAPM model (specifically the SL-CAPM) for regulatory purposes. That endorsement would be rendered void if it now concluded inputs to the model were correlated.	23
	Any relationships (MRP and risk-free rate) the AER might or might not find when using the 10 years estimates of the inputs, may or may not hold if it shifts to using five year estimates in the RORI, and five year estimates of inflation.	21
	In the absence of data supporting stable relationship (return on equity parameters and risk-free rate) or the absence of a clearly evidenced and theoretically sound explanation of changing relationships, the AER's position in the 2018 RORI should prevail.	23
Financeability	Supports the AER's assessment of financeability issues as they apply to regulated energy networks in Australia, including the conclusion that the primary responsibility for financeability lies with the regulated business.	24
	Considers that network representations have offered little to counter the AER's assessment. The CRG sees no compelling evidence that the networks have suffered financial distress, failed to provide dividends to their investors or had their credit rating downgraded as a direct result of the 2018 RORI.	24-25
	It is not clear why the AER has considered it necessary to respond yet again to financeability concerns in the absence of compelling new evidence from the networks.	25
	The REU's paper confirms the AER's and the CRG's view, that the simple financial measures used by the networks to support their case fail to capture the overall financial position of the networks, and the response to this position by the rating agencies.	25
	The CRG is concerned that network stakeholders' focus on narrow quantitative assessments such as FFO/debt thresholds in isolation are poor proxies for the broader quantitative and qualitative evaluations carried out by rating agencies.	26

	The CRG is not aware of any evidence of a decline in reliability of the networks since 2018 (other than due to extreme climate events), nor do the network's capital expenditure proposals to the AER indicate any hesitancy to undertake capital investments.	28
Energy Networks Australia (ENA)		
Process	The current low rate environment has exposed more clearly the inability of some aspects of the AER's existing rate of return approach to produce the best possible estimate of the market cost of capital at the time of each regulatory decision.	4
	The objective should be to consider how the AER's framework might be made more robust to the sorts of events that have occurred since the 2018 RORI.	4
	The ENA proposes that the best way to support efficient investment, in the long-term interests of consumers, is to set the allowed return to the best possible estimate of the market cost of capital at the time of each network determination decision.	4
	The ENA considers that there are two possible interpretations of "unbiased' in this context and that the 2022 RORI process would benefit from a clear statement on this issue from the AER. The two potential interpretations are: • The regulatory allowance has to be an unbiased estimate of the market cost of capital at the time of the decision; or • It is acceptable for regulatory allowances to be above the market cost of capital for some periods and below it in others; so long as the unders and overs are expected to (i.e. on average) cancel out over the long run.	10
	The ENA considers that 'unbiased' should be interpreted with respect to the available evidence at the time of a decision, rather than in terms of a long-run average. The ENA submits that stakeholders would benefit from a clear statement from the AER on this.	11
Rate of return	The further decline in government bond yields since 2018, and the consequential historically low level of allowed returns, raises questions about the ability of the current approach to produce reliable estimates of the market cost of capital in the prevailing market conditions.	16
Return on debt	The ENA supports the AER's current approach to the allowed return on debt.	16
Return on equity	The ENA notes that Brattle have demonstrated that, by every relevant metric, the allowed return on equity under the AER's 2018 approach is lower than that adopted by every other regulator for which a comparison could be made.	18
	A 2021 report published by the Council of European Energy Regulators (CEER), which surveys (amongst other things) the allowed rates of	19

	return and individual WACC parameter decisions that prevailed in 2020 in European Union member states, as well as the United Kingdom, Norway and Iceland, is consistent with Brattle's findings.	
	A recent report by Morgan Stanley Research, which compared the returns available to equity investors in regulated utilities in a range of economies, identified real return on equity allowances of regulated energy networks in Australia as being the lowest available in any market studied, with the exception of India.	20
	Even if it were the case that nearly every overseas regulator was over-estimating the required return on equity, it would remain the case that equity investors searching globally for opportunities to commit capital would find Australian networks unattractive compared to regulated networks in other jurisdictions.	20
	Agrees (with Brattle) that this cross-check with the allowed returns of other regulators should be used to identify the various aspects of the AER's approach to the allowed return on equity that might benefit from a review to ensure that they remain fit for purpose in the current market conditions.	21
	The ENA submits that, in the same way and for the same reasons (as return on debt), the allowed return on equity should be based on evidence of the returns that real-world investors require for providing equity finance to the regulated firm.	17
	Notes that Brattle has concluded that the AER's approach in relation to the allowed return on equity is not as effective as the approaches of other regulators and makes a number of recommendations for further consideration throughout the 2022 RORI process. ENA considers that it is important that the Brattle recommendations be given careful consideration through the 2022 RORI review process.	21
Return on equity — MRP	The AER's current approach of adopting an essentially constant MRP based on the long-run average of historical excess returns produces estimates: • That are currently below those allowed by other comparable regulators; and • That are upwardly biased in some market conditions and downwardly biased in others.	35
	Brattle concludes that it is unsafe to update one return on equity parameter and not others, noting that declines in the risk-free rate are often associated with increases in the MRP, and vice versa.	36
	The IPART has recently explained that it is essential to pair together internally-consistent estimates of the MRP and the risk-free rate, and that failure to do so is likely produce "biased estimates of the market cost of equity".	36

	Brattle also draws attention to the practice of other regulators. For example, Brattle notes that FERC explicitly quantifies the relationship between risk-free rates and MRP. The result is an allowed return on equity that is relatively more stable as falls in risk-free rates are partially offset by increases in MRP, and vice versa.	36
	It is also common for independent expert valuation reports to recognise that the total required return on equity has not fallen one-for-one with the decline in government bond yields.	37
	The ENA also notes that a move away from the AER's current approach of adopting a fixed historical average MRP in all market conditions would also have the effect of reducing volatility in the allowed return on equity.	37
	We consider that the starting point in this process is a consideration of how to relax the assumption of a one-for-one relationship between the allowed return on equity and the prevailing government bond yield. In this regard, the ENA endorses Brattle's recommendation about having some increased regard to forward-looking evidence.	37
	It would be inconsistent to adopt the mean HER estimate in the RORI (which reflects no relationship between the MRP and the risk-free rate) but then apply a mechanism to update the MRP to account for changes in the risk-free rate during the RORI period.	38
	Considers that the AER should: • Attach greater weight to forward-looking MRP estimates • Ensure internal consistency of the final cost of equity estimate	38
	The ENA submits that the approach of increasing the MRP when government bond yields rise and decreasing the MRP when government bond yields fall should be ruled out at this stage of the 2022 RORI process.	38
	The notion of a positive relationship between the MRP and risk-free rate contradicts the overwhelming empirical evidence. The evidence overwhelmingly suggests that the returns required by equity market investors are more stable than is implied by adding a constant MRP to the prevailing government bond yield.	38
	The ENA is unaware of any regulator or any market professional adopting a positive relationship between the risk-free rate and the MRP. By contrast, there are many examples of regulators and market professionals who adopt a negative relationship.	39
	The approach of adopting a positive relationship would amplify the volatility in government bond yields leading to more volatility in the allowed return on equity and on customer prices.	39
	The academic reports to which the AER refers do not make a strong case for the positive relationship. Damodaran (2012)—has been superseded by a 2021 version of the same study that in fact presents	39

	strong evidence of a countercyclical (rather than procyclical) MRP since the Global Financial Crisis in 2008, and which argues strongly against the application of a fixed MRP estimate. The two remaining studies cited in the draft working paper—Li (2006) and Kim and Lee (2008)—do not adopt a CAPM framework, and arrive at the same conclusion even though they adopt diametrically opposed starting assumptions.	
CGS as a proxy for the risk-free rate	In the UK regulatory setting, questions have been raised about whether the prevailing government bond yield is an appropriate proxy for the CAPM risk-free rate. Government bond yield is affected by a convenience yield that is not relevant to the CAPM risk-free rate, and investors are able to borrow at the CAPM risk-free rate but they cannot borrow at the prevailing government bond yield.	5
	In this regard: • There is regulatory precedent for recognising these issues and adopting a CAPM risk-free rate above the prevailing government bond yield; • Academic literature recommends adopting a CAPM risk-free rate above the prevailing government bond yield; • The market practice of equity analysts, independent experts, and survey respondents is to adopt a risk-free rate above the prevailing government bond yield; and • Standard textbooks recognise these issues and note that market practitioners tend to adopt a CAPM risk-free rate above the prevailing government bond yield.	5
	The ENA proposes that, as part of the 2022 RORI process, the AER consider: • Whether the prevailing government bond yield is an appropriate proxy for the CAPM risk-free rate • Whether the issues raised in the UK regulatory setting, and the evidence of market practice, has any other relevance to the allowed return on equity • What impact recent monetary interventions by the RBA have had on observed government bond yields; and • How a best unbiased estimate of the required return on equity should be determined in circumstances when central bank interventions have driven government bond yields lower than the level that would be determined by the market.	22
	In summary, the finance literature establishes that government bonds have special ‘money-like’ features, and that market participants are willing to accept a lower yield due to the benefits of these features. The lower yield due to these special features is not relevant to the CAPM risk-free rate, which should reflect only the single characteristic of an asset with returns that are uncorrelated with the returns on the market portfolio.	24

	The 2019 KPMG Corporate Finance Survey indicates that respondents, on average, adopted a risk-free rate approximately 100 basis points above the prevailing government bond yield when applying the CAPM, and that 64% of respondents adopted a figure more than 50 basis points above the prevailing yield.	26-27
	The Fernandez surveys, to which the AER has previously had some regard, also routinely report that participants adopt a risk-free rate above the prevailing government bond yield.	27
	We also note that standard finance textbooks observe that market participants tend to adopt risk-free rates that are higher than the prevailing government bond yield. For example, the most recent edition of Berk and DeMarzo (2020) indicates that there has been an increase in the spread that high-quality borrowers pay over the prevailing government bond yield.	27
	In its Final Decision, the CMA recognised that a CAPM based on the ILG rate alone may understand the return required by investors on equities, if it underestimates the return associated with a 'zero-beta' asset. The CMA has concluded that the CAPM risk-free rate should be set above the prevailing government bond yield.	28
	The ENA accepts that the yield on government bonds is the yield that can be obtained when lending money to the Commonwealth government. But the key question is whether that yield represents an appropriate proxy for the rate of return required on a zero-beta asset in the CAPM. The prevailing government bond yield may not be an appropriate proxy because it is affected by a convenience yield and the CAPM zero beta asset is not.	33
Financeability	A financeability assessment should be performed as a cross-check of the AER's allowed return on capital, providing 'early warning' of adverse outcomes that could arise if the return on capital allowance for the benchmark firm were inadvertently set below the efficient level.	43
	A financeability cross-check on the overall allowed return on equity is particularly important given the high degree of imprecision, uncertainty and methodological debate about each parameter, and the degree of regulatory judgment that is required in arriving at a final allowed return.	43
	The financeability assessment would have two key purposes: • To ensure that the regulatory determination is internally consistent such that the allowed return is sufficient to support the credit rating that is assumed when deriving it; and • To ensure that the regulatory determination is robust to potential changes in future financial market conditions.	43
	It is difficult to conceive of any reason why the determination of the allowed return on equity would be made less reliable by the consideration of relevant evidence such as a financeability assessment.	7

	The financeability assessment would be performed by computing the set of financial ratios that form the basis of credit ratings for regulated utilities. These financial ratios would be computed for the benchmark firm as a simple augmentation of the PTRM.	43
	The ENA recognises that 'financeability' has different meanings and interpretations among different stakeholders. To that end, we have tried to set out clearly the standard interpretation of financeability assessments as they have been used for decades by regulators in a number of jurisdictions.	44
	The terms 'financeability' or 'financeable' are often misinterpreted. Financeability should not be: • Interpreted as a test of whether a firm might be able to raise capital for a particular project. • Interpreted as a test of whether a particular firm might become insolvent. • Interpreted as a back-solving approach to setting allowed returns. • Applied in a mechanistic way to adjust regulatory allowances. Interpreted in terms of the balance of cash returns and RAB indexation.	45-48
	Financeability assessments have two clear benefits for consumers: • Keeping prices down by keeping the required return on debt low. • Supporting efficient and prudent investment.	51
Endeavour Energy		
Rate of return	Returns are well below those allowed by comparable international regulators as established by benchmarking reports and research from Brattle, Morgan Stanley and the Council of European Energy Regulators.	2
	A rate of return cannot be set on the basis of the assumption that a period of under-compensation will be offset by some unspecified, assumed future period of over-compensation. The best estimate of an efficient return is required each period or determination.	3
Return on debt	Endeavour Energy supports the AER's position that the current low interest rate environment does not suggest any change in its approach to estimating the efficient return on debt allowance is required.	3
Return on equity	Further review of the return on equity is required, specifically the appropriateness of the risk free rate.	3
	Whilst government bonds are effectively risk-free, which is appropriate for estimating the return required on a CAPM zero beta asset, they also possess special liquidity and safety characteristics that mean market participants are willing to accept a lower yield. This aspect of government bonds is not suited to setting the CAPM risk-free rate more	3

	generally as investors cannot borrow at the prevailing government bond yield (which includes the convenience yield).	
	In reviewing the relationship between the MRP and risk-free rate we would urge the AER to have regard to the broader recommendations of Brattle.	4
	If the HER approach remains the preferred option for estimating the MRP, it would be inconsistent to then adjust the MRP for movements in the risk-free rate during the RORI period. This is because the HER estimate is effectively constant and independent of the level of the risk-free rate.	4
	It is not even-handed to assign weight to evidence that is of questionable relevance or contrary to an established academic, regulatory and market consensus. On this matter, the literature cited by the AER (Damodaran, Li and Kim and Lee) provide little support for a positive relationship when taken as a whole.	4
	There is an overwhelming amount of evidence and regulatory precedent in support of a negative relationship.	4
Financeability	It is not appropriate to start from the premise that the existing RORI operates effectively nor is it being suggested that a financeability test be used to deterministically adjust the RORI.	1
	This work stream would be better served by reviewing whether the current environment indicates any existing parameter is not working effectively and examining whether including financeability checks as part of the RORI process would help produce a ROR that better promotes the long term interests of customers.	1
	A financeability test does not need to examine the circumstances of an individual firm to check whether it may be able to raise capital or avoid insolvency. Instead, we see it as a forward-looking, preventative measure to ensure the overall ROR: • Delivers a financial outcome consistent with the BEE credit rating assumption underpinning it; and; • Is reasonable and robust under a range of potential scenarios.	2
	These comparably low returns in a period of historically low results has resulted in: • Negative NPAT in some decisions. • Credit rating downgrades for some networks. • Some networks unable to pay distributions. Some key investments are uneconomical for private investment and cannot proceed without taxpayer underwriting.	2-3
	To adopt a negative relationship would increase the volatility in the allowed return on equity.	4

Energy Queensland		
Are we in a low interest environment?	Energy Queensland acknowledges and supports the AER's view that we are in a low interest rate environment.	3
Return on equity	Submits that the AER should holistically revisit its approach to setting the return on equity in the 2022 RORI, and in particular, both the estimation and relationship of the risk-free rate and MRP in the SL-CAPM.	3
	We do not consider that it is reasonable that the return on equity varies one-for-one with the risk-free rate, which has been the AER's approach to date.	3
Financeability	Submits that financeability tests are good regulatory practice. Many regulators have regard to financeability tests when evaluating their decisions.	3
	Believes it is reasonable that financeability tests must be part of the regulatory tool-kit used, at a minimum, to test whether the regulator's judgements are internally consistent. This is especially pertinent in the current low interest rate environment where recent AER decisions have projected negative net profits after tax in the PTRM.	3
	We accept that businesses can undertake a range of measures to address financeability issues including deviating from the AER's benchmarks. However, this should generally only apply in exceptional circumstances such as when a business is required to undertake a relatively large capital expenditure program.	3
Investors Mutual		
Rate of return	An upward bias in the return on equity is warranted, as the alternative is a risk of insufficient investment, potentially leading to poor consumer outcomes.	2
Return on equity	All of the survey participants use the 10 year bond (or longer in the case of Forsyth Barr) for the term of the risk free rate. The majority appear to use a long term forecast of the 10 year bond rate, or a combination of the spot 10 year rate with historical averaging, likely to account for the fact that current rates are artificially low.	2
Major Energy Users Inc. (MEU)		
Rate of return	What is not addressed is that, if the current low interest environment is impacting the networks negatively, the impact of a high interest rate environment would positively impact the networks, presumably to the detriment of consumers.	10
Return on equity	Unfortunately, the tools are yet to be developed that would provide sufficient certainty as to what the values for MRP and equity beta might be in the ensuing years until the next reset.	8

	The MEU considers that values of MRP and equity beta in more recent times are more likely to be reflective of the future movements in these parameters and by assessing these over a reasonable past period will provide greater stability of the return needed for assets which have a 50-60 year life.	8
	The MEU does not support the view that values for these parameters over a short forward-looking period, will provide a reflection of the need of a return over the life of the assets.	9
Financeability	The MEU agrees with the AER that a financeability test is not required or applicable as part of the setting of the RORI.	10
Network of Illawarra Consumers of Energy (NICE)		
Are we in a low interest environment?	Clearly we are in a low interest rate environment. It is not outside the bounds of experience but is significantly lower than has been the case when previous rate of return decisions were made.	14
Return on equity	Believe that interest rates so low as to present negative real interest rates are indicative of an environment that is behaving abnormally. Accordingly, believes that there is merit modifying the RORI to specify that there is a floor on the real risk-free rate to be used in calculating return on equity.	16
	If the AER determines that the estimates of MRP and Beta should move more to the midpoint of estimates, then the lower bound could conceivably move up to the point such that the final return on equity was never lower than had the high points on the estimate been applied to a zero real risk-free rate.	16
	The alignment between return on debt and return on equity should also not only apply to the term of the underlying series used for estimation, but also to the application of the trailing average approach to return on equity.	1
CGS as a proxy for the risk-free rate	The risk-free rate is still determined by markets, and the price applied by that market is determined by supply and demand characteristics. Historically that has been determined by supply characteristics, but now by demand characteristics.	15
	Where we are today is no different to where we have been at any time since the RBA was given a remit to target an inflation band – the RBA targets an interest rate and participates in the market to achieve that outcome.	15
Financeability	If remaining cashflow impacts are an impediment to financeability can be addressed by allowing accelerated depreciation, but no financeability metrics or tests should be introduced.	1
	The AER position is, however, wrong on both counts. While the approach to depreciation means that the same amount is recovered from consumers (in real terms) for the return of capital (depreciation)	16

	current consumers pay more for return on capital as the undepreciated proportion is so much higher.	
	Secondly, the regulatory accounts and the actual financial accounts of the entity are completely different. The question of whether accelerated depreciation improves financeability in the future depends entirely on what the regulated business does with the extra cash that is generated.	16
Network Shareholder Group (NSG)		
Rate of return	Concerned that the issues and approaches being considered by the AER in its various papers favour a reduction in the rate of return because of methodological changes rather than because of changes in the efficient cost of capital.	1
	There is already considerable evidence to suggest that the rate of return set in the 2018 RORI, which reduced the equity risk premium by 95 basis points, was too low to attract the necessary investment.	4
	The failure of the regulatory framework to provide efficient risk adjusted returns has meant that some large-scale infrastructure investments have required government intervention in the form of underwriting and financing support.	4
	The funding for PEC included a A$295 million, hybrid security instrument in the form of subordinated notes from CEFC. Without CEFC support, PEC would have been unable to proceed.	8
Return on equity	It is critical that the AER gives weight to actual practice of equity analysts, valuation experts and views of equity investors in fulfilling its task of estimating the efficient cost of equity. Relying on a theoretical approach that does not attract actual capital is not in the long term interests of consumers.	2
	The AER needs to demonstrate that it has used market information and practice in its decision-making process to assess whether the estimate is the best unbiased estimate of an efficient return on equity – and most importantly whether the theoretical view of returns on equity will actually support the attraction of capital.	15
	We agree that adopting an inverse relationship is consistent with experts, market practice and estimates of the cost of equity.	13
	In the 2018 RORI, most experts agreed that there was a relationship between the MRP and RFR in estimating the cost of equity that lay somewhere between the constant MRP or constant total market returns. Yet the AER adopted a constant MRP.	13
	Experts agreed that forward that forward looking information such as dividend growth model estimates, surveys and historical excess return information should be used to estimate the market risk premium. The AER accepted this but applied a zero weight to dividend growth model estimates and surveys.	13

	Neither market practitioners nor valuation experts adopt a short-term risk free rate with a long term MRP. Instead, they match a long term risk free rate (or blend) with a long term MRP or adjust the MRP. Indeed, the increased volatility in the RFR has resulted in a more volatile MRP and upward adjustment to reflect the anomalously low government bond yields.	13
Financeability	Recognising this imprecise science and the risks of getting it wrong, financeability assessments are an important tool used by many regulators around the world to test the reasonableness of rate of return estimates.	15
	They have been used extensively by regulators in the United Kingdom (such as OFWAT and OFGEM) and by IPART in the context of water regulatory decisions. It is unclear why the AER has rejected the use of financeability assessments so strongly when other regulators use them either by choice or by law.	15
	Undertaking a financeability assessments is important to: • Provide confidence in regulatory decision-making process and outcomes • Test that assumptions used in making a decision are internally consistent • Ensure that a regulated network service provider adopting the same benchmark financing assumptions can finance efficient investment at the regulated return • Minimise the cost and impact on consumers of failing infrastructure, poor reliability and higher long term investment costs.	15
	Do not understand why the AER would choose not to apply a test that could demonstrate transparently the veracity of its regulatory decision making and minimise the risk of getting it wrong.	15
	It is not acceptable for a regulated business adopting benchmark assumptions and undertaking the efficient levels of investment set out in a determination to not achieve and maintain the credit rating assumed by the AER.	16
	Regulated business are required to draw on the revenues and balance sheet of unregulated services or a related party to enable it to provide regulated services at the efficient cost. Not only is this inconsistent with the revenue and pricing principles, but it also contravenes the principle underpinning ring fencing requirements that regulated service revenue should not subsidise unregulated services and vice versa.	16
	If a network service provider adopting the same benchmark financing assumptions must reduce dividends to finance investment, this is the same as saying that these investors should expect to receive a return on equity that is less than that set out in the RORI.	16

Queensland Treasury Corporation (QTC)		
Return on equity	QTC agrees with the AER's decision to reconsider the relationship between Commonwealth Government Security (CGS) yields and the expected return on equity. We believe this will be most productive if the AER takes a balanced approach by considering a range of inputs such as: • Real-world practices of investors and valuation professionals • Academic research • Commentary and observations from central banks • Time series properties of implied estimates from the dividend discount model, and • Consultant reports.	1
	Members of the Investor Reference Group (IRG) have presented at multiple AER online stakeholder forums on the factors that real-world investors and valuation professionals consider. In QTC's view, it would be useful for the AER to confirm how it intends to incorporate this information into the return on equity approach as it remakes the 2022 RORI.	1
	The 2012 paper by Professor Aswath Damodaran report (cited by the AER) was updated in March 2021 and contains new findings that are relevant to the return on equity approach: 'the combination of low rates and high equity risk premiums since 2008 seems to have eliminated even that mild connection between the two, a result consistent with the regime change recorded by Campbell, Pfueger and Viceira' (CPV).	2
	The main conclusion in CPV is that the systematic risk of nominal fixed-rate bonds changed from positive to negative around 2001 due to a change in the correlation between inflation and the output gap.	2
	Any increase in price (ie, reduction in yield) that is due to the ability of sovereign bonds to hedge equity risk does not reduce the expected return on equity. Expressed differently, the hedging properties of sovereign bonds is a factor that reduces the yield on sovereign bonds but not the expected return on equity.	3
Financeability	QTC considers that credit and financial metrics based on post-tax revenue model (PTRM) cash flows and benchmark parameters can provide useful information on the reasonableness of the allowed return on equity at the time of a regulatory determination.	3
	QTC does not agree with the position in the Draft Working Paper that negative net profit after tax (NPAT) in the PTRM is not a problem, or with the implication that NPAT is not important because it is an accounting concept and not a reflection of free cash flows.	3

	The benchmark firm cannot be assumed raise additional capital to fund a negative NPAT outcome because there is no corresponding increase in the RAB if NPAT is negative.	3
	At a minimum, it would be helpful if the AER could explain where the cash is expected to come from within the PTRM (ie, for the benchmark firm with constant gearing, not an actual service provider) to fund negative NPAT outcomes in the PTRM.	4
TransGrid		
Are we in a low interest environment?	We agree with the AER that we are in a low interest rate environment – many stakeholders recognise this and the data presented in the AER's paper confirms it.	3
Consequences of a low interest rate environment	The consequences of this are that rates of return allowed by the AER have reduced materially over recent decisions. The net impact being lower prices faced by consumers and lower cash flows available to energy businesses to reinvest in their networks	3
Return on debt	Broadly comfortable with how the return on debt is estimated	4
Return on equity	Concerned that the approach used to estimate the return on equity does not work in a low interest rate environment.	4
	The simplistic approach of assuming a fixed margin over the yields on Commonwealth Government Securities (CGS) is not robust to the real world impact of interest rate changes. A simplification that may work when those yields are stable and close to their long term averages. However, when rates reach high or low extremes it becomes apparent that it just does not hold.	4
	TransGrid supports the ENA's position that: • The mean historical excess returns (HER) estimate is essentially constant over time, whereas the true MRP varies over time, and • A superior estimate of the MRP can be obtained by giving some weight to forward-looking evidence.	4
	We agree with the ENA that, it would be inappropriate to assume that the MRP increases when the risk-free rate increases.	4
	Options that could be adopted for the 2022 RORI, include: • A smoothed approach whereby the return on equity only changes by a proportion of the change in the risk-free rate • An MRP that varies over time with the risk-free rate in some automated way, and • Caps and collars (i.e. upper and lower bounds) around the MRP that limit potential volatility in MRP changes.	4-5

	There may also be other options. TransGrid does not have a settled preference for any specific option at this stage, but look forward to further engaging with the AER on these when it releases its future working and consultation papers.	5
	Encourages the AER to take particular care to avoid combining an MRP that reflects an historical average of excess returns over varying interest rate environments with a mechanism to update the MRP to reflect changes in prevailing interest rates.	5
Financeability	TransGrid agrees with the ENA that a financeability assessment has an important role to play in assessing the overall allowed return, including to ensure that the return is robust to potential changes in future financial market conditions.	5
	The financeability of Major Projects continues to be a major concern. For the reasons set out in our recent financeability rule change request, TransGrid remains concerned that the current regulatory framework does not support efficient investment in Major Projects.	5
	In relation to investment in PEC, it required significant financial support from the Clean Energy Finance Corporation (and earlier support by the South Australian government) in order to make it financeable.	6
	In order to ensure timely investment in Major Projects, including those identified by AEMO in its ISP optimal development path, NSPs must be compensated for the additional greenfield and other risks associated with these investment which include risks arising from climate change, the energy transition, and energy system security.	6
VPN, SAPN and AGIG		
Rate of return	It is not clear whether the allowed rates of return stemming from the 2018 RORI will be sufficient to provide incentives for this new investments in a timely fashion.	2
	We are already seeing an impact on investment, which are troubling early signs. For example: • The AGIG Mt Barker expansion will not proceed because it is not economically viable given the current level of allowed returns; and • Project Energy Connect would not have proceeded without the $295 million of government subsidised funding provided by the CEFC.	3
	The businesses do not suggest that allowed returns should be 'aimed up' to provide a special incentive to encourage investment – just a matching of the regulatory allowance to the returns that investors currently require to provide capital for investment.	3
Return on equity	The Brattle Report identifies that:	3

	• The AER's allowed return on equity is lower than that adopted by every other regulator for which a comparison could be made; and • The AER's approach to the allowed return on equity "is not as effective as the approach of other regulators" such that the AER should consider a number of areas for reform. We consider it to be important that, throughout the 2022 RORI review, stakeholders engage fully with the Brattle material, conclusions and recommendations.	
	The allowed return on equity is 'at the mercy' of whatever happens to government bond yields – whereas market practitioners, valuation experts, and other regulators take a different approach that produces more stable estimates of the required return on equity.	4
	The starting point of this consideration is a discussion about how to relax the assumption of a one-for-one relationship between the allowed return on equity and the prevailing government bond yield.	4
	A move away from the AER's current approach of adopting a fixed historical average MRP in all market conditions would also have the effect of reducing volatility in the allowed return on equity.	4
Financeability	The businesses consider that a financeability assessment is a useful tool that is part of good regulatory process.	5
	The ENA submission explains how financeability assessments might be used as part of an early warning system in the regulatory process. We endorse the ENA's submission on this issue and note the importance of these kinds of cross checks in a setting where parameters cannot be precisely estimated and economic models cannot produce precise estimates of the true market cost of capital.	5
	Financeability is critical to delivering acceptable credit metrics consistent with the achievement of the regulatory benchmark credit rating, particularly in a low return environment. Investor confidence in the regulatory process, including the ability to finance required investment is critical in allowing returns to stay low.	5

Appendix A: REU Advice

Convenience and inconvenience yields on government bonds

This note was prepared by the ACCC's Regulatory Economic Unit at the request of the AER.

This short REU note examines the Energy Network Australia's (ENA) submission that there may exist a convenience yield on Commonwealth Government Securities (CGS). One implication of the ENA's submission is the consideration of an adjustment to the yields on CGS for the purpose of estimating the Network Service Provider's (NSP) cost of equity using the Sharpe-Lintner Capital Asset Pricing Model (hereafter the SL CAPM). Another implication is the consideration of an alternative proxy to that of government bonds for the risk free asset. While an alternative proxy is briefly considered in the note, the focus is on the convenience yield which is the basis for request for advice, but also because an alternative proxy is rarely contemplated in the surveyed mainstream literature.

On the basis of the substance of the ENA's proposal and the REU's research, the REU does not recommend further inquiry into a possible convenience yield on CGS. The ENA's definition of a convenience yield is incorrect, it has not established that there exists a convenience yield on CGS and it has not considered how such adjustments can be reasonably estimated and are compatible with SL CAPM. The ENA has also not considered the most recent studies of a possible inconvenience yield on governments bonds. In the absence of further evidence, the REU remains convinced that government bonds are the correct proxy for the risk free asset.

ENA Submission

In its submission, the ENA[521] argues that in a regulatory setting there are questions about whether the prevailing government bond yield is the appropriate proxy for the risk free rate since it may include a 'convenience yield'. The convenience yield reflects certain benefits such as special safety and liquidity features[522] which are inconsistent with the risk free rate in the CAPM. The convenience yield has the effect of pushing the return on government bonds below the return on a CAPM zero-beta asset.

The ENA also submits the following, based partly on the Oxera (2020) report for the Energy Networks Association UK[523]:

- Academic literature on the convenience yield (Feldhutter and Lando (2008)[524]; Krishnamurthy and Vissing-Jorgensen (2012)[525]; Binsbergen et al. (2019)[526])

[521] ENA (2021), Rate of return and cashflows in a low interest rate environment, Response to the Draft AER Working Paper, 2 July.
[522] ENA (2021), Rate of return and cashflows in a low interest rate environment, Response to the Draft AER Working Paper, 2 July, p. 23.
[523] Oxera (2020), Are sovereign yields the risk-free rate for the CAPM? Prepared for the Energy Networks Association, 20 May.
[524] Peter Feldhutter and David Lando (2008), 'Decomposing swap spreads', *Journal of Financial Economics*, 88, pp. 375-405.
[525] Arvind Krishnamurthy and Annette Vissing-Jorgensen (2012), 'The Aggregate Demand for Treasury Debt', *Journal of Political Economy*, 120(2), pp. 233-267.
[526] Jules van Binsbergen, William Diamond and Marco Grotteria, 'Risk Free Interest Rates', *NBER*, Working Paper 26138.

recommends adopting a CAPM risk-free rate above the prevailing government bond yield.

- Standard textbooks – Berk and DeMarzo (2020) – recognise the issues with government bond yields and note that market practitioners tend to adopt a CAPM risk-free rate above the prevailing government bond yield.
- The ENA also makes reference to the UK Competition & Markets Authority use of AAA-rated non-government bonds as a suitable input into the estimate of the risk free rate.

REU Summary and Findings

The review of the ENA's submission and the analysis below considers whether or not there may be a convenience yield on government bonds. The analysis also briefly considers whether an adjustment to the yield on CGS should and can be made for the convenience yield or whether an alternative proxy for the true risk free asset be considered on the basis of convenience yield studies.

The REU observes that the ENA has not presented evidence of a convenience yield on CGS. The literature on the convenience yield on US Treasuries – also examined by the ENA – is surveyed in detail by the REU. Where CGS supply, transaction and yield data may inform potential inferences of a *possible* convenience yield on CGS, the data are also reviewed by the REU.

Even accepting that there may be a convenience (or inconvenience) yield on CGS, the findings of the REU analysis are as follows:

1. The definition of a convenience yield does not include safety since the risk free asset in the SL CAPM and indeed the proxy for the risk free asset – government bonds – is safe. The REU observes that, on this basis, some care is required in considering the literature on convenience yield because some alternative proxies for risk free assets exclude the safety property, which is inconsistent with the risk free asset in the SL CAPM.
2. The REU considers the possibility of a convenience yield in detail. And since safety is a property of the risk free asset and not the convenience yield, the REU observes that episodes of relative liquidity and illiquidity of government bonds alone may be characterised and estimated as convenience and inconvenience yields, respectively. Many studies below attribute the convenience (inconvenience) yield to the relative liquidity (illiquidity) of government bonds. However, the REU remains unconvinced that the occasional relative liquidity (illiquidity) of government bonds should be formalised as an estimate of a convenience (inconvenience) yield for the purpose of estimating the cost of equity. Equivalently, the REU remains unconvinced that an alternative proxy for the risk free asset should be adopted for the cost of equity simply because an alternative proxy may be occasionally illiquid (liquid) relative to government bonds. The estimation and measurement issues, combined with the potential incompatibility of a convenience (inconvenience) yield with the SL CAPM, may lead to an inefficient estimate of the cost of equity. The incompatibility of convenience (inconvenience) yield estimates with the SL CAPM is readily apparent by the latter's assumption of liquid capital markets – liquidity is not an endogenous feature of the SL CAPM, it is a given.
3. A number of studies have shown that a convenience yield may be inversely related to the supply of government bonds. If a convenience yield did exist, substantial growth in the supply of CGS since 2005 may have reduced the convenience yield to zero.
4. There is growing evidence in the US Treasury market that supply of Treasuries may have increased to such an extent that the convenience yield may have switched sign

since 2015 – to an *inconvenience* yield. The recently observed patterns in the US Treasury market during the COVID-19 crisis that prompted studies into an inconvenience yield are also observed in the market for CGS.

5. There are a number of challenges and difficulties in the estimate of the convenience or inconvenience yield.
    a. In the literature surveyed on convenience yield, there are more proxies for an alternative 'true' risk free asset than there are papers surveyed, indicating that the literature has not settled on the correct alternative proxy to estimate the convenience yield. Moreover, the estimated magnitude of the convenience or inconvenience yield is unlikely to be robust to the alternative proxy employed for the risk free asset.
    b. The choice of an alternative proxy for the 'true' risk free asset may be afflicted by distortions, such as illiquidity or default risk, which may explain estimates of a convenience yield in some studies. These distortions raise the question as to whether or not the adopted alternative proxies for the risk free asset are appropriate.
    c. The estimated convenience yield is highly time varying and as observed may have switched sign since 2015. An estimate of the convenience or inconvenience yield may therefore not be robust to different sample periods chosen.
    d. The standard texts on asset pricing, cost of capital, financial economics and corporate finance that are surveyed use government bonds/bills as the proxy for the risk free asset. This literature does not consider an alternative and observable proxy for the risk free asset in any detail.
    e. Even if a convenience (inconvenience) yield adjustment was argued to be compatible with the SL CAPM, there are many challenges and difficulties of achieving a reliable and robust estimate of the cost of equity by including a convenience (inconvenience) yield adjustment.

The findings of the above analysis raise a number of concerns with the ENA's submissions:

1. The ENA's definition of a convenience yield is incorrect and incompatible with the property of the risk free asset in the SL CAPM. The ENA's definition of a convenience yield includes a safety or default free property which means that the return on the true 'risk free' asset in the SL CAPM must be absent this property. However, the return on the risk free asset in the SL CAPM possesses the safety property because there is zero variation of the return on the risk free asset in the SL CAPM. If the asset is not safe and there is risk of default, there would be non-zero variation of the return on the risk free asset, which is inconsistent with the SL CAPM. Many studies surveyed below correctly exclude or attempt to exclude the safety property from the convenience yield.

   Only government bonds/bills organically possess the safety property. As Damodaran (2012) states: 'The only securities that have a chance of being risk free are government securities, not because governments are better run than corporations, but because they usually control the printing of currency.'[527] The REU agrees. Unless government debt is redeemable for anything other than the currency it issues, recourse to seigniorage implies that the market price of government debt, and only government

[527] Aswath Damodaran (2012), *Investment Valuation University Edition Tools and Techniques for Determining the Value of Any Asset*, Wiley, p. 154.

debt[528], is unlikely to be distorted by default risk. The same cannot be said for any securities issued by the private sector or state/local governments for that matter.

2. The ENA highlighted that the liquidity (and also safety) property of government bonds is incompatible with the CAPM, implying either an adjustment to the government bonds for a convenience yield or consideration of an alternative proxy for the risk free asset. In contrast, and as noted, the REU considers that formalising and estimating temporary episodes of relative liquidity (illiquidity) of government bonds is incompatible with the SL CAPM given its liquid capital market assumption. The ENA also needs consider why time-varying liquidity of government bonds requires the disproportionate response of estimating an offsetting adjustment for such liquidity (or illiquidity) if the estimated adjustment itself is at great risk of being distorted and there is no agreement on the alternative risk free proxy. The ENA has not provided a convincing case as to why formalising and modelling relative liquidity (illiquidity) of government bonds – via an alternative proxy for the risk free asset or an estimated convenience (inconvenience) yield – is not incompatible with the SL CAPM and how such an approach does not have measurement and estimation issues.
3. The ENA raised the possible issue of a convenience yield on CGS in 2007 and linked this convenience yield to the scarcity of supply of CGS, further arguing that: 'When supply of Treasuries is sufficiently high the price 'premium' on government bonds falls close to zero…'[529] The ENA has appeared not to consider that the supply of CGS not held by the RBA has increased from approximately 4 per cent of GDP in 2007 to approximately 33 per cent of GDP in 2020. If a convenience yield does or did exist it may be negligible or even negative – an inconvenience yield.
4. The ENA has not considered the possible time variation of the magnitude of the estimated convenience yield and the uncertainty around the potential sign of the convenience yield. In particular, the ENA has not considered the growing evidence and studies finding that since 2015 there may be an emerging inconvenience yield on US Treasuries. The most recent studies (2020; 2021) indicate that the traditional safe haven status of US Treasuries could be eroding. The Australian market for CGS has exhibited similar patterns of behaviour to that of the US Treasury market during the COVID-19 crisis. The COVID-19 crisis prompted research into an inconvenience yield. If there is an inconvenience yield on CGS, it is possible that the yield on CGS may be an over-estimate of the 'true' risk free rate rather than an under-estimate as claimed by ENA.
5. The ENA may not have considered that, even if it has estimated the convenience yield on CGS, the estimate may not be robust to the different proxies for the 'true' risk free asset. There appears to be no consensus in the literature on the correct proxy for an alternative 'true' risk free asset and this has two implications. Firstly, that an estimate of the convenience or inconvenience yield may be not be robust since it may be sensitive to the proxy chosen. Secondly, the proxy employed for the alternative and 'true' risk free asset may itself be distorted by illiquidity and/or default risk.
6. The ENA refers to a textbook by Berk and DeMarzo (2020) to support its submission that an alternative asset to government bonds should be considered as a risk free asset. Berk and DeMarzo (2020) state the following: 'that practitioners sometimes use rates from the highest quality corporate bonds' as a proxy for the risk free rate. In the same section on risk free rates, the authors note that for the CAPM: 'We generally determine the risk-free saving rate using the yields on U.S. Treasury securities.' [530]

[528] Including government guaranteed debt if the government making the guarantee is also the currency issuer.
[529] NERA (2007), *Bias in Indexed CGS Yields as a Proxy for the CAPM Risk Free Rate: A report for the ENA*, March, p. 37.
[530] Jonathan Berk and Peter DeMarzo (2020), *Corporate Finance Fifth Edition*, Pearson, p. 447; Oxera (2020), Are sovereign yields the risk-free rate for the CAPM? Prepared for the Energy Networks Association, 20 May, p. 2.

This statement suggests that this textbook does not necessarily support the ENA's submission. Further, in standard cost of capital, asset pricing theory, financial economics and corporate finance texts such as Armitage (2005),[531] Brealey et al. (2017),[532] Cochrane (2005)[533], Damodaran (2012)[534], Danthine and Donaldson (2015),[535] Jones (2008)[536], Porras (2011)[537] and Pratt and Grabowski (2014),[538] government bonds/bills are the proxy for the risk free asset.[539]

[531] Seth Armitage (2005), *The Cost of Capital Intermediate Theory*, Cambridge, pp. 278-281.

[532] Richard Brealey, Stewart Myers and Franklin Allen (2017), *Principles of Corporate Finance, 12th Edition*, McGraw-Hill, p. 206; p. 228; and other page references.

[533] John Cochrane (2005), *Asset Pricing Revised Edition*, Princeton University Press, p. 21; pp. 456-457.

[534] Aswath Damodaran (2012), *Investment Valuation University Edition Tools and Techniques for Determining the Value of Any Asset*, Wiley, p. 154; pp. 154-157.

[535] Jean-Pierre Danthine and John Donaldson (2015), *Intermediate Financial Theory: Third Edition*, p. 470; p. 485.

[536] Chris Jones (2008), *Financial Economics*, Routledge, p. 57; p. 104.

[537] Eva Porras (2011), *The Cost of Capital*, Palgrave, p. 19; p. 74.

[538] Shannon Pratt and Roger Grabowski (2014), *Cost of Capital: Applications and Examples*, Wiley, Chapter 7.

[539] While Mehra and Prescott (2008) raise some issues with yields on government bonds as the true risk free rate, their framework is that of the general equilibrium or consumption-based CAPM framework, not the SL CAPM. The former framework includes a number of issues such as the equity risk premium puzzle and the risk free rate puzzle. The latter puzzle may be described briefly and crudely as follows. Risk averse individuals want to smooth their consumption over time by transferring consumption from good times to bad times. If consumption is growing in a predictable manner, the good times lie in the future so that agents want to borrow now against their future income, which in a representative agent model would result in everyone being on the same side of the market which forces a higher risk free rate. However, the model predictions do not fit with the observed low risk free rates. The observed low return on the risk-free asset is 'one that the C-CAPM is not designed to provide'. (Danthine and Donaldson (2005)). See: Rajnash Mehra and Edward Prescott (2008), 'Non-Risk-based Explanations of the Equity Premium', in Rajnash Mehra (ed.), *Handbook of the Equity Risk Premium*, Elsevier, pp. 102-106; Jean-Pierre Danthine and John Donaldson (2005), *Intermediate Financial Theory, Third Edition*, Academic Press, p.289; p. 293.

The risk free rate and the standard Sharpe-Lintner CAPM

Before examining the convenience yield, and assuming the standard CAPM, it is necessary to review how and under what conditions the return on the risk free asset is determined under this 'standard' or 'Sharpe-Lintner' (SL) CAPM[540]. Sharpe (1964) defines this return as the 'price of time'.[541] The SL CAPM is a demand side, partial equilibrium model where the supply of assets, contingent returns, the market risk premium and the risk free return are all exogenous: they are not explained by the SL CAPM.[542] The risk free return has a number of properties in the SL CAPM:

1. Borrowing and lending can occur at that return
2. It has zero variance
3. There is zero correlation between the risk free return and the return on any risky asset or portfolio (zero beta)[543]
4. Trade is liquid since capital markets are assumed to be perfect and frictionless.[544]

Standard practice in the application of the SL CAPM is to use the yields on government bonds as a proxy for the risk free rate.

The convenience yield

On the basis of the ENA's submissions, the yields on government bonds may be an imperfect proxy for the risk free rate, where the true risk free rate may be above the yield on government bonds by the amount of a 'convenience yield'. That is, a convenience yield may drive a wedge between 'the price of time' and the yield on government bonds because government bonds may possess properties aside from those of the risk free asset outlined above. The ENA claims that a convenience yield includes 'money like' convenience properties such as safety and liquidity.[545] The ENA's reference to both of these properties is found in Krishnamurthy and Vissing-Jorgensen's (2012) definition of the convenience yield:

> Money is a medium of exchange for buying goods and services, has high liquidity, and has extremely high safety in the sense of offering absolute security of nominal repayment. Investors value these attributes of money and drive down the yield on money relative of other assets. We argue that a similar phenomenon affects the prices of Treasury bonds. The high liquidity and safety of Treasuries drive down the yield on Treasuries relative to assets that do not to the same extent share these attributes.[546]

However, the REU considers that the definition of the convenience yield must exclude the safety property (such as zero default risk) considered by both the ENA and Krishnamurthy and

---

[540] William Sharpe (1964), 'Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk', *Journal of Finance*, XIX(3), pp. 425-442; John Lintner (1965), The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets', *The Review of Economics and Statistics*, 47(1), pp. 13-37.

[541] William Sharpe (1964), 'Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk', *Journal of Finance*, XIX(3), p. 425.

[542] Seth Armitage (2005), *The Cost of Capital Intermediate Theory*, Cambridge, pp. 38-47.

[543] Seth Armitage (2005), *The Cost of Capital Intermediate Theory*, Cambridge, p. 43.

[544] Haim Levy (2011), *The Capital Asset Pricing Model in the 21st Century*, Cambridge, p. 135.

[545] ENA (2021), Rate of return and cashflows in a low interest rate environment, Response to the Draft AER Working Paper, 2 July, p. 23.

[546] Arvind Krishnamurthy and Annette Vissing-Jorgensen (2012), 'The Aggregate Demand for Treasury Debt', *Journal of Political Economy*, 120(2), p. 234.

Vissing-Jorgensen (2012). The safety property is a property of the risk free asset in the SL CAPM and therefore is not a property of the convenience yield. An asset subject to default risk has non-zero variation of its return, violating the SL CAPM assumption of zero variation of the return on the risk free asset.

Many studies that are surveyed below consider proxies for alternative risk free assets that are purportedly safe or attempt to adjust risky assets for default risk to obtain a synthetic and alternative risk free asset that is purportedly safe. That is, these studies exclude the safety property from the convenience yield. Some studies that do include the safety property in the convenience yield should be treated with caution since this approach is inconsistent with SL CAPM assumptions. If the ENA undertakes further research into this area, it must redefine the convenience yield and remove any safety property from its convenience yield estimation.

The REU considers the possibility of a convenience yield in detail. And since safety is a property of the risk free asset and not the convenience yield, the REU observes that episodes of relative liquidity and illiquidity of government bonds alone may be characterised and estimated as convenience and inconvenience yields, respectively. Many studies below attribute the convenience (inconvenience) yield to the relative liquidity (illiquidity) of government bonds. However, the REU remains unconvinced that the occasional relative liquidity (illiquidity) of government bonds should be formalised as an estimate of a convenience (inconvenience) yield for the purpose of estimating the cost of equity. Equivalently, the REU remains unconvinced that an alternative proxy for the risk free asset should be adopted for the cost of equity simply because an alternative proxy may be occasionally illiquid (liquid) relative to government bonds. The estimation and measurement issues observed below, combined with the potential incompatibility of a convenience (inconvenience) yield with the SL CAPM, may lead to an inefficient estimate of the cost of equity. The incompatibility of convenience (inconvenience) yield estimates with the SL CAPM is readily apparent by the latter's assumption of liquid capital markets – liquidity is not an endogenous feature of the SL CAPM, it is a given.

A Survey of the Relevant Literature

The convenience yield can be traced to Irving Fisher (1922) who attributed it to the special service of money 'and offsets the apparent loss of interest involved in keeping it in one's pocket instead of investing'.[547] [548] Keynes (1936) further developed the concept in the *General Theory*, corresponding to the premium people are willing to pay in the form of a liquidity premium (the liquidity demand for money).[549] Its usage and application in the context of futures markets originates from Kaldor (1939).[550] The convenience yield is a standard concept in futures markets analysis, corresponding to the benefits of holding an inventory of commodities, where some of these benefits may be the ready availability of the inventory and protection against stocking out (which may result from lost production or sales). These benefits reduce the carrying costs of holding inventory.[551]

[547] Irving Fisher (1922), *The Purchasing Power of Money*, Macmillan, p. 16.

[548] Bailey (2005) extends the forms of benefits of the convenience yield to intangible utility to the owner of the asset, such as: 'a miser who finds pleasure in gazing at a hoard of gold ingots … an investor who finds some financial assets especially attractive because they can easily be sold for cash.' Roy Bailey (2005), *The Economics of Financial Markets*, Cambridge, p. 350.

[549] John Maynard Keynes (1936), *The General Theory of Employment, Interest and Money*, Palgrave Macmillan, Chapter 17.

[550] Nicholas Kaldor (1939), 'Speculation and Economic Stability', *Review of Economic Studies*, 7(1), p. 6.

[551] Zvi Bodie, Alex Kane and Alan Marcus (2011), *Investments – Tenth Edition*, McGraw-Hill/Irwin, pp. 822-823.

A possible convenience yield on government bonds appears to have been considered as early as the 1990s (and perhaps earlier). One motivation for this consideration was to explain away the 'equity premium puzzle'.[552] Put narrowly, this puzzle emerges because, on the basis of consumption growth data, an unrealistically high level of risk aversion of the representative agent in a consumption-based CAPM framework must be assumed to match the magnitude of the observed historical equity premium. Cochrane (2005) observes that a large literature then tried to explain this puzzle by introducing frictions that make treasury bills 'money-like', with the corollary that the observed short term interest rates are artificially low, such that true risk free rate is higher and the true equity risk premium is lower.[553] (Cochrane did not find this particular explanation of the puzzle convincing for one because simply raising the interest rate did not remove the puzzle.[554])

Some early studies of the convenience yield on government bonds include Duffie (1996)[555], who identified a 'convenience yield' on US Treasury notes to explain the difference between market repo (repurchase agreement[556]) rates and the (lower) repo rates traders can access on occasion when using US Treasury notes as collateral on loans.

Since Duffie (1996), there are also a number of other papers that attempt to estimate the convenience yield on Treasuries. However, since 2015 there is growing evidence that the estimated convenience yield on government bonds may have turned negative. There are findings of an 'inconvenience yield' that may be related to the strong growth in the supply of government bonds and because the traditional 'safe haven' status of government bonds may be eroding. The REU surveyed six of the potentially most important and contemporaneous papers on convenience and inconvenience yields on US Treasury bonds/bills. These papers are surveyed in Table A.1 below. At this point in time the REU is unaware of any academic/central bank literature on convenience yields on CGS. There are three key findings from the literature surveyed:

1. Many studies attempt to remove the safety feature from the convenience yield by arguing that the alternative proxy for the risk free asset is safe, approximately safe or they estimate a safe synthetic alternative risk free asset by adjusting the asset for default risk. Other studies such as Krishnamurthy and Vissing-Jorgensen (2012) split the convenience yield into liquidity and safety components, albeit it is done imperfectly.[557]
2. The estimate of the convenience yields may be highly sensitive to the chosen sample period. The most recent studies suggest that the convenience yield has changed sign. An inconvenience yield suggests that government bonds have become illiquid relative to the proxy for the alternative risk free asset.
3. The estimate of the convenience and inconvenience yields may be highly sensitive to the proxy chosen for the 'true' risk free asset. There are more proxies employed for the

[552] *Vide:* Rajnish Mehra and Edward Prescott (1985), 'The Equity Premium: A Puzzle', *Journal of Monetary Economics*, 15, pp. 145-161.
[553] John Cochrane (2005), *Asset Pricing Revised Edition*, Princeton University Press, p. 459.
[554] John Cochrane (2005), *Asset Pricing Revised Edition*, Princeton University Press, p. 459.
[555] Darrell Duffie (1996), 'Special Repo Rates', *Journal of Finance*, 51(2), pp. 493-526.
[556] For brief explanation of repurchase agreement markets, see ACCC/AER (2017) Working Paper No. 11: *Best estimates of expected inflation: a comparative assessment of four methods*.
[557] Arvind Krishnamurthy and Annette Vissing-Jorgensen (2012), 'The Aggregate Demand for Treasury Debt', *Journal of Political Economy*, 120(2), pp. 233-267.

true risk free asset than there are papers surveyed, indicating that the literature has not settled on the correct proxy in which to estimate the convenience/inconvenience yield.

Table A.1: A sample of studies finding convenience and inconvenience yields on US Treasuries

Authors	Proxy for 'true' risk free rate	Government bond/bill maturities	Basis point magnitude and sample period	Findings/Features
Feldhutter and Lando (2008)[558]	Tabulated estimates based on 2 year, 3 year, 5 year, 7 year, 10 year swap and AAA corporate bonds Interest rate swaps adjusted for the credit spread arising from the credit risk in LIBOR rates and a swap-specific factor. The swap factor captures differences in two measures of AA credit spreads due to differences in, for example, default scenarios, recovery rates and liquidity (measuring the deviations from the homogeneous credit risk quality assumptions between LIBOR and AA).	2 year, 3 year, 5 year, 7 year, 10 year	50 to 56.8 basis points depending on maturity, over the period 20 December 1996 to 30 December 2005.	The convenience yield is what separates the Treasury yield from the riskless rate. At all maturities, the riskless rate is better proxied by the swap rate than the Treasury rate.
Krishnamurthy and Vissing-Jorgensen (2012)[559]	A Treasury convenience yield measured by the spread between Baa corporate bonds and Treasuries. The spread between Baa and Aaa is assumed to be the 'safety'	Maturity or callable after 8 years (for the larger sample period including	Convenience yield of 73 basis points on average from 1926 to 2008 (liquidity convenience of 46 basis points and safety	A reduction (increase) in the supply of Treasuries increases (decreases) the price of safety and price of liquidity attributes of Treasuries that make up the total value of the convenience yield.

[558] Peter Feldhutter and David Lando (2008), 'Decomposing swap spreads', *Journal of Financial Economics*, 88, pp. 375-405.
[559] Arvind Krishnamurthy and Annette Vissing-Jorgensen (2012), 'The Aggregate Demand for Treasury Debt', *Journal of Political Economy*, 120(2), pp. 233-267.

Authors	Proxy for 'true' risk free rate	Government bond/bill maturities	Basis point magnitude and sample period	Findings/Features
	component of the Treasury convenience yield whereas the spread between Aaa and Treasuries is assumed to be 'liquidity' component of the Treasury convenience yield. The spread between Aaa and Treasuries is an upper bound for the liquidity convenience because Aaa also carries some default risk.	1919-1925), 10 years, 12 years, 15 years, and maturity of 20 years over different periods (Treasury bonds).	convenience of 27 basis points).	'…the existence of a priced long-term safety attribute is driven by Treasury supply.'[560] 'Theory suggests that the value of convenience should go to zero given sufficient convenience assets.'[561]
Binsbergen et al. (2019)[562]	Inferred from price of risky assets: put-call parity relationship of European Call Options.	On Treasury bonds/bills of maturities up to 2.5 years, average 40 basis points	Convenience yield of 40 basis points 2004-2018	Monetary stimulus reduces convenience yields, strong time variation of the estimated yields, growing during periods of financial distress.
Klingler and Sundaresan (2020)[563]	Overnight Index Rate Swap (OIS) rates, yields on Federal Home Loan Bank (FHLB) discount notes, highly rated dealer placed commercial paper and LIBOR rates.	1 month, 3 month and 6 month Treasury bills, 2 year, 5 year, 10 year	Increases in relative dealer holdings coincide with increases in Treasury-OIS spreads. A one unit increase in relative primary dealer Treasury holdings increases Treasury-OIS spreads by 0.92 basis points.	After the GFC the yields of Treasury bills frequently exceed other risk-free rate benchmarks, indicating a diminishing convenience yield. Treasury yields regularly exceed the Overnight Index Rate Swap (OIS) rates or the yields on Federal Home Loan Bank (FHLB) discount notes.

560 Arvind Krishnamurthy and Annette Vissing-Jorgensen (2012), 'The Aggregate Demand for Treasury Debt', *Journal of Political Economy*, 120(2), p. 253.
561 Arvind Krishnamurthy and Annette Vissing-Jorgensen (2012), 'The Aggregate Demand for Treasury Debt', *Journal of Political Economy*, 120(2), p. 257.
562 Jules van Binsbergen, William Diamond and Marco Grotteria, 'Risk Free Interest Rates', *NBER*, Working Paper 26138.
563 Sven Klingler and Suresh Sundaresan (2020), Diminishing Treasury Convenience Premiums: Effects of Dealers' Excess Demand at Auctions, Working Paper, 23 October.

Authors	Proxy for 'true' risk free rate	Government bond/bill maturities	Basis point magnitude and sample period	Findings/Features
		Treasury bonds.	Increasing the Treasury supply has a positive and significant impact on Treasury-OIS spreads. Sample period of January 2010-December 2019.	Increases in market uncertainty now appear to increase Treasury yields instead of triggering flights to safety.
He et al. (2020)[564]	Triparty Repo rate (where large dealers borrow from cash rich investors) and Overnight Index Rate Swap (OIS) rates.	3-month and 10 year Treasury bonds	An inconvenience yield, increasing to yield of 30 bps (10 year Treasury-OIS spread) and 60 bps (General Collateral Finance-Triparty Repo rate spread) during COVID-19 crisis. Sample period of August 2012 to April 2020 (GCF-Triparty repo spread) and January 2006 to April 2020 (Treasury-OIS spread).	Since 2015 Treasury-OIS and (General Collateral Finance) GCF spreads increased after 2015. The safe haven status of Treasuries may be eroding, giving rise to potential inconvenience yields.
Fleckenstein and Longstaff (2021)[565]	Risk free discounting curve adjusted for the Treasury credit default risk (based on Treasury credit default swap (CDS) data). Risk free discounting curve: interest rate swap where the	Treasury bills, notes and bonds of different maturities from 1 month	Negative convenience yield that is consistently between 30 and 50 basis points since 2015 for longer term notes and bonds. Sample period	US Treasury bonds persistently cheap, and a negative convenience yield since 2015. 'An important advantage of this approach [employing their proxy for the risk free rate] is that it allows us to estimate the actual – rather

564 Zhiguo He, Stefan Nagel and Zhaogang Song (2020), 'Treasury inconvenience yields during the COVID-19 crisis', *NBER*, Working Paper No 27416

565 Matthias Fleckenstein and Francis Longstaff (2021), 'Treasury Richness', *NBER*, Working Paper 29081.

Authors	Proxy for 'true' risk free rate	Government bond/bill maturities	Basis point magnitude and sample period	Findings/Features
	floating leg of the swap is the overnight repurchase agreement (repo) rate, known as the Secured Overnight Financing Rate. Treasury credit default risk (credit default mid spreads) based on Treasury credit default swap (CDS) data and an estimate of default intensity.	to 30 years maturity.	of 23 January 1997 to 30 October 2020.	than relative – premia/discounts in Treasury security prices across the entire maturity spectrum.'[566]

[566] Matthias Fleckenstein and Francis Longstaff (2021), 'Treasury Richness', *NBER*, Working Paper 29081, pp. 1-2.

The supply of Treasuries and evidence of a disappearing convenience yield

A standard explanation behind any estimated convenience yield is scarcity of Treasury bonds.[567] Scarcity of Treasury bonds increases the price and reduces the yield, potentially giving rise to a convenience yield. However, the growth of the supply of both US Treasuries and Australian CGS imply convenience yields may be disappearing.

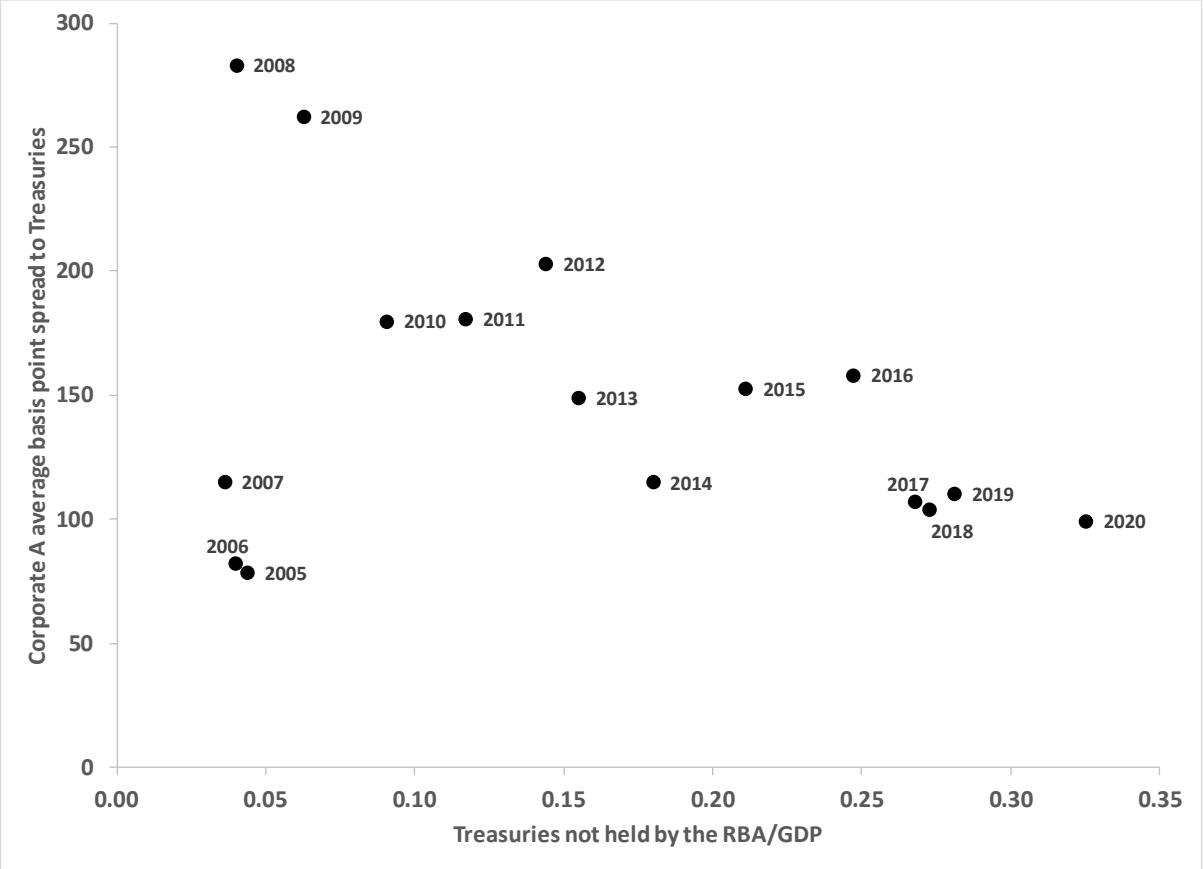
As early as 2012, Krishnamurthy and Vissing-Jorgensen (2012)[568] found that the increasing supply of US Treasuries since the Great Recession could have contributed to a disappearing convenience yield. Other researchers noted above also relate the increase in supply to a disappearing convenience yield and even relate the increase in supply to an inconvenience yield. Evidence of an emerging inconvenience yield is discussed in detail below.

Krishnamurthy and Vissing-Jorgensen plot the corporate bond spread against the market value of publicly held US government debt to GDP. Krishnamurthy and Vissing-Jorgensen argue that the plot reflects the Treasury demand or money demand function: when the supply of Treasuries is high (low) the convenience yield is low (high). Their reasoning is straightforward: the corporate bond spread is larger (smaller) when the convenience yield is larger (smaller), where the latter depends on the relative scarcity of Treasuries. Some of the literature surveyed above supports Krishnamurthy and Vissing-Jorgensen's argument – a substantial increase in the US government debt in recent years may have reduced the convenience yield.

In its report to the ENA, and on the basis of Krishnamurthy and Vissing-Jorgensen's earlier working paper, NERA (2007) argued that the same convenience yield-CGS supply relationship held for CGS, and that such a premium falls to zero when the supply of CGS is sufficiently high.[569] Figure A.1 shows that since 2005 the supply of CGS not held by the RBA and as a share of GDP has increased from approximately 4 per cent to approximately 33 per cent (2020), and that the corporate bond spread has fallen relative to its peak in 2008. On the basis of the ENA's argument this would suggest that the convenience yield, to the extent that it exists in CGS yields, may now be negligible or even fall to zero as anticipated by the ENA/NERA. However, the REU does acknowledge the crudity of such a relationship and that there may be many other explanations for the spread aside from the supply of CGS and a possible 'convenience yield' (the small spread pre-GFC is a case in point).

[567] Andrea Burashi and Paul Whelan (2017), 'Bond Markets and Unconventional Monetary Policy', in Pietro Veronesi (ed.) *Handbook of Fixed-Income Securities*, Wiley, p. 104.
[568] Arvind Krishnamurthy and Annette Vissing-Jorgensen (2012), 'The Aggregate Demand for Treasury Debt', *Journal of Political Economy*, 120(2), pp. 233-267.
[569] NERA (2007), *Bias in Indexed CGS Yields as a Proxy for the CAPM Risk Free Rate: A report for the ENA*, March, p. 37.

Figure A.1: Corporate bond spread and Treasury bonds not held by RBA/GDP



Source: RBA, AOFM, REU estimates

Growing evidence of an inconvenience yield (negative convenience yield) since the US Great Recession

There is evidence that inconvenience yields on US government debt since 2015. And consistent patterns of behaviour between the US Treasury and Australian CGS markets during the COVID-19 crisis may suggest a similar phenomenon is occurring in the CGS market.

Klingler and Sundaresan (2020)[570] find that convenience yields on US Treasury bills are diminishing. Treasury yields regularly exceed the rate in corresponding OIS or the yields of Federal Home Loan Bank (FHLB) discount notes, giving rise to an inconvenience yield on holding Treasury bills. They also find that, in contrast to the idea that Treasury Bills are a safe haven, moderate increases in market uncertainty are associated with increases in Treasury yields. One reason why convenience yields may be disappearing and negative convenience yields emerging is the increase in the supply of Treasuries. Klingler and Sundaresan find that increasing the supply of Treasuries (Treasury bills as a share of GDP) has a positive and significant impact on Treasury-OIS spreads. That is, the increase in the supply of Treasuries may be contributing to an inconvenience yield on Treasury bills. While Klingler and Sundaresan consider default risk of US Treasuries, they only significantly relate to 1 month

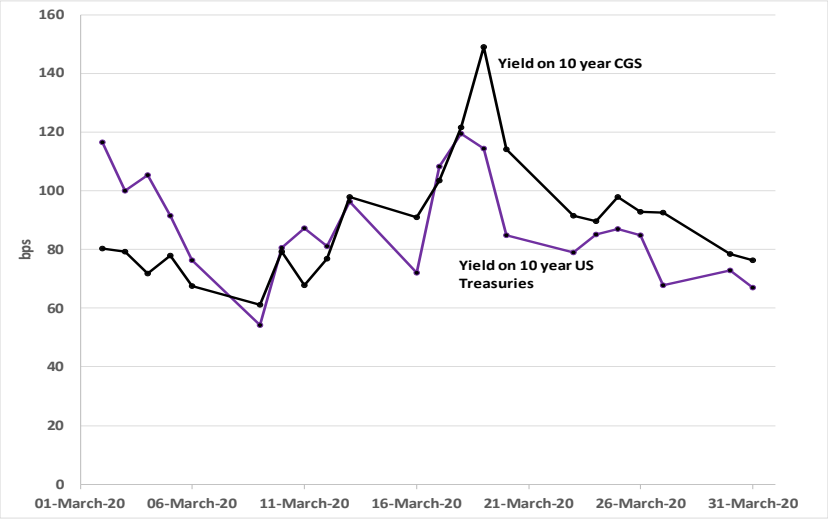
[570] Sven Klingler and Suresh Sundaresan (2020), Diminishing Treasury Convenience Premiums: Effects of Dealers' Excess Demand at Auctions, Working Paper, 23 October.

and 3 month Treasury bills during the specific debt ceiling episodes in 2011 and 2013, or 10 weeks out of a sample period of 10 years.

He et al. (2020) find an inconvenience yield rather than convenience yield during the latest COVID-19 crisis. He et al. measured the spread between US Treasuries and overnight index swap (OIS) rates and the spreads between dealers' reverse repo and repo rates, finding them highly positive during the COVID-19 crisis, suggesting an inconvenience yield. On the basis of the most recent COVID-19 crisis, He et al. (2020)[571] found that the US Treasury market experienced severe stress and illiquidity in March 2020. He et al. documented that large owners of Treasuries substantially reduced their holdings and the intermediary sector (dealers and hedge funds) struggled to absorb the supply shock. The REU considers that one possible explanation is that if the balance sheets of dealers and hedge funds already include significant exposure to government debt, dealers may only be willing to absorb additional government debt at lower prices during the crisis.

He et al. contrasted the flight to safety to long term US Treasuries during the GFC, giving rise to a potential convenience yield, to the selling pressure during the COVID-19 crisis giving rise to an inconvenience yield. Prices of long-term US Treasuries fell sharply. He et al. observed that from 9 March to 23 March when the stock market experienced four trading halts the 10 year US Treasury yield-OIS spread and the GCF-triparty repo spread increased sharply. This is corroborated by the observed sharp increase in 10 year US Treasury yields during the period – see Figure A.2. The Australian market experienced a similar pattern over the same period. That is, over the period 9 March to 23 March, the peak increase in the yield was approximately 120 per cent for US Treasuries and approximately 144 per cent for 10 year CGS (or approximately 88 basis points), indicating a sharp decline in the prices of 10 year nominal CGS. Over the same period, Australian stock market prices (All Ordinaries) collapsed by over 21 per cent.

Figure A.2: Daily yields on 10 year nominal US Treasuries and CGS (bps) during the COVID-19 Crisis, March 2020

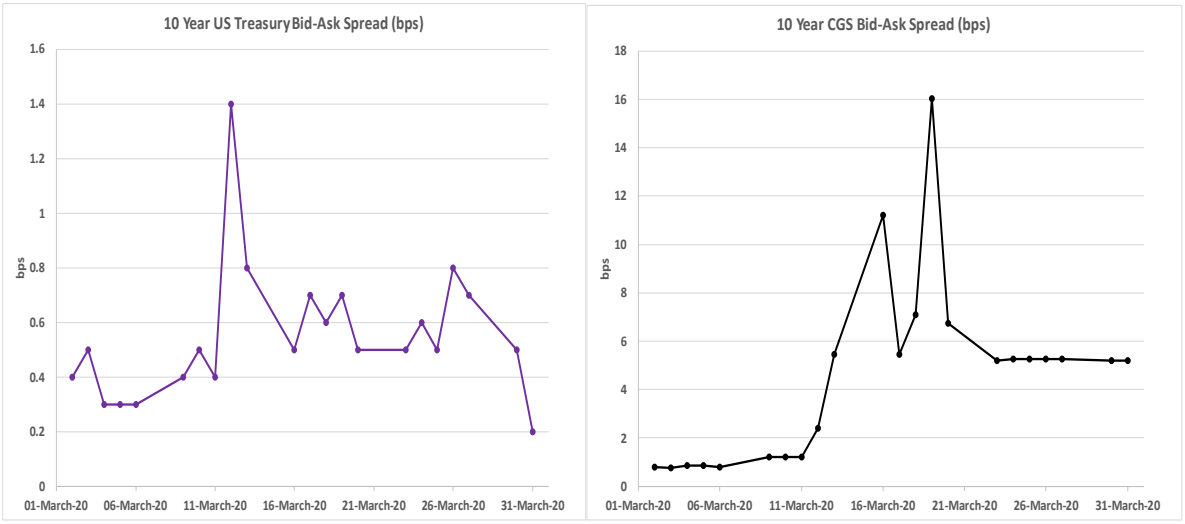


Source: Bloomberg GTAUD10Y, GT10, REU analysis

[571] Zhiguo He, Stefan Nagel and Zhaogang Song (2020), 'Treasury inconvenience yields during the COVID-19 crisis', *NBER*, Working Paper No 27416.

He et al. also observed widening bid-ask spreads in the US Treasury market during the COVID-19 crisis indicating market illiquidity in the US Treasury market (bid-ask spreads are a proxy for liquidity[572]), which is in stark contrast to the high liquidity of US Treasuries during the episodes of 'flight to quality' of the GFC. It appears that the widening bid-ask spreads was also a phenomenon in the CGS market. Indeed, the basis point change in bid-ask spreads was more severe in the CGS market than in the US Treasury market – see Figure A.3. From 9 March 2020 to 23 March 2020, the peak increase in bid-ask spreads was approximately 250 per cent for 10 year US Treasuries and over 1200 per cent for 10 year CGS. The observed worse liquidity outcomes for CGS are consistent with the sharper increase in the yields on 10 year CGS *vis-à-vis* 10 year US Treasuries over the same period.

Figure A.3: Daily bid-ask spreads 10 year US Treasuries and 10 year CGS during the COVID-19 Crisis, March 2020



Source: Bloomberg GT10, GTAUD10Y, REU analysis

He et al. (2020) concluded the traditional safe-haven status could be eroding, and posing the question: 'Are the events in March 2020 the canary in the coal mine indicating a fundamental change in the properties of Treasury bonds away from the being a negative-beta flight-to-safety target asset?'[573] The consistent pattern of behaviour observed in the market for CGS may also prompt a consideration of the same question for Australia. The REU observes that He et al.'s analysis does not consider that the erosion of the safe-haven status of US Treasuries pertains to the risk of default, and indeed He et al. argue that during the COVID-19 crisis 'there is little to suggest that concerns about the U.S. fiscal situation are the underlying cause'.[574] Rather, the 'erosion' of the safe haven status and the inconvenience yield likely pertains to the erosion of liquidity, which is corroborated by the increase in bid-ask spreads during the COVID-19 crisis.

[572] Michael Fleming (2003), 'Measuring Treasury Market Liquidity', *Federal Reserve Bank of New York Economic Policy Review*, September, p. 84.
[573] Zhiguo He, Stefan Nagel and Zhaogang Song (2020), 'Treasury inconvenience yields during the COVID-19 crisis', *NBER*, Working Paper No 27416, p. 1.
[574] Zhiguo He, Stefan Nagel and Zhaogang Song (2020), 'Treasury inconvenience yields during the COVID-19 crisis', *NBER*, Working Paper No 27416, p. 6.

He et al.'s (2020) conclusion that the traditional safe-haven status of Treasuries could be eroding is corroborated by the findings of Fleckenstein and Longstaff (2021).[575] Fleckenstein and Longstaff argue that the view that Treasury securities trade at a premium because of their safety and money-like attributes is actually not true on an absolute basis – that is, with respect to their intrinsic fair values. It is only true on a relative basis when compared to other bonds. This is because they argue that, on a relative basis, the fixed income securities *used as benchmarks* to estimate the convenience yield on Treasuries may be priced at a discount because of their illiquidity.

As a proxy for the alternative and benchmark risk free rate, Fleckenstein and Longstaff use the term structure of swaps tied to the overnight repurchase agreement rate, which is adjusted for Treasury default risk (where the latter is based on Treasury credit default swap (CDS) data and an estimate of default intensity). They argue that the overnight repurchase agreement rate is the best proxy for the risk free asset since the Treasury repurchase agreement loans are fully secured by the safest and most-liquid collateral in the market – Treasury securities.[576] They argue that: 'An important advantage of this approach [employing their proxy for the risk free rate] is that it allows us to estimate the actual – rather than relative – premia/discounts in Treasury security prices across the entire maturity spectrum.'[577] Fleckenstein and Longstaff plot the monthly time series of the average premia of US Treasuries, which is likened to a convenience yield when positive, and an inconvenience yield when negative. They find that the negative premia has persisted for US Treasuries since 2015. Similar to the findings of He et al., Fleckenstein and Longstaff conclude the following on the persistent cheapness of Treasuries since 2015:

> The evidence that Treasury securities have cheapened dramatically since 2015 could suggest a major shift in the confidence market participants may place in Treasuries as a safe haven. [578]
>
> This recent trend raises important questions about the ongoing safe-asset status of Treasury securities … the negative premia [inconvenience yield] observed in markets, as well as the evidence that Treasuries often cheapen during times of crisis, pose major challenges to current models in the literature and point to the need for additional theoretical research.[579]

Challenges and difficulties in estimating the convenience yield or adopting alternative risk free rate proxies

This section examines the possibility that, even if the ENA was able to provide modelling and evidence that there exists a convenience yield on CGS or provide support for an alternative 'risk free' asset, a robust and reasonable approximation of either is likely to remain elusive.

What proxy for the alternative 'true' risk free rate?

[575] Matthias Fleckenstein and Francis Longstaff (2021), 'Treasury Richness', *NBER*, Working Paper 29081.
[576] Matthias Fleckenstein and Francis Longstaff (2021), 'Treasury Richness', *NBER*, Working Paper 29081, pp. 9-10.
[577] Matthias Fleckenstein and Francis Longstaff (2021), 'Treasury Richness', *NBER*, Working Paper 29081, pp. 1-2.
[578] Matthias Fleckenstein and Francis Longstaff (2021), 'Treasury Richness', *NBER*, Working Paper 29081, p. 5.
[579] Matthias Fleckenstein and Francis Longstaff (2021), 'Treasury Richness', *NBER*, Working Paper 29081, pp. 25-26.

The estimate of the convenience yield is only as accurate as the proxy for the alternative and 'true' risk free rate. The literature has not settled on the correct alternative proxy. Indeed, a number of different proxies for the true risk free rate have been proposed in the literature. A non-exhaustive list is included below:

- Interest rate swap rates adjusted for the credit spread from the credit risk in LIBOR rates and adjusted for a swap-specific factor.[580]
- The Baa corporate bond-Treasury spread, reflecting the long term safety and liquidity of Treasuries.
- Put-call parity relationship on European-style options on the S&P500 traded on the Chicago Board Options Exchange (CBOE). (The difference between the put price and call price equals discounted value of the strike price minus the current value of the underlying security.) [581]
- Yields on Federal Home Loan Bank (FHLB) discount notes. [582]
- Triparty Repo rate (where large dealers borrow from cash rich investors). [583]
- Overnight Index Rate Swap[584] (OIS) rates.
- Risk free discounting curve adjusted for the Treasury credit default risk (based on Treasury credit default swap (CDS) data).[585] The risk free discounting curve is an interest rate swap where the floating leg of the swap is the overnight repurchase agreement (repo) rate, known as the Secured Overnight Financing Rate. The Treasury credit default risk (credit default mid spreads) is based on Treasury credit default swap (CDS) data and an estimate of default intensity.

There may be considerable uncertainty around an accurate forward-looking estimate of a convenience yield if the estimates of the convenience yield change depending on the proxy employed for the alternative risk free rate.

The ENA makes reference UK Competition & Markets Authority use of AAA-rated non-government bonds as a suitable input into the estimate of the risk free rate.[586] But the rate from this proxy may not correspond to the UK equivalent of the rates of many other competing proxies listed above. If it does not, there may be some contention regarding the 'true' alternative risk free rate. Moreover, the adoption of such a bond, like the ENA's definition of the convenience yield, is incorrect if it wrongly excludes the safety property of the risk free asset. AAA-rated non-government bonds that are unadjusted for default risk still include a risk of default. Consistent with the correct definition of the convenience yield that is absent the safety property, the use of non-government bonds require adjustment for the estimated default

---

580 Peter Feldhutter and David Lando (2008), 'Decomposing swap spreads', *Journal of Financial Economics*, 88, pp. 375-405.

581 Jules van Binsbergen, William Diamond and Marco Grotteria, 'Risk Free Interest Rates', *NBER*, Working Paper 26138.

582 Sven Klingler and Suresh Sundaresan (2020), Diminishing Treasury Convenience Premiums: Effects of Dealers' Excess Demand at Auctions, Working Paper, 23 October.

583 Zhiguo He, Stefan Nagel and Zhaogang Song (2020), 'Treasury inconvenience yields during the COVID-19 crisis', *NBER*, Working Paper No 27416

584 An arrangement where one party agrees to pay the other party a fixed interest in exchange for receiving the average cash rate over the term of the swap where the Federal Funds Rate may be used as the underlying rate for the floating leg. He et al. (2020) argue that the OIS rate can be interpreted as the risk-neutral expectation of the Federal Funds Rate Target.

585 Matthias Fleckenstein and Francis Longstaff (2021), 'Treasury Richness', *NBER*, Working Paper 29081.

586 ENA (2021), Rate of Return and cashflows in a low-rate environment: Initial network sector views, AER Stakeholder Forum, 23 June 2021, Pathway to 2022 Rate of Return Instrument, p. 27.

risk. Then there is also the consideration that if the AAA-rated non-government bonds were used to estimate the convenience yield, the convenience yield could be attributed to the distortion of illiquidity in the AAA-rated non-government bonds.

The contentiousness of the choice of an alternative risk free asset is in contrast to the consideration of the risk free asset in the standard textbook literature. The standard textbook literature rarely considers an alternative risk free asset to that of government bonds/bills. In standard cost of capital, asset pricing theory, financial economics and corporate finance texts such as Armitage (2005),[587] Brealey et al. (2017),[588] Cochrane (2005)[589], Damodaran (2012)[590], Danthine and Donaldson (2015),[591] Jones (2008)[592], Porras (2011)[593] and Pratt and Grabowski (2014),[594] government bonds/bills are the proxy for the risk free asset. And as observed above, the Berk and DeMarzo (2020) corporate finance text referred to by the ENA does not support its argument to abandon government bond yields as a proxy for the risk free rate.

There may be a consideration of employing one of the above proxies for the risk free rate for the SL CAPM by appealing to surveys that market practitioners also use proxies for risk free assets that are not government bonds. For example, Oxera (2020) cited a recent survey of the market risk premium and the risk free rate (conducted by Fernandez et al. (2020)[595]) indicating that many respondents in Europe do not use 10 year government bonds due to quantitative easing.[596] However, there are some concerns if this survey is used to inform the adoption of an alternative risk free asset. Firstly, the alternative proxy or proxies adopted by respondents were not disclosed, and there may be a number of alternative proxies, each with their own particular distortions. Secondly, the survey indicates that most use government bonds/bills as the proxy for the risk free asset. The survey is of over 5000 practitioners in 81 countries of which 48 are non-European. Fernandez et al. do not disclose the number of 'many' respondents in Europe who do not use government bonds as risk free assets. Moreover, conservatively assuming that all European respondents did not use government bonds as the proxy for risk free assets, this means that 48 non-European countries out of a total 81 countries use government bonds. That is, the majority still use government bonds as the proxy for the risk free asset. Thirdly, and perhaps most importantly, there was no mention that any of the 37 Australian respondents reported the use of a risk free asset other than government bonds.

Time variation

---

587 Seth Armitage (2005), *The Cost of Capital Intermediate Theory*, Cambridge, pp. 278-281.

588 Richard Brealey, Stewart Myers and Franklin Allen (2017), *Principles of Corporate Finance, 12th Edition*, McGraw-Hill, p. 206; p. 228; and other page references.

589 John Cochrane (2005), *Asset Pricing Revised Edition*, Princeton University Press, p. 21; pp. 456-457.

590 Aswath Damodaran (2012), *Investment Valuation University Edition Tools and Techniques for Determining the Value of Any Asset*, Wiley, p. 154; pp. 154-157.

591 Jean-Pierre Danthine and John Donaldson (2015), *Intermediate Financial Theory: Third Edition*, p. 470; p. 485.

592 Chris Jones (2008), *Financial Economics*, Routledge, p. 57; p. 104.

593 Eva Porras (2011), *The Cost of Capital*, Palgrave, p. 19; p. 74.

594 Shannon Pratt and Roger Grabowski (2014), *Cost of Capital: Applications and Examples*, Wiley, Chapter 7.

595 Pablo Fernandez, Eduardo de Apellaniz and Javier Acin (2020), Survey: Market Risk Premium and Risk-Free Rate used for 81 countries in 2020, *IESE Business School*.

596 Oxera (2020), Are sovereign yields the risk-free rate for the CAPM? Prepared for the Energy Networks Association, 20 May, p. 12.

Binsbergen et al. (2019) find that the estimated convenience yield is strongly time varying.[597] The survey of studies in Table A.1 corroborate Binsbergen et al.'s findings. The convenience yields may not only be substantially different over different sample periods but that they may switch sign. The potential non-stationarity of the estimated convenience yield, including its potential to switch sign, may present particular challenges for its forward-looking estimation if conditions which give rise to the time variation are expected to change relative to the sample period used for its historical estimate.

The magnitude of any adjustment may be small, raising further concerns

If the SL CAPM could be *a priori* specified to include an adjustment for a convenience/inconvenience yield, the adjustment may be specified as follows:

$$E(R_i) = R_Y^{CGS} + \lambda_Y^{CGS} + \beta_i.\left(E(R_M) - \left(R_Y^{CGS} + \lambda_Y^{CGS}\right)\right) \quad (1)$$

Where:

$E(R_i)$ is the expected return on asset i

$E(R_M)$ is the expected return on the capital market portfolio

β_i is asset i's beta, $0 < \beta_i < 1$

R_Y^{CGS} is the yield to maturity on Commonwealth Government Securities used as a proxy for risk free rate

$$\lambda_Y^{CGS} = R_f - R_Y^{CGS} = \begin{cases} convenience\ yield, & if\ R_f > R_Y^{CGS} \\ inconvenience\ yield, & if\ R_f < R_Y^{CGS} \\ 0, & if\ R_f = R_Y^{CGS} \end{cases}$$

R_f is the 'true risk free rate' or the 'price of time' from the SL CAPM.

Rearranging (1)

$$E(R_i) = \lambda_Y^{CGS}.(1 - \beta_i) + R_Y^{CGS} + \beta_i.\left(E(R_M) - R_Y^{CGS}\right) \quad (2)$$

The rearrangement shows that the extent of the absolute adjustment to $E(R_i)$ for a convenience/inconvenience yield on CGS depends inversely on the size of the estimated beta, β_i, of the expected return of asset i. The potential result is a considerably smaller effect of the estimated convenience/inconvenience yields on $E(R_i)$ than the magnitude of their effect on the yields of government bonds documented in the literature. Therefore, even if the ENA could successfully establish that a convenience (inconvenience) yield is *a priori* compatible with the SL CAPM, the adjustment may be small. And given a potentially small adjustment, the likelihood of spurious accuracy of such an adjustment may be great if the convenience yield is time varying and switches sign.

Adjusting the MRP for a convenience/inconvenience yield

[597] Jules van Binsbergen, William Diamond and Marco Grotteria, 'Risk Free Interest Rates', *NBER*, Working Paper 26138, p. 1.

As shown in (1) above if the SL CAPM can be specified to include a convenience yield, the calculation of excess returns require an estimate of the convenience/inconvenience yield on the CGS proxy for the risk free rate, and this must be subtracted from the calculation of excess returns.

The AER (2018) [598] Rate of Return Instrument employs the observed arithmetic MRP from historical excess returns that are currently estimated from 1988 to 2020. The historical excess returns are calculated on the basis of the following risk free rate proxies from Brailsford et al. (2008; 2012) and the AER (2020):

1. 1988-2005: yield on 10 year non-rebatable treasury bonds
2. 2006-2020: yield on 10 year CGS.[599]

Therefore, over the sample period the historical excess returns must be adjusted for any convenience/inconvenience yield estimated over the sample period 1988 to 2020. The required estimates of the convenience/inconvenience yield over this historical period increase the risk that the cost of equity may be over or underestimated if the proxy used for the 'true' risk free rate cannot be reliability estimated, particularly if it is subject to distortions such as illiquidity and default risk.

[598] AER (2018), *Rate of Return Instrument Explanatory Statement*, December, p. 220.

[599] Tim Brailsford, John Handley and Krishnan Maheswaran (2008), 'Re-examination of the historical equity premium in Australia', *Accounting and Finance*, 48, pp. 73-97; Tim Brailsford, John Handley and Krishnan Maheswaran (2012), 'The historical equity premium in Australia: post-GFC and 128 years of data', *Accounting and Finance*, 52, pp. 237-247; AER (2020), *Rate of Return Annual Update December 2020*.