Rate of Return Instrument

Explanatory Statement

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AUSTRALIAN ENERGY REGULATOR

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Executive summary

We regulate the revenues and prices that electricity and gas networks (transmission and distribution) are permitted to charge their consumers. We do this because these networks are natural monopolies supplying essential services. Without regulation, the owners of these networks could charge excessive prices, damaging the broader economy and the interests of consumers. A key component of the prices these networks charge is the rate of return they recover for their capital investments. Electricity and gas networks are capital-intensive businesses and the return on capital is typically about half of their total revenue.

Australian governments have established legislation to regulate the operation of these networks including the rate of return they can recover for their capital investments. This is our role and the purpose of the 2022 Rate of Return Instrument.

We had planned to publish the Instrument in December 2022. However, the Independent Panel that reviewed our draft decision recommended that we seek independent advice on the extent to which some of the rate of return parameters may have been impacted by the low interest rates and quantitative easing that is now being unwound. We sought and received advice from the Australian Government Treasury at the end of October 2022 that was material to the form of the Instrument. It was important to test the Treasury advice with stakeholders, so we delayed publication of the Instrument to allow us to receive and consider submissions on the advice. While the Instrument is published in 2023, we refer to it as the 2022 Instrument as per our original intention of making this Instrument in 2022.

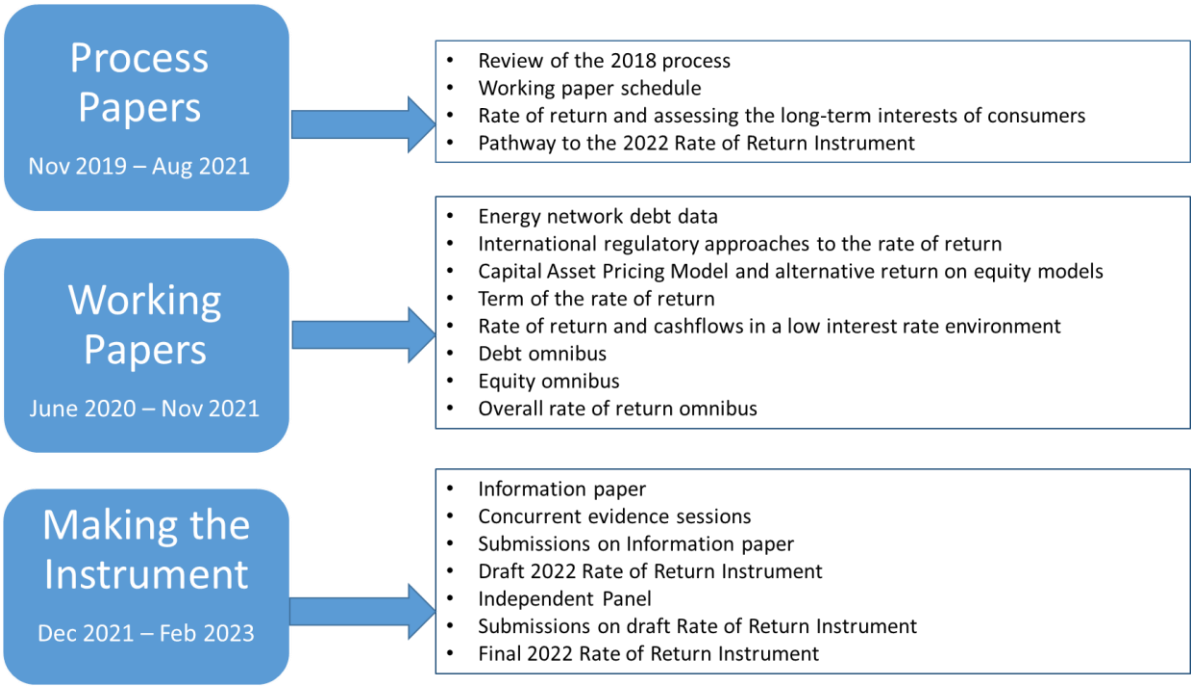
This explanatory statement sets out our reasoning for the approach we specify in the Instrument. The Instrument is a separate document that specifies the methods, formulae and data to be used to calculate the rate of return. The Instrument is binding on providers of network services and on us at the AER. It determines the rate of return that will be used in our forthcoming regulatory decisions over the next 4 years.

Setting an appropriate rate of return requires the exercise of regulatory judgement for 2 main reasons. First, we are looking into the future. We are asking what rate of return is needed to attract an efficient level of investment in energy networks. We are looking for a rate of return that is neither too high nor too low. Second, the tools and data available to undertake this task are imperfect. There are high-level approaches and models available to assist, but experts, investment professionals and other regulators have different views about how they should be applied. Reasonable people can make different decisions when reviewing the same material.

In view of these uncertainties, we have undertaken extensive consultation to help us make the best judgements. We wanted to hear a full range of views on the methods and data available. We started in 2020 with a series of working papers that examined the fundamental components of the rate of return as well as some important topical issues. We held concurrent evidence sessions, where we heard directly from experts in the field and we received submissions from stakeholders. We published a draft Instrument, which has been reviewed by an Independent Panel. We are grateful for the panel's considered review and we address its recommendations and insights throughout this explanatory statement.

In preparing this Instrument we have carefully considered all submissions provided throughout the process, including submissions on our June 2022 draft Instrument. We also undertook 2 targeted consultations in response to Independent Panel recommendations. The first was consultation on additional work on RAB multiples undertaken by CEPA. The second was consultation on the Treasury advice. We address submissions in our discussion of our reasons. In appendix B we list the key issues made in submissions and identify the sections in this decision that discuss the issue. Figure 0.1 is a summary of our process.

Figure 0.1 Elements of the pathway to the 2022 Rate of Return Instrument



Our decision-making framework

The National Electricity Objective (NEO) and National Gas Objective (NGO) establish the ultimate objective for our decision-making. In each case, the objective is to promote efficient investment in, and efficient operation and use of, the relevant electricity or gas services, for the long-term interests of consumers with respect to the price, quality, safety, reliability and security of supply. 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 achievement of the national electricity and gas objectives to the greatest degree.

Early in our working paper series we considered it would be helpful to set out how we saw this objective operating to guide our decision-making. We saw that stakeholders had different perspectives on the objective. In May 2021, following some targeted engagement, we published a position paper explaining our understanding and approach for applying the objective. In that paper we outlined a guiding principle we have used to develop the Instrument. In no way do we see the guiding principle as supplanting or adding to our legislative objectives, rather we see it as an aid in applying the legislation. The guiding principle is:

> an unbiased estimate of the expected efficient return, consistent with the relevant risks involved in providing regulated network services.

We consider that the NEO, NGO and the long-term interests of consumers are best served through this guiding principle. As we have progressed through the process, we have seen a broad level of acceptance for this principle.

In addition to this principle, we have also employed a set of criteria to help guide our judgements. We first developed these criteria in 2013 and have reviewed and adjusted them in this process so that they are of most value. The criteria are:

1. Reflective of economic and finance principles and market information
2. Fit for purpose
3. Implemented in accordance with good practice
4. Models are based on quantitative modelling that is sufficiently robust and avoids arbitrary filtering
5. Market data is credible, verifiable, comparable, timely and clearly sourced
6. Flexible to allow changing market conditions and new information
7. Materiality of any proposed change from the 2018 Instrument
8. Longevity or sustainability of new arrangements.

The Consumer Reference Group (CRG) submitted that we should take into account its 5 principles before proposing a change to an established regime. The CRG considers its criteria are the minimum required of the AER to engender consumer confidence in regulatory processes and outcomes. We agree with the CRG that we should use a principled approach to assessing new information before making a change and our assessment criteria are for that purpose. The CRG's 5 principles are:

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

We consider the CRG's proposed principles, in practical terms, are reflected in our criteria. For example, consumer confidence is built when our decisions are based on sound economic and finance principles and market data is credible. Similarly, when considering potential changes, we look to the materiality and longevity and sustainability of potential changes.

As we have progressed through the process, we have seen that stakeholders have placed a high value on stability and continuity of approach. The CRG articulated this as 'a high bar for

change' and this is reflected consistently in its submissions.[1] In submissions to our draft Instrument we have now seen the principle of 'a high bar for change' prominent among networks and investors.[2]

Role of the CRG

We are required to establish a CRG to advise on consumer engagement and to actively engage consumers and provide us with their insights.

The CRG has been set up to submit consumer perspectives, including on technical and procedural issues, during the rate of return process. The final membership encompasses representatives with a diverse range of skills and experience.

Framework for the rate of return

We apply a 'building block' model to set regulated revenues for electricity and gas network service providers (NSPs). The building blocks – return on capital, return of capital, operating expenditure and tax – reflect the expected costs that would be incurred by a benchmark efficient business operating the network. This is a form of incentive regulation because building blocks are estimated in advance of a regulatory control period (typically 5 years) and the network retains any benefit (or bears any detriment) where it can reduce costs below our estimates. Revealed costs are then used to inform building block estimates for the following control period, so that efficiency gains are passed on to consumers. We also operate a number of incentive schemes in conjunction with the building block framework. The return on capital building block is set by applying a rate of return on capital to the regulatory asset base each year. This rate of return is calculated using the approach set out in the Instrument.

We use a nominal vanilla weighted average cost of capital (WACC) formulation. We separately estimate an efficient return on debt and return on equity and then combine them according to the ratio of debt to total debt and equity. The tools we have available to estimate the return on debt are better than for equity. For debt, we can directly observe the debt instruments issued by the businesses we regulate and use this information to review and adjust our approach to setting a benchmark allowance. For equity, our task is to estimate the returns investors expect in the future to incentivise efficient investment for the long-term interests of consumers. This task faces 2 particular challenges. First, unlike debt we cannot directly observe expected returns on equity. Our judgements are informed through indirect measures. Second, the models available for estimating expected returns are incomplete and

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1 CRG, *Advice to the Australian Energy Regulator CRG Response to the AER's December 2021 Information paper*, March 2022, pp. 9, 29, 58; CRG, *Advice to the Australian Energy Regulator CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, pp. 43, 77, 80–83.

2 ENA, *Response to Final AER Omnibus Paper*, March 2022, pp. 39–40, 56; Endeavour Energy, *Response to rate of return information paper*, March 2022, p. 2; Endeavour Energy, *Response to Draft RORI*, September 2022, p. 8; ENA, *Response to AER Draft Rate of Return Instrument*, September 2022, p. 79.

require judgement about their inputs. Nevertheless, we have information and models that are of considerable value in estimating the expected return on equity.

Summary of our final decision

Our final decision is for a Rate of Return Instrument that requires the rate of return to be calculated at the time of each determination and updated annually. The methods and the input data to be used are summarised in Table 0.1. The results in the table compare the 2018 Instrument using 2018 data and the final 2022 Instrument using end of December 2022 data. We have used December 2022 as our reference point for all data in this explanatory statement. We previously indicated we would update this data for our final decision using September data; however, because of the delay in our final decision, we have now used updated December 2022 data.

In summary, the approach and parameters we have chosen in the 2022 Instrument are largely the same as for the 2018 Instrument. However, the rate of return derived at this time from the 2022 Instrument is higher than the rate in December 2018. This is because underlying market interest rates have risen in recent years, rather than changes we have made to our approach. The changes we have made in the 2018 Instrument include:

- specifying a market risk premium of 6.2% whereas it was 6.1% in the 2018 Instrument
- using a gamma value of 0.57 compared to 0.585 in the 2018 Instrument and
- shifting forward by one month the window for averaging periods for calculating the risk-free rate and return on debt.

Table 0.1 shows the rate of return under the 2022 Instrument using 2 methods for calculating the return on debt. One calculation is a 20-day average as at end December 2022, which we refer to as ‘on-the-day’, and the other is an indicative 10-year trailing average beginning in 2014. The risk-free rate has been calculated using a 20-day average as at end December 2022. The 2018 Instrument values are those published in that explanatory statement based on November 2018 data. In that explanatory statement only the on-the-day method data was published.

Our return on debt approach is a 10-year trailing average and network service providers are currently at different stages of transitioning to the full trailing average. Any new network service provider will receive the on-the-day cost of debt, which is around 6.5%, but existing service providers receive their trailing average. Although the current difference is significant, this is a natural outcome of our debt approach at times when interest rates change significantly over short periods. In contrast, when interest rates were dropping the trailing average was higher than on-the-day rate.

We did not come to this process with the expectation of making only minimal changes. We have undertaken an extensive and open process, exploring all aspects of the rate of return in detail. As we progressed through our review, we found the approach in the 2018 Instrument was supported by data and finance principles. We acknowledge concerns about the sufficiency of our return on equity during the low interest rate period. Our working paper on

Rate of return and cashflows in a low interest rate environment [3] considered the consequences of lower interest rates and investigated whether we need to adjust our approach to the rate of return. The available evidence suggests overall returns achieved under our regulatory regime during that low interest rate period were not inadequate.

A balanced assessment of our cross-checks leads us to reasonably conclude that the 2018 Instrument has broadly performed adequately. We note that interest rates have recently moved back up from the low rates seen from mid-2020 through to early 2022 towards rates seen before we made our 2018 Instrument. In addition, stakeholders increasingly reinforced the importance of stability and predictability in approach, expressed as a 'high bar for change'. When we consider our decision in the round, the approach in the 2018 Instrument has delivered outcomes that are consistent with the relevant risks. As such, we think the NEO and NGO are best advanced by largely continuing our current approach. Minimising change is likely to promote stability and predictability and, therefore, efficient investment. We do not consider the bar for change has been met for material changes to our approach.

Table 0.1 Summary of our 2018 and 2022 Rate of Return Instruments

Parameter	2018 Instrument (data as published in the 2018 explanatory statement using November 2018 data)	Final 2022 Instrument (December 2022 data)	
Overall rate of return			
Indicative rate of return	5.36% (using on-the-day return on debt as at the end of Nov 2018)	6.84% (using on-the-day return on debt)	5.75% (using full transition trailing average return on debt)
Estimation approach	Weighted average of the: • nominal pre-tax return on debt • nominal, post-company tax, pre-imputation return on equity Weighted by the gearing ratio Updated annually (to reflect annually updating return on debt)	Weighted average of the: • nominal pre-tax return on debt • nominal, post-company tax, pre-imputation return on equity Weighted by the gearing ratio Updated annually (to reflect annually updating return on debt)	
Gearing ratio			
Value of gearing ratio	0.6	0.6	
Return on debt			
Indicative return on debt	4.70% (using numbers from 2018 Instrument that used on-the-day return on debt as at the end of Nov 2018)	6.52% (using on-the-day return on debt)	4.70% (using full transition trailing average return on debt)
Estimation approach	10-year trailing average, updated annually	10-year trailing average, updated annually	
	10-year transition into the trailing average (continue transitions already underway)	10-year transition into the trailing average (continue transitions already underway)	

[3] AER, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment – Final working paper*, September 2021.

Parameter	2018 Instrument (data as published in the 2018 explanatory statement using November 2018 data)	Final 2022 Instrument (December 2022 data)
	Benchmark to observed market rate curves: • for a given credit rating and term • for each annual update, averaged over periods nominated by regulated business	Benchmark to observed market rate curves: • for a given credit rating and term • for each annual update, averaged over periods nominated by regulated business
Benchmark term of debt	10 years	10 years
Benchmark credit rating	BBB+	BBB+
Source of market rate curves	RBA, Bloomberg & Thomson Reuters	RBA, Bloomberg & Thomson Reuters (Refinitiv)
Weighting of sources of market rate curves	Equal weight	Equal weight
Market rate curves to proxy the benchmark credit rating	Weighted average of Broad BBB and Broad A curves	Weighted average of Broad BBB and Broad A curves
Weighting of curves	2/3 weight on BBB curves, 1/3 weight on A curves	2/3 weight on BBB curves, 1/3 weight on A curves
Averaging period conditions	Nominated before the start of the period and not after submitting a regulatory proposal for the relevant regulatory period	Nominated before the start of the period and not after submitting a regulatory proposal for the relevant regulatory period
	Between 10 days and 12 months in length	Between 10 days and 12 months in length
	Starts no earlier than 16 months before, and ends no later than 4 months before, the start of the relevant regulatory year	Starts no earlier than 17 months before, and ends no later than 5 months before, the start of the relevant regulatory year
	Periods for each year in a regulatory period should not overlap	Periods for each year in a regulatory period should not overlap
Return on equity		
Indicative return on equity	6.36% (using a risk-free rate of return as at end Nov 2018)	7.32% (using a risk-free rate of return estimated over Dec 2022)
Estimation approach	The Sharpe-Lintner Capital Asset Pricing Model formula, where return on equity is the product of: • the risk-free rate • the sum of the market risk premium and the equity beta Set for the entirety of each regulatory period and not updated annually	The Sharpe-Lintner Capital Asset Pricing Model formula, where return on equity is the product of: • the risk-free rate • the sum of the market risk premium and the equity beta Set for the entirety of each regulatory period and not updated annually
Value of market risk premium	6.1%	6.2%
Value of equity beta	0.60	0.60
Indicative risk-free rate	2.70% (10-year term)	3.60% (10-year term)
Risk-free rate estimation approach	Yield to maturity on 10-year Commonwealth Government Securities, averaged over period nominated by regulated business	Yield to maturity on 10-year Commonwealth Government Securities, averaged over period nominated by regulated business
	Nominated in advance	Nominated in advance

Parameter	2018 Instrument (data as published in the 2018 explanatory statement using November 2018 data)	Final 2022 Instrument (December 2022 data)
Risk-free rate averaging period conditions	Regulated business to nominate length between 20 and 60 consecutive business days	Regulated business to nominate length between 20 and 60 consecutive business days
	Start no earlier than 7 months before the start of the regulatory period Finish no later than 3 months before the start of the regulatory period	Start no earlier than 8 months before the start of the regulatory period Finish no later than 4 months before the start of the regulatory period
Imputation credits		
Value of imputation credits	0.585	0.57
Estimation approach	The 'utilisation' approach, where gamma is the product of the utilisation rate and distribution rate	The 'utilisation' approach, where gamma is the product of the utilisation rate and distribution rate
Value of imputation credit distribution rate	0.90	0.88[3]
Value of imputation credit utilisation rate	0.65	0.65[3]

Notes: 1. The indicative rate in column 2 reflects the values published in the 2018 Instrument explanatory statement and not rates of return allowed in past determinations.
2. The 2022 Instrument and 2018 Instrument approaches both set out the 'first-best' or most-likely approach. A number of contingencies are triggered in certain events, such as if certain data is not available or nominated averaging periods do not comply with the conditions in the Instrument. The 2018 data is taken from the 2018 Instrument explanatory statement.
3. The distribution rate and the utilisation rate here are shown as rounded to 2 decimal places. The full unrounded figures are 0.878670689 for the distribution rate and 0.647450918 and should be used in practice.

Key issues for the 2022 Instrument

As we have moved through the process of developing the Instrument, we have made considerable progress in narrowing the issues in contention. There is broad stakeholder and expert agreement on the majority of issues, including some of the key foundational issues.

Therefore, for this decision we confirm our proposed approach to the following key aspects:

- our decision-making framework and the application of our legislative requirements as summarised in section 1.2 and expanded in chapter 2
- the use of a nominal vanilla weighted average cost of capital (WACC) formulation (see chapter 3)
- continued use of third-party debt yield curves to estimate the return on debt at each point in time (see chapter 9)
- the standard Sharpe-Lintner Capital Asset Pricing Model used as the basis for determining the return on equity (see chapter 5)
- using Commonwealth Government Securities as proxy for the riskless investment for our purposes (see chapter 6).

Table 1.1 in chapter 1 provides a summary of each of the individual issues we have reviewed and sets out our position on each issue.

However, stakeholders and experts continue to have different views on a handful of key topics. These remaining topics have potentially material impacts on the final rate of return. These topics attract the majority of our consideration in this explanatory statement.

The 6 priority topics we have identified are:

- term of the return on equity
- market risk premium (MRP)
- equity beta
- use of our industry debt index
- weighted trailing average return on debt
- cross-checks of the rate of return.

The following sections provide an outline of our position and considerations on each topic. These topics were also a focus of the Independent Panel's review. The panel provided 3 central recommendations, which are also a focus in this explanatory statement.

1) That the AER consider the extent to which the recent data used in the analysis of MRP and beta have been distorted by the temporary policy responses to the COVID-19 pandemic – extraordinarily low interest rates and unprecedented quantitative easing – which are now being rapidly reversed. Decisions in the draft Rate of Return Instrument (RoRI) should be re-assessed in light of this reversal.
2) That the AER undertake a more conclusive analysis of the efficacy of the 2018 RoRI, by, for example
    a) expediting the process of consulting on the decomposition of the RAB multiple, which is a central part of its cross-checks analysis
    b) assessing the incentive the RoRI provides for investment by analysing regulated companies' applications for approval of capital expenditure that is discretionary e.g. increases reliability above minimum quality standards. Since such expenditure is not mandatory, applications to undertake it are evidence that the allowed rate of return on it is attractive
    c) examining other regulators' ways of addressing this issue.
3) That the AER discuss the effect of the RoRI under a wider range of scenarios so as to better inform consumers regarding the potential impact of the regulatory system combined with changes in macroeconomic variables on energy bills and thus help to retain their confidence.

Context for the key issues

Before turning to each of the key topics, we outline the broader context of how each issue fits in our framework.

The first 3 topics are motivated by the standard Sharpe-Lintner Capital Asset Pricing Model (CAPM or SL CAPM) we use for estimating the return on equity. The CAPM requires specification of 3 parameters: the rate of return on riskless assets (the risk-free rate), a measure of the sensitivity of returns of the specific firm to variations in the market as a whole

(the equity beta) and the expected excess return on the market (or market risk premium (MRP)).

- The return on Commonwealth Government Securities is generally considered a good proxy for the risk-free rate and is the most directly observable parameter we have in the equity space. However, there is a question about whether we should be estimating returns based on the duration of the forthcoming regulatory period (typically 5 years) or a longer time horizon. We need to apply parameters consistently with our choice of term in the CAPM.
- The equity beta can be estimated from market data, but there are challenges in selecting comparator firms, the period over which beta is estimated and the estimation interval. These challenges and the debate around their resolution are the reason this topic features.
- The MRP can be informed by historical excess returns in the market. However, there are questions about whether the MRP should also be informed by other estimates of excess returns (such as those that can be calculated from dividend growth models). There are also broader questions about the stability of the return on equity and underlying MRP over time.

The use of our industry debt index features because we have observed variations between our return on debt and the debt costs derived from the actual debt instruments of the businesses we regulate. We have explored whether we should adjust our return on debt because of the variations we have seen in our industry debt index.

We have considered whether we need to adjust our current simple trailing average return on debt because of the expected need for large investments in our networks as we move to greater reliance on renewable electricity generation. We have considered whether moving to an approach that weights for future levels of capital investment would be more robust to potential movements in market conditions.

Finally, we have considered whether there are other indicators that might allow us to draw broad conclusions about the adequacy of the rate of return set out in our draft Instrument. This is an ‘in the round’ type of assessment or a sense-check of our overall approach.

Term of the return on equity

This topic came to our attention in 2020 during our review of how inflation should be incorporated into our regulatory framework. Before our review we estimated expected inflation based on a 10-year term. During the review, we came to the view that it would be more consistent to employ a term for inflation that matched the length of the regulatory period (typically 5 years).

At the time, we did not express a concluded view on whether we should also employ a shorter term in other parts of our regulatory framework – in particular, for our estimate of the return on equity. In the process of developing this Instrument we have looked at the appropriate term for the return on equity.

There is disagreement among stakeholders about which approach we should take.

Networks and investors submit that we should maintain our current approach of estimating the return on equity over a 10-year horizon. Networks and investors point to the common practice of investment professionals of using a 10-year term, among other reasons.

Our CRG has submitted a framework to inform our decision-making on this aspect. The CRG stated:[4]

> Energy consumers have told us they expect:
>
> - a regulatory framework that is internally consistent across all its moving parts
> - the exercise of regulatory judgement that is unbiased in all its instances, and
> - an outcome producing the lowest cost of capital to support required network investment.
>
> It is for these reasons the CRG has not provided a singular answer to the AER's question about whether it prefers a 5- or 10-year estimation term for equity. Our answer depends on how the AER responds to the three expectations noted here.

The AEC submitted that it agreed with the AER's draft decision to not use a 10-year term as it may lead to a biased outcome because the task is to set an efficient return for the next regulatory period.[5]

After extensive consultation and consideration, our view is that the question of the term of return on equity must be settled through the exercise of regulatory judgement. We have seen cogent cases made for employing a term that matches the length of the regulatory period and a term of 10 years, consistent with our current practices. Intelligent and reasonable people have reached different conclusions on this issue. Stakeholders, experts, regulators and review panels have reached different conclusions supported by detailed and thorough reasons.

Overall, we have decided to maintain our current approach in the 2018 Instrument of using a 10-year term for the return on equity. This is a change in position from our draft Instrument.

We maintain our view from the draft Instrument that there is a sound rationale for employing a term that matches the length of the regulatory period as was recognised and supported by our Independent Panel. However, there is also a case for continuing to use a 10-year term.

In the face of these competing views, we have turned our mind to questions around whether there is a sufficiently strong case for changing the approach from our 2018 Instrument. At this time, we are not satisfied there is a sufficiently strong case for making the change, but we acknowledge that the balance could shift in future reviews.

In reaching this position we make the following observations:

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4 CRG, *Advice to the Australian Energy Regulator CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 90.

5 AEC, *Consultation: Draft Rate of Return Instrument 2022*, September 2022, pp. 1–2.

- We are broadly satisfied with how the 2018 Instrument has been performing and we want any change to lead to clearly superior outcomes.
- Once we account for consequential amendments to the MRP we would need to make, changing approach as per our draft decision would be of modest materiality at this time and on average over the long-term historical period.
- Stakeholders representing both consumers and industry told us that they see merit in stability and predictability of our regulatory framework. They have expressed this view as 'a high bar for change'. It has been our regulatory practice to use a term of 10 years for considerable time. Regulatory stability is promoted by continuing this approach.
- There has been a trend among Australian regulators to adopt a 10-year equity term. In outlining their decisions, these regulators considered the rate of return investors in long-lived assets would require over the asset lives.[6] We have also adopted a 10-year term in the past, with reference to the long-lived nature of the assets in an infrastructure business.[7] There has been acknowledgement that from a regulatory perspective NPV=0 is satisfied by matching term to the length of the regulatory period, while from a long-term investor perspective NPV=0 is satisfied by matching their practice (typically 10 years).[8]

We outline our reasoning and the cases on both sides in more detail in section 6.3.1. We are alert to the CRG submission that there may be bias within our decision that requires adjustment and we address each of these potential biases in the relevant sections.

Market risk premium (MRP)

Our regulatory task in estimating the MRP is to estimate the risk premium required by investors over the return on the risk-free asset to invest in a fully diversified Australian market portfolio. When added to the risk-free rate of return, the MRP will give an estimate of the opportunity cost of investing in an investment with the same systematic risk as a fully diversified Australian equities portfolio (or "market" portfolio with a beta of 1 by definition).

The MRP we estimate is multiplied by our estimate of the equity beta to give an estimate of the equity risk premium for investing in the equity of the businesses we regulate assuming a 40% equity to 60% debt capital structure. This equity risk premium is then added to an

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6 For example, QCA noted: 'We consider this approach reflects the requirements of investors and lenders who, in relation to long-lived infrastructure assets, will deploy equity over the entire life of the asset, rather than over any given regulatory period'. QCA, *Rate of return review, Final report,* November 2021, p. 83. See also ERA, *Explanatory Statement for the 2022 Draft Gas Rate of Return Instrument*, June 2022, pp. 95–99; IPART, *Review of our WACC method, Final Report Research,* February 2018, pp. 41, 43, 47.

7 See, for example, AER, *Explanatory Statement – Rate of Return guideline*, December 2013, p.49; *Rate of return instrument - Explanatory statement,* December 2018, p. 126–131.

8 ERA, *Explanatory Statement for the 2022 Draft Gas Rate of Return Instrument*, June 2022, pp.95–99.

estimate of the risk-free return to determine the allowed return on equity. This allowed return should reflect the opportunity cost of this equity investment given its level of systematic risk.

Our decision is to set an MRP of 6.2% per annum over the yield to maturity on Australian Commonwealth Government Securities with a term to maturity of 10 years (10-year CGS).

In estimating the MRP, we have reviewed various sources of evidence and note that the evidence before us is incomplete and some pieces of evidence have greater explanatory power than others. Therefore, we have exercised judgment to determine the value of the MRP. Our decision is more strongly influenced by evidence that has the greatest strengths and therefore these are more persuasive in arriving at our point estimate.

We do not currently consider it is possible to model a conditional MRP accurately over time. We acknowledge that the MRP varies over time and it would be desirable in principle to estimate a conditional (or time-specific) MRP. However, given that there are questions about reliability of measurement and differing views on the relative value of DGM based estimates, we have chosen to place more emphasis on the historical excess return (HER) estimates because it is an approach we have used and relied on in the past to estimate a forward-looking unconditional MRP.

We consider that estimating an unconditional MRP is the best course available to us. This will best contribute to achieving the NEO and NGO, in combination with other rate of return parameters. An unconditional MRP is one that is largely stable over time and does not move with market shocks, whereas a conditional MRP moves constantly over time. Further, we consider that using an unconditional MRP will lead to stable and predictable investment signals over time.

After reviewing the evidence from the arithmetic average of the HER, we established a range of 6.1 to 6.6%.

After evaluating all the available evidence, we arrived at the view that, on balance, the current unconditional MRP is likely to be towards the lower end of our range of 6.1 to 6.6%. We were also conscious of the Australian Treasury advice that the higher HER estimates in recent years were likely to have been influenced by the cycle of monetary policy.

We identified 6.2% as our point estimate within this range. 6.2% also coincides with the arithmetic average of HER from 1988 to 2022 and is consistent with the approach we employed in selecting the MRP in the 2018 Instrument. We then considered whether the other evidence might persuade us to choose a different value. We note the evidence is not consistent – some points to a higher value while other evidence points to a lower value.

In our view, data from HER provides the most appropriate estimate for the MRP.

- The range given by arithmetic averages for different sample periods is 6.1% to 6.6%. The most recent sample period produces an estimate of 6.2% and is most likely to reflect current prevailing conditions.
- Geometric averages indicate a range of 4.2% to 5.0%. These geometric averages indicate the forward-looking MRP value is most likely to be towards the bottom of the range given by the arithmetic averages. The most recent sample period produces an estimate of 4.6%.

- The arithmetic average range of 6.1% to 6.6% is close to the weighted average range of 5.9% to 6.3%, whereas the geometric average range of 4.4% to 5.05% is well below the other 2 ranges.[9] Therefore, we give more weight to the arithmetic average range of 6.1% to 6.6%.

Other evidence that we consider has lesser persuasive value:

- The 2-stage and 3-stage DGM results indicate that the MRP has been trending down over the past 2 years and are materially below the estimates from 2018, although above the averages from the early 1990s through to the current period.
- The most common value for the survey evidence since the 2018 Instrument has been between 6.0% and 6.3% noting the surveys also indicate respondents take different approaches to estimating the risk-free rate.
- The implied volatility is currently below its long-term average and is around the same level it was at the time of publishing the 2018 Instrument.
- The current dividend yields have not changed significantly since the December 2018 Instrument.
- Credit spreads from state government debt have started to increase in recent months and are higher than the levels when publishing the 2018 Instrument.
- Credit spreads from corporate debt have increased in recent months and are higher than the levels when publishing the 2018 Instrument.

In view of this contrasting evidence, we do not consider the bar for change is satisfied to move away from our past approach. Considering all the information currently before us, we consider that our MRP of 6.2% is an unbiased estimate.

Equity beta

In this decision, we adopt the same overall approach to estimating equity beta as we did in the 2018 Instrument. This has led us to adopting a beta value of 0.6, which is consistent with the 2018 Instrument.

Our value for beta (0.6) is primarily informed by the beta estimates of the existing Australian comparator set of 9 firms. We also use international estimates, which we consider to be less relevant than Australian estimates, as a cross-check. These estimates show a degree of inconsistency:

- the longest period available estimates have remained relatively stable despite recent market volatilities, supporting continuation of our current value of 0.6
- the recent 5-year domestic data has decreased, suggesting our value could be lower

[9] Since arithmetic averages are argued to typically provide upward biased estimates while geometric averages are argued to typically provide downward biased estimates, literature suggests that the least biased estimates would be a weighted average of the geometric and arithmetic averages. Our term weighting here is a mathematical weighting and is a horizon weighted average.

- the recent 5-year international data has increased, suggesting our value could be higher.

Our approach has been to place most weight on the long-run estimates while also being informed by the recent 5-year data. Having considered the available data and its strengths and weaknesses, we consider that a case for change has not been established. We do not consider the evidence for a higher or lower value is sufficiently strong and so we should continue with a value of 0.6 for equity beta.

The Independent Panel supported our overall approach, including our reasoning and exercise of judgement.

A key issue on equity beta is the diminishing number of the Australian comparators we use for estimating beta. This has declined from 3 live firms in the 2018 review to being just one (APA) – Spark Infrastructure and AusNet having recently been de-listed due to takeovers. For most of the period since 2018, we still had data from these 3 firms, but this underlines a challenge to our current approach going forward.

Some stakeholders considered that data from international energy firms may contain useful information. We have considered issues around using international energy firms in the past. In our 2018 review, we reported beta estimates of a group of international energy firms, which was used as a cross-check only. We have continued to update their beta estimates in our rate of return annual update since then to inform stakeholders' consideration and our own analysis of this matter.

We have also engaged on this issue as part of our working paper series, as well as our draft Instrument. Having considered the latest submissions and other relevant evidence before us, our view remains that there are likely considerable complexities around developing an approach using international firms as comparators. In particular, international firms likely have different characteristics and operating and market environments to the regulated 'pure play' Australian energy network businesses and, as a result, may not be directly comparable to those we regulate. We intend to undertake work on this issue in advance of the 2026 Instrument, particularly considering the diminishing number of comparators.

We have also considered several other issues relating to equity beta, including setting a separate equity beta for the regulated gas networks and the potential low beta bias. On those issues our decision is to maintain the 2018 Instrument approach (discussed in detail in chapter 8).

Considering all the information currently before us, we consider that our equity beta estimate of 0.6 is an unbiased estimate.

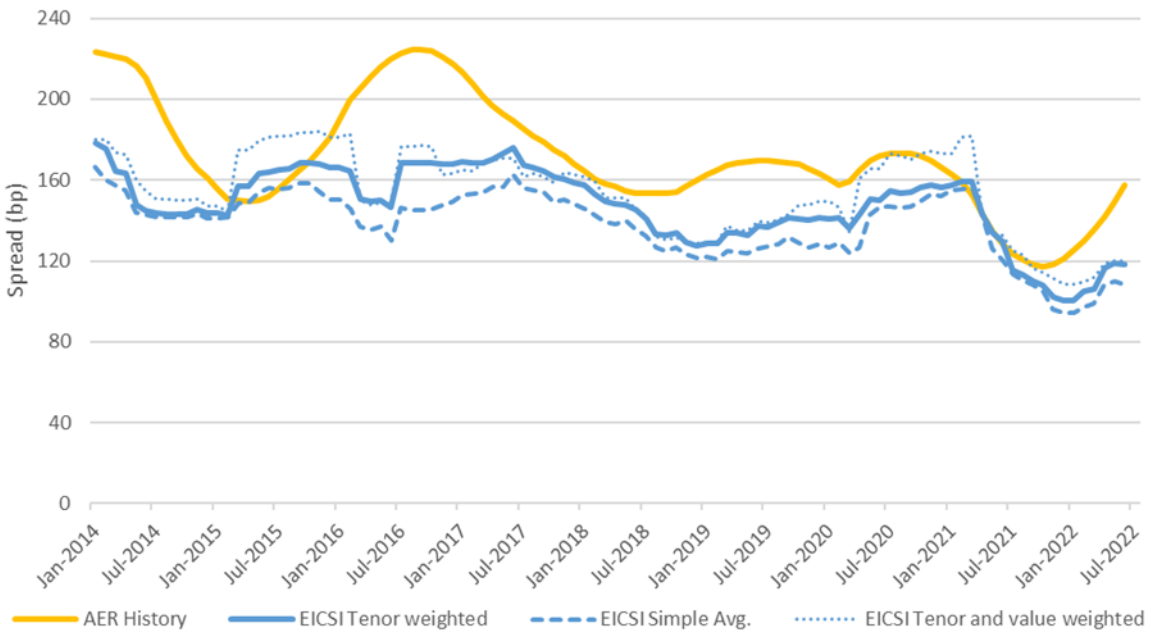
Use of our industry debt index

We developed the Energy Infrastructure Credit Spread Index (EICSI) in 2018 with assistance from Chairmont using actual debt issuance data obtained from regulated NSPs. It reports a

rolling 12-month historical average of credit spreads across all new debt instruments issued by privately owned NSPs.[10]

The EICSI provides an indication of the cost of NSP-issued debt to compare with our estimate of the cost of debt. The primary EICSI metric is the spread over the swap rate (credit spread), which is similar to the debt risk premium. This allows us to monitor the performance of our benchmark return on debt against NSPs' actual cost of debt. Figure 0.2 shows our most recent update of the index.

Figure 0.2 Comparison of EICSI 12-month rolling average (unweighted, tenor weighted and tenor and face value weighted) against AER A/BBB (10-year term) estimate (January 2014 to June 2022)



Source: AER analysis; Chairmont, *Aggregation of debt data for portfolio term to maturity*, 28 June 2019.

When we look at the unweighted EICSI (no tenor or value weighting) over time, we observe a discrepancy between the cost of NSP debt instruments and the benchmark return on debt. A factor for this is the over-representation of short-term instruments in unweighted EICSI. We have adjusted for this effect to some extent by tenor weighting EICSI, where each instrument is weighted proportionally to its tenor (as shown in Figure 0.2). For example, a 10-year instrument is given a weight 10 times greater than a 1-year instrument. This helped to reduce the overweighting of short-term debt. However, after tenor weighting, we are still seeing apparent outperformance. This is due to EICSI only showing a 12-month snapshot of debt issuance, rather than the entire portfolio. For instance, if the overall debt portfolio has both short-term and long-term debt, but no long-term debt is issued in the last 12 months, the

[10] AER, *Discussion paper, Estimating the allowed return on debt*, May 2018, pp. 27–35.

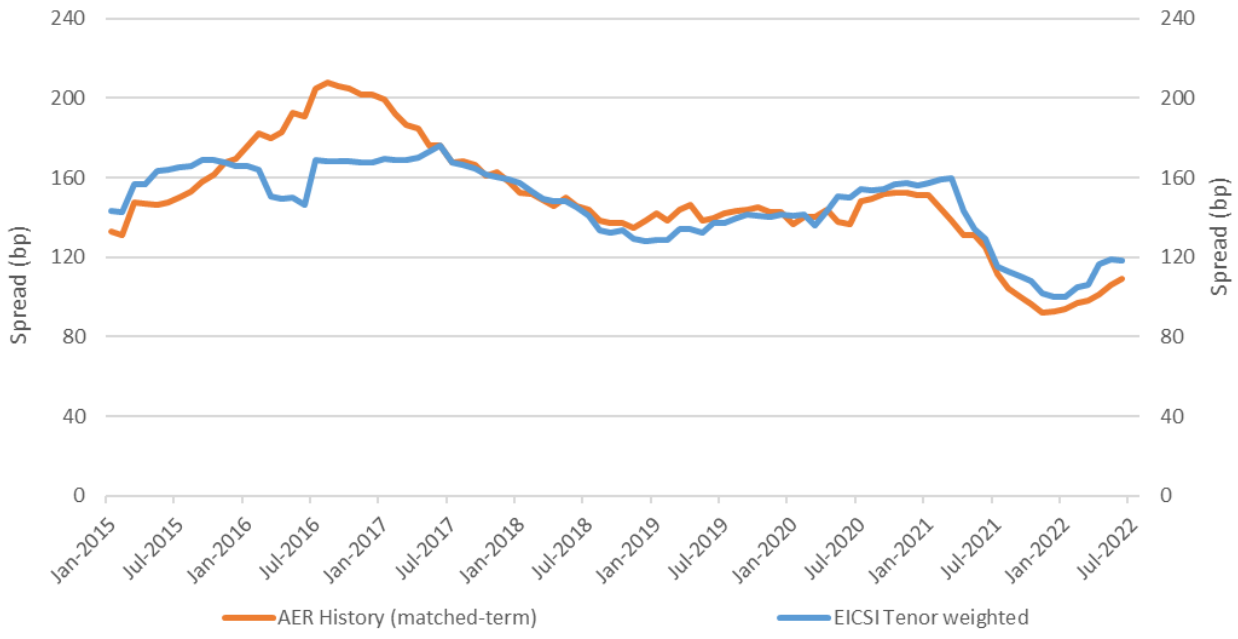
instruments in the EICSI would not be representative of the overall portfolio and we would likely see apparent outperformance.

As the unweighted EICSI is showing a discrepancy between the NSP cost of debt and our benchmark allowance, we have considered 2 other indicators to inform our decision – weighted average term to maturity (WATMI) and matched-term analysis.

Unlike EICSI, instruments remain in WATMI until they have reached maturity, providing a better reflection of the average term of the entire portfolio. WATMI suggests that the average term of debt is currently between 8 years as the lower bound and 10 to 11 years as the upper bound. That is, using a debt term of 10 years is consistent with the observed WATMI.

A matched-term analysis accounts for any discrepancy caused by a shorter EICSI term and allows us to cross-check how other return on debt parameters are performing (credit rating and data providers). Figure 0.3 compares EICSI (tenor weighted) against AER history with a matched term (matched to the EICSI term and not to the 10-year benchmark). This analysis indicates adequate performance of the benchmark credit rating and third-party yield curves once the term of EICSI is matched.

Figure 0.3 Comparison of EICSI 12-month rolling average (tenor weighted) against AER A/BBB (matched-term) estimate (January 2014 to June 2022)



Source: AER analysis; Chairmont, *Aggregation of debt data for portfolio term to maturity*, 28 June 2019.

The Independent Panel recommended that we consider using the EICSI as the primary source of data relating to credit spreads and that the current third-party yield curve approach be used as the cross-check. We have considered the panel recommendation carefully and undertaken further analysis using updated data. When we look at each of our models (EICSI, WATMI, matched-term) holistically, we do not see sufficient evidence to adjust our benchmark approach at this time.

We are satisfied that not making an adjustment to our benchmark approach leads to an unbiased outcome.

Our decision is to maintain our current approach of using the EICSI as a 'sense-check' on our benchmark return on debt.

Weighted trailing average return on debt

In this final decision, we maintain the 10-year simple trailing average approach with annual updates as adopted in the 2018 Instrument to determine NSPs' return on debt allowances. We continue the transition that has commenced in a previous determination for an NSP and allow NSPs to complete the 10-year transition period from the previous 'on-the-day' approach to the trailing average approach.

In our working paper series, we considered implementing a weighted trailing average approach to account for expected large projects to be undertaken in the next few years in line with NSPs' transition towards renewable energy. Such transition will require large capital investments. We examined whether a weighted trailing average may better align with the NPV=0 condition and so may better promote efficient investment. However, in our analysis, we identified a number of issues that could mitigate potential benefits provided by a weighted trailing average, while adding significant complexity.

Compared with the simple trailing average, a weighted trailing average would better satisfy the NPV=0 condition if the benchmark business:

- raised extra debt beyond the 10% level of its existing debt balances
- financed its new capital investment by issuing debt and equity in the proportion consistent with the benchmark gearing ratio.

However, we are not certain a benchmark business would find it efficient to increase debt raising significantly beyond 10% of its debt balance in a year to raise large amounts of capital for new projects. Instead, the benchmark business is likely to issue proportionately more equity than that consistent with the benchmark gearing level, especially at the project's early stages. The businesses we regulate adjust their gearing depending on their individual circumstances even though we set a benchmark allowance. This is intended under our incentive framework. The benefit provided by a weighted trailing average is diminished under such conditions.

Even when a benchmark business does raise its debt issuance beyond 10% in a year, there are administrative complexities and practical difficulties with implementing a weighted trailing average. We considered whether to set the weights using forecasts or through a true-up after actual capital expenditure is known.

Except for Marinus Link, all other stakeholder submissions to our draft decision supported the retention of the simple trailing average. Marinus Link supported the adoption of a weighted trailing average, as a simple trailing average would not achieve NPV=0 due to its debt raising profile.

We acknowledge Marinus Link's concerns and consider that it should be able to manage any interest rate mismatch risk it faces under our current approach. This is because Marinus Link

is funded by 3 Australian governments that have treasuries that manage relatively large debt portfolios and are experienced in managing interest rate risk. We also expect any residual issues to be addressed in legislation specific to Marinus Link.

As such, we currently consider it is not sufficiently necessary to make a change from our current simple trailing average approach. We intend to continue to monitor debt financing practices of the NSPs and, as recommended by the Independent Panel, we will do further work on how a weighted trailing average would be implemented before we consult on this topic again in preparation for the 2026 Rate of Return Instrument review.

Other topics

In this section we discuss a few topics that are important for our decision but do not feature in our list of priority topics.

Gearing

To apply our nominal vanilla weighted average cost of capital (WACC) formulation we need an approach for combining the return on debt and equity. Our approach is to combine them according to the ratio of debt to total debt and equity. This is known as the gearing ratio. We have reviewed the latest data on the level of gearing adopted by our comparator firms. Our review can be found in chapter 4.

In summary, we have concluded to continue using our current benchmark gearing ratio of 60%. The most recent data is showing average gearing slightly below 60% but there is some variability in the data. We are not sufficiently confident in the trend of the data to lower our gearing at this time. In addition, the overall WACC does not vary materially with gearing due to the 2 offsetting effects of gearing on the overall WACC value. Therefore, we consider the benefits of maintaining consistency in our approach outweigh the potential benefits of a change.

Gamma

Under the Australian imputation tax system, investors receive imputation credits for tax paid at the company level. For eligible shareholders, imputation credits offset their Australian income tax liabilities. The value of imputation credits (known as gamma or ‘γ’) needs to be factored into regulation to recognise that imputation credits benefit equity holders, in addition to any dividends or capital gains they receive.

Because we use a post-tax framework with a rate of return after company tax but before personal tax, the value of imputation credits is not a WACC parameter. Instead, it is a direct input into the calculation of a regulated firm’s tax liability, via the corporate tax component of the building block model.

Our final decision is to adopt the same approach as the 2018 Instrument when estimating gamma. This involves:

- using the ‘utilisation’ approach, under which gamma is equal to the product of 2 parameters – the distribution rate and the utilisation rate
- using the same data source to inform estimation of the 2 parameters.

The Independent Panel considered our approach to rounding inconsistent and recommended that we revise our rounding policy. Having considered the Independent Panel's recommendation, we have determined to not round the intermediate numbers (that is, the utilisation and distribution rates) before rounding the final gamma number to 2 decimal places. Applying this approach, we have adopted a value of 0.57 for gamma.

Gamma has been considered in great depth in the past. Our approach has also been tested in several court cases, with our approach found to be open to us by the Full Federal Court. Given this, our consultation to date has focused on a couple of discrete issues. Having considered submissions and information before us, we do not believe there is sufficient evidence that warrants a change to our approach.

Cross-checks of the rate of return

We have explored a range of measures that might provide some insight into the suitability of our overall rate of return. All of these measures suffer limitations, but collectively may provide a sense-check of our overall outcome.

After reviewing the available cross-checks, a balanced assessment of the performance of the 2018 Instrument leads us to reasonably conclude that the 2018 Instrument has broadly performed adequately.

RAB multiples

Regulated asset base multiples (RAB multiples) are a measure of the value of the firm compared with the RAB. The equity value of the firm is measured according to the value of its shares. These values can be observed continuously if the firm is listed on the stock market (known as trading multiples) or observed at a point in time when a large parcel of shares is exchanged or through a takeover of the firm (known as transaction multiples).

There is disagreement among stakeholders and experts about the merit of RAB multiples as a cross-check. This disagreement arises because RAB multiples can be influenced by a range of factors beyond the regulated rate or return and return on equity. These factors include:

- firms undertaking business activities beyond the regulated element ('unregulated business')
- control premium, overpayment or 'winner's curse'
- incentive rewards and outperforming price control targets
- expected growth in unregulated business and/or incentive rewards or outperformance.

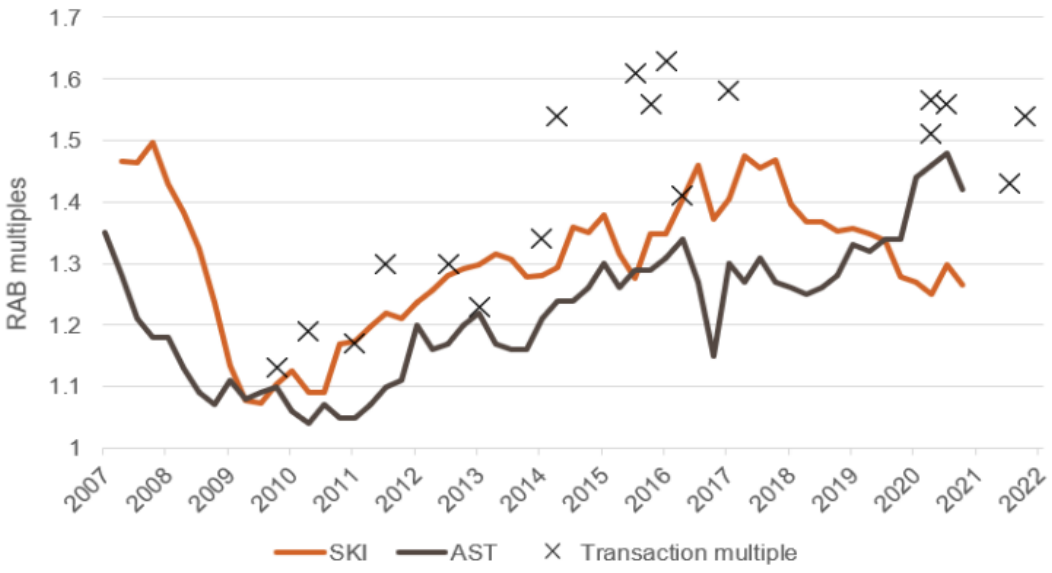
We accept that care is needed in the interpretation of RAB multiples. Where businesses have a large proportion of their revenue derived from regulated activities, we think the rate of return and the return on equity are likely to be material contributors to the value of the firm

and this will be reflected in the RAB multiples. In the case of Spark Infrastructure and Ausnet Services, around 72%[11] and 85%[12] of revenue is from regulated services.

What the data shows

We have been tracking RAB multiples since 2007 as shown in Figure 4.

Figure 4 AER regulated networks – transaction and trading multiples



Note: These values are as reported by Morgan Stanley and have not been adjusted for factors that may drive RAB multiples above 1x. SKI is Spark Infrastructure, which holds ownership stakes in SA Power Networks (49%), Victoria Power Networks (49%) and TransGrid (15%). AST is AusNet Services, which owns a Victorian electricity distribution network, electricity transmission network and gas distribution network.
Source: AER, *Electricity network performance report 2022*, p. 32.

We observe:

- RAB multiples have varied over time from a low of 1.0 to a high of approximately 1.6.
- Transaction multiples have tended to be higher than trading multiples.
- After a period of decline from 2007 to 2009 during the global financial crisis, RAB multiples have generally shown an upward trend since 2010 (some downward movements are observed, for SKI for example, and some stability since 2016 can be

[11] Regulated revenue has been sourced using figures from Spark Infrastructure's HY 2021 Fact Book. This was derived by combining the distribution revenue for Victoria Power Networks and SA Power Networks with the transmission revenue for Transgrid, over the total revenue for all 3 companies. Total revenue includes distribution, transmission, semi-regulated and unregulated revenue. We have taken this at an overall level and not considered ownership stakes for Spark Infrastructure of these companies in our calculation.

[12] AusNet Services, *Scheme Booklet and Grant Samuel's Independent Expert Report*, December 2021, p. 126.

> inferred). This has been over the period when our regulated return on equity has been tracking lower with the risk-free rate.

In our final working paper, we concluded:

> We cautiously note that the information would suggest our current and expected rates of return are at least sufficient (as part of the overall regulatory compensation to investors) and potentially higher than that needed to attract investment.

Since that conclusion we have seen competitive bidding for AusNet Services between Brookfield and APA, and considered independent valuation reports.[13,14] We consider this acquisition and valuation activity suggests investor interest in the assets we regulate and supports this conclusion.

In addition to reviewing raw RAB multiples, we have undertaken work to disaggregate some of the components implicit in RAB multiples and have published 2 reports from CEPA that has outlined the findings from this work.[15,16] In summary, CEPA's work indicated to us that the rate of return could not be excluded as a contributor to the RAB multiples greater than 1.0x, and that it would be necessary to adopt extreme assumptions about the value to be derived from other factors to bring the RAB multiples back to 1.0x. We consider that the CEPA reports provide additional insights into the sufficiency of the overall expected returns from the regulatory regime and in relation to the adequacy of the return on equity.

Overall, our further investigation leads us to conclude that our current and expected rates of return are at least sufficient (as part of the overall regulatory compensation to investors) and that the allowed return has not been below investor expectations.

However, in view of the limitations with this type of analysis, we do not consider the evidence is sufficiently strong to make an adjustment to the position we have reached in our consideration of individual parameters.

Financeability tests

Financeability tests aim to assess whether a business can raise debt capital at a given credit rating. In practice these assessments are undertaken by rating agencies and are informed by subjective judgements and financial metrics. Therefore, it is not possible to undertake a hypothetical assessment for a benchmark firm with precision. As such, regulators typically condense their analysis to a review of financial metrics against a benchmark rule of thumb.

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[13] AusNet Services, *Scheme Booklet and Grant Samuel's Independent Expert Report*, December 2021, p. 3.

[14] Spark Infrastructure Group, *Scheme Booklet and KPMG's Independent Expert Report*, October 2021, p. 217.

[15] CEPA, *Report to the AER – EV:RAB multiples*, May 2022.

[16] CEPA, *Report to the AER – EV:RAB multiples*, October 2022.

The most common ratio used is funds from operations to net debt (FFO to net debt). It is a measure of free cash flow and tends to be assessed against a benchmark of 7%.

This analysis is limited because:

- it does not include the subjective component undertaken by rating agencies
- the 7% benchmark is itself subjective
- most importantly, financeability is actively managed by the firm to optimise debt costs. Financeability is especially sensitive to the choice of amount of debt compared with equity. In the past few years, we have seen regulated firms actively choose a higher level of debt, recognising this could lead to a credit rating downgrade.

What the data shows

In 2018 we calculated FFO to net debt for each of the businesses we regulate. We did these calculations based on our benchmark gearing of 60% because we wanted to test our benchmark rather than the actual position of each business. This analysis showed variation across businesses, but 21 out of 29 were able to meet the 7% benchmark.

When we repeated this analysis for our December 2021 paper, using 2021 data and based on submissions from regulated networks, we found that 24 of the 32 firms met the 7% benchmark, as seen in Table 0.2Table 0.2. These results suggested that financeability had not deteriorated under the 2018 Instrument. Higher depreciation and revenue adjustments seem to have offset the decline in return on equity.

We have updated our financeability analysis for this final decision, shown in Table 0.2. This includes an estimate of FFO to net debt if a new regulatory determination was to be conducted at this time based on this final decision.

We consider that this updated analysis continues to support our conclusion that financeability has not emerged as a problem under our 2018 Instrument. We do not consider the evidence is sufficiently strong to make an adjustment to the position we have reached in our consideration of individual parameters.

Table 0.2 Update of 2018 Instrument FFO/net debt analysis

Measure	2018	2021 (2018 firms)	2021 (all firms)	2021 (not in 2018 analysis)	2022 (all firms)*
Number of firms	29	29	32	3	32
Average FFO/net debt	8.44%	8.32%	8.33%	8.42%	8.07%
Industry average return on equity	7.06%	5.86%	5.78%	5.00%	5.78%
Number of firms with less than 7% FFO/net debt	8	7	8	1	10
Number of firms with higher FFO/net debt compared with 2018	–	12 out of 29	–	–	8 out of 32
Average increase in FFO/net debt	–	0.89%	–	–	1.19%
Average decrease in FFO/net debt	–	−0.82%	–	–	−1.06%
Gearing estimate (5-year average)	–	–	51.99%	–	–

Note: Net debt is estimated as the average of opening and closing debt proportion (60%) of the RAB. Average change in FFO/net debt is the simple average of the difference between each firm's 2018 estimate and their 2021 and hypothetical 2022 estimate (which assumes cash flow is fixed and makes updates to inflation and return on equity). We estimated each firm's FFO/net debt as the average over the relevant 5-year period. Average increases and decreases in FFO/net debt take a simple average of the % change in FFO/net debt for all companies that had an increase or decrease from 2018 to 2021. Gearing estimate is based on a 5-year average for APA, AST and SKI from 2017 to 2021.
*The 2022 column is a hypothetical FFO estimate for illustrative purposes, which assumes cash flow is fixed and makes updates to inflation and return on equity.
Source: AER analysis.

Scenario testing

In this explanatory statement, we make a distinction between sensitivity analysis and scenario testing. We describe sensitivity analysis as an approach for observing movements in the rate of return to movements in the underlying parameters. We describe scenario testing as an approach for observing rate of return outcomes in different states of the world. Variations in the return on equity are of most interest for this review, but by making some assumptions these results can be extended to the overall rate of return, revenues and prices.

There has been some debate among stakeholders about the value of this type of analysis and the methodology that should be employed. The strengths of scenario testing are that:

- it allows stakeholders, including us, to see the rate of return under different conditions and states of the world
- it may act as a sense-check for our rate of return if properly implemented, especially because the Rate of Return Instrument is fixed for the duration of its application (4 years).

We have undertaken a suite of sensitivity tests across multiple facets of the Instrument. We have chosen variations in the underlying parameters that are large enough to illustrate the respective sensitivity. We do not make any judgement about the likelihood of these variations. We also acknowledge that more extreme sensitivities could be explored. Table 0.3 provides a list of the tests undertaken.

Table 0.3 Sensitivity testing

Test undertaken	Description	Results
Market risk premium (MRP)	Comparing outcomes of the following MRP options: • historical excess returns (HER) • combined HER and 3-stage dividend growth model (DGM)	Under the option 1 approach (HER), if interest rates change by ±3%, we estimate: • an ROE impact of ±3% • a household bill impact of ±$96. Under the option 3b approach (combined HER and 3-stage DGM approach, if interest rates change by ±3%, we estimate: • an ROE impact of ±2.3% • a household bill impact of ±$74.
Beta	Using differing beta values to examine the impact on: • ROE • revenues • household bills	We estimate that each ± 0.1 change in beta has the following impacts: • ± 0.6% on ROE • ± 2. 0% on revenues • ± $20 per year on household bills.

What the data shows

How the return on equity varies with the risk-free rate:

- We explore movements in the return on equity for differing values of the risk-free rate under 2 options for setting the market risk premium:
  - setting a fixed MRP based on option 1 (HER)
  - allowing the MRP to vary based on option 3b (combined HER and 3-stage DGM).

The results are summarised in Table 0.3. Key conclusions are:

- based on current market rates at this time, the return on equity is similar under our 2 options for determining the MRP
- if the risk-free rate changes in the future, option 3b (combined HER and 3-stage DGM) is likely to generate a more stable return on equity (and therefore prices) but this depends on how the DGM reacts to changes in the risk-free rate over time.

How the return on equity varies with beta:

- We considered whether there was evidence to support an equity beta between 0.5 and 0.7. The 2018 Instrument used an equity beta of 0.6. We estimate that each ± 0.1 change in beta has the following impacts:
  - ± 0.6% on ROE
  - ± 2. 0% on revenues
  - ± $22 per year on household bills.

We have also considered 6 possible states for scenario testing:

- a low interest rate environment (0 to 5 years)
- a high interest and high inflation environment (0 to 5 years)
- a low economic growth environment (0 to 5 years)
- higher inflation over a prolonged period (5 to 10 years)
- lower inflation over a prolonged period (5 to 10 years)
- a scenario with extremely high interest and inflation rates.

We do not express any view about the likelihood of these scenarios. We have chosen them because they span a range of environments.

In broad terms we are satisfied with how the Instrument would operate under a range of conditions.

Historical profitability

Over the past few years, we have been expanding our reporting of historical profitability measures. They are reported in our annual network performance reports. In September 2021 we reported on the return on regulated equity (RoRE).

What the data shows

Our conclusions from the 2022 performance report were that from 2014 to 2021:[17]

- average electricity network returns on regulated equity declined materially
- despite this, electricity networks achieved returns on regulated equity that exceeded forecast returns on equity by approximately 4.2%.[18]

This occurred against a backdrop of declining forecast returns on equity, reflecting:

- declining interest rates, including the rates on Commonwealth Government Securities (on which we base the risk-free rate)
- the 2013 Rate of Return Guideline and, from 2020, the 2018 Rate of Return Instrument.

Our analysis of this cross-check clearly shows RoRE declining with interest rates in combination with the progressive application of the 2013 Rate of Return Guideline and the 2018 Instrument. But it also shows average returns significantly above our regulated return due to a range of factors, including the incentive framework we operate. However, this cross-check does not provide an insight into whether lower returns on equity, of themselves, are appropriate or problematic.

Investment trends

Investment trends can provide some indication of the rate of return because:

- an allowed rate of return that is too high may encourage inefficient overinvestment
- an allowed rate of return that is too low may discourage efficient investment.

A key issue with using investment trends as a cross-check is that investment levels are determined by many factors and rate of return is only one of these factors. For example, a comparison between pre-2013 and post-2013 investment would need to consider the network reliability standard changes in New South Wales and Queensland in 2005 and the rollout of mandatory smart metering in Victoria over this period.

We are now moving into a period where substantial investment in transmission networks is required to support the shift to renewable energy sources. We must consider this need as part of this review.

What the data shows

The Independent Panel suggested that consideration be given to investment trends and how these are considered by other regulators. We have found that specific analysis of investment trends does not appear to be conducted by other regulators in assessing the appropriate levels of investment.

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[17] AER, *Electricity network performance report 2022*, July 2022.

[18] This difference was 2.4 percentage points in 2021.

As such, our view remains that investment trends are determined by many factors, which can make it difficult to infer anything meaningful from them as a cross-check at this time.

Rate of return by other regulators and practitioners

This type of evidence can provide an indication of the required rate of return because:

- other regulators also set the rate of return for regulated businesses – their estimates may be comparable with our rate of return because they are for businesses with similar risks and the other regulators may have similar objectives to us
- discount rates used by market analysts and valuation reports may indicate the rate of return expected by investors
- depending on the purpose of the discount rates used by statutory bodies, they may provide an indication of the rate of return expected by investors.

We also note a range of factors that limit the suitability of this type of information because of the difference in approach and characteristics of the regulated entities. However, we acknowledge that consideration of other regulators' methodologies can be useful in highlighting differences and similarities to our own methods.

What the data shows

We have compared the return on equity that would be produced using our draft Instrument with overseas and local regulators. Over the past few years our return on equity has been lower than for some other regulators because we have used the prevailing risk-free rate, which was lower than the long-term average. Now that interest rates and the risk-free rate have increased, our return on equity might appear more comparable (or even higher) than regulators that use a long-term average. We consider that the approach we use for our return on equity should, and does, reflect current market conditions at the time we make our decision.

In view of the limitations with this type of analysis, we do not consider the evidence is sufficiently strong to make an adjustment to the position we have reached in our consideration of individual parameters.

Decision in the round

We now step back and consider this final decision. In particular, we consider whether the NEO and NGO would be better advanced by continuing the 2018 Instrument (with parameters updated for latest data) or whether we can improve against the objectives by making changes.

Continuing the 2018 approach has aspects to commend it. Much of the data we have available to inform our decision is at similar levels now compared with 2018. The CRG has submitted that we should employ a principle of a high bar for change. While we do not use the same terminology proposed by the CRG, we do accept the general principle. Stability and predictability of the regulatory framework and its application is important for both investors and consumers. Stability and predictability promote efficient investment because investors and consumers can make commitments with confidence. They can reasonably foresee how they will be treated under the regulatory framework.

Although we are broadly satisfied with how the 2018 Instrument has performed, the review process for the 2022 RoRI suggested we further investigate some aspects and consider options.

For example, we identified an option for estimating the market risk premium that may give a more stable return on equity over time (although that is not our preferred choice). This option involves using a combination of historical excess returns and outcomes from a dividend growth model to vary the market risk premium at each regulatory decision. This option may introduce a more forward-looking element if dividend growth models are able to reflect future changes in market conditions. This option also means our return on equity may not move one-for-one with the risk-free rate. We also explored changing the term on equity to match the regulatory control period.

However, we think our current approach to estimating the market risk premium is a safer option because it is a well understood approach and can be readily estimated in advance. It has the advantage of allowing the return on equity to vary with movements in market conditions (as reflected in movements in the risk-free rate). Our current approach also avoids implicitly introducing a relationship between the market risk premium and risk-free rate when such a relationship cannot be estimated with confidence. We also decided to continue our current approach to the term on equity.

To assist in resolving these choices we have returned to our overarching principle:

> an unbiased estimate of the expected efficient return, consistent with the relevant risks involved in providing regulated network services.

1 Our review process

The current Rate of Return Instrument was published on 17 December 2018 (the 2018 Instrument). We are cognisant that the Rate of Return Instrument we publish is a binding instrument that will determine the allowed rate of return on capital in regulatory determinations for the following 4-year period. Given its material impact and binding nature, we need to consider the evidence before us thoroughly and ensure that stakeholders are offered the opportunity to present their perspectives. We consider it best practice to establish a clear process and to improve on the process used in the 2018 review.

On 4 November 2019 we released a consultation paper that proposed a pathway to the 2022 Instrument, together with a report by The Brattle Group summarising stakeholder feedback on the process used to set the 2018 Instrument.[19] Having considered submissions on our consultation paper and stakeholder feedback received by The Brattle Group on our 2018 Instrument making process, in May 2020 we published our position paper, *Pathway to the 2022 Instrument* (Pathway to 2022).[20] That paper focused on the decision-making process, not the content of the Instrument. It provided a high-level outline of the decision-making stages and our proposed timelines for them and outlined high-level roles for various entities involved in the consultation and review process. We also committed to publishing annual updates on key data series informing the rate of return and a series of working papers on technical aspects of the rate of return ahead of the 2022 Instrument making stage.

Our steps and processes include those prescribed in the National Electricity Law (NEL) and National Gas Law (NGL), such as the concurrent evidence sessions[21] and the Independent Panel review.[22]

We also established the Consumer Reference Group (CRG) to advise us on consumer engagement, to actively engage consumers and provide us with their insights.[23] The CRG is an important element in providing a strong consumer perspective in the consultation process given the challenges (such as resourcing, coordination and information asymmetry) facing individual consumers seeking to be heard.

In August 2021 we published our position paper on the Pathway to 2022 process, focusing on the Independent Panel and concurrent evidence sessions.[24] The concurrent evidence sessions allowed the AER Board to engage with expert views and obtain an overview to assist the Board to make its decision.

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19 AER, *AER Consultation Paper – Pathway to 2022 Rate of Return Instrument*, November 2019; The Brattle Group, *Stakeholder Feedback on the AERs Process for the 2018 Rate of Return Instrument*, 27 June 2019

20 AER, *Pathway to 2022 Rate of Return Instrument – Position Paper*, May 2020

21 NEL, s18M; NGL, s30H

22 NEL, s18P; NGL, s30K

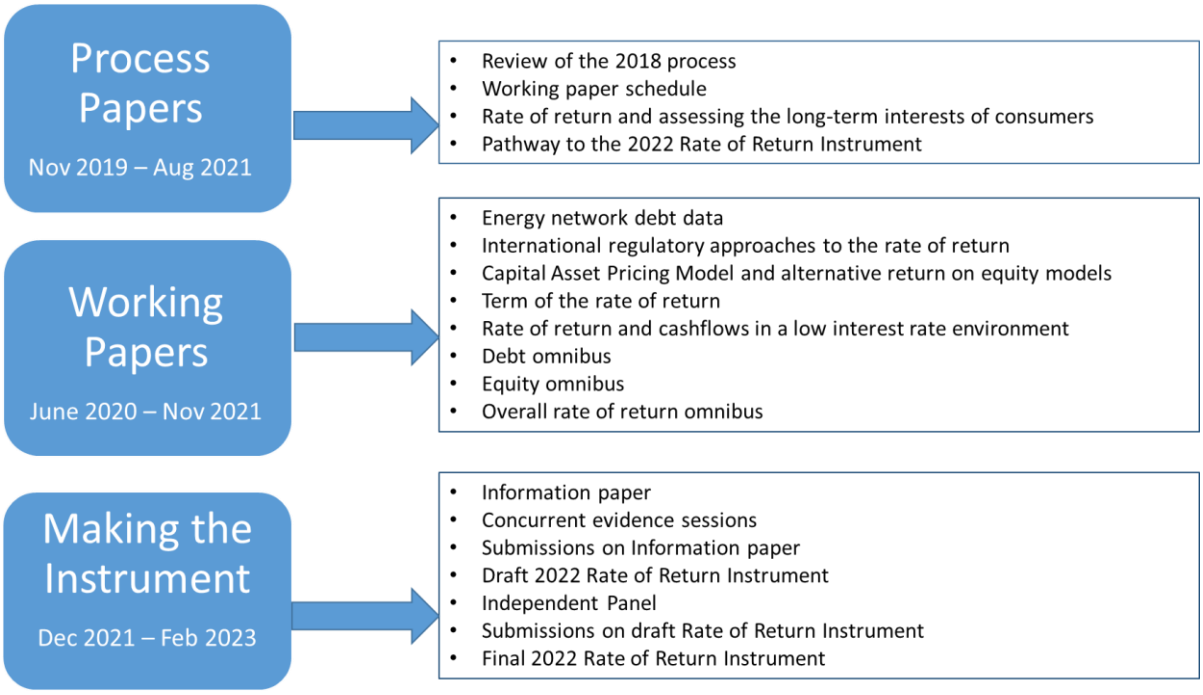
23 NEL, s18M(1) and s18N; NGL, s30H(1) and s30I

24 AER, *Pathway to 2022 Rate of Return Instrument – Position Paper*, August 2021

Additionally, we established 2 other stakeholder groups, the Investor Reference Group (IRG) and Retailer Reference Group (RRG). These groups provided us more regular feedback from these stakeholders and have allowed us to hear different perspectives.

The major elements of our Pathway to 2022 are illustrated in Figure 1.1.

Figure 1.1 Elements of the Pathway to the 2022 Rate of Return Instrument



Working papers

Our approach to getting to the draft decision via our Pathway to 2022 was to transparently set out our thinking on the specific technical issues discussed in the working papers as the papers progressed through stakeholder engagement. All our working papers included a draft paper step, which provided us an opportunity to hear from stakeholders before finalising the papers. This draft paper stage included written submissions as well as a public forum, where stakeholders discussed the material in our draft papers.

We covered 8 discrete topics in our working paper series. They were:

1) *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.[25]

2) *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

[25] AER, *Energy Network Debt Data – Final working paper*, 18 November 2021

set the rate of return. The paper outlined some ways this might influence the rate of return in our decisions.[26]

3) *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.[27]

4) *Term of the rate of return* – This 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.[28]

5) *Rate of return and cashflows in a low interest rate environment* – This paper considered the consequences of lower interest rates and investigated whether we need to adjust our approach to the rate of return.[29]

6) *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.[30]

7) *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.[31]

8) *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.[32]

The last 3 topics were separately published at the draft stage but combined to one omnibus final working paper.[33]

Our working paper series allowed us to explore a large number of issues across the breadth of rate of return and has provided an important check that we have not missed any key aspects requiring consideration and potential change. Through our working papers, we were genuinely looking for issues that might be impacted by new theoretical and empirical evidence since the previous review. Through the working paper series, we were able to transparently put forward positions on our preliminary thinking and seek to narrow down the issues in contention. In some instances, we were satisfied to put forward preferred or

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[26] AER, *International regulatory approaches to rate of return – Final working paper*, 16 December 2020.

[27] AER, *CAPM and alternative return on equity models – Final working paper*, 16 December 2020.

[28] AER, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment - Final working paper*, September 2021.

[29] AER, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment – Final working paper*, September 2021.

[30] AER, *Rate of return - Overall rate of return draft working paper*, July 2021.

[31] AER, *Rate of return - Equity draft working paper*, July 2021.

[32] AER, *Rate of return - Debt draft working paper*, July 2021.

[33] AER, *Rate of return - Final omnibus paper*, December 2021.

preliminary positions on our thinking. Where we considered an issue needed more analysis and wider input, we indicated an open position.

Our working papers traversed a large number of issues, but we managed to narrow the issues to a small number of matters of methodology. While there was some debate about whether a specific issue needed consideration via a working paper, stakeholders largely agreed with our consultative open engagement approach to the narrowing of issues.

Once we had completed the first 5 working papers listed above, we set out all of the issues explored and our preliminary thinking on each of them in our *Overall rate of return draft working paper*.[34] Thereafter, having considered stakeholder submissions, we identified that the issues that had some disagreements were narrowed down to 6 key topics. Our omnibus final working paper focused on these 6 topics.[35]

In December 2021 we published our information paper, which was the first paper in the 'Making the Instrument' set of papers which take us from the positions set out in the individual working papers to the final 2022 Instrument. The purpose of this paper was two-fold:

- to set out priority topics for the concurrent evidence sessions
- to call for submissions to inform our draft Rate of Return Instrument.

Draft decision

On 16 June 2022 we published our Rate of Return Instrument 2022 draft decision.[36] This included our Draft 2022 Rate of Return Instrument and Explanatory Statement published 6 months before making our 2022 Instrument. We invited submissions as required under the NEL and NGL.[37]

After publishing our draft decision, we held 2 public forums for stakeholders to engage with us. The first, on 27 July 2022, was mainly for us to explain the key points, approach and rational for arriving at our draft decision. The second, on 7 September 2022, provided a platform for stakeholders to tell us about the key points from their submissions on the draft decision. We received 23 submissions, which are listed in Appendix A.[38] Appendix B contains a summary of the key points contained in those submissions.

The review of our draft Instrument by an Independent Panel – which was specifically constituted for this purpose – is an important part of the process of making the 2022

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[34] AER, *Rate of return - Overall rate of return draft working paper*, July 2021.

[35] AER, *Rate of return - Final omnibus paper*, December 2021.

[36] AER, Rate of Return Instrument 2022 draft decision.

[37] NEL, s18O(1); NGL, s30J(1).

[38] Stakeholder presentations and submissions on Rate of Return Instrument 2022 draft decision.

Instrument.[39] They are a highly capable group with extensive experience and standing in their fields, who collectively possess a range of capabilities including:

- finance and economics
- regulatory experience
- experience in consumer perspectives
- institutional investment experience.[40]

The Independent Panel's work is intended to support the AER to make the best possible Instrument by reviewing the draft Instrument and the information available to us in making the 2022 Instrument. The questions for the Independent Panel are:

- In the panel's view, is the draft Instrument supported by evidence and reasons, taking into account competing factors such as accuracy, consistency, accessibility and transparency?
- In the panel's view, is the draft Instrument likely to contribute to the achievement of the National Electricity Objective and National Gas Objective?

The Independent Panel's responses are:

> The Panel's conclusion regarding the first question asked by AER is that the draft RORI is supported by evidence and reasons, subject to the reservations regarding specific issues which are summarised in the High Level Review section of this report.
>
> The recommendations of the Panel, listed at the end of this Executive Summary, suggest how the specific reservations should be addressed.
>
> The Panel's view regarding the second question asked is that the draft RORI is likely to contribute to the Energy Objectives based on the process that has been conducted, the general way the AER has communicated and used evidence, and the transparency with which it has operated.
>
> The Panel concludes that the AER should undertake and present in its final ES [Explanatory Statement] a more conclusive analysis of the efficacy of the RORI since its first creation in 2018. This is crucial to assure stakeholders, particularly consumers, that they can be confident regarding the contribution of the RORI to their long-term interests and hence to the Energy Objectives.
>
> Subject to the recommendations set out below, the Panel consider the ES and RORI fulfil their role at this stage of the current review of the RORI. [41]

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[39] NEL, s18P; NGL, s30K.

[40] The members of the Independent Panel and their biographies are available here.

[41] Independent Panel Report, *AER Draft Rate of Return Instrument*, pp.7-8.

The Independent Panel made several recommendations, which are listed in Appendix C. Of these, the central recommendations are that the AER:

4. Considers the extent to which the recent data used in the analysis of MRP and beta have been distorted by the temporary policy responses to the COVID-19 pandemic – extraordinarily low interest rates and unprecedented quantitative easing – which are now being rapidly reversed. Decisions in the draft RORI should be re-assessed considering this reversal.
5. Undertakes a more conclusive analysis of the efficacy of the RORI, including for example by:
    a) Expediting the process of consulting on the decomposition of the RAB ratio, which is a central part of its cross checks analysis
    b) Assessing the incentive the RORI provides for investment by analysing regulated companies' applications for approval of capital expenditure that is discretionary e.g. increases reliability above minimum quality standards. Since such expenditure is not mandatory, applications to undertake it are evidence that the allowed rate of return on it is attractive
    c) Examining other regulators' ways of addressing this issue.
6. Discusses the effect of the RORI under a wider range of scenarios so as to better inform consumers regarding the potential impact of the regulatory system combined with changes in macroeconomic variables on energy bills and thus help to retain their confidence.[42]

We have considered the Independent Panel's recommendations and addressed them in the relevant sections of this final decision.

Consequent to the Independent Panel's core recommendations noted above we sought external advice. We engaged CEPA to update its May 2022 report on Regulated Asset Base (RAB) multiples and consider whether network companies' discretionary capital expenditure proposal could provide evidence about the attractiveness of the allowed rate of return. We also sought advice from the Reserve Bank of Australia (RBA) and the Commonwealth Treasury (The Treasury) about the extent to which some of the rate of return parameters may have been impacted by the low interest rates and quantitative easing which is now being unwound.

We published CEPA's report and the advice from The Treasury and invited submissions from stakeholders. These submissions and a summary of the key points are listed in Appendix A.[43] To allow us to fully consider these submissions and not close off any options available to us in relation to using the historical excess returns data available to us, we delayed our 2022 Rate of Return Instrument decision until February 2023. Whilst this delay will change the "4th anniversary date" for the subsequent 2026 Rate of Return Instrument, our intention is to publish it in December 2026 and realign the timing going forward. We consider realigning to

[42] Independent Panel Report, *AER Draft Rate of Return Instrument*. p.9.

[43] Stakeholder presentations and submissions on Rate of Return Instrument 2022 draft decision.

December is reasonable to alleviate concerns of network service providers that are required to submit regulatory proposals in January and also manage administrative practicalities of finalising regulatory determinations in April and annual pricing proposals.

Following the recent delisting of Spark Infrastructure Group and AusNet Services, during this review process we noted that going forward we are likely to have only one listed entity available to us for analysis. Consequently, in the next review we intend to review the information available to inform our beta estimate.

As recommended by the Independent Panel, we will do further work on how a weighted trailing averaged would be implemented before we consult on this topic again in preparation for the 2026 Rate of Return Instrument review.

Whilst this review is now complete, we recognise the importance of creating opportunities for stakeholders to tell us how we might approach our task next time and we will enable this in due course.

Table 1.1 sets out the issues we canvassed, their position in our 2018 Instrument and how they progressed through our working paper series and draft decision. Our positions fell into:

- those where we have a preferred position (blue highlight / A)
- those where we have a preliminary position (yellow highlight / B)
- those where we have taken no position and are seeking views (green highlight / C).

The table also sets out the positions in this final decision and whether any have changed from the draft decision.

Table 1.1 Rate of return issue and positions

Working paper	2018 Instrument position	Positions published as at July 2021	Proposed positions on the 6 focus issues – December 2021	2022 draft Instrument positions	2022 final Instrument positions
Energy network debt data	Use the EICSI as a crosscheck for benchmark credit rating.	A EICSI is to be used directly to determine the benchmark blend of A and BBB bonds.	B Preliminary position is to further analyse and consult on whether the residual outperformance identified, or departures on term, should be adjusted for and what form such an adjustment may take.	Use the EICSI as a 'sense check' on our benchmark return on debt.	No change from draft decision.
	Use the weighted average term to maturity at issuance (WATMI) as the floor of possible options for the benchmark debt term.	B An updated WATMI, combined with the more detailed drawdown data, may be useful in determining a benchmark debt term.	B Preliminary position that the WATMI can be useful in determining the benchmark debt term. Open to considering change to the benchmark debt term further but note the practical difficulties and further analysis required.	Analysis of industry debt data does not show clear evidence that the current benchmark of 10 years is no longer an appropriate benchmark term. Maintain the benchmark return on debt term at 10 years.	No change from draft decision.
International regulatory approaches to the rate of return	Review of Instrument to be held every 5 years consistent with legislation. Annual updates to be undertaken each year.	A Review of Instrument to be held every 4 years consistent with legislation. Annual data updates published.	–	Review of Instrument to be held every 4 years consistent with legislation. Annual updates to be undertaken annually.	No change from draft decision.
	Set the risk-free rate only at the beginning of each reset period.	A Set the risk-free rate only at the beginning of each reset period.	–	Set the risk-free rate only at the beginning of each reset period.	No change from draft decision.
	Make no adjustments for expected incentive scheme outcomes.	A Make no adjustments for expected incentive scheme outcomes.	–	Make no adjustments for expected incentive scheme outcomes.	No change from draft decision.

Working paper	2018 Instrument position	Positions published as at July 2021	Proposed positions on the 6 focus issues – December 2021	2022 draft Instrument positions	2022 final Instrument positions
CAPM and alternative return on equity models	Standard Sharpe-Lintner CAPM model used as the basis for determining the return on equity.	A Standard Sharpe-Lintner CAPM model used as the basis for determining the return on equity.	–	Standard Sharpe-Lintner CAPM model used as the basis for determining the return on equity.	No change from draft decision.
Term of the rate of return	The term of equity and debt were of 10-year duration.	B It is unnecessary to align the term of equity, debt and expected inflation.	A Preferred position is that the terms of equity, debt and inflation do not have to be of the same value.	Terms of equity, debt and inflation do not have to be of the same value.	No change from draft decision.
	10-year term for return on equity, consistent with life of underlying asset.	C 10-year term consistent with existing practice or 5-year term for return on equity, consistent with length of the regulatory period.	C This topic remains open and we will continue to consult on this topic as part of our 2022 review including at the concurrent evidence sessions. We still considered that there are merits with matching the equity term to the length of the regulatory period despite not receiving strong stakeholder support.	Term for return on equity that is consistent with length of the regulatory period.	10-year term consistent with existing approach which is a change from draft decision.
	Return on debt determined through a trailing average approach.	A Return on debt determined through a trailing average approach.	A Preferred position is to estimate the return on debt through a trailing average approach.	Return on debt determined through a trailing average approach.	No change from draft decision.
	10-year term for return of debt.	B Match the term of the return on debt to that of an efficient firm's borrowing.	B Preferred position is to match the term of the return on debt to that of an efficient firm's borrowing based on Dr Lally's advice.	10-year term for return of debt.	No change from draft decision.

Working paper	2018 Instrument position	Positions published as at July 2021	Proposed positions on the 6 focus issues – December 2021	2022 draft Instrument positions	2022 final Instrument positions
			Preliminary position is that the WATMI can be useful in determining the benchmark term but note the practical difficulties of change and further analysis required.		
Rate of return and cashflows in a low interest rate environment	–	A We are currently in a low interest rate environment.	–	–	–
		A 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.	A Commonwealth Government Securities are an appropriate proxy for the riskless investment for our purposes.	–	Commonwealth Government Securities are an appropriate proxy for the riskless investment for our purposes.	No change from draft decision.
	Measures of financeability are not used directly when setting the rate of return.	B Measures of financeability are not used directly when setting the rate of return.	B Consistent with our preliminary position on overall crosschecks, our preliminary position is that we intend to review financeability tests as a sense check on our overall allowed rate of return.	Measures of financeability are not used directly when setting the rate of return.	No change from draft decision.
Equity omnibus	Use comparator set of 9 Australian firms to estimate equity beta.	B Use comparator set of 9 Australian firms to estimate equity beta.	A Our preliminary position is to maintain the current approach for estimating beta. This includes retaining the	Use comparator set of 9 Australian firms to estimate equity beta.	No change from draft decision.

Working paper	2018 Instrument position	Positions published as at July 2021	Proposed positions on the 6 focus issues – December 2021	2022 draft Instrument positions	2022 final Instrument positions
			current comparator set. We need to lay the foundation for future reviews to consider approaches that may involve being informed by international energy firms and domestic infrastructure firms.		
	Give the greatest weight to equity beta estimates from the longest estimation period.	A Give the greatest weight to equity beta estimates from the longest estimation period.	A Our preliminary position is to continue to place most weight on the longest period estimates.	Give the greatest weight to equity beta estimates from the longest estimation period.	No change from draft decision.
	Set a forward-looking market risk premium.	A Set a forward-looking market risk premium.	–	Set a forward-looking market risk premium.	No change from draft decision.
	Diminished confidence in the use of dividend growth models.	C Consider if the dividend growth model might be used to inform the relationship between the MRP and risk-free rate.	C Open to considering the use of estimates from the dividend growth model to inform our point estimate of the MRP within the range observed from the evidence we look at.	In determining the MRP, we do not use estimates from the dividend growth model to inform our point estimate of the MRP within the range observed from the evidence we look at.	No change from draft decision in relation to using estimates from the dividend growth model. The MRP trends derived from dividend growth models have informed us but with lesser persuasive evidentiary value.
		–	C Open to considering the use of estimates from the dividend growth model estimate(s) alongside the historical excess returns estimate by applying a method to give weight to both sets of estimates.	Although we have considered using dividend growth model estimate(s) alongside the historical excess returns estimate by applying a method to give weight to both sets of estimates, given features of its application remain unresolved at this point in time we do not use this	No change from draft decision.

Working paper	2018 Instrument position	Positions published as at July 2021	Proposed positions on the 6 focus issues – December 2021	2022 draft Instrument positions	2022 final Instrument positions
				approach to determine the MRP.	
	In determining the MRP, consider the historical excess return, both the arithmetic and geometric mean MRP, and MRP surveys and conditioning variables.	A In determining the MRP, consider the historical excess return, both the arithmetic and geometric mean MRP, and MRP surveys and conditioning variables.	C Open to considering the historical excess return, both the arithmetic and geometric mean MRP, and MRP surveys and conditioning variables.	In determining the MRP, we have considered the historical excess returns (HER) using both the arithmetic and geometric mean, MRP surveys and conditioning variables.	No change from draft decision. We consider data from HER information has the most persuasive evidentiary value.
	No reliance placed on the Wright approach.	C Consider the potential for a relationship between the MRP and risk-free rate, and whether an appropriate implementation method is available.	A Not pursue the potential for a relationship between the MRP and risk-free rate, and whether an appropriate implementation method is available.	No reliance placed on the Wright approach.	No change from draft decision.
	Allow networks flexibility in nominating the averaging period for the risk-free rate.	A Allow networks flexibility in nominating the averaging period for the risk-free rate.	–	Allow networks flexibility in nominating the averaging period for the risk-free rate.	No change from draft decision.
	Averaging period was between 20 and 60 consecutive business days within a window running from between 3 and 7 months prior to the commencement of the regulatory control period.	A Shift the allowed nomination period window for the risk-free rate forward in time by one month to lessen timing issues.	–	Averaging period was between 20 and 60 consecutive business days within a window running from between 4 and 8 months prior to the commencement of the regulatory control period.	No change from draft decision.
	Use crosschecks to inform our overall return on equity point estimates.	B Use crosschecks to inform our overall return on equity point estimates.	–	Use crosschecks to inform our overall return on equity point estimates.	No change from draft decision.

Working paper	2018 Instrument position	Positions published as at July 2021	Proposed positions on the 6 focus issues – December 2021	2022 draft Instrument positions	2022 final Instrument positions
	Adopt a single benchmark for electricity and gas businesses.	B Adopt a single benchmark for electricity and gas businesses.	A Our preliminary position is to continue to adopt a single benchmark for electricity and gas businesses and to consider gas network stranding risk under the broader regulatory framework. We are open to considering further evidence on this matter.	Adopt a single benchmark for electricity and gas businesses.	No change from draft decision.
	Do not adjust for 'low beta bias'.	–	A Our preliminary position is to not adjust for 'low beta bias'.	Do not adjust for 'low beta bias'.	No change from draft decision.
Debt omnibus	Application of a simple trailing average approach to determine the return on debt, with a 10% weighting for each of the 10 years.	C Seek views on weighting trailing average approach by capex spending.	C We will continue to explore and analyse the available options: • Option 1: Maintain the current (simple trailing average) approach. • Option 2: Weighted trailing average that applies to every regulated business. Weights are based on the debt issuance assumptions in the PTRM. • Option 3: Weighted trailing average only starts to apply when a large increase in the regulatory asset	Application of a simple trailing average approach to determine the return on debt, with a 10% weighting for each of the 10 years.	No change from draft decision.

Working paper	2018 Instrument position	Positions published as at July 2021	Proposed positions on the 6 focus issues – December 2021	2022 draft Instrument positions	2022 final Instrument positions
			base (RAB) (and therefore debt issuances) is forecast. We would need to set a threshold for the shift to a weighted trailing average. Once the weighted trailing average is triggered, weights are based on the debt issuance assumptions in the PTRM. • Option 4: Weighted trailing average that applies to all TNSPs. Weights are based on the debt issuance assumptions in the PTRM. Our preliminary position is that if a weighted trailing average (using any of the above options) was to be adopted, it should be based on the debt issuance assumptions in the PTRM.		
	The debt averaging period must start no more than 16 months before the regulatory period and finish no less than 4 months prior to the commencement of the regulatory period.	A Change timing so the debt averaging period must start no more than 17 months before the regulatory period and finish no less than 5 months prior to the	–	The debt averaging period must start no more than 17 months before the regulatory period and finish no less than 5 months prior to the commencement of the regulatory period.	No change from draft decision.

Working paper	2018 Instrument position	Positions published as at July 2021	Proposed positions on the 6 focus issues – December 2021	2022 draft Instrument positions	2022 final Instrument positions
		commencement of a regulatory year.			
	Included only pure debt instruments in the EICSI, excluding hybrids, working capital and bridging loans, any instrument with a term under 12 months, and any instrument not used to finance the RAB.	A Included only pure debt instruments in the EICSI, excluding hybrids, working capital and bridging loans, any instrument with a term under 12 months, and any instrument not used to finance the RAB.	–	Include only pure debt instruments in the EICSI, excluding hybrids, working capital and bridging loans, any instrument with a term under 12 months, and any instrument not used to finance the RAB.	No change from draft decision.
	Used the EICSI purely as a crosscheck for benchmark credit rating.	B Implement the EICSI by adjusting the weights of A and BBB data to match network cost of debt over the past 4 years.	B Preliminary position is to further analyse and consult on whether the residual outperformance identified, or departures on term should be adjusted for, and what form such an adjustment may take.	Use the EICSI as a 'sense check' on our benchmark return on debt.	No change from draft decision.
	Instrument set out a number of contingencies to ensure that the formulaic application of the Instrument could be applied in instances where all relevant debt data was not available.	A Continuation of 2018 approach.	–	Continuation of 2018 approach.	No change from draft decision.
	Debt raising costs collected based on historical criteria.	A Debt raising costs collected through a debt RIN to be issued in 2021.	–	Continued collection of debt raising cost data through debt RINs. Have not been considered as part of the 2022 Instrument as they form part of the regulated operating expenditure and do not contribute to the rate of return.	No change from draft decision.

Working paper	2018 Instrument position	Positions published as at July 2021	Proposed positions on the 6 focus issues – December 2021	2022 draft Instrument positions	2022 final Instrument positions
	Continued use of the RBA and Bloomberg data providers, while adding Thomson Reuters.	A Continued use of the RBA, Bloomberg and Thomson Reuters data providers.	–	Continued use of the RBA, Bloomberg and Thomson Reuters (Refinitiv) data providers.	No change from draft decision.
		B Consider the merits of any additional debt data providers.	–	Continued use of the RBA, Bloomberg and Thomson Reuters (Refinitiv) data providers.	No change from draft decision.
	Debt averaging periods must be between 10 days and a year in length and not overlap with each other.	A Debt averaging periods must be between 10 days and a year in length and not overlap with each other.	–	Debt averaging periods must be between 10 days and a year in length and not overlap with each other.	No change from draft decision.
	Nominal vanilla WACC, estimated as a weighted average of the return on equity and return on debt.	A Nominal vanilla WACC, estimated as a weighted average of the return on equity and return on debt.	–	Nominal vanilla WACC, estimated as a weighted average of the return on equity and return on debt.	No change from draft decision.
Overall rate of return omnibus	Place primary reliance on market value estimates and the continued use of existing observation periods when estimating gearing.	A Place primary reliance on market value estimates and the continued use of existing observation periods when estimating gearing.	–	Place primary reliance on market value estimates and the continued use of existing comparator averages over 5, 10 and 16-year observation periods.	No change from draft decision.
	In calculating gearing, hybrid securities excluded from Envestra and Spark Infrastructure, but included for AusNet services.	C Seek views on the inclusion of hybrid securities for gearing.	–	Exclude hybrid securities for empirical estimates of gearing.	No change from draft decision.
	After reviewing data, consistency with previous use of 60% gearing.	B Consider adjusting gearing to more closely align with market data.	–	Maintain a gearing ratio of 60% for the 2022 Instrument.	No change from draft decision.

Working paper	2018 Instrument position	Positions published as at July 2021	Proposed positions on the 6 focus issues – December 2021	2022 draft Instrument positions	2022 final Instrument positions
	Distribution rate for imputation credits obtained through the use of ASX50 firms, utilisation rate from ABS wealth data.	A Distribution rate for imputation credits obtained through the use of ASX50 firms, utilisation rate from ABS wealth data, pending investigation of ATO data.	–	Distribution rate for imputation credits obtained through the use of ASX50 firms, utilisation rate from ABS wealth data.	No change from draft decision regarding the source of data. The rounding policy adopted in our draft decision has been changed to make consistent with other parts of our decision and we use the 10-year average utilisation rate estimate.
	Assume that non-resident investors assign no value to imputation credits.	B Assume that foreign non-resident investors assign no value to imputation credits.	–	Assume that non-resident investors assign no value to imputation credits.	No change from draft decision.
	Crosschecks have limitation but can provide contextual information. However, they are not useful in informing the rate of return directly.	C Seeking views on the use of crosschecks.	B Our preliminary position is to use overall crosschecks as a sense check on our overall allowed rate of return. That is, gauge whether the regulatory allowance is likely to be sufficient; alternatively, evidence is used to assist with identifying potential issues with our regulatory regime and areas of further research and inquiry. We intend to review RAB multiples, scenario testing and financeability tests. To the extent any information can be drawn, RAB multiples may act as a trigger for investigation and indicate if the total compensation (inclusive of the rate of	Crosschecks have limitations but all are useful as a sense check on our overall rate of return. Our primary focus is on RAB multiples, scenario testing and financeability tests. Historical profitability, investment trends, other regulators' rate of return and other practitioners' discount rates have greater limitations and have less value than RAB multiples, scenario testing and financeability.	No change from the draft decision, We have considered all the cross checks and have taken them into account when making our overall decision. Regulated asset base (RAB) multiples, financeability tests and scenario testing encouraged us to investigate further. Historical profitability, investment trends, other regulators' rate of return and analysts discount rates, at this time did not prompt us to investigate further.

Working paper	2018 Instrument position	Positions published as at July 2021	Proposed positions on the 6 focus issues – December 2021	2022 draft Instrument positions	2022 final Instrument positions
			return) provided to investors is sufficient. We think historical profitability, investment trends, other regulators' rate of return and other practitioners' discount rates have greater limitations and are of less value than RAB multiples, scenario testing and financeability.		

2 How the Instrument contributes to the legislative objectives

2.1 Key concepts in the legislative objectives

We develop and publish the Rate of Return Instrument in accordance with the legislative framework set out in the National Gas Law (NGL) and National Electricity Law (NEL). Under this legislative framework we must review our Instrument and make a new one to replace the reviewed Instrument every 4 years.[44] The Instrument must contribute to the achievement of the legislative objectives[45].

In section 2.1 we discuss the key concepts in the legislative objectives that guide our decision-making on the allowed rate of return.

In section 2.2 we set out our view on benchmark efficiency in the context of setting the rate of return.

In section 2.3 we consider how we exercise our judgement and measure success in setting the rate of return.

In section 2.4 we set out our considerations of the risks involved in the provision of regulated energy network services and how this relates to the allowed rate of return.

The material in this chapter is largely unchanged from the views we expressed in making the 2022 draft Instrument, although we have responded to a number of stakeholder submissions.[46] The views here build on the views we expressed when making our 2018 Instrument.[47]

2.1.1 National gas and electricity objectives

The legislation governing our regulation of energy network services currently provides multiple objectives and considerations for our decision on the Instrument. These are found in the:

- national gas and electricity objectives
- revenue and pricing principles.

In this section we discuss what these provisions entail, how they impact on our decision-making and our views on the common concepts that apply across all of the legislative objectives and principles.

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[44] NEL, s18U; NGL s30P.

[45] NEL, s18I(3); NGL, s30D(3).

[46] See section 2.3.2 below.

[47] AER, *Rate of return instrument - Explanatory statement*, December 2018, pp 27-56.

2.1.1.1 National gas and electricity objectives

The National Electricity Objective (NEO) and the National Gas Objective (NGO) establish the ultimate objective of our decision-making.[48] In each case, the objective is to promote efficient investment in, and efficient operation and use of, the relevant electricity or gas services for the long-term interests of consumers with respect to the price, quality, safety, reliability and security of supply.[49]

We may make an instrument only if satisfied the instrument will, or is most likely to, contribute to the achievement of the national electricity and gas objectives to the greatest degree.[50]

To lay a foundation for our review, in May 2021 we prepared the *Rate of return assessing the long-term interests of consumers position paper*.[51] This paper set out our views about what the NEO and NGO mean in the context of setting the expected rate of return. In particular, we discussed how the concept of the long-term interests of consumers, mentioned in the NEO and NGO, features in setting the expected rate of return.

In forming our position, we took into account the views expressed on this topic by the Consumer Reference Group (CRG) and Energy Networks Australia (ENA).

In the position paper we developed a guiding principle to aid us in developing an instrument that best achieves the NEO and NGO. That guiding principle is that the expected rate of return should be:

> an unbiased estimate of the expected efficient return, consistent with the relevant risk involved in providing regulated network services.[52]

2.1.2 Revenue and pricing principles

In support of the NEO and NGO, collectively the national energy objectives, the NEL and NGL set out revenue and pricing principles.[53] These principles underlie the achievement of the national energy objectives and we have considered these principles in making our decision. In making an instrument, the AER must have regard to the revenue and pricing principles.[54]

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

49 The NEO contains an additional objective of the reliability, safety and security of network system: see NEL s.7.

50 NEL, s. 18I(3); NGL, s. 30D(3).

51 AER, *Rate of return, Assessing the long term interests of consumers* Position paper, May 2021.

52 AER, *Rate of return, Assessing the long term interests of consumers* Position paper, May 2021, p. 1.

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

54 NEL, s. 18I(5)(a); NGL, s. 30D(5)(a).

The revenue and pricing principles are expressed in similar terms for both electricity and gas. These are discussed in Table 2.1 and our considerations of these has not changed since we made the current Instrument in 2018.

Table 2.1 Revenue and pricing principles in the NEL and NGL

Revenue and pricing principle	AER consideration
A service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs in: • providing regulated services; and • complying with a regulatory obligation or requirement or making a regulatory payment.	We consider that a reasonable opportunity to recover efficient costs of providing regulated services is achieved when the rate of return satisfies the 'NPV=0' condition. The NPV=0 condition means that the ex-ante expectation is that over the life of an investment the expected cashflow from the investment meets all the operating expenditure and corporate taxes, repays the capital invested and there is just enough cashflow left over to cover investors' required return on the capital invested. We consider that the efficient cost of capital is reflected in market rates. We consider that benchmarking and incentive regulation provides appropriate incentives for efficient costs. This principle refers to the efficient costs of providing regulated services. An efficient cost of capital must be commensurate with the risk of providing regulated services.
A service provider should be provided with effective incentives in order to promote economic efficiency with respect to the regulated services the operator provides. The economic efficiency that should be promoted includes: • efficient investment in the network with which the operator provides regulated services; and • the efficient provision of regulated services; and • the efficient use of the system with which the operator provides regulated services.	Effective incentives for efficiency are provided through benchmarking and incentive regulation, and the use of market data as benchmarks. An efficient cost of capital must be commensurate with the risk of providing regulated services.
Regard should be had to the regulatory asset base adopted • in any previous determination or arrangement, or • in the Rules.	We take into account the regulatory asset base when determining an allowed rate of return through consideration of the NPV=0 condition. This means that the rate of return should contribute to an ex-ante expectation that over the life of an investment the expected cashflow from the investment repays the capital invested.
A price or charge for the provision of a regulated service should allow for a return commensurate with the regulatory and commercial risks involved in providing the service.	An efficient cost of capital must be commensurate with the risk of providing regulated services. Our consideration of the risk of providing regulated services is set out in greater detail in section 2.4.
Regard should be had to the economic costs and risks of the potential for under and overinvestment by a regulated network service provider in the relevant system.	A rate of return that is too high may encourage overinvestment, while a rate of return that is too low may encourage underinvestment. Overinvestment may not be in the long-term interests of consumers with respect to price. Underinvestment may not be in the long-term interest of consumers with respect to quality of service.
Regard should be had to the economic costs and risks of the potential for under and over-utilisation of the relevant system.	Under-utilisation may be a result of overinvestment and over-utilisation may be a result of underinvestment. A rate of return that is too high may encourage overinvestment and a rate of return that is too low may encourage underinvestment.

Source: NEL; NGL; AER analysis

2.1.3 Balancing concepts in the revenue and pricing principles

Each of these principles has an important guiding role when determining an appropriate way to calculate the rate of return to achieve the national gas and national electricity objectives. For example, if the rate of return is set at a rate that is too low to promote efficient investment in infrastructure, it will lead to underinvestment. It may not allow a provider a reasonable opportunity to recover at least its efficient costs in providing services or complying with regulatory obligations. It will not provide effective incentives for efficient investment in, provision for, or use of services. It will not provide for a return that is likely to be commensurate with the commercial and regulatory risks. It may lead to various economic costs and risks that might arise from underinvestment in the network system. These factors would compromise the realisation of the national energy objectives.

Similarly, if the rate of return is set too high, it will provide an incentive to overinvest in network infrastructure. It will not reflect a return that is commensurate with the regulatory and commercial risks. It will not promote efficient investment in the network system and it is likely to lead to under-utilised investment in regulated assets.

There is a balance involved in having regard to these principles. We aim to determine a rate of return and a value for imputation credits that will provide the appropriate investment incentives for neither overinvestment nor underinvestment in assets and will achieve an appropriate balance of sustainable long-term consumer outcomes in respect to price, quality, safety, reliability and security of supply. This task cannot be undertaken mechanically. Instead, it requires the exercise of judgement looking to future outcomes. The objectives and principles guide our assessment of the evidence.

2.1.4 Key concepts in the legislative objectives and principles

Certain common repeated concepts within these legislative objectives and principles are particularly relevant to setting the rate of return and the value of imputation credits. We adopt standard, well-established regulatory economic approaches to our understanding of each these concepts.

Efficiency is the first of these concepts. For example, the legislative objectives provide that we must have regard to:

- efficient investment in, and efficient operation and use of, the relevant electricity or gas services for the long-term interests of consumers with respect to a number of service outcomes[55]
- a reasonable opportunity to recover at least the efficient costs in providing certain regulated services and complying with regulatory obligations requirements or making regulatory payments[56]

[55] NEL, s7; NGL s23

[56] NEL s7A(2); NGL s24(2)

- effective incentives in order to promote economic efficiency with respect to certain regulated services.[57]

Economists typically think of efficiency in 3 dimensions – productive, allocative and dynamic. Table 2.2 sets out how this applies in the context of the rate of return.

Table 2.2 Application of efficiency concepts to rate of return

Dimension of efficiency	Economic meaning	Application to rate of return estimation
Productive efficiency	Achieved when output is produced at minimum cost. This occurs where no more output can be produced given the resources available – that is, the economy is on its production possibility frontier. Productive efficiency incorporates technical efficiency. This refers to the extent that it is technically feasible to reduce any input without decreasing the output or increasing any other input.	Refers to least cost financing (that is, the lowest allowed return on debt and equity) subject to any constraints, such as risk. For our determinations to be productively efficient we need to incentivise service providers to seek the lowest cost financing (all else being equal).
Allocative efficiency	Achieved when the community gets the greatest return (or utility) from its scarce resources.	Allocative efficiency can be achieved by setting an allowed return consistent with the expected return in the competitive capital market (determined by demand and supply) for an investment of similar degree of risk as a service provider supplying regulated services.
Dynamic efficiency	Refers to the allocation of resources over time, including allocations designed to improve economic efficiency and to generate more resources. This can mean finding better products and better ways of producing goods and services.	Refers to the existence of appropriate incentives. We can encourage dynamic efficiency by setting an allowance that does not distort investment or consumption decisions. Dynamic efficiency is advanced through incentive regulation rather than cost of service regulation that compensates a service provider for its actual costs no matter how inefficient.

Source: AER analysis; Productivity Commission, *On efficiency and effectiveness: Some definitions*, May 2013; AER, *Better regulation: Rate of return guidelines consultation paper*, May 2013

Productive efficiency is promoted through benchmarking and incentive regulation and through setting the rate of return as a market cost of capital reflective of the risks involved in providing regulated services. Allocative efficiency is promoted through estimating the rate of return as a market cost of capital commensurate with the risk involved in providing regulated services. Dynamic efficiency is promoted through benchmarking and incentive regulation, and through adherence to the NPV=0 condition. The use of market data, benchmarking and the NPV=0 condition are discussed further in sections 2.1.6, 2.2, and 2.2.2. The NPV=0 condition is an ex-ante concept and regulated businesses' returns are not guaranteed because they still face risk.

[57] NEL s7A(3); NGL s24(3)

The second common repeated concept is compensation for risk and the relationship between risk and return. The legislative principles provide that we must have regard to prices that allow for a return commensurate with the regulatory and commercial risks involved in providing the service.

When estimating the allowed rate of return we consider the degree of risk involved in providing regulated services. This also contributes to the achievement of the legislative objectives by promoting efficiency – it is well accepted that there is a risk-return trade-off and it would not be efficient to determine an allowed return that is not commensurate with the risks involved. Further consideration of the risks involved in providing regulated services is set out in section 2.42.4.

2.1.5 Criteria we have developed to help guide our judgements

As noted in the executive summary, we have developed the following criteria to assist us to exercise our regulatory judgement:

1) Reflective of economic and finance principles and market information
2) Fit for purpose
3) Implemented in accordance with good practice
4) Models are based on quantitative modelling that is sufficiently robust and avoids arbitrary filtering
5) Market data is credible, verifiable, comparable, timely and clearly sourced
6) Flexible to allow changing market conditions and new information
7) Materiality
8) Longevity or sustainability of new arrangements.

The first 6 of these criteria were developed when making our 2013 Rate of return guideline and are explained in detail in the explanatory document to the guideline.[58] We proposed to include criteria 7 and 8 when we made our *Overall rate of return draft working paper* in July 2021.[59] These additional criteria were added to ensure change would not be adopted lightly in the absence of compelling evidence and that any case for change must demonstrate there was a clear improvement or benefit to be realised.

We consider our assessment criteria capture the 5 principles the CRG considered we should take into account before proposing a change. The CRG criteria, and support for these criteria, are discussed further in section 2.3.

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[58] AER, *Better Regulation Explanatory Statement Draft rate of return guideline*, August 2013, pp 27–32.

[59] AER, *Overall rate of return Draft working paper*, July 2021, p 22.

2.1.6 Market data

We will consider market data where it is available to assist us. A number of criteria have helped guide our exercise of judgement, including a specific criterion for market data – that the market data is credible, verifiable, comparable, timely and clearly sourced. We have considered these criteria, including what different stakeholders have indicated about how various pieces of market data align with these criteria, in determining how we have had regard to and used various pieces of market data.

2.2 Benchmark efficiency

The regulatory framework the AER operates under is largely an ex-ante allowance regime, where forecasts are set and businesses have a financial incentive to beat these forecasts. The following sections discuss the benchmark rate of return we set under the Instrument and the incentives the framework create, the NPV=0 condition, estimating a market cost of capital and setting a return commensurate with the risk of providing regulated network services.

2.2.1 Benchmarking and incentive regulation

We estimate a benchmark rate of return, which is then applied to a specific NSP, rather than determining the returns of a specific NSP based on its specific circumstances.[60] We note:

- while we have set a single benchmark for all regulated businesses in this final Instrument, we would have set multiple benchmarks if we considered this was legally permissible and would better achieve the NEO and/or NGO. For example, it is legally permissible to set different ways to calculate the rate of return for gas and electricity.[61] Given this flexibility, we would have set a different equity beta for gas and electricity networks if we considered this would better achieve either the NEO and NGO.
- the allowed return on capital will vary for different businesses depending on when their allowed return on capital is estimated under the Instrument.

The NSPs' actual returns could also differ from the benchmark regulatory allowance depending on how efficiently it finances and operates its business. This is consistent with incentive regulation. That is, our rate of return approach drives efficient outcomes by creating the correct incentive by allowing (requiring) NSPs to retain (fund) any additional income (costs) from outperforming (underperforming) the efficient benchmark.[62]

We consider that the objective of the allowed rate of return under an incentive regulatory framework is not to provide a guaranteed degree of outperformance. However, we also note that it is important for allocative and dynamic efficiency that the allowed rate of return

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[60] See AER, *Better regulation: Explanatory statement rate of return guideline*, December 2013, ch. 3.

[61] NEL – 18W(3); NGL – 30R(3)

[62] NEL, s. 7A(3); NGL s. 24(2)(b).

provides (in expectation) an opportunity for service providers to recover their efficient costs (without expectation of monopoly rents), consistent with the NPV=0 condition.

We have updated our empirical analysis in a number of areas consistent with incentive regulation. We have reviewed our benchmark gearing, credit rating, debt term and overall debt costs by examining the recent, actual costs and financial management practices of NSPs. We have also reviewed our equity beta estimates based on equities market data.

2.2.2 The NPV=0 condition

Because the regulatory regime is ex-ante[63], 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 described as follows:[64]

> The zero NPV [NPV=0] investment criterion has 2 important properties. First, a zero NPV [NPV=0] investment means that the ex-ante expectation is that over the life of the investment the expected cashflow from the investment meets all the operating expenditure and corporate taxes, repays the capital invested and there is just enough cashflow left over to cover investors' required return on the capital invested. Second, by definition a zero NPV [NPV=0] 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.

In concurrent evidence session 2 held in 2022, there was general agreement that the rate of return should be set to achieve NPV=0 condition, although experts disagreed on how returns should be set to achieve that condition.[65] While our 2022 draft Instrument used a 5-year term for estimating the required return on equity, this final Instrument has used a 10-year term. That is, we have not made a change to the term under our current 2018 Instrument. We believe continuing our current Instrument will best achieve the NEO and NGO because it will make it more likely investors will expect to receive their required return on equity investment. It also promotes stability and predictability which supports efficient investment.

The NPV=0 condition is discussed further in section 6.3. Throughout this explanatory statement, we use the terms 'NPV=0 condition' and 'NPV=0 principle' interchangeably.

2.2.3 Market cost of capital

Because the market for capital finance is competitive, an efficient NSP is expected to face competitive prices in the market for funds. Therefore, we consider efficient financing costs

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[63] The AEMC describes, 'allowed revenues for network businesses are now set using the expenditure required by prudent, efficient operators as a benchmark. Companies have incentives to beat the benchmarks so they can keep some of their savings and pass the rest on to customers'. See AEMC, Overview 2014–15.

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

[65] AER, *Concurrent Evidence Session 2 - Proofed Transcript*, February 2022, pp. 10–64.

are reflected in the prevailing market cost of capital (or WACC) for an investment with a similar degree of risk as that which applies to a service provider for providing regulated services.[66] As Alfred Kahn stated:

> since the regulated company must go to the open capital market and sell its securities in competition with every other would-be issuer, there is clearly a market price (a rate of interest on borrowed funds, an expected return on equity) that it must be permitted and enabled to pay for the capital it requires.[67]

We consider employing a rate of return that is commensurate with the prevailing market cost of capital (or WACC) is consistent with the NPV=0 investment condition. We also consider economic efficiency more generally is advanced by employing a rate of return that reflects rates in the market for capital finance. Similarly, Partington and Satchell interpret efficient financing costs as the opportunity cost of capital, which is a market rate of return for assets with a given level of risk.[68]

Table 2.3 outlines how we have applied benchmarking and incentive regulation in coming to our final decision.

Table 2.3 Application of benchmarking in coming to our draft decision

Element	Application of benchmarking
Gearing ratio	In coming to a benchmark gearing ratio, we have had regard to observed gearing levels of listed Australian energy networks. These gearing levels are the result of these firms managing their financing practices as part of their operations in competitive capital markets.
Return on equity – risk-free rate	We estimate the risk-free rate from market yields on CGS.
Return on equity – market risk premium	Our market risk premium benchmark is informed by market data on: • the historical returns on the All Ordinaries • analyst forecasts and market prices of equities that are used in dividend growth models • conditioning variables derived from market prices and dividends.
Return on equity – beta	Our equity beta estimate is informed by market prices and dividends of listed Australian energy networks relative to the market prices and dividends for the ASX 300.
Return on debt – credit rating and term	Our benchmark credit rating is derived from observed credit ratings of privately owned Australian energy network firms. Our benchmark debt term is informed by observed term of debt issuances of privately owned service providers. These firms are managing their financing practices as part of their operations in competitive capital markets.
Return on debt – yield	The return on debt is estimated from market yields on Australian corporate bonds.

[66] See Partington, G and Satchell, S, *Report to the AER: Discussion of the allowed cost of debt*, 5 May 2016, p. 15. We note the cost of capital (from a firm's perspective) is also known as investors' required rate of return (from an investors' perspective).

[67] Kahn, AE, *The economics of regulation: Principles and institutions*, The MIT Press, Massachusetts, 1988, p. 45.

[68] Partington, G and Satchell, S, *Report to the AER: Discussion of the allowed cost of debt*, 5 May 2016, p. 15.

Element	Application of benchmarking
Imputation credits – utilisation rate	Our benchmark utilisation rate is derived from the ABS equity ownership statistics for all Australian equity. This ownership data is the result of the operation of equity markets.
Imputation credits – distribution rate	Our benchmark distribution rates are derived from the observed distribution rates of listed Australian equity. These listed Australian firms determine their distribution rates as part of their operations in competitive equity markets.

2.2.4 Commensurate with risk

When estimating our benchmark rate of return we consider the degree of risk involved in providing regulated services. This is consistent with the revenue and pricing principles, which state that a price or charge should allow for a return that matches the regulatory and commercial risks involved in providing the regulated service to which that charge relates. It also contributes to the achievement of the legislative objectives by promoting efficiency – it is well accepted that there is a risk-return trade-off and it would not be efficient to determine an allowed return that is not commensurate with the risks involved.

Further consideration of the risks involved in providing regulated services is set out in section 2.4.

2.3 Exercising our judgement and measuring success

We must exercise our discretion when we make decisions in the Instrument that we consider will best achieve the NEO and NGO. In doing so, we have:

- focused on trying to achieve the best overall decision
- considered any risk-cost trade-offs
- considered the views of all stakeholders, including the survey results of the CRG survey of consumers' views on various topics.

As we did in making the 2018 Instrument, we have reconsidered the input parameters to be used in the 2022 Instrument to best achieve the NEO and NGO. In making this final decision we have started from our 2018 Instrument and considered whether any new information has established a case for change. That is, we have focused particularly on applying a consistent high bar for change across rate of return input parameters and in ensuring our overall decision will best achieve the NEO and NGO. Stakeholders have consistently told us that predictability and stability are important and changes should not be made lightly.

We also note that in most things we have considered in making the 2022 Instrument there is no consensus on a preferred approach. For example, there is no consensus on what use, if any, should be given to dividend growth model estimates of the market risk premium. In this context, we have considered the merits of a range of diverse views in exercising our regulatory judgment in a way we consider will or is most likely to best achieve the NEO and NGO.

In exercising our judgement on the individual parameters and methodologies set out in the 2022 Instrument, we have considered the overall decision, and the impact on this decision of various different parameter options. Ultimately, we need to be satisfied that the overall decision will or is most likely to best achieve the NEO and NGO. Key considerations on the

impacts of individual parameters on the overall decision are set out in the cross checks section of this decision (Chapter 11).

2.3.1 Risk-cost trade-off

The risk-cost trade-off topic was discussed extensively during the 2018 Instrument process. This was documented in the 2018 Instrument explanatory statement, specifically in chapter 13, which covered the potential issues if the rate of return is set too low or too high, because this could affect whether our legislative objectives are being met.[69] After consideration of stakeholder viewpoints and submissions in 2018, our assessment of the risk-cost trade-off found that the application of a bias toward a higher or lower rate of return is not supported by available evidence. Reasonable points were made in support of both directions.[70]

Further consideration was given to this topic as part of the 2022 Instrument process, when we considered the term of the rate of return, and rate of return and cashflows in a low interest rate environment.[71] The working paper considered discussion by stakeholders on several topics related to the risk-cost trade-off, including discussion on:

- an upward bias of the return on equity to provide positive investment in AEMO's 2020 ISP projects, to which we restated our position that the best possible estimate of the expected rate of return is to be neither upwardly or downwardly biased[72]
- a focus on the promotion of investment efficiency, to which we reiterated that our approach of establishing an allowed rate of return that is neither upwardly or downwardly biased was necessary to achieve our statutory objectives to promote efficiency in the investment in, and operation and use of, energy services for the long-term interests of consumers.[73]

This latter point was expanded on in our 2021 position paper on rate of return and assessing the long-term interests of consumers, in addition to additional coverage of the risks and costs of a biased estimate. Setting the Instrument is guided by the NEO and NGO and our understanding of consumer interests, and how the Instrument may serve both to the greatest degree.[74] This understanding of consumer interests has been developed through continued engagement with our CRG and ENA, whose additional perspectives have assisted us in developing our guiding principle. The guiding principle, which will be used in developing the

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69 AER, *2018 Draft rate of return guideline explanatory statement*, July 2018, pp 406–415.

70 AER, *2018 Draft rate of return guideline explanatory statement*, July 2018, p 415.

71 AER, *Rate of return term of the rate of return and Rate of return and cashflows in a low interest rate* environment *final working paper*, September 2021.

72 AER, *Rate of return term of the rate of return and Rate of return and cashflows in a low interest rate* environment *final working paper*, September 2021, p. 67.

73 AER, *Rate of return term of the rate of return and Rate of return and cashflows in a low interest rate* environment *final working paper*, September 2021, p. 68.

74 AER, *Rate of return assessing the long term interests of consumers* position paper, May 2021, pp 8–9.

2022 Instrument, is to set an unbiased estimate of the expected efficient return, consistent with the relevant risks involved in providing regulated network services.

For the 2022 Instrument review, there was limited discussion by stakeholders in March and September 2022 submissions on the risk-cost trade-off topic. As such, our approach remains unchanged.

2.3.2 CRG consumer principles

A set of consumer-oriented principles, first outlined in a CRG submission in October 2020 were developed by the CRG to provide a direct link between our decision and the efficient operation and use of electricity or gas as set out in the NEO and NGO.[75] As such, these principles are viewed by the CRG as integral to us achieving our statutory objectives. The principles are:

- Principle 1 – A regulatory framework serving the long-term interests of consumers must promote behaviours that engender consumer confidence in the framework.
- Principle 2 – Any change to the regulatory model must be tested against detrimental consumer impacts in relation to absolute prices and price changes.
- Principle 3 – Any change to the regulatory model must be tested against acceptable consumer impacts in relation to service standards.
- Principle 4 – Risks should be borne by the party best placed to manage them.
- Principle 5 – There should be a high bar for change.

The CRG noted that consumers and consumer representatives support the consumer-oriented principles.[76] Engagement with consumers on the principles involved various engagement methods, such as:

- surveys of residential and commercial energy consumers
- interviews and workshops with consumer representatives.

Support for the principles was primarily established through Consumer Survey 1, which demonstrated that both residential and commercial energy customers broadly agree with the substance of each principle. Support from consumer representatives is also noted, although a similar survey to serve as a reference point is not available. However, the CRG's engagement with consumer representatives included interviews from July to October 2020, workshops from June to August 2021 and additional interviews from January to February 2022.[77]

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[75] Consumer Reference Group, *Submission to the AER Return on equity*, 9 Oct 2020, pp 20–22.

[76] CRG, *Response to the AER's July 2021 Draft Working Papers: The Overall rate of return, Debt omnibus and Equity omnibus papers*, Volume 2: Engagement, 7 Sep 2021, p. 4.

[77] CRG, *Response to the AER's December 2021 Information paper*, March 2022, pp. 143–158.

Consequently, the CRG considered that the AER must give weight to consumer-oriented principles when exercising its judgement.

The CRG noted that, in addition to giving weight to consumer-oriented principles, the AER should consider a number of points of interest for consumers when exercising judgement. These are detailed in Table 2.4.

Table 2.4 CRG findings on consumer views on key points

Key point	CRG findings
Consumers support a focus on the long term	The CRG found that: [78] • consumers generally believe 'long term' to be a period of 10 years or more • consumers, consumer representatives and independent investors consider 'long term', and associated benefits, to be beyond a 5-year regulatory period • independent investors consider investment in a regulated network as a long-term proposition.
Consumers are generally satisfied with current service levels	The CRG pointed to findings of the ECA Consumer Sentiment Survey to note that consumers are satisfied with current electricity and gas services, with proportions of satisfied customer being consistently high.[79]
Consumers value a stability of process	The CRG suggested that stability of frameworks is critical because it enhances consumer confidence through:[80] • certainty • reduced risk of gaming by networks • reduced regulatory capture • reduced requirements for debate with networks, given resource and capacity constraints.
Consumers are sensitive to price changes	The CRG noted that even small changes to prices could create behavioural changes in residential and commercial consumers, primarily in attempting to use less energy. This is especially true for vulnerable customers.[81] The CRG also found that residential and commercial consumers generally favour affordable energy over a highly reliable supply, although commercial customers are more balanced in viewing both as critical.[82]
Consumers value a stability of approach	The CRG posited that there should be a high bar for change with a requirement for strong justification and demonstration that it is in consumers' interests.[83] A stable regulatory framework is in customers' long-term interests.[84] According to the CRG, a long-term approach is also aligned with the interest of long-term investors (pension funds, private equity and governments) that increasingly dominate the sector and is promotive for investor confidence.[85]

[78] CRG, *Response to the AER's December 2021 Information paper*, March 2022, pp. 31–33.
[79] CRG, *Response to the AER's December 2021 Information paper*, March 2022, pp. 33–34.
[80] CRG, *Response to the AER's December 2021 Information paper*, March 2022, p. 34.
[81] CRG, *Response to the AER's December 2021 Information paper*, March 2022, p. p35.
[82] CRG, *Response to the AER's December 2021 Information paper*, March 2022, p. 38.
[83] CRG, *Response to the AER's December 2021 Information paper*, March 2022, p. 30.
[84] CRG, *Response to the AER's December 2021 Information paper*, March 2022, p. 10.
[85] CRG, *Response to the AER's December 2021 Information paper*, March 2022, p. 10.

The CRG conducted its Consumer Survey 3 in August 2022. The aim of this survey was to reassess consumer sensitivity to price increases, considering the changed economic circumstances since Survey 2 in August 2021. Consumer Survey 3 included over 2,000 energy consumers (including 1,500 residential and 501 commercial). Additionally, the CRG conducted 2 consumer representative workshops and 2 in-depth discussion groups with individuals recruited by 2 social service organisations.[86]

The CRG noted that its latest research confirmed that the previous messages (see Table 2.4) continue to hold true. Moreover, the CRG found that consumers' financial stresses were worsening, which was clear from a comparison of the results from its earlier surveys with its most recent survey.[87] Additionally, it noted that there is a higher risk of consumers disconnecting from the grid and as prices increase consumer confidence in Australia's energy system is declining.[88]

Following the AER's 2022 draft Instrument the CRG noted that we had adopted 2 new assessment criteria – materiality and that any proposed change needed to be sustainable in the face of changing circumstances. We had referred to the need for compelling evidence and clear improvement or benefit before changing approach. However, the CRG considered we had not applied these principles in making the draft Rate of Return Instrument as the CRG had hoped we would.[89] It appears its key concern is we have exercised our judgement in a manner that has created bias in the overall decision.[90] The concerns around bias are considered further in section 2.3.2.2 and in the other sections of this document covering individual parameter estimates.

2.3.2.1 Other submissions before the draft Rate of Return Instrument that mentioned how we should exercise judgement

In addition to the submissions of the CRG, other submissions that touched on how we should exercise our regulatory judgement included submissions from:

- APA, which submitted that the AER should put more emphasis on substance over process[91]
- Ausgrid, which submitted that the most critical element to the success of the process is that the AER demonstrate a balanced evaluation of all the evidence in reaching its conclusions[92]
- AGIG, which submitted that the concurrent evidence should be run with more rigour to distinguish between evidence and opinion; expert reports by the AER should be obtained before the concurrent evidence sessions; the AER should develop a standard

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86 CRG, *Advice to the Australian Energy Regulator, Attachment 1 Survey report 3*, September 2022.

87 CRG, *Advice to the Australian Energy Regulator*, September 2022, p. 13.

88 CRG, *Advice to the Australian Energy Regulator, Attachment 1 Survey report 3*, September 2022.

89 CRG, *Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 80.

90 CRG, *Response to the AER's Draft Rate of Return Instrument*, September 2022, pp. 3–4.

91 APA, *Submission on Pathway to 2022 Rate of Return instrument*, January 2022, p. 1.

92 AusGrid, *Submission on AER's 2022 RoR instrument pathway consultation*, January 2022, p. 1.

by which evidence is assessed and transparently explain why the AER has taken a view by reference to that standard[93]

- APGA, which submitted that assuming an equal role to each crosscheck does not mean that they have equal weight with the primary estimate – crosschecks would still only be a check on the judgement that the AER has used to choose a point within the range that its data and application of its foundation model suggest is reasonable[94]
- ENA, which submitted that scenario testing could be used to assist in providing information relevant to judgements the AER is considering or makes against its assessment criteria[95]
- Endeavour Energy, which submitted with respect to crosschecks that the approach of international regulators provides useful insight into the types of data and methods that other regulators use to estimate parameters and the way in which they exercise their regulatory judgement[96]
- QTC, which submitted that an unintended bias against the Wright approach has been created due to the way the AER has applied its assessment criteria.[97]

We have considered all stakeholder submissions in making the draft Instrument that we consider will best achieve the NEO and NGO.

2.3.2.2 Submissions in response to the draft Instrument

In response to the draft Instrument, the CRG submitted a University of Wollongong expert report authored by David Havyatt, Rabindra Nepal and David Johnstone.[98] The CRG also provided a separate report that examined the draft Instrument and the rationale for the AER to undertake an assessment of the relationship between the energy objectives of efficient investment and efficient operation and use of the gas and electricity networks. This report also provided a summary of the CRG's interpretation of the work by Havyatt, Nepal and Johnstone.[99]

In the CRG's report there were 2 key points put forward to support the AER doing more work on consumption efficiency:

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93 AGIG, *Submission to consultation on 2022 instrument process*, January 2022, pp. 1–2.

94 APGA, *Submission - AER rate of return information paper*, March 2022, pp. 19–20.

95 ENA, *Rate of Return Instrument Review Response to AER's Final Omnibus and information papers*, March 2022, pp. 141–142.

96 Endeavour Energy, *Rate of Return information paper Submission*, March 2022, p. 5.

97 QTC, *Submission AER Rate of Return information paper and final working papers*, March 2022, p. 2.

98 Havyatt, D, Nepal, R and Johnstone, D, *AER consideration of demand side issues in making the Rate of Return Instrument: A report for the Rate of return consumer reference group*, August 2022.

99 CRG, *Improving how the AER assesses Consumption Efficiency*, September 2022.

1) Setting a rate of return that attracts capital is not necessarily sufficient to ensure efficient consumption.[100]

2) The AER has not considered that consumers have greater opportunities to withdraw from using network services if they believe prices do not represent value for money and/or network changes will continue to rise.[101]

The report by Havyatt, Nepal and Johnstone made a number of comments about our interpretation of the legislation in the draft Instrument. Key issues included:

- '[D]ue to misdirection of the AER… it could be argued the Independent Panel has not fully performed its task as specified in legislation.'[102]
- The RPPs do not require an allowed return commensurate with the regulatory and commercial risk involved in the provision of direct control services. Investors receive returns from the entire regulatory determination, not just the allowed rate of return.[103]
- '[F]inance theory relied on by regulators to establish allowed rates of return needs adjustment when used for incentive regulation to deal with the additional cash flows generated by incentive schemes.'[104]
- "[E]fficient operation and use" in the RPPs mean something and would be redundant if efficient investment was sufficient to guarantee efficient operation and use.[105]
- In the RPPs the words "regard should be had to the economic costs and risks of the potential for under and over utilisation" means something separate to the requirement to have regard to the potential for under and over investment.[106]

On these points, we make the following comments:

- Our questions to the Independent Panel encompassed the requirement that the report 'include the panel's assessment of the evidence and reasons supporting the rate of

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[100] CRG, *Improving how the AER assesses Consumption Efficiency*, September 2022, p. 6.

[101] CRG, *Improving how the AER assesses Consumption Efficiency*, September 2022, p. 7.

[102] Havyatt, D, Nepal, R and Johnstone, D *AER consideration of demand side issues in making the Rate of Return Instrument: A report for the Rate of return consumer reference group*, August 2022, p. 12.

[103] Havyatt, D, Nepal, R and Johnstone, D, *AER consideration of demand side issues in making the Rate of Return Instrument: A report for the Rate of return consumer reference group*, August 2022, p. 13.

[104] Havyatt, D, Nepal, R and Johnstone, D, *AER consideration of demand side issues in making the Rate of Return Instrument: A report for the Rate of return consumer reference group*, August 2022, pp. 22, 32–33.

[105] Havyatt, D, Nepal, R and Johnstone, D, *AER consideration of demand side issues in making the Rate of Return Instrument: A report for the Rate of return consumer reference group*, August 2022, pp. 22, 34.

[106] Havyatt, D, Nepal, R and Johnstone, D, *AER consideration of demand side issues in making the Rate of Return Instrument: A report for the Rate of return consumer reference group*, August 2022, pp. 22, 35.

return on capital or the value of imputation credits under the instrument'. Our direction to the Independent Panel to take into account competing factors such as accuracy, consistency, accessibility and transparency, was consistent with the provisions in the NEL. In addition, while our direction provided examples, it did not limit what the Independent Panel could take into account.

- In no place in our draft decision did we indicate that the return a regulated network receives is not impacted by other, non-allowed rate of return, cashflow streams. We also note that the final CEPA work on RAB multiples identifies incentive outperformance as a driver of revenue and shareholder value for the businesses we regulate.[107]
- As we found in 2018, we do not consider an adjustment to the allowed return for expected under or outperformance under incentive schemes is appropriate.[108]
- We have had regard to the need to have efficient operation and use of infrastructure as well as efficient investment. We consider that a return that will generate efficient investment also contributes to efficient operation and use of infrastructure.
- We have also had regard to the economic costs and risks of the potential for under and over-utilisation. Our view is that setting an unbiased rate of return is the best basis for regulatory decisions that will lead to a desirable level of network utilisation.

We are also aware that consumers may seek to withdraw from energy markets where they perceive it is in their economic interests.[109] We agree that this is a reason to keep prices as low as practical, but we do not consider it warrants a return below the efficient level for the investment risk involved.

The CRG also considered that we need to exercise judgement in making our decision, but that our cumulative judgements in making both our 2018 Instrument and our 2022 draft Instrument appeared upwardly biased.[110] The Queensland Cane Growers Organisation Ltd supported the view of the CRG, while the Energy Users Association of Australia also considered our 2022 draft decision upwardly biased.[111]

In response to the concern raised around cumulative bias, we have considered this overall final decision and whether we think it is biased in one way or another. We consider this decision is not biased because we consider each input parameter is a reasonable estimate taking into consideration all evidence on the parameter before us. We have also considered the overall rate of return generated from the individual parameters and a number of cross checks in determining the overall decision (in the round) is both unbiased and will best

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[107] CEPA, *EV:RAB Multiples – Australian Energy* Regulator, October 2022, p4.

[108] AER, *Rate of return instrument – Explanatory Statement*, December 2018, pp. 229–20; AER, *Draft Rate of return instrument – Explanatory Statement*, July 2018, pp. 98–99.

[109] CRG, *Advice to the Australian Energy Regulator, Attachment 1 Survey report 3*, September 2022.

[110] Consumer Reference Group, *CRG Response to the AER's Draft Rate of Return Instrument*, August 2022, pp. 13–18.

[111] Queensland Cane Growers Organisation Ltd, *Letter of Support for Consumer Group response to the Draft Rate of Return* Instrument; Energy User Association of Australia, *Submission Draft rate of return instrument*, September 2022, p. 1.

achieve the NEO and NGO. Nonetheless, we acknowledge that different stakeholders have different views on individual parameters and we have exercised judgement in choosing values where there is no 'correct' answer. For example:

- for the risk-free rate, there are cogent arguments for using either a term based on the regulatory period length and a term based on the life of the assets
- for MRP, there are arguments for a lower (or higher) MRP based on geometric versus arithmetic averages, alternative models such as the dividend growth model, and the approaches of some other regulators
- for beta, there are arguments for a lower beta based on updated Australian data and a higher beta based on overseas beta data.

We have had regard to the competing arguments in reaching each decision point and considered the principles we set down for the review and the importance of a sufficiently high bar for change. We have also had regard to the interaction between parameters. The reasoning for each choice is set out in the relevant chapter of this explanatory statement.

A significant number of submissions also argued that our draft decision has not achieved the NEO or NGO because our approach to estimating a specific rate of return parameter was not appropriate.

For example, a number of NSPs, energy networks associations and investor groups argued in response to the draft decision that the use of a 5-year term for the risk free rate would not achieve the NEO or NGO. As covered in section 6.3, those submissions related to:

- the AER's regulatory task, the interpretation of the NPV=0 principle within the overall regulatory framework and the relevance of the actual returns required by investors[112]
- the mathematical interpretation of the NPV=0 principle[113]

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[112] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 5, 10, 13, 26, 28–38, 47–49, 57, 61–70; APGA, *Draft 2022 Rate of Return Instrument*, September 2022, pp. 6–9, 12; Transgrid, *Response to AER draft Rate of Return Instrument*, September 2022, p. 3; NSG, *Response to AER RORI 2022 Draft Decision,* September 2022, pp. 2–3, 7–16; Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, September 2022, p. 4; Ausgrid, *Submission Draft RoRI*, September 2022, p. 2; AGIG, *Draft RoRI response*, September 2022, p. 1; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, pp. 2–3; Jemena, *Submission on AER's draft Rate of Return Instrument (RORI),* September 2022, p. 3; IPA, *Submission to the AER on the Draft Rate of Return Instrument 2022*, August 2022, p. 3.

[113] See, for example, ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 4, 11, 12, 26, 53–61; APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p.12; APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, pp. i, ii, 4–12; Transgrid, *Response to AER draft Rate of Return Instrument*, September 2022, p. 3; Jemena, *Submission on AER's draft Rate of Return Instrument (RORI),* September 2022, pp. 3–4; Professor R. Schmalensee, *Statement of Richard Schmalensee, Ph.D. To the Australian Energy Regulator*, report for ENA, July 2022; Professor R. Schmalensee, *Response of Richard Schmalensee, Ph.D*, October 2022.

- the interpretation of the risk-free rate and term of the risk-free rate/term of return on equity in the context of the CAPM[114]
- the effect of adopting a shorter equity term on consumer prices and their volatility over an economic cycle[115]
- the effect of adopting a shorter equity term on beta, credit risk and the accuracy of the allowed return on equity in estimating the cost of equity[116]
- confidence in, transparency, stability and predictability of the regulatory framework[117]
- consistency with the AER's previous decisions and decisions of other Australian regulators[118]
- the relationship between equity term and the term of the expected inflation[119]

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[114] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, pp. i–iii, 9–27.

[115] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 4, 10, 26, 29; Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, September 2022, p. 5; AusNet, *Response to the Draft 2022 Rate of Return Instrument,* September 2022, p. 2.

[116] APGA, *Draft 2022 Rate of Return Instrument*, September 2022, pp. 9, 12–13; CEG, *Critique of AER estimate of a 5-year RoE*, report for APGA, September 2022, pp. 7–8, 11–17, 19–28.

[117] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 4, 10, 26, 29; Transgrid, *Response to AER draft Rate of Return Instrument*, September 2022, p. 3; NSG, *Response to AER RORI 2022 Draft Decision,* September 2022, pp. 3–4, 6, 8–9; IPA, *Submission to the AER on the Draft Rate of Return Instrument 2022*, August 2022, p. 2; AGIG, *Draft RoRI response*, September 2022, p. 2; GIIA, *Response to draft decision on the 2022 Rate of Return Instrument and independent panel report,* September 2022, p. 2.

[118] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 38–40, 48–53; NSG, *Response to AER RORI 2022 Draft Decision,* September 2022, pp. 2, 8; Jemena, *Submission on AER's draft Rate of Return Instrument (RORI),* September 2022, p. 4; IPA, *Submission to the AER on the Draft Rate of Return Instrument 2022*, August 2022, p. 2; Ausgrid, *Submission Draft RoRI*, September 2022, p. 4; AusNet, *Response to the Draft 2022 Rate of Return Instrument,* September 2022, p. 3; QTC, *Draft Rate of Return Instrument Explanatory Statement,* September 2022, p. 4; Transgrid, *Response to AER draft Rate of Return Instrument*, September 2022, p. 3; IPA, *Submission to the AER on the Draft Rate of Return Instrument 2022*, August 2022, p. 2; Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, September 2022, pp. 3–4; Energy Queensland, *Draft 2022 Rate of Return Instrument*, September 2022, p. 2; CEC, *Draft 2022 Rate of Return Instrument,* September 2022, pp.1–2; GIIA, *Response to draft decision on the 2022 Rate of Return Instrument and independent panel report,* September 2022, p. 2; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, pp. 5–6.

[119] Transgrid, *Response to AER draft Rate of Return Instrument*, September 2022, p. 3; Ausgrid, *Submission Draft RoRI*, September 2022, p. 3; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 4; APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, pp. iii–iv, 15–16; ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 11–12, 27, 40–47.

- the relevance of the floating rate bond analogy to setting the return on equity.[120]

Other submissions, in response to the draft decision, that indicated or implied we should exercise our regulatory judgment differently (to the way we have in this final decision) included:

- ENA, APA and also the NSG that submitted that the AER should not make a major change to its approach to compiling HER estimates of the MRP at this late stage of the process as it should recognise the need for regulatory stability, predictability, and consistency.[121]
- NSPs supported the use of a DGM as an approach to MRP estimation alongside the HER. NSPs stated that compared to the HER, the DGM better captures the changes in assets risks and investor willingness to bear those risks that seem to underlie time variation in the MRP.[122] However, the view was also expressed that if we were to use a DGM we should use a 'calibrated' DGM to produce estimates that are unbiased over time.[123]
- The ENA, Endeavour Energy, and the Queensland Treasury Corporation that indicated we should give some weight to the 'Wright' approach to estimating the MRP[124]

All of the submissions relating to individual parameters have been considered in making the decision and are covered in the relevant parameter chapters of this explanatory statement.

2.3.2.3 Questions of the Independent Panel related to the interest of consumers and the efficiency of the 2018 Instrument

The Independent Panel also recommended we answer several questions related to efficiency of the 2018 Instrument, and provide evidence on how the interests of consumers have been given appropriate weight, the impact of bills of different plausible scenarios and if the Instrument is likely to enable necessary investment:[125]

- Does the explanatory statement demonstrate that the interests of consumers have been given due weight in the process?

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[120] QTC, *Draft Rate of Return Instrument Explanatory Statement,* September 2022, pp. 1, 4–24; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 3; ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 31, 62–63.

[121] ENA, *Options for Historical Excess Returns sample periods for 2022 Rate of return Instrument,* 25 November 2022, pp. 4, 5, 7, 31; APA, *APA submission on the alternative options for estimating the market risk premium*, 25 November 2022, p. 3; NSG, *Submission on Treasury Advice,* 28 November 2022, pp. 2, 3.

[122] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 7.

[123] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 74.

[124] QTC, *Draft Rate of Return Instrument Explanatory Statement,* September 2022, pp. 2–3; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 7; ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 75.

[125] Independent Panel Report, *AER Draft Rate of Return Instrument*, July 2022, pp. 9–10, recommendations 4 and 7.

- Does the evidence, e.g. from the assessment of the efficiency of the 2018 Instrument, show that the AER's decisions are likely to produce an outcome that is neither too high nor too low in terms of consumer bills and investor returns?
- What will be the impact on bills of different plausible scenarios (such as higher inflation or interest rates)?
- Is the Instrument likely to enable the necessary investment in the coming period?

In response to these questions:

- This explanatory statement shows we have carefully considered the interests of consumers throughout the process. We appreciate that the cost of energy is a major issue for many consumers. In making this decision we have sought to ensure consumers pay no more than is necessary. We have examined how we have exercised our judgement, and the interactions between parameters, to try to ensure bias is not present in our decision. The other questions and recommendations of the Independent Panel have been considered and addressed in other sections of this explanatory document. Most notably, in response to the panel's recommendation that we seek advice on potential bias in our estimate of the market risk premium, we sought advice from the Commonwealth Treasury and delayed this final decision so we could consider the options presented in the advice and stakeholder submissions on these options.
- The efficiency of the 2018 Instrument is considered in chapter 11, the cross checks section of this document. Although we cannot conclude with certainty how the 2018 Instrument has performed, we have seen no evidence that it has not supported sufficient investment while ensuring consumers have paid no more than is necessary.
- The impact on bills of different plausible scenarios is shown in chapter 11, the crosschecks section, of this document. We provided a fact sheet that was targeted at non-technical readers when we released our draft decision. Along with this final Instrument we have published a rate of return overview specifically for consumers. This explains how our rate of return moves with interest rates and its impact on consumer bills.
- We consider we have set a rate of return in line with the efficient cost of obtaining finance and believe this should support necessary investment in the coming period. In further support of this, we have not seen any lack of needed investment under the 2018 Instrument.

2.4 Risk and return

In section 2.1 we set out the legislative objectives that guide our decision-making. The revenue and pricing principles provide that, among other things:[126]

- a price or charge for the provision of a regulated service should allow for a return commensurate with the regulatory and commercial risks involved in providing the service

[126] NEL, s7A cl (5-7).

- regard should be had to the economic costs and risks of the potential for under and overinvestment by a regulated service provider in the relevant system
- regard should be had to the economic costs and risks of the potential for under and over-utilisation of the relevant system.

Risk is the degree of uncertainty about an event – such as the uncertainty around the expectation of the return on an investment.[127] It is strictly a forward-looking concept because no event is uncertain after it has occurred. The risk-return trade-off in finance theory provides that a risk averse investor will want a higher expected return when faced with a higher risk.[128]

When considering an efficient return for risk, it is important to differentiate between risks that are efficiently compensated through the allowed rate of return. In finance, there are 2 distinct types of risk – systematic risk (market risk or non-diversifiable risk) and non-systematic risk (firm-specific risk or diversifiable risk).[129] Systematic risk affects the entire market and cannot be avoided, while non-systematic risk is unique to the individual investment and can be reduced by holding a diversified portfolio. Since investors can eliminate non-systematic risk, investors do not require compensation for these risks and it would be inefficient to compensate for non-systematic risk in the allowed rate of return. Therefore, assuming that investors hold the fully diversified 'efficient' market portfolio, only an investment's systematic risk is relevant.

In setting the allowed return on equity, we provide compensation for the systematic risk that an efficient firm in the supply of regulated energy services would face through the equity beta. In setting the allowed return on debt, we provide efficient compensation for the risks that an investor in the service provider's debt faces, as they are reflected in the promised returns we observe using our debt data sources.

The principles set out in this document about the efficient compensation of risk through the allowed rate of return should be applied consistently in the estimation of all rate of return parameters. However, while agreed principles should be applied consistently, the availability of some data may mean that the consistent application of these principles may result in different datasets being used for different parameters.

In the next sections we consider the following risk related topics:

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[127] Bishop, S, Faff, R, Oliver, B and Twite, G, *Corporate Finance, Ed. 5 Pearson Prentice Hall*, 2004, p. 577.

[128] Handley, J, *Advice on the return on equity: report prepared for the AER*, 16 October 2014, p. 4.

[129] Refer to AER, *Draft Rate of return guideline – explanatory statement*, July 2018, p. 87 for a detailed discussion on systematic and unsystematic risk.

- In section 2.4.1, we consider the framework for which we analyse whether a risk should be compensated for in the allowed rate of return and risk that should not be compensated for.[130]
- In section 2.4.2, we discuss whether gas and electricity businesses face different risk environments and whether different benchmarks are warranted.
- In section 2.4.3 we consider the impact of regulation on risk.
- In section 2.4.4 we consider interrelationship between financial parameters.

2.4.1 Compensation for risk

In setting the allowed return on equity, we provide compensation for the systematic risk of an efficient firm in the supply of regulated energy services.

During this review process there have been limited submissions on how systematic risk has changed over time, or on the role and impact of technological, regulatory and catastrophic risks. However, the NSG did submit that our current approach to estimating beta mutes the impact of increases in systematic risk over time and the CRG submitted that stranding risk is not systematic and so should not be compensated under our approach to equity beta.[131] In concurrent evidence session 1 there was some agreement that stranding risk was likely primarily a non-systematic risk, although there appeared acceptance there could be some systematic component.[132]

We consider that any stranding risk is primarily non-systematic in Australia and it would be inappropriate to adjust equity beta to compensate for potential stranding risk. This is discussed further in section 8.3. We also remain of the view expressed in the current Instrument in 2018 that technological, regulatory and catastrophic risk should not be compensated through the rate of return and that an efficient rate of return compensates only for systematic risk.[133]

Our updated analysis of equity beta in section 8.3 suggests a single beta for gas and electricity networks in the range of 0.5 to 0.6. This range is heavily influenced by the beta estimates for relevant Australian firms estimated using data over the longest available time-period. We consider the most relevant Australian firms we have recent information on are AusNet Services, Spark Infrastructure, and APA Group and note a beta estimate for a portfolio of these firms has been within the 0.5 to 0.6 range since 2018. Our own estimates

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[130] In the 2018 Instrument and Draft 2022 Instrument we used the term “compensable risk”. We have ceased using this term for clarity, but the intended meaning is unchanged. By compensable we referring to risk that requires compensation. Under the Capital Asset Pricing Model this is systematic (or non-diversifiable) risk.

[131] NSG, *AER Rate of Return information paper and Omnibus final working paper - Submission*, March 2022, pp. 108–109; CRG, *Rate of Return Instrument information paper - Submission*, March 2022, p. 81.

[132] Concurrent Evidence Session 1, 10 Feb 2022, pp 79–83.

[133] AER, *Rate of return instrument - Explanatory Statement*, December 2018, pp. 43–46.

also found that the longest period estimates tend to be relatively stable over time. While less comparable from a point estimate perspective, we also found International beta estimates of the most comparable international firms have tended to be relatively stable when estimated over the longest time period. Given the range of information before us and its limitations, we therefore consider the appropriate approach to best achieve the NEO and NGO is to maintain our current value of 0.6. This is also consistent with our principle of promoting stability and predictability.

2.4.2 Gas and electricity

We extensively considered the potential differences in risk between gas and electricity network businesses in making the current Rate of Return Instrument in 2018.[134] At that time we formed the view that the likely differences were not material enough to justify different benchmarks. We considered this again in our 2021 draft equity omnibus working paper, proposing to continue to use a single beta estimate for gas and electricity businesses.[135] Both Jemena and APGA raised concerns that systematic risk for gas could exceed electricity for a number of reasons, including due to different user characteristics and as a result of stranding risk due to various government policies.[136] However, we have found no clear evidence of material differences in systematic risk between gas and electricity networks.[137]

These issues are discussed in section 8.3.

ENA, APGA and Jemena have suggested that existing evidence from domestic comparators does not allow an adequate comparison of beta between gas and electricity networks, and that further analysis is needed with a larger sample of firms, such as international firms.[138] We think there are challenges in comparing the beta of gas and electricity firms using international energy firms, as some experts and stakeholders suggested. As discussed in section 8.3, we found that many international energy firms have unrelated business segments and/or are vertically integrated. Very few firms can be considered 'pure play' regulated energy network businesses.

We also disagree with APA's conclusion that gas networks have higher betas by comparing the beta of APA against AusNet and Spark.[139] APA derives a significant proportion of its

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134 AER, *Rate of return instrument - Explanatory statement*, December 2018, pp. 51–56.

135 AER, *Rate of return Equity Omnibus Draft working paper*, July 2021, p. 49.

136 Jemena, *Submission on rate of return omnibus papers*, September 2021, p. 6; APGA, *Submission to the AER Rate of return omnibus papers*, September 2021, p. 13.

137 AER, *Overall rate of return, equity and debt omnibus, Final working paper*, December 2021, pp 114–115.

138 ENA, *Rate of Return Instrument review - AER Final Omnibus Paper and information paper – Submission*, March 2022, p. 105; APGA, *2022 Rate of Return Instrument information paper – Submission*, March 2022, pp. 13, 14, 15; APA, *2022 Rate of Return instrument review information paper and final Omnibus paper – Submission*, 11 March 2022, p. 51; Jemena, *AER information paper – Submission,* 11 March 2022, p. 4.

139 APA, *2022 Rate of Return instrument review information paper and final Omnibus paper – Submission*, March 2022, p. 51.

revenue from non-regulated pipeline activities, such as gas storage and processing, energy generation and asset management services.[140]

For these reasons we have adopted a single rate of return for the gas and electricity networks.

2.4.3 Impact of regulation on risk

As we noted when making our 2018 draft Instrument decision, we have concluded in past decisions that an entity providing unregulated services in a competitive market is likely to have a higher risk and more variable expected returns than a monopoly business, such as the providers of regulated services.[141] This is because regulation:[142]

- mitigates monopolies from being able to extract monopoly rents, thereby constraining potential profits
- increases the certainty of the revenue stream, thereby reducing risk.

This gave us insight into the equity beta for a benchmark efficient entity relative to the average equity beta across all firms in the market, which is 1.0 by definition.[143]

We maintain the view expressed in making our 2018 Instrument and in earlier decisions that incentive regulation allows NSPs to earn more stable cashflows with periodic resets of revenues reflecting changes in actual expenditure.[144] As most unregulated businesses do not have the same protections or restrictions, they are likely to face different risk environments.[145]

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[140] APA, *Annual Report* 2021, August 2021, p. 64.

[141] For example see: AER, *Better regulation explanatory statement rate of return guideline*, December 2013, pp. 36–46; AER, *Final decision APA VTS gas access arrangement 2018 to 2022*, *Attachment 3–Rate of return*, November 2017, p. 24.

[142] For example see: AER, *Better regulation explanatory statement rate of return guideline,* December 2013, pp. 36–46; AER, *Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return,* November 2017, p. 24.

[143] More precisely, the value weighted average equity beta across all firms in the market is 1.0. As pointed out by McKenzie and Partington, the equal weighted average may not be 1.0, since larger firms may be unevenly distributed above or below 1.0. See McKenzie and Partington, *Estimation of the equity beta (conceptual and econometric issues) for a gas regulatory process in 2012*, April 2012, p. 21.

[144] AER, *2018 Draft Rate of return guideline explanatory statement*, June 2018, p. 105; For example see AER, *Better regulation explanatory statement rate of return guideline*, December 2013, pp. 36–46; AER, *Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return,* November 2017, p. 25.

[145] For example see AER, *Better regulation explanatory statement rate of return guideline*, December 2013, pp. 36–46; AER, *Better regulation explanatory statement rate of return guideline (appendices)*, December 2013, pp. 39–46; AER, *Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return*, November 2017, p. 25.

Frontier has also recognised the role of regulation in affecting risk in advising:[146]

> The form and nature of regulation applicable to Australian energy networks mitigates most of the business risks they face as compared to the business risks faced by other types of firms in the economy. Regulated revenues are set on a periodic basis and changes in volumes may only affect the timing of revenues (under a revenue cap). Even where revenues fall short of expectations due to lower volumes (as under a price cap), the lower volumes imply that costs would probably also have been lower than expected. Unanticipated or poorly managed changes in costs are partly borne by customers and only partly by the network business through the building block form of incentive regulation that applies. Stranding and optimisation risks are minimal for energy networks, a complete contrast to businesses operating in other sectors.

For clarity, regulation of the kind embodied in the national electricity and gas legislation reduces risks compensated through the rate of return (for example, demand risk). Regulation also reduces uncompensated risks by allowing cost pass throughs for non-systematic risks, such as industry-specific tax changes or geographic-specific natural disasters.

As we noted in making our 2018 draft Instrument, we have previously determined that regulation of energy network services reduces risks that require compensation in the rate of return such as:[147]

- Demand risk: The revenue or price setting mechanism mitigates demand risk. Under a price cap, NSPs may mitigate the risk of forecast error by restructuring tariffs, such that higher fixed charges are set to offset falls in demand. Under a revenue cap, where forecast quantity demanded differs from actual quantity demanded, NSPs have the possibility to recover for variation through price adjustments in subsequent years.
- Inflation risk: NSPs of regulated energy network services face less inflation risk than unregulated businesses because movements in actual inflation are reflected in the CPI-X mechanism. We reviewed our treatment of inflation in 2017, after receiving stakeholder submissions on the issue.
- Interest rate risk: The regulatory framework effectively moves risk of interest rate movements affecting financing costs onto customers. NSPs may further limit their exposure to this risk by raising capital during the averaging periods they know in advance. To the extent they are unable to raise capital over the averaging periods, they can still materially reduce their exposure to interest rate risk by hedging the base rate.

Table 2.5 summarises a selection of provisions in the National Electricity Rule (NER) and National Gas Rule (NGR) that we consider likely to mitigate various systematic and non-

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[146] Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia*, July 2013, p. 4.

[147] AER, *2018 Draft Rate of return guideline explanatory statement*, June 2018, p. 106.

systematic risks. Our views on these clauses have not changed since we made our draft 2018 Instrument.[148]

Table 2.5 Key clauses in the NGR and NER that mitigate systematic risk

NER clause	NGR clause	Clause Summary[149]	Effect on risk
6.3.2(b)	50	A regulatory control period (in electricity) must be not less than 5 regulatory years. For gas, a revision commencement date must be no less than 12 months after a review submission date which must be at least 12 months after submitting a reference service proposal	The term of each regulatory control period for electricity is at least 5 years, providing a fixed duration in which an NSP has a regulated return on its assets, cashflow certainty and fixed terms of access for its services. For gas, the term of an access arrangement is chosen by the service provider (subject to regulatory approval) and likely to be, as a minimum, several years providing a similar degree of certainty.
6.2.6, 6.5.9		The control mechanism for standard control services must be of the prospective CPI minus X form, or some incentive-based variant of this form.	This control mechanism automatically accounts for indexation and annual increases in efficient costs. It smooths cashflows from year to year to provide stable level of cashflow, reducing risks of short-term revenue.
6.18	97(5)	Prices are set annually and do not change during a regulatory year	The prices NSPs may charge annually are certain.
6.4.3(a)(1)–(3), 6.5.1, 6.5.2, 6.5.5, S6.2.1, S6.2.2B, S6.2.3	76, 77, 78, 87(1), 90	The regulatory asset base is set and adjusted for investment and deprecation through time. The regulatory allowance must be determined using a 'building block' approach that includes forecasting operating costs, a return on and return of capital of the regulatory asset base, depreciation, increments or decrements that arise from the operation of an incentive scheme and taxes.	The cashflow that the AER determines incorporates a return on and of the NSP's asset base. The historical asset base rolls forward from one regulatory control period to the next and from year to year within each regulatory control period. This guarantees recovery of historical asset costs through depreciation, the earning of a return on the asset base, indexation and recovery of future efficient capex. This substantially lessens risks in capital investment that might otherwise apply to a business operating in a workably competitive market.
6.5.2	87	The AER sets the rate of return on the regulatory asset base in accordance with the rate of return instrument.	The AER sets the rate of return on the asset base by reference to the risks faced by the NSP. The AER updates this each regulatory control period to account for changed market conditions.
6.5.3	87A	The AER must set an allowance for corporate income tax based on the estimated tax payable for a benchmark efficient entity.	Provision for tax in determining total revenue is required regardless of whether the NSP pays tax.
6.5.6, 6.5.7	79, 91	The AER assesses expenditure requirements for each NSP by reference to the amount necessary to meet a set of	This removes risks that could otherwise arise in providing a reliable and safe service.

[148] AER, *2018 Draft Rate of return guideline explanatory statement*, June 2018, p. 108.

[149] The full National Electricity Rules and National Gas Rules are available on the Australian Energy Market Commission website here

NER clause	NGR clause	Clause Summary[149]	Effect on risk
		objectives and criteria. These include the need to meet the expected demand for services and to meet quality, reliability, security and safety standards. The AER reassesses the requirements of NSP for each regulatory period to account for changes in market conditions and trends.	
6.5.10	97 (1)(c)	NSPs can pass through (to consumer charges) costs of certain predefined events	Allows NSPs to pass through certain costs to consumers in circumstances where this might not be possible in a workably competitive market. For instance, the pass through provisions provide for a pass through of costs that arise through regulatory change.
6.5.7(f), 6.6A, chapter 5	80	The NSPs may include in regulatory proposals expenditure that may be needed in the future (e.g. contingent projects in electricity)	Assists in appropriate planning for changes in the commercial environment, including provision for new projects during a regulatory period.
6.20, 6.21, 6.6.1(a1)(d), and RoLR provisions	Parts 19–21	Provides for a statutory billing and settlements framework with prudential requirements (and other similar provisions). There is also provision for dealing with potential risks associated with retailer insolvency.	These provisions minimise financial risk associated with providing and charging for services.
6.6.5, 6A.7.1	–	Provides an opportunity to apply for a reopening of a determination for capital expenditure if an event that is beyond reasonable control of the NSP and the occurrence of the event could not have reasonably been foreseen by the NSP at the time of making the determination.	This materially reduces the risk for NSP of these events.

Source: NER; NGR; AER analysis

2.4.4 Interrelationships

In publishing explanatory information for the Instrument, the AER must explain how it considered any interrelationships between estimates of financial parameters used, or to be used, to decide the rate or value.[150]

We have had regard to interrelationships between financial parameters when determining these. We have done this by directly consider how each parameter interacts with other parameters (for example how a change MRP will impact the equity risk premium when multiplied by a given beta estimate), and how they impact the overall decision. A number of

[150] NEL s18F(e)(v); NGL s30A(e)(v)

interactions are considered in chapter 11 on cross checks. In addition, we have also explored the decision as a whole in considerable detail in the final chapter of this explanatory statement.

3 Form and structure of the Rate of Return Instrument

In this section we set out how we will estimate a rate of return that achieves the legislative objectives set out in chapter 2.

We set out how the allowed rate of return will be calculated under the Instrument and the components required to be estimated. This is discussed in section 3.1. Further detail on this approach for the return on equity components of the rate of return is discussed in section 5.

We also set out the choice on how each component is estimated – whether as a value that is estimated in this decision and applied in the Instrument, or as a formula that is set out in the Instrument and implemented automatically using pre-defined input data. This is discussed in section 3.2.

3.1 Nominal, vanilla, weighted average cost of capital

Our decision is to determine the benchmark allowed rate of return for a regulatory year as a weighted average of the return on equity for the regulatory period in which that regulatory year occurs and the return on debt for that regulatory year, weighted by our benchmark gearing ratio. The rate of return is calculated as follows:

$$WACC = (ke).(1 - G) + E(kd).G$$

Where:

- E(ke) is the expected return on equity
- E(kd) is the expected return on debt
- G is the proportion of debt in total financing, otherwise referred to as the gearing ratio.

Our allowed rate of return is determined on a nominal vanilla basis that is consistent with our estimate of the value of imputation credits.

We consider that a nominal, vanilla, weighted average of the return on equity and return on debt, without adjustment for capital raising costs, would best contribute to achieving the legislative objectives, for the following reasons:

- The use of a weighted average of the returns on equity and debt allow for the relative risks involved in investing as an equity holder or debt holder to be reflected in the overall rate of return.
- A nominal, vanilla rate of return provides for a simpler rate of return estimation and a more transparent and detailed modelling of the impacts of inflation and tax costs on regulated cashflows. The vanilla formulation reflects expected returns to debt holders pre-tax and expected returns to equity holders post company tax.
- This has been our longstanding approach that we have applied consistently over a number of years. We have not received any submissions suggesting that we should change any of these aspects of our rate of return estimation approach.

We also estimate an allowed rate of return that does not include the transaction costs involved in raising debt and equity capital. Instead, we will continue to assess efficient compensation of these costs through expenditure allowances at each regulatory determination. Similar to the treatment of inflation and tax, this approach is consistent with our current approach, provides for a simpler estimate of the allowed rate of return, and a more transparent and detailed modelling of capital raising transaction costs.

3.2 Automatic application

Amendments to the NEL and NGL were passed by the South Australian Parliament in November 2018 and proclaimed in December 2018.

These amendments require us to make a binding rate of return instrument that states:

- for the rate of return on capital – the way to calculate the rate
- for the value for imputation credits – the value or the way to calculate the value.

Where the instrument states a way to calculate the rate of return or value for imputation credits, it must provide for the same methodology to apply for all regulated NSPs. Further, the methodology must be capable of being automatically applied during the life of the Rate of Return Instrument, without any exercise of discretion. We cannot set different methodologies or a band of values from which we can choose at the time of applying the Rate of Return Instrument in a regulatory determination.

Implementing this approach, our decision is to make an instrument that sets:

- the way to calculate the rate of return as a formula, being the weighted average of the return on debt and return on equity, weighted by the gearing ratio. For each input into this formula, we set:
  - the return on equity as a formula, being the Sharpe-Lintner Capital Asset Pricing Model (SL CAPM) formula
  - the return on debt as a formula, being the trailing average portfolio approach, with a transition from an on-the-day approach to a trailing average, and based on third-party debt data
  - a fixed value for the benchmark gearing ratio
- a fixed value of imputation credits (gamma).

This is a similar approach to that used for the 2018 Instrument, which we consider has supported efficient investment. As we did in 2018, in deciding on whether to set a fixed value or a fixed formula we have considered whether a formula will reliably reflect the relationship between the true value of the parameter being estimated by the formula and the variables used as inputs into the formula. If the formula does not reliably reflect the relationship between the true parameter and its dependent variables, then changes in input variables may cause the parameter value resulting from the formula to change in a manner that is inconsistent with movements in the true parameter value. This has been a particular concern in estimating the market risk premium and considering the extent of any relationship between the market risk premium and the risk-free rate.

We have considered combining the use of a dividend growth model in combination with the historical excess returns (HER) method to set the MRP during application of the 2022

Instrument. This would allow the market risk premium that impacts the return on equity to vary with market conditions. However, we have decided on balance that it is preferable to fix the market risk premium for the duration of the 2022 Instrument for several reasons, including:

- the uncertainty with the dividend growth model outputs and how well it will reflect true changes in the conditional MRP
- the application of the Instrument will only apply to any business for 5 years
- there is difficulty in estimating the conditional MRP
- this fixed MRP approach has been consistently applied by both the AER and the ACCC since the commencement of regulation in Australia.

Table 3.1 Choice of fixed value of formula for rate of return parameters

Parameter	Fixed value or formula	Decision
Rate of return	Formula	Our decision is to set the rate of return as a nominal vanilla weighted average of the return on equity and return on debt, weighted by the gearing ratio.
Gearing ratio	Fixed value	Observed values may change over time, but we consider that changes in target gearing ratios are likely to be infrequent and we see no reason to expect movement up or down. We continue to agree with the view expressed by experts in 2018 that conceptually the capital structure of companies is stable. We also agree that gearing should not be determined based on spot values during the life of the instrument because short-term gearing data can be distorted by market fluctuations in share prices.[151] Therefore, it is appropriate to fix a value for the life of the Rate of Return Instrument.
Risk-free rate	Formula	It is widely agreed among stakeholders and experts that the risk-free rate should be set as a formula because it fluctuates over time with changes in market conditions.
Equity beta	Fixed value	We consider that setting a fixed value for equity beta in the Rate of Return Instrument will best contribute to the legislative objectives and we have not received any submissions that hold a contrary view. We consider equity beta for a benchmark regulated network is likely to be stable over long periods.
Market risk premium	Fixed value	The experts at our third concurrent expert evidence session considered how the market risk premium might vary with time and if this could be modelled.[152] There were also different views on whether there was a genuine negative relationship between the risk rate and the market risk premium. We consider that the market risk premium may vary over time but we remain of the view we held in 2018 that its movement is not clearly linked to the risk-free rate. We have not been persuaded by the evidence of a genuine and stable relationship between the risk-

[151] Joint Expert Report, RORG review – Facilitation of concurrent evidence sessions, CEPA, 21 April 2018, section 3.06, p. 30. Dr. Martin Lally noted that the optimum historical averaging period is unclear but getting it 'wrong' and consequential over or under forecasting gearing would not materially affect gearing.

[152] AER, Concurrent evidence session 3, 17 Feb 2022.

Parameter	Fixed value or formula	Decision
		free rate and the market risk premium that can be reliably estimated. While we have considered using the dividend growth model to partially determine the MRP over the life of the instrument, we remain of the view a fixed MRP based on HER estimation is preferable. The lack of an acceptable robust method to calculate a market risk premium leads us to set a fixed value for the market risk premium rather than a fixed formula. This is the same approach as used in the current 2018 Instrument. This issue is discussed in more detail in section 7.3.
Return on debt	Formula	The return on debt fluctuates over time with changes in market conditions. Our decision is to set a formula that calculates the return on debt based on data from third-party data providers for a particular benchmark credit rating and term to maturity.
Credit rating	Fixed value	Observed values may change over time, but we consider that change is infrequent because service providers take time to adjust to target levels, address legacy debt arrangements and manage transaction costs. We see no reason to expect movement up or down. Therefore, it is appropriate to fix a value for the life of the Rate of Return Instrument.
Term to maturity	Fixed value	Observed values may change over time, but we consider that change is infrequent because service providers take time to adjust to target levels, address legacy debt arrangements and manage transaction costs. We see no reason to expect movement up or down. Therefore, it is appropriate to fix a value for the life of the Rate of Return Instrument.
Value of imputation credits	Fixed value	Our approach to estimating the value for imputation credits (gamma) is set as the product of the distribution rate (the proportion of imputation credits generated by an efficient service provider that are distributed to investors) and the utilisation rate (the extent to which investors can use the imputation credits they receive to reduce their personal tax).

Where a fixed value will be used, the precise value will be specified in the Instrument. The Instrument will specify the value to a certain degree of place accuracy (that is, number of decimal places). In determining these fixed values, we consider the relative merits of the relevant evidence used to estimate the value and the degree of uncertainty in the estimation.

Where a formula will be used to determine a value, the Instrument provides that ‘all calculations made pursuant to this Instrument must be done in Microsoft Excel or a software program that undertakes equivalent calculations, and must be unrounded’. This is the same approach taken in the current Instrument.

4 Benchmark gearing ratio

A regulated NSP's financing is made up of debt and equity capital. The gearing ratio is the proportion of an NSP's RAB financed by debt. The gearing ratio is used to weight the expected required returns on debt and equity to derive the weighted average cost of capital (WACC).

The level of gearing is interrelated with the equity beta and credit rating due to the effect of leverage risk on these parameters. There are also interrelationships between gearing and tax expense.

4.1 Final decision

Consistent with our draft decision[153], our final decision is to maintain a gearing ratio of 60% to derive the WACC for the 2022 Instrument. This decision is based on a benchmarking approach and examining relevant empirical evidence, primarily based on the market data of our comparator set of listed Australian service providers over the longer term. We are satisfied that a 60% gearing ratio, and our benchmarking approach to estimating this ratio, will contribute to achieving the NEO and NGO to the greatest degree. In deciding whether a change to the current value is required, we have also considered the robustness of the empirical estimates and the impact of changes to the gearing ratio on the overall rate of return.

We consider that a benchmarking approach will contribute to the achievement of the legislative objectives because it both provides an incentive for service providers to adopt efficient gearing structures and prevents exposing consumers to different gearing levels adopted by individual service providers.[154] Empirically estimating the benchmark gearing ratio is also consistent with our estimation of equity beta and credit rating.[155] Section 4.3 discusses the key issues in estimating a benchmark gearing ratio and how we considered these issues to arrive at our final decision.

For this final decision we decided to exclude hybrid securities (securities with characteristics of both debt and equity) from our gearing estimation. As it is not clear that the use of hybrid securities is reflective of the practice of a benchmark NSP, and its inclusion/exclusion does not materially impact on the overall gearing level. This approach is consistent with our draft decision, but is different from our 2018 Instrument approach, in which hybrid securities were individually considered.

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[153] AER, *Draft rate of return instrument explanatory statement*, June 2022, pp. 73-83.

[154] All else equal, variabilities in gearing levels lead to different rates of return and consequently different prices across service providers.

[155] In addition to weighting the returns on debt and equity to form a WACC, the gearing ratio can affect the leverage risk of a firm. We expect leverage risk to have an effect on equity beta and be a factor in the considerations of credit rating agencies.

Similar to equity beta, we recognise that in the future we may need to develop a revised approach to estimate gearing as our comparator set ages, unless privately owned networks once again list on the ASX. We aim to undertake more work to consider whether other comparators can be satisfactorily employed. We will also consider whether the comparator set used for beta estimation should be consistent with one used for gearing.

4.2 Draft decision

Our draft decision was to adopt a gearing ratio of 60% based on a benchmarking approach and examining the relevant empirical evidence. For the draft decision we adopted a similar estimation approach to that of our 2018 Instrument, except for our treatment of hybrid securities. We also decided to exclude all hybrid securities from our gearing ratio estimation.

4.3 AER considerations

Our empirical estimation of a benchmark gearing ratio is primarily based on market evidence from a comparator set of listed Australian service providers over the short term (last 5 years) and longer term. This includes consideration of the treatment of certain 'hybrid' securities and their impact on estimation of the benchmark gearing ratio.

We consider that the gearing ratios of Australian service providers will most closely reflect the regulatory and commercial risks involved in providing regulated services. Benchmarking against listed NSPs allows us to consider market gearing values and is consistent with our approach to estimating the benchmark credit rating and equity beta parameters. Updated estimates of the gearing ratios for our comparator set of service providers are presented in section 4.3.1.[156]

Market values have been accepted by our experts as being more appropriate than book values in our assessment of gearing.[157] Further, considering both short and longer historical averages allows us to take into account more recent data as well as the larger comparator set available from older data. The sample period, use of market and book values, the appropriate comparator set, and treatment of hybrid securities are further considered in section 4.3.2.

Since the release of our draft decision, updated financial data for APA Group (APA) and AusNet Services (AST) has become available. Our updated analysis shows that the average gearing level of our comparator set based on market value of equity and book value of debt (our preferred estimator) over the past 5, 10 and 17 years are 51%, 53% and 59%, respectively. These are below the benchmark gearing level of 60% adopted in the 2018 Instrument. These values are also slightly lower than the corresponding estimates in our draft decision. By contrast, observed average gearing level based on book values of equity and debt has increased over time as shown in Table 4.2 below. The average gearing level of our

[156] Our empirical evidence was based on the financial reports of closely related comparators along with the data provided by Bloomberg. The estimates from Bloomberg were broadly consistent with our estimates.

[157] CEPA, *Expert Joint Report*, April 2018, p.27.

comparator set based on book values of equity and debt over the past 5, 10 and 17 years are 74%, 70% and 72%, respectively.

We note that our approach – which uses historical book values of debt as a proxy for market values – may underestimate the true market gearing ratio as interest rates have been declining up until recently. This is because the market value of previously issued fixed rate debt would tend to increase when the interest rates fall, while the book value would remain unchanged.

Further, we consider the gap between average gearing level based on market value of equity and book value of debt and the current 60% ratio is not sufficient to justify a change. Our expert report from Partington and Satchel noted that small changes in gearing are likely to have little appreciable effect on the overall WACC, and regulatory action may only be justified at the extremes (gearing close to 0 or 1).[158]

This is due to 2 effects that gearing has on the overall rate of return:

- the ratio of return on debt to return on equity
- the re-leveraged equity beta applied to the return on equity.

In theory, these effects mostly offset each other.[159] This is consistent with advice from our expert Dr Lally in 2018 that an 8% change in benchmark gearing would only have a modest impact (10 basis points) on the allowed rate of return (WACC).[160]

Finally, stakeholder submissions to our draft decision noted that a gearing level of 60% continues to be appropriate for the 2022 Rate of Return Instrument.[161]

Combining these considerations with our assessment of our approach against the assessment criteria (notably materiality and sustainability), we do not consider that a change from the current benchmark gearing ratio of 60% is required.

4.3.1 Updated empirical estimates

Table 4.1 presents gearing estimates for 5 comparator businesses since 2006 using market values of equity and book value of debt (book value of debt is used as a proxy for the market value of debt). It shows a declining trend in the average market value gearing estimates. For the 2018 Instrument, the 5-year and 10-year averages (to 2017) were 54% and 61%, respectively. Our draft decision 5, 10 and 16-year averages updated to 2021 were 52%, 55%

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[158] Partington and Satchell, *Report to the AER: WACC and Leverage*, May 2021, pp. 27–28.

[159] Return on equity is generally higher than return on debt, therefore a lower gearing will increase the overall return (before accounting for the impact on beta). However, a lower gearing also generally lowers the equity beta applied to the return on equity, in turn reducing the overall rate of return.

[160] Dr Martin Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, pp. 11–13.

[161] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 7, APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p. 18, ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 111, Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 8.

and 60%, respectively. For this final decision, 5, 10 and 17-year averages updated to 2022 are 51%, 53% and 59%, respectively.

Table 4.1 AER gearing estimates based on market values of equity and book values of debt

Year	ENV	APA	DUE	AST	SKI	Average
2006	66%	51%	79%	56%	60%	62%
2007	65%	59%	67%	55%	57%	61%
2008	77%	73%	76%	59%	70%	71%
2009	75%	68%	80%	70%	70%	73%
2010	74%	61%	80%	64%	65%	69%
2011	66%	53%	79%	64%	62%	65%
2012	63%	47%	72%	59%	59%	60%
2013	53%	46%	71%	57%	62%	58%
2014	47%	45%	64%	58%	55%	54%
2015	n/a	50%	62%	59%	56%	57%
2016	n/a	49%	51%	54%	54%	52%
2017	n/a	49%	n/a	50%	52%	50%
2018	n/a	45%	n/a	53%	57%	52%
2019	n/a	45%	n/a	53%	59%	52%
2020	n/a	45%	n/a	57%	59%	54%
2021	n/a	49%	n/a	49%	58%	52%
2022	n/a	45%	n/a	44%	n/a	45%
5-year average	**n/a**	**46%**	**n/a**	**51%**	**58%**	**51%**
10-year average	**50%**	**47%**	**62%**	**53%**	**57%**	**53%**
Average since 2006	**65%**	**52%**	**71%**	**57%**	**60%**	**59%**

Note: ENV is Envestra Limited, APA is APA Group, DUE is DUET Group, AST is AusNet Services and SKI is Spark Infrastructure. SKI estimates are as at 31 December each year (except 2021, which represents 30 June estimates due to availability of data). AST estimates are as at 31 March each year. All other estimates are as at 30 June each year. Average represents the average for all firms in a year and does not make any adjustment for these timing differences. The estimates presented reflect our decision to exclude all hybrid securities from analysis, which may result in discrepancies with values presented in 2018 and annual updates.
Average values over a number of years are calculated as simple averages with any n/a values in the year range indicated ignored.
Source: Annual reports, AER analysis

For completeness, in Table 4.2 we present gearing estimates for 5 comparator businesses over the past 17 years using book values of both equity and debt. The average gearing level of our comparator set is 72% over the 17 years to 2022, 70% for the 10 years to 2022 and 74% in the last 5 years to 2022. The 5-year and 10-year estimates have increased slightly from 68% and 70% since the 2018 Instrument containing estimates to 2017.

Table 4.2 AER gearing estimates based on book values of equity and debt

Year	ENV	APA	DUE	AST	SKI	Average
2006	91%	67%	82%	57%	81%	76%
2007	90%	69%	75%	57%	80%	74%

Year	ENV	APA	DUE	AST	SKI	Average
2008	82%	71%	76%	58%	89%	75%
2009	80%	70%	79%	67%	85%	76%
2010	79%	68%	79%	62%	66%	71%
2011	78%	63%	77%	60%	69%	70%
2012	78%	64%	77%	61%	68%	70%
2013	71%	63%	79%	61%	68%	68%
2014	71%	65%	76%	64%	67%	69%
2015	n/a	68%	74%	69%	66%	69%
2016	n/a	71%	65%	64%	69%	67%
2017	n/a	71%	n/a	62%	69%	67%
2018	n/a	70%	n/a	66%	73%	70%
2019	n/a	74%	n/a	69%	76%	73%
2020	n/a	77%	n/a	74%	77%	76%
2021	n/a	77%	n/a	66%	76%	73%
2022	n/a	81%	n/a	81%	n/a	81%
5-year average	**n/a**	**76%**	**n/a**	**71%**	**75%**	**74%**
10-year average	**71%**	**72%**	**73%**	**67%**	**71%**	**70%**
Average since 2006	**80%**	**70%**	**76%**	**65%**	**74%**	**72%**

Note: ENV is Envestra Limited, APA is APA Group, DUE is DUET Group, AST is AusNet Services and SKI is Spark Infrastructure. SKI estimates are as at 31 December each year (except 2021, which represents 30 June estimates due to availability of data). AST estimates are as at 31 March each year. All other estimates are as at 30 June each year. Average represents the average for all firms in a year and does not make any adjustment for these timing differences. The estimates presented reflect our decision to exclude all hybrid securities from analysis, which may result in discrepancies with values presented in 2018 and annual updates.
Average values over a number of years are calculated as simple averages with any n/a values in the year range indicated ignored.
Source: Annual reports, AER analysis

4.3.2 Estimation approach

Consistent with our draft decision, this final Instrument's approach to estimating the gearing ratio is based on:

- using listed NSPs for the comparator set of firms
- placing primary weight on gearing estimates based on market values (the availability of market value of debt is limited, so the book value of debt is used as a proxy)
- considering both shorter and longer historical averages
- removing hybrid securities from both debt and equity values.

In response to our draft decision, there was a high degree of agreement among stakeholders that this approach to estimating gearing is appropriate.[162] The Independent Panel did not specifically comment on our approach to estimating the gearing ratio, but noted that our draft decision overall was supported by evidence and was likely to contribute to the achievement of the Energy Objectives.[163]

4.3.2.1 Sample period

In 2013 and 2018 we considered gearing estimates from comparable businesses over a historical 10-year period, taking account of both the 10-year and 5-year average gearing levels.[164] For the 2022 Instrument, we continue to estimate the gearing levels averaged over 5 years or longer periods.

In 2018 we observed that the experts' view was that the core capital structure decisions of companies are stable, gearing choices typically reflect a long-term investment strategy and share price movements and changes in the market capitalisation of a listed company can distort shorter-term gearing estimates.[165] Consistent with these observations, we consider that we should continue to take into account averages over a 5-year or longer periods when deciding on the benchmark gearing. Our empirical analysis of equity beta and credit ratings also involves consideration of data over a relatively long time period of 5 to 10 or more years. We consider it is generally desirable to have a consistent approach to estimating rate of return parameters (where possible).

Further, we recognise that there is a trade-off between the stability of the longer-term (10-years or longer) estimates based on a larger dataset, and the timeliness and relevancy of the shorter-term (5-year) estimates based on a small dataset. As such, we recognise that there is some regulatory judgement required in the weight to apply to each estimate.

The majority of submissions received from stakeholders on our draft working paper noted that the downward trend in market value gearing was likely a result of short-term movements in market data for a small number of firms.[166] ENA and AusGrid suggest solely using the 10-year average to calculate gearing to reduce the volatility from these short-term movements, while CRG recommends focusing on the 5-year average to better reflect the declining trend

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[162] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 7, APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p. 18, ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 111, Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 8.

[163] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p. 5.

[164] AER, *Explanatory Statement - Draft rate of return guideline*, August 2013, pp. 179-180; AER, *Explanatory Statement - Draft rate of return guideline*, July 2018, pp. 168–169.

[165] AER, *Explanatory Statement - Draft rate of return guideline*, July 2018, pp. 168–169; CEPA, *Evidence session 1 & 2 – Expert Joint Report*, April 2018, p. 30.

[166] ENA, *Submission - Overall rate of return*, 3 September 2021, p. 18-19; Endeavour Energy, *Submission - Overall rate of return, Equity and Debt*, 3 September 2021, p. 4; AEC, *Submission - Overall rate of return, Equity and Debt*, 3 September 2021, p. 1; NSG, *Submission - Overall rate of return, Equity and Debt*, 3 September 2021, p. 5.

in market value for gearing.[167] The CRG also submitted that maintaining the current 60% gearing ratio was appropriate.

Our shorter-term estimates of market gearing may indeed have been affected by short-term movement in market data. For example, as further explained in section 4.3.2.2, using historical book values of debt as a proxy for market values may underestimate the true market gearing ratio when interest rates have been declining – as has been the case until recently. While we do not consider it necessary to focus our analysis exclusively on average gearing levels over 10 years (or longer), we consider it is important to understand how changing economic conditions may affect our estimates.

4.3.2.2 Market and book values of equity and debt

A gearing ratio requires estimates of the value of a business's debt and equity.[168] These values can be obtained from book values and market values. Book values are derived from financial statements, whereas market values are obtained from market prices of debt and equity securities.

In 2018 we placed primary weight on estimates from market values and secondary weight on book values of the same listed firms to estimate the benchmark level of gearing. Our review of domestic regulators also indicates that 4 of the 7 regulators use market value estimates only, while Brattle's review of international regulators indicates that a range of approaches are used when estimating gearing and 2 regulators explicitly use market value estimates.[169] A report we commissioned from Partington and Satchell also considered that market values should be used when estimating gearing where possible.[170]

The market value of debt is not typically available because corporate debt is not as frequently traded as market equity.[171] Hence, we considered book value of debt an acceptable proxy for market value and used book value of debt to estimate gearing.

However, using the historical book value of debt is not a perfect proxy and may underestimate (overestimate) gearing where interest rates have been declining (rising). Networks have a combination of fixed rate and floating rate debt instruments. The market value of fixed rate debt tends to have a negative relationship with the interest rate because

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[167] ENA, *Submission - Overall rate of return*, 3 September 2021, p. 23-24; AusGrid, *Submission - Overall rate of return*, 3 September 2021, p. 3-4; CRG, *Overall rate of return, Equity and Debt - Volume 1*, 3 September 2021, p. 37-38.

[168] AER, *Rate of return instrument, Explanatory Statement*, December 2018, p. 69.

[169] Brattle, *A review of international approaches to regulated rates of return*, June 2020. We reviewed 7 domestic regulators: Economic Regulation Authority of West Australia (ERAWA), Queensland Competition Authority (QCA), Essential Services Commission of South Australia (ESCOSA), and Independent Pricing and Regulatory Tribunal (IPART) in New South Wales use market values. Independent Competition and Regulatory Commission (ICRC) in Canberra, Essential Services Commission (ESC) in Victoria and Australian Competition and Consumer Commission (ACCC) are not determinative.

[170] Partington and Satchell, *Report to the AER: WACC and leverage*, 19 May 2021, p. 20.

[171] Lally, M., *Review of the AER's views on gearing and gamma*, 7 May 2018, pp. 7-8.

as interest rates fall, demand for previously issued fixed rate bonds – and the price of those bonds – increases. Since around 2009, interest rates – including yields on 10-year non-financial corporate bonds – have trended down (up to March 2022), suggesting that the historical book value of debt outstanding during our sample period might underestimate the current market value of debt. In turn, the gearing estimated using historical book values of debt may underestimate true market gearing.

Submissions from APA, Ausgrid, ENA, Energy Queensland and Endeavour Energy following our draft working paper agreed with continuing to primarily use market values to estimate gearing.[172] CRG's submission to the draft working paper recommended revisiting the estimation of gearing based on book values.[173] This is due to the divergence in market value and book value, which CRG submitted should be examined before coming to a decision. In its submission to the information paper, CRG noted the limitations of market gearing and noted the stability of book gearing over the period as evidence that the case for changing overall gearing based on market value estimation was low.[174]

We maintain that primary weight should be placed on gearing estimates based on market values. We consider that they better reflect current market information on the efficient financing of the benchmark entity. As market value of debt is not readily available, we use book value of debt as a proxy for market value of debt. However, this may cause discrepancies between our gearing estimation and true market gearing through the interest rate cycle and may underestimate (overestimate) the true market gearing when interest rates are falling (rising).

The use of market values promotes consistency between our benchmark gearing ratio and other rate of return parameters that are typically informed by market data. We consider this important given the relationship between leverage risk and equity beta, and the estimation of equity beta from returns data of listed equity.

4.3.2.3 Comparator set

Our comparator set for gearing estimation includes 5 listed Australian NSPs with data back to 2006. However, for the most recent 5-year period the number of listed firms has dropped from 5 to one (APA), due to the delisting of AST and Spark Infrastructure in 2022.

In its submission to our draft working paper, ENA stated that the change in the average gearing estimate is partially the result of the change in the comparator set, thus the support for any change in gearing is weak.[175] We agree with this view. CRG also submitted that we

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[172] APA, *Submission - Overall rate of return, Equity and Debt*, 3 September 2021, p. 1; AusGrid, *Submission - Overall rate of return*, 3 September 2021, pp. 3-4; ENA, *Submission - Overall rate of return*, 3 September 2021, pp. 22-23; Energy Queensland, *Submission - Overall rate of return, Equity and Debt*, 3 September 2021, p. 1; Endeavour Energy, *Submission - Overall rate of return, Equity and Debt*, 3 September 2021, p. 4.

[173] CRG, *Submission - Overall rate of return, Equity and Debt - Volume 1*, 3 September 2021, pp. 35-47.

[174] CRG, *Submission - Rate of Return Instrument information paper*, 11 March 2022, p. 124.

[175] ENA, *Submission - Overall rate of return*, 3 September 2021, p. 28.

should consider excluding firms that have been delisted for 5 or more years from our analysis. We do not consider that this is required because historical information from firms that have been delisted can still be useful in our consideration of benchmark gearing, noting the limitations of this data.

Acknowledging the decline in our comparator set, observed long-term average gearing levels have been relatively stable, with minor declines observed between our draft decision and this final decision. This stability along with the updated data for 2 out 5 firms for this 2022 Instrument, lead us to consider it prudent to continue to be informed only by listed domestic firms for our 2022 Instrument gearing estimation.

We recognise the firms in our comparator set have varying degrees of unregulated activities, which we must consider when exercising our regulatory judgement. APA has around 90% unregulated revenue, so its inclusion may be less representative of the risks involved in providing regulated services.[176] Nevertheless, it is largely a network business and the risks it faces are likely to be closer to those of a domestic regulated network business than international or other infrastructure businesses.

Further, we do not consider that adding gearing estimates from other sectors or countries is required for this review. We do not consider there is sufficient evidence to suggest that any of these options would provide a significant improvement to our current estimate. As the overall level of risk of providing regulated services may differ between sectors and countries, we consider it appropriate to rely on Australian listed NSPs for our gearing estimation. This is consistent with our comparator set used to estimate equity beta.

We recognise that we may need to develop a revised approach to estimate gearing as our comparator set ages, unless privately owned networks once again list on the share market. Several submissions to the Economic Regulatory Authority of Western Australia's (ERAWA) draft gas rate of return instrument[177] noted the need to consider the issue of the small domestic sample size.

For our next Instrument review, we aim to undertake more work to consider whether other comparators can be satisfactorily employed.

4.3.2.4 Hybrid securities

Hybrid securities are securities that have characteristics of both debt and equity. They often do not have simple debt characteristics like simple senior debt bond issuances or bank debt, and it is important to understand the terms and conditions of each security.

Our 2018 Instrument adopted different approaches to account for these securities in estimating gearing, depending on the characteristics of the securities. We did not include hybrid securities from Envestra and Spark Infrastructure in our gearing calculation because

[176] APA Group, *Annual Report 2022*, August 2022, p. 17.

[177] ERAWA, *Explanatory statement for the 2022 draft gas rate of return instrument*, June 2022, p. 145

they were not sufficiently similar to debt. Hybrid securities from AusNet Services were included but were unlikely to be material when estimating gearing.

We have observed an increased use of hybrid securities by regulated businesses in 2020 and 2021.[178] Our *Overall rate of return draft working paper* explored further the impacts of including and excluding hybrid securities as well as a sensitivity analysis of different options.[179] This previous analysis did not include post-2018 issued hybrid securities, as these were issued after the 2020 annual reports were published. For this explanatory statement we have updated the sensitivity analysis for the information that became available since the release of the *Overall rate of return draft working paper.*

We have conducted a sensitivity analysis on the inclusion of hybrid securities on our gearing estimates using the following scenarios:

- 2018 approach (AusNet included pre-2018, others excluded)
- hybrids included as 100% debt
- hybrids included as 100% equity
- all hybrids excluded for all businesses (alternatively, hybrids included as 50% debt/equity).

Table 4.3 displays the results from our sensitivity analysis.

Table 4.3 AER hybrid securities gearing sensitivity analysis

Value	2018 approach	100% hybrids as debt	100% hybrids as equity	Hybrids excluded from debt and equity [50% share]
Market value				
5-year industry average estimates	52%	54%	48%	51% [51%]
10-year industry average estimates	54%	55%	51%	53% [53%]
Average since 2006	60%	61%	57%	59% [59%]
Book value				
5-year industry average estimates	75%	76%	69%	74% [72%]
10-year industry average estimates	71%	72%	67%	70% [69%]
Average since 2006	72%	73%	68%	72% [70%]

[178] AusNet Services issued 2 60-year hybrid security in the form of non-convertible subordinated notes in 2020 and 2021, and TransGrid (15% owned by Spark Infrastructure) secured a hybrid security in the form of subordinated notes from the Clean Energy Finance Corporation (CEFC) in 2021.

[179] AER, *Overall rate of return – Draft working paper*, July 2021, p. 37.

Source: Hybrid securities sensitivity analysis, AER analysis

Our draft working paper also sought submissions from stakeholders on the appropriate treatment of hybrid securities for our assessment of gearing. ENA, Ausgrid, Energy Queensland, AusNet and NSG stated that hybrid securities should be included in gearing and also be used to inform cost of debt for consistency.[180] The MEU suggested considering hybrid securities as debt until they are converted to equity.[181] APGA stated that hybrid securities should not be included in benchmark gearing due to limited issues and different characteristics across current hybrids.[182] APA and CRG also submitted that they did not consider the use of hybrid securities formed part of the portfolio of financing instruments used by a benchmark service provider.[183] However, CRG noted that the inclusion of hybrid securities should be revisited in the next review if they become more prevalent.

ERAWA's draft gas rate of return instrument[184] also noted the difficulty in properly understanding the characteristics of hybrid and the associated risk of misclassifying debt and equity levels.

It is not clear that the use of hybrid securities is reflective of the practice of a benchmark NSP. Having regard to the results of our sensitivity analysis, we consider that excluding hybrids from gearing estimation is almost equivalent to treating hybrids as 50% debt and 50% equity – a common approach used by credit rating agencies in their assessments. Furthermore, our sensitivity analysis also shows that the difference between excluding these values and treating them as 100% debt does not have a material impact on the overall gearing level.

Therefore, consistent with our draft decision, our final decision is to exclude hybrid securities for our empirical estimates of gearing. However, should hybrid securities become more prevalent and material in the future we will investigate the appropriate treatment and allocation of securities for estimating the benchmark gearing ratio.

4.3.3 Assessment criteria

As discussed above, we are required to exercise our discretion about the evidence and methods that are available for us to make our decision. Where necessary, we have applied

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[180] ENA, *Rate of Return Instrument review - AER Final Omnibus Paper and information paper - submission*, 11 March 2022, p. 32; ENA, *Submission - Overall rate of return*, 3 September 2021, pp. 24-27; Ausgrid, *Submission - Overall rate of return*, 3 September 2021, p. 4; Energy Queensland, *Submission - Overall rate of return, Equity and Debt*, 3 September 2021, p. 1; AusNet, *Submission - Overall rate of return, Equity and Debt*, 3 September 2021, p. 4; NSG, *Submission - Overall rate of return, Equity and Debt*, 3 September 2021, p. 5.

[181] MEU, Submission - *Overall rate of return, Equity and Debt*, 3 September 2021, pp. 3-5.

[182] APGA, *2022 Rate of Return Instrument information paper - Submission*, 11 March 2022, p. 26

[183] APA, *2022 Rate of Return instrument review information paper and final Omnibus paper - Submission*, 11 March 2022, p. 73; CRG, *Rate of Return Instrument information paper - Submission*, 11 March 2022, pp. 124-125.

[184] ERAWA, *Explanatory statement for the 2022 draft gas rate of return instrument*, June 2022, p. 47

our assessment criteria to assist us to exercise our judgement. Table 4.4 sets out our assessment criteria and key areas in which they have assisted us to make our decision.

Table 4.4 Criteria of final decision benchmark gearing ratio assessment

Assessment criteria		Final decision
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.	Empirical estimates underlying decision reflect updated market information and well-accepted economic and finance principles. We maintain a preference for market values over book values as more reflective of market information.
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.	Final decision is primarily based on market data and a comparator set of listed Australian service providers gearing levels over the short and longer term using a simple estimation method.
3	Implemented in accordance with good practice (a) supported by robust, transparent and replicable analysis that is derived from available credible datasets.	Estimation approach based on robust, transparent and replicable market-based analysis in accordance with good practice. Have had regard to deficiencies in data as evident.
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 inputs estimation (b) based on quantitative modelling which avoids arbitrary filtering or adjustment of data, which does not have a sound rationale.	Models underlying analysis of benchmark gearing are based on robust quantitative modelling and avoid arbitrary adjustments without sound rationale. Have had regard to deficiencies and biases in data where relevant.
5	Where market data and other information is used, this information is (a) credible and verifiable (b) comparable and timely (c) clearly sourced.	Market data used in gearing estimation is sourced from verifiable financial statements and reflects latest data available at the time.
6	Sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.	Estimation approach includes latest information and considers shorter-term outcomes to the extent they reflect changing market conditions.
7	The materiality of any proposed change.	Our approach is to only implement a change to overall gearing if material and likely to be persistent. Small changes to benchmark gearing not likely to be material.
8	The longevity or sustainability of new arrangements.	Consider the gearing ratio likely to be stable. Estimation approach may need adjustment in future due to declining comparator set. Unless clear change required, we have a preference to maintain current benchmark gearing ratio.

5 Overall approach to return on equity

We estimate the expected return on equity using the approach we developed in our 2013 guidelines and continued in our 2018 Instrument. This approach is described as the foundation model approach. This chapter explains our final decision under each step of the foundation model approach for estimating the final equity risk premium (ERP). The ERP is then added to the risk-free rate to determine the expected return on equity.

The critical allowance for an equity investor in an efficient firm in the supply of Australian regulated energy network services is the allowed equity risk premium over and above the estimated risk-free rate at a given time. Under the standard application of the SL CAPM, this equals the MRP multiplied by the equity beta.

5.1 Final decision

Our final decision is to maintain our current approach to estimate the expected return on equity by using the foundation model approach.

Recognising our decision in the round where we evaluate whether the decision as a whole likely contributes to the achievement of the National Electricity Objective (NEO) and National Gas Objective (NGO) to the greatest degree, we have now included step 7.

The 7-step process is briefly explained below:

- Step 1 – Identify relevant material.
- Step 2 – Determine role and how best to employ relevant material, including determining the foundation model (SL CAPM).
- Step 3 – Implement foundation model. Determine SL CAPM input parameter ranges and point estimates.
- Step 4 – Other relevant information. Estimate other relevant information used to inform overall return on equity.
- Step 5 – Evaluate information from steps 3 and 4.
- Step 6 – Distil return on equity point estimate. Use SL CAPM point estimate as a starting point and select final return on equity value, taking into account information from steps 4 and 5.
- Step 7 – Look at the decision in the round and consider whether the decision as a whole is likely to contribute to the achievement of the National Electricity Objective (NEO) and National Gas Objective (NGO) to the greatest degree.

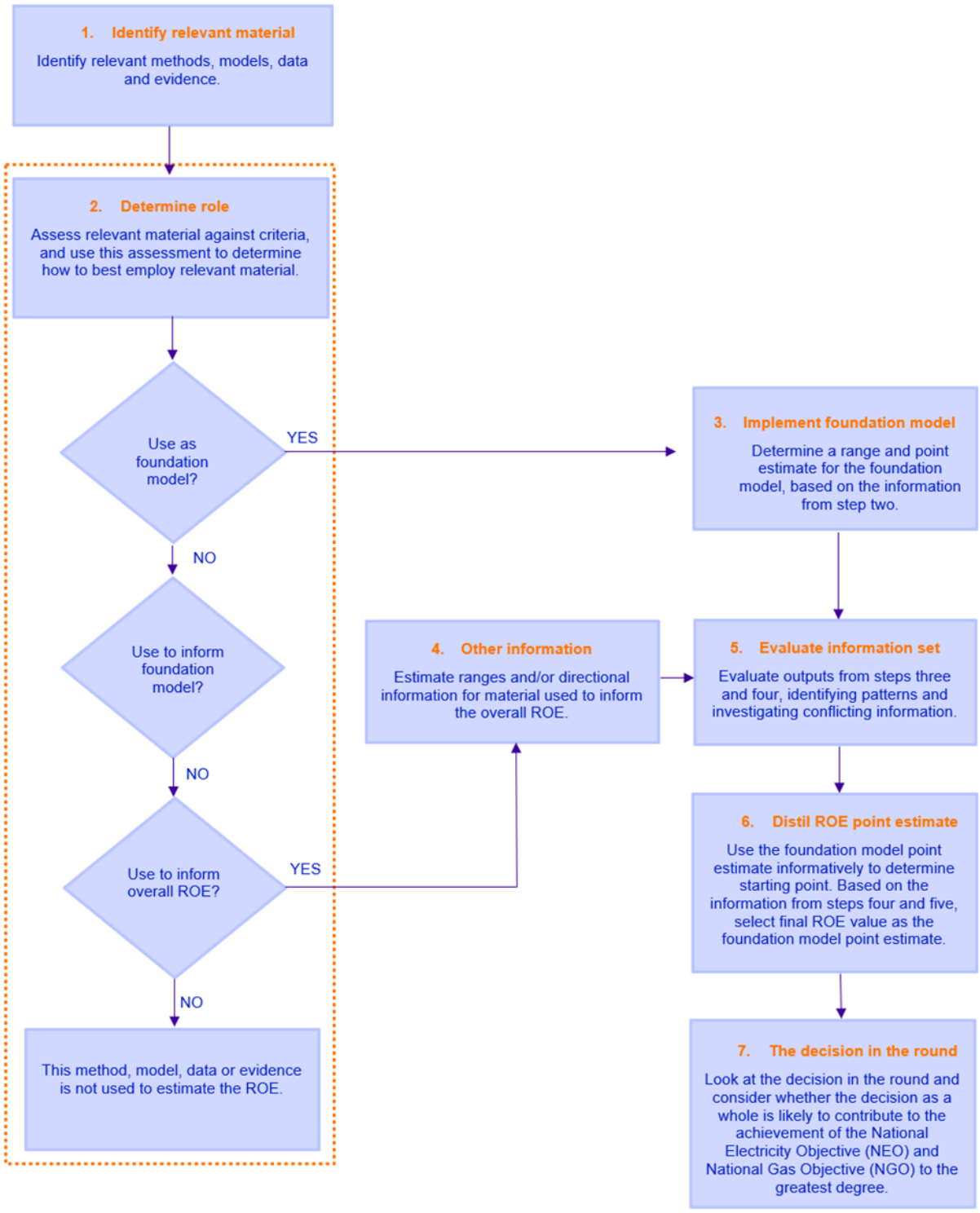
Our final decision under step 2 is to calculate the return on equity using the Sharpe-Lintner CAPM (SL CAPM). Under step 3 our input parameters for the SL CAPM are a market risk premium of 6.2% and an equity beta of 0.6, resulting in an ERP of 3.72%. We combine this ERP with the risk-free rate using a term of 10 years, observed at the time the 2022 Instrument is applied. Having considered the information under steps 4, 5 and 7 our final decision is to adopt the ERP estimate derived under step 3 without revisiting the SL CAPM input parameters.

Combining our ERP of 3.72% with a placeholder risk-free rate of 3.60% results in an expected return on equity of 7.32%.[185] We consider this estimate resulting from applying our foundation model approach will, or is most likely to, contribute to the achievement of our legislative objectives. We explain the reasons supporting this conclusion in detail in sections 6, 7 and 8 which relate to our return on equity parameter estimates (risk-free rate, MRP and beta), and in section 11, where we evaluate other relevant information to inform our overall return on equity point estimate.

Figure 5.1 presents the 7 steps graphically.

[185] The 10-year term risk free rate has been calculated over 20 days at the end of December 2022.

Figure 5.1 Foundation model approach flowchart



5.2 Draft decision

Our draft decision applied the foundation model approach comprising of only 6 steps.

We have now assessed submissions and new evidence since our draft decision at each of the 7 steps and any changes at the level of a step is discussed under that step.

5.3 AER considerations

The foundation model approach provides a framework for systematically considering relevant information and then exercising our judgement on the appropriate regulated return on equity. It does not require all information to be used if it did not satisfy our assessment criteria. Our approach is to assess all information and employ it according to its merits.

We consider that our 7-step process (foundation model approach):

- provides opportunity to evaluate the merits of relevant evidence
- applies appropriate weight to the relevant evidence at the most suitable point in the assessment
- uses a well-established forward-looking asset pricing model to compensate for systematic risk populated with parameter value estimates that:
  - are consistent with good finance theory
  - are based on market data and developed using robust empirical methods
  - recognise and allow for inherent uncertainties in the data.

We now discuss each of the 7 steps in our foundation model and our consideration of the evidence.

5.3.1 Steps 1 and 2 – Identify relevant material and determine role

Overall, we have not identified any additional classes of material that we did not consider when preparing our 2018 Instrument. Therefore, the list of material we employed in 2018 remains appropriate for our 2022 Instrument.

In 2020 we consulted with stakeholders on alternative equity models through our *CAPM and alternative return on equity models* working paper[186] to settle our position early in the process.

In August 2020 we published a consultation paper[187] along with an expert report from Graham Partington and Stephen Satchell, who provided expert advice on alternative models.[188] A report by the Brattle Group also provided relevant information on the use of equity models by international regulators.[189]

Having considered submissions on our discussion paper and the material in the expert reports, our final position set out in December 2020 is to maintain the use of the standard SL CAPM as the foundation model in our 2022 Instrument.[190] There was general support

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[186] AER, Final working paper, *CAPM and alternative return on equity models, December 2020.*

[187] AER, Draft working paper, *CAPM and alternative return on equity models, December 2020.*

[188] Partington and Satchell, *Report to the AER, Alternative asset pricing models*, 30 June 2020.

[189] The Brattle Group, *A review of international approaches to regulated rates of return, Prepared for the AER*, 30 June 2020

[190] AER, Final working paper, *CAPM and alternative return on equity models,* December 2020, p. 24.

from all stakeholders for the use of the SL CAPM as the foundation model, but some noted the importance of how the SL CAPM is implemented. We note the importance of the calculation of the input parameters of the SL CAPM. Sections 6, 7 and 8 discuss the risk-free rate, MRP and equity beta parameters, respectively.

In support of our final position set out in December 2020 of maintaining the use of the standard SL CAPM, network stakeholders such as APGA and APA submitted that the SL CAPM when properly applied can be used to estimate equity returns.[191] In addition, the Independent Panel further noted that the AER has canvassed a wide range of views on the best way to implement the SL CAPM and that the review process has been comprehensive and thorough.[192]

Table 5.1 sets out all the relevant material and the role we have applied to it, if any, within our overall framework.

Table 5.1 Relevant material and role

Material (Step 1)	Role in 2018 (Step 2)	Role in 2022 and relevant merit
Sharpe-Lintner Capital Asset Pricing Model (SL CAPM)	Foundation model.	Foundation model.[193]
Black CAPM	Related to the overall return on equity. However, at the time of finalising the 2018 Instrument we had diminished confidence in the robustness of the Black CAPM. We were not persuaded to adjust the Sharpe-Lintner CAPM estimate for the theory of the Black CAPM.	No role.
Dividend growth models (DGMs)	Can be used to inform the market risk premium. However, at the time of finalising the 2018 Instrument we had diminished confidence in the robustness of the DGMs. We were not persuaded to select a market risk premium toward the top of the observed empirical estimates of historical excess returns.	We have explored DGMs extensively and the information they can provide in setting the MRP. We included an outline of how the DGM could be given meaningful weight in setting the MRP as an alternative approach to our draft decision. That alternative approach was not adopted in this final decision and we continue to adopt our draft decision. We consider historical excess returns provide the best estimate of the MRP at this time because we are not confident that the conditional MRP can be accurately modelled using the DGM (see section 7).
Fama-French 3-factor model	No role.	No role.
Wright approach (TMR approach)	We have diminished confidence in the robustness of the Wright approach, leading us to place no reliance on it.	Having evaluated the theoretical basis and empirical evidence of the TMR approach, we have determined that the TMR

[191] APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p. 4; APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 3.

[192] Independent Panel Report*, AER Draft Rate of Return Instrument 2022*, July 2022, p. 6.

[193] AER, *CAPM and alternative return on equity models,* December 2020.

Material (Step 1)	Role in 2018 (Step 2)	Role in 2022 and relevant merit
		approach should not play a role in our MRP estimation process (see section 7).
Commonwealth Government Securities	Inform foundation model parameter estimates (risk-free rate).	Inform foundation model parameter estimates (risk-free rate – see section 6).
Observed equity beta estimates	Inform foundation model parameter estimates (equity beta).	Inform foundation model parameter (equity beta – see section 8).
Historical excess returns	Inform foundation model parameter estimates (MRP).	Inform foundation model parameter estimates (MRP – see section 7).
Survey evidence of the MRP	Inform foundation model parameter estimates (MRP).	Inform foundation model parameter estimates (MRP – see section 7).
Implied volatility	Inform foundation model parameter estimates (MRP).	Inform foundation model parameter estimates (MRP – see section 7).
Other regulators' MRP estimates	Inform foundation model parameter estimates (MRP).	Inform foundation model parameter estimates (MRP – see section 7).
Debt spreads	Inform foundation model parameter estimates (MRP).	Inform foundation model parameter estimates (MRP – see section 7).
Dividend yields	Inform foundation model parameter estimates (MRP).	Inform foundation model parameter estimates (MRP – see section 7).
Other Australian regulators' return on equity estimates	Inform the overall return on equity.	Inform the overall return on equity (see section 5.3.4).
Takeover/valuation reports	Inform the overall return on equity.	Inform the overall return on equity (see section 5.3.4).
Brokers' return on equity estimates	Inform the overall return on equity.	Inform the overall return on equity (see section 5.3.4).
Comparison with return on debt	Inform the overall return on equity.	Inform the overall return on equity (see section 5.3.4).

Source: AER, *Rate of return instrument, Explanatory Statement*, December 2018, pp. 82–83.

5.3.2 Step 3 – Implement the foundation model

Implementing the foundation model is a key step in our 7-step approach and has stood the test of time. After assessing the relevant evidence, we consider the best estimates for the SL CAPM parameters are:

- a formula for calculating the risk-free rate based on yields on Commonwealth Government Securities (CGS) using a term of 10 years
- a value of 0.6 for equity beta
- a value of 6.2% for market risk premium.

These parameter input point estimates and reasons are discussed in sections 6, 7 and 8.

5.3.3 Step 4 – Other information

Under step 4, we set out the form of the other relevant information that will inform the overall return on equity estimate. The additional information we will consider under step 4 is in Table 5.2 and is consistent with our 2018 Instrument.

Table 5.2 Other relevant information

Other relevant information	Form of information
Other Australian regulators' return on equity estimates	Can inform point-in-time estimate if they are sufficiently comparable
Brokers' return on equity estimates	Point in time and directional
Takeover/valuation reports	Directional
Comparison with return on debt	Relative

Source: AER analysis

5.3.4 Step 5 – Evaluation of information

Under step 5, we evaluate the outputs from steps 3 and 4. We evaluate the strengths and weaknesses of the relative merits of the other relevant information in forming a view as to whether, overall, they persuade us to adjust our equity risk premium. In undertaking this evaluation, we may consider matters including:

- patterns shown in the other relevant information
- the strengths and limitations of the other relevant information
- the magnitude by which the other relevant information suggests that the foundation model point estimate underestimates or overestimates the equity risk premium (if at all).

Since our overall rate of return crosschecks section is also evaluating the suitability of our return on equity, we have discussed our evaluation of other relevant information in chapter 11.

5.3.5 Step 6 – Select point estimate

We have considered the reasons for our input parameter point estimates using our foundation model approach calculated via the SL CAPM in sections 6, 7 and 8 and our evaluation of other relevant information in chapter 11. As a result, we are satisfied that an expected return on equity using a market risk premium of 6.2%, an equity beta of 0.6 and a risk-free rate observed at the time the Instrument is applied, will contribute to achieving our legislative objectives. That is, using a well-established forward-looking asset pricing model to compensate for systematic risk and populating it with parameter value estimates based on market data reflects a good estimate of expected market cost of capital. When capital is priced via a competitive market, the opportunity to beat the benchmark creates incentives to seek efficiencies. In a similar manner, providing a benchmark return on equity for service providers, reflecting a market rate of return for the risk of providing regulated services, furthers the revenue and pricing principles and is in the long-term interests of energy users.

5.3.6 Step 7 – The decision in the round

We have now added an extra step (step 7) where we assess the outcome of step 6 as part of our decision in the round and consider whether the decision as a whole is likely to contribute to the achievement of the National Electricity Objective (NEO) and National Gas Objective (NGO) to the greatest degree.

With the addition of step 7, if we found that the Instrument did not perform well in respect of cross-checks or future scenarios, we would consider options for making changes to our approach or parameters. For example, if we were not satisfied that the decision in the round is likely to contribute to the achievement of the NEO/NGO, we could reconsider the CAPM input parameters (risk-free rate, MRP and equity beta).

Since our overall rate of return crosschecks section is also evaluating the suitability of our return on equity, we have discussed our consideration of the in the round decision in chapter 11.

5.3.7 Assessment criteria

As discussed above, our consideration of issues shows that we are required to exercise our discretion about the evidence and methods that are available for us to make our decision. Where necessary we have applied our assessment criteria to assist us to exercise our judgement. Table 5.3 sets out our assessment criteria and key areas where they have assisted us to make our decision.

Table 5.3 Criteria of final decision assessment about the foundation model approach

Assessment criteria		Final decision
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.	The foundation model approach provides a framework for systematically considering all relevant material (the foundation model and other relevant information) as shown in Table 5.1. We consider material to be relevant if it is based on information, methods and models that are reflective of economics and finance principles and market information. However, using the foundation model and other relevant information informatively, as opposed to determinately, acknowledges the need for regulatory judgement in estimating the expected return on equity. Given the breadth of material and range of values that may represent reasonable estimates of the expected return on equity, the use of judgement is unavoidable.
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 consider the limitations of that purpose (b) promote simple over complex approaches where appropriate.	The foundation model approach provides a framework for systematically considering all relevant material (the foundation model and other relevant information) to estimate the expected return on equity. As such, it is fit for purpose. Using a foundation model approach is also relatively simple to implement, particularly in comparison with combining different estimates of multiple models. For example, our foundation model, the SL CAPM, is a model that stakeholders are familiar with already given its widespread use among market practitioners and other regulators.
3	Implemented in accordance with good practice (a) supported by robust, transparent and replicable analysis that is derived from available credible datasets.	Using our foundation model, the SL CAPM, to determine the expected return on equity, provides relatively replicable and transparent process. It allows stakeholders to make reasonable estimates of the returns expected to be determined in advance of a determination.
4	Where models of the return on equity and debt are used these are	Our foundation model approach uses the SL CAPM as the foundation model for the return on equity. In our 'CAPM and alternative return on equity models'

Assessment criteria		Final decision
	(a) based on quantitative modelling that is sufficiently robust as to not be unduly sensitive to errors in inputs estimation (b) based on quantitative modelling that avoids arbitrary filtering or adjustment of data that does not have a sound rationale.	working paper,[194] we considered that the SL CAPM was found to be robust with a clear theoretical foundation based on finance and economic principles. Australian data, which is used for the SL CAPM, is easily obtained for its estimation and calculations are easy to replicate. It is a model that is most likely to give estimates that have the least error and are unbiased.
5	Where market data and other information is used, this information is (a) credible and verifiable (b) comparable and timely (c) clearly sourced.	The foundation model approach provides a framework for systematically considering all relevant material as shown in Table 5.1. We consider material to be relevant if it is supported by market data or information that is credible, verifiable, comparable, timely and clearly sourced.
6	Sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.	Using the foundation model and drawing on other relevant information informatively, as opposed to determinately, to determine a final estimate of the expected return on equity, provides an appropriate balance between a relatively replicable and transparent process and providing flexibility in changing market circumstances.
7	The materiality of any proposed change.	Our final decision is to maintain our foundation model approach that we have implemented in the 2018 Instrument. As such, there is no proposed change.
8	The longevity or sustainability of new arrangements.	We consider that the foundation model approach is sustainable because it assists us in achieving our regulatory objectives by providing a framework to estimate the expected return on equity while systematically considering all relevant material available to us.

[194] AER, Draft working paper, *CAPM and alternative return on equity models,* December 2020*,* p. 14

6 Risk-free rate

The risk-free rate is a key parameter in the SL CAPM, our foundation model for estimating the return on equity. The risk-free rate measures the return an investor would expect from a 'riskless' investment. We then add the returns on this riskless asset to the equity risk premium to estimate the return on equity.

We must choose a proxy for the riskless investment. In choosing the proxy security, we need to consider the risk associated with the proxy and the appropriate term for calculating returns. We refer to the term as the benchmark term of the risk-free rate (or interchangeably the benchmark term of the return on equity). We also have to consider the appropriate period over which to observe the returns on this proxy security to calculate the risk-free rate. We call this length of time the averaging period – the period we average the returns on the proxy investment.

6.1 Final decision

6.1.1 Term of the return on equity

Our decision is to use the return on Commonwealth Government Securities (CGS) with a 10-year term. This is a change from our draft decision to use a benchmark term of the risk-free rate (equity term) matching the term of the access arrangement period or regulatory control period (typically 5 years) as our proxy for a risk-free rate.[195]

6.1.2 Choice of the proxy for the risk-free rate

In choosing the proxy security, we need to consider the risk associated with the proxy. Our final decision is to maintain that the CGS remains an appropriate proxy for the risk-free rate. This is a continuation of our draft decision.

6.1.3 Averaging period length

The averaging period is the length of time during which we observe the yields on CGS, using a term of 10 years to derive our estimate of the risk-free rate. The objective when choosing the appropriate length for the averaging period is to ensure that the estimate is relevant to the on-the-day rate but also that the estimate is not unduly biased by short-term volatility in the CGS yields. Our final decision is to require an averaging period between 20 and 60 business days, which in our view provides a pragmatic alternative to the on-the-day rate. This is a continuation of our draft decision.

6.1.4 Length of the nomination window

The nomination window sets out the period over which a regulated business can nominate their averaging period. We need to specify the nomination window length to ensure that the

[195] In the discussion that follows we refer to both these terms as 'regulatory control period'.

Rate of Return Instrument is capable of automatic application.[196] This is because the Instrument is binding, which reduces our ability to select the nomination window for each determination. Our final decision is that we require that a nominated averaging period must start and end between 8 months and 4 months before commencement of the regulatory control period. This is a continuation of our draft decision.

6.1.5 Automatic application of the risk-free rate

Since the Instrument applies automatically, it removes the need for us to exercise discretion. Therefore, in our final decision we have codified the process for nominating the risk-free rate averaging period in scenarios where the final decision is delayed, when the nominated averaging periods do not meet the criteria and when the number of business days changes. This is a continuation of our draft decision.

6.1.6 Carve-out clauses

Some NSPs are affected by a timing issue that arises because the Rate of Return Instrument overlaps with some reset processes.[197] Service providers affected by the timing issue will be required to nominate their averaging periods before the commencement of the current Rate of Return Instrument even though we will make a final regulatory decision[198] under the next Rate of Return Instrument. For NSPs in this situation, our final decision is to permit averaging periods that comply with either the 2018 or 2022 Rate of Return Instrument. This is consistent with our draft decision. This approach is specified in carve-out clauses 8, 24 and 25.

We have modified the carve-out clauses in the 2018 Instrument[199] to provide some additional flexibility. Our final decision is to allow specified NSPs to nominate their return on equity and debt averaging periods at or before the lodgement of their regulatory proposals. The reason for this changed approach is we consider it does not penalise service providers if they lodged compliant regulatory proposals. This is also a continuation of our draft decision.

6.2 Draft decision

Our draft decision was to use a benchmark term of the risk-free rate (equity term) matching the term of the access arrangement period or regulatory control period (typically 5 years) as our proxy for a risk-free rate. All other aspects of the risk-free rate final decision are consistent with our draft decision.

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[196] NEL, s. 18J(2)(b), NGL, s. 30E(2)(b).

[197] The AER is required to publish the rate of return instrument on the fourth anniversary of publishing the previous rate of return instrument: NEL, s. 18U(2)(a); NGL, s. 30P(s)(a).

[198] NER, cll. 6.11.1, 6A.13.1; NGR, r 62.

[199] 2018 Rate of Return Instrument clauses 8(d)(ii) and 24(f)(ii) in conjunction with clause 25.

6.3 AER considerations

Our final decision is based on our consideration in the following sections:

- Term of the risk-free rate
- Choice of the proxy for the risk-free rate
- Averaging period length
- Length of the nomination window
- Automatic application of the risk-free rate
- Carve-out clauses.

We have explored the arguments relevant to our decision to set the benchmark term of the return on equity to 10 years in section 6.3.1. In this section, we set out our reasons for changing our position from the draft decision. Our decisions about the choice of the proxy for the risk-free rate, the averaging period length, the length of the nomination window, the automatic application of the risk-free rate, and the carve-out clauses are consistent with our draft decision and are covered in sections 6.3.2, 6.3.3, 6.3.4, 6.3.5, and 6.3.6, respectively.

6.3.1 Term of the return on equity

To make our final decision, we reviewed the submissions from our stakeholders, consultant reports and expert evidence. We also considered the discussion around the equity term in the Independent Panel report. Overall, we have decided to maintain our current approach in the 2018 Rate of Return Instrument of using a 10-year benchmark term for the return on equity (term of the risk-free rate). This is a change in position from our draft 2022 Instrument.

Although we are maintaining our current approach of using a 10-year term of equity, we are open to reconsidering the issue in future if there is new evidence or reasoning.

After extensive consultation and consideration, our view is that the question of the term of return on equity must be settled through the exercise of regulatory judgement. We have seen cogent cases made for employing a term that matches the length of the regulatory period and a term of 10 years, consistent with our current practices. It is an issue where intelligent and reasonable people have reached different conclusions. Stakeholders, experts, regulators and review panels have reached different conclusions supported by detailed and thorough analysis.

We maintain our view from the draft Instrument that there is a sound rationale for employing a term that matches the length of the regulatory period as was recognised and supported by our Independent Panel. However, there is also a case for continuing to use a 10-year term. On balance, we consider that the bar for change has not been met at this time. In this decision we have decided to maintain the current approach for the following reasons:

- Stakeholders representing both consumers and industry told us that they see merit in stability and predictability of our regulatory framework. They have expressed this view as ‘a high bar for change’. It has been our regulatory practice to use a term of 10 years for considerable time. Regulatory stability is promoted by continuing this approach.

- Once we account for consequential amendments to the MRP, changing approach as per our draft decision would be of modest materiality at this time and on average over the long-term historical period.
- We are broadly satisfied with how the 2018 Instrument has been performing and we want any change to lead to clearly superior outcomes (see Chapter 11 for further detail).
- There has been a trend among Australian regulators to adopt a 10-year equity term. In outlining their decisions, these regulators considered the rate of return investors in long-lived assets would require over the asset lives.[200] We have also adopted a 10-year term in the past, with reference to the long-lived nature of the assets in an infrastructure business.[201] There has been acknowledgement that from a regulatory perspective NPV=0 is satisfied by matching term to the length of the regulatory period, while from a long-term investor perspective NPV=0 is satisfied by matching their practice (typically 10 years).[202]

The following discussion sets out our considerations in more detail. We have previously explored the arguments both in favour of and against matching benchmark equity term to the length of the regulatory period in our draft explanatory statement. Therefore, for this final decision we chose not to repeat this discussion and instead provide only a high-level summary of the main arguments.

6.3.1.1 Benchmark term of return on equity

In a commercial context, the term of the required rate of return on an asset relates to the expected investment time horizon for a physical asset or holding period of a corresponding security. In a regulatory context, the term of the allowed rate of return is related to the period of the allowance (such as the length of a regulatory control period where the rate of return will be reset at the commencement of each new regulatory control period).

We typically consider 2 options for setting the benchmark term of return on equity:

- match it to the length of the regulatory control period (typically 5 years)
- match it to the long asset lives associated with electricity and gas network infrastructure (typically 10 years because it is considered to better reflect long asset lives).

The 2018 Instrument set the term of the rate of return at 10 years for both the return on equity and return on debt and we previously determined a 10-year estimate of the expected

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[200] For example, QCA noted: 'We consider this approach reflects the requirements of investors and lenders who, in relation to long-lived infrastructure assets, will deploy equity over the entire life of the asset, rather than over any given regulatory period'. QCA, *Rate of return review, Final report,* November 2021, p. 83. See also ERA, *Explanatory Statement for the 2022 Draft Gas Rate of Return Instrument*, June 2022, pp. 95–99; IPART, *Review of our WACC method, Final Report Research,* February 2018, pp. 41, 43, 47.

[201] See, for example, AER, *Explanatory Statement – Rate of Return guideline*, December 2013, p.49; *Rate of return instrument - Explanatory statement,* December 2018, p. 126–131.

[202] ERA, *Explanatory Statement for the 2022 Draft Gas Rate of Return Instrument*, June 2022, pp.95–99.

inflation rate. However, in the *2020 Inflation Review* we decided to match our estimate of expected inflation to the length of the regulatory control period (typically 5 years).[203] We indicated that, because of this, we would review the term of the rate of return as part of our 2020 Instrument review.[204]

We calculate the allowed return on equity using the SL CAPM. SL CAPM describes the relationship between systematic risk and expected return on investments over a single period. The expected return on equity is calculated as a sum of the risk-free rate and an equity risk premium (which is a product of the market risk premium and equity beta). The risk-free rate is the expected return on a riskless investment. It characterises investors' time value (opportunity cost) of money.[205] That is, it reflects how the investors value a unit of money at the end of a given period relative to the beginning of the same period.

To calculate the allowed return on equity, we must choose a proxy for the riskless investment. In Australia, CGS are often used as such a proxy by both market practitioners and government agencies. We have used CGS yields in the 2018 Instrument, as well as our 2013 Rate of return guideline.[206]

Returns on the CGS tend to have an upward sloping term structure. That is, the returns tend to be higher when the term to maturity of these securities is longer.[207] To calculate the allowed return on equity, we must specify the term to maturity of the CGS we will use. We call it the benchmark term of the return on equity or the benchmark term of the risk-free rate.

6.3.1.2 Term premium

Figure 6.1 presents an example of a typical, upward sloping CGS term structure.

[203] AER, *Final Position*, *Regulatory treatment of inflation*, December 2020, p. 35.

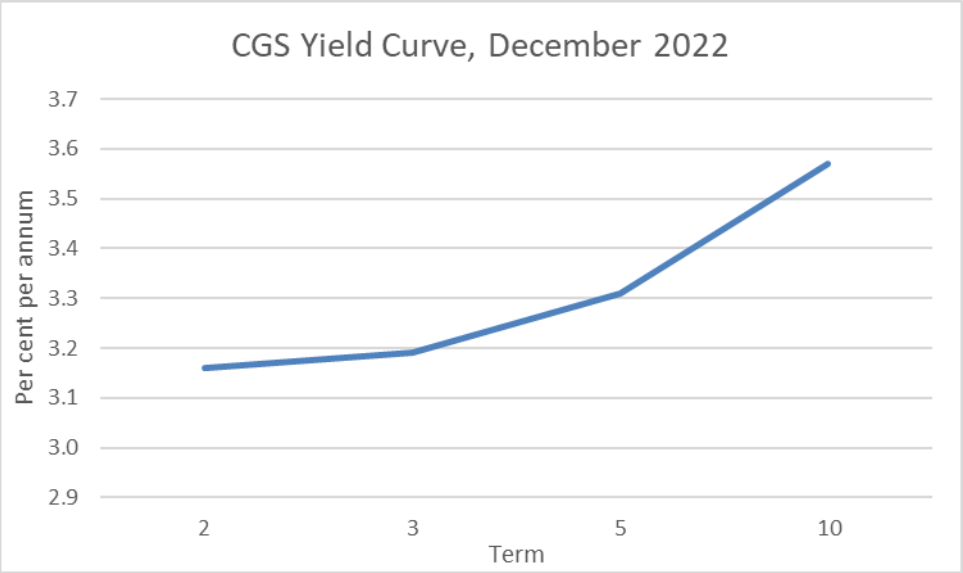
[204] AER, *Final Position*, *Regulatory treatment of inflation*, December 2020, p. 23.

[205] Sharpe (1964). *Capital asset prices: a theory of market equilibrium under conditions of risk*. The Journal of Finance 19(3), p. 425.

[206] AER, *Rate of return instrument - Explanatory statement*, December 2018, p. 125; AER, *Better regulation - Explanatory statement rate of return guideline*, December 2013, p. 73.

[207] The term structure of interest rates is the relationship between the short- and long-term interest rates.

Figure 6.1 CGS yield curve, December 2022



Source: RBA statistical tables, AER calculations.

There are several explanations for a non-flat term structure. Expectations theory of the term structure suggests that investment in a series of short-maturity bonds must offer the same expected return as an investment in a single long-maturity bond. Therefore, the only reason for an upward-sloping (downward-sloping) term structure is that investors expect short-term interest rates to rise (fall).[208]

Other, more modern theories suggest that in addition to reflecting expectations of future short-term rates, longer term rates also include compensation for risk borne by investors or a term premium.[209] A term premium is compensation that investors receive/pay for locking in an interest rate for a long period, rather than rolling over short-dated securities.[210]

There are 3 types of risk associated with the term premium: interest rate risk, credit default risk and liquidity risk.[211] In the case of the CGS, it appears likely that, out of these 3 types of risk, term premium (if any) would primarily arise due to (nominal) interest rate risk. That is, risk arising due to uncertainty of the future interest rates and future inflation.

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[208] R. Brealey, S. Myers, F. Allen, *Corporate Finance*, 12th ed., McGrawHill Education, New York, p. 59.

[209] R. Brealey, S. Myers, F. Allen, *Corporate Finance*, 12th ed., McGrawHill Education, New York, pp. 59-67. Other explanations of the difference also exist, e.g., those due to bond yields' convexity and difference between yields on non-zero coupon bonds and zero coupon rates.

[210] J. Hambur, R. Finlay, *Affine Endeavour: Estimating a Joint model of the Nominal and Real Term Structures of Interest Rates in Australia*, RBA Research Discussions paper 2018-2, February 2018, p. 3.

[211] F. Geiger, *The Yield Curve and Financial Risk Premia*, *Implications for Monetary Policy*, Lecture Notes in Economics and Mathematical Systems, Springer-Verlag Berlin Heidelberg, 2011, p. 86.

Figure 6.2 illustrates the movement of CGS yields with 5 and 10 years to maturity. The difference between these yields can be positive, negative or zero, but tends to be positive on average. Positive difference means that 10-year CGS yield is higher than the corresponding 5-year CGS yield. For example, for the period of January 1988 to December 2022 the average difference between 5-year and 10-year CGS was 28 basis points, with a maximum of 125 and minimum of −95 basis points (bps).

Figure 6.2 5-year and 10-year CGS yields (January 1988 to December 2022)

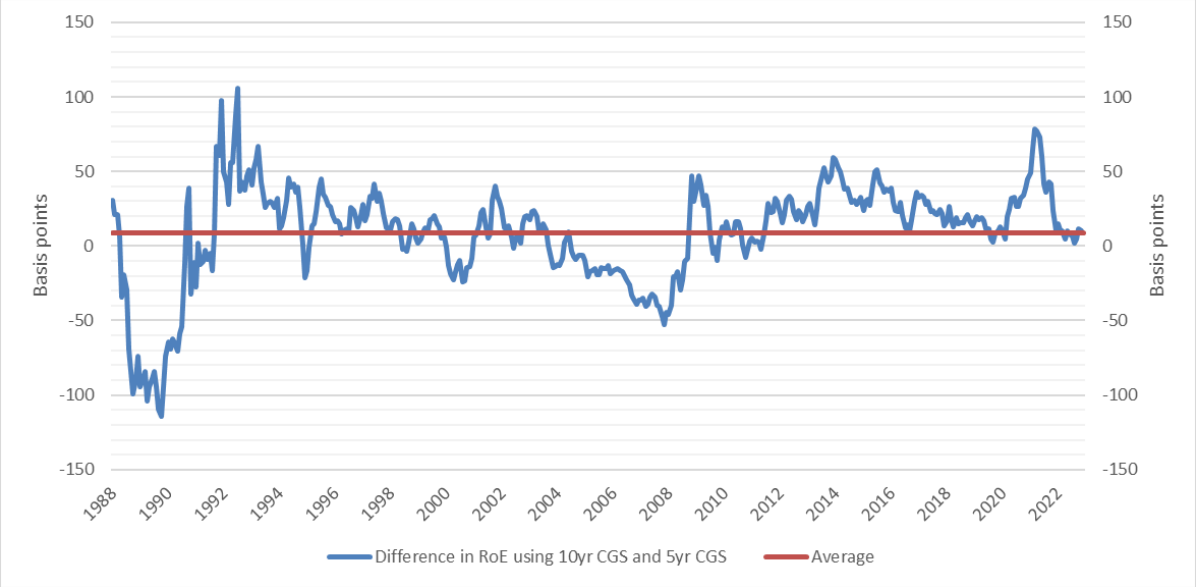
Source: RBA statistical tables, AER calculations.

6.3.1.3 Does choice of benchmark term make a difference

The benchmark term of the return on equity affects the resulting value of the allowed rate of return on equity in 2 ways – firstly, through the direct effect on the value of the risk-free rate, and secondly, through the (indirect) effect on the estimate of the MRP. In the case of the MRP, the nature of the effect depends on the method used to estimate the MRP. For example, when we use the historical excess returns (HER) approach, the estimate of the MRP would generally depend on a sequence of historical risk-free rates. Because shorter-term risk-free rates tend to be lower on average, the MRP estimate corresponding to a 5-year equity term would tend to be higher than that for a 10-year term. On the other hand, if we use a dividend growth model (DGM), the MRP estimate would primarily depend on the prevailing risk-free rate. The 2 ways in which the risk-free rate enters the allowed return on equity calculations partially offset each other, with the overall result depending on the value of the equity beta and the MRP estimation method.

Figure 6.3 illustrates the difference between the allowed return on equity computed using 5-year and 10-year CGS yields over the period of 1988 to 2022.[212] The regulatory allowance is computed using an equity beta of 0.6 and the point estimates of the MRP of 6.24% (10 years) and 6.56% (5 years) using the HER approach over the period of January 1988 to December 2022 and CGS yields with the relevant term.[213] While the difference can be positive, negative or zero, it tends to be positive on average. For example, for the period of January 1988 to December 2022 10-year allowed return on equity was on average 9 bps higher than 5-year allowed return on equity, with the maximum difference between them being 106 bps and minimum difference of −114 bps. For the shorter, post-GFC period, the average difference was 25 bps, with maximum of 79 bps and minimum of −7 bps.[214]

Figure 6.3 Difference between return on equity based on 5-year and 10-year CGS yields



Source: RBA; ASX; Brailsford, T., Handley, J. C., & Maheswaran, K. (2012). The historical equity risk premium in Australia: Post-GFC and 128 years of data. *Accounting and Finance*, 52(1), 237-247; AER calculations.

[212] This example is an illustration. The exact result depends on the modelling assumptions, such as the values of beta and MRP. For this example, we have assumed that beta and MRP do not vary throughout the observation period. These may generally differ from the regulatory parameters that historically applied.

[213] In this section, to better illustrate the difference in the return on equity arising due to the difference in the equity term, we have rounded the HER estimates of the MRP to 2, rather than one, decimal places. Due to limited data availability, we have used a different data source for the historical 5-year risk-free rate series (RBA Statistical Table F2 rather than Table F16). We consider that the difference in the resulting averages will be immaterial.

[214] A positive difference refers to a situation when a 10-year yield is above a 5-year yield.

Table 6.1 Difference between return on equity based on 5-year and 10-year CGS yields, 1988 to 2022

Statistic	10-year return on equity	5-year return on equity	Difference (bps)
Average (1988–2022)	9.62%	9.53%	9
Minimum (1988–2022)	4.56%	4.23%	−114
Maximum (1988–2022)	17.64%	18.59%	106
Average (2010–2022)	6.70%	6.45%	25
Minimum (2010–2022)	4.56%	4.23%	-7
Maximum (2010–2022)	9.54%	9.47%	79
Current (December 2022)	7.31%	7.25%	7

Note: MRP HER estimation is based on monthly data for the period of January 1988 – December 2022. The statistics (minimum, maximum, average) are computed using monthly data for the periods of January 1988 – December 2022 and January 2010 –December 2022). A positive difference means a 10-year return is higher than a 5-year return. For the purposes of this table, we have rounded the MRP estimates up to 2 decimal places. Due to limited data availability, we have used a different data source for the historical 5-year risk-free rate series (RBA Statistical Table F2 rather than Table F16). We consider that the difference in the resulting averages will be immaterial.
Source: RBA; ASX; Brailsford, T., Handley, J. C., & Maheswaran, K. (2012). The historical equity risk premium in Australia: Post-GFC and 128 years of data. *Accounting and Finance*, 52(1), 237-247; AER calculations.

As illustrated, the choice of the equity term affects the allowed return on equity and therefore consumer prices. This effect may be more or less material, depending on the difference between the prevailing longer-term and shorter-term rates (10-year and 5-year rates in our example). On average over the long-term historical period, using a 5-year benchmark term of return on equity would slightly reduce the regulatory WACC. For example, if the historical averages over 1988 to 2022 from Table 6.1 are indicative of future values, the effect would be to reduce the regulatory WACC by less than 5 basis points, which is typically less than 1% of the regulatory rate of return allowance. The effect would be of similar magnitude if we use current (December 2022) values.

6.3.1.4 Required rate of return: regulatory and investor perspectives

In coming to our draft decision to match the equity term to the length of the regulatory control period, our key consideration was the relationship between the reset frequency of the return on equity allowance and the benchmark equity term. We made the following observations:[215]

- Our task is to set a revenue allowance for the regulatory period for an efficient benchmark. At the start of each regulatory period, the revenue allowance (and therefore prices and cashflows) is reset using updated market data.
- Our practice of resetting the allowed rate of return on equity at each regulatory determination affects the profile and riskiness of regulatory cash flows. In turn, this impacts the expected return investors require.

[215] AER, *Draft rate of return instrument explanatory statement*, June 2022, pp. 93–94.

- Matching the term of the allowed return on equity to the length of the regulatory period better aligns our regulatory allowance with the efficient costs of providing regulated services and risks borne by the investors.

We also considered that matching the equity term to the length of the regulatory control period would both better achieve the NPV=0 condition and bring consistency to our approach. The latter is because we also relied on the NPV=0 condition in our decision on the term of the expected inflation.

Further, we considered the argument in favour of a 10-year term based on a standard commercial practice put to us by investor and network stakeholders.[216] The argument runs as follows. The NPV=0 principle requires that the regulatory allowance should match the return that is required by investors. This criterion is centred around the returns that real-world investors might reasonably require on the capital they invest. Investments in regulated infrastructure are long term and the standard practice of valuation professionals and market practitioners is to use a 10-year risk-free rate as an input to the CAPM when valuing such investment projects. Therefore, the return real-world investors require is based on a 10-year term.

The above arguments are detailed in our 2022 draft Instrument explanatory statement. Because our final decision focuses on the considerations around the bar for change, we have not reproduced the detail of this analysis here. However, we acknowledge the point made by the Economic Regulation Authority of Western Australia (ERAWA). In coming up with its a draft decision to change its position on the term of the return on equity and adopt the 10-year equity term, the ERAWA noted that 'the term for equity depends on what a regulator is setting':[217]

> A regulatory rate – A rate that provides required returns according to regulatory settings and principles, and recognises resets for every regulatory period. Application of such a rate reflects one view of efficient costs under a resetting regulatory framework.
>
> A competitive market rate – A rate that provides the expected returns of equity investors according to market conditions and practices for infrastructure assets, which is generally a long-term rate with a term exceeding the length of the regulatory period. Application of such a rate reflects one view that regulated assets have long lives and investors are concerned with cashflows over the life of the asset. This rate also uses the longest term generally available (10 years) for a proxy that investors would use to discount cashflows.

6.3.1.5 Stakeholder support

We acknowledge the large volume of submissions on issues related to the equity term, including detailed submissions from the ENA, APGA, APA, QTC and the CRG and

[216] AER, *Draft rate of return instrument explanatory statement*, June 2022, pp. 105–110.

[217] ERA, *Explanatory Statement for the 2022 Draft Gas Rate of Return Instrument*, June 2022, p. 95.

consultant reports from CEG (prepared for the APGA), Schmalensee (for the ENA), Wright (for the APA) and Partington and Satchell (for the CRG).

The network and investor stakeholders supported maintaining the 10-year term of the return on equity and made submissions in relation to:

- the AER's regulatory task, the interpretation of the NPV=0 principle within the overall regulatory framework and the relevance of the actual returns required by investors[218]
- the mathematical interpretation of the NPV=0 principle[219]
- the interpretation of the risk-free rate and term of the risk-free rate/term of return on equity in the context of the CAPM[220]
- the effect of adopting a shorter equity term on consumer prices and their volatility over an economic cycle[221]
- the effect of adopting a shorter equity term on beta, credit risk and the accuracy of the allowed return on equity in estimating the cost of equity[222]

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[218] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 5, 10, 13, 26, 28–38, 47–49, 57, 61–70; APGA, *Draft 2022 Rate of Return Instrument*, September 2022, pp. 6–9, 12; Transgrid, *Response to AER draft Rate of Return Instrument*, September 2022, p. 3; NSG, *Response to AER RORI 2022 Draft Decision,* September 2022, pp. 2–3, 7–16; Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, September 2022, p. 4; Ausgrid, *Submission Draft RoRI*, September 2022, p. 2; AGIG, *Draft RoRI response*, September 2022, p. 1; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, pp. 2–3; Jemena, *Submission on AER's draft Rate of Return Instrument (RORI),* September 2022, p. 3; IPA, *Submission to the AER on the Draft Rate of Return Instrument 2022*, August 2022, p. 3.

[219] See, for example, ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 4, 11, 12, 26, 53–61; APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p.12; APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, pp. i, ii, 4–12; Transgrid, *Response to AER draft Rate of Return Instrument*, September 2022, p. 3; Jemena, *Submission on AER's draft Rate of Return Instrument (RORI),* September 2022, pp. 3–4; Professor R. Schmalensee, *Statement of Richard Schmalensee, Ph.D. To the Australian Energy Regulator*, report for ENA, July 2022; Professor R. Schmalensee, *Response of Richard Schmalensee, Ph.D*, October 2022.

[220] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, pp. i–iii, 9–27.

[221] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 4, 10, 26, 29; Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, September 2022, p. 5; AusNet, *Response to the Draft 2022 Rate of Return Instrument,* September 2022, p. 2.

[222] APGA, *Draft 2022 Rate of Return Instrument*, September 2022, pp. 9, 12–13; CEG, *Critique of AER estimate of a 5-year RoE*, report for APGA, September 2022, pp. 7–8, 11–17, 19–28.

- confidence in, transparency, stability and predictability of the regulatory framework[223]
- consistency with the AER's previous decisions and decisions of other Australian regulators[224]
- the relationship between equity term and the term of the expected inflation[225]
- the relevance of the floating rate bond analogy to setting the return on equity.[226]

While the issues raised in these submissions are largely similar to those raised in the previous round of submissions, we acknowledge the substantial volume of feedback we have received and the degree of concern expressed by the investor and network stakeholders.

Our draft decision did not find consistent support in submissions.

The AEC supported our draft decision and noted that 'using a 10-year term is likely to lead to a biased outcome because the task is to set an efficient return *for the next regulatory period*'.[227]

The CRG submitted:[228]

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[223] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 4, 10, 26, 29; Transgrid, *Response to AER draft Rate of Return Instrument*, September 2022, p. 3; NSG, *Response to AER RORI 2022 Draft Decision,* September 2022, pp. 3–4, 6, 8–9; IPA, *Submission to the AER on the Draft Rate of Return Instrument 2022*, August 2022, p. 2; AGIG, *Draft RoRI response*, September 2022, p. 2; GIIA, *Response to draft decision on the 2022 Rate of Return Instrument and independent panel report,* September 2022, p. 2.

[224] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 38–40, 48–53; NSG, *Response to AER RORI 2022 Draft Decision,* September 2022, pp. 2, 8; Jemena, *Submission on AER's draft Rate of Return Instrument (RORI),* September 2022, p. 4; IPA, *Submission to the AER on the Draft Rate of Return Instrument 2022*, August 2022, p. 2; Ausgrid, *Submission Draft RoRI*, September 2022, p. 4; AusNet, *Response to the Draft 2022 Rate of Return Instrument,* September 2022, p. 3; QTC, *Draft Rate of Return Instrument Explanatory Statement,* September 2022, p. 4; Transgrid, *Response to AER draft Rate of Return Instrument*, September 2022, p. 3; IPA, *Submission to the AER on the Draft Rate of Return Instrument 2022*, August 2022, p. 2; Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, September 2022, pp. 3–4; Energy Queensland, *Draft 2022 Rate of Return Instrument*, September 2022, p. 2; CEC, *Draft 2022 Rate of Return Instrument,* September 2022, pp.1–2; GIIA, *Response to draft decision on the 2022 Rate of Return Instrument and independent panel report,* September 2022, p. 2; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, pp. 5–6.

[225] Transgrid, *Response to AER draft Rate of Return Instrument*, September 2022, p. 3; Ausgrid, *Submission Draft RoRI*, September 2022, p. 3; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 4; APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, pp. iii–iv, 15–16; ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 11–12, 27, 40–47.

[226] QTC, *Draft Rate of Return Instrument Explanatory Statement,* September 2022, pp. 1, 4–24; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 3; ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 31, 62–63.

[227] AEC, *Consultation: Draft Rate of Return Instrument 2022*, September 2022, pp. 1–2.

[228] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 87–88.

> From the outset of this rate of return review, the CRG has rejected the AER's original position that each estimation term can be determined on a standalone basis. Initially, we argued that all terms needed to be considered together. A little later, we accepted that although inflation and equity needed to be estimated on the same term, debt could be dealt with separately. … [W]e no longer consider this to be a sustainable position. The terms of expected inflation, equity and debt need to be considered collectively – even if the final outcome sees different inputs estimated using different terms.
>
> In other words, the CRG does not have a singular answer to the AER's overly simplistic question about whether the CRG would prefer the AER adopt 5 or 10-year estimation term for the return on equity. The CRG's position on this matter depends on how the AER's final decision treats with other elements in the Rate of Return Instrument.
>
> In the following discussion, the CRG describes four options that we consider to be plausible outcomes in the final decision. The discussion provides the CRG's assessment of each option, whether the CRG supports each option, and whether the CRG's support is conditional on further action by the AER.

Below we reproduce the table summarising the CRG positions on the four options:

Table 6.2 Summary of the CRG positions on the terms of the expected inflation, equity and debt

Option	Inflation	Equity	Debt	CRG position	Rationale
1	10 yrs	10 yrs	10 yrs	**SUPPORT subject to the AER:** • Removing the biases that we identified in the AER's estimates of beta, the MRP and the cost of 10-year debt (see Chapters 2, 3 and 4, respectively)	Section 7.3.1
2	5 yrs	10 yrs	10 yrs	**DO NOT SUPPORT**	Section 7.3.2
3	5 yrs	5 yrs	10 yrs	**CONDITIONALLY SUPPORT** **SUPPORT IF AND ONLY IF:** • The AER identifies a mechanism to address the bias introduced by maintaining a longer estimation term for debt than for equity (see Chapter 6), and • The AER removes the biases the CRG has identified in the AER's estimates of beta, the MRP and the cost of 10-year debt (see Chapters 2 ,3 and 4, respectively); or **NOT SUPPORTED in all other circumstances**	Section 7.3.3
4	5 yrs	5 yrs	5 yrs	**SUPPORT subject to the AER:** • Removing the biases that we identified in the AER's estimates of beta and the MRP (see Chapters 2 and 3, respectively[221]), and • Identifying whether a transition mechanism and continuation of a trailing average is required when applying a lower estimation term for the allowed return on debt	Section 7.3.4

Source: CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 88, Figure 7-1.

We recognise that the CRG did not support the option we adopt in this decision (option 2 in the notation of Table 6.2). However, we remain of the view that our analysis in the 2020 Inflation review and our decision to adopt a 5-year term of the expected inflation remain valid. We also remain of the view that that the benchmark term of debt, equity and expected inflation may be set independently based on relevant principles and analysis. If they are the same value, it should be the result of analysis rather than an explicit requirement. We now have undertaken the analysis with respect to setting the benchmark term of equity. For the reasons detailed in chapters 6 and 9 we are satisfied that a 10-year term of equity and debt is an appropriate option. Further, we have carefully examined CRG's concerns about biases in our estimates of beta, MRP and cost of 10-year debt and we do not consider significant biases are present.

Further, in a consultant report prepared for the CRG, Partington and Satchell suggested:[229]

> We support the logic of Lally's analysis; however, we feel uneasy about the divergence from a well-established method in estimating the cost of equity both in practice and by the AER. With respect to the latter, the CRG has advocated for a high bar to change, and the question is whether the case for change is strong enough.

We acknowledge that the Independent Panel considered that our reasoning provided strong support for our draft decision on equity term.[230] Further, we remain of the view that our analytical case for matching the equity term to the length of the regulatory control period has merit. However, we consider that the stakeholder response we received is indicative of the technical complexity of the issue. We acknowledge the concern expressed by Partington and Satchell and their observation that while the 'matching the term of the cost of equity to the term of the regulatory period is consistent with finance theory', 'there remains the issue of measurement' with respect to the term structure of the return on equity.[231]

Under these circumstances, there may be scope for a regulator to reasonably arrive at different decisions, especially when a broader range of issues is considered. As pointed out in the Independent Panel report in the parallel RoRI process run by the ERAWA:[232]

> There is no single 'right' economic answer in the estimation or application of rate of return regulation… Consequentially, regulators acting reasonably can reach different positions on questions of contested theory, methodology and the results that follow from those choices...

6.3.1.6 Regulatory practice

As discussed in the draft explanatory statement, we received submissions from both the network and investor stakeholders in support of the status quo 10-year term, saying that we have applied a 10-year term in our past reviews and the evidence has not changed since then.[233] In addition, the stakeholders said that a 10-year (or longer) risk-free rate is standard

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[229] Partington & Satchell, *Report to the CRG: The Dividend Growth Model the MRP and the AER's 2022 Draft Rate of Return Instrument*, report for CRG, August 2022, p. 62.

[230] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, pp. 7, 33–35.

[231] Partington & Satchell, *Report to the CRG: The Dividend Growth Model the MRP and the AER's 2022 Draft Rate of Return Instrument*, report for CRG, August 2022, pp. 62–63.

[232] ERA, *Independent Panel Report on ERA's 2022 Draft Gas Rate of Return Instrument*, August 2022, p. 4.

[233] Ausgrid, *Rate of Return 2022 information paper – Submission*, 11 March 2022, pp. 1–2; GIIA, *AER final omnibus paper – Submission*, 11 March 2022, pp. 2–3; Transgrid, *AER Rate of Return final Omnibus paper – Submission*, 11 March 2022, p. 7; Jemena, *AER information paper – Submission*, 11 March 2022, p. 2; QTC, *Submission - AER Rate of Return information paper and final working papers*, March 2022, p. 29; AGIG, SAPN, VPN, *2022 Rate of Return Instrument review - Omnibus papers final – Submission*, 11 March 2022, p.3; Endeavour Energy, *Rate of Return information paper – Submission*, 11 March 2022, p. 3; ENA, *Rate of Return Instrument review - AER Final Omnibus Paper and information paper – Submission*, 11 March 2022, p. 39.

regulatory practice.[234] We have since received similar submissions in response to our draft explanatory statement.[235]

In our draft explanatory statement, we noted the following considerations in response to the submissions:[236]

- We make decisions based on the evidence before us at the time and our regulatory judgement about the merits of a case. Our past decisions and the approaches taken by other regulators are relevant to the extent they inform our judgement – for example, by providing evidence or a line of argument in support of a particular position. As we assess the available evidence and exercise regulatory judgement, our positions may evolve over time.
- When reviewing our past practices, the submissions have focused only on a subset of those. The ACCC considered matching the government bond term to the length of a regulatory period a 'preferred measure' in 1999.
- As far as decisions of other regulators are concerned, we agree with Dr Lally that 'it is not the practices of other regulators that are important, but the merits of the arguments offered in support of those practices'.[237]

These considerations continue to remain relevant to our decision. As regulatory practice evolves, we will continue to consider other regulators' decisions and the evidence they put forward in support.

There has been a trend among Australian regulators to adopt a 10-year equity term. In outlining their decisions, these regulators considered the rate of return investors in long-lived assets would require over the asset lives. For example, QCA noted: 'We consider this approach reflects the requirements of investors and lenders who, in relation to long-lived

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[234] AGIG, SAPN, VPN, *2022 Rate of Return Instrument review - Omnibus papers final – Submission*, 11 March 2022, p.3; QTC, *Submission - AER Rate of Return information paper and final working papers*, March 2022, p. 3; ENA, *Rate of Return Instrument review - AER Final Omnibus Paper and information paper – Submission*, 11 March 2022, pp. 7, 40, 42, 47–54.

[235] NSG, *Response to AER RORI 2022 Draft Decision,* September 2022, p. 8; Jemena, *Submission on AER's draft Rate of Return Instrument (RORI),* September 2022, p. 4; IPA, *Submission to the AER on the Draft Rate of Return Instrument 2022*, August 2022, p. 2; Ausgrid, *Submission Draft RoRI*, September 2022, p. 4; AusNet, *Response to the Draft 2022 Rate of Return Instrument,* September 2022, p. 3; QTC, *Draft Rate of Return Instrument Explanatory Statement,* September 2022, p. 4; ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 38–40, 48–53; Transgrid, *Response to AER draft Rate of Return Instrument*, September 2022, p. 3; Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, pp. 3–4; Energy Queensland, *Draft 2022 Rate of Return Instrument*, September 2022, p. 2; CEC, *Draft 2022 Rate of Return Instrument,* September 2022, pp.1–2; GIIA, *Response to draft decision on the 2022 Rate of Return Instrument and independent panel report,* September 2022, p. 2; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, pp. 5–6.

[236] AER, *Draft rate of return instrument explanatory statement*, June 2022, pp. 116–117.

[237] Dr Martin Lally (Capital Financial Consultants Ltd), *The Appropriate Term for the Allowed Cost of Equity*, 20 April 2022, p. 20.

infrastructure assets, will deploy equity over the entire life of the asset, rather than over any given regulatory period'.[238]

There have been new developments since we published the draft 2022 Instrument. In the RoRI process parallel to ours, the ERAWA made a draft decision to change its position on the term of the return on equity and adopt the 10-year equity term.

As the ERAWA Independent Panel pointed out:[239]

> Most strikingly, in draft decisions released concurrently, the ERA and AER have both changed their approach to the term of equity, with the ERA going from 5 to 10 years, and the AER from 10 to 5 years.

Similarly to the QCA and IPART, it its decision the ERAWA also made a reference to long lives of the regulated assets and common market practice:[240]

> … the ERA now considers that the weight of the evidence requires that it change its approach to match common market practice for long-lived assets and support a longer term market rate when setting the return on equity.

We consider that the ERAWA's draft decision is relevant to our final decision. As our CRG explained:[241]

> If the AER and ERA proceed as flagged in their respective draft decisions, the AER will be the only Australian regulator to apply a 5-year term when estimating the return on equity. The CRG notes the AER has previously cited the ERA's use of a 5-year term in support of its own proposal.
>
> In reaching its draft position, the ERA has systematically considered and refuted many of the arguments the AER is still relying upon, including those made by Dr Lally.

As with the stakeholder feedback, we consider that the ERAWA's decision indicates that the issue is complex and that reasonable regulators can reach different decisions when faced with similar evidence. Under these circumstances, it is particularly important to give weight to stability and predictability of the regulatory framework.

We note that the ERA approach and change are in line with changes made by the QCA in 2021 and IPART in 2013.

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[238] QCA, *Rate of return review, Final report*, November 2021, p. 83. See also: ERA, *Explanatory Statement for the 2022 Draft Gas Rate of Return Instrument*, June 2022, pp. 95–99; IPART, *Review of our WACC method, Final Report Research,* February 2018, pp. 41, 43, 47.

[239] ERA, *Independent Panel Report on ERA's 2022 Draft Gas Rate of Return Instrument*, August 2022, p. 4.

[240] ERA, *Explanatory Statement for the 2022 Draft Gas Rate of Return Instrument*, June 2022, pp. 98.

[241] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 86.

6.3.1.7 Stability and predictability of the regulatory framework and the balance of evidence

During the *2020 Inflation Review* the CRG recommended the AER take into account several consumer-oriented principles, including that there should be a high bar for change:[242]

> We are strongly opposed to changes that are adopted in response to short term issues at the cost of longer-term predictability and transparency for investors and consumers. Overarchingly, the CRG accepts the AER should apply a 'high bar for change'.
>
> In particular, any alternative methodology must clearly demonstrate it better contributes to the National Electricity Objective (NEO) and National Gas Objective (NGO), and this improvement is material over time.

Since then, the CRG has consistently advocated for applying the same principle to the 2022 Instrument.[243] For example, with respect to our decision on the 2022 Instrument, the CRG noted:[244]

> By 2026, the AER will need to conduct a major review of its approach. The CRG contends that in the face of the 2026 challenge, the AER should adopt a conservative approach to introducing major changes in the 2022 RoRI unless there is substantive evidence of a material problem.

And further:[245]

> **Absence of compelling evidence to the contrary, the AER should for the most part maintain the approach it adopted in the 2018 RoRI.** Most relevant to the AER's decision here is our evidence from consumers and investors that they value stability in process and outcomes.

The investor and network stakeholders also referred to the importance of stability and predictability of our approach and the 'high bar for change' in their submissions through various stages of the 2022 Instrument process. These stakeholders particularly emphasised the importance of this principle in the context of the term of return on equity.[246] For example, the ENA noted that '[r]ecord network investment is required over the coming decade to meet Australia's decarbonisation commitments and unlock cost savings for consumers'. The ENA

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[242] CRG, *Submission to AER Review of Inflation*, 29 July 2020, p. 8.

[243] For example, see CRG, *Letter to the AER regarding the long-term interests of consumers*, September 2021, p. 4; CRG, *CRG response to the AER's December 2021 Information paper*, March 2022, p. 30; CRG, *Submission to AER Return on Equity*, October 2020, p. 21.

[244] CRG, *CRG response to the AER's December 2021 Information paper*, March 2022, p. 16.

[245] CRG, *CRG response to the AER's December 2021 Information paper*, March 2022, p. 23.

[246] See, for example, ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 4, 10, 25, 30; Transgrid, *Response to AER draft Rate of Return Instrument*, September 2022, p. 3; IPA, *Submission to the AER on the Draft Rate of Return Instrument 2022*, August 2022, p. 2; GIIA, *Response to draft decision on the 2022 Rate of Return Instrument and independent panel report,* September 2022, p. 2.

further noted the concern of network investors with the proposed change of the equity term and its implications for the stability and predictability of the regime and confidence in the regulator.[247]

We recognise the importance of stability and predictability of the regulatory framework for ensuring investor and consumer confidence and promoting efficient investment.[248] For the 2022 Instrument we added the following 2 assessment criteria closely related to the CRG's 'high bar for change' criterion:[249]

- the materiality of any proposed change
- the longevity or sustainability of new arrangements.

We noted that these additional criteria ensure that change is not to be adopted lightly in the absence of compelling evidence. Further, we noted that any case for change must demonstrate there to be a clear improvement or a benefit to be realised.[250]

Applying these criteria to our decision about the equity term, we conclude that the bar for change has not been met at this time. Therefore, our final decision is to maintain our current approach of using the 10-year term of return of equity. While for this decision we are maintaining our current approach, we are open to reconsidering the issue in future.

6.3.2 Choice of the proxy for the risk-free rate

In 2021 we consulted with stakeholders on the suitability of CGS as an appropriate proxy for the risk-free rate in our *Rate of return and cashflows in a low interest rate environment* working paper.[251]

In response to the working paper, the ENA questioned whether the CGS is an appropriate proxy for the risk-free rate.[252] The ENA submitted there is regulatory precedent to adjust CGS and that academic literature, market practice and standard textbooks suggest that the CGS is not an appropriate proxy for the risk-free rate. The ENA explained that government bonds tend to contain a convenience yield, which is not relevant to the SL CAPM risk-free rate.

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[247] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp. 25–26.

[248] AER, *Draft rate of return instrument explanatory statement*, June 2022, p. 31.

[249] AER, *Rate of return – Final omnibus paper*, December 2021, pp. 11–14.

[250] AER, *Rate of return – Overall rate of return draft working paper*, July 2021, p. 22.

[251] AER, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment – Final working paper*, September 2021.

[252] AER, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment – Final working paper*, September 2021, p. 102.

We also considered expert advice we received from the ACCC's Regulatory Economic Unit (REU).[253] Based on our assessment of the material before us, our preferred position set out in September 2021 was that the CGS is an appropriate proxy for the riskless investment for our purposes. We also decided that we should not adjust for an estimated convenience yield. Key reasons for this 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.
- The risk-free asset in the SL CAPM possesses the safety property. Standard practice in applying the SL CAPM is to use the yields on government bonds as a proxy for the risk-free rate.
- 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.
- It is not supported by robust analysis that convenience yields exist in Australia or that they can be reliably estimated. Recent evidence suggests there might be an inconvenience yield since 2015.
- It is common practice to use the CGS as a proxy for the risk-free rate. We are not aware of another Australian regulator using a proxy other than the CGS for the risk-free rate.

In response to our information paper and draft decision, neither stakeholders nor the Independent Panel raised any issues about the suitability of the CGS as a proxy for the risk-free rate. Rather, network stakeholders such as APGA and APA in response to the draft decision submitted that the AER should continue to rely on yields on CGS, which reflects the opportunity cost of capital.[254]

Having considered submissions to our *Rate of return and cashflows in a low interest rate environment* working paper, expert advice we received from the ACCC's REU and submissions to our draft decision, our final decision is to maintain that the CGS remains an appropriate proxy for the risk-free rate, and that we should not adjust for an estimated convenience yield. This is a continuation of our draft decision.

6.3.3 Averaging period length

The averaging period is the length of time during which we observe the yields on CGS, using a term of 10 years to derive our estimate of the risk-free rate. In choosing the appropriate length for the averaging period, the objective is to ensure that the estimate is relevant to the on-the-day rate but also that the estimate is not unduly biased by short-term volatility in the CGS yields.

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[253] AER, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment – Final working paper*, September 2021, p. 161.

[254] APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p. 4; APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 4.

We recognise that the SL CAPM does not say how the risk-free rate should be estimated. For instance, some market practitioners use the historical risk-free rate because they expect the risk-free rate to increase in the future. However, our preference is to adopt a rate that is closer to the on-the-day rate because we are looking to set a forward-looking rate over the regulatory period. As explained in our *Rate of return final omnibus paper,* the valuation problem facing a regulator with a 5-year regulatory cycle is different from that of market participants valuing an unregulated business.[255]

In the draft decision we have not adopted an on-the-day rate because these estimates may be unduly sensitive to short-term volatility. Instead, we proposed an averaging period between 20 and 60 business days. In response to our draft decision, neither stakeholders nor the Independent Panel raised any issues about the choice of averaging period.

Our averaging period between 20 and 60 business days provides businesses with flexibility because they could choose a longer averaging period, which would reduce the volatility in the estimate but also reduce the relevance to current rates in the market. Conversely, a shorter averaging period would be more relevant but also more volatile. This approach is consistent with the approach we adopted in 2018.[256]

NSPs are required to nominate the period in advance of the period commencing, which reduces the possibility of picking an averaging period that upwardly biases the risk-free rate.

Figure 6.4 shows the impact of different averaging period lengths on volatility compared with the on-the-day rate.

Figure 6.4 Impact of different lengths of averaging CGS yields

Source: RBA interest rates statistics, F16, AER analysis.

[255] AER, *Rate of return – Final omnibus paper*, December 2021, p. 65.

[256] AER, *Rate of return instrument – Explanatory statement*, December 2018, p. 131.

The 20-day averaging period reduces the impact of individual days in the on-the-day rate. However, it does not remove short-term fluctuations in the on-the-day rate. In comparison, the 60-day averaging period reduces the impact of short-term fluctuations but still follows the underlying trends of the on-the-day rate. In contrast, the 250-day average departs significantly from the on-the-day rate.

Our final decision is to require an averaging period between 20 and 60 business days, which in our view provides a pragmatic alternative to the on-the-day rate. This is a continuation of our draft decision.

6.3.4 Length of the nomination window

The nomination window sets out the period over which a regulated business can nominate their averaging period. We need to specify the nomination window length to ensure that the Rate of Return Instrument is capable of automatic application.[257] This is a result of the Instrument being binding, which reduces our ability to select the nomination window for each determination.

Since our 2018 Instrument, we have found that the nomination window for the risk-free rate averaging period ending 3 months before the start of the next regulatory control period creates practical difficulties for finalising regulatory determinations, which are required to be finalised 2 months before the next regulatory control period. A period of one month between the end of the averaging period and making our final decision creates practical difficulties.

We raised this issue in our *Equity omnibus draft working paper,* where we proposed to shift the allowed nomination window forward by one month to lessen timing issues.[258] In response, stakeholders submitted that they do not oppose changing the nomination window and accept the practical reasons that necessitate a shift in the nomination window.[259] More recently, in response to our draft decision, APA submitted that the changes to the length of the nomination window do not depart significantly from current requirements and practice, and should facilitate the AER's regulatory decision-making. In their view, these changes should be incorporated in the 2022 Rate of Return Instrument.[260]

Having considered submissions to our draft decision as well as submissions to our *Equity omnibus draft working paper*, our final decision is to require that a nominated averaging period must start and end between 8 months and 4 months before the commencement of the regulatory control period. This is a continuation of our draft decision.

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[257] NEL, s. 18J(2)(b), NGL, s. 30E(2)(b).

[258] AER, *Equity omnibus draft working paper*, July 2021, pp. 52–53.

[259] Endeavour Energy, *Overall rate of return, Equity and Debt*, 3 September 2021, p. 9; Ausgrid, *Overall rate of return, Equity and Debt*, 3 September 2021, pp. 7–8.

[260] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 30.

6.3.5 Automatic application of the risk-free rate

Since the Instrument applies automatically, it removes the need for us to exercise discretion. Therefore, in our final decision we have codified the process for nominating the risk-free rate averaging period in scenarios where the final decision is delayed, when the nominated averaging periods do not meet the criteria and where the number of business days changes.

If the final decision is delayed

We have considered how delays in a final network regulatory decision or a remittal interact with our risk-free rate methodology. We do not see it necessary to require a business to nominate a revised risk-free rate averaging period. We make delayed determinations and access arrangements as if they were in effect from the original commencement of the regulatory control period or revision commencement date. Therefore, the nominated averaging period would remain appropriate and we would not require a revised nomination.

Nominated averaging periods that do not meet the criteria

We have included a mechanism for addressing circumstances where service providers fail to meet the nominated averaging period criteria (this includes failing to nominate a period). We will use a default averaging period of 20 days, ending 4 months before the commencement of the regulatory control period or revision commencement date. We will not reveal whether the service provider has failed to meet the averaging period criteria until after the default averaging period has ended. If the service provider fails to meet the nominated averaging period criteria, then we will calculate the risk-free rate using the default averaging period.

Situation where the number of business days changes

We have considered how changes to public holidays may cause nominated averaging periods to fail to meet the criteria. We consider it appropriate that the nominated averaging period merely meet the criteria at the time of the proposal. This will avoid forcing service providers to use the default averaging period due to unforeseeable changes in the number of business days. To clarify, this does not include public holidays that are public knowledge at the time of the proposal. Public holidays are determined according to the state of New South Wales (NSW).

Our draft decision also highlighted the above 3 scenarios. In response to our draft decision, neither stakeholders nor the Independent Panel raised any issues about the 3 scenarios. Our final decision is to continue our draft decision where we have codified the process for nominating the risk-free rate averaging period in the relevant 3 scenarios.

6.3.6 Carve-out clauses

Some NSPs are affected by a 'timing issue' that arises because the Rate of Return Instrument overlaps with some reset processes.[261] For NSPs affected by the timing issue, they will be required to nominate their averaging periods compliant with the 2018 Instrument

[261] The AER is required to publish the Rate of Return Instrument on the fourth anniversary of publishing the previous Rate of Return Instrument: NEL, s. 18U(2)(a); NGL, s. 30P(s)(a).

even though we will make a final regulatory decision[262] under the 2022 Instrument. For NSPs in this situation, our final decision is to permit averaging periods that comply with either the 2018 or 2022 Instrument. This is consistent with our draft decision. This approach is specified in clauses 8, 24 and 25.

We have made this change because these NSPs were required to nominate averaging periods consistent with clauses 7, 8, 23 and 24 of the 2018 Instrument before they were aware of the requirements for averaging periods under the 2022 Instrument. This change ensures that if these NSPs lodged compliant averaging periods with their regulatory proposals (under the 2018 Instrument) they will not be penalised irrespective of the clauses in the 2022 Instrument.

Clauses 8 and 24 are amended in this final Instrument to deal with this by specifying that NSPs impacted by the above timing issue should have their nominated averaging periods assessed using the same permitted averaging period timing as exists in the 2018 Instrument. This is a continuation of our draft decision.

Our draft decision also highlighted the changes to carve-out clauses in the 2022 Instrument. In response to our draft decision, neither stakeholders nor the Independent Panel raised any issues about these changes. Our final decision is to continue our draft decision.

6.3.7 Assessment criteria

Our consideration of issues shows that we are required to exercise our discretion about the evidence and methods that are available for us to make our decision. Where necessary we have applied our assessment criteria to assist us exercise our judgement. Table 6.3 sets out our assessment criteria and key areas where they have assisted us to make our decision.

Table 6.3 Criteria of final decision benchmark term of return on equity assessment

Assessment criteria		Final decision
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 are informed by sound empirical analysis and robust data.	There is a sound rationale for employing a term that matches the length of the regulatory period. On the other hand, it is common market practice to use the same – 10-year or longer – rate to discount expected net cashflows for different years in business valuations. Using an averaging period is 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.	There is a sound rationale for employing a term that matches the length of the regulatory period as was recognised and supported by our Independent Panel. However, there is also a case for continuing to use a 10-year term.

[262] NER, cll. 6.11.1, 6A.13.1; NGR, r 62.

Assessment criteria		Final decision
		Use of averaging periods is consistent with the purpose of smoothing day-to-day volatility in market data.
3	Implemented in accordance with good practice (a) supported by robust, transparent and replicable analysis that is derived from available credible datasets.	The presented analysis is robust, transparent and replicable, and is in accordance with good practice.
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 inputs estimation (b) based on quantitative modelling which avoids arbitrary filtering or adjustment of data, which does not have a sound rationale.	Models underlying the analysis are based on robust quantitative modelling and avoid arbitrary adjustments without sound rationale.
5	Where market data and other information is used, this information is (a) credible and verifiable (b) comparable and timely (c) clearly sourced.	Market data used is sourced from publicly available sources and reflects latest data available at the time.
6	Sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.	The approaches to both benchmark equity term and averaging periods are sufficiently flexible and allow to reflect the changing market conditions.
7	The materiality of any proposed change.	The materiality of the choice of the benchmark equity term and averaging periods varies depending on the prevailing market conditions, such as interest rate cycle. Currently, the materiality of the choice of the equity term is modest.
8	The longevity or sustainability of new arrangements.	Maintaining the benchmark equity term at 10 years is consistent with our past decisions as well as decisions of other Australian regulators. As such, continuing this approach maintains regulatory stability.

7 Market risk premium

The market risk premium (MRP) is the difference between the expected return on a market portfolio and the return on the risk-free asset. The MRP compensates an investor for the systematic risk of investing in the market portfolio. Systematic risk affects all firms in the market (such as macroeconomic conditions and interest rate risk) and cannot be eliminated or diversified away through investing in a wide pool of firms.

Our regulatory task is to determine an overall rate of return (or WACC) for a benchmark business supplying regulated energy network services commensurate with its efficient financing costs. Because we use an Australian domestic Sharpe-Lintner Capital Asset Pricing Model (SL CAPM), the relevant MRP is the expected Australian dollar return on the Australian market portfolio less the return on the Australian dollar risk-free asset.

Our regulatory task in estimating the MRP is to estimate the risk premium required by investors over the return on the risk-free asset to invest in a fully diversified Australian market portfolio. When added to the risk-free rate of return, the MRP will give an estimate of the opportunity cost of investing in an investment with the same systematic risk as a fully diversified Australian equities portfolio (or market portfolio with a beta of 1 by definition.

The MRP we estimate is multiplied by our estimate of the equity beta to give an estimate of the equity risk premium for investing in the equity of the businesses we regulate assuming a 40% equity to 60% debt capital structure. This equity risk premium is then added to an estimate of the risk-free return to determine the allowed return on equity. This allowed return should reflect the opportunity cost of this equity investment given its level of systematic risk.

The MRP estimate we use in the SL CAPM needs to be a good estimate of the expected Australian domestic MRP. However, the expected MRP is not directly observable. As a result, stakeholders have suggested several different methods for us to use to estimate the expected MRP. These include using the historical excess returns (HER), dividend growth models (DGMs), the total market returns or Wright approach and surveys.

7.1 Final decision

Our final decision is to set an MRP of 6.2% per annum over the yield to maturity on Australian Commonwealth Government Bonds with a term to maturity of 10 years (10-year CGS).

In estimating the MRP we have considered all relevant evidence available to us including evidence from historical excess return (HER) data and other methods of estimating a forward looking MRP. We consider an MRP of 6.2% per annum will, or is most likely to, contribute to the achievement of our legislative objectives.

In reaching this conclusion, we have reviewed various of sources of evidence. We note the evidence before us is incomplete and some pieces of evidence have greater explanatory power than others. We have therefore exercised judgment to determine the value of the MRP. Our decision is more strongly influenced by evidence we consider more persuasive. In our discussion of our reasons, we tend to use the short-hand terminology of 'weighting’.

When we use this terminology, we are not implying a mathematical or quantitative weighting, but rather a process of identifying the evidence that is most important to us.

We have determined that the best course available to us is to estimate an unconditional MRP. An unconditional MRP is one that is largely stable through time and does not move with market shocks, whereas a conditional MRP moves constantly through time. We consider an unconditional MRP estimate will best contribute achieve the NEO and NGO, in combination with other rate of return parameters.

We do not currently consider it is possible to model a conditional MRP accurately over time. We acknowledge that the MRP varies over time, and it would be desirable in principle to estimate a conditional (or time specific) MRP. However, given that there are questions about reliability of measurement and differing views on the relative value of DGM based estimates, we have chosen to place more emphasis on the historical excess return (HER) estimates because it is an approach we have used and relied on in the past to estimate a forward-looking unconditional MRP.[263] Further, using an unconditional MRP will lead to stable and predictable investment signals through time.

After reviewing the evidence from the arithmetic average of the HER, we established a range of 6.1 to 6.6%. We considered all the information available and arrived at the view that, on balance, the current unconditional MRP is likely to be towards the lower end of our range of 6.1% to 6.6%. We were also conscious of the Australian Government Treasury advice that the higher HER estimates in recent years were likely to have been influenced by the cycle of monetary policy.

We identified 6.2% as our point estimate within this range. 6.2% coincides with the arithmetic average of HER from 1988 to 2022 and is consistent with the approach we employed in selecting the MRP in the 2018 Instrument. We then considered whether the other evidence might persuade us to choose a different value. We note the evidence is not consistent, some points to a higher value while other evidence points to a lower value. As such we did not consider the evidence was sufficiently persuasive to move away from the arithmetic average point estimate for the period 1988-2022 which is 6.2%. For example, recently debt spreads have widened and the gap between the return on debt and equity has narrowed suggesting we might select a higher MRP.[264] By contrast, recent trends in MRP estimates from the DGMs have been trending down, suggesting we might choose a lower MRP value.

In view of this contrasting evidence, we do not consider the bar for change is satisfied to move away from our past approach and our point estimate of 6.2%.

Considering all the information currently before us, we consider that our MRP of 6.2% is an unbiased estimate.

The evidence available to us is as follows.

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[263] AER, *Concurrent evidence session 3 - Proofed transcript*, February 2022, pp. 20, 26.

[264] Refer Chapter 11, Overall rate of return cross checks, Section 11.3.1.8.3

Table 7.1 Relevant evidence on MRP

Evidence	2018 Instrument	2022 Instrument
HER range (Based on the arithmetic average)	6.0 to 6.6%	6.1 to 6.6%
HER range (based on the geometric average)	4.2 to 5.0%	4.4 to 5.0%
HER weighted average range	5.7 to 6.2%	5.9 to 6.3%
HER estimate based on the most recent sample period	6.1% (1988-2017)	6.2% (1988-2022)
HER estimate based on the 1958 sample period	6.6% (1958-2017)	6.6% (1958-2022)
Three stage DGM point estimate	7.2% (Two-month average to end Sep 2018, g assumed to be 4.55%)	5.0% (Two-month average to end Dec 2022, g assumed to be 3.85%)
Three stage DGM point estimate (Two-month average, g assumed to be 4.55%, based on 2013 Guideline)	7.2% (Two-month average to end Sep 2018)	5.7% (Two-month average to end Dec 2022)
Three stage DGM point estimate both based on CE growth data.	7.1% (Two-month average to end of Sep 2018, g assumed to be 4.15%)	5.0% (Two-month average to end Dec 2022, g assumed to be 3.85%)
CEPA estimate of MRP using the DGM (Long term averages)	3.1% (1958 – 2017) 3.0% (1988 – 2017)	3.3% (1958 – 2020) 3.8% (1988 – 2020)
CEPA estimate of MRP using DGM (point estimate)	6.2% (2017)	8.0% (2020)
Survey range	6.0% (The most common mode, mean, median for the last 3 years as at Sep 2018)	6.0 to 6.3% (The most common values since the 2018 Instrument)
Volatility index (VIX)	As at September 2018, the implied volatility was lower than the historical average and has been for a sustained period of time.	As at December 2022, the implied volatility is currently below its long-term average and is around the same level it was at the time of publishing the 2018 Instrument.
Credit spreads and dividend yields	As at September 2018, state government credit spreads with a term to maturity of 3 years had started to increase slightly, however they were still around the pre-GFC level and were significantly lower than they were in 2013. As at September 2018, corporate credit spreads with a term to maturity of 3 years were lower than levels seen in 2013 when the previous guidelines decision was made. As at September 2018, Average dividend yields were around their long-term average for the series.	As at December 2022, credit spreads from state government with a term to maturity of 3 years have started to increase in recent months and are higher than the levels when publishing the 2018 Instrument. However, they are still around the pre-GFC level and are significantly lower than they were in 2013. As at December 2022, corporate credit spreads with a term to maturity of 3 years have started to increase in recent months and are higher that the levels when publishing the 2018 Instrument.

		As at December 2022, the current dividend yields have not changed significantly since the December 2018 Instrument and are currently slightly higher than the long-term average for the series.

Note: The tables and charts for these data points are contained in section 7.3.3.

We also recognise that the Independent Panel stated that we appear to have taken different approaches to estimating beta and MRP in the draft decision, with beta being characterised as an exercise of judgement and MRP being characterised as mechanical.[265] The Independent Panel stated that in deciding not to change beta from the 2018 estimate, the AER has exercised judgement regarding temporary influences rather than adopting the estimate resulting from a mechanistic approach of updating the data series to the end of 2021.[266]

In making this final decision we have applied judgement on whether we think the information before us offers sufficient evidence to move away from our initial estimate of 6.2% based on the approach we used in 2018.

We understand how the Independent Panel came to the view that we had taken a mechanical approach. Therefore, we have sought to clearly explain the judgement we have employed in selecting the MRP and beta values and we have sought to be consistent in our exercise of judgment across these parameters.

7.2 Draft decision

Our draft decision was to maintain our current approach (consistent with our 2018 Instrument), which was to give most weight to the historical excess returns estimates when setting an MRP. We also decided to set the MRP consistent with the term of the regulatory period (typically this is 5 years) because our draft decision changed the term of the risk-free rate (term of equity) from 10-years to the term of the regulatory period.[267]

Since we expect the majority of our regulatory decisions to have a regulatory control period of 5 years, we decided to set an MRP of 6.8% for a 5-year application of the SL CAPM. The way this was calculated was explained in section 7.2.1 of our draft decision.[268]

Our draft decision acknowledged that there are differences of view on the best way to set the MRP in our context and outlined alternative options for setting the MRP.[269]

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[265] Independent Panel Report*, AER Draft Rate of Return Instrument 2022*, July 2022, pp. 9–10.

[266] Independent Panel Report*, AER Draft Rate of Return Instrument 2022*, July 2022, p. 36

[267] AER, *Draft Rate of return instrument, Explanatory Statement*, June 2022, p. 124.

[268] AER, *Draft Rate of return instrument, Explanatory Statement*, June 2022, p. 128.

[269] AER, *Overall Rate of Return, Equity and Debt omnibus working paper*, December 2021, pp. 32–33.

We outlined an alternative option (also known as option 3b) for setting the MRP and set out the details of its implementation. [270] Under this option we would set the MRP equal to the average of HER and an MRP value derived from a DGM. We would undertake this calculation before a final regulatory determination. We also recognised that this approach may have some desirable characteristics because it may capture market information at any given time.

7.3 AER considerations

In response to our draft instrument, the Independent Panel recommended that we consider the extent to which some of the rate of return parameters may have been impacted by the low interest rates and quantitative easing which is now being unwound. To this end, the Independent Panel suggested that we seek expert advice.[271]

Having considered the Independent Panel's recommendations, we sought advice from the Australian Commonwealth Treasury (Treasury) and the Reserve Bank of Australia (RBA). The RBA indicated that it was not in a position to provide input into these matters.[272] The Treasury however suggested that the simplest and least subjective method for reducing bias in the measured HER – to the extent that it exists – is to either:[273]

- Extend the sample period to include the 2022 calendar year, though this may require a short extension to the planned publication date of the final RoRI. This approach would incorporate into the calculation window the signalling by central banks of their intention to unwind the extraordinary monetary policy settings of the pandemic period or;
- Shorten the sample period to end in 2019, which would exclude any bias in the measured HER stemming from the pandemic period. The pandemic and post-pandemic period could then be incorporated into the calculation window at the next RoRI review

Having regard to The Treasury advice, we decided to delay our final decision to consult on the Treasury advice and options for estimating the MRP. The options we identified for consultation were:

- No change to our current approach in the draft determination, which uses Historical Excess Return (HER) data to December 2021
- Adopt HER data up to December 2019
- Adopt HER data up to September 2022, given that is the latest available data

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[270] AER, *Draft Rate of return instrument, Explanatory Statement*, June 2022, pp. 150–151.

[271] Independent Panel Report*, AER Draft Rate of Return Instrument 2022*, July 2022, p. 10.

[272] RBA, *AER review of the Rate of return Instrument and impact of monetary policy post the Global Financial Crisis on asset prices*, 26 September 2022, p. 1

[273] The Treasury, *Australian Energy Regulator review of the Rate of Return Instrument and impacts of monetary policy post the Global Financial Crisis on asset prices,* 26 October 2022, p. 2.

- Adopt HER data up to December 2022. Alternatively, delay the decision to February 2023 or adopt a formula that could be applied when the December 2022 data is available.

We note that the decision to delay the 2022 Instrument allowed us to fully consider submissions on MRP and not close of any options available to us. We have discussed our decision to delay in more detail in Chapter 1.

In response to the Treasury advice, consumer groups such as the CRG and the EUAA submitted that given the AER's recent announcement to defer publication of the Instrument until February 2023, the sample period should run to 31 December 2022.[274] Consumer groups stated that this is consistent with the preference for an unconditional estimate of the HER, which requires the longest possible sample period as well as being consistent with the AER's view that the sample period should be the period "most likely to be reflective of recent market structure, conditions and investor expectations."[275]

By contrast, NSPs such as ENA, APA and NSG submitted that the AER should not make a major change to its approach to compiling HER estimates of the MRP at this late stage of the process as it should recognise the need for regulatory stability, predictability, and consistency.[276] In the NSPs view, the caveated and limited advice from Treasury is not a sufficient or proper basis for a departure from the AER's long-standing approach to HER estimation. As such NSPs supported no change to our current approach of the sample period ending at the end of the 2021 calendar year.[277]

However, NSPs also stated that if the AER is minded to make a change, and use the 2022 end year data, an annual update must occur at the end of each year as there is no logical basis for delaying the final Instrument to include 2022 data, but then not updating for new data that becomes available each year.[278] In the NSPs' view, it would be logical and improve the quality of estimates over time to routinely update the estimate each year as new data becomes available.

We also note that the ENA suggested that the Independent Panel appears to be considering a conditional MRP, where the MRP varies according to the level of interest rates, as affected by different monetary policies. Therefore, the ENA proposed that AER needs to determine

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[274] CRG, *Advice to the AER regarding changing HER sample periods, 25 November 2022*, pp. 3, 7; EUAA, *Changing HER Sample Periods*, 25 November 2022, p. 1.

[275] CRG, *Advice to the AER regarding changing HER sample periods, 25 November 2022*, p. 7.

[276] ENA, *Options for Historical Excess Returns sample periods for 2022 Rate of return Instrument,* 25 November 2022, pp. 4, 5, 7, 31; APA, *APA submission on the alternative options for estimating the market risk premium*, 25 November 2022, p. 3; NSG, *Submission on Treasury Advice,* 28 November 2022, pp. 2, 3.

[277] ENA, *Options for Historical Excess Returns sample periods for 2022 Rate of return Instrument,* 25 November 2022, p. 31.

[278] ENA, *Options for Historical Excess Returns sample periods for 2022 Rate of return Instrument,* 25 November 2022, pp. 7, 24; APGA*, 2022 Rate of Return Instrument Review - Release of Treasury Advice to AER,* 25 November 2022, p. 3

whether it will continue to use an unconditional MRP or change to a conditional MRP.[279] We disagree with the ENA's view that the Independent Panel was considering a conditional MRP. The Independent Panel appears to be talking about a potential bias in the estimate of an unconditional MRP due to monetary policy.

Stakeholders such as the ENA, APA, APGA and the CRG submitted that if the AER is seeking a better estimate of the unconditional mean, it should use the decades of historical data which are available to it, rather than a single recent datapoint. The ENA specifically recommended that the historical period should start in 1958 as the estimate from that period is not subject to material variation from year to year such that the question of whether or not an individual year is included becomes unimportant and uncontroversial.

We agree that placing more weight on historical excess returns averaged over a longer time period (e.g on the period from 1958 – 2022) will lessen the impact on the average of a few years of relatively high or low excess returns. However, there is a trade-off as we consider more recent data may be more representative of the unconditional MRP going forward

With regard to using HER data up to September 2022, neither consumer groups nor NSPs were in favour. NSPs considered that the inclusion of an end-September data point for 2022 would be problematic and is unnecessary as it is not clear how a part-year market return would be converted into an annual figure, nor how the part-year figure might be weighted relative to the annual figures for every other year.[280] In agreement, the CRG submitted that there is no reason to consider a part-year figure now that the AER has delayed publication of the final Instrument until early 2023 – at which time the full year of data will be available.[281]

Similarly, with regard to using HER data up to December 2019, neither consumer groups nor NSPs were in favour. The CRG submitted that there is no obvious logic in a cut-off date of 2019 to avoid the pandemic era.[282] NSPs also considered that the removal of data points would raise a range of new areas of subjective judgement which would adversely affect regulatory predictability, confidence, and replicability and that a clear and consistent approach to identifying outliers would need to be developed rather than focussing only on the last three years.[283]

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[279] ENA, *Options for Historical Excess Returns sample periods for 2022 Rate of return Instrument,* 25 November 2022, p. 9.

[280] ENA, *Options for Historical Excess Returns sample periods for 2022 Rate of return Instrument,* 25 November 2022, p. 6; APA, *APA submission on the alternative options for estimating the market risk premium*, 25 November 2022, p. 4.

[281] CRG, *Advice to the AER regarding changing HER sample periods, 25 November 2022*, p. 6.

[282] CRG, *Advice to the AER regarding changing HER sample periods, 25 November 2022*, p. 7.

[283] ENA, *Options for Historical Excess Returns sample periods for 2022 Rate of return Instrument,* 25 November 2022, p. 5; APA, *APA submission on the alternative options for estimating the market risk premium*, 25 November 2022, pp. 3, 6; CRG, *Advice to the AER regarding changing HER sample periods, 25 November 2022*, p. 7; APGA*, 2022 Rate of Return Instrument Review - Release of Treasury Advice to AER,* 25 November 2022, p. 4.

In our view, we consider it most appropriate to use all available recent data (i.e. to the end of 2022) rather than exclude data due to unusual events (such 2020 and 2021). While using 2022 data is a change in approach, it is driven by the exceptional events from the monetary response to Covid, the Independent Panel recommendations and the Treasury advice. However, as noted in Chapter 1, we intend publishing our next 2026 Rate of Return Instrument in December 2026 and re-align the 4th year anniversary.

Since we have more recent data available to us, we do not consider it preferable to base our decision on older data that requires an adjustment to annualise.

We also do not consider updating the MRP throughout the 2022 Instrument period will create more benefit relative to the uncertainty it creates. Fixing the MRP, when combined with a fixed value for beta, results in a return on equity that moves with the risk-free rate. Conversely, having the MRP move with updates in HER will result in both the risk-free rate and MRP moving resulting in more variability in potential return on equity outcomes. We prefer to exercise our judgement to choose the fixed value for the MRP to apply for the duration of the Instrument we consider will best achieve the NEO and NGO having regard to all of the information currently before us. We note that there are high-level approaches and models available to assist us estimate an MRP, but experts, investment professionals and other regulators have different views about how they should be applied. Ultimately, we think choosing the approach that will most likely contribute to achieving the NEO is an exercise in judgement and reasonable minds may differ in this judgement.

However, we note the NSPs and investor groups have stated that the AER's proposed approach to estimating the return on equity as a fixed margin above the risk-free rate will lead to a 'lottery' for regulated energy networks and their customers. NSPs state that no consideration should be given to the desirability of the allowed return on equity moving point-for-point with changes in the risk-free rate when the AER makes the Final 2022 RoRI.[284]

The ENA also remains concerned about the robustness of the AER's preferred approach to unusual economic conditions, such as a return to the low-rate conditions that eventuated after the 2018 RoRI.[285]

We recognise that by maintaining our current approach of fixing the MRP it will result in a 1:1 positive relationship between changes in the risk-free rate and changes in the return on equity. However, government securities are the common proxy used for a risk-free asset and their yield reflects the required return in view of market conditions at the time. Consequently, fixing a forward-looking MRP estimate for 4 years, to be combined with a current risk-free rate selected close to the start of the regulatory period (each time the Instrument is applied), reflects the risks (and required return on equity capital) faced by firms in the supply of Australian regulated energy network services in an unbiased manner. If we were to introduce a formula for adjusting the MRP annually this would result in additional uncertainty about the returns that would prevail going forward. At this point in our process, we are not confident

[284] Jemena, *Submission on AER's draft Rate of Return Instrument (RORI),* September 2022, pp. 4–5; QTC, *Draft Rate of Return Instrument Explanatory Statement,* September 2022, p. 43.

[285] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 5.

this additional uncertainty would be consistent with the stated views of stakeholders about their preference for stability and predictability in our approach.

In making our final decision we have reviewed all the evidence available to inform our view and understand what it is showing. There are strengths and weaknesses for each piece of evidence. We have exercised our judgement to choose a value from this array of information which we consider is most likely to contribute to the NEO. We have also been conscious of the appropriate bar for change and making sure we factor in stability and predictability.

In the sections below we explore the key aspects of our decision-making process of setting an MRP. This includes our initial consideration of the framework we use to set the MRP.

7.3.1 Does the MRP vary through time, and can it be modelled?

At the concurrent evidence session, the experts agreed that there are 2 types of MRP:[286]

- the unconditional MRP and;
- the conditional MRP.

The unconditional MRP is one that does not vary much through time (a relatively constant risk premium), whereas the conditional MRP varies around the unconditional MRP through time. At any given point in time the conditional MRP may be above or below the unconditional MRP.

We agree with the expert view that the conditional MRP does vary through time and is in principle desirable to estimate.

However, there was no agreement among the experts that the conditional MRP can be accurately modelled. Some experts argued it is impossible to measure the conditional MRP precisely and reliably, while others argued that there is convincing empirical evidence of a negative relationship between the MRP and the risk-free rate.[287]

Valuation models such as the DGM or conditioning variables are options to estimate a time varying MRP. However, there is some uncertainty about their ability to predict excess returns. Accordingly, we express caution when using them to predict excess returns. We have discussed this in more detail in our Rate of return final omnibus paper.[288]

In our view, the unconditional MRP is most relevant to our regulatory task as we are setting a return that applies to long lived assets. This approach is also consistent with our decision to continue to estimate the return on equity based on a 10-year term.

We also acknowledge that a number of European regulators utilise a long-term average of the risk-free rate, in combination with a HER base MRP, in their return on equity methodology. However, in our view this approach will result in approximately the same

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[286] AER, *Concurrent evidence session 3 - Proofed transcript*, February 2022, p. 25.

[287] AER, *Concurrent evidence session 3 - Proofed transcript*, February 2022, pp. 20, 26.

[288] AER, *Rate of return final omnibus paper,* p. 34.

average return on equity through time as us, but a different return on equity at a given a point in time. For example, in the current environment where the risk-free rate is increasing, the approaches of European regulators of adopting a long-term average of the risk-free rate is likely to result in a lower return on equity than us all else equal (assuming the same MRP and beta). Conversely, in an environment where the risk-free rate is decreasing, the approaches of European regulators of adopting a long-term average of the risk-free rate is likely to result in a higher return on equity than us all else equal. With respect to brokers and valuation experts, they use a range of approaches to estimate the return on equity. Approaches include combining a HER based MRP with a current risk-free rate (as we do) and combining a HER based MRP with a risk-free rate that is adjusted in some way relative to the current risk-free rate. Methods of adjustment included using an average of historical risk-free rates and the current risk-free rate. [289] However, no one approach is universal or can be considered correct. Overall, we consider our approach preferable to using some form of average of historical risk-free rates given we consider it likely to be more reflective of the forward-looking required return on equity at the time of regulatory determinations.

We also recognise that some experts in the concurrent evidence session argued that historical averaging will give the best estimate of the unconditional MRP if the longest available data is used and the data passes the tests for stationarity and ergodicity.[290] In their view, we should continue with the unconditional MRP because we do not know how to estimate the conditional MRP with any precision and trying to do so could introduce more noise and error in the process.[291] They also argued that, although the HER is not perfect, there is no reliable alternative to track conditional MRP changes.[292]

7.3.2 Framework for estimating MRP

7.3.2.1 Historical excess returns

Our draft decision was to maintain our current approach (consistent with our 2018 Instrument), which was to give most weight to the historical excess returns estimates when setting the MRP.

However, in response to our draft decision, NSPs submitted that the average of a long series of HER embeds an assumption that the MRP is constant and may not capture the changes in asset risks and investor willingness to bear those risks that seem to underlie time variation in the MRP.[293]

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[289] AER, *Rate of return final omnibus paper,* pp. 40–41; AER, *Draft Rate of return instrument, Explanatory Statement*, June 2022, p. 153; CEPA, *Relationship between RFR and MRP*, 16 June 2021, pp. 5, 19; AER analysis of broker reports, dated 1 January 2019 to 31 December 2022 that include a valuation for AusNet Services, Spark Infrastructure, APA Group, and/or DUET Group

[290] AER, *Concurrent evidence session 3 - Proofed transcript*, February 2022, p. 70.

[291] AER, *Concurrent evidence session 3 - Proofed transcript*, February 2022, p. 70.

[292] AER, *Concurrent evidence session 3 - Proofed transcript*, February 2022, p. 58.

[293] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 32.

In contrast, the CRG stated that it continues to favour the use of HER data to inform the estimate of the MRP as this approach provides a stable, consistent signal to investors and consumers based on long-term evidence of returns to Australian equities. It also stated that the HER method is not perfect, but there is an absence of empirical evidence that the prevailing approach has had a detrimental impact.[294] In its view, the HER method is the most appropriate for long-lived assets with long-term investors.

The AEC also submitted that the AER's draft approach to set the MRP based on estimates of the HER is consistent with the 2018 Instrument, and a consistent and coherent approach to use in the rate of return framework. It considered that using the HER does not mean an MRP estimate is backward-looking. But rather, that the HER is commonly used by both regulators and market practitioners to inform their estimates of the MRP within a forward-looking rate of return.[295] It also stated whilst an academic or theoretical case can be made for greater weight to be given to other information in determining the MRP, there is no compelling case made that there is a problem with the current method that must be addressed.[296]

To date, our approach has been to rely on HER as the best indicator of future values of the MRP. This approach is based on the view that (on average) past realised returns are the best indicator of investor expectations. It has several desirable characteristics for estimating the MRP in a regulatory setting:

- Investor expectations of future returns are informed by past realised returns.
- The method is easily replicable, transparent and widely used in both regulation and by market practitioners.
- Using a fixed MRP will result in the total return on equity moving in line with the risk-free rate. The risk-free rate moves in line with economic conditions, meaning our return on equity will also tend to move with the base cost of money because it varies with changing market conditions.
- Applying this approach consistently over time will ride through short-term economic cycles and promote stability and predictability.

Using the HER does not mean an MRP estimate is backward-looking. HER data is commonly used by both regulators and market practitioners to inform their estimates of the market risk premium within a forward-looking rate of return. This view was recognised by the Tribunal in the Dampier to Bunbury Natural Gas Pipeline (DBNGP) matter.[297]

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[294] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 33; CRG, *Rate of Return Instrument Review: CRG Response to AER's Final Omnibus and Information papers*, P. 11, 69, 76.

[295] AEC, *Consultation: Draft Rate of Return Instrument 2022*, September 2022, p. 2.

[296] AEC, *Consultation: Draft Rate of Return Instrument 2022*, September 2022, p. 2.

[297] Australian Competition Tribunal, *Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012] ACompT 14*, 26 July 2012, paragraph 153.

Sample periods

In 2018 we considered 5 sampling periods for HER as suggested by Brailsford, Handley and Maheswaran (BHM).[298] These sample period have been updated to December 2022 to reflect the current market data. The results have been illustrated in section 7.3.3.1.

The rationale for each of the estimation periods have been explained in our draft decision.[299] In our draft decision we considered all the relevant estimation periods as they all provide useful information in estimating a forward looking MRP.[300] However, while the longer periods are likely to be more statistically robust, we consider the period of 1988 onwards is most likely to provide an estimate that is more representative of current investor expectations and macroeconomic conditions. This period also has the advantage of only including data after commencement of the imputation tax system in Australia, which has impacted the operation of the market and investor expectations. The more recent period is also largely post inflation targeting by the Reserve Bank of Australia.

In response to our draft decision, the ENA submitted that its preference is to use the sample period from 1958 as this period is long enough to provide statistical reliability, consists exclusively of reliable data that is not subject to alternative estimates, and does not vary materially with the introduction of each additional year of data. It considers that the estimation of the MRP as an average of HER has some validity only if a very long series of HER data is used. [301]

APA also shared a similar view for MRP estimation from HER. It stated that the longest - and most appropriate - series available is the Brailsford, Handley and Maheswaran series for 1958 to 2010, extended, using the Brailsford, Handley and Maheswaran methods, for 2011 to 2021. Estimation of the MRP as an average of HER has some validity only if a very long series of those HER is used: the series from 1958 (64 observations) might be long enough. There is no evidence of a structural break around 1988 has been put forward to justify a focus on the series from 1988, which is simply too short for reliable estimation.[302]

The CRG also raised concerns with sample period selection stating that none of the periods can be considered a priori, as more representative than others of the true market risk premium. In its view, a longer data series is most likely to provide an unbiased estimate of the unconditional MRP and the relatively short period used to construct what is intended to be an unconditional estimate is a relevant concern because of the surprisingly large movement in the HER data over this shorter period between 2018 and 2022.[303]

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[298] AER, *Rate of Return Instrument, Explanatory Statement*, December 2018, p. 240.

[299] AER, *Draft Rate of return instrument, Explanatory Statement*, June 2022, p. 130.

[300] AER, *Draft Rate of return instrument, Explanatory Statement*, June 2022, pp. 130–131.

[301] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 81.

[302] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 8.

[303] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, pp. 35, 36.

We also note that we were advised by the experts at the concurrent evidence session advised us that 30 years of data is short, and we would need to test for stationarity and ergodicity. They suggested that certain statistical properties such as the law of large numbers[304] only apply once there are many observations in the data series – by using only 30 years of data, the confidence intervals of the HER point estimates are wide. [305]

We had Dr Lally perform tests for mean stationarity in excess returns, real returns and nominal returns using data from 1884 through to 2021.[306] His results indicated you could not reject mean stationarity in any of the data series.

In our view all the relevant estimation periods provide useful information in estimating a forward looking MRP. However, while we agree that placing more weight on a longer time period of historical returns will lessen the impact on the average of given years, there is a trade-off as we consider more recent data may be more representative of the unconditional MRP going forward. Using post 1988 data is also consistent with the approach used in making the 2018 Instrument.

Term of the MRP

In our draft decision we stated that we should apply the SL CAPM consistently with the length of the regulatory period as we changed our term of the risk-free rate. However, for the reasons discussed in Chapter 6 in this final decision we continue with our current approach of using a 10-year term for the risk-free rate. Therefore, the MRP is also set for a 10-year application of the SL CAPM.

Arithmetic vs geometric averages

In terms of arithmetic and geometric average, our draft decision was to review both sets before settling on a value. We acknowledged that both sets of averages may provide biased estimates in different circumstances. This decision is consistent with the approach we adopted in 2013 and 2018 guidelines, where we gave most weight to arithmetic averages but also had regard to the geometric average in forming our final estimates.[307]

In response to our draft decision, NSPs submitted that only arithmetic means should be used.

However, the CRG submitted that the AER's choice of HER estimate does not account for potential upward bias from the exclusion of geometric averages. In the CRG's view, neither the arithmetic nor geometric averages are clearly the best estimate, and that the AER should select a figure that lies between the arithmetic averages and the geometric averages. It

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[304] The law of large numbers states that an observed sample average from a large sample will be close to the true population average and that it will get closer the larger the sample.

[305] AER, *Concurrent evidence session 3 - Proofed transcript*, February 2022, pp. 35, 69–70.

[306] Dr Martin Lally, *Test of mean stationarity for Australian share market returns data*, 2 June 2022.

[307] AER, Explanatory statement – Rate of return guideline, December 2013, p. 83; AER, Draft rate of return guidelines – Explanatory statement, July 2018, pp. 211–213.

further stated that by taking account of only the arithmetic average, the AER has ignored its own assessment that arithmetic averages will overstate the MRP.[308]

In response, we have explored the theory around arithmetic and geometric means and think both approaches have advantages and disadvantages:

The arithmetic mean (average) gives an estimate of future expected returns under strong assumptions. It makes the implicit assumption that each security return is an independent observation from a stationary underlying probability distribution. Under the independence assumption, the arithmetic average, when compounded over many periods, is the one that gives the expected value (i.e., the mean) of the probability distribution of expected values. However, it is mathematically shown in literatures that compounding at the arithmetic average historical return results in an upward bias in forecasted values.[309] This bias is resulted from:

- the facts that cumulative performance is a non-linear function of average return[310]
- the sample average is necessarily a noisy estimate of population mean[311]
- the assumption that single-period returns are identically and independently distributed does not necessarily hold.[312] The empirical evidence from Fama and French (1988a, 1988b), Lo and MacKinlay (1988), and Poterba and Summers (1988) suggests there is significant long-term negative autocorrelation in equity returns and that historical returns are not independent draws from a stationary distribution. The presence of negative autocorrelation magnifies the upward bias inherent in the use of arithmetic averages and the downward bias inherent in the use of geometric averages.[313]

It has been noted that even if the sample average is computed from long data series and returns form a stable distribution with no correlation, the bias does not necessarily disappear.[314] Studies show that the bias depends on the ratio of the length of the historic

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[308] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 4, 33.

[309] Jacquier, Eric, Alex Kane, and Alan J. Marcus. "Geometric or arithmetic mean: A reconsideration." *Financial Analysts Journal* 59.6, 2003.

Indro, Daniel C., and Wayne Y. Lee. "Biases in arithmetic and geometric averages as estimates of long-run expected returns and risk premia." *Financial Management*,1997, pp. 81-90.

[310] Jacquier, Eric, Alex Kane, and Alan J. Marcus. "Geometric or arithmetic mean: A reconsideration." *Financial Analysts Journal* 59.6, 2003, p. 4.

[311] Jacquier, Eric, Alex Kane, and Alan J. Marcus. "Geometric or arithmetic mean: A reconsideration." *Financial Analysts Journal* 59.6, 2003, p. 4.

[312] Indro, Daniel C., and Wayne Y. Lee. "Biases in arithmetic and geometric averages as estimates of long-run expected returns and risk premia." *Financial Management*,1997, p. 81.

[313] Indro, Daniel C., and Wayne Y. Lee. "Biases in arithmetic and geometric averages as estimates of long-run expected returns and risk premia." *Financial Management*,1997, p. 81.

[314] Jacquier, Eric, Alex Kane, and Alan J. Marcus. "Geometric or arithmetic mean: A reconsideration." *Financial Analysts Journal* 59.6, 2003, p. 4.

estimation period to that of the forecast holding period.[315] Keeping the historical estimation period fixed, the longer investment horizon, the bigger bias one will get. For short investment horizons, the arithmetic average will be close to the unbiased compounding rate. Conversely, bias declines with an increasing historical estimation period, because longer sample periods increase the precision of our estimates.[316]

On the other hand, the forecasts obtained by compounding at the geometric average is likely to be downward biased depending on the presence of autocorrelation and the length of the investment horizon relative to the length of the sample historical period.[317] The geometric mean, sometimes referred to as compounded annual growth rate or time-weighted rate of return, is the average rate of return of a set of values calculated using the products of the terms. When used for forecasting, the implicit assumption is that the geometric-mean risk premium treats the observed historical path as the single best estimate of the future, an assumption that may or may not be correct in the future.

The mathematical equation in Indro and Lee's paper suggests that the geometric average is unbiased when there is no autocorrelation and when investment horizon approaches the sample historical period. However, if there is negative autocorrelation the geometric average is always biased downward. [318] For the purpose of this decision, the investment horizon is considered to be relatively short compared to the sample period, therefore estimates from geometric average is expected to be more downward biased.

Since arithmetic averages are argued to typically provide upward biased estimates while geometric averages are argued to typically provide downward biased estimates, literature suggests that the least biased estimates would be a weighted average of the geometric and arithmetic averages.[319] In this instance, when we use the term 'weighted' we are indicating a mathematical weighting. Indro and Lee's (1997) simulation results indicate that a horizon weighted average contains the least bias and is also more efficient than arithmetic and geometric averages in the presence of negative autocorrelation, time-varying variance or

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[315] Jacquier, Eric, Alex Kane, and Alan J. Marcus. "Geometric or arithmetic mean: A reconsideration." Financial Analysts Journal 59.6, 2003, p. 4.

[316] Jacquier, Eric, Alex Kane, and Alan J. Marcus. "Geometric or arithmetic mean: A reconsideration." *Financial Analysts Journal* 59.6, 2003, p. 12.

[317] Indro, Daniel C., and Wayne Y. Lee. "Biases in arithmetic and geometric averages as estimates of long-run expected returns and risk premia." *Financial Management*,1997, p. 83.

Jacquier, Eric, Alex Kane, and Alan J. Marcus. "Geometric or arithmetic mean: A reconsideration." *Financial Analysts Journal* 59.6, 2003, p. 4.

[318] Indro, Daniel C., and Wayne Y. Lee. "Biases in arithmetic and geometric averages as estimates of long-run expected returns and risk premia." *Financial Management*,1997, p. 83.

[319] Indro, Daniel C., and Wayne Y. Lee. "Biases in arithmetic and geometric averages as estimates of long-run expected returns and risk premia." *Financial Management*,1997, p. 81.

Jacquier, Eric, Alex Kane, and Alan J. Marcus. "Geometric or arithmetic mean: A reconsideration." *Financial Analysts Journal* 59.6, 2003, p. 4.

stationary variance.[320] The following equation is applied in the paper in calculating the horizon weighted average:[321]

$$E(W^N) = \frac{T-N}{T-1} R_A^N + \frac{N-1}{T-1} R_G^N$$

Where:

$\mathrm{E}(\mathrm{W}^{\mathrm{N}})$ is the expected weighted average of the geometric and arithmetic averages for investment horizon length of N

T is the length of the historical sample period

N is the length of the forecast investment horizon

$\mathrm{R}_{\mathrm{A}}^{\mathrm{N}}$ is the arithmetic average for investment horizon length of N

$\mathrm{R}_{\mathrm{G}}^{\mathrm{N}}$ is the geometric average for investment horizon length of N

When the forecast horizon is short relative to the sample period, the arithmetic average will be close to the unbiased compounding rate and receive a weight close to one. At investment horizon of 1, the arithmetic average receives all the weight. However, as the horizon approaches the length of the estimation period, the weight on the geometric average approaches one.

In section 7.3.3.1 we illustrate the weighted average estimates for the arithmetic and geometric averages for the relevant sample periods based on the equation above.

7.3.2.2 Dividend Growth Model

In our draft decision we explored DGMs extensively and the information they can provide in setting the MRP. We also included an outline of how the DGM could be given meaningful weight in setting the MRP as an alternative approach.[322]

In response to our draft decision NSPs supported the use of a DGM as an approach to MRP estimation alongside the HER. NSPs stated that compared to the HER, the DGM better captures the changes in assets risks and investor willingness to bear those risks that seem to underlie time variation in the MRP.[323] However NSPs also stated that a key requirement of any DGM estimate is that it must produce estimates that are unbiased over time. In NSPs' view, any DGM specification that produces estimates that are systematically different from observed outcomes (i.e., the HER estimate) should not be used. In this regard, NSPs considered that a calibrated DGM produces an unbiased average estimate by construction

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[320] Indro, Daniel C., and Wayne Y. Lee. "Biases in arithmetic and geometric averages as estimates of long-run expected returns and risk premia." *Financial Management*,1997, p.89.

Bias refers to the magnitude of estimation error whereas efficiency refers to standard deviation.

[321] Indro, Daniel C., and Wayne Y. Lee. "Biases in arithmetic and geometric averages as estimates of long-run expected returns and risk premia." *Financial Management*,1997, p.84.

[322] AER, *Draft Rate of return instrument, Explanatory Statement*, June 2022, p. 88.

[323] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 7.

whereas the AER's proposed specification produces estimates that are materially lower than observed outcomes on average which introduces a bias into allowed returns.[324]

On the other hand, the CRG was of the view that DGMs generate estimates of MRP that carries the risk of resulting in volatile estimates, given that several of the inputs to a DGM are subject to variation over time and that these variations feed through to variations in the output. It further submitted that DGMs tend to be upward biased due to analyst optimism.[325]

The Independent Panel stated that the current state of disagreement about the DGM makes it more unreliable than using historical averages as a method of estimating the level of MRP. In the Independent Panel's view, the DGM can give estimates of MRP that vary greatly in the short term in periods where there have been no obvious changes to fundamental determinants of MRP, such as risk aversion and the level of long run risk. The Independent Panel concluded that even the proponents of the DGM advocate its use more for tracking short term changes in the MRP, rather than estimating its level at a point in time.[326]

In our view, the DGM method is a theoretically sound estimation method for the MRP. Since DGM estimates incorporate prevailing market prices, they are more likely to reflect prevailing market conditions. DGM estimates are also clearly forward-looking because they estimate expectations of future cashflows and equate them with current market prices through the discount rate.

However, we have highlighted consistently in the past that there are practical limitations and issues with using this evidence.[327] Such as:

- analyst forecasts are upwardly biased[328]
- the implicit assumption of a stable return on equity
- wide variety of potentially acceptable growth rates
- various constructions of the model and diverging estimates of the MRP over time.
- sticky dividends

In our view DGM estimates are highly sensitive to the assumptions used. It is also necessary that all assumptions used have a sound basis; otherwise, estimated results from DGM analysis may be inaccurate and lead analysts into error.

We note that the ENA constructed and submitted a version of the DGM (the 'calibrated DGM') that attempts to address these concerns.

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[324] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 74.

[325] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 33.

[326] Independent Panel Report*, AER Draft Rate of Return Instrument 2022*, July 2022, p. 30–33.

[327] AER, *Rate of Return Instrument, Explanatory Statement*, December 2018, p. 92–93; AER, *Draft rate of return guidelines – Explanatory statement*, July 2018, pp. 220–222.

[328] Lally, The Dividend Growth Model, 4 March 2013, pp.5-9

The ENA's calibrated model uses our DGM specifications (such as the 2-stage and 3-stage DGM) and inputs, except for our long-run estimate of the terminal growth rate. Instead, in 'calibrating' the models, the ENA solves for the long-run growth rate that equates the mean DGM estimate over a sample period with an estimate of the historical average MRP based on HER over the same sample period.[329]

We discuss the models we have been estimating over a number of years and the calibrated DGM in the next 2 sections. We have also reviewed estimates from the DGM used by CEPA.

The 2-stage and 3-stage DGM

The 2-stage and 3-stage versions of the DGM are commonly used to estimate the DGM. We have illustrated the formulae used and explained the differences between the two version in our draft decision. We have used this formulation since the 2013 Guideline and stakeholders have not raised any issues in the past.

We note that the Independent Panel wanted us to make available the DGM model and the data we have used.[330] We cannot publish the data due to confidentiality reasons but have published the updated results of the two models on our website.[331]

We also note that the Independent Panel wanted us to clarify whether we will include the DGM information in the current rate of return review or if we are soliciting views in anticipation of the next 5-year review.[332]

At this point of time, we prefer to observe the trend of both estimates when setting the MRP, however we are not persuaded to place significant weight on its observed outcomes as our we have reservations about the DGM.[333] We are not soliciting views in anticipation of the next 5-year review.

Our decision is consistent with the approach we adopted in the 2018 Instrument.[334]

The trend line from our 2-stage and 3-stage DGM is illustrated in section 7.3.3.2.

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[329] Frontier economics, *ENA models user guide, Implementation of a calibrated DGM*, September 2021, p. 1.

[330] Independent Panel Report*, AER Draft Rate of Return Instrument 2022*, July 2022, p. 10.

[331] Rate of Return Instrument 2022, Supporting information.

[332] Independent Panel Report*, AER Draft Rate of Return Instrument 2022*, July 2022, p. 10.

[333] AER, *Rate of Return Instrument, Explanatory Statement*, December 2018, p. 83.

[334] AER, *Rate of Return Instrument, Explanatory Statement*, December 2018, p. 83.

Long run expected growth rate in dividends

In operating a DGM, we need to develop an approach to forecasting future dividends. The two approaches we could employ are a:

- constant terminal dividend growth expectations over time; or
- variable terminal dividend growth expectations updated each time we run the DGM.

The approach we have used for our two stage and three stage DGM in the past is based on the constant terminal real GDP growth approach. This has resulted in us not changing our real terminal GDP growth rate forecast since we first estimated it in 2013. This terminal GDP growth rate is then adjusted for the net creation of new shares from new companies and new share issues (net of buybacks) from existing companies. It is then converted into nominal terms using expected inflation estimates.

To illustrate this, we refer to our 2013 Guideline and 2018 Instrument where our central dividend growth rate was 4.6%. This estimate comprised of the expected long-run real growth in GDP of 3% derived from the Australian Treasury (in 2012) less a deduction of 1% for the net creation of capital. The expected inflation estimate was 2.5% (the midpoint of the Reserve Bank of Australia's target range)

We will continue to adopt this approach going forward but update the real terminal GDP forecast for the 2022 Instrument. As a minimum we consider updating the real GDP growth rate at the commencement of the 2022 Instrument is required. We derive the real GDP growth forecast from the latest available Consensus Economics forecasts. We then make a deduction to account for the net creation of new shares from new companies and new share issues (net of buybacks) from existing companies. We also use the forecast provided by Consensus Economics for inflation in year 10. We have discussed this in more detail in our draft decision.

If we were to maintain our current approach but update it with a more recent real GDP growth rate prior to making the 2022 Instrument, our long run expected growth rate in dividends would be 3.85% based on the most recent Consensus Economics data report.

Calibrated DGM proposed by the ENA

The ENA considers that the Calibrated DGM addresses the key concerns expressed by the AER, which are:

- there is no single objective way to determine the long-run growth rate and estimates are sensitive to the choice of growth rate
- there are concerns that the DGM approach might produce estimates that are systematically upwardly biased.

The ENA stated that the benefit of the calibrated DGM approach is that, not only does it produce the same average MRP as the historical excess returns approach, but it also provides an indication of whether the current MRP is above or below that long-run average.

We have explained how the model is constructed in our Rate of return final omnibus paper and discuss its results in the section below.[335]

The model was endorsed by the NSPs and investor groups.[336] We also engaged with the ENA to discuss the suitability of the calibrated DGM for regulatory purposes.

We recognise that the logic of a calibrated DGM has some merit. As the experts highlighted to us in the concurrent evidence session, there are 2 forms of MRP – the unconditional MRP and a conditional MRP. The calibrated DGM attempts to understand where the conditional MRP sits in comparison with the unconditional MRP.

We appreciate the ENA's attempt to calibrate the DGM to align it with the HER output, but we do not think the results produced by the model can be applied to our rate of return as explained in our draft decision.[337]

We note that Professor Graham Partington and Stephen Satchell also shared a similar view in their report to the CRG.[338] They agreed that the results produced by the calibrated DGM cannot be applied to AER's rate of return. However, we note that the same concerns on the extreme range of variation in MRP estimates from the calibrated DGM would also largely apply to the AER's preferred DGM specification.

We agree with Professor Graham Partington and Stephen Satchell that the AER's preferred DGM specification also exhibits extreme volatility over the same period. Our confidence in its estimates have not changed since our 2018 Instrument. However, we prefer to use it over the calibrated DGM as the growth rate is based on our estimate of expected dividend growth at each given point in time as opposed to being a single growth for all periods in the model generated via the calibration process.

In our draft decision we stated that if we were to adopt a mechanical approach, we would use the standard 3-stage DGM and not a calibrated DGM because we have more confidence in its MRP estimate than one produced through a calibrated DGM.[339]

In response to our draft decision the ENA stated that we should use the calibrated DGM to inform MRP estimates. This would provide greater stability in allowed return on equity estimates, and network charges. It would also provide a more forward-looking risk premium estimate, avoiding sole reliance on an untestable assumption that expectations exactly

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[335] AER, *Overall Rate of Return, Equity and Debt omnibus working paper*, December 2021, p. 48.

[336] APGA, *APGA Submission to the AER: Rate of return final omnibus paper and information paper*, 11 March 2022, p. 22; Endeavour Energy, *Rate of return information paper and call for submissions*, 11 March 2022, p. 4; APA, *APA submission on the Rate of Return Information Paper, Omnibus Paper, and Expert Evidence*, 11 March 2022, p. 26; NSG, *Response to AER Rate of return information paper and Omnibus final working paper*, 11 March 2022, p. 8.

[337] AER, *Draft Rate of return instrument, Explanatory Statement*, June 2022, p. 145.

[338] Partington & Satchell, *Report to the CRG: The Dividend Growth Model the MRP and the AER's 2022 Draft Rate of Return Instrument*, report for CRG, August 2022, p. 59.

[339] AER, *Draft Rate of return instrument, Explanatory Statement*, June 2022, p. 150.

match long-term historical returns, improving the likely quality of the resulting rate of return estimate.[340]

The ENA also stated that a key requirement of any DGM estimate is that it must produce estimates that are unbiased over time. Any DGM specification that produces estimates that are systematically different from observed outcomes (i.e., the HER estimate) should not be used. In this regard:[341]

- The calibrated DGM produces an unbiased average estimate by construction
- By contrast, the AER's proposed specification produces estimates that are materially lower than observed outcomes, on average. This introduces a bias into allowed returns.

The NSPs have stated that in their submission that the AER's key criticisms of the calibrated DGM approach apply equally to the AER specification.[342]

We agree with the NSPs that AER's preferred DGM specification also exhibits volatility for the same period. However, we prefer to use it over the calibrated DGM as the growth rate can be updated using a reasonable forecast as opposed to generating an artificial static growth rate produced by the calibrated DGM.[343]

We note that the ENA has stated that long-term dividend growth assumption of 6% is used because that drives the long-term HER estimate that is being calibrated. It stated that it is not an input selected by ENA, but a back-solved input to ensure the long-term HER is maintained on average. ENA submit that maintaining the long-term HER is the key principle that makes the calibrated DGM superior to other DGMs because it produces an unbiased MRP.

In our view, the back-solved growth rate produced by the calibrated DGM is well above other current estimates of long-term dividend growth, including Australian Treasury forecasts for long-term nominal GDP growth of 5%, resulting in the current MRP estimate currently coming out of the model being upwardly biased all else equal. We also note that the ENA stated in 2018 that there is a strong empirical basis for the AER's DGM specification of linking the dividend growth rate to the GDP growth rate.[344]

The Economic Regulation Authority (ERA) of Western Australia also raised some concerns over the calibrated DGM in its *Explanatory statement for the 2022 final gas rate of return instrument.*[345] Its analysis has found:

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[340] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 7.

[341] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 74.

[342] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 14.

[343] AER, *Draft Rate of return instrument, Explanatory Statement*, June 2022, p. 150; Frontier, *A calibrated dividend growth estimate of the market risk premium*, 28 April 2022, p. 15.

[344] ENA, *AER review of the rate of return guideline response to draft guideline*, 25 September 2018, pp. 122, 124.

[345] ERA, *Explanatory statement for the 2022 final gas rate of return instrument,* p. 149.

- Sensitivity of the market risk premium estimates to the time period that the forecast is made.
- Large variability of the market risk premium estimate.
- Doubts that unbiasedness can be achieved without some transition process as it will be adopting the calibrated DGM late in the calibration cycle. The calibrated DGM is currently producing high implied market risk premiums.
- Concern about the artificial static growth rate produced by the model and how actual changes in growth rates over the period may lead to distortions to the implied market risk premium.
- Concerns whether calibration to a historical target reduces the usefulness of the calibrated DGM as a forward-looking model.

In our view there may be a material time varying error in the model created from using a constant growth rate. We estimate that a 1% increase in the growth rate used will result in approximately a 0.8% increase in the estimated MRP from the model. We also recognise the concerns raised by the CRG over the calibrated DGM. CRG noted that the calibrated DGM 'decouples' the DGM result from the long-term growth rate. The analysis conducted by Woollahra Partners suggests there is at least one independent variable short in the regression model – leading to potential for omitted variable bias and future analysis. As a result, investigation is useful.[346]

While we appreciate the effort made by the ENA, we consider that the calibrated DGM is not yet suitable for use in the 2022 Instrument.

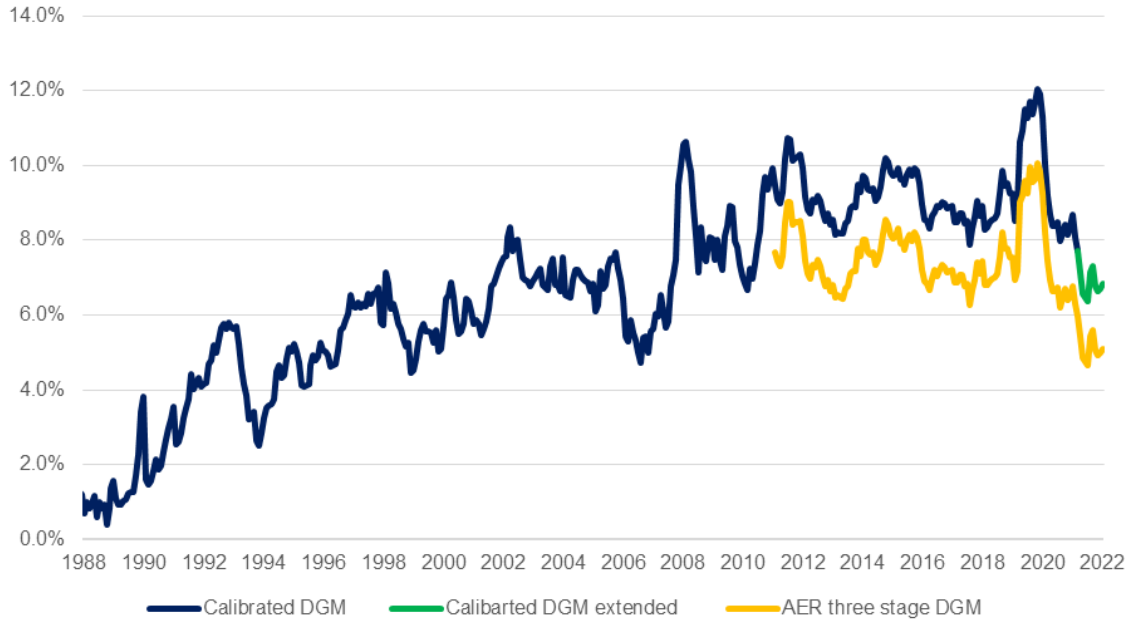
Figure 7.1 shows the MRP estimates produced by the calibrated DGM over the period January 1988 to December 2022 (Estimates used from Feb 2022 to Dec 2022).

We note that the model submitted to AER by the ENA was calibrated to 6.51% for the period of January 1998 to January 2022. However, we have extended the model to December 2022 but did recalibrate the model.

The calibrated DGM uses the AER's DGM model specification with a constant growth rate determined to give a predetermined average MRP over a given period. The calibration process (change in growth rate) means the MRP output of the model averages approximately 1.7% above the output of the AER model from January 2012 through to Jan 2022 and the difference does not vary greatly over the period (as shown on Figure 7.1). Therefore, we have, as an approximation, extended the calibrate model beyond Jan 2022 by taking the results of the AER's model from Feb 2022 to Dec 2022 and adding 1.7%. The results show the December point estimate is expected to be slightly above the average calibrated value for the period 1988 to 2022.

[346] CRG, Advice to the Australian Energy Regulator: CRG Response to the AER's December 2021 Information paper, March 2022, p. 72.

Figure 7.1 ENA's calibrated DGM



Source: AER analysis, ENA calibrated DGM results.

Mechanical approach updated throughout the life of the Instrument

In our draft decision we set out details on implementing a mechanical approach that is updated throughout the life of the Instrument (option 3b).

In response to our draft decision the NSPs preferred an approach that applies some weight to an unbiased DGM approach – such as option 3b using the calibrated DGM or some other specification that produces estimates that are consistent with observed historical outcomes, on average.[347]

The CRG on the other hand was concerned that the AER is still leaving open in the draft decision the prospect of adopting an MRP based on an equally weighted HER and DGM (Option 3b). In its view the introduction of option 3b has significant implications not only for the AER's initial return on equity, but for the operation of the Rate of return Instrument framework over the next four years. The full implications of this approach were not adequately canvassed in the draft decision.[348]

The CRG also stated that it puts very little weight on the putative stability benefits of Option 3b. In its view:

- Stability is somewhat important to many consumers. However, this does not mean that consumers in general are interested in "buying" stability through higher prices.

[347] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 5.

[348] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 38.

- Whether option 3b is more stable in the future is unclear because the stability benefits from the interaction with the risk-free rate may be outweighed by variability due to variations in the other inputs. The outcomes of DGMs are typically highly sensitive to variations in inputs. Partington and Satchell compared the statistical stability of Option 1 and Option 3b including variations in other inputs but not g, as a single value of g was used by the AER in computing their MRP estimates. They find that Option 3b appears to be more stable, however the differences are not great and the result must be treated as contingent on the stability of g, which cannot be taken as a given.

Having looked at the evidence presented to us we have decided to not pursue option 3b as we continue to have concerns surrounding the DGM. We also note that there is a level of subjectivity on the weight that should be applied to the DGM under this option.

The CRG also raised concerns over the weight given to the HER and the DGM under this option. It stated that:[349]

- Partington and Satchell critique this aspect of the AER's approach. More fundamentally they question the premise of averaging an unconditional estimate of MRP with a conditional estimate of MRP.
- There is a fundamental problem with taking an average of two very different ways of analysing the MRP. The mathematics is easy, but the resulting figure has no conceptual or theoretical foundation; it is more a convenience than an attempt to decide an unbiased estimate.
- The HER approach provides a sensible statistically sound methodology for estimating future expectations on the overall returns on equity and is widely used for this purpose. The DGM approach relies on subjective forecasts (often derived based on short-term recent market events) and with no statistical framework for assessing the probabilities of these events in the future.

The Independent Panel further wanted us to explain how we will deal with the fact that some of the short-term variation that the DGM picks up may reflect variations in market sentiment rather than fundamentals. In our view one way we might partially deal with this risk is to reduce the weight we apply to the DGM.

At this point of time, we are not persuaded that option 3b is superior and we have decided to not adopt it.

If we were to have considered this option, the MRP would have been 5.6% at the start of the Instrument.[350] This is illustrated in Table 7.2.

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[349] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 40.

[350] AER, *Draft Rate of return instrument, Explanatory Statement*, June 2022, pp. 150–151.

Table 7.2 MRP estimates based on option 3b as at December 2022

Mechanical approaches (Option 3b)	10-year term (%)
Mechanical approach using 3-stage DGM	
HER estimate	6.2
DGM estimate (3-stage DGM)	5.0
MRP (equal weight applied to the HER and DGM)	5.6

Note: HER has been calculated as at end December 2022. The 3-stage DGM and the calibrated DGM estimates are based on a two-month average ending December 2022.

7.3.2.3 Surveys

Survey evidence provides an expectation of a forward-looking MRP from market participants. Raw results are rarely produced; however, in published results, modes, means and medians are often included.

In our draft decision we stated that we will not move our HER estimate of the MRP or provide and uplift to the risk-free rate based on the survey results.

In response to our draft decision, NSPs supported AER's decision to not give weight to survey responses in setting the MRP. In the NSPs view, if the survey data were to be relied upon, it is important that the survey responses on the risk-free rate should also be considered.[351]

We also note that in the past CRG highlighted the considerable noise and possible bias surveys contain. However, it noted that surveys may have some value when combined with other approaches.[352]

We recognise that surveys have limitations and are not at a level of reliability to give weight as a direct estimation method of the MRP. However, we consider that they have some value because they inform us of expectations of survey participants and changes in those expectations through change.

We have updated our estimates of the survey result for Australia in section 7.3.3.3.

[351] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 14; APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 8.; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 7.

[352] CRG, *Advice to the Australian Energy Regulator: CRG Response to the AER's December 2021 Information paper*, March 2022, p. 72.

7.3.2.4 Conditioning variables

Conditioning variables (such as implied volatility, dividend yields and credit spreads) are market data indicators that provide information on the potential risk in the market. Their main strength is their ability to detect changing market conditions, which may indicate expectations of risk premium movement.

In our draft decision we stated that we will not move the HER estimate of the MRP based on the conditioning variable results.

In response to our draft decision, NSP's agreed that there is no useful role for conditioning variables and the AER should not move the HER estimate of the MRP based on the observation of conditioning variables.[353]

The CRG also highlighted the considerable noise and possible biases conditioning variables contain. It stated that given these indicators are impacted by short-term spikes, conditioning variables could provide a misleading indicator of a forward-looking MRP for the next decade.[354]

We have updated our estimates of the conditioning variable using data to December 2022, in section 7.3.3.4.

7.3.2.5 The Total market returns approach (TMR or Wright approach)

The total market returns (TMR) approach, also known as the Wright approach, assumes a largely stable return on equity. The approach implies a perfect negative relationship between the risk-free rate and the MRP and is used by several regulators in the United Kingdom, including Ofgem and Ofwat.

In the 2018 Instrument, we did not place any reliance on the TMR approach.[355] We noted that there is no theoretical basis for the TMR approach in Australia, and it is not used by market practitioners.

Since then, we engaged Partington and Satchell to provide expert advice on return on equity models. They found the TMR approach assumptions implausible – for example, where the risk-free rate was above the historical average return (as has been the case) it would lead to a negative market risk premium.[356]

However, we note that CEPA recommended that we consider the use of a TMR approach along with a fixed MRP and hybrid approach.[357]

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[353] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 14; APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 8.

[354] CRG, *Advice to the Australian Energy Regulator: CRG Response to the AER's December 2021 Information paper*, March 2022, p. 72.

[355] AER, *Rate of return instrument, Explanatory Statement*, December 2018, p. 83.

[356] Partington and Satchell, *Report to the AER: Alternative Asset Pricing Models*, June 2020, p. 23.

[357] CEPA, *Relationship between RFR and MRP*, 16 June 2021, p. 44.

In response to our overall rate of return, equity and debt omnibus paper, ENA and QTC submitted that the AER has not properly considered the TMR approach (which assumes a perfect negative relationship between the MRP and the risk-free rate) and should reconsider using it in our 2022 Instrument. In the ENA's and QTC's view, there is at least as much evidence to support the use of the TMR approach as for the historical excess returns approach and that different standards of assessment have been applied to each piece of evidence.[358] The NSPs recommended that we give meaningful weighting to the HER, TMR approach and the calibrated DGM.[359]

In contrast, the CRG recommended that the AER not use the TMR approach, or any modification of this approach, to determine or constrain the estimate of the market risk premium or the overall return on equity.[360] The CRG considered the assumption of a one-for-one inverse relationship between the risk-free rate and market risk premium was not supported in any consistent way by the empirical data and would lead to market risk premium results that did not make sense from either a practical or theoretical perspective.

In our draft decision we evaluated the theoretical basis and empirical evidence of the TMR approach and determined that it should not play a role in our MRP estimation process.[361]

We stated that in our view, the consumption CAPM (CCAPM) does not predict stable expected total return, so it cannot act as a theoretical basis for the Wright approach.

The CCAPM also fails empirical tests. For instance, Campbell and Cochrane stated that:

> Unfortunately, consumption-based pricing models prove disappointing empirically.
>
> Alas, the canonical consumption-based model performs no better, and in many respects worse, than even the simple static Capital Asset Pricing Model (CAPM).
>
> The canonical consumption-based model has failed perhaps the most important test of all, the test of time. Twenty-five years after the development of the consumption-based model, almost all applied work in finance still uses portfolio-based models to correct for risk, to digest anomalies, to produce cost of capital estimates, and so forth.

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[358] ENA, *Rate of Return Instrument Review: Response to AER's Final Omnibus and Information papers*, 11 March 2022, p. 88; QTC, *2022 Rate of Return Instrument: Rate of return information paper and final working papers*, 11 March 2022, p. 2

[359] QTC, *2022 Rate of Return Instrument: Rate of return information paper and final working papers*, 11 March 2022, p. 1; ENA, *Rate of Return Instrument Review: Response to AER's Final Omnibus and Information papers*, 11 March 2022, pp. 88-91.

[360] CRG, *Submission to AER, Return on equity*, 9 October 2020, pp. 8, 37.

[361] AER, *Draft Rate of Return Instrument – Explanatory statement*, June 2022, pp. 156-160.

We also replicated key elements from Sigels chart using Australian data and noted that nominal return on equity appears to move with the nominal return on bonds and the MRP appears relatively stable.

In response to our draft decision, QTC submitted that the AER's assessment of the theoretical basis for the Wright approach was not done in good faith, or in a way that is consistent with good regulatory practice. It also stated that it is too late for the AER to make a proper assessment of the Wright approach, because stakeholders will have no opportunity to respond. Therefore, QTC considered the most appropriate course of action for the AER when making the Final 2022 RoRI is to:[362]

- place no weight on the conclusions of the draft explanatory statement and;
- follow the advice already provided by its consultants and give weight to the HER and Wright approaches alongside the calibrated DGM.

Endeavour energy submitted that there remains merit in having regard to the Wright approach to which the AER is setting an impossibly high evidentiary standard to be considered. In its view, there is no single perfect method for estimating market returns and that the Wright approach is used by other regulators and supported by compelling evidence that there is a negative relationship between the MRP and risk-free rate. [363]

ENA also submitted that the AER appears to apply an impossibly high standard of theory to the Wright approach, and none at all to the HER approach and that empirical evidence supports weight being given to the Wright approach. In support, it stated that there is compelling evidence of a negative relationship between MRP and risk-free rates over the last 30 years, which the AER has concluded is the period of most relevance. In relation to Dr Lally's statistical tests, ENA considered that: [364]

- Those tests do not relate to the 30-year period that the AER has concluded to be most relevant in forming investor expectations. Over the relevant period, the two approaches have similar stability.
- In any event, the stability tests do not support weights of 100% and 0%, respectively; and
- The AER's conclusions in relation to these stability tests are inconsistent with Dr Lally's recommendation that the AER should apply equal weight to the HER and Wright estimates.

In contrast, the CRG recommended that the AER not use the TMR approach, or any modification of this approach, to determine or constrain the estimate of the market risk premium or the overall return on equity.[365] The CRG considered the assumption of a one-for-one inverse relationship between the risk-free rate and market risk premium was not

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[362] QTC, *Draft Rate of Return Instrument Explanatory Statement,* September 2022, pp. 2–3.

[363] Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 7.

[364] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 75.

[365] CRG, *Submission to AER, Return on equity*, 9 October 2020, pp. 8, 37.

supported in any consistent way by the empirical data and would lead to market risk premium results that did not make sense from either a practical or theoretical perspective.[366]

The Independent Panel stated that the TMR approach has been reviewed extensively in the 2018 Rate of return review and the 2018 Independent Panel endorsed the AER's decision not to pursue it. The Independent Panel concluded that no new evidence has been presented since 2018 that favours the fixed TMR approach and agreed with the draft decision not to revisit the fixed TMR approach.[367]

In 2021, as part of the *Rate of return and cashflows in a low interest rate environment draft working paper,* we stated that we would consider the TMR approach of the United Kingdom regulators and the rationale for its findings.[368] This would include considering:

1. The decisions of Ofgem and other regulators where it determined to apply a constant total market returns approach.
2. Whether we consider any relationship between the MRP and the risk-free rate found in the United Kingdom is likely to apply in Australia and could be determined with sufficient validity and stability to warrant Australian regulatory use.
3. The initial 2003 work of Smithers and Company that proposed that the real market cost of capital should be assumed constant on the basis of UK data from long-term historic averages of realised stock returns.
4. The 2013 and 2018 consulting work that concluded that the approach of assuming the total market return is relatively constant that had been adopted by the UK regulators remained appropriate.

We do not agree with QTC that we did not consider the TMR approach in good faith. We have considered the TMR approach extensively in this process. As a result of this consideration, we are not persuaded that the TMR approach should be employed in setting the rate of return. Our consideration of the TMR approach included:

- the approaches adopted by other regulators in the *Final omnibus paper.*[369]
- the relationship between the MRP and risk-free rate in our *2022 Draft Instrument*.[370]
- the consulting work supporting TMR including initial 2003 work of Smithers and Company as part of the *2022 Draft Instrument.*[371]

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366 CRG, *Submission to AER, Return on equity*, 9 October 2020, p. 7.

367 Independent Panel Report*, AER Draft Rate of Return Instrument 2022*, July 2022, p. 32.

368 AER, *Rate of return and cashflows in a low interest rate environment draft working paper,* May 2021, p. 29.

369 AER, *Rate of return final omnibus paper,* pp. 53–55.

370 AER, *Draft Rate of return instrument, Explanatory Statement*, June 2022, pp. 135–139.

371 AER, *Draft Rate of return instrument, Explanatory Statement*, June 2022, pp. 157–159.

In the 2018 Instrument, we did not place any reliance on the TMR approach as our confidence in the robustness of the approach has diminished.[372] We noted that there is no theoretical basis for the TMR approach in Australia, and it is not used by market practitioners. We were also of the view that there was neither a strong theoretical reason, nor strong empirical evidence, to support the assumption of an ongoing and consistent relationship between the risk-free rate and the MRP.

In our view, the evidence put forward by the stakeholders during 2022 Instrument review process has not persuaded us to change this position. The theoretical basis put forward by the stakeholders for the approach does not have a basis and most regulators in Australia have no regard for it. We also note that the question of a relationship between the MRP and the risk-free rate is still open, and it is unlikely that there is a perfect negative correlation between them. Any relationship that may exist is not sufficiently well established to form the basis for regulatory adjustment to the MRP.

Having regard to all material before us, we have determined that the Wright approach should not play a role in determining the MRP point estimate.

7.3.3 Empirical evidence on the MRP

7.3.3.1 Historical excess returns

The range given by arithmetic averages for different sample periods is 6.1% to 6.6%. The most recent, 34-year period produces an estimate of 6.2% and is most likely to reflect current prevailing conditions.

The HER data is relatively volatile over short periods. The estimate from 1988 onwards has varied as follows: 6.3% (end 2020), 6.5% (end 2021), 6.2% (end 2022). By contrast, for the longest reliable period from 1958 onwards the estimate has remained steady at 6.6%.

Geometric averages indicate a range of 4.4% to 5.0%. We place more weight on arithmetic returns however these geometric averages indicate the forward looking MRP value is most likely to be towards the bottom of the range given by the arithmetic averages. The most recent, 34-year period produces an estimate of 4.9%.

Table 7.3 Historical excess returns using a 10-year term as of 31 December 2022

Sampling period	Arithmetic average (%)	Geometric average (%)	Weighted average 10 years (%)
1883 to 2022	6.3	5.0	6.3
1937 to 2022	6.1	4.4	5.9
1958 to 2022	6.6	4.4	6.3
1980 to 2022	6.6	4.6	6.1
1988 to 2022	6.2	4.9	5.9

Note: Calculated using an assumed imputation utilisation value (or theta value) of 0.65
Source: Handley, *An estimate of the historical equity risk premium for the period 1883 to 2011*, April 2012, p.6; AER analysis.

[372] AER, *Rate of return instrument, Explanatory Statement*, December 2018, p. 83.

Table 7.3 also shows that at an investment horizon of 10 years, the arithmetic average range of 6.1% to 6.6% is close to the weighted average range of 5.9% to 6.3%, whereas the geometric average range of 4.4% to 5.0% is well below the other two ranges.

7.3.3.2 Two stage and three stage DGM trend line

The two stage and three stage DGM have been trending downwards over the last 2 years. They are also currently below their long-run average.

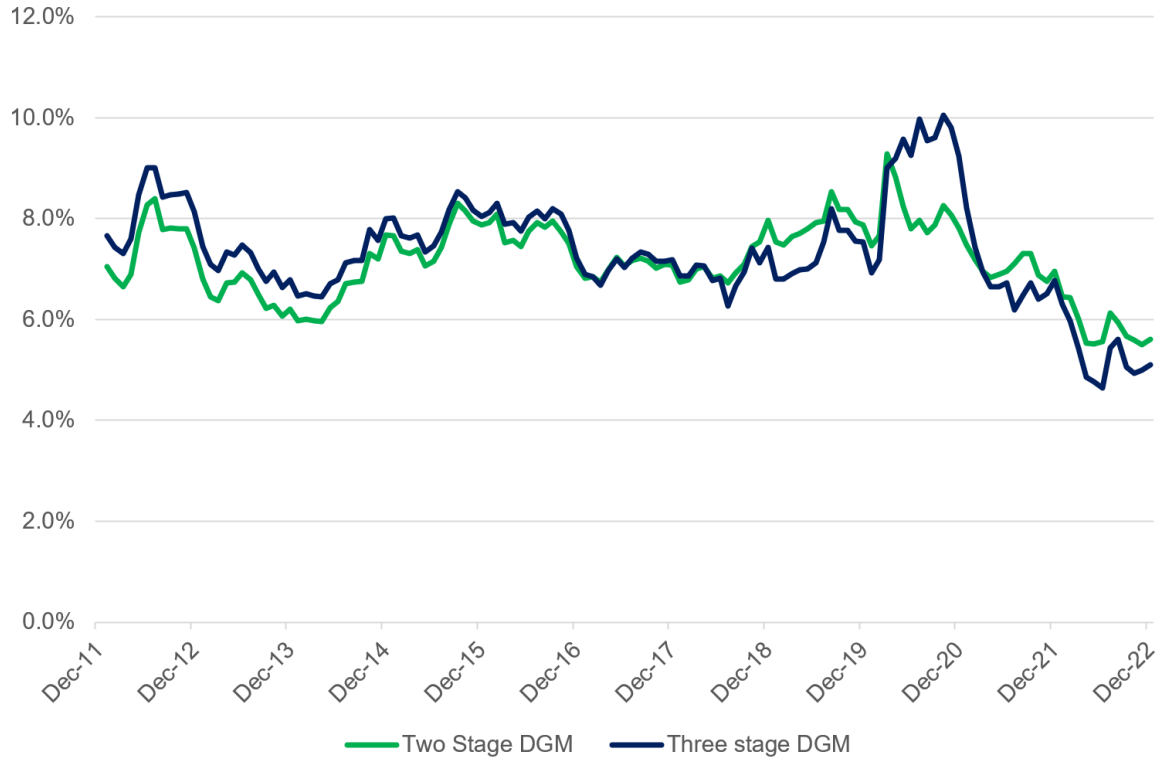
The results for the two stage and three stage DGM for the last 12 month are as follows. As explained in section 7.3.2.2 we have used a growth rate of 3.85%.

Table 7.4 Two stage and three stage DGM results as of December 2022

Averaging period	Two stage model	Three stage model
2-month average to end Dec 2022	5.5	5.0
6 months average to end Dec 2022	5.7	5.2
12 months average to end Dec 2022	5.8	5.3

Note: AER analysis

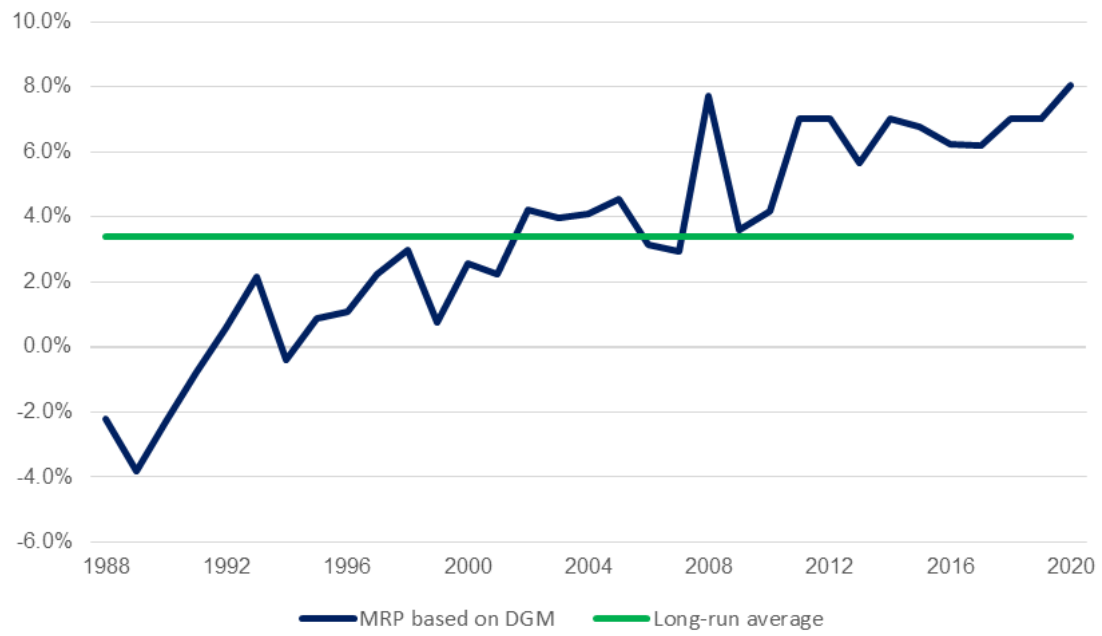
Figure 7.2 MRP trend line from the two stage and three stage DGM



Source: AER analysis.

We have also reviewed estimates from the DGM used by CEPA.[373] We have illustrated their results from 1988 to 2022 in Figure 7.3.

Figure 7.3 MRP trend line from the DGM constructed by CEPA (1988 to 2020)



Source: AER analysis; CEPA analysis of data sourced from RBA and Refinitiv Eikon.

Figure 7.3 shows the calculated MRP was higher than its average of 3.82% (over the period from 1988 to 2020) in 2020.

[373] CEPA, *Relationship between RFR and MRP*, 16 June 2021, p 38.

7.3.3.3 Surveys

In the 2018 Instrument we stated that survey evidence supports a broad MRP value between 4.0% and 7.6%. However, the most common value for mode, mean and median was 6.0%.

Since then, we note that the survey evidence supports a MRP between 5.5% and 7.9%. However, the most common values since the 2018 Instrument has been between a range of 6.0% to 6.3%.

Table 7.5 MRP survey results for Australia, 2012 to 2022

Survey	Number of responses	Mean (%)	Median (%)	Mode (%)
Fernandez et al. (2012)	73	5.9	6.0	N/A
Fernandez et al. (2013)	17	6.8	5.8	N/A
Fernandez et al. (2014)	93	5.9	6.0	N/A
Fernandez et al. (2015)	40	6.0	5.1	N/A
Fernandez et al. (2016)	87	6.0	6.0	N/A
Fernandez et al. (2017)	26	7.3	7.6	N/A
Fernandez et al. (2018)	74	6.6	7.1	N/A
Fernandez et al. (2019)	54	6.5	6.1	N/A
Fernandez et al. (2020)	37	7.9	6.2	N/A
Fernandez et al. (2021)	31	6.4	6.3	N/A
Fernandez et al. (2022)	34	6.3	6.0	N/A
KPMG (2013)	19	N/A	6.0	6.0
KPMG (2015)	~27	N/A	6.0	6.0
KPMG (2017)	45	N/A	6.0	6.0
KPMG (2018)	56	5.5	6.0	6.0
KPMG (2019)	59	5.9	6.0	6.0
Asher and Hickling (2013)	46	4.8	5.0	6.0
Asher and Hickling (2014)	27	4.4	4.6	6.0
Asher and Carruther (2015)	29	4.9	N/A	N/A
Carruther (2016)	24	5.3	N/A	N/A

Source: KPMG, Valuation practices survey 2018, November 2018; Fernandez, Ortiz, Acín, Market Risk Premium and Risk-Free Rate used for 69 countries in 2019: a survey, April 2019; KPMG, Valuation practices survey 2019, February 2020; Fernandez et al, Survey: Market risk premium and risk- free rate used for 81 countries in 2020, March 2020; Fernandez et al, Survey: Market Risk Premium and Risk-Free Rate used for 88 countries in 2021, June 2021; Fernandez et al, Survey: Market Risk Premium and Risk-Free Rate used for 95 countries in 2022, June 2021. All other data is the same as published with the 2018 explanatory statement.

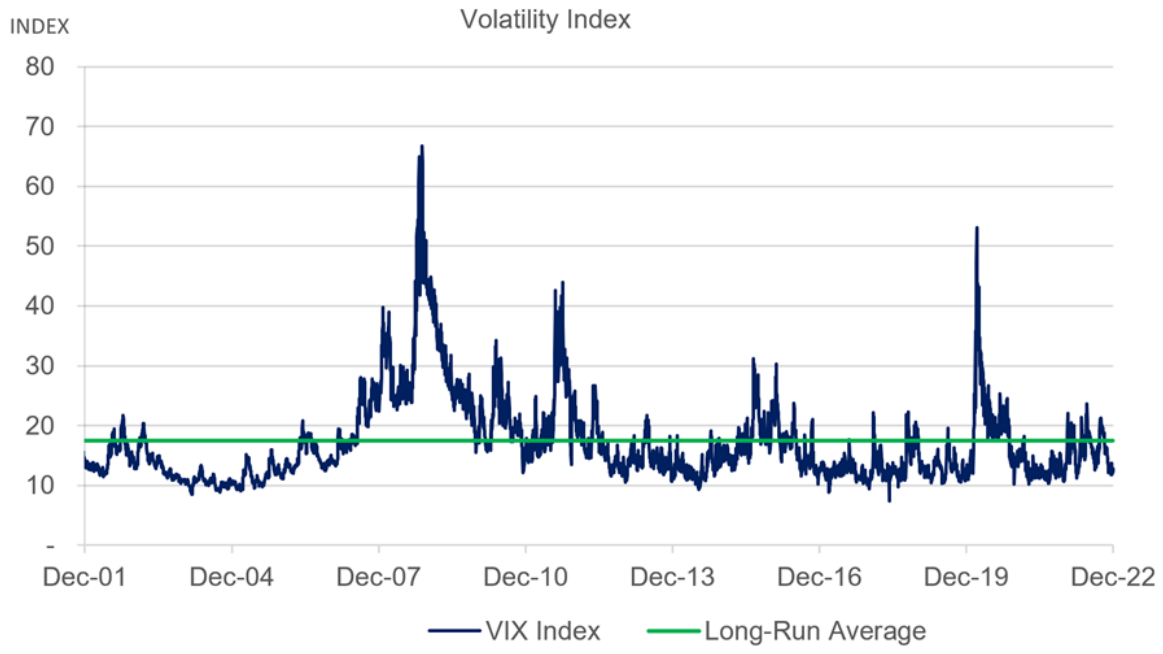
7.3.3.4 Conditioning variables

Volatility Index

The implied volatility is currently below its long-term average and is around the same level it was at the time of publishing the 2018 Instrument. Low volatility is likely to signal lower risk in the market.

We note that there is also a large spike in the volatility index in early 2020 likely due to the COVID-19 pandemic.

Figure 7.4 Implied volatility of ASX 200



Note: Long-run average taken from the start of the data series in 1997.
Source: AER analysis; ASX200 VIX volatility index, sourced via Bloomberg code AS51VIX from 2/01/2008 and code CITJAVIX prior to 2/01/2008.

Dividend Yields

The current dividend yields have not changed significantly since the December 2018 Instrument and are currently slightly higher than the long-term average for the series. The most recent dip in divided yield may be related to pandemic-related lockdowns and associated impacts and the recent increase may reflect the end of these lockdowns and improved consumer and financial market certainty

There is no indication from the data that suggests there is excess risk in the market at the current time.

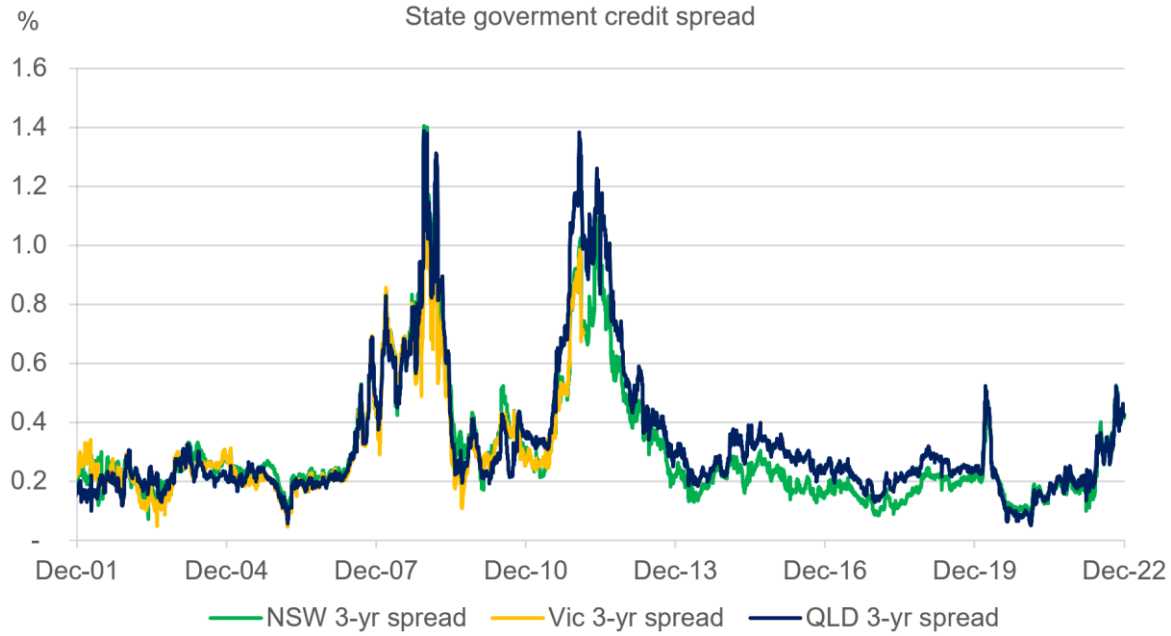
Figure 7.5 Dividend yields from ASX 200

Notes: Long-run average taken from the start of the data series in 2000.
Source: AER analysis; sourced via Bloomberg code AS51.

Credit Spreads

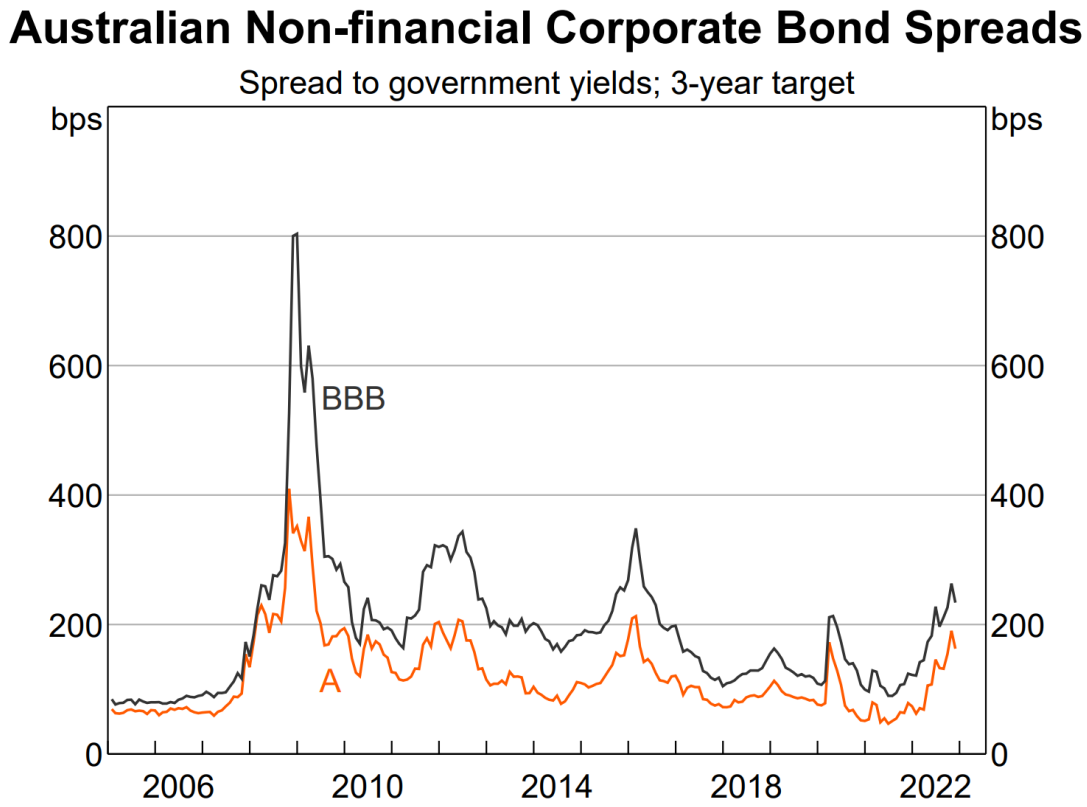
Credit spreads from state government have started to increase in recent months and are much higher than the levels we had when publishing the 2018 Instrument. However, they are still around the pre-GFC level and are significantly lower than they were in 2013. Corporate credit spreads with a term to maturity of 3 years have also started to increase in recent months and are higher that the levels we have when publishing the 2018 Instrument.

Figure 7.6 Spread of State Government Debt



Source: AER analysis; Spreads from Australian government securities to state government bonds with 3 years term to maturity, sourced via Bloomberg interest rate statistics.

Figure 7.7 Spread of corporate debt



Notes: Data updated to 20 December 2022.
Source: RBA, Chart Pack, downloaded January 2023.

7.3.3.5 Our point estimate

As set out above we consider a range of evidence in determining our MRP estimate. We give evidence from the HER the most weight in our estimation of the MRP as we acknowledge that there are difficulties in estimating a conditional MRP. We consider data from HER shows:

- The range given by arithmetic averages for different sample periods is 6.1% to 6.6%. The most recent sample period produces an estimate of 6.2% and is most likely to reflect current prevailing conditions
- Geometric averages indicate a range of 4.2% to 5.0%. We place more weight on arithmetic returns however these geometric averages indicate the forward looking MRP value is most likely to be towards the bottom of the range given by the arithmetic averages. The most recent sample period produces an estimate of 4.6%.
- The arithmetic average range of 6.1% to 6.6% is close to the weighted average range of 5.9% to 6.3%, whereas the geometric average range of 4.4% to 5.0% is well below the other two ranges. We therefore give more weight to the arithmetic average range of 6.1% to 6.6%.

The range of other evidence to which we give less weight to are as follows:

- The two stage and three stage DGM results indicate that the MRP has been trending down over the last two years and are materially below the estimates from 2018, although above the averages from the early 1990s through to the current period.

- The most common value for the survey evidence since the 2018 Instrument has been between a range of 6.0% to 6.3%, noting the surveys also indicate respondents take different approaches to estimating the risk-free rate.
- The implied volatility is currently below its long-term average and is around the same level it was at the time of publishing the 2018 Instrument.
- The current dividend yields have not changed significantly since the December 2018 Instrument.
- Credit spreads from state government debt have started to increase in recent months and are higher than the levels when publishing the 2018 Instrument
- Credit spreads from corporate debt have increased in recent months and are higher than the levels when publishing the 2018 Instrument.

We considered all the information available and arrived at the view that, on balance, the current unconditional MRP is likely to be towards the lower end of our HER range of 6.1% to 6.6%. Given this view, we consider there isn't persuasive evidence to move away from a point estimate of 6.2%, which coincides with the arithmetic average over the period from 1988 to 2022. This is consistent with the methodological approach used to set the MRP in 2018 and for the draft Instrument. We do not consider the evidence for a higher or lower value relative to 6.2% is sufficiently strong to warrant a change.

Considering all the information currently before us, we consider that our MRP of 6.2% is an unbiased estimate.

7.3.4 Assessment criteria

As discussed above, our consideration of issues shows that we are required to exercise our discretion about the evidence and methods that are available for us to make our decision. Where necessary we have applied our assessment criteria to assist us to exercise our judgement. Table 7.6 sets out our assessment criteria and key areas where they have assisted us make our decision.

Table 7.6 Criteria of final decision MRP assessment

Assessment criteria		Final decision
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 are informed by sound empirical analysis and robust data.	• The HER method is based on the view that (on average) past realised returns equal investor expectations and that past expectations are as good an estimate of forward expectations (or required returns). - This method has been extensively studied and the results are well understood. This ensures they are credible and verifiable. The estimates are widely used and have support as the benchmark method for estimating the MRP in Australia. • The DGM method is a theoretically sound estimation method for the MRP. As DGM estimates incorporate prevailing market prices, they may better reflect prevailing market conditions. DGM estimates are also forward-looking as they estimate expectations of future cash flows and equate them with current market prices through the discount rate. • Survey evidence provides an expectation of a forward-looking MRP from market participants • Conditioning variables (such as implied volatility, dividend yields and credit spreads) provide information on the potential risk in the market. Their main strength is their ability to detect changing market conditions, which may indicate expectations of risk premium movement.
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 consider the limitations of that purpose (b) promote simple over complex approaches where appropriate.	• In estimating the HER we use the Brailsford, Handley and Maheswaran (BHM) methodology to estimate the excess returns. This method has been extensively studied and the results are well understood. This ensures they are credible and verifiable. Historical estimates are widely used and have support as the benchmark method for estimating the MRP in Australia. - The HER method is relatively simple to implement, and it tends to give estimates that are sensible and reasonably stable over time. The results are supported by estimates used in broker reports,

Assessment criteria		Final decision
		survey results and by most domestic regulators. • Dividend Growth Models can use analyst forecasts of current dividends combined with estimates of dividend growth and the current price to estimate an implied MRP. - They are also clearly forward-looking as they estimate expectations of future cash flows and equate them with current market prices through the discount rate. • Survey evidence provides an expectation of a forward-looking MRP from market participants • Conditioning variables (such as implied volatility, dividend yields and credit spreads) provide information on the potential risk in the market. Their main strength is their ability to detect changing market conditions, which may indicate expectations of risk premium movement.
3	Implemented in accordance with good practice (a) supported by robust, transparent and replicable analysis that is derived from available credible datasets.	• The simplicity of the HER method enables it to be estimated in a robust, transparent and replicable manner. The method is widely used by academics, market practitioners and other regulators to estimate the market risk premium and the input parameters values can be estimated with tolerable accuracy. • The DGM can be relatively simple, but how simple depends on which variant of the model is implemented. The DGM estimates are also highly sensitive to the assumptions used. It is also necessary that all assumptions used have a sound basis; otherwise, estimated results from DGM analysis may be inaccurate and lead analysts into error • Surveys have limitations and are not at a level of reliability to give weight as a direct estimation method of the MRP. However, we consider that they have some value because they inform us of expectations of survey participants and changes in those expectations through time. • Conditioning variables contain considerable noise and possible biases. Given these indicators are impacted by short-term spikes, conditioning variables could provide a misleading indicator of a forward-looking MRP for the next decade.
4	Where models of the return on equity and debt are used these are	• The HER data is relatively volatile over short periods. The estimate from 1988 onwards has varied as follows: 6.3% (end 2020), 6.5% (end 2021), 6.2%

Assessment criteria		Final decision
	(a) based on quantitative modelling that is sufficiently robust as to not be unduly sensitive to errors in inputs estimation (b) based on quantitative modelling that avoids arbitrary filtering or adjustment of data that does not have a sound rationale.	(end 2022). By contrast, for the longest reliable period from 1958 onwards the estimate has remained steady at 6.6%. - Placing more weight on a longer time period of historical returns will lessen the impact on the average of given years. However, there is a trade-off as we consider more recent data may be more representative of the unconditional MRP going forward. Using post 1988 data is also consistent with the approach used in the 2018 Instrument. • The DGM estimates are highly sensitive to the assumptions used. It is also necessary that all assumptions used have a sound basis; otherwise, estimated results from DGM analysis may be inaccurate and lead analysts into error.
5	Where market data and other information is used, this information is (a) credible and verifiable (b) comparable and timely (c) clearly sourced.	• The HER input parameters are sourced from S&P Dow Jones indices, RBA and the ATO. Therefore, the market data is credible and verifiable. However, we acknowledge the limitation with the data, particularly pre-1958 data. • DGM input parameters are sourced from Bloomberg, RBA, Consensus Economics. However, analysts' forecasts that are used in the DGM have been found to be upwardly biased and therefore may not be credible. • The survey results available to us contains the statistics of a survey about the Risk-Free Rate (RF) and the Market Risk Premium (MRP) sourced from over 80 countries. The conditional variables data has been sourced from Bloomberg.
6	Sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.	• MRP varies through time, and it would be in principle desirable to estimate a conditional (or time specific) MRP. However, there was no agreement among the experts that the conditional MRP can be accurately modelled. Some experts argued it is impossible to measure the conditional MRP precisely and reliably, while others argued that there is convincing empirical evidence of a negative relationship between the MRP and the risk-free rate. • Given that there is no reliable alternative to track conditional MRP changes, and differing views on the relative value of DGM based estimates, we have chosen to place more emphasis on the HER estimates as it is an approach we have used and relied

Assessment criteria		Final decision
		upon in the past to estimate a forward looking unconditional MRP. • Also, deviations from the unconditional MRP are likely to be for relatively short periods and we are setting an MRP that will apply for the durations of AER revenue determinations set under the instrument. • Further, using an unconditional MRP will lead to stable and predictable investment signals through time.
7	The materiality of any proposed change.	The approach we have adopted is consistent with the 2018 Instrument.
8	The longevity or sustainability of new arrangements.	The approach we have adopted promotes regulatory stability.

8 Equity beta

The equity beta is a key parameter within the Sharpe-Lintner CAPM (SL CAPM) that we use to estimate the return on equity. It measures a firm's exposure to systematic risk compared with that of the market. Specifically, the equity beta measures the standardised correlation between the returns on an individual asset or firm with that of the overall market.[374]

Investors are generally able to diversify away non-systematic risk and do not require compensation for business-specific risk.[375] Therefore, the equity beta only compensates investors for bearing systematic risk.[376]

A firm's sensitivity or exposure to systematic risk will depend on its business activities and its level of financial leverage.[377] For firms we regulate, this reflects the risk in providing Australian regulated energy network services.[378]

8.1 Final decision

Our final decision is to maintain a point estimate of 0.6 for the value of equity beta.

We continue our approach to estimating the equity beta parameter from the Draft Instrument, including:

- placing most weight on the longest period estimates, while also being informed by 5-year estimates
- maintaining the existing comparator set of 9 Australian firms, using international energy firms only as a crosscheck and not using domestic infrastructure firms
- setting a single beta for regulated gas and electricity networks
- not making an adjustment for low beta bias
- not using other regulators' decisions on equity beta values to directly inform our estimates.

Because we have decided not to change our approach to the term of equity in this decision, we do not need to consider the need for consequential adjustments to the equity beta.

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[374] R. Brealey, S. Myers, G. Partington and D. Robinson, *Principles of corporate finance*, McGraw–Hill: First Australian edition, 2000, pp.186–188.

[375] G. Pierson, R. Brown, S. Easton and P. Howard, *Business Finance*, 8th Edition, p.214.

[376] Non-systematic risks are considered separately in the cash flows that are discounted by the rate of return, for example, in depreciation.

[377] M. McKenzie and G. Partington, *Report to the AER: Estimation of the equity beta (conceptual and econometric issues) for a gas regulatory process in 2012*, 3 April 2012, p.5.

[378] NER 6.5.2(c), 6A.6.2(c) and NGR 87(3).

The Independent Panel supported our overall approach, including our reasoning and exercise of judgement.[379] Stakeholders had mixed views on our approach, including the comparator set, other regulators' decisions and our point estimate of 0.6.

We have updated our empirical beta estimates to include data up to December 2022. These estimates are largely consistent with that of our previous update in the Draft Instrument.

We maintain our point estimate of 0.6 from the Draft Instrument, primarily because we continue to see stability in the longest period estimates, which we give most weight. The recent 5-year estimates, which we consider to be less relevant to our task, have declined since 2018. We also use international estimates, which we consider to be less relevant than Australian estimates, as a crosscheck. We observe that longer-term international estimates have remained stable since 2018, while the 5-year international estimates have risen significantly since 2018. Therefore, in summary, we see a degree of inconsistency in the information available to us:

- the longest period estimates have remained relatively stable supporting continuation of our current value of 0.6
- short-term domestic data has decreased suggesting our value could be lower
- short-term international data has increased suggesting our value could be higher

Having considered the available data and their strengths and weaknesses, we consider that a case for change has not been established. We do not consider the evidence for a higher or lower value is sufficiently strong and therefore we should continue with a value of 0.6 for equity beta.

8.2 Draft decision

Our draft decision was to apply a point estimate of 0.6 for the value of equity beta. We maintained our overall approach to estimating the equity beta parameter from the 2018 Instrument.

8.3 AER considerations

The Independent Panel considered that the reasoning in the Draft Instrument supported our conclusions, noting that many of the issues were comprehensively considered in the 2018 Instrument and the rationale remains unchanged.[380] The Independent Panel also supported our approach in updating our estimate of beta.[381]

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[379] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.36

[380] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.36.

[381] Ibid., p.37.

The CRG submitted that we had demonstrated bias in proposing a point estimate of 0.6 in our draft decision.[382] The CRG draws from our 2018 Instrument and submits that we took a 'gradual approach' in 2018 to reduce beta from 0.7 to 0.6 as the data clearly supported a lower value than 0.6.[383] Amongst other concerns with our exercise of judgement, the CRG considered that we have now concluded that little has changed since 2018 and therefore we are maintaining our same approach and same point estimate.[384]

Our 2018 draft decision stated:[385]

> 'We considered a point estimate of 0.6 is reasonable because it reflects… our gradual approach to changing parameter values consistent with empirical evidence which gives due consideration for stability and predictability that stakeholders value.'

The CRG referenced the above statement to support its view.

The CRG's submissions are important and multifaceted. We outline our consideration of the key aspects of the submission in the sections that follow. Before turning to these key points, we first want to respond to the CRG's submission about whether we have been taking a gradual approach that has been part of a long-term trend toward a beta estimate that is less than 0.6.

The CRG is correct in pointing to the terminology of a 'gradual approach' in our draft 2018 instrument. The CRG is also correct that if we were departing from a gradual downward trend by maintaining a value of 0.6 then this would be a change of approach where we would need demonstrate the case for change.

However, we also acknowledge that we did not continue the reasoning about a gradual approach in our final decision. The Independent Panel report in 2018 raised a concern about this line of reasoning as follows:[386]

> 'The Explanatory Statement should explain why limiting the change in beta from that selected in the 2013 Guidelines is justified, given that the 2013 beta estimate was materially influenced by the Black model, in which the AER has diminished confidence.'

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[382] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p.21.

[383] Ibid., p.22.

[384] Ibid., p.24.

[385] AER, *Rate of return instrument Explanatory Statement*, December 2018, pp.185-186.

[386] Independent Panel, *Review of the Australian Energy Regulator's Rate of Return Draft Guidelines*, 7 September 2018, p.41.

Following recommendations from the Independent Panel at the time, we clarified that our point estimate was supported by the empirical data and was not limited by a concern for a gradual approach to parameter movements:[387]

> 'We recognise that our draft decision discussed the concept of stability in the context of the equity beta. We agree with the Independent Panel that this discussion was not clear and created the impression we may have been switching methodologies. To be clear, we have not bounded the exercise of judgment in this Instrument. We have not limited movements in parameters by using the 2013 Guidelines as an anchor point. Rather, we reviewed the most robust evidence that is relevant to the task and utilised that evidence according to its merits.'

In our 2022 Draft Instrument, we have exercised our judgment in a similar fashion as described in our 2018 final decision and derived a point estimate based on the evidence according to its merits.

8.3.1 Methodology for estimating beta

Our approach to estimating beta is to use regression analyses of the returns of a set of comparator firms against the return of the overall market. Our comparator set comprises of Australian energy networks, which should have a similar degree of risk as the benchmark Australian regulated energy network business.

Our methodology was developed in Professor Olan Henry's 2009 study,[388] which he subsequently updated in 2014.[389] It was adopted in our 2013 Guideline, 2018 Instrument and subsequent annual updates.

We consider that the most useful empirical estimates:

- use the ordinary least squares (OLS) estimator
- are measured over multiple estimation periods
- use weekly return intervals
- are based on averages of individual firm estimates and fixed weight portfolios (equal weighting and value weighting)
- use the Brealey–Myers formula to de-lever and re-lever raw estimates to a benchmark gearing of 60%
- do not apply a Blume or Vasicek adjustment.

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[387] AER, *Rate of return instrument Explanatory Statement*, December 2018, p.123.

[388] Olan Henry, *Estimating Beta*, April 2009.

[389] Olan Henry, *Estimating Beta*, An Update, April 2014.

We consider that these empirical estimates best meet the criteria for assessing materials for relevance and suitability in informing our decision on the rate of return. That is, the empirical estimates are:

- reflective of economic and finance principles and market information because they are based on available market data and derived from sound, econometric techniques
- fit for purpose, because they are based on firms that most closely meet our definition of a service provider in the provision of Australian regulated energy services
- implemented in accordance with good practice, because they are derived from robust, transparent and replicable regression analysis
- based on quantitative modelling in that they are derived using regression techniques with no arbitrary adjustment to the data
- based on market data that is credible, verifiable, comparable, timely and clearly sourced.

We recognise that our proposed approach may not best satisfy the criteria for sustainability and flexibility for changing market conditions in the future, because 8 of the 9 firms in our comparator set have now been delisted. We aim to further explore ways to use other comparators in future reviews, which we discuss further in section 8.3.4.

For the 2022 Instrument, we consider that our empirical results are likely to contribute to an equity beta estimate, which forms part of a rate of return estimate, that would achieve the regulatory objectives.

8.3.2 Estimation period

Our decision is to continue to give most weight to estimates from the longest estimation period, while also being informed by the most recent 5 years.

This was also our approach from the Draft Instrument, where we considered that the longest period data provides the most reliable estimates, because:[390]

- the equity beta of Australian regulated energy networks is likely to remain relatively stable over the long term due to the monopoly nature of the service it provides as well as the regulatory protection it enjoys
- longer-term estimates provide more statistical observations, which would lead to a more robust and reliable equity beta estimate
- we observe higher volatility in short-term beta estimates and long-term estimates minimise the impact of one-off events, which can temporarily obscure the true underlying systematic risk of a regulated energy network business
- experts and stakeholders broadly agree on the strengths of long-term estimates.

[390] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, p.173.

We are also informed by the 5-year data because it may better reflect current market conditions.

The Independent Panel supported our approach to place the most weight to the longest period estimates.[391]

Stakeholders had mixed views on the issue. The CRG favoured relying solely on the longest period estimates.[392] APA supported our approach but questioned the long-term stability of beta.[393] The Brattle Group, in a report commissioned by the ENA, recommended a shorter estimation period,[394] but the ENA did not reflect this in their main submission.[395]

We continue to consider the longest period estimates to be the most reliable for reasons we have outlined above. Given the support from the Independent Panel, we maintain our existing position of giving most weight to estimates from the longest period, while also giving limited weight to the most recent 5-year data.

We agree with the CRG's assessment that we did not have the same regard for short-term estimates in the 2022 Draft Instrument as we did in the 2018 Instrument.[396] This is because our comparator set has diminished over this time. Our most recent 5-year estimates are based on data from 3 firms: APA, SKI, and AST. The recent delisting of SKI and AST means that 8 of the 9 firms in our comparator set have now been delisted, with only APA remaining. In contrast, the 5-year estimates in 2018 were based on data from 5 firms. As such, we exercise caution when considering the decline in the 5-year domestic estimates.

8.3.2.1 Impact of short-term factors

By giving the most weight to long-term estimates, we minimise the impact of short-term factors that can temporarily obscure the true underlying systematic risk of regulated energy network businesses.

The Independent Panel recommended that we consider and explain:

- the impact of macroeconomic cycles on regulated energy network and the interplay between market conditions and short-term parameter estimates[397]

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[391] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.36.

[392] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, pp.27-28.

[393] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, pp.42-45.

[394] The Brattle Group, *International Rate of Return Methods—Recent Developments*, report for ENA, September 2022, p.iv.

[395] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022.

[396] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, pp.26-28.

[397] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.6.

- the extent to which the recent data used in the analysis of beta have been distorted by the temporary policy responses to the COVID-19 pandemic (extraordinarily low interest rates and unprecedented quantitative easing), which are now being rapidly reversed.[398]
- the means of dealing with unusual circumstances, such as COVID-19 and the war in Ukraine and to be more transparent about the way in which these issues have been taken into account in arriving at the estimates of beta.[399]

The ENA and the APGA also noted that the beta estimates for Spark and AusNet were both materially higher prior to the period affected by COVID-19.[400]

We consider the beta of regulated energy networks to be relatively stable over the long term, due to the monopoly nature of the service it provides as well as the regulatory protection it enjoys. The nature of the price cap or revenue cap regimes under which regulated firms operate means that the cash flow risk of these businesses is relatively stable.

We observe higher volatility in short-term beta estimates, which are constrained by the smaller number of observations. Short-term estimates can be influenced by macroeconomic cycles and interest rate movements, one-off events such as the global financial crisis and the economic impact of events such as COVID-19 and the war in Ukraine. These factors can (temporarily) obscure the longer-term systematic risk of a regulated energy network, whose exposure is mitigated by regulation and the monopoly nature of the service it provides. However, shorter-term macroeconomic events do impact both shorter-term and longer-term systematic risk. Therefore, our view is that these should be included as part of the longer dataset when estimating beta over the longer periods.

Our empirical estimates in Table 8.5 and Figure 8.2 also show that the longest period estimates have been stable since 2018 for both domestic and international estimates. We updated our estimates up to December 2022 to better capture the unwinding of the expansionary monetary policy of the pandemic period.

8.3.3 Impact of the term of return on equity on beta

Our decision is to not adjust the value of beta because we will maintain the current 10-year term of return on equity.

In our draft decision, we considered moving to a 5-year term for return on equity, but that the term of equity should not affect the beta estimate, because they are separate issues.[401]

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[398] Ibid., pp.20-22.

[399] Ibid. p.37.

[400] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p.107; APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p.17.

[401] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, p.177.

Stakeholders raised concerns about the impact of a change to a 5-year term for return on equity on beta.[402] However, given that we have decided to maintain the current 10-year return on equity, these concerns are no longer relevant and no adjustment to beta is required.

8.3.4 Comparator set

Our decision is to be informed by the existing comparator set of 9 Australian energy network firms. These firms are listed in Table 8.1.

Table 8.1 List of our comparator firms

Firm (ASX ticker)	Time/trading period	Sectors
AGL Energy Limited (AGK)	January 1990 – October 2006	Electricity, gas
Alinta (AAN)	October 2000 – August 2007	Gas
APA Group (APA)	June 2000 – present	Gas, minority interest in other energy infrastructure
DUET Group (DUE)	August 2004 – April/May 2017	Electricity, gas
Envestra Ltd. (ENV)	August 1997 – October 2014	Gas
GasNet (GAS)	December 2001 – November 2006	Gas
Hastings Diversified Utilities Fund (HDF)	December 2004 – November 2012	Gas
Spark Infrastructure Group (SKI)	March 2007[403] – November 2021	Electricity, gas
AusNet Services (AST), formerly SP AusNet (SPN)	December 2005 – February 2022	Electricity, gas

Source: AER analysis

Our comparator firms are aggregated into 8 portfolios (labelled P1 to P8), each with different constituent firms and time periods. We use both portfolio estimates (equal-weighted and value-weighted) and averages of individual firm estimates to inform our decision. The portfolios are summarised in Table 8.2.

Table 8.2 List of our comparator portfolios

Portfolio	Firms	Dates
P1	APA, ENV	June 2000 – September 2014
P2	AAN, AGL, APA, ENV, GAS	December 2001 – October 2006
P3	APA, DUE, ENV, HDF, AST	December 2005 – November 2012
P4	APA, DUE, ENV, HDF, SKI, AST	March 2007 – November 2012
P5	APA, DUE, ENV, SKI, AST	March 2007 – September 2014

[402] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, pp.67-68; CEG, *Critique of AER estimate of a 5-year RoE*, report for APGA, September 2022, p.19.

[403] The SKI data is available from December 2005, but the data prior to March 2007 reflects stapled securities traded as instalment receipts—these instalments require further leverage adjustment and makes beta estimation difficult.

P6	APA, DUE, SKI, AST	March 2007 – April 2017
P7	APA, SKI, AST	March 2007 – November 2021
P8	SKI, AST	March 2007 – November 2021

Source: AER analysis

This approach was also used in our draft decision, where we considered that the existing comparator set of domestic firms provides (historically) reliable information on the systematic risk of an efficient Australian regulated energy network business.[404]

The recent delisting of SKI and AST means that 8 of the 9 firms in our comparator set have now been delisted, with only APA remaining. Some stakeholders, especially energy network businesses, suggested that our existing comparator set is outdated and should be expanded to include international energy firms and/or domestic infrastructure firms.[405] The Independent Panel noted that 8 regulated network companies having been acquired by private investors since 2006 shows that the revenue streams offered by regulated network businesses are attractive to investors.[406]

We consider our existing comparator set to be appropriate for the time being. While it may have diminished since the 2018 Instrument, it still includes 3 firms (APA, Spark, AusNet) with at least 4 years of data out of the most recent 5 years. Therefore, we consider our existing comparator set to be sufficiently reflective of contemporary market conditions for the purpose of the 2022 Instrument. The Independent Panel agreed with our choice of comparator set,[407] as did APA.[408]

We recognise the need to develop a revised approach in the future. The Independent Panel recommended that we provide details on the nature of future research that we propose to conduct or commission on the potential use of international comparators as well as other methodologies.[409] To this end, we propose to undertake further analysis to understand the degree to which international energy firms are comparable to domestic firms. We may examine differences in firm structure, regulatory framework, local economy and other factors that may result in difference in systematic risk exposure between domestic and international

[404] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, p.178.

[405] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp.98,102-106; The Brattle Group, *International Rate of Return Methods—Recent Developments*, report for ENA, September 2022, p.iv; APGA, *Draft 2022 Rate of Return Instrument*, September 2022, pp.15-16; NSG, *Response to AER RORI 2022 Draft Decision,* September 2022, p.17; AGIG, *Draft RoRI response*, September 2022, p.2; Ausgrid, *Submission Draft RoRI*, September 2022, p.5; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p.7; Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, September 2022, p.6; TransGrid, *Response to AER draft Rate of Return Instrument*, September 2022, p.5.

[406] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.40.

[407] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.36.

[408] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p.41.

[409] Ibid., p.40,42.

energy firms. This may help us to determine what adjustments we could make to international estimates, so as to make better use of these estimates to inform our beta estimate. We may also consider other sources of information, such as domestic infrastructure firms and other regulators' methodologies.

8.3.4.1 International energy firms

Our decision is to not include international energy firms in our comparator set, but to use them to crosscheck our domestic estimates.

This was also our draft decision, in which we reviewed a range of potential comparators and comparator sets and found significant differences between international energy firms and Australian regulated energy networks, particularly in terms of firm characteristics.[410]

The Independent Panel agreed with our choice of comparator set,[411] as did APA.[412] Similarly, the CRG suggested that we should not include international energy firms.[413]

However, the ENA, the NSG, the APGA and several networks supported including international energy firms.[414] In particular, the ENA noted that other regulators, such as the New Zealand Commerce Commission, the Queensland Competition Authority, the Economic Regulation Authority Western Australia and the Independent Pricing and Regulatory Tribunal, have either adopted or are considering adopting international comparators.[415] The main reasons cited from these regulators can be summarised as:

- the domestic Australian sample has become too small, and a larger sample would allow for beta estimates that are more statistically reliable and that better reflect current market conditions
- international energy firms have broadly similar regulatory arrangements to regulated energy networks in Australia – they all tend to allow for recovery of efficient costs,

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[410] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, pp.181-182.

[411] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.36.

[412] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p.41.

[413] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p.32.

[414] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp.98,102-106; The Brattle Group, *International Rate of Return Methods—Recent Developments*, report for ENA, September 2022, p.iv; APGA, *Draft 2022 Rate of Return Instrument*, September 2022, pp.15-16; NSG, *Response to AER RORI 2022 Draft Decision,* September 2022, p.17; AGIG, *Draft RoRI response*, September 2022, p.2; Ausgrid, *Submission Draft RoRI*, September 2022, p.5; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p.7; Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, September 2022, p.6; TransGrid, *Response to AER draft Rate of Return Instrument*, September 2022, p.5.

[415] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp.103-106.

including a return on capital – and so they are likely to have broadly similar risks as Australian regulated energy networks

- international energy firms also offer a more sustainable approach, because the number of listed Australian energy networks is diminishing.

We noted in the Draft Instrument that there has been a significant divergence in the beta estimates between domestic and international energy firms.[416] Since the 2018 Instrument, we have undertaken annual updates of beta estimates of a comparator set of 56 US firms that was originally compiled by CEG in 2013.[417] We have updated our estimates using data up to December 2022 in section 8.3.8. Figure 8.2 showed that the longest period beta estimates have been relatively stable, while 5-year estimates showed a significant increase since 2020. This trend contrasts with the trend in our domestic comparator set in Table 8.5, which shows a notable decrease in the 5-year beta estimates since 2020. The divergence in beta estimates between domestic and international energy firms suggests a potential difference in systematic risk exposure and calls into question the degree of comparability between the 2 samples.

We reviewed comparator sets of international energy firms used by other regulators and reached similar conclusions. We note that there is significant overlap between these and our own annual update sample. The comparator sets we reviewed include:

- New Zealand Commerce Commission's (NZCC) 2016 comparator set[418]
- Economic Regulation Authority Western Australia's (ERAWA) 2022 comparator set.[419]

We also noted in the Draft Instrument that a key challenge to adopting international energy firms is that most (if not all) of them have significant non-energy-related operations (such as telecommunications, water, construction and real estate), with most firms being vertically integrated with energy generation and/or retail activities.[420] We found this to be true for our own comparator set of 56 US firms, NZCC's 2016 comparator set[421] and ERAWA's comparator set.[422]

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[416] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, p.181.

[417] CEG, *Information on equity beta from US companies*, June 2013.

[418] NZCC, *Input methodologies review decisions, Topic paper 4: Cost of capital issues*, December 2016, pp.221-228.

[419] ERA, *Explanatory statement for the 2022 final gas rate of return instrument*, 16 December 2022, pp.237-238.

[420] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, pp.181-182.

[421] NZCC, *Input methodologies review decisions, Topic paper 4: Cost of capital issues*, December 2016, pp.221-228.

[422] ERA, *Explanatory statement for the 2022 final gas rate of return instrument*, 16 December 2022, pp.237-238.

We considered ways in which comparable firms may be systematically identified and we noted TDB Advisory's previous analysis to refine NZCC's comparator set in 2016.[423] It concluded that only 8 of the 74 firms in NZCC's comparator set can be considered 'pure play' firms,[424] including 3 Australian firms that are already in our domestic comparator set. We noted that, of the 5 non-Australian 'pure play' firms, 3 (Spire, Northwest Natural Gas and Unitil) still appear to be vertically integrated with energy retail operations.

Stakeholders' submissions did not address the obstacles in adopting international energy firms.

8.3.4.2 Domestic infrastructure firms

Our decision is to not use domestic infrastructure firms in our equity beta comparator set. This was also our draft decision, in which we found significant differences between non-energy infrastructure firms and regulated energy networks. These differences are difficult to quantify or adjust for.[425]

While the Independent Panel agreed with our choice of comparator set,[426] it also suggested that we consider the possibility of using domestic infrastructure companies.[427] The ENA also supported considering domestic infrastructure firms.[428] In contrast, the CRG suggested that we should not include infrastructure firms in our comparator set.[429]

We discussed this issue in our Draft Instrument. Non-energy infrastructure firms such as Transurban and Atlas Arteria do not provide an essential service and are likely to be exposed to higher systematic risks relative to regulated energy networks.[430] We provided the example of the COVID-19 pandemic, which led to lockdown periods across Australia that placed severe restrictions on travel but had relatively minor impact on energy consumption (and regulated network revenues).[431] We also noted the significantly higher beta estimates of domestic infrastructure firms (0.9 to 1.5 or above) relative to that of our existing comparator set.[432] Furthermore, there was a lack of suitable methodology to adjust for differences between infrastructure firms and regulated energy networks.[433]

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[423] TDB Advisory, *Submission to the Commerce Commission on the Input Methodologies Review Draft Decisions: Comparative Company Analysis*, August 2016.

[424] Ibid., p.44.

[425] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, pp.182-184.

[426] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.36.

[427] Ibid., p.40.

[428] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p.106.

[429] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p.32.

[430] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, p.183.

[431] Ibid.

[432] Ibid.

[433] Ibid. p.184.

We maintain the view that the difference in risk exposures between non-energy infrastructure firms and regulated energy networks, and a lack of methodology to adjust for this difference, provides sufficient justification to not include domestic infrastructure firms in our comparator set.

8.3.4.3 Delisted firms

Our decision is to continue to include delisted firms in our comparator set. This was also our draft decision, where we considered that these firms remain relevant in informing the systematic risk and the beta estimate of regulated energy networks.[434] We noted that the experts at the concurrent evidence session mostly agreed that beta is likely to be stable over time and that long-run historical data would provide useful information and enable more accurate and precise beta estimates.[435] Economic Insights suggested that this is due to the long-term nature of the regulatory framework under which the regulated energy firms operate and their strong natural monopoly characteristics.[436]

The Independent Panel agreed with our view to maintain our existing comparator set but noted that the relevance of the historic data will decline over time.[437]

The CRG suggested that we should give less weight to firms that have been delisted for a long time.[438] The ENA and other stakeholders also considered our existing comparator set to be outdated.[439]

We maintain our view that delisted firms continue to offer some value in informing our decision, for reasons we outlined in the draft decision, and as supported by experts at the concurrent evidence session as well as Economic Insights. Given that beta is likely to be stable over the long term, historical data of the delisted firms can improve the statistical reliability of beta estimates by providing more observations and so remain relevant in informing our beta estimate.

8.3.5 Setting a single beta for regulated gas and electricity businesses

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[434] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, pp.184-185.

[435] AER, *Concurrent evidence session 1, Proofed transcript*, February 2022, pp.40-45, 49, 72-74.

[436] Economic Insights, *Methodological issues in estimating the equity beta for Australian network energy businesses*, June 2021, p.vi.

[437] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.38.

[438] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p.23,31.

[439] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p.99; The Brattle Group, *International Rate of Return Methods—Recent Developments*, report for ENA, September 2022, p.iv; NSG, *Response to AER RORI 2022 Draft Decision,* September 2022, p.17; Ausgrid, *Submission Draft RoRI*, September 2022, p.5; TransGrid, *Response to AER draft Rate of Return Instrument*, September 2022, p.5.

Our decision is to continue to set a single beta for the regulated gas and electricity firms.

In our draft decision, we considered that they are likely to face similar systematic risks, given that they share similar characteristics as natural monopolies and operate under similar regulatory frameworks.[440] We also considered that, while there may be a potential risk of asset stranding for gas networks, we did not find evidence that would suggest that such risk is primarily systematic in Australia.[441] We decided not to adjust the equity beta to compensate for potential stranding risk and considered it more appropriate to address this issue under the broader regulatory framework, such as through depreciation policy.[442]

The Independent Panel agreed with our approach to set a single beta for electricity and gas companies.[443]

The CRG agreed with our view of not adjusting beta to account for stranding risk.[444] APA considered that beta for gas pipeline businesses is rising, partly due to carbon transition risks, but this may not be reflected in the current data and should be an issue for future consideration.[445] No stakeholder explicitly supported a change in our current approach.

Therefore, we continue to adopt a single rate for gas and electricity networks. We maintain the view that asset stranding risks faced by gas networks should be addressed through the broader regulatory framework (for example, accelerated depreciation).

8.3.6 Low beta bias

The low beta bias is an observation that ex-post returns from low beta stocks tend to outperform their expected returns implied by the SL CAPM.

Our decision is to maintain our approach of not adjusting the equity beta or the rate of return for low beta bias.

This was also our draft decision, where we reaffirmed the reasons that we gave previously:[446]

- the SL CAPM remains the standard and most widely used model in practice
- investors and market practitioners do not appear to consider low beta bias on an ex-ante basis

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[440] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, p.185.

[441] Ibid.

[442] Ibid.

[443] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.36,38.

[444] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p.32.

[445] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, pp.42-45.

[446] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, p.188.

- observations of higher actual returns than the SL CAPM estimates for low beta stocks do not necessarily imply low beta bias or that the bias should warrant increasing the allowed rate of return – a range of reasons can explain these observations and it is not clear investors expect a higher return from low beta stocks.

The Independent Panel agreed with our approach of not adjusting for low beta bias.[447] The CRG also agreed with this view.[448] The ENA maintained its earlier view that there is empirical evidence of low beta bias.[449]

We considered this issue in detail in our 2018 Instrument, where we concluded that low beta bias is a matter of ongoing academic debate and there are a range of issues with ex-post empirical tests for low beta bias.[450] As such, we disagree with the ENA's view that low beta bias is supported by well-accepted evidence. Therefore, our decision is to maintain our approach to not adjust for low beta bias.

8.3.7 Other regulators' decisions

Our decision is to not use other regulators' beta values to directly inform our own estimates. This was also our approach from the draft decision.[451]

The Independent Panel supported the use of a wide range of inputs, including practices of other regulators.[452] The ENA and several network businesses suggested that other regulators generally set beta allowances that are higher than our current estimate.[453] Specifically, the Economic Regulation Authority Western Australia (ERAWA) has adopted a beta value of 0.79 (adjusted for gearing differences) and several international regulators have adopted beta values of 0.8 or higher.[454]

The ERAWA uses an estimation period of 5 years and includes international energy firms in its comparator set.[455] The Brattle Group, in a report commissioned by the ENA, similarly

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[447] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.36.

[448] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p.32.

[449] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p.109.

[450] AER, *Rate of return Instrument, Explanatory Statement*, December 2018, pp.211-212.

[451] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, p.189.

[452] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.41.

[453] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp.99-106; AGIG, *Draft RoRI response*, September 2022, p.2; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p.7; TransGrid, *Response to AER draft Rate of Return Instrument*, September 2022, p.5.

[454] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, pp.100-101.

[455] ERA, *Explanatory statement for the 2022 final gas rate of return instrument*, 16 December 2022, pp.172,179-182.

found that international regulators generally use a shorter estimation period and/or include international firms in their comparator set.[456] This is consistent with the findings of our earlier working paper 'International regulatory approach to rate of return'.[457]

As recommended by the Independent Panel, we gave due consideration to other regulators' approaches to estimating beta, including on the issues of estimation period and comparator set, and decided to not adopt them at this time. Given the differences between our approach and that of other regulators, our resulting beta estimate is also not directly comparable with that of other regulators.

8.3.8 Range and point estimate

We have updated our estimates using data up to December 2022. Table 8.3 provides a comparison of the key ranges between the 2022 estimates and estimates from the 2018 Instrument. The longest period estimates have remained relatively stable, while the 5-year estimates have decreased significantly. Both the 2018 and 2022 estimates clustered around 0.5 to 0.6.

Table 8.3 Comparison of key ranges of re-levered weekly equity beta estimates (OLS, data to September 2018/December 2022)

Australian comparator set estimates	2018 Instrument	2022 Instrument
All portfolios (all estimation periods)	0.42 – 0.88	0.35 – 0.69
Largest cluster of all estimates	0.5 – 0.6	0.5 – 0.6
All portfolios (longest period)	0.42 – 0.67	0.40 – 0.68
All portfolios (recent 5 years)	0.49 – 0.88	0.35 – 0.57
Portfolio estimates for SKI and AST (longest period)	0.42 – 0.43	0.40 – 0.41
Portfolio estimates for SKI and AST (recent 5 years)	0.70 – 0.72	0.35 – 0.36
Individual firm average (longest period and 5 years)	0.57 – 0.72	0.51 – 0.56

Source: Bloomberg, AER analysis

Table 8.4 provides the detailed empirical portfolio estimates (equal-weighted and value-weighted) as well as averages of firm estimates.

The Independent Panel recommended that we show the beta estimates for APA separately.[458] We have done this in Table 8.4 but caution that a significant proportion of APA's revenue is unregulated. Therefore, it is likely to have higher systematic risk exposure than the benchmark regulated energy network. Nevertheless, it is largely a network business and the risks it faces are likely to be closer to those of a regulated network business than other infrastructure businesses. This justifies the attention that we give APA.

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[456] The Brattle Group, *International Rate of Return Methods—Recent Developments*, report for ENA, September 2022, p.iv.

[457] AER, *International regulatory approach to rate of return*, August 2020, pp.9-12.

[458] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.39,42.

Table 8.4 Re-levered weekly beta estimates (OLS, data to December 2022)

Portfolios	Average of firm estimates	P1	P2	P3	P4	P5	P6	P7	P8	APA
Firms	All firms	APA, ENV	AAN, AGL, APA, ENV, GAS	APA, DUE, ENV, HDF, AST	APA, DUE, ENV, HDF, SKI, AST	APA, DUE, ENV, SKI, AST	APA, DUE, SKI, AST	APA, SKI, AST	SKI, AST	APA
Start	Various	23 Jun 2000	28 Dec 2001	23 Dec 2005	09 Mar 2007	09 Mar 2007	09 Mar 2007	09 Mar 2007	09 Mar 2007	23 Jun 2000
End	Various	12 Sep 2014	06 Oct 2006	23 Nov 2012	23 Nov 2012	12 Sep 2014	28 Apr 2017	26 Nov 2021	26 Nov 2021	30 Dec 2022
Equal weighted										
Longest available period	0.56	0.49	0.50	0.54	0.52	0.43	0.46	0.52	0.41	0.69
Post tech boom & excl. GFC	0.59	0.53	0.51	0.59	0.58	0.50	0.54	0.58	0.47	0.75
Recent 5 years	0.51	n/a	n/a	n/a	n/a	n/a	n/a	0.51	0.36	0.82
Value weighted										
Longest available period	n/a	0.53	0.68	0.47	0.47	0.44	0.49	0.56	0.40	n/a
Post tech boom & excl. GFC	n/a	0.58	0.69	0.56	0.55	0.53	0.58	0.63	0.48	n/a
Recent 5 years	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.57	0.35	n/a

Note: Please refer to Table 8.1 for more details on our comparator firms.
Source: Bloomberg; AER analysis

Table 8.5 summarises the historical ranges of beta estimates and Table 8.6 shows the historical average firm beta estimates. These historical estimates show that the 5-year estimates have declined and are now below the longest period estimates. This is apparent in the decline in the 5-year estimates for P7 and P8 from 2020 onwards.

Table 8.5 Historical ranges of re-levered weekly beta estimates (OLS, data to September 2018/August 2019/August 2020/August 2021/February 2022/December 2022)[459]

Equal and value weighted portfolio estimates	Whole comparator set [P1 to P8]	Still listed and recently delisted firms (APA, SKI, AST) [P7]	Recently delisted majority regulated firms (SKI, AST) [P8]
Longest period			
2018 review	0.42 – 0.67	0.52 – 0.55	0.42 – 0.43
2019 update	0.42 – 0.68	0.53 – 0.56	0.42 – 0.43

[459] The results for the 2020 update have been revised since its original publication due to an anomaly in SKI data.

Equal and value weighted portfolio estimates	Whole comparator set [P1 to P8]	Still listed and recently delisted firms (APA, SKI, AST) [P7]	Recently delisted majority regulated firms (SKI, AST) [P8]
2020 update	0.40 – 0.68	0.51 – 0.54	0.40 – 0.41
2021 update	0.40 – 0.68	0.51 – 0.55	0.40 – 0.41
2022 Draft Instrument	0.40 – 0.68	0.51 – 0.55	0.40 – 0.41
2022 Final Instrument	0.40 – 0.68	0.52 – 0.56	0.40 – 0.41
Post technology boom and excluding GFC			
2018 review	0.50 – 0.67	0.64 – 0.67	0.52 – 0.53
2019 update	0.50 – 0.69	0.64 – 0.68	0.54 – 0.55
2020 update	0.47 – 0.69	0.60 – 0.62	0.47 – 0.47
2021 update	0.47 – 0.69	0.59 – 0.62	0.47 – 0.47
2022 Draft Instrument	0.47 – 0.69	0.57 – 0.62	0.47 – 0.47
2022 Final Instrument	0.47 – 0.69	0.58 – 0.63	0.47 – 0.48
Recent 5 years			
2018 review	0.49 – 0.88	0.81 – 0.88	0.70 – 0.72
2019 update	0.69 – 0.89	0.83 – 0.89	0.73 – 0.74
2020 update	0.44 – 0.69	0.59 – 0.68	0.44 – 0.44
2021 update	0.37 – 0.70	0.53 – 0.59	0.37 – 0.38
2022 Draft Instrument	0.36 – 0.59[460]	0.53 – 0.59	0.36 – 0.38
2022 Final Instrument	0.35 – 0.57	0.51 – 0.57	0.35 – 0.36

Note: Please refer to Table 8.1 for more details on our comparator firms. Results for the 2022 Draft Instrument has been revised since its original publication due to an anomaly in the gearing data.
Source: Bloomberg, AER analysis

Table 8.6 Historical re-levered weekly average firm beta estimates (OLS, data to June 2013/September 2018/August 2019/August 2020/August 2021/February 2022/December 2022)

Period	Henry (April 2014)	Sep 2018	Aug 2019	Aug 2020	Aug 2021	Feb 2022	Dec 2022
Longest period	0.52	0.57	0.56	0.56	0.56	0.56	0.56
Post tech boom and excluding GFC	0.56	0.61	0.61	0.59	0.59	0.59	0.59
Recent 5 years	0.46	0.72	0.72	0.56	0.59	0.53[461]	0.51

Note: Results for the 2020 update have been revised since its original publication due to an anomaly in SKI data.
Source: Bloomberg; AER analysis; Olan Henry, Estimating beta: An update, April 2014.

[460] The recent 5 years estimates show a substantial decrease from Aug 2021 to Feb 2022 because P6 was removed from the category.

[461] The recent 5 years estimates show a substantial decrease from Aug 2021 to Feb 2022 because DUE was removed from the category.

Consistent with the Independent Panel's recommendations, we have shown the historical beta estimates for APA in Table 8.7.

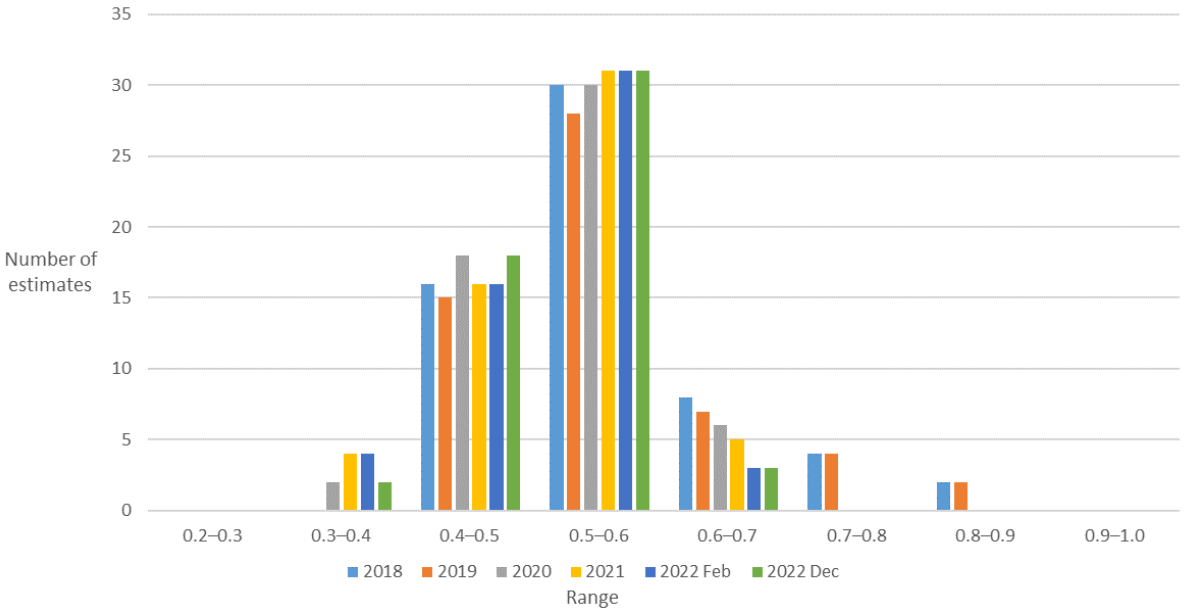
Table 8.7 Historical re-levered weekly beta estimates for APA (OLS, data to June 2013/September 2018/August 2019/August 2020/August 2021/February 2022/December 2022)

Period	Henry (April 2014)	Sep 2018	Aug 2019	Aug 2020	Aug 2021	Feb 2022	Dec 2022
Longest period	0.59	0.68	0.69	0.70	0.69	0.69	0.69
Post tech boom and excluding GFC	0.64	0.75	0.75	0.77	0.75	0.75	0.75
Recent 5 years	0.54	1.06	1.06	0.93	0.87	0.86	0.82

Source: Bloomberg; AER analysis; Olan Henry, Estimating beta: An update, April 2014.

Figure 8.1 shows the distribution of beta estimates. Consistent with the previous years, the most recent estimates continue to cluster around 0.5 to 0.6.

Figure 8.1 Distribution of re-levered weekly beta by range (OLS, data to September 2018/August 2019/August 2020/August 2021/February 2022/December 2022)



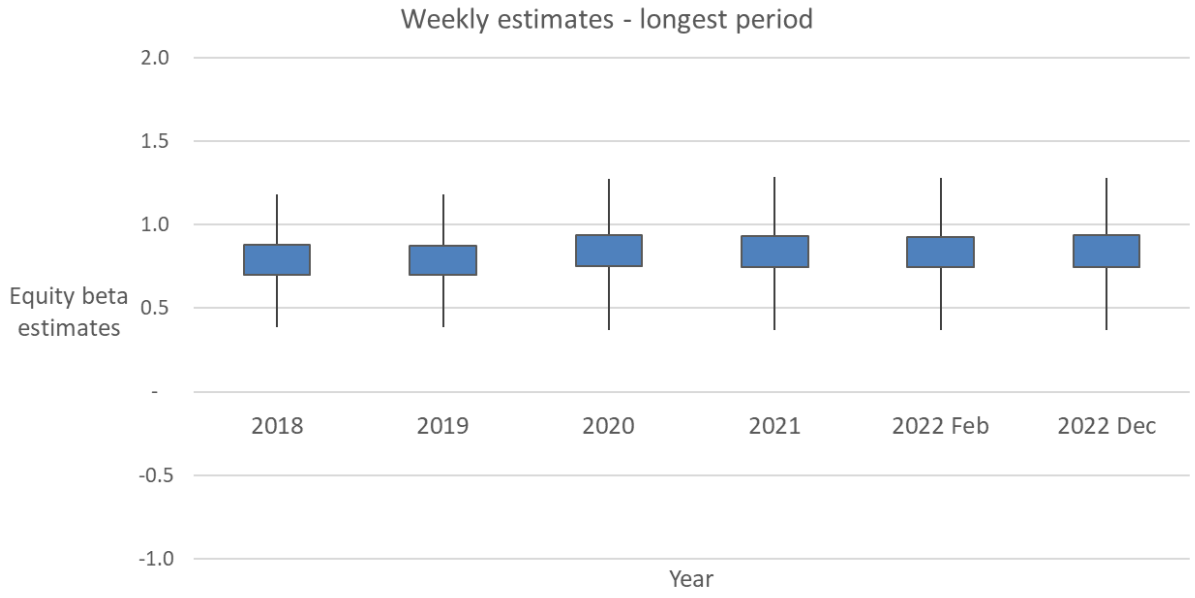
Note: There are fewer total estimates from 2019 onwards because the 'recent 5 years' category no longer includes portfolios ending in 2014 (P1 and P5). Similarly, the 'recent 5 years' category in 2022 excluded P6, which ended in 2017. We have updated the chart to include P8. Results for 2022 February has been revised since its original publication due to an anomaly in the gearing data.
Source: Bloomberg; AER analysis

We also reviewed estimates from a sample of 56 international energy firms that we have analysed in the 2018 Instrument, subsequent annual updates and the 2022 Draft Instrument. The results in Figure 8.2 are largely consistent with our earlier results from the Draft Instrument. The longest period international estimates have been relatively stable at around 0.7 to 0.9, but the 5-year international estimates have increased by more than 0.5 since 2020. This contrasts with the significant decrease in our domestic estimates since 2020 (shown in Table 8.5).

In our Draft Instrument we considered whether this divergence in trends between the domestic and international data is a statistical anomaly or a reflection of a difference in risk profile between domestic and international energy firms.[462] Our network performance monitoring showed that networks maintained stable revenue profiles during the pandemic period. Domestic networks were largely insulated from the instability observed across the broader economy, which may explain the decrease in their equity beta estimates.

The Independent Panel agreed that the regulatory regime has been stable and that this lends support to our conclusion.[463] It also supported our view that, while there has been changes in the energy landscape, such as a shift towards increasing reliance on renewables, these changes are unlikely to have had a meaningful impact on the value of beta.[464]

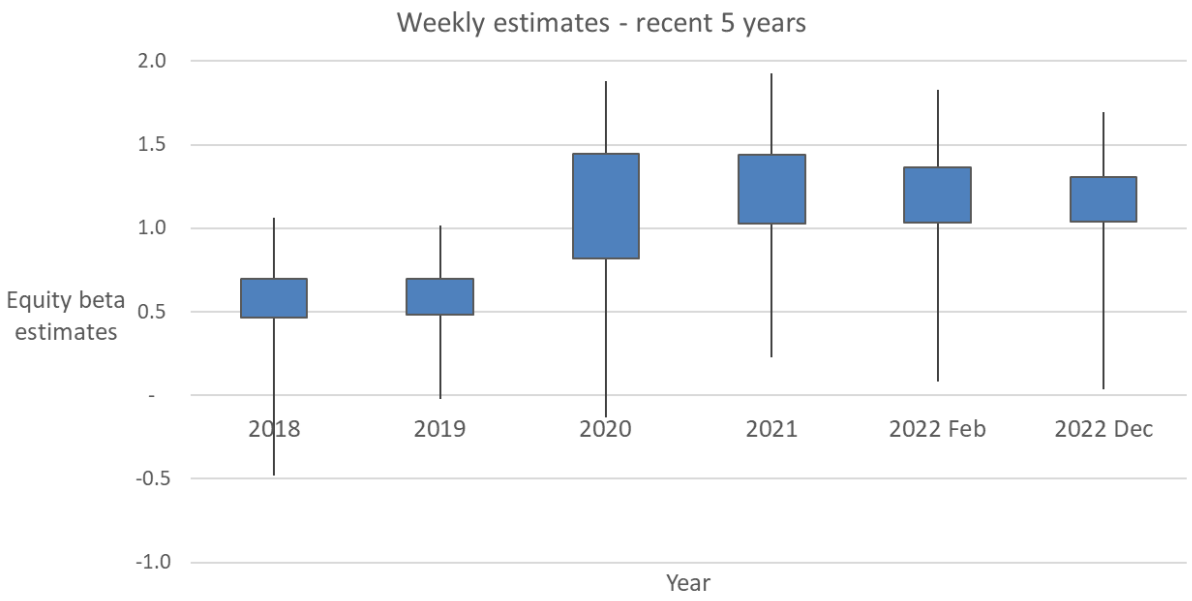
Figure 8.2 Summary of re-levered weekly international estimates (OLS, data to December 2022)



[462] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, p.171.

[463] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.38.

[464] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.38.



Notes: Figure shows the quartile distribution of estimates by charting the minimum, first quartile, third quartile and maximum of the relevant estimates. The top of the top line indicates the maximum and bottom of the bottom line indicate the minimum. The bottom of the rectangle represents the first quartile. The top of the rectangle represents the third quartile.
Source: AER analysis; Bloomberg

8.3.8.1 Our point estimate

Our decision is to maintain a point estimate of 0.6 from the Draft Instrument and the 2018 Instrument.

The most relevant information is the Australian data for the longest available period. These estimates tend to be in the range from 0.5 to 0.6 and have been largely stable during the period since 2018.

We have also considered Australian shorter-term data, for example estimates for the most recent 5 years. These estimates are lower now than in 2018. However, we think shorter-term estimates are less relevant for our task than longer-term estimates because they are likely to be influenced by short-term economic developments that are subject to change.

International data are less relevant than Australian data because the risks faced by the available international comparators differ from those faced by an Australian regulated network business. However, we have considered longer-term international estimates of beta for energy businesses and these estimates have remained largely unchanged since 2018. Unlike the Australian estimates, the shorter-term international estimates of equity beta have increased over the period since 2018.

In 2018 we determined a value of 0.6 for equity beta. Having considered the available data and their strengths and weaknesses, we consider that a case for change has not been established and that we should continue with a value of 0.6 for equity beta.

8.3.9 Assessment criteria

Our consideration of issues shows that we are required to exercise our discretion about the evidence and methods that are available for us to make our decision. In this regard, where

necessary we have applied our assessment criteria to assist us exercise our judgement. Table 8.8 sets out our assessment criteria and key areas where they have assisted us to make our decision.

Table 8.8 Criteria of final decision equity beta assessment

Assessment criteria		Final decision
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 are informed by sound empirical analysis and robust data.	Our decision is informed by empirical estimates based on up-to-date market information and reflect well-accepted economic and finance principles.
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 consider the limitations of that purpose (b) promote simple over complex approaches where appropriate.	Our decision is based on well-established methodology of estimating beta in accordance with the CAPM. We used regression analysis of market data of a comparator set of listed Australian energy networks.
3	Implemented in accordance with good practice: (a) supported by robust, transparent and replicable analysis that is derived from available credible datasets.	Our approach to estimating beta is based on good practices that are supported by relevant academic literature. We have clearly described our approach so that it is transparent and replicable. We use data sourced from Bloomberg, a reputable provider, in conjunction with company annual reports.
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 inputs estimation (b) based on quantitative modelling that avoids arbitrary filtering or adjustment of data and that does not have a sound rationale.	Our approach to regression modelling is statistically robust because it relies on a large number of observations based on a comparator set of firms over multiple estimation periods. We have provided rationales for when we gave more (or less) weight to some evidence relative to others.
5	Where market data and other information is used, this information is: (a) credible and verifiable (b) comparable and timely (c) clearly sourced.	We used up-to-date market data sourced from Bloomberg, a reputable provider, as well as company annual reports, which are publicly available. We have included footnote references for our sources of information.
6	Sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.	Our existing approach sufficiently reflects existing market conditions, but may not be flexible to changes, because only one of the 9 firms in our comparator set is still listed. We aim to further explore ways to use international energy firms, which may offer more up-to-date market information, in future reviews.
7	The materiality of any proposed change.	We largely maintained the same approach to estimating beta as that of the 2018 Instrument. We also maintained the point estimate of 0.6.
8	The longevity or sustainability of new arrangements.	Our existing approach may not be sustainable, because only one of the 9 firms in our comparator set is still listed. We aim to explore more sustainable solutions by analysing international energy firms, which offer a larger sample of still-listed firms, in future reviews.

9 Return on debt approach

In this section we discuss our overall approach and the implementation of our approach to return on debt.

In our 2018 Instrument, we calculated the return on debt through a simple trailing average approach. We used third-party yield curves with a 10-year benchmark term of debt and benchmark credit rating of BBB+. We adopted a 10-year transition between the previous 'on-the-day' approach and the 10-year trailing average to satisfy our NPV=0 principle. Each yield estimate was calculated through an averaging period between 10 days and one year in length, with each NSP nominating their respective averaging period.

We focused our 2022 Instrument review on our return on debt approach – whether to adjust our simple trailing average approach, and whether to use the Energy Infrastructure Credit Spread Index (EICSI) to adjust return on debt. We considered implementing a weighted trailing average approach to account for expected large projects to be undertaken in the next few years in line with NSPs' transition towards renewable energy, which will require large capital investments. We also reviewed our benchmark term of debt, benchmark credit rating, use of third-party yield curves and averaging periods.

9.1 Final decision

9.1.1 Benchmark term

We need to specify the benchmark debt term for a debt portfolio to estimate the allowed return on debt for an NSP. It also establishes the period over which the trailing average is calculated and determines the period of the transition to the trailing average. Our final decision is to use a benchmark return on debt term of 10 years. This is a continuation of our draft decision.

9.1.2 Use of industry data

We developed the EICSI in 2018 with assistance from Chairmont using actual debt issuance data obtained from regulated NSPs. It reports a rolling 12-month historical average of credit spreads across all new debt instruments issued by privately owned NSPs.[465] The EICSI provides an indication of the cost of NSP-issued debt to compare with our benchmark estimate of the cost of debt.

In the 2018 Instrument, we used EICSI as a 'sense check' on our benchmark cost of debt approach. We considered 3 broad alternative options for using the EICSI in a more formulaic way to adjust our benchmark to better align the return on debt allowance with the expected actual debt costs of the NSPs.

Our final decision is to maintain our current approach of using the EICSI as a 'sense check' on our benchmark return on debt. This is a continuation of our draft decision. We used EICSI

[465] AER, *Discussion paper, Estimating the allowed return on debt*, May 2018, pp. 27–35.

as a sense check to inform our benchmark term, benchmark credit rating and choice of third-party data providers.

9.1.3 Benchmark credit rating

We need to specify the benchmark credit rating for a debt portfolio to estimate the allowed return on debt for an NSP. Our final decision is to use a benchmark credit rating of BBB+. This is a continuation of our draft decision.

9.1.4 Choice of third-party provider

We use third-party yield curve data to estimate the return on debt. We source this data from a number of independent third-party providers. Our final decision is to maintain the use of 3 data providers: the Reserve Bank of Australia (RBA), Bloomberg and Refinitiv.[466] This is a continuation of our draft decision.

9.1.5 Return on debt averaging periods

To mitigate the day-to-day volatility of market rates, our established approach has been to estimate the return on debt over a specified averaging period. To ensure that the Instrument can be automatically applied, the Instrument must set out the required characteristics for return on debt averaging periods and the process for NSPs to nominate periods in regulatory proposals.[467]

Our final decision is to modify the start and end dates of the averaging period nomination window to finish no less than 5 months (previously 4 months) prior to the commencement of a regulatory year and start no earlier than 17 months (previously 16 months) prior to the commencement of a regulatory period. For NSPs that were required to submit regulatory proposals prior to us making this 2022 Instrument and have their final regulatory determinations made under this 2022 Instrument, these NSPs can nominate return on debt averaging periods no less than 4 months prior and start no earlier than 17 months prior to the commencement of a regulatory year.

9.1.6 Data provider contingencies

As we adopt an annually updating return on debt approach, our decision on how to apply third-party data sources must be fully specified upfront in each determination and must be capable of application over the regulatory control period without the use of subsequent judgement or discretion. For this reason, we have described a series of contingencies that set out how we propose to estimate the annual return on debt in the event of revisions in the RBA's, Refinitiv's or Bloomberg's methodologies or other changes to data availability. Our

[466] Due to a corporate restructure, the Thomson Reuters series is now called Refinitiv. The change is in name only and the series remains the same as previously used.

[467] NEL, s. 18J(2)(b), NGL, s. 30E(2)(b).

final decision is to maintain the contingencies outlined in the 2018 Instrument. This is a continuation of our draft approach.

9.1.7 Trailing average

Our final decision is to estimate the return on debt using the 10-year trailing average portfolio approach (including transition) with annual updates as adopted in our 2018 Instrument and 2013 Guideline. For clarity, our final decision is to continue a consistent transition approach across all networks we regulate. That is, we will continue the transition that has commenced in a previous determination for an NSP. This will allow NSPs to complete the 10-year transition period from the previous 'on-the-day' approach to the trailing average approach. This is a continuation of our draft approach.

9.2 Draft decision

All aspects of the return on debt approach final decision are consistent with our draft decision.

9.3 AER considerations

The following sections set out our final decision consideration of the issues related to our approach to the return on debt:

- Benchmark term
- Use of industry data
- Benchmark credit rating
- Choice of third-party provider
- Return on debt averaging periods
- Data provider contingencies
- Trailing average

9.3.1 Benchmark term

We need to specify the benchmark debt term for a debt portfolio to estimate the allowed return on debt for an NSP. The benchmark term is an input to obtaining yields to estimate the return on debt. It also establishes the period over which the trailing average is calculated and determines the period of the transition to the trailing average.

The debt term for the return on debt is currently set at 10 years and applied through a 10-year trailing average. NSPs go through a 10-year transition period to transition from our

previous 'on-the-day' approach – applied prior to the *2013 Rate of Return guideline* – to the trailing average.[468] Our draft decision maintained this approach.

We consider that the benchmark term of debt, equity and expected inflation should be set independently. If they are the same value, it should be the result of analysis rather than an explicit requirement. Further, we consider that the benchmark debt term should match that of an efficient firm's borrowing consistent with Dr Lally's advice.[469] As we detail in this section, we have conducted further analysis to ascertain whether the benchmark debt term of 10 years remains appropriate.

The Independent Panel recommended that we consider in greater depth options to achieve alignment with consumers' interests of incentives on NSPs regarding the term of debt issuance. The Independent Panel further suggested that regulated companies have an incentive to adopt a lower term at issuance if that is efficient for them. Therefore, when regulated companies reveal efficiencies, the regulator should adjust its regulation to ensure those efficiencies are shared with consumers.[470] We agree that if we observed on average that the regulated businesses tended to issue shorter-term debt, this would support a change to our benchmark term. However, it is not clear this is the case at present.

The approach proposed by Chairmont in 2019 to calculating the average term of debt is to use a weighted average term to maturity at issuance (WATMI) using the data collected in our RIN.[471] The WATMI suggests that the average term of debt is currently between 8 years as the lower bound and 10 to 11 years as the upper bound. That is, using the debt term of 10 years is consistent with the observed WATMI. The Independent Panel refers to the unweighted average debt term in its report.

We consider that a change to the benchmark term may not be warranted when only a subset of regulated businesses issue shorter-term debt at some points of time – without having substantial effect on the WATMI. We do not require the regulated NSPs to follow any particular financing practice and an individual business may choose not to follow our benchmark. However, it will then bear both the upside and downside risks of such a decision.

There was consensus from network and investor submissions on our draft Instrument that the benchmark term of debt should be maintained at 10 years.[472] The CRG did not specify a preferred benchmark debt term but submitted that the terms of expected inflation, equity and

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[468] AER, *Explanatory Statement – Rate of Return guideline*, December 2013, pp. 120–121.

[469] Dr Martin Lally, *The Appropriate Term for the Allowed Cost of Capital*, 9 April 2021, pp. 53–54.

[470] Independent Panel Report, *AER Draft Rate of Return Instrument*, July 2022, pp. 44–45.

[471] Chairmont, *Aggregation of Debt Data for Portfolio Term to Maturity*, 28 June 2019.

[472] AGIG, *Draft RoRI response*, September 2022, p. 1; APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 46; APGA, *Draft 2022 Rate of Return Instrument, September 2022*, p. 17; Ausgrid, *Submission Draft RoRI*, September 2022, p. 5; AusNet, *Response to the Draft 2022 Rate of Return Instrument*, September 2022, p. 3; ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 111; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 8; Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, September 2022, p. 6.

debt need to be considered collectively. Depending on the term of equity chosen, conditional support was provided for a 10-year debt term if the bias from using a shorter term of equity than debt was removed and/or outperformance identified in EICSI was removed.[473]

Our final decision is to maintain the benchmark return on debt term at 10 years. This aligns with the debt financing practices of regulated businesses to issue longer term debt. Our analysis of industry debt data also does not show clear evidence that the current benchmark of 10 years is no longer an appropriate benchmark term or that there is a materially better alternative. There are also significant practical limitations on adjusting the benchmark term if a transition is to be applied.

9.3.1.1 Estimation approach

Conceptual considerations

We maintain our view from the 2018 Instrument and 2013 Guidelines, in which we concluded that the choice of term at issuance reflects a trade-off between refinancing risk and higher overall portfolio costs.[474] We consider that, within the constraints of the market for corporate debt, a regulated business would aim to issue longer-term bonds to minimise refinancing risk. However, we consider this is balanced with higher costs arising from the term premium of longer-term issuance.

Refinancing risk is the risk that a firm would not be able to efficiently finance its debt at a given point in time. This may be because the debt instruments that it seeks are not available to it or would not be able to be refinanced at the same cost. Refinancing risk is often due to systematic factors, such as macroeconomic trends or changes in debt market liquidity. However, refinancing risk may also result from company-specific matters.

The need to manage refinancing risk is balanced against the overall cost of the benchmark business's debt portfolio. For example, a longer average term of debt for a debt portfolio means debt needs to be refinanced less often. But it also means the total cost of the debt portfolio is higher because of the upward sloping term structure and term premium associated with longer-term debt. The efficient debt financing practices would address this trade-off and may vary over time.

The CRG submitted that our draft Instrument did not discuss the endogeneity between the AER's regulatory treatment of debt and the debt financing practices of regulated businesses. '[T]he AER's assumptions are a determinant of industry practice. For the AER to then argue industry practice informs its regulatory judgement about such matters ignores the endogeneity between its actions and those of the networks'.[475] We acknowledge the CRG's point, but we consider that the way we set the benchmark allowance is only one

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[473] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, pp. 87–88.

[474] AER, *Draft rate of return guideline - explanatory statement*, 10 July 2018, p. 352; AER, *Final rate of return guideline—Explanatory statement*, December 2013, p. 104.

[475] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, pp. 70–71.

consideration that NSPs have when they choose their debt financing practices. The debt instruments provided by businesses demonstrate a variety of strategies are employed. Therefore, we consider that the data we collect about the actual financing practices of regulated businesses contain useful information, including on the benchmark debt term.

In the past, we have observed similarly long tenors at issuance previously under different regulatory settings. For example, when we introduced a 10-year trailing average in 2013, we based our decision on the observed debt financing practices of regulated (and unregulated) infrastructure businesses. They tend to stagger their debt issuance over time. While they issue a range of debt instruments, their average tenor of debt is relatively long. We considered that staggering debt issuance over time helped businesses to mitigate refinancing risk (which would arise if they refinanced all their debt portfolio at once). This practice is adopted among both regulated and unregulated businesses and is not occurring just because we introduced the trailing average approach with a benchmark term of 10 years.

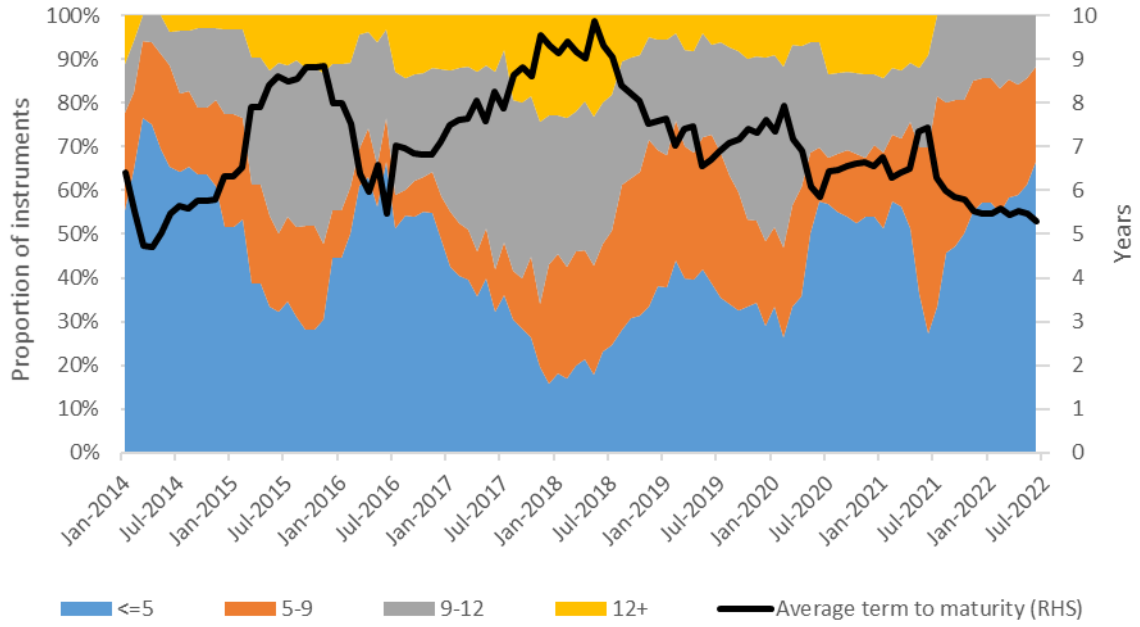
In the remainder of this section, we examine evidence from actual debt raising by (privately owned) NSPs between 2013 and 2022.

Using the EICSI and WATMI for estimating the benchmark term

The Energy Infrastructure Credit Spread Index (EICSI) is a 12-month rolling average of credit spreads across all debt instruments that meet our criteria for privately owned NSPs. The EICSI allows us to monitor our benchmark return on debt approach and provides an estimate of the average term and credit rating of debt instruments issued by NSPs. We discuss the EICSI and its relationship with the benchmark term further in section 9.3.2.

As shown in Figure 9.1, the simple average term of all instruments in the EICSI varies over time. In June 2016 the average term was under 6 years, increasing to almost 10 years in May 2018. The estimate of the average EICSI term in the draft Instrument was 7.5 years in June 2021. We received data in September 2022 for the period July 2021 to June 2022. With the updated data, the average EICSI term dropped to 6.9 years due to an increase in the amount of short-term debt issued in 2021–22.

Figure 9.1 Proportion of debt instruments included in EICSI by broad term to maturity grouping (January 2014 to June 2022)



Source: AER analysis; Chairmont, *Aggregation of debt data for portfolio term to maturity*, 28 June 2019

The 2021–22 update is dominated by low face value and short-term bank debt. A comparison of 2021–22 against previous data is provided in Table 9.1. We consider that NSPs may have raised shorter term and less debt than usual in 2021–22 due to macroeconomic uncertainty. Recent takeovers of NSPs may also have affected debt issuance.

Table 9.1 Comparison of EICSI data for 2021–22 compared with previous years

EICSI data	July 2021 – June 2022	Average prior to July 2021 (per year)	% change
No. of instruments issued	51	36	42% increase
Total value of debt issued	$9.0 billion	$10.1 billion	12% decrease
Average face value of instruments	$176 million	$281 million	37% decrease
Proportion of new debt in portfolio[1]	10%	17%	41% decrease
% of hybrids in portfolio	4%	1.8%	122% increase

Note 1. Portfolio is the total amount of debt issued by the networks and includes instruments that are excluded from EICSI and/or WATMI.
Source: AER analysis.

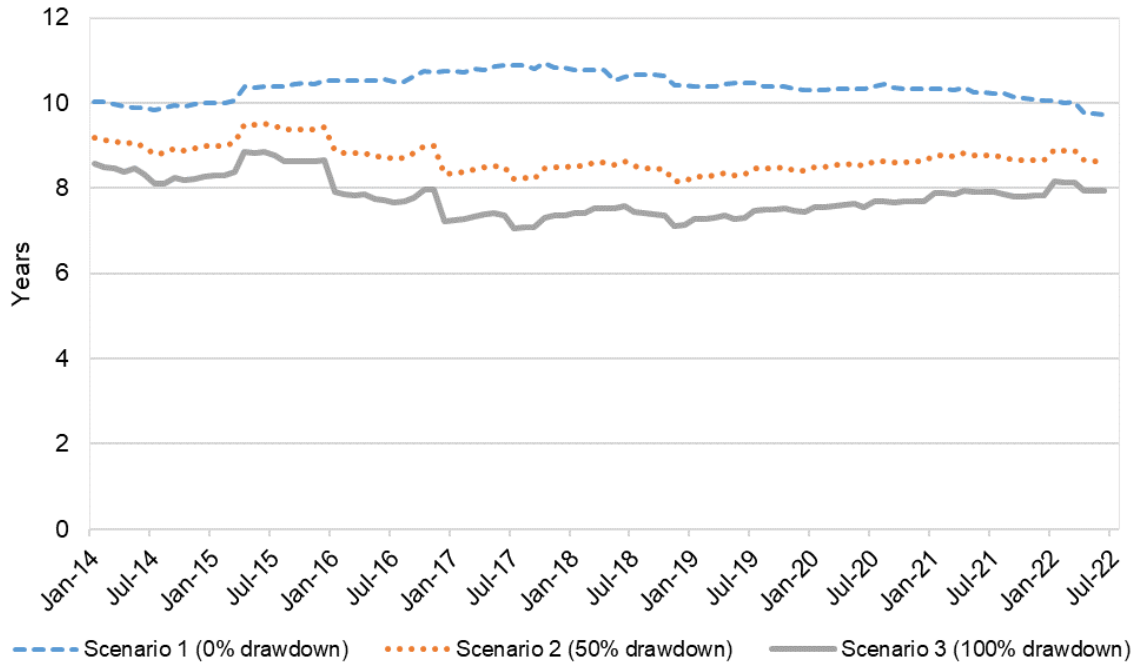
The average term of debt in the EICSI varies significantly across NSPs. Individual NSPs' average term of instruments issued since July 2013 range from under 5 years to over 12 years. As such, the average term of instruments in the EICSI is influenced by a few NSPs that raise shorter-term debt. For example, if 3 of the NSPs with the shortest-term debt instruments are removed from the analysis, the simple average term of instruments in the EICSI would increase from 6.9 years to 8.0 years.

The 2019 Chairmont report suggested an alternative method to calculate the average term of debt using the WATMI. This index is weighted by the face value of debt and does not apply the same exclusion criteria as the EICSI. Therefore, it includes a broader range of instruments. Instruments also remain in WATMI until they reach maturity in contrast to the simple average term in EICSI where instruments only remain for 12 months. That is, a 10-year bond would remain in WATMI for 10 years and only 12 months in EICSI. Because of this, WATMI is a better reflection of an NSP's overall debt portfolio at a given point in time.

The WATMI also includes scenarios for the drawdown of bank debt (that is, whether funds are drawn for any of the bank debt reported by the NSPs). As shown in Figure 9.2, scenario 1 reflects no funds being drawn, scenario 2 reflects 50% drawdown of bank debt and scenario 3 reflects 100% drawdown (that is, all bank facilities are fully utilised). When bank facilities are used, the weighted average term drops because the bank facilities used by the NSPs have shorter terms than other debt instruments (such as bonds).

The 0% drawdown scenario results in the weighted average debt term at issuance being relatively stable between 10 and 11 years. The 50% and 100% drawdown scenarios show lower average terms. The 100% drawdown scenario is currently around 8 years. This analysis is presented in Figure 9.2 and reflects the updated data received from NSPs through to June 2022.

Figure 9.2 Weighted average term to maturity at issuance for the EICSI dataset – comparison of drawdown sensitivities (January 2014 to June 2022)



Source: AER analysis, based on method in Chairmont, *Aggregation of debt data for portfolio term to maturity*, June 2019.

Stakeholders submitted that we should not use EICSI and WATMI to lower the benchmark term of debt at this stage. Ausgrid, Transgrid, ENA and APGA stated the WATMI cannot be used to deterministically set a benchmark term unless drivers of shorter-term debt are fully

understood.[476] Further, APA noted that the EICSI and WATMI were calculated from data for a small number of businesses and could not be regarded as indicators of an industry term to maturity.[477] We think these submissions undervalue the information from our data collection. The data we collect is a window into actual debt raising practices and is valuable for our task.

ENA and AusNet also noted in their submissions that, based on analysis performed by its consultant CEG – which was provided access to similar industry data – recent estimates of WATMI were very close to 10 years, particularly if NSW NSPs were excluded.[478] The most recent WATMI update provided to the AER by CEG was 9.3 years, which falls within the range of our WATMI.

Temporary or typical issuance patterns

In reaching a conclusion on the benchmark term of debt, we seek to estimate an appropriate sector-wide benchmark for the forward-looking period to which the Instrument will apply.

It is not clear from the actual debt data from NSPs whether the current debt issuance patterns are temporary – based on the specific circumstance and practices of a few NSPs – or typical of a sector-wide forward-looking benchmark practice. For example, the ENA noted in its submission that if recently privatised firms in NSW were excluded, recent estimates of WATMI would be very close (and sometimes above) 10 years. The ENA suggested that, following the recent sale of those NSPs, debt was refinanced with portfolios of staggered maturities of debt. It is likely that as these tranches of shorter-term debt mature they will be replaced by longer-term debt. As such, it is not clear that the recent trend of issuing shorter-term debt is representative of a longer-term benchmark estimate. This is consistent with our latest observations in the 2021–22 data.

We also recognise that debt issuances from NSPs or their parent companies are unlikely to only reflect the benchmark approach we adopt to estimating the return on debt. As identified in previous reports by Chairmont, NSPs could adopt a range of different strategies depending on their appetite for risk.[479]

Differences in debt profile between service providers

Different average terms between the NSPs could reflect different appetites for risk across the sector. The nature of a benchmark term allows for the possibility that different NSPs might adopt strategies facing more or less risk according to their risk preference and expect returns commensurate with the risks. Average term of debt varies significantly across NSPs.

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[476] Ausgrid, *Rate of Return 2022 information paper*, 11 March 2022, p.3; Transgrid, *AER Rate of Return final Omnibus paper - Submission*, p. 7; ENA, *Rate of Return Instrument review - AER Final Omnibus and information paper - Submission*, 11 March 2022, p. 32, APGA, *Rate of Return Instrument information paper - Submission*, 11 March 2022, p. 21.

[477] APA, *2022 Rate of Return instrument review information paper and final Omnibus paper - Submission*, 11 March 2022, pp. 15–16.

[478] ENA, *Rate of Return Instrument review - AER Final Omnibus and information paper - Submission*, 11 March 2022, p. 32; AusNet, *Rate of Return information paper - Submission*, 11 March 2022, p. 3.

[479] Chairmont, *Financial practices under regulation: past and transitional*, October 2015, pp. 75–84.

Individual estimates of WATMI for NSPs as of June 2022 (scenario 3) also range from 5 years to 13 years, with an industry average of 7.7 years.

The Independent Panel stated that 'the ideal, in terms of the principles of incentive regulation, would be to adjust the allowance for the debt premium to reflect the actual term of debt issuance by individual NSPs'.[480] This was also cited by the CRG in its submission.[481] We agree that if we observed on average that the regulated businesses tend to issue shorter-term debt, this would support a change to our benchmark debt term. However, it is not clear this is currently the case, given that a debt term of 10 years is consistent with the observed WATMI.

Further, a change to the benchmark term may not be warranted when only a subset of regulated businesses issue shorter-term debt at some points of time – without having substantial effect on the WATMI. We do not require the regulated NSPs to follow any particular financing practice and an individual business may choose not to follow our benchmark. However, it will then bear both the upside and downside risks of such a decision.

Interaction with the trailing average

We have taken into consideration that the trailing average approach (using a 10-year trailing average) and the 10-year transition from an 'on-the-day' debt approach to the trailing average depend on the benchmark debt term of 10 years.

If we were to adopt a different benchmark debt term, or change it during the transition period, we consider it would be necessary to undertake a further transition between approaches or adjust the trailing average calculation methods to achieve the NPV=0 principle. The implementation of this change would require a further transition from midway through the ongoing transition based on the 10-year term.

In response to our final working paper, Transgrid and AGIG/SAPN/VPN submitted that they supported the continued use of a 10-year benchmark term because this would avoid the need to implement a further complex transition before NSPs have completed their transition to the current term.[482] However, the CRG noted that, if most NSPs were already not following the existing benchmark term, there would be no need to apply any transition to maintain NPV neutrality because the NPV=0 principle would already be violated in a manner that favoured NSPs.[483] These 2 positions were echoed by ENA and the CRG in their submissions on the draft Instrument.[484] Under our benchmark approach to setting the rate of return, we consider that to satisfy the NPV=0 principle we must base our considerations of whether a transition

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[480] Independent Panel Report, *AER Draft Rate of Return Instrument*, July 2022, p. 45.

[481] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 44.

[482] Transgrid, *AER Rate of Return final Omnibus paper - Submission*, 11 March 2022; AGIG SAPN VPN, *2022 Rate of Return Instrument review - Omnibus papers final - Submission*, 11 March 2022

[483] CRG, *Rate of Return Instrument information paper - Submission*, 11 March 2022, pp. 93–94.

[484] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 44; ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 112.

applies on the circumstance of the benchmark NSP – independent of the specific practice of individual NSPs.

We maintain that adjusting the benchmark term to reflect shorter-term debt issuances would require a transition and may cause implementation issues. Part of our assessment criteria is to prefer options that promote simple over complex approaches where appropriate. However, we consider that if there was a clearly more appropriate benchmark debt term, we should employ this approach and seek to address the complexity.

There are several considerations in relation to the extent of benefit to consumers from moving to a shorter term. First, if a transition is implemented, the change would be neutral in terms of the NPV. Further, applying a shorter term under the trailing average is likely to lead to higher price volatility. If this term is shortened, then the volatility of the average would likely increase. The CRG submitted that its research indicates that consumers do value stability, but also value lower prices. It noted the challenge in considering these preferences but that there are other tools available to mitigate volatility, such as revenue smoothing. On balance the CRG considers that the benefit to consumers of lower prices would outweigh volatility concerns in this instance.[485] We note this consideration. Our view is that the evidence at this point is not sufficiently strong to justify moving to a different benchmark term. However, we will continue to monitor the evidence closely and will change our approach in future if there is a clear case for change to the benefit of consumers.

Interaction with term of equity

The CRG submitted that we did not adequately justify our claim that the terms of debt and equity can be considered independently or our proposal to apply different estimation terms to equity (5 years) and debt (10 years) in our draft decision.[486] It also submitted that lowering the estimation term for equity without taking similar action for debt implies the latter will be overpriced – resulting in an upwardly biased overall rate of return.[487] We consider that the benchmark term of debt, equity and expected inflation should be set independently based on all relevant considerations. If they are the same value, it should be the result of analysis rather than an explicit requirement. Further, we consider that the benchmark term should match that of an efficient firm's borrowing, consistent with Dr Lally's advice. [488]

Our analysis supports maintaining a benchmark debt term of 10 years, so our final decision is 10 years. We do not consider that the WACC is inherently biased if the term of equity is lower than the term of debt (as proposed in the draft decision). However, as the equity term in this decision is also 10 years, the discussion of 'bias' is not relevant. Equity term is discussed in section 6.3.1.

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[485] CRG, *Rate of Return Instrument information paper - Submission*, 11 March 2022, p. 94.

[486] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 69.

[487] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 76.

[488] Dr Martin Lally, *The Appropriate Term for the Allowed Cost of Capital*, 9 April 2021, pp. 53–54.

9.3.1.2 Assessment criteria

We have applied our assessment criteria to assist us exercise our judgement. Table 9.2 sets out our assessment criteria and key areas where they have assisted us make our decision.

Table 9.2 Assessment criteria of final decision benchmark debt term

Assessment criteria		Final decision
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.	Current market evidence not sufficiently strong to justify moving to a different benchmark term.
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.	Method of estimating benchmark term for draft decision is consistent with the original purpose of gathering industry debt data and considers its limitations.
3	Implemented in accordance with good practice: (a) supported by robust, transparent and replicable analysis that is derived from available credible datasets.	Construction of EICSI and WATMI has inherent transparency and replicability issues due to confidentiality. Separate work by CEG with similar dataset reaches similar conclusions.
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 inputs estimation (b) based on quantitative modelling that avoids arbitrary filtering or adjustment of data that does not have a sound rationale.	We consider that current data underlying the EICSI and WATMI is sufficiently robust for use as a check on benchmark term. Current evidence not sufficiently strong to justify moving to a different benchmark term.
5	Where market data and other information is used, this information is: (a) credible and verifiable (b) comparable and timely (c) clearly sourced.	This criterion is hard to satisfy due to the confidential nature of the underlying industry data – as such, it is not material to our consideration.
6	Sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.	We will continue to collect industry debt data annually and monitor EICSI and WATMI and use the results to review the overall reasonableness of our benchmark debt term at the next rate of return Instrument.
7	The materiality of any proposed change.	We do not consider there is sufficient evidence to justify moving to a different benchmark term.
8	The longevity or sustainability of new arrangements.	We consider that our benchmark term should only be adjusted if there is a persistent change expected from the current benchmark term of 10 years.

9.3.2 Use of industry data

We developed the EICSI in 2018 with assistance from Chairmont using actual debt issuance data obtained from regulated NSPs. It reports a rolling 12-month historical average of credit spreads across all new debt instruments issued by privately owned NSPs.[489]

The EICSI provides an indication of the cost of NSP-issued debt to compare with our benchmark estimate of the cost of debt. The primary EICSI metric is the spread over the swap rate (credit spread), which is similar to the debt risk premium. This allows us to monitor the performance of our benchmark return on debt against NSPs' actual cost of debt. In the 2018 Instrument, we did not use the EICSI in a determinative way to set or adjust the benchmark cost of debt. Instead, it was used as a 'sense check' against our approach to setting the benchmark cost of debt. That is, we used the results of the analysis as a review of the overall reasonableness of our benchmark allowance.[490]

We consider that our benchmark allowance should be adjusted if there is expected to be future material and persistent outperformance (or underperformance). In undertaking this assessment it is important to review the full set of data available to us, including the weighted average term to maturity (WATMI) and credit rating analysis. It is also important to understand the construction of the EICSI and its strengths and limitations. For example, the EICSI in its original form is a simple average of instruments issued over a 12-month period. Therefore, it is important to also look at the entire portfolio of debt on issue rather than the 12-month snapshot. In the analysis that follows, the information should be considered within the full context of the dataset.

9.3.2.1 Background

The EICSI is a simple index constructed from actual debt issuance information collected from privately owned (that is, non-government owned) NSPs we regulate. In 2018 we obtained data on actual debt costs from most of these service providers for the period 2013–14 to 2016–17.[491] We engaged Chairmont to assist us with the collection and analysis of this debt data and the development of the EICSI. The purpose of collecting actual debt information (and developing the EICSI) was to provide a 'sense check' of reasonableness of the outcomes under our benchmark approach.

Since its development, we have updated the index to include new data as it has become available and enhanced the functionality of the existing model. We have also clarified and refined the criteria we employ for deciding which debt instruments to include in the index.

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[489] AER, *Discussion paper, Estimating the allowed return on debt*, May 2018, pp. 27–35.

[490] AER, *Draft rate of return guidelines, Explanatory statement*, July 2018, p. 452.

[491] We asked for details of all outstanding debt and financial instruments held as of 1 January 2013, and then details of all debt and financial instruments issued between January 2013 and December 2017 (though some NSPs provided data through to February 2018). AER, *Discussion paper, Estimating the allowed return on debt*, May 2018, p. 27.

How the EICSI is constructed

Not all debt issued by NSPs is included in the EICSI. When creating the EICSI in 2018, Chairmont decided which instruments would be included. We refined the criteria to guide our decisions as to which debt instruments should be included.

The criteria promote transparency and replicability, but we recognise that applying the criteria may also require some judgement.[492] In our 2020 paper on *Energy Network Debt Data*, we set out criteria by which we would include and exclude debt instruments from the index.

For inclusion, there is a single overarching criterion:

- We will include any instrument that has the purpose of financing the RAB, has the characteristics of debt and does not meet one of the exclusion criteria. Types of instruments that are included are simple bond issuances, bank loans, USPP (US private placement) or MTN (medium-term note).

We will exclude instruments that do not have simple debt characteristics or are issued for other purposes. These include:

- commercial papers, non-convertible subordinated notes, hybrids and short-term capex facilities
- bridges, working capital and overdrafts
- anything with a term under 12 months.

We have previously published a public version of the EICSI model with indicative data illustrating the construction of the EICSI.[493] We met with CEG, which was independently commissioned by the ENA to analyse the industry data provided to it separately to discuss aspects of the construction of the EICSI. As noted in ENA's submission CEG was largely able to reproduce the results of the EICSI in its analysis of NSP data.[494] We met with CEG for a second time in December 2022 and, again, CEG was able to closely match the results of the EICSI. In the meeting CEG identified methodological differences in how it calculated EICSI outperformance, which explains some differences between our outperformance (underperformance) analysis. We will consider whether we should incorporate some elements of CEG's approach in preparation to the 2026 Instrument.

We received mixed responses to our information paper on our treatment of hybrid securities in the EICSI.[495] ENA and AusNet's submissions supported the inclusion of hybrid securities in

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[492] By replicability in this context, we mean the ability of other parties to replicate our work – that is, to reproduce the EICSI given the same raw data.

[493] AER, *Aggregation of return on debt data - EICSI model - Public version with indicative data*, 22 May 2018. Available here: https://www.aer.gov.au/node/57843.

[494] ENA, *Rate of Return Instrument review - AER Final Omnibus Paper and information paper - Submission*, 11 March 2022, pp. 114–121.

[495] In this discussion 'hybrid securities' includes subordinated debt because these have been referred to as hybrids in previous discussions.

EICSI, while APA and the CRG disagreed with including hybrid instruments because they do not reflect the practices of most NSPs.[496]

ENA also submitted that hybrid securities should be included in EICSI and consistently included across all other parameters as debt, such as in gearing. ENA and AusNet both noted that this approach supports Dr Lally's advice to the AER. As noted by AusNet in its submission, our final working paper misquoted Lally on his suggested treatment of hybrid securities. Lally's advice was that if the EICSI were used to directly set the allowed DRP for the regulated businesses subordinated debt should be included.[497]

Our decision for this Instrument does not use the EICSI to directly set the return on debt allowance. As such, we will continue our approach to excluding hybrid securities from the EICSI. Hybrid instruments do not meet our current inclusion criteria of having simple debt characteristics because they also have some of the character of equity.

How the data is collected

We collect data on an annual basis from NSPs.[498] This data is used to update the EICSI and inform our analysis. The updated EICSI and analysis is published each year in the *Rate of Return annual updates*.[499] Originally this data was provided to us on an informal and voluntary basis.

In 2021 we moved from a voluntary data request to a compulsory information gathering process and issued regulatory information notices (RINs) to service providers. As well as being compulsory, a RIN requires assurances, by way of statutory declaration, from service providers that the data provided is actual or the best estimate when it is not possible to provide actual information. These assurances provide greater certainty that the data included in the EICSI is accurate, which we considered necessary for the ongoing use of the EICSI.

The most recent update was received in September 2022 for the period July 2021 to June 2022.

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[496] ENA, *Rate of Return Instrument review AER Final Omnibus Paper and information paper Submission*, 11 March 2022, pp. 32–33; AusNet, *Rate of Return 2022 information paper Submission*, 11 March 2022, p. 3; APA, *2022 Rate of Return instrument review information paper and final Omnibus paper Submission*, 11 March 2022, p. 73; CRG, *Rate of Return Instrument information paper Submission*, 11 March 2022, p. 93.

[497] Dr Martin Lally, *The Appropriate Term for the Allowed Cost of Capital*, 9 April 2021, pp. 51–52.

[498] The 2019 submission included all debt issuances between 1 July 2018 and 30 June 2019, the 2020 submission included all debt issuances between 1 July 2019 and 30 June 2020. In 2021 the AER moved from a voluntary data request to a compulsory information gathering process and issued regulatory information notices (RINs) to NSPs. For the 2021 submission, NSPs were asked to submit all debt issued between 1 July 2020 and 30 June 2021 as well as resubmit all instruments issued back to 1 July 2013.

[499] AER, *Rate of return Annual Update*, December 2020, pp. 20–22.

How we compute the EICSI

The EICSI is based on a 12-month rolling average of – in broad terms – the 'current' debt risk premium. The EICSI was originally deliberately constructed without model adjustments, as described by Chairmont:[500]

> It does not weight or adjust the raw data from the companies. The purpose is to produce a 'pure' unadjusted index which reflects actual debt raising costs[501] without modelling adjustments to target a theoretical benchmark.

When Chairmont created the EICSI in 2018, it was recognised that the index was a basis that should be built on for future analysis. This includes updating the EICSI analysis to include data beyond 2018 and enhance the functionality of the existing debt aggregation model. As part of our updates, and further analysis in the *Energy network debt data working paper* in 2020, we identified several improvements that could be made to the original index to better reflect the costs faced by NSPs. The main change was the weighting of debt costs by tenor, which accounts for the difference in issuing long-term debt compared with short-term debt. That means the credit spread of longer-term debt in the rolling data window (12 months) is given more weight than the credit spread of shorter-term debt.[502] In its submission to the information paper, ENA recommended also presenting the EICSI weighted by the face value of debt instruments included. This was also raised by Dr Tom Hird in our expert concurrent evidence sessions.[503] We maintain that the tenor weighted EICSI is appropriate for comparison against our benchmark approach. Weighting by face value gives significant weight to the debt costs of a few service providers with large asset bases. We do not consider that reflecting this weighting is fit for the purpose of using the EICSI as a check against the benchmark cost of debt. However, in Figure 9.3 we also present the EICSI weighted by value and tenor for comparison.

Fees that are directly attributable to eligible instruments are also included. In this way, the EICSI reflects the actual expenditure related to the instruments. This is particularly significant for short-term debt, such as bank debt, which has high commitment fees. Therefore, we have included ongoing annual commitment fees for bank debt. NSPs were asked not to include any fees that would be compensated in the debt raising cost allowance or the opex allowance more generally. In our final working paper we asked for submissions from stakeholders on which fees, if any, should be included in the EICSI, but we did not receive any submissions on this issue.[504]

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[500] Chairmont, *Aggregation of Return on Debt Data*, April 2018, p. 3.

[501] In this quote, Chairmont uses the term 'debt raising costs' to refer to the ongoing costs of issued debt (effectively interest payments every year). The AER reserves the term 'debt raising costs' for one-off transactional costs incurred when debt is first raised and uses the terms 'cost of debt' and 'return on debt' for ongoing interest costs. The AER provides a separate debt raising costs allowance (as part of operating expenditure).

[502] AER, *Rate of Return - Draft Debt Omnibus Paper*, July 2021, p. 13.

[503] AER, *Concurrent evidence session 1 - Proofed transcript*, February 2022, p. 12.

[504] AER, *Overall rate of return, equity and debt omnibus – Final working paper*, November 2021, p. 74.

How the EICSI is different to other series

When referring to the market for debt, there are commonly 2 distinct subcategories that underlie the market – the 'primary market', where securities are initially created and issued, and the 'secondary market', where these securities are subsequently traded by investors.

The EICSI is constructed from debt issued directly by the business on the primary market. The price and yield of this debt are determined by market conditions and the characteristics of the issuer and bond at the time of issue. The issuer is required to pay back this debt at the agreed rate and terms.

The third-party yield curves that we use in estimating our return on debt – RBA, Bloomberg and Refinitiv – are constructed using data from the secondary market. These transactions occur without the issuers' involvement and do not impact the cost incurred by the issuer of the underlying security.

The third-party curves include debt in a broad range of industries beyond regulated gas and electricity NSPs. The EICSI only relates to debt issued by a specific subset of these – privately owned service providers of regulated gas and electricity NSPs.

The EICSI is also weighted by tenor to give more weight to the credit spread of longer-term debt than shorter-term debt in the 12-month window. The RBA yield curve is weighted by the value of debt instruments included, while the Bloomberg and Refinitiv series are at least partly value-weighted through excluding low value bonds.[505] The number of firms and instruments included in EICSI is significantly fewer than in the third-party yield curve.

The criteria for instruments to be included in the various series also vary. We have set out the broad principles for inclusion/exclusion in the EICSI above. The third-party providers have their own criteria for inclusion in their series and this will differ from the EICSI (and from each other).

9.3.2.2 Analysis of data

The allowed return on debt has cycled over time.[506] As shown in Figure 9.3, prior to January 2018 we had seen peaks around 225 basis points and lows around 150 basis points, with the data taking around 18 months to 2 years to move between highs and lows. With the data updated to mid-2021, the credit spread appeared to level off around 160–170 basis points between 2018 and 2021. Beginning in January 2021 we saw a sharp decline, with the credit spread around 130 basis points. The credit spread began to rise again in the latter half of 2021 and is currently just under 160 basis points.

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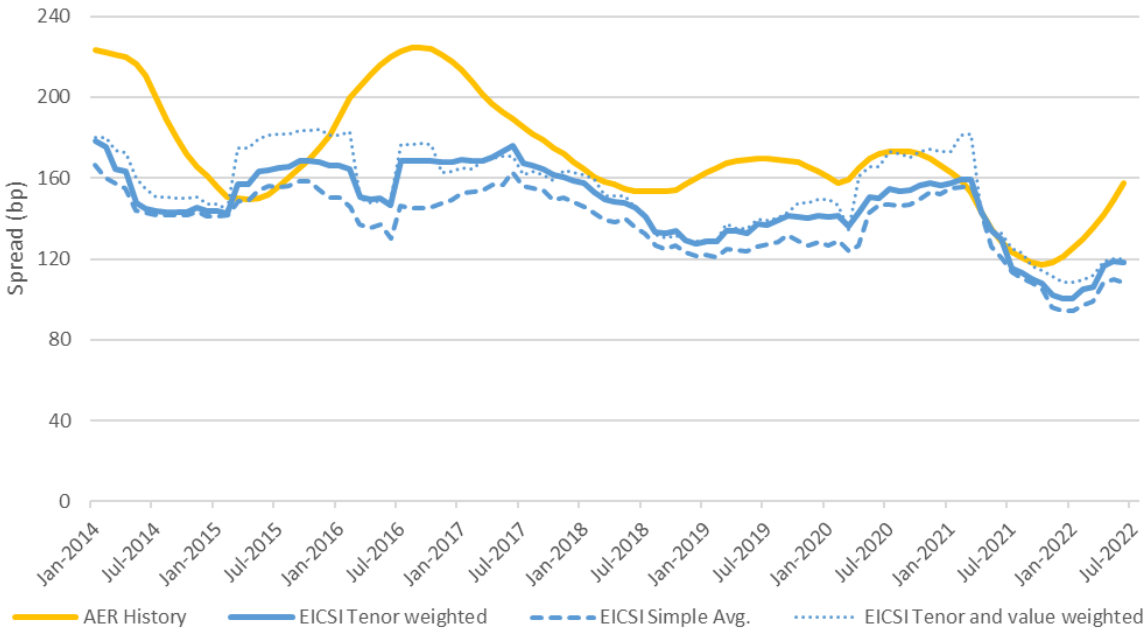
[505] Dr Martin Lally (Capital Financial Consultants), *The appropriate term for the allowed cost of capital*, April 2021, p. 51; ACCC, *Thomson Reuters credit curve methodology - Note for the AER*, April 2017, pp. 6–7.

[506] Our approach uses an average weighted 2/3 to BBB and 1/3 to A to estimate a credit rating of BBB+.

Figure 9.3 Comparison of EICSI (spread over swap) 12-month rolling average (unweighted, tenor weighted and tenor and face value weighted) against AER A/BBB (10-year term) estimate (January 2014 to June 2022)



Source: AER analysis; Chairmont, *Aggregation of debt data for portfolio term to maturity*, 28 June 2019

The EICSI has remained below our cost of debt for almost the entire period observed, suggesting possible outperformance. There have only been 11 months in the last 91 where the EICSI has been above our benchmark cost of debt – all within 14 basis points (based on our current debt methodology approach set in the 2018 Instrument). On average, the gap between the EICSI and our approach has been about 19 basis points. The gap has been as high as 74 basis points (June 2016) but closed markedly in the first half of 2021. In 2022 the gap began to widen and was around 40 basis points as of June 2022.

As part of our recent working papers, we received a consultant report from Dr Martin Lally, which included comments on our construction and use of the EICSI. This report noted that, in considering any adjustment to our return on debt approach, we should look to decompose the observed EICSI outperformance into 3 factors.[507] These factors were:

- rating
- term
- residual.

[507] Dr Martin Lally (Capital Financial Consultants), *The appropriate term for the allowed cost of capital*, April 2021, p. 48.

The following sections discuss our analysis of the drivers of the observed outperformance.[508]

Impact of credit rating

We analysed the credit ratings given to issued debt and whether the mix of credit ratings changes over time. To do this we assigned a numerical rating to each instrument included (shown in Table 9.3), with 'BBB−' rated instruments assigned 1 and 'A' instruments assigned 5. Each higher integer represents a step up in the rating system. This allowed us to perform a high-level check of whether the outperformance appears to be impacted by the changes in credit ratings of the debt instruments in the EICSI.

Table 9.3 Numerical rating proxies applied to instruments

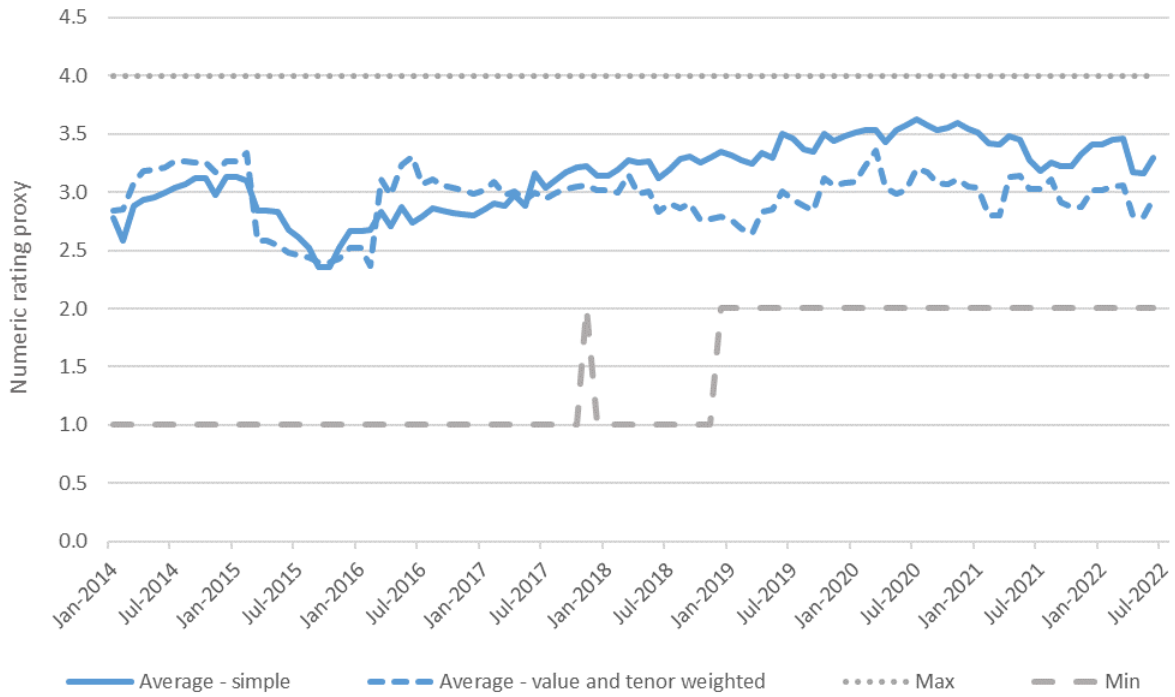
Rating (S&P/Fitch)	Rating (Moody's)	Numerical proxy
A	A2	5
A-	A3	4
BBB+	Baa1	3
BBB	Baa2	2
BBB-	Baa3	1

Notes: Where an instrument has multiple ratings, we have used the S&P/Fitch rating. Where it has an alternative rating, we have matched to the equivalent S&P/Fitch rating.

As shown in Figure 9.4, the average credit rating of instruments issued has slowly increased since around 2016. Under our numerical rating, the range of BBB+ would be between 2.5 and 3.5. The current average rating is between 3 and 3.5, and it has been relatively stable around the BBB+ range since around 2018.

[508] The decomposition we undertook was broader in nature than that described by Dr Lally in his report.

Figure 9.4 Average and face value weighted credit rating (proxy) of instruments in EICSI (January 2014 to June 2022)

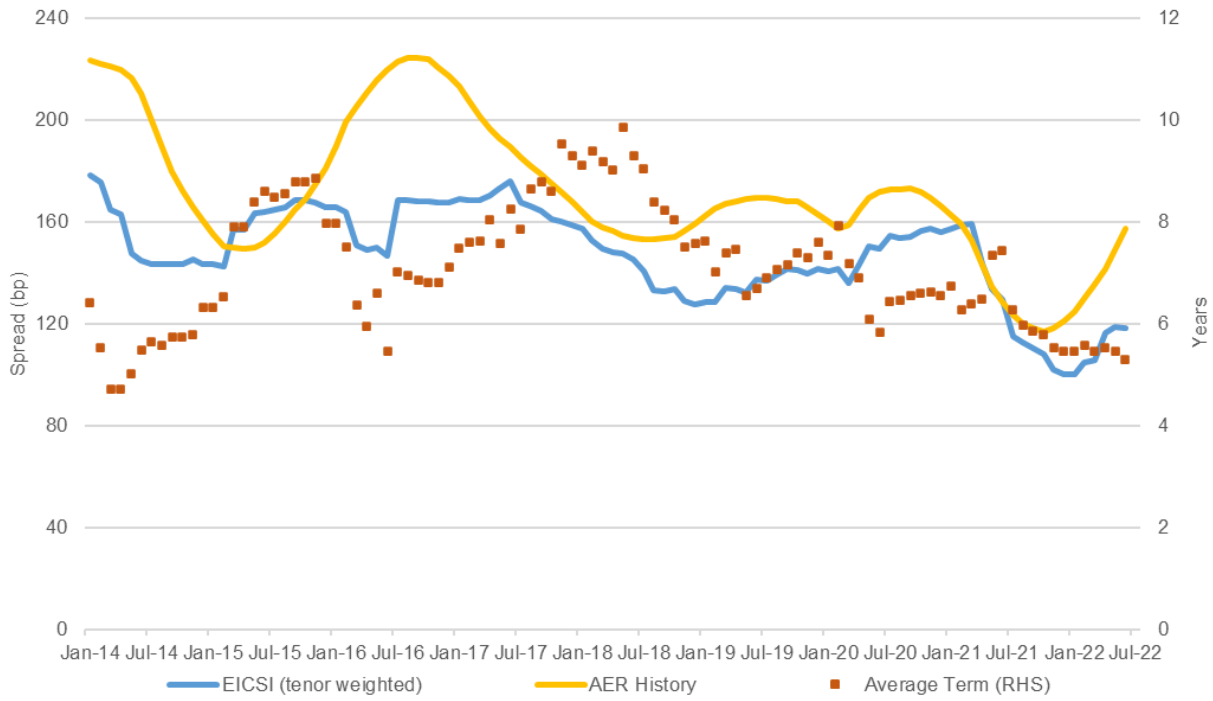


Our analysis also showed no clear relationship between the average credit rating of the EICSI and outperformance against the benchmark estimate. However, it should also be noted that, while rating proxies have been used to allow for this quantitative analysis, credit rating bands are ordinal (non-metric). Although they are ordered categories, the distances between each category are not known. The proxies assume distances are equal between each band, which may not be true in practice.

Impact of term

The simple average term at issuance of instruments in the EICSI has continued to vary over time, as shown in Figure 9.5. It also appears to have a negative relationship with the observed outperformance – when average term is relatively high, there is minimal difference between EICSI and our benchmark, and vice versa. Average term also tends to vary considerably over time. In April 2018 average term at issuance was around 10 years, before declining to around 6 in May 2020. The latest estimate (June 2022) is low, around 5.3 years.

Figure 9.5 EICSI 12-month rolling average, AER A/BBB (10-year term) benchmark estimate and average term at issuance in EICSI (January 2014 to June 2022)



Source: AER analysis; Chairmont, *Aggregation of debt data for portfolio term to maturity*, 28 June 2019

When we look at the unweighted EICSI (no tenor or value weighting) over time, we observe a discrepancy between the cost of NSP debt instruments and the benchmark return on debt. A factor for this is the over representation of short-term instruments in unweighted EICSI. We have adjusted for this effect to some extent by tenor weighting EICSI, where each instrument is weighted proportionally to its tenor. For example, a 10-year instrument is given a weight ten times greater than a 1-year instrument. This helped to reduce the overweighting of short-term debt. However, after tenor weighting, we are still seeing apparent outperformance. This is due to EICSI only showing a 12-month snapshot of debt issuance, rather than the entire portfolio. For instance, if the overall debt portfolio has both short- and long-term debt, but no long-term debt is issued in the last 12 months, the instruments in the EICSI would not be representative of the overall portfolio and we would likely see apparent outperformance.

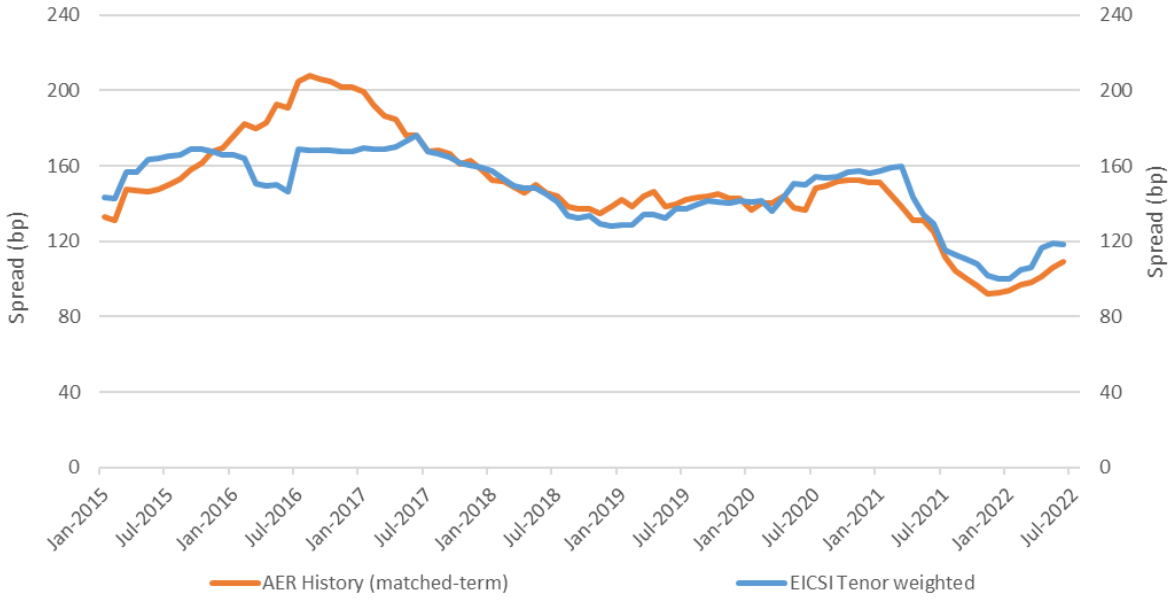
As the unweighted EICSI is showing a discrepancy between the NSP cost of debt and our benchmark allowance, we have considered two other indicators to inform our decision: weighted average term to maturity (WATMI) and matched-term analysis.

Unlike EICSI, instruments remain in WATMI until they have reached maturity, providing a better reflection of the average term of the entire portfolio. WATMI suggests that the average term of debt is currently between 8 years as the lower bound and 10 to 11 years as the upper bound. That is, using a debt term of 10 years is consistent with the observed WATMI.

A matched-term analysis accounts for any discrepancy caused by a shorter EICSI term and allows us to cross-check how other return on debt parameters are performing (credit rating and data providers). Figure 9.6 compares EICSI (tenor weighted) against AER History with a

matched-term (matched to the EICSI term and not to the 10-year benchmark).[509] The average outperformance when compared against this matched-term cost of debt is reduced from 19 basis points to 2.5 basis points. This analysis suggests that the term (tenor) of debt issuances included in the EICSI is a key driver of the observed outperformance.

Figure 9.6 Comparison of EICSI 12-month rolling average (tenor weighted) against AER A/BBB (matched-term) estimate (January 2014 to June 2022)



Source: AER analysis; Chairmont, *Aggregation of debt data for portfolio term to maturity*, 28 June 2019.

We do not consider that it necessarily flows that term being a key driver of the observed outperformance automatically implies that the benchmark term should be changed or that this outperformance should be adjusted. We discuss our assessment of the benchmark term of debt further in section 9.3.1. In summary, we are satisfied that our third-party benchmark continues to remain a good enough proxy for the efficient debt financing costs of a benchmark business.

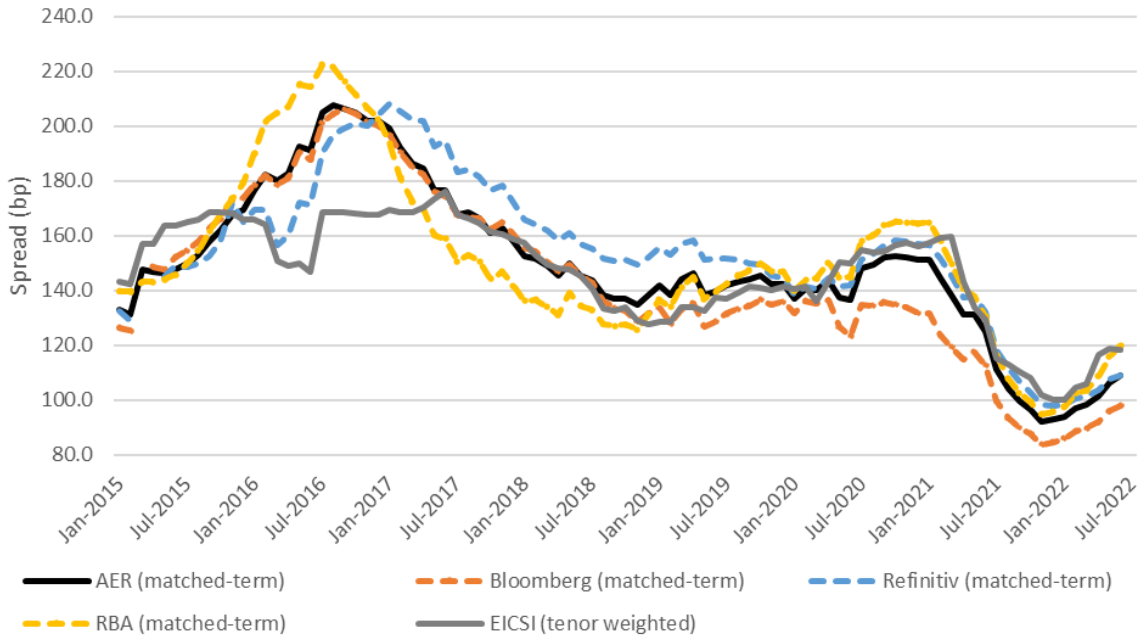
Other impacts

We have also performed further analysis to investigate what else might be driving the residual outperformance of our benchmark. We examined whether any of the individual third-party data series used for our estimate (Bloomberg, Refinitiv and RBA) appear to better reflect the debt costs of the NSPs. As shown in Figure 9.7, while the individual series (weighted 2/3 to BBB and 1/3 to A) vary over time, none appear to be particularly more

[509] This involves interpolating values for the AER benchmark estimates from the published debt curves for each 0.1-year increments between 5 and 10 years and matching this to the average term in EICSI for each month.

reflective of the EICSI over the longer term than the average used in our benchmark approach.

Figure 9.7 Comparison of individual matched-term series (RBA, Refinitiv and Bloomberg), A/BBB 12-month rolling average against EICSI (January 2015 to June 2022)



Source: AER analysis; Chairmont, *Aggregation of debt data for portfolio term to maturity*, 28 June 2019

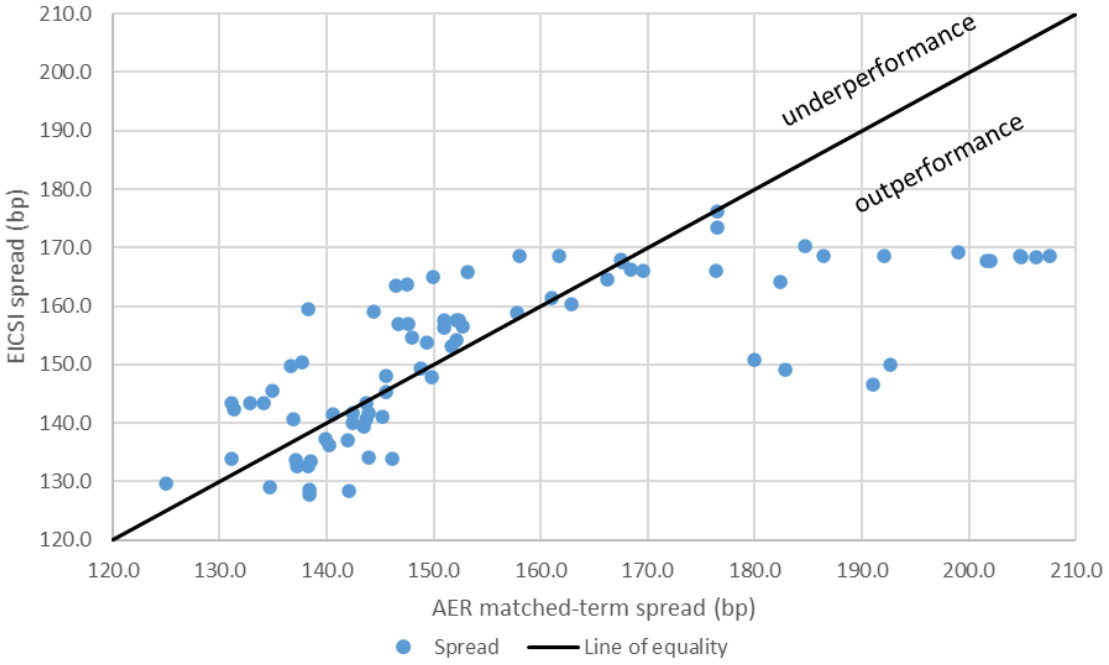
Table 9.4 compares the range of the EICSI and our benchmark spread since January 2014. It shows that, while minimums observed are similar, the EICSI has a much lower maximum and smaller range compared with our current approach.

Table 9.4 Range comparison of EICSI and AER benchmark credit spreads (January 2014 to June 2022)

Statistic	EICSI	AER
Minimum (basis points)	100	118
Maximum (basis points)	178	223
Range (basis points)	78	105

The peaks of the benchmark credit spread tend to be the periods of highest outperformance. This is the case after adjusting for the difference in term. Figure 9.8 plots the monthly EICSI credit spread against the relevant AER matched-term credit spread. Where the point lies to the right of the line, there is residual outperformance (the EICSI is lower than the AER matched-term estimate). It shows minimal outperformance or underperformance when the AER benchmark (matched-term) credit spread is under 170 basis points but increases substantially as the benchmark credit spread increases above 170 basis points. When the benchmark (matched-term) credit spread is above 170 basis points the EICSI shows consistent outperformance.

Figure 9.8 AER A/BBB 10-year rolling 12-month and matched-term outperformance (January 2015 to June 2022)



Source: AER analysis; Chairmont, *Aggregation of debt data for portfolio term to maturity*, 28 June 2019

Analysis above suggests that the debt raised by privately owned regulated service providers on the primary debt market may be somewhat insulated from the high-risk premiums that may be evident in the secondary market, which covers a broader range of borrowers. As such, there may be some residual outperformance in times of high credit spreads (or risk premiums) in the secondary debt market, allowing the regulated NSPs to raise debt at a lower cost than our benchmark suggests. If this is the case and debt costs rise in the secondary market, there may be some expected residual outperformance against our benchmark.

However, the number of observations where the AER matched-term credit spread is above 170 basis points is relatively few – only 18 monthly observations from the 92 observations presented in Figure 9.8. The average residual outperformance of the EICSI against a matched-term benchmark since the start of 2015 is around 2.5 basis points. When we perform the same analysis for the period post-April 2018, the residual outperformance decreases from 2.5 basis points to −2.4 basis points (underperformance with matched-term).[510]

ENA noted in its submission to the information paper that it considered residual outperformance of 4 basis points over the period was clearly within the bounds of estimation error. It also submitted CEG's analysis of the NSPs' data that indicated underperformance of

[510] Residual outperformance refers to outperformance against the matched-term benchmark cost of debt.

1 basis points on average (EICSI is higher than the AER benchmark), with greater underperformance in recent years. It also noted persistent average underperformance when EICSI is tenor and value weighted.[511] As such, ENA submitted that the residual outperformance and underperformance identified was not materially significant. Experts in concurrent evidence sessions also agreed that this residual outperformance was unlikely to be statistically or economically significant.[512] Mr Kumareswaran likewise stated during the concurrent evidence sessions that if we were to consider materiality of outperformance, we should also take into consideration the underperformance evident on the left of the line in Figure 9.7, which may be material as well.[513]

9.3.2.3 Reasons for decision

In the 2018 Instrument, we used EICSI as a 'sense check' on our benchmark cost of debt approach. In our final working paper, we considered 3 broad alternative options for using the EICSI in a more formulaic way to adjust our benchmark to better align the return on debt allowance with the expected actual debt costs of the NSPs.[514] These options were:

- remove the residual outperformance and adjust the benchmark blend of credit curves
- remove the residual outperformance and adjust the benchmark term
- remove the residual outperformance.

Adjusting blend of credit curves

We noted in our final working paper that adjusting the blend of credit curves was not a preferred option for the 2022 Instrument.[515] The result of our decomposition indicates that credit rating is not a key driver of the observed outperformance. The main driver of the observed outperformance is related to the term of debt, with some potential residual outperformance in times of high average risk premiums in the secondary market yield curves. We do not consider there is sufficient evidence to adjust the blend of credit rating curves at this time.

Adjusting the benchmark term

While term (tenor) of debt issuances included in the EICSI is a key driver of observed outperformance, we do not consider that this necessarily implies that this outperformance should be adjusted or that the benchmark term should be changed. We consider that the benchmark term of the return on debt should match that of an efficient firm's borrowing, consistent with the principles of incentive regulation. As discussed in section 9.3.1, our decision is to maintain the benchmark term of the return on debt at 10 years. We do not consider there to currently be sufficient evidence for applying a shorter term. Furthermore, it

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[511] ENA, *Rate of Return Instrument review AER Final Omnibus Paper and information paper Submission*, 11 March 2022, p. 115.

[512] AER, *Concurrent evidence session 1 - Proofed transcript*, February 2022, pp. 15, 21–23.

[513] AER, *Concurrent evidence session 1 - Proofed transcript*, February 2022, pp. 22-23.

[514] AER, *Overall rate of return, equity and debt omnibus - Final working paper*, November 2021, p. 83.

[515] AER, *Overall rate of return, equity and debt omnibus - Final working paper,* November 2021, pp. 85–86.

is unclear whether issuing shorter-term debt is a temporary practice by some firms given their circumstance or reflects efficient borrowing practice that will continue in the future. Our analysis of WATMI indicates that the current range for the average term of the return on debt (as of June 2022) is between 8 and 10 years.

After adjusting for the impact of term, our analysis suggests there remains some small residual outperformance on average since 2014, particularly when credit spreads in the secondary debt market are high. However, we do not consider there is sufficient evidence to suggest this residual outperformance is material and persistent. A single period in 2016 when the third-party curves showed high debt costs in the secondary debt market has contributed to this observed outperformance. It is not clear from the current evidence that this experience in 2016 was the result of unusual market conditions or can be expected in future periods of high debt costs. This is consistent with experts' views in the concurrent evidence sessions and submissions from stakeholders, who agreed that observed outperformance is unlikely to be statistically or economically significant to warrant any adjustment.[516]

ENA submitted there is no evidence of persistent or expected outperformance. Networks do not systematically issue debt at a yield below that of the independent third-party benchmark. Any difference in term is explained entirely by the necessity of issuing short-term debt after a transaction and by the AER's exclusion of a relevant form of debt.[517]

Implementing a cap on the benchmark cost of debt

The CRG and ENA both disagreed with implementing a cap on the benchmark cost of debt. The CRG noted that such a cap may create unanticipated consequences, while ENA submitted that a cap would embed bias in the regulatory allowance and the AER should rule out ever applying a cap.[518] We do not consider it appropriate to rule out the application of a cap should further evidence suggest that the debt costs of service providers of regulated gas and electricity NSPs are materially different to the debt cost evident from the third-party yield curves.

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[516] AER, *Concurrent evidence session 1 - Proofed transcript*, February 2022, pp. 15, 21–23; AGIG SAPN VPN, *2022 Rate of Return Instrument review - Omnibus papers final - Submission*, 11 March 2022, p. 6; APA, Ausgrid, ENA, *Rate of Return Instrument review AER Final Omnibus Paper and information paper Submission*, 11 March 2022, p. 120; Endeavour Energy, *Rate of Return information paper - Submission*, 11 March 2022, p. 5, NSG, *AER Rate of Return information paper and Omnibus final working paper - Submission*, 11 March 2022, p. 13; Transgrid, *AER Rate of Return final Omnibus paper - Submission,* 11 March 2022, pp. 8-9, APGA, *Rate of Return Instrument information paper - Submission*, March 2022, p. 24; AusNet, *Rate of Return 2022 information paper - Submission*, 11 March 2022, p. 2.

[517] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 113.

[518] ENA, *Rate of Return Instrument review AER Final Omnibus Paper and information paper Submission*, 11 March 2022, p. 121.

Using EICSI as the primary source of data

The Independent Panel recommended that we consider using the EICSI as the primary source of data relating to credit spreads and that the current third-party yield curve approach be used as the cross-check.[519]

Network submissions on the draft Instrument were supportive of maintaining the use of EICSI as a cross-check and that it should not be used in any deterministic way to set the return on debt benchmark.[520] However, the CRG agreed with the Independent Panel recommendation for the AER to further consider using EICSI and submitted that in an incentive regime, consumers should over time share in the benefits when there is clear evidence of continuing outperformance.[521]

We have considered using EICSI as the primary source of data in our earlier work. A constraint of the EICSI data is that it only reflects the cost of newly issued debt. As regulated entities issue new debt relatively infrequently, the EICSI dataset does not have many observations. Based on an assumption that EICSI had a small dataset, Dr Lally spoke in support of using EICSI as a cross-check during the concurrent evidence sessions.[522] We agree with Dr Lally that the dataset underlying the EICSI is not large yet, but we will continue to collect industry debt data to improve the robustness of EICSI and inform our future analysis. We consider the current dataset is sufficiently large to be useful as a cross-check.

We also note that using EICSI as the primary source of data may create a situation where the return on debt allowance is affected by the debt financing practices of individual NSPs. This means that forces other than efficient debt financing practices may come into play, as raised by APGA.[523] An advantage of the current yield curve approach is that it is based on data from credible and independent third parties.

Removing all outperformance

The CRG submitted that it is a priority that the outperformance observed in EICSI is addressed and that consumers see some benefit of this outperformance as well as networks. The CRG was agnostic about how this was addressed.[524] The average outperformance of

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[519] Independent Panel Report, *AER Draft Rate of Return Instrument*, July 2022, p. 45.

[520] AGIG, *Draft RoRI response*, September 2022, p. 1; APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 47; APGA, *Draft 2022 Rate of Return Instrument, September 2022*, p. 17; Ausgrid, *Submission Draft RoRI*, September 2022, p. 5; AusNet, *Response to the Draft 2022 Rate of Return Instrument*, September 2022, p. 3; ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 113; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 8; Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, September 2022, p. 6.

[521] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 44.

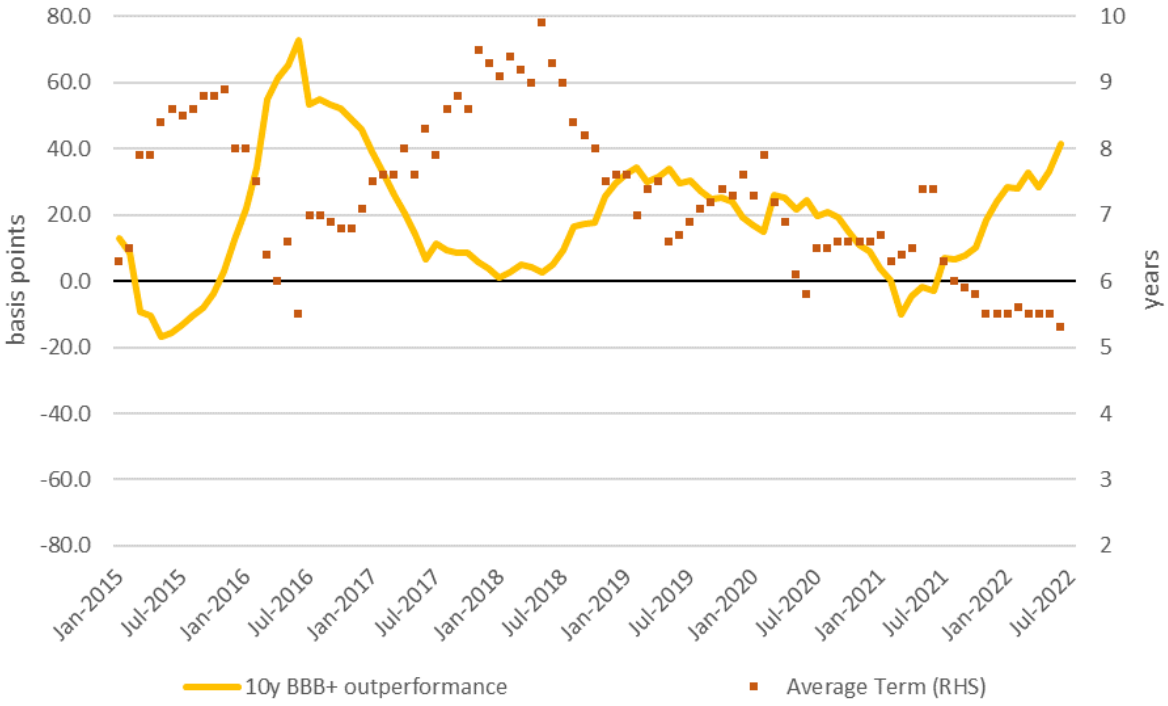
[522] AER, *Concurrent Evidence Session 1 - Proofed transcript*, February 2022, p. 15.

[523] APGA, *Draft 2022 Rate of Return Instrument*, September 2022, pp. 17–18.

[524] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, pp. 43,45.

EICSI against the AER benchmark from January 2015 to June 2022 is 19 basis points (previously 18 basis points to June 2021). Figure 9.9 shows the difference between the AER benchmark and EICSI since January 2015. There was a period of very high outperformance in 2016 with a very low average term. The potential causes of this are discussed under *Adjusting the benchmark term*. While outperformance dropped (and even went negative) in 2021, the latest data collection shows that it has risen again and was around 40 basis points in June 2022. This also corresponds to a period with very low average term.

Figure 9.9 Difference between AER benchmark and EICSI (tenor weighted) (January 2015 to June 2022)



Source: AER analysis

The data received in 2021–22 showed debt issuances with shorter terms and smaller face values compared with the remaining outstanding debt. However, we consider that:

3) This pattern may be temporary and it is unclear whether it would persist into the future. For example, the observed pattern may be related to the recent period of economic uncertainty, as well as acquisitions of several NSPs in 2022.

4) The overall debt portfolios of the NSPs carry debt of various maturities and the average tenor of debt in those portfolios, once adjusted by value (as reflected in WATMI) is between 8 and 10 years.

Therefore, while we currently observe outperformance in EICSI in 2022, it is likely due to several newly issued, relatively small-value and short-tenor debt instruments. This new issuance does not appear to be representative of the debt instruments in the NSPs' overall debt portfolios. It might also not be reflective of the future debt issuance pattern.

The CRG also submitted that, due to us not formally defining persistent or material outperformance, we are not applying objective standards but rather using our regulatory

judgement.[525] We agree with this assessment but consider the adopted approach reasonable, given the characteristics of the EICSI dataset.

Conclusion

We consider that EICSI is becoming an increasingly valuable data source to inform our decision-making and plays a significant role as a cross-check. While EICSI is an important part of our analysis, there are also other models we consider, such as tenor weighting, WATMI and matched-term analysis. This analysis indicates adequate performance of the benchmark credit rating and third-party yield curves once the term of EICSI is matched. When we look at all these models holistically, we do not see sufficient evidence to adjust our benchmark approach at this time.

9.3.2.4 Assessment criteria

As discussed above, our consideration of issues shows that we are required to exercise our discretion about the evidence and methods that are available for us to make our decision. Where necessary we have applied our assessment criteria to assist us exercise our judgement. Table 9.5 sets out our assessment criteria and key areas where they have assisted us make our decision.

Table 9.5 Assessment criteria of final decision use of industry data

Assessment criteria		Final decision
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.	Using the results of the EICSI analysis as a review of the overall reasonableness of our benchmark allowance is reflective of 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.	The use of industry debt issuance data is consistent with the purpose of examining the relevance of the third-party credit curves for informing the benchmark.
3	Implemented in accordance with good practice: (a) supported by robust, transparent and replicable analysis that is derived from available credible datasets.	While transparency of calculations is limited because the dataset cannot be published due to confidentiality, the methodology has been published and the results independently replicated.
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 inputs estimation (b) based on quantitative modelling that avoids arbitrary filtering or adjustment of data that does not have a sound rationale.	We consider that current data underlying the EICSI is sufficiently robust for use as sense check on benchmark approach. Not yet sufficiently large to appropriately adjust the benchmark cost of debt.

[525] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 43.

Assessment criteria		Final decision
5	Where market data and other information is used, this information is: (a) credible and verifiable (b) comparable and timely (c) clearly sourced.	This criterion is hard to satisfy due to the confidential nature of the underlying data – as such, it is not material to our consideration.
6	Sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.	We will continue to collect industry debt data annually and monitor EICSI and use the results to review the overall reasonableness of our benchmark allowance at the next rate of return Instrument.
7	The materiality of any proposed change.	We do not consider there is sufficient evidence to suggest any residual outperformance is material and persistent to justify formulaic adjustment to the benchmark.
8	The longevity or sustainability of new arrangements.	We consider that our benchmark allowance should only be adjusted if there is expected to be future material and persistent outperformance (or underperformance).

9.3.3 Benchmark credit rating

Our final decision is to maintain a benchmark credit rating of BBB+. We consider this is consistent with the available empirical evidence. Table 9.6 shows the historical credit ratings for NSPs from 2013 to 2022.

Table 9.6 Credit ratings

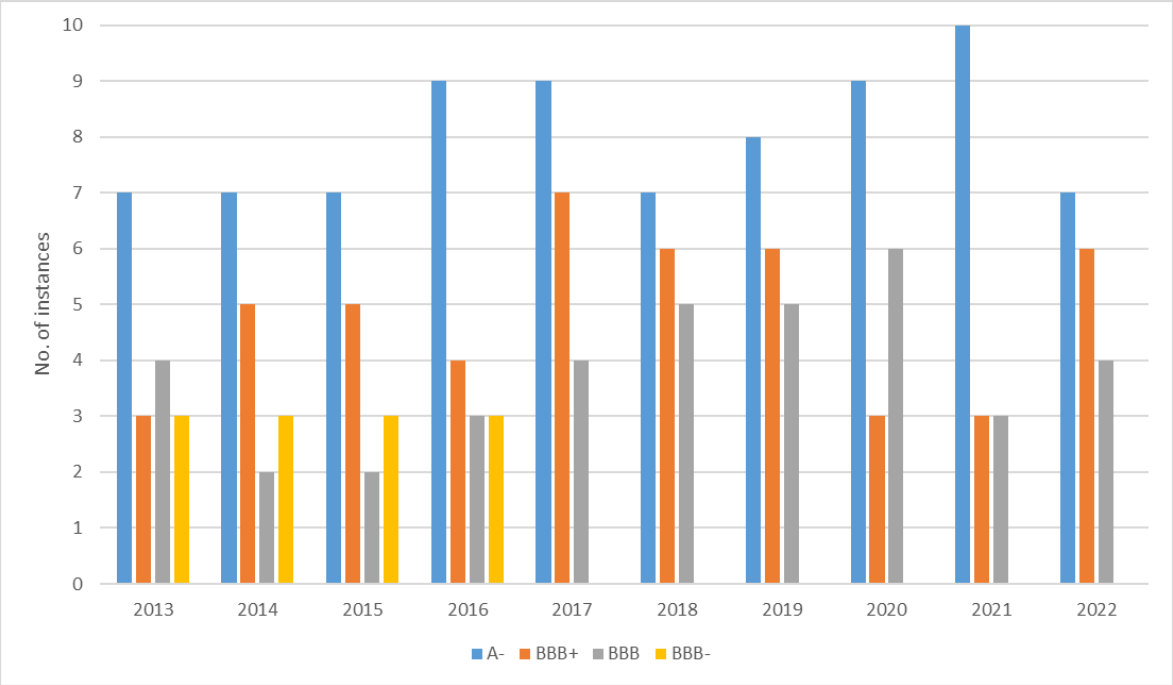
Issuer	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
APT Pipelines Ltd	BBB	BBB	BBB	BBB	BBB	BBB	BBB	BBB	BBB	BBB
ATCO Gas Australia LP	A-	A-	A-	A-	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+
DBNGP Trust	BBB-	BBB-	BBB-	BBB-	BBB	BBB	BBB	BBB	NR	NR
DBNGP Finance Co P/L	BBB-	BBB-	BBB-	BBB-	BBB	BBB	BBB	BBB	A-	A-
DUET Group	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
ElectraNet P/L	BBB	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+	BBB	NR	BBB
Energy Partnership (Gas) P/L	BBB-	BBB-	BBB-	BBB-	BBB+	BBB+	BBB+	BBB+	A-	A-
Australian Gas Networks Ltd	BBB	BBB+	BBB+	BBB+	BBB+	BBB+	A-	A-	A-	A-
ETSA Utilities	A-	A-	A-	A-	A-	NR	A-	NR	NR	NR
ETSA Utilities Finance P/L	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-
Powercor Australia LLC	BBB+	BBB+	NR	NR	NR	NR	NR	NR	NR	NR
AusNet Services (Distribution) Pty Ltd	A-	A-	A-	A-	A-	NR	NR	NR	NR	NR
AusNet Services Ltd	A-	A-	A-	A-	A-	A-	A-	A-	A-	BBB+

Issuer	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
AusNet Service Holdings P/L	A-	A-	A-	A-	A-	A-	A-	A-	A-	BBB+
AusNet Transmission Group P/L	A-	A-	A-	A-	A-	A-	A-	A-	A-	BBB+
SGSP (Australia) Assets Pty Ltd	BBB+	BBB+	BBB+	A-	A-	A-	A-	A-	A-	A-
The CitiPower Trust	BBB+	BBB+	NR	NR	NR	NR	NR	NR	NR	NR
United Energy Distribution P/L	BBB	BBB	BBB	BBB	A-	A-	A-	A-	A-	A-
Victoria Power Networks Pt/L	NR	NR	BBB+	BBB+	BBB+	BBB+	BBB+	A-	BBB+	BBB+
Victoria Power Networks (Finance) P/L	NR	NR	BBB+	A-	A-	A-	BBB+	A-	A-	A-
NSW Electricity Networks Finance P/ L	NR	NR	NR	BBB	BBB	BBB	BBB	BBB	BBB	BBB
Ausgrid Finance P/ L	NR	NR	NR	BBB+	BBB+	BBB	BBB	BBB	BBB	BBB
Network Finance Company P/L	NR	NR	NR	NR	BBB+	BBB+	BBB+	BBB+	BBB+	BBB+
Industry median (yearly)	**BBB+**	**BBB+**	**BBB+**	**BBB+**	**BBB+**	**BBB+**	**BBB+**	**BBB+**	**A-**	**BBB+**

Notes: The data is as 31 December for each year. ATCO Gas Australia, DBNGP Trust and DBNGP Finance are not under AER regulation. For some of the NSPs there is now more than one related entity listed in the table, which may affect the calculation of the median. However, after considering this factor, we still consider BBB+ to be the appropriate benchmark.
Source: Bloomberg; Refinitiv (S&P Global, Moodys); AER analysis

All debt issuers within the sample have maintained investment grade credit ratings (between BBB- and A-). Table 9.6 shows that NSPs have maintained a median credit rating of BBB+ over the past 10 years. The only exception is 2021 when the median credit rating improved to A-. While this could indicate that NSPs' credit ratings are improving, the 5-year and 10-year medians remain BBB+. Further, the 2022 median has dropped back to BBB+. Figure 9.10 displays the instances of each credit rating per year.

Figure 9.10 Instances of each credit rating per year (2013 to 2022)



We also analysed the credit ratings given to issued debt and whether the mix of credit ratings changes over time in our EICSI. Using a numerical scale, the average credit rating of instruments issued remained relatively stable over the past 5 years at BBB+. This is discussed further in section 9.3.2.2.

Submissions supported a benchmark credit rating of BBB+.[526] The only submission not supportive was from APA, which submitted that the benchmark should be BBB.[527]

In our view the evidence supports maintaining a benchmark credit rating of BBB+.

9.3.3.1 Implementation of the benchmark credit rating

Our final decision is to use a weighting of two-thirds broad-BBB curves and one-third broad-A curves to reflect a BBB+ benchmark credit rating. This maintains the approach in the 2018 Instrument.

A combination of broad-BBB and broad-A curves is required to provide the best fit to a BBB+ benchmark credit rating because:

[526] AGIG, *Draft RoRI response*, September 2022, p. 1; APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p. 17; Ausgrid, *Submission Draft RoRI*, September 2022, p. 5; AusNet, *Response to the Draft 2022 Rate of Return Instrument*, September 2022, p. 3; ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 111; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 8; Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, September 2022, p. 6.

[527] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 49.

- reliance on a broad-BBB curve only would overestimate the level of credit risk of a BBB+ benchmark credit rating due to the inclusion of lower rated bonds in the sample (BBB and BBB-)
- reliance on a broad-A curve only would underestimate the level of credit risk for a BBB+ benchmark credit rating because all the constituents (A-, A, A+) are higher rated than the BBB+.

A 2/3 broad-BBB: 1/3 broad-A blend was selected in 2018 after analysis of actual debt raised by service providers in the EICSI showed that it provided the best estimate of the BBB+ benchmark.[528]

Since 2018 we have continued to collect data on the actual debt raised by NSPs and undertaken further analysis. In the final omnibus paper, we conducted a decomposition of the credit rating blend to understand how much of the observed outperformance of the benchmark return on debt was due to credit rating. This analysis showed that credit rating did not appear to be a particular driver of outperformance, indicating that the current blend was appropriate.[529] Updated analysis conducted using 2022 data (received after the draft Instrument was published) continues to support the current blend.

Submissions did not advocate for change to the 2/3 broad-BBB: 1/3 broad-A estimate for a BBB+ benchmark.

Therefore, we conclude that a 2/3 broad-BBB: 1/3 broad-A estimate is a good match for our benchmark credit rating of BBB+. This is supported conceptually and by our analysis of debt issuances over the past 10 years (2013 to 2022).

9.3.4 Choice of third-party provider

We use third-party yield curve data to estimate the return on debt. We source this data from a number of independent third-party providers. Our final decision is to maintain the use of 3 data providers – RBA, Bloomberg and Refinitiv.

In the 2013 Guideline, we relied on yield curve data from 2 data providers, RBA and Bloomberg. In the 2018 Instrument, we added a third data provider, Thomson Reuters. We included Thomson Reuters to expand the number of data providers and reduce the impact of outlier of missing observations on our estimation of the cost of debt. At that time, a fourth provider, S&P Global, was also considered but not included.

In 2018 Thomson Reuters sold a majority stake of its finance and risk unit to a private equity firm, the business formed was subsequently called Refinitiv. We have previously continued to call the series ‘Thomson Reuters’ in our publications but have updated to ‘Refinitiv’ in this explanatory statement and in the Instrument, where appropriate. The change is in name only

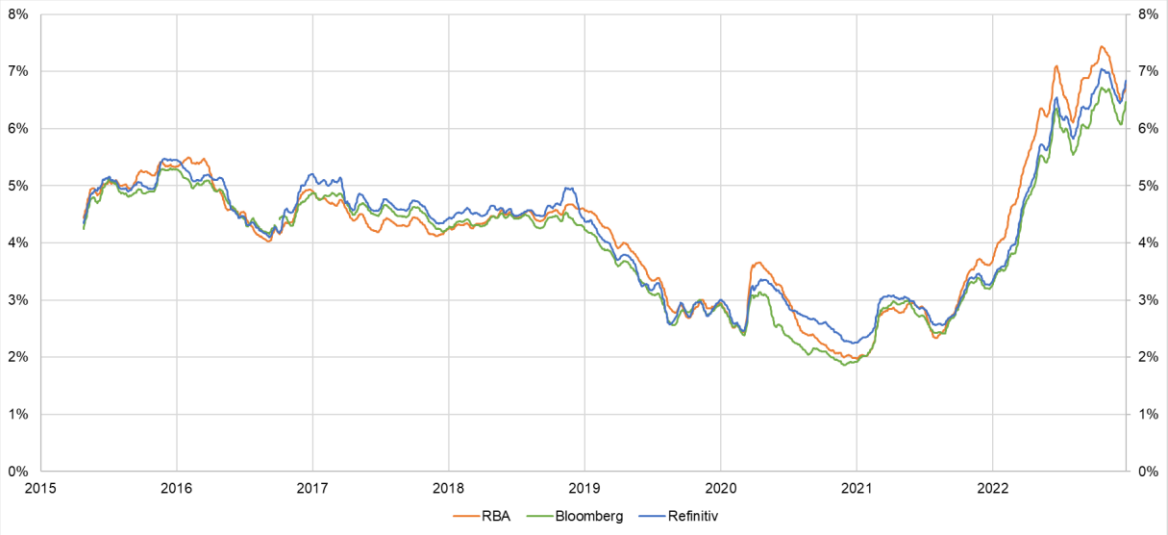
[528] AER, *Rate of return instrument - Explanatory statement*, December 2018, p. 280.

[529] AER, *Overall rate of return, equity and debt omnibus - Final working paper*, December 2021, pp. 85–86.

and is the same series included in the 2018 Instrument. Thomson Reuters and Refinitiv may be used interchangeably throughout this explanatory statement.

Figure 9.11 displays debt yield curves for each data provider using the benchmark return on debt methodology outlined in the 2018 Instrument (10-year term and BBB+ credit rating).[530]

Figure 9.11 BBB+ debt yield curves for RBA, Bloomberg and Refinitiv (April 2015 to December 2022)



Notes: Yields are shown as effective annualised rates and have been calculated according to the 2022 Instrument. Yields have been averaged over a 10-day period.
Source: RBA; Bloomberg; Refinitiv; AER analysis

Using data from RBA, Bloomberg and Refinitiv has been working well and our EICSI analysis in section 9.3.2.2 shows no material outperformance once term is accounted for, indicating good performance from the data providers. As such, there is limited reason to change the composition of providers.

Specifically, we will rely on:

- RBA estimates from its Aggregate Measures of Australian Corporate Bond Spreads and Yields - F3 data series
- Bloomberg estimates from its BVAL series (BVCSAB Index and BVCSAE Index)
- Refinitiv estimates from its blended AUD corporate series (BBBAUDBMK Index and AAUDBMK) Index.

Based on the available evidence, we consider none of the RBA, BVAL or Refinitiv methodologies to be clearly superior. Our view is that the combined use of the 3 data providers will contribute to achievement of the NEO and NGO to the greatest degree. Our key reasons for this view are:

[530] AER, *Rate of return instrument - Explanatory statement,* December 2018, pp. 7–17.

- On the bond selection criteria (including approach for identifying outliers) and curve fitting (or averaging) methodologies, we consider that the approaches employed by the RBA, Bloomberg and Refinitiv have their unique strengths and weaknesses, but we are not satisfied that any curve is clearly superior.
- All of the curves from all 3 of the data providers require adjustment from their published form to make them fit for purpose. We are not satisfied that one can be more simply or reliably adjusted to estimate the annual return on debt than another.
- Applying equal weight to each of the 3 data providers is simple and fit for purpose. The process of developing a more sophisticated weighting scheme would rely on contentious assumptions and we are not persuaded that the increase in complexity would result in an estimator we have greater confidence in. In our view, there is no persuasive evidence that the likely difference in averages from different weighting schemes will be material over time.
- An average of the 3 data providers reduces the impact of shocks in any one of the individual curves. This will likely reduce volatility of our estimator. Further, using 3 data providers incorporates a natural contingency if one of the providers ceases publication.

We did not receive any submissions calling for changes to our third-party data providers or support for using any additional providers.

9.3.4.1 Adjustments to published data

We rely on published third-party yield curves to implement our return on debt approach. In some cases, these published third-party yield curves require minor adjustments to meet the requirements for our estimation process. Table 9.7 sets out the current features of published yield curves that may necessitate some adjustment. Presently, these required adjustments involve extrapolation, interpolation and conversion to an effective annual rate.

In the 2018 Instrument we adopted a common approach to the extrapolation, interpolation and conversion for each of the published curves. Our final decision in 2022 is to maintain this approach.

We did not receive any submissions calling for changes to our adjustments to published third-party data.

9.3.4.2 Extrapolation

Where the published curve has a maximum published effective term of less than the target term to maturity, we will extrapolate that term to our benchmark term of 10 years. Specifically:

- If we need to extrapolate a curve with a longest published estimate less than 10 years but greater than or equal to 7 years, we will linearly extrapolate the spread to Commonwealth Government Securities (CGS) component of the published yield to 10 years using the 2 longest published estimates and will add this to a 10-year CGS.
- If a curve provider ceases publishing a curve with a longest term of greater than or equal to 7 years, we will not rely on that curve.

9.3.4.3 Interpolation

We will use linear interpolation, where we need a value for which there is no published estimate but it lies between 2 published estimates. For example, the RBA only publishes its curve estimates for one day each month, but we require estimates for each business day. As a result, we interpolate the RBA month-end data across all business days in the month.[531] This requires assumptions about the linearity of spread movements over the course of the month.

9.3.4.4 Conversion to an effective annual rate

The effective annual rate is calculated by taking the nominal rate of adjusting it for the number of compounding periods in the year, as follows:

$$\text{Effective annual rate} = \left(1 + \frac{r}{n}\right)^{n} - 1$$

Where:

- *r* is the stated yield
- *n* is the number of compounding periods in a year.

Table 9.7 Necessary adjustments to published yield curves

Curve	Criteria
BVAL	Bloomberg typically publishes a daily 10-year BVAL estimate so the only necessary adjustment is conversion to an effective annual rate, which is a straightforward adjustment.
RBA	The RBA only publishes data on one day per month. As a result, we are required to interpolate monthly spreads to Commonwealth Government Securities (CGS) to produce a daily yield series. Because of the RBA's curve-fitting methodology, its published 10-year estimate typically has an 'effective term' of less than 10 years. We extrapolate the RBA curve from its 'published' 10-year term (effective term is closer to 9 years) to an 'actual' 10-year term using linear extrapolation from the published 7-year and 10-year estimates. In addition, RBA estimates require conversion to an effective annual rate.
Refinitiv	Refinitiv typically publishes a daily 10-year estimate, so the only necessary adjustment is conversion to an effective annual rate. However, Refinitiv does not extrapolate beyond the longest term in its bond sample and the availability of its 10-year estimate may vary.

Source: AER analysis; Bloomberg; RBA; Refinitiv.

9.3.5 Return on debt averaging periods

To mitigate the day-to-day volatility of market rates, our established approach has been to estimate the return on debt over a specified averaging period. To ensure that the Instrument can be automatically applied, it must set out the required characteristics for return on debt averaging periods and the process for NSPs to nominate periods in regulatory proposals.[532]

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[531] For the purposes of all return on debt calculations, 'business days' are those days on which the RBA publishes CGS data in its F16 data release – Indicative Mid-Rates of Australian Government securities.

[532] NEL, s. 18J(2)(b), NGL, s. 30E(2)(b).

In our view, the 2018 Instrument approach for determining averaging periods remains mostly appropriate for the purposes of implementing the return on debt approach.

For our 2022 Instrument our final decision is to modify the start and end dates of the averaging period nomination window to finish no less than 5 months (previously 4 months) prior to commencement of a regulatory year and start no earlier than 17 months (previously 16 months) prior to the commencement of a regulatory period. Our key reasons for this decision are:

- We require sufficient time after the end of an averaging period, and prior to the start of a regulatory year, to calculate the updated return on debt and communicate the results to NSPs. NSPs then need time to consider these results and incorporate them into their annual pricing for that regulatory year. Retailers then require sufficient time to adjust their pricing.
- Since establishing the averaging period criteria in 2018, we have found that a change to the publication schedule of the RBA (one of the data providers used for the updates) in conjunction with our own internal processes are resulting in short turnaround times for the updates. This increases pressure on us, NSPs, retailers and customers.

Because clause 24(e) of the Instrument states that averaging periods may not overlap for each different regulatory year, this change will have a one-off impact of reducing the maximum length nomination period to 11 months in the first year of the regulatory period for some NSPs. If an NSP previously nominated averaging periods ending 4 months prior to the start of the last regulatory year in their current regulatory control period, they will be unable to select a period commencing 17 months prior to the first year of a new regulatory period (they will only be able to select a period commencing up to 16 months prior). This is because different years' averaging periods cannot overlap. After reviewing all previously nominated averaging periods, we do not consider this one-off impact to be material.

Support for the amended return on debt nomination window was provided by APA and ENA.[533] ENA noted that some NSPs have swap portfolios with financial instruments designed to rollover in periods that they expect to be able to nominate averaging periods within. Further it noted that placing a new restriction on when an averaging period can be nominated may be disruptive to those businesses, and/or add cost.[534] This view was echoed by Ausnet in its submission – Ausnet was not supportive of the change.[535]

We acknowledge these potential disruptions, but our view is that providing more time for the price adjustment process is important for the orderly operation of the framework. Further, our review of nominated averaging periods did not indicate material disruption.

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[533] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 53; ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 114.

[534] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 114.

[535] AusNet, *Response to the Draft 2022 Rate of Return Instrument,* September 2022, p. 3.

9.3.5.1 Timing issue

NSPs are required to nominate averaging periods consistent with the Instrument in force at the time of submitting their regulatory proposals. However, the AER is required to apply the Instrument in force at the time of making our final regulatory decision. Some NSPs are affected by a 'timing issue' that arises because some NSPs are required to submit averaging period nominations compliant with the 2018 Instrument but will have the 2022 Instrument applied when we make our final regulatory decision.

The change to the averaging period nomination windows in this 2022 Instrument and the timing issue could result in NSPs nominating averaging periods that would not be compliant with the 2022 Instrument when we make our final regulatory decision. Delay to the publication of the 2022 Instrument to February 2023 increased the number of NSPs affected by this timing issue to include the NSPs with regulatory proposal due in January 2023. When putting together their regulatory proposals, some of these NSPs relied on the draft 2022 Instrument when determining their averaging periods in anticipation of the 2022 Instrument being made in December 2022 and being in force when they submit their regulatory proposals in January 2023.

Therefore, for all NSPs affected by the above timing issue, the permitted averaging period nomination windows encompass periods set out in both the 2018 Instrument and the draft 2022 Instrument.[536] That is a return on debt averaging period nomination window commencing no earlier than 17 months and ending no later than 4 months before the start of a regulatory year. This change ensures that if NSPs impacted by the timing issue lodged compliant averaging periods with their regulatory proposals (theoretically compliant under either the 2018 Instrument or the draft 2022 Instrument) they will still be able to use the averaging period that they nominated. The requirement for averaging periods to not overlap still applies, as does the requirement that averaging periods are no longer than 12 months in length.[537]

This is a slightly different approach to the carve out clauses we used in the 2018 Instrument.[538] The reason for this changed approach is to allow NSPs to use the averaging periods that they have nominated if the nominated periods are consistent with either instrument's averaging period clauses. Therefore, it will not penalise NSPs that prepared proposals on the basis that the 2022 Instrument would be published in December 2022 and that it would apply to their proposals which would be lodged after this date.

No changes were made to all other averaging period clauses, outlined in Table 9.8.

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[536] The impacted NSPs that are allowed this flexibility are: AGN (VIC), Ausgrid, Ausnet Services (Gas), ElectraNet, Endeavour Energy, Essential Energy, Evoenergy, Multinet, Murraylink, Power and Water Corporation, TasNetworks, Transgrid.

[537] See clauses 7 and 24 of the 2022 Instrument.

[538] 2018 Rate of Return Instrument clauses 8(d)(ii) and 24(f)(ii) in conjunction with clause 25.

Table 9.8 Return on debt averaging period criteria – clause 24 of draft Rate of Return Instrument

Clause no.	2018 Instrument criteria	2022 final Instrument criteria	Comments
24(a)	Be over a period of 10 or more consecutive business days, up to a maximum of 12 months	No change	N/A
24(b)	Start no earlier than **16 months prior** to the commencement of a regulatory year	Start no earlier than **17 months prior** to the commencement of a regulatory year	Modified to allow service providers to nominate averaging periods up to 12 months with the change to cl. 24(c). There may be a one-off impact in the first year of the regulatory period where service providers can only nominate an 11-month period due to potential overlap with previous averaging periods.
24(c)	Finish no later than **4 months prior** to the commencement of a regulatory year	Finish no later than **5 months prior** to the commencement of a regulatory year	Modified to allow more time for the price adjustment process.
24(d)	Be specified for each regulatory year within the regulatory control period	No change	N/A
24(e)	Not overlap for each different regulatory year, although the averaging period is not required to be identical for each regulatory year	No change	N/A
24(f)	Be nominated both: • prior to the start of the return on debt averaging period, and • no later than the lodgement date of the regulatory proposal for the regulatory control period.	No change	N/A

9.3.6 Data provider contingencies

Our final decision is to adopt an annually updating return on debt approach.

As a result, our decision on how to apply third-party data sources must be fully specified upfront in each determination and must be capable of being applied over the regulatory control period without the use of subsequent judgement or discretion.

For this reason, we have described a series of contingencies. These contingencies are set out formally in clause 26 of the final Instrument. They set out how we propose to estimate the annual return on debt in the event of revisions in the RBA's, Refinitiv' or Bloomberg's methodologies or other changes to data availability. Our final decision is to maintain the contingencies outlined in the 2018 Instrument.

Our overall principles are that the contingencies should:

- Be clear and unambiguous. The rules require the automatic application of a formula to update the trailing average portfolio return on debt. As a result, we will be unable to analyse changes to the approaches or new approaches during the regulatory control or access arrangement period. Therefore, it is important that any contingency be clear and easily implementable.
- Use curves in a form as close as possible to their published form.
- Where necessary, rely on the independent expert judgement of the RBA, Bloomberg and Refinitiv. Where Refinitiv, the RBA or Bloomberg makes changes to its methodology, we would prefer to evaluate these changes before concluding we are satisfied the curve still meets the criteria set out in the draft Instrument.
- Preserve the use of as many data sources as possible. Where a curve provider shortens its longest published term below 10 years but greater than or equal to 7 years, we will use linear extrapolation to allow for a 10-year estimate for that curve.
- Favour up-to-date data. Where we cannot source data for one or 2 of the 3 yield curve providers on a particular day, we will rely only on the remaining curve providers. While this results in a smaller dataset, it reflects up-to-date data. Only where all third-party yield curve providers cease publication will we rely on historical data.

Table 9.9 Contingencies for implementing the return on debt approach[539]

Clause no.	Contingency approach
Cl 26(a)	If a curve provider on day *i* publishes either a broad A-rated or broad BBB-rated yield estimate with a maximum published term less than 10 years, but greater than or equal to 7 years, then the yield estimate for day *i* must be linearly extrapolated to an exact term of 10 years in accordance with clause 14.
Cl 26(b)	If a curve provider on day *i* does not publish either a broad A-rated and broad BBB-rated yield estimate with term greater than or equal to 7 years but less than or equal to an exact term of 10 years, then the yield for day *i* in clause 10 must be calculated using the remaining available data curves. If all curve providers on day *i* do not publish a broad A-rated or a broad BBB-rated yield estimate (such that there is not a single A-rated or not a single BBB-rated yield estimate) with term greater than or equal to 7 years but less than or equal to an exact term of 10 years, then a simple average of the spread to 10-year CGS will be added to the daily 10-year CGS estimate to provide each curve estimate.
Cl 26(c)	If any curve provider substitutes its current methodology for a revised or updated methodology to replace the current methodology listed in clause 32, clause 33, clause 34 and clause 35, then the revised or updated methodology must be used to calculate yield for day *i* in clause 12, in accordance with clause 31.
Cl 26(d)	If any curve provider revises or updates its historical yield estimates, the revised or updated historical yield estimates must not be used to recalculate the allowed return on debt that has been finalised for any regulatory year in accordance with clause 8.
Cl 26(e)	If the RBA replaces its publication with daily yield estimates, then linear interpolation is no longer required to obtain daily yield estimates, and so the newly published daily yield estimates must be used to calculate the yield for day *i*.

[539] Exact formulas are set out in the draft Instrument and they take precedent in the event of any perceived or actual inconsistency in Table 9.9.

Cl 26(f)	If either Refinitiv or Bloomberg replaces their publication with a different frequency (for example, monthly yield estimates instead of daily yield estimates), the new yield estimates must be converted into daily yield estimates in accordance with clause 14, clause 15 and clause 16.

We did not receive any submissions calling for changes to our third-party data provider contingencies.

9.3.7 Trailing average

Our final decision is to estimate the return on debt using the 10-year trailing average portfolio approach (including transition) with annual updates as adopted in our 2018 Instrument and 2013 Guideline.

For clarity, our final decision is to continue a consistent transition approach across all networks we regulate. That is, we will continue the transition that has commenced in a previous determination for an NSP. This will allow NSPs to complete the 10-year transition period from the previous 'on-the-day' approach to the trailing average approach.

For each year of the 10-year trailing average, we will continue to estimate the return on debt as the simple average of rates observed over a period nominated (averaging period) by the NSP. This (simple) trailing average approach:

- applies equal weights to each annual return on debt estimate feeding into the trailing average other than the first year that the transition to the trailing average commenced
- updates the return on debt estimate annually
- uses a benchmark term of debt of 10 years
- implements a 10-year transition into the adoption of the 10-year trailing average approach.[540]

9.3.7.1 Background

Our current simple trailing average approach estimates the return on debt as the cost of debt that would be incurred by a benchmark business for debt raised over 10 regulatory years in equal increments.[541] As discussed in our previous decisions, this approach provides ex-ante efficient compensation on debt capital over the term of the RAB if a full transition is applied.[542]

This outcome relies on debt balances of a benchmark business remaining relatively stable over time. If the benchmark business has significantly increasing (or decreasing) debt balances along with large changes in prevailing interest rates, using a simple trailing average

[540] AER, *2018 Rate of return Instrument – Explanatory statement*, December 2018, pp. 276, 282.

[541] We assume the benchmark efficient entity refinances an equal share of debt each year. That is refinancing of 10% of total debt each year with new 10 years fixed rate debt. This results in us applying a weight of 1/10 for each year in the trailing average.

[542] AER, *Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3 - Rate of return*, November 2017, pp. 326–328. AER, *Final decision AusNet Services distribution determination 2016 to 2020 Attachment 3 - Rate of return*, May 2016, pp. 307–308.

might result in a mismatch between its efficient debt financing costs and the allowed return on debt.[543] This mismatch would generally lead to a departure from the NPV=0 condition and could lead to an inefficient outcome.

Since we introduced the simple trailing average and, until recently, observed post-tax revenue model (PTRM) debt balances have tended to be relatively stable. In our final working paper, we presented annual changes in PTRM debt balances for the regulated businesses based on AER decisions (or draft decisions) to 2021.[544] It showed that, setting aside Transgrid and ElectraNet, average annual growth rates over a regulatory period in PTRM debt balances varied between −0.5% and 4.6%. An average growth rate in PTRM debt balances of under 5% would be unlikely to result in material deviation from the NPV=0 condition.

However, the Australian Energy Market Operator's (AEMO) Integrated System Plan (ISP) has raised the prospect of large transmission projects being undertaken over the next 10 to 15 years.[545] These projects could result in the RABs of several transmission NSPs increasing significantly over a short period. As a result, there could be debt raising requirements in some years materially beyond the 10% level applied in our current simple trailing average approach.

Therefore, in our draft debt omnibus paper[546] and final working paper[547] we explored options to introduce weights to the trailing average approach introduced in the 2013 Guideline (simple trailing average). We did so because we were concerned that the simple trailing average might not operate effectively when regulated businesses finance large capital expenditure by raising more debt in a rising interest rate environment. We were particularly concerned that large capital investments would be required in the transmission sector and that, if the current cost of debt was different to the historical trailing average, there could be impacts on incentives to invest. For example, if current interest rates are above the historical trailing average, networks could face issues in financing a significant step up in investment.

Under a weighted trailing average, instead of assigning equal weights to each year of the trailing average, weights would reflect potential time variability of NSPs' RABs. This aims to reduce any mismatch between the return on debt allowance and benchmark efficient debt financing costs. This might better align with the NPV=0 condition and so may better promote an efficient outcome.

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[543] Dr Martin Lally (Capital Financial Consultants), *The appropriate term for the allowed cost of capital*, 9 April 2021, pp. 3–4.

[544] AER, *Rate of return overall rate of return, equity and debt omnibus,* December 2021, pp. 92–94.

[545] AEMO, *2020 Integrated System Plan (ISP)*, 30 July 2020, p. 64.

[546] AER, *Rate of return draft debt omnibus paper*, July 2021, pp. 18–25.

[547] AER, *Rate of return overall rate of return, equity and debt omnibus*, December 2021, pp. 87–99.

After hearing from experts in the concurrent evidence session on 10 February 2022[548] and reviewing stakeholder submissions to our information paper and call for submissions,[549] our draft decision[550] was to maintain the simple trailing average approach. Key reasons in reaching this conclusion were:

- It is not clear whether a benchmark business would find it efficient to increase debt raising significantly beyond 10% in a year. Instead, the benchmark business may issue proportionately more equity than that consistent with the benchmark gearing level, especially at the project's early stages.[551]
- Even when a benchmark business does raise its debt issuance beyond 10% in a year, there are practical difficulties with implementing a weighted trailing average. One difficulty is that introducing a weighted trailing average would introduce additional administrative complexity.[552]
- Another practical difficulty is whether to set the weights using forecasts or through a true-up after actual capex is known. The effectiveness of using a forecast depends on the accuracy of the forecast. We have observed that forecast capital expenditure in the post-tax revenue model (PTRM) differs, both in timing and magnitude, from actual capital expenditure. We frequently see projects that are delayed by several years. As a result, weights based on PTRM debt issuance assumptions may not reflect efficient debt financing costs. Using actual capital expenditure to set the weights would result in the need to apply a true-up mechanism. Applying such a mechanism would add complexity and may also result in uncertainty because the true-up could occur under a different instrument.[553]
- For an NSP receiving its first determination under the 2022 Instrument, application of the current simple trailing average approach would start with on-the-day allowed return on debt before a gradual transition to a full trailing average over 10 years. To the extent a new project is financed by issuing both debt and equity around the time of the first application of the Instrument, the simple trailing average approach would mitigate the potential mismatch between the return on debt allowance and cost of debt.[554]
- We compared outcomes under the simple and weighted trailing average across a range of scenarios. Under these scenarios, the difference over the next 5 years in return on debt between the 2 approaches was only pronounced when both large increases in the

[548] Transcript of proceedings, Australian Energy Regulator Rate of Return Instruments Concurrent Evidence Session 2 of 4, February 2022, pp. 51–52.

[549] AER, *Rate of return information paper and call for submissions*, December 2021, pp. 27–28.

[550] AER, *Draft rate of return instrument explanatory statement*, June 2022, pp. 225–242.

[551] AER, *Draft rate of return instrument explanatory statement*, June 2022, p. 229.

[552] AER, *Draft rate of return instrument explanatory statement*, June 2022, pp. 229–230.

[553] AER, *Draft rate of return instrument explanatory statement*, June 2022, pp. 229–230.

[554] AER, *Draft rate of return instrument explanatory statement*, June 2022, p. 231.

regulatory asset base (RAB) and prevailing interest rates occurred. This could potentially happen for a limited number of transmission NSPs undertaking large new projects.[555]

- Many submissions to our information paper also generally supported retaining the simple trailing average approach, noting that it had the most merit and the case for change has not yet been made. The network that is most likely to be impacted is Transgrid because it is likely to be undertaking large amounts of additional investment as part of the Integrated System Plan. Transgrid's submission to our information paper did not support the weighted approach.[556]

9.3.7.2 AER considerations

In our draft decision analysis, we identified a number of considerations that could mitigate potential benefits provided by a weighted trailing average. Those considerations are summarised above. We consider these issues are still pertinent.

In our draft decision we also considered several scenarios. We observed that for a business with relatively steady RAB, changes in prevailing interest rates would result in a similar return on debt allowance under both weighted and simple trailing average approaches. This captures most businesses we regulate most of the time. We observed that for the weighted and simple trailing average approaches to produce noticeably different outcomes there needed to be a large change in both capex and interest rates.

This is consistent with the advice of Dr Lally that the extent of the departure from the NPV=0 condition would depend on:

- the difference between the prevailing return on debt and the trailing average
- the size of the new capital expenditure relative to RAB.[557]

In the next round of regulatory determinations under this 2022 Instrument, out of currently regulated NSPs only Transgrid is likely to have a particularly large change in debt balances and could be impacted by the introduction of a weighted trailing average.[558] However, we expect this change to be gradual, with the new projects going through regulatory investment tests and early stages of construction. This gradual pace of change in debt balances would limit the impact of a weighted trailing average. Transgrid also noted in its submission to our draft decision that weighted trailing average would not address Transgrid's concerns in relation to large new investment and suggested a different rate of return be applied during construction to recognise its risk.[559]

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[555] AER, *Draft rate of return instrument explanatory statement*, June 2022, pp. 231–238.

[556] AER, *Draft rate of return instrument explanatory statement*, June 2022, pp. 238–241.

[557] Dr Martin Lally (Capital Financial Consultants), *The appropriate term for the allowed cost of capital*, 9 April 2021, pp. 32–33.

[558] We further discuss Intending Transmission NSPs below in Treatment of new entrants.

[559] Transgrid, *Response to AER draft Rate of Return Instrument*, September 2022, p. 4.

Aside from Marinus Link, all other stakeholder submissions to our draft decision on this matter supported the retention of the simple trailing average.[560] APA further noted in its submission that a weighted trailing average could add considerable complexity and further consultation is required.[561]

The Independent Panel review of our draft decision also recommended further work be undertaken before our next review so that modifications to our simple trailing average approach could be introduced if required.[562]

In addition, the ENA's presentation at the second rate of return public forum on 7 September 2022 noted that, while the current simple trailing average return on debt is below the prevailing interest rate, ENA supported the retention of trailing average because of the smoothing benefits for networks and consumers.[563] This broadly aligns with the CRG's view that consumers and networks ride the cycle of 'ups and downs'.

Given the above, for our final decision, we consider it prudent to retain the simple trailing average. As recommended by the Independent Panel, we will do further work on how a weighted trailing averaged would be implemented before we consult on this topic again in preparation for the 2026 Rate of Return Instrument review.

Treatment of new entrants

In our draft decision we observed under the current Instrument the issue of potential mismatch between return on debt allowance and cost of debt of a new entrant could be partly mitigated by the transition period arrangement. Under this arrangement, for an NSP's first determination under the Instrument, its allowed return on debt is initially set at the prevailing rate of return on debt, and then each year 10% of it is reset (refreshed) to the new prevailing rate. This corresponds to the debt costs of a benchmark business that starts by raising 100% of debt in year one and then refinances 10% of its debt balances in the following years.

To the extent that new entrants raise most of their capital in the early years of their determinations under the Instrument, the current arrangement of placing greater weight on the return on debt in the first year of the transition works to mitigate any potential difference between debt costs and regulatory return on debt allowance. Therefore, in the draft decision we considered that the benefits of introducing weighted trailing average for new entrants were likely limited.

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[560] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 9, Ausgrid, *Submission Draft RoRI*, September 2022, p. 5, CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 46, ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 112, Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 8, Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, September 2022, p. 6.

[561] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 62.

[562] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p. 46.

[563] ENA, *Public forum presentation*, September 2022, p. 15.

Marinus Link submitted to our draft decision its support for the adoption of a weighted trailing average.[564] Marinus Link's submission noted that most of its debt will be raised in later years of construction and the relatively high weighting that applies to year one debt under the current transition period arrangement will not provide an appropriate benchmark cost of debt.[565]

While we acknowledge Marinus Link's concerns, we consider Marinus Link should be able to manage any interest rate mismatch risk it faces under our current approach. This is because Marinus Link is funded by the Australian Government and 2 state/territory governments with treasuries that manage relatively large debt portfolios and are experienced in managing interest rate risk.

However, while we consider a change is not required for Marinus Link given its particular circumstances, our intention is to revisit the weighted trailing average for our 2026 instrument review.

9.3.7.3 Assessment criteria

Our consideration of issues shows that we are required to exercise our discretion about the evidence and methods that are available for us to make our decision. Where necessary, we have applied our assessment criteria to assist us to exercise our judgement. Table 9.10 sets out our assessment criteria and key areas where they have assisted us to make our decision.

Table 9.10 Criteria of draft decision on trailing average

Assessment criteria		Draft decision
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 are informed by sound empirical analysis and robust data.	Having a debt portfolio with staggered maturity dates, as modelled by the current trailing average approach, is critical to mitigating refinancing risk. This approach reflects economic and finance principles for achieving NPV=0 and market practice by NSPs.
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.	The current trailing averaging approach is fit for purpose and the estimation method is simple to implement.
3	Implemented in accordance with good practice: (a) supported by robust, transparent and replicable analysis that is derived from available credible datasets.	Market data used in calculating the trailing average return on debt is sourced from 2 reputable financial data providers (Bloomberg and Refinitiv) and the RBA. These datasets are robust, transparent and replicable.
4	Where models of the return on equity and debt are used these are:	Calculation to determine return on debt under the current trailing average approach

[564] Marinus Link, *2022 Rate of Return Instrument – Draft Decision*, September 2022, p. 2.

[565] Marinus Link, *2022 Rate of Return Instrument – Draft Decision*, September 2022, pp. 1–2.

Assessment criteria		Draft decision
	(a) based on quantitative modelling that is sufficiently robust as to not be unduly sensitive to errors in inputs estimation (b) based on quantitative modelling that avoids arbitrary filtering or adjustment of data that does not have a sound rationale.	is robust and does not involve any arbitrary filtering or adjustment of data.
5	Where market data and other information is used, this information is: (a) credible and verifiable (b) comparable and timely (c) clearly sourced.	Data used to calculate the trailing average return on debt are sourced from 2 reputable financial data providers (Bloomberg and Refinitiv) and the RBA. The analysis is credible and verifiable and reflects latest data available at the time.
6	Sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.	As one-tenth of debt balance is updated with the on-the-day cost of debt annually, reflective of benchmark business financing practices, this ensures the trailing average return on debt continuously reflect changing market conditions and new information.
7	The materiality of any proposed change.	Proposed weighted trailing average approach, for the determinations made under 2022 RORI, is unlikely to result in material differences from the current trailing average approach, while adding significantly more complexity and uncertainty.
8	The longevity or sustainability of new arrangements.	The majority of NSPs have relatively stable RABs, making the current simple average approach most applicable. We currently do not consider the benefits of a weighted trailing average approach are sufficiently clear or necessary to make a change from our current simple trailing average approach. We intend to continue to monitor debt financing practices of the NSPs and revisit the issue in our 2026 Instrument review.

10 Imputation tax credits

Under the Australian imputation tax system, investors receive imputation credits (also known as franking credits) for tax paid at the company level. For eligible shareholders, imputation credits can be used to offset their Australian income tax liabilities. The value of imputation credits (known as gamma or 'γ') needs to be factored into regulation to recognise that imputation credits benefit equity holders, in addition to any dividends or capital gains they receive.[566]

Because we use a post-tax framework with a rate of return that is after company tax but before personal tax, the value of imputation credits is not a weighted average cost of capital (WACC) parameter.[567] Instead, it is a direct input into the calculation of a regulated firm's tax liability, via the corporate tax component of the building block model. This approach is consistent with standard Australian regulatory practice and is the approach prescribed in the National Electricity Rules (NER) and the National Gas Rules (NGR).

10.1 Final decision

Our decision is to maintain our approach to estimating gamma as the product of the distribution rate and the utilisation rate. We adopt a gamma estimate of 0.57.

We considered the implied market value approach in estimating the utilisation rate. We reaffirm our view that this approach is inconsistent with the Officer framework and do not give weight to it.

We met with the Australian Taxation Office (ATO) on 8 December 2022 to better understand the underlying methodology and data that were used to produce its estimates of the utilisation rate. The ATO largely reiterated its previous advice to us. The ATO has subsequently provided us with updated estimated rates of imputation credits distributed to residents and net franking credit usage. The updated data is broadly consistent with previous data. We do not have additional visibility of the underlying data used to produce those estimates. Therefore, while having regard to the updated ATO estimates, we continue to primarily rely on estimates based on Australian Bureau of Statistics (ABS) data.

Our final gamma estimate of 0.57 is marginally below that of our draft decision estimate of 0.585. We made this change based on a revised rounding approach using updated empirical estimates of the distribution rate and the utilisation rate. We have rounded the final gamma number to 2 decimal places.

10.2 Draft decision

Our draft decision was to maintain our overall approach to estimating gamma. We also maintained the same values from the 2018 Instrument for gamma and its 2 parameters:

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[566] In this document we use 'value of imputation credits and 'gamma' interchangeably.

[567] The AER uses a nominal vanilla WACC.

- gamma: 0.585 (= distribution rate x utilisation rate)
- distribution rate: 0.90
- utilisation rate: 0.65.

Under the 'utilisation' approach for estimating the value of imputation credits, gamma is equal to the product of the distribution rate and the utilisation rate:[568]

- The distribution rate[569] is the proportion of imputation credits generated that is distributed to investors. Our estimate of the distribution rate was informed by data in the financial statements of the top 50 Australian Securities Exchange (ASX) listed firms.
- The utilisation rate is the utilisation value to investors in the market per dollar of imputation credits distributed. Our estimate of the utilisation rate estimate was informed by the ABS wealth data applying the equity ownership approach.

In our review of the 2018 Instrument, the topic of gamma was considered in great depth. We adopted a gamma value of 0.585, which was based on an estimated distribution rate of 0.90 and a utilisation rate of 0.65. Our view was that the 2018 approach remains robust and appropriate.

We considered whether we should use data from the ATO to inform our estimate of the utilisation rate. The ATO provided us with updated estimated rates of imputation credits distributed to residents and net franking credit usage in October 2021. However, it did not include any additional information about the ATO's detailed data or methodology, which would enable us to adequately assess the suitability of these estimates. Therefore, we propose that we do not give weight to these ATO estimates.

We also considered it appropriate to maintain our assumption that non-resident investors derive zero value from imputation credits. This was broadly supported by stakeholders and there was no evidence that would persuade us to adopt a different assumption.

10.3 AER considerations

10.3.1 Market value approach

Our decision is to maintain our existing approach to estimating the utilisation rate and gamma and not adopt a market value approach.

[568] See P. Monkhouse, 'The Valuation of Projects Under the Dividend Imputation Tax System', Accounting and finance, 1996, vol. 36(2), pp.185–212.

[569] This is also known as payout ratio.

The Independent Panel agreed with our existing approach,[570] as did the APGA, the AGIG and APA.[571]

On the other hand, the ENA, the NSG and Endeavour suggested that imputation credits should be interpreted as the market value of dividend imputation franking credits.[572] Specifically, the ENA considers that gamma should be estimated as the value of franking credits relative to the value of the dividends and capital gains that they replace.[573]

We previously discussed this issue in detail in the 2018 Instrument, where we considered the merits of implied market value studies (specifically dividend drop off studies) to estimate the utilisation rate.[574] Dividend drop off studies involve comparing the share price between:

- the cum-dividend date – the last day on which investors owning shares will be eligible to receive dividends and the attached imputation credits
- the ex-dividend date – the first day on which investors owning shares will not be eligible to receive dividends and attached imputation credits.

Using an assumption of no arbitrage, the cum-dividend share price should equal the ex-dividend share price plus the dividend amount and franking credit amount, with all other things being equal. This is so that the investor who buys a share on the cum-dividend date is no better or worse off than the investor who buys a share on the ex-dividend date.

We examined a number of dividend drop-off studies and found that these studies have several shortcomings, including:[575]

- Their results can be influenced by factors such as differential personal taxes and risk. This is inconsistent with the Officer framework, which uses a post company tax and pre personal tax and cost framework.
- Their results reflect the marginal investor who trades around the ex-dividend dates. This is also inconsistent with the Officer framework, which assumes that investors choose portfolios and hold them for some period.
- There are practical issues of how to separate the value of dividend and the value of imputation credits.

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[570] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.46.

[571] APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p.4; AGIG, *Draft RoRI response*, September 2022, p.1; APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p.54.

[572] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p.114; NSG, *Response to AER RORI 2022 Draft Decision,* September 2022, p.14; Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p.8.

[573] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p.114.

[574] AER, *Rate of return instrument Explanatory Statement*, December 2018, pp.367-374.

[575] Ibid., pp.371-374.

Furthermore, the Full Federal Court found that 'it was not an error of construction for the AER to focus on utilisation rather than on implied market value'.[576]

For these reasons, we placed no reliance on estimates from the implied market value approach in the 2018 Instrument.[577]

Stakeholders did not offer any significant new evidence to warrant a change in our view. We consider our reasoning from 2018 to remain valid. Therefore, we do not adopt the implied market value approach to estimating the utilisation rate and gamma.

10.3.2 ATO data

Our decision is to continue to not rely on data provided by the ATO in estimating the utilisation rate and gamma.

In 2018 and 2021 the ATO provided us with high level estimates of:[578]

- imputation credits distributed to resident versus non-residents/non-lodgers as a percentage of imputation credits distributed – defined as the proportion of franking credits received by individuals, superannuation funds, self-managed super funds, charities and companies to the total franking credits distributed
- franking credits claimed through the tax system (excluding companies) – defined as the proportion of franking offset used by individuals, superannuation funds, self-managed super funds and charities compared with the net franking credits distributed.

These estimates were based on the ATO's confidential data.

In the Draft Instrument, we noted that we could not obtain further details on its methodology or underlying data to assess its usefulness in informing our estimate of the utilisation rate.[579]

The Independent Panel suggested that giving weight to ATO data may make a material difference to our gamma estimate.[580] It recommended that we further engage with the ATO to gain a better understanding of any data issues so as to estimate the utilisation rate with greater confidence.[581] The APGA agreed with this recommendation.[582]

We met with ATO staff on 8 December 2022 and sought further assistance to understand its data.[583] The ATO clarified that it uses tax return lodgement data to estimate the amount of

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[576] Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017, para.756.

[577] Ibid., p.374.

[578] ATO, *ATO Note*, 11 December 2018; ATO, *ATO Note*, 28 October 2021.

[579] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, p.255.

[580] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, pp.48-49.

[581] Ibid.

[582] APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p.19.

[583] AER, *Minute of 8 December 2022 meeting with ATO*, December 2022.

franking credits paid versus claimed.[584] It also indicated that the ratios in previous ATO notes were derived based on aggregated data, which may not be useful as not being detailed enough to give a clear picture.[585] The ATO was unable to provide unit record data due to taxpayer confidentiality.[586]

Given that we cannot access the underlying data used to estimate ATO's franking credit usage rates, we are unable to further investigate the reliability and validity of its data.

The ATO subsequently provided updated estimates of its franking credit usage rates.[587] The latest figures are largely consistent with that of previous years. The ATO suggested that the first table (i.e. imputation credits distributed to resident versus non-residents/non-lodgers as a percentage of imputation credits distributed) may be more reflective of overall franking credit usage.[588] As shown in Table 10.1, these figures range from 61% to 66% over the years 2012 to 2020 and are broadly consistent with our own estimates of the utilisation rate using ABS data.

Table 10.1 Assumed imputation credits distributed to residents vs. non-residents/non-lodgers as a percentage of imputation credits distributed

Income year	Residents	Non-residents/non-lodgers
2012	61%	39%
2013	62%	38%
2014	62%	38%
2015	66%	34%
2016	63%	37%
2017	64%	36%
2018	63%	37%
2019	64%	36%
2020	62%	38%

Source: ATO, *ATO Note*, 15 December 2022.

We noted in the Draft Instrument that stakeholders did not provide substantive comments on the 2021 ATO note.[589]While having regard to the updated ATO estimates, we consider that our current approach of using ABS data to estimate the utilisation rate remains robust and transparent. Therefore, it should be retained.

10.3.3 Rounding approach

[584] Ibid.

[585] Ibid.

[586] Ibid.

[587] ATO, *ATO Note*, 15 December 2022.

[588] AER, *Minute of 8 December 2022 meeting with ATO*, December 2022.

[589] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, p.255.

Our decision is to not round the distribution rate or the utilisation rate, and only round the overall gamma number to 2 decimal places.

In our Draft Instrument, we continued the rounding approach from the 2018 Instrument, where we rounded the distribution rate and the utilisation rate each to the nearest 0.05 and did not round the resulting gamma.[590]

The Independent Panel considered our approach to rounding inconsistent, both internally and with the approach adopted elsewhere in the Draft Instrument.[591] It recommended that we round the distribution rate, the utilisation rate and gamma all to 2 decimal places.[592] The ENA and the APGA also supported this approach.[593] No stakeholders opposed this approach.

We have generally not rounded intermediate numbers in other calculations before rounding the final number to the degree we consider appropriate given the precision of the data. For example, we have not rounded inputs into our historical excess return model before rounding our final MRP estimate to one decimal place.

Having considered the Independent Panel's recommendation, we have now determined to not round the intermediate numbers as recommended (that is, the utilisation and distribution rates) before rounding the final gamma number to 2 decimal places. This is consistent with our approach elsewhere in the 2022 Instrument. While rounding is not expected to create an error on average, we consider rounding intermediate numbers in calculations could create a rounding error and, as a result, a bias at a given point in time. We have determined to round the final gamma number to 2 decimal places given the accuracy of the underlying data. This approach is also supported by the ENA and the APGA.[594]

Table 10.2 compares the gamma estimate under different rounding approaches. Adopting the new rounding approach results in a decline in the gamma estimate from 0.585 to 0.57. We consider that the impact of this change is unlikely to be material.

10.3.4 Updated empirical estimates

We maintain our 'utilisation' approach of estimating gamma as a product of the distribution rate and the utilisation rate.

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[590] AER, *Draft Rate of Return Instrument Explanatory Statement*, June 2022, pp.243-245.

[591] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.48-49.

[592] Ibid.

[593] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p.114; APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p.18.

[594] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p.114; APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p.18.

This utilisation approach is informed by the Monkhouse extension of the Officer framework,[595] where investors are considered to obtain a certain 'utilisation' value from distributed credits and no value from undistributed credits.

Clauses 6.5.3 and 6A.6.4 of the NER and rule 87A of the NGR set out the cost of corporate income tax rule, which includes an adjustment for the value of imputation credits as follows:

> The estimated cost of corporate income tax of a Distribution/Transmission Network Service Provider for each regulatory year (ETC_t) must be calculated in accordance with the following formula:
>
> $$ETC_t = ETI_t \times r_t \times (1 - \gamma)$$
>
> Where:
>
> ETI_t is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of standard control/prescribed transmission services if such an entity, rather than the Distribution/Transmission Network Service Provider, operated the business of the Distribution/Transmission Network Service Provider, such estimate being determined in accordance with the post-tax revenue model.
>
> r_t is the expected statutory income tax rate for that regulatory year as determined by the AER, and
>
> γ is the value of imputation credits.

The Independent Panel agreed with our approach and suggested that the methodology is both transparent and widely accepted as fit for purpose.[596] The APGA, the AGIG and APA also agreed with our approach.[597]

Using our latest empirical estimates, we adopt a value for gamma of 0.57, based on a distribution rate of 0.878670689 and a utilisation rate of 0.647450918 (using the most recent 10-year average, as discussed in section 10.3.4.2). We have revised our rounding approach to not round the distribution rate or the utilisation rate and only round the final gamma value to 2 decimal places, as discussed in section 10.3.3. Table 10.2 compares the different outcomes under different rounding approaches.

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[595] R. Officer, 'The cost of capital of a company under an imputation system', Accounting and finance, vol. 34(1), May 1994, pp.1–17.

[596] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.46.

[597] APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p.4; AGIG, *Draft RoRI response*, September 2022, p.1; APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p.54.

Table 10.2 Comparison of gamma estimates using different rounding approaches

Estimates	Previous approach	Independent Panel's recommendation	Our final decision
Unrounded			
Distribution rate	0.878670689	0.878670689	0.878670689
Utilisation rate	0.647450918	0.647450918	0.647450918
Rounded			
Distribution rate	0.90	0.88	Not rounded
Utilisation rate	0.65	0.65	Not rounded
Gamma	0.585	0.57	0.57

Note: The previous approach was used in the 2018 Instrument and the 2022 Draft Instrument and refers to rounding the distribution rate and the utilisation rate each to the nearest 0.05 and not rounding the resulting gamma. The Independent Panel's recommendation is to round the distribution rate, the utilisation rate and gamma all to 2 decimal places. Our final decision is to not round the distribution rate or the utilisation rate and only round the final gamma number to 2 decimal places.
Source: AER analysis

10.3.4.1 Distribution rate

Our estimate of the distribution rate is informed by our update of Dr Lally's previous analysis of the aggregate distribution rate using the data in the financial reports of the top 50 ASX listed firms.[598] We updated this analysis using 2021 data and applied the same methodology used by Dr Lally.

The Independent Panel noted that both the methodology and the apparent stability of the outcome of the distribution rate suggest that this approach has merit.[599]

We estimated the distribution rate as the amount of franking credits distributed divided by the amount of tax paid from 2001 to 2021 for the top 50 ASX firms:

$$Distribution\ rate_{2001\ to\ 2021} = \frac{Franking\ credits\ distributed_{2001\ to\ 2021}}{Tax\ paid_{2001\ to\ 2021}}$$

The amount of franking credits distributed is estimated for each year from 2001 to 2021 from dividend payments based on a tax rate of 30%:

$$Franking\ credits\ distributed = Franked\ dividends \times \frac{Tax\ rate}{1 - Tax\ rate}$$

The amount of tax paid is estimated by taking the most recent franking account balance as at 2021, minus the franking account balance as at 2000, plus the amount of franking credits distributed:

[598] Lally, *Estimating the distribution rate for imputation credits for the top 50 ASX companies*, 24 June 2021.

[599] Independent Panel, *Independent Panel Report – AER Draft Rate of Return Instrument*, July 2022, p.47.

$$Tax\ paid_{2001\ to\ 2021} = Franking\ credits\ distributed_{2001\ to\ 2021} + Franking\ balance_{2021} - Franking\ balance_{2000}$$

We estimated the aggregate distribution rate to be 0.878670689 (unrounded).

Table 10.3 shows the estimates of distribution rate since 2018.

Table 10.3 Distribution rates for the ASX top 50

ASX top 50	2018 Instrument (2000–2017)	2019 update (2000–2018)	2021 update (2000–2020)	2022 Instrument (2000–2021)
Imputation distribution ($m)	235,970	260,292	317,085	346,008
Tax payments ($m)	265,770	294,179	357,298	393,786
Distribution rate	0.888	0.886	0.887	0.879

Comparator: Tables 1 and 2 (pages 5–7) of October 2018 Lally report.
Note: The top 50 ASX companies were determined at 1 August 2018, consistent with the 2018 report.
Source: AER analysis, Lally, *Estimating the distribution rate for imputation credits for the top 50 ASX companies*, 22 November 2019, p.6; Lally, *Estimating the distribution rate for imputation credits for the top 50 ASX companies*, 24 June 2021, p.6.

10.3.4.2 Utilisation rate

Our approach to estimating the utilisation rate is informed by the Monkhouse framework, where the utilisation value is equal to the weighted average, by wealth and risk aversion, of the utilisation rates of individual investors.[600]

For an 'eligible' investor, each dollar of imputation credit received is assumed to be fully returned to the investor in the form of a reduction in tax payable or a refund.[601] Therefore, we have considered that eligible investors have a utilisation rate of 1. Conversely, 'ineligible' investors cannot utilise imputation credits and are assumed to have a utilisation rate of 0.

We updated our estimates using the most recent ABS finance and wealth data. The most recent 5-year average is 0.642473343, while the most recent 10-year average is 0.647450918.

In the 2018 Instrument, we relied on both the 5-year average and the 10-year average in informing our estimates of the utilisation rate and gamma. The rounding approach we adopted at the time, which was to round the utilisation rate to the nearest 0.05, resulted in the same value regardless of which of the two averages we used.

As discussed in section 10.3.3, we have now revised our rounding approach. Under this new approach, we must decide whether to adopt either a 5-year average or a 10-year average of the utilisation rate estimate. At this time, the two approaches result in marginally different

[600] J. Handley, *Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits*, 29 September 2014, pp.18–20.

[601] This is the return to eligible investors before administrative costs, personal taxes and diversification costs.

values of gamma. Using the most recent 5-year average of 0.642473343 results in a gamma value of 0.56, while using the 10-year average of 0.647450918 results in a gamma value of 0.57. We previously relied on both 5 and 10 years, but because of the change in rounding policy we now have to make a choice between either 5 or 10 years as the outcomes are slightly different. Our decision is to adopt an estimate using the 10-year average because we consider the utilisation rate to be stable over time and that a longer period would produce a more reliable estimate. In any event, the difference is not material.

Table 10.4 shows our estimates of utilisation rate since 2018.

Table 10.4 Utilisation rates from the equity ownership approach (2000 to 2022)

Estimates	2018 Instrument (2000–2018)	2019 update (2000–2019)	2020 update (2000–2020)	2021 update (2000–2021)	2022 Draft Instrument (2000–2021 Dec)	2022 Final Instrument (2000–2022 Sep)
Range of annual results	0.612–0.697	0.606–0.697	0.606–0.697	0.618–0.702	0.618–0.702	0.618-0.702
Most recent point estimate	0.638	0.643	0.639	0.647	0.646	0.625
Average over last 5 years	0.646	0.651	0.649	0.646	0.645	0.642
Average over last 10 years	0.643	0.658	0.646	0.646	0.647	0.647

Comparator: Page 366 of the December 2018 explanatory statement.
Note: ABS data commences in September 2000 and runs to June 2018 (2018 instrument), June 2019 (2019 update), June 2020 (2020 update), June 2021 (2021 update), December 2021 (2022 draft instrument), and September 2022 (2022 final instrument).
Source: AER analysis; ABS Australian National Accounts: Finance and Wealth.

10.3.5 Assessment criteria

Our consideration of issues show that we are required to exercise our discretion about the evidence and methods that are available for us to make our decision. Where necessary we have applied our assessment criteria to assist us exercise our judgement. Table 10.5 sets out our assessment criteria and key areas where they have assisted us make our decision.

Table 10.5 Criteria of final decision gamma assessment

Assessment criteria		Final decision
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.	Our approach is consistent with the requirements of the Rules and informed by the Monkhouse extension of the Officer framework.
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 consider the limitations of that purpose (b) promote simple over complex approaches where appropriate.	Our approach is broadly supported by stakeholders and has been found open to us by the Full Federal Court.

Assessment criteria		Final decision
3	Implemented in accordance with good practice: (a) supported by robust, transparent and replicable analysis that is derived from available credible datasets.	Our approach is robust, transparent and informed by reliable publicly available data.
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 inputs estimation (b) based on quantitative modelling that avoids arbitrary filtering or adjustment of data that does not have a sound rationale.	While gamma is not a direct input into the rate of return, our approach for estimating gamma is consistent with the broader building block model framework and our use of a nominal vanilla WACC.
5	Where market data and other information is used, this information is: (a) credible and verifiable (b) comparable and timely (c) clearly sourced.	Our approach is informed by publicly available data, including audited final reports and the public release of ABS national account data.
6	Sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.	We have been open to considering alternative approaches when supported by fresh and robust evidence (e.g. our consideration of ATO private data).
7	The materiality of any proposed change.	We maintained the same approach to estimating gamma as that of the 2018 Instrument and only made a minor change to the rounding approach.
8	The longevity or sustainability of new arrangements.	We consider our conceptual approach to estimating gamma will likely remain appropriate going forward.

11 Overall rate of return crosschecks

Cross-checks involve comparing estimates of the rate of return against other relevant information sources. They may provide a sense check on whether the calculated estimates appear reasonable and consistent with other sources of information. They can also provide additional information in situations where regulatory judgement may be required.

We can apply cross-checks at the overall rate of return level, at the return on equity level and at individual levels within the return on equity (for example, risk-free rate and MRP). In this section, we focus on possible cross-checks at the overall return on equity and rate of return levels. In chapter 5 we describe our foundation model approach, the 6-step process for determining the return on equity. In steps 4 and 5 of the foundation model approach, we look to broader indicators of the suitability of the return on equity. We explicitly consider these latter steps in this section, covering other information and their evaluation.

We then outline the sensitivity and scenario testing we have undertaken. We make a distinction between sensitivity analysis and scenario testing. We describe sensitivity analysis as an approach for observing movements in the rate of return to movements in the underlying parameters. We describe scenario testing as an approach for observing rate of return outcomes in different states of the world.

In the final section of this chapter, we look at the decision in the round and consider whether the decision as a whole is likely to contribute to the achievement of the National Electricity Objective (NEO) and National Gas Objective (NGO) to the greatest degree.

11.1 Final decision

11.1.1 Role of cross-checks in determining overall rate of return

We use cross-checks as a sense check on our overall allowed rate of return and to assist in identifying potential issues. However, we do not use cross-checks in a formulaic way to determine the overall rate of return. Therefore, no cross-check is used to directly determine parameter estimates for the allowed rate of return.

This decision reflects our analysis of the available evidence and consideration of submissions from stakeholders and the Independent Panel on the role cross-checks should play.

If we found that the Instrument did not perform well in a cross-check or future scenario, we would consider options for making changes and review the trade-off with other issues that could also arise.

For example, if we were not satisfied that the decision in the round is likely to contribute to the achievement of the NEO/NGO, we would reconsider:

- CAPM input parameters (for example, equity beta and use of DGM to set MRP)
- cost of debt assumptions
- broader adjustments (for example, the notional gearing assumption, and revenue profile).

We are also conscious that apparent issues in the cross-checks may arise because of other factors in our broader regulatory framework. Therefore, a solution may involve an adjustment in other parts of our decision-making. For example, concerns arising about financeability might be due to our approach to estimating operating costs or the profile of depreciation rather than in our rate of return.

11.1.2 Consideration of cross-checks

We have considered a range of cross-checks and have looked for insights that can be drawn from each. Having considered these, we find some have encouraged us to investigate further.

This has been the case when we consider regulated asset base (RAB) multiples, financeability tests and scenario testing.

We considered additional cross-checks – historical profitability, investment trends, other regulators' rate of return and analysts discount rates. At this time, we found that these did not prompt us to carry out further analysis to inform our assessment of the overall rate of return.

As such, we have considered all these cross-checks and have taken them into account when making our overall decision.

11.1.3 Cross-checks and the overall rate of return

In December 2021 we cautiously expressed the view that the outcomes from the 2018 Instrument remain broadly appropriate.[602]

Our subsequent analysis of cross-checks has not provided evidence to change this view. We considered the information from RAB multiples carefully alongside all the cross-checks and the Independent Panel's considerations. We also evaluated the divergent views put to us by all stakeholders. We consider that a balanced assessment of the performance of the 2018 Instrument finds there is not sufficient evidence to say that it has not performed well.

We find that the parameters maintained for the 2022 Instrument are supported when we consider:

- RAB multiples, given that network businesses have been consistently trading at a price range that represents RAB multiples of 1.2 to 1.6 since the 2018 Instrument and takeover offers indicate RAB multiples of 1.5 to 1.7[603]
- financeability tests, given no material deterioration in financeability since the application of the 2018 Instrument[604]

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[602] That is, it is within the range of reasonable values for the rate of return.

[603] AER, *Electricity network performance report*, September 2021, p. 33; AER, *Electricity network performance report*, July 2022, p. 32.

[604] AER, *Overall rate of return, equity and debt omnibus - final working paper*, December 2021, p. 2.

- sensitivity testing of aspects of the 2022 Instrument (MRP and beta). We have also used scenario testing to assess our 2022 draft and final decisions in potential 'future states' of the world, to check the potential impact of different scenarios.

We are satisfied that we have exercised our judgement across parameters, methodologies and ranges such that the final decision in the round will, or is most likely to, contribute to the achievement of the NEO/NGO.

11.2 Draft decision

11.2.1 Role of cross-checks in determining overall rate of return

This final decision is in line with our draft decision.

11.2.2 Consideration of cross-checks

Our draft decision included an assessment of the usefulness of each cross-check (see table 11.1 of the draft decision). However, for this final decision we do not state 'usefulness' or provide a relative ranking amongst cross-checks. Instead, we confirm our view on which cross-checks encouraged us to investigate further.

11.2.3 Cross-checks and the overall rate of return

For this final decision, we have had regard to the range of cross-checks considered in the draft decision. We have, however, increased our focus on those of most interest (e.g. RAB multiples, financeability tests, and scenario testing).

We considered our 2022 draft decision on the overall rate of return appeared reasonable, given our deployment of relevant cross-checks.[605]

11.3 AER considerations

11.3.1 Role and use of cross-checks

This section covers our consideration of the role and use of each cross-check, which has been informed by our analysis, stakeholder submissions and engagement, and the Independent Panel report.

There are different potential roles for using cross-check evidence to inform the rate of return:

- A formulaic approach – evidence is used to change the rate of return by means of a mathematical formula or other type of a mechanistic approach. For example, if an economic or financial indicator is outside a predetermined range by X amount, we adjust the rate of return (or a rate of return parameter) by Y%.

[605] In particular, RAB multiples and financeability tests.

- Sense check – evidence is used to gauge whether the regulatory allowance is likely to be sufficient. Alternatively, evidence is used to assist with identifying potential issues with our regulatory regime and areas for further research and inquiry.

Our overall preliminary position, outlined in our December 2021 working paper on the overall rate of return, was that cross-checks can be used in a sense-check capacity.[606] This position was reiterated in our draft decision[607] and is supported by analysis for this final decision.

No new evidence supports elevating any of the cross-checks to a higher status or indicates they should be used in a formulaic role. This position is supported by all stakeholders and the Independent Panel. As such, we consider that no cross-check should be used in a formulaic way, as evidence suggests that:

- CAPM should remain our primary model
- all cross-checks have inherent limitations, biases and risks
- there is a lack of regulatory precedent for a formulaic use of cross-checks.

However, the Independent Panel did suggest that consideration should be given to other regulators' use of cross-checks.[608]

Though it is difficult to determine the extent to which cross-checks are used by other regulators due to differences in terminology, availability of information and changes in approach, some examples are available.

For example, Ofgem uses the following cross-checks for its cost of equity estimate:[609]

- Modigliani-Miller cost of equity inference (weighted average cost of capital cross-check)
- market-to-asset ratio (MAR) implied cost of equity
- unadjusted offshore transmission owner (OFTO) implied equity internal rate of return (IRR)
- adjusted OFTO implied cost of equity
- unadjusted investment managers' total market return (TMR) cost of equity
- unadjusted infrastructure fund implied equity IRR
- CAPM with 0.9 equity beta and investment managers' TMR.

However, in its most recent decision, Ofgem made no adjustment to the rate of return based on the findings of cross-checks. Further, Ofgem's latest draft decision (ED2 from June 2022) shows that CAPM is used without adjustment even though cross-checks supported lower

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[606] AER, *Overall rate of return, equity and debt omnibus - final working paper*, December 2021, p. 22.

[607] AER, *Draft 2022 Rate of Return Instrument Explanatory Statement*, June 2022, p. 261.

[608] AER, *Independent Panel report on draft rate of return instrument*, July 2022, p. 56.

[609] Ofgem, RIIO-ED2 Draft Determinations, June 2022, p. 49.

values, stating that: '…we do not adjust the results […] because we are mindful that no cross-check is perfect, and we are confident that CAPM should remain the primary model.'[610]

The Water Services Regulation Authority in the UK (Ofwat) has recently discussed the use of cross-checks in its draft methodology for PR24,[611] stating that it intends to 'set the allowed return on equity on the basis of the CAPM [and does] not envisage departing from the CAPM-derived estimate of the allowed return, unless there is strong and compelling evidence from market-based cross-checks.'[612] Further, Ofwat notes that 'there should be a high evidential bar for moving away from [a] central estimate [and] expect that any adjustment would be modest and would in any case lie within the endpoints of the CAPM-derived cost of equity range.'[613]

Ofwat proposed to use the market-to-asset ratio analysis (that is, RAB multiples) as the main cross-check in determining the allowed cost of equity, noting that '[Ofwat does] not envisage departing from the CAPM-derived central estimate of the allowed return, unless there is strong and compelling evidence from market-based cross-checks such as MAR analysis.'[614] Ofwat's recently published final methodology for PR24 proposes that there is not 'sufficiently strong evidence from our MAR-based cross-check to choose a point estimate other than our central CAPM-derived point estimate.'[615]

Therefore, in considering the Independent Panel's suggestion to look at other regulators' use of cross-checks, we find support for our position to use them as a sense check and not in a formulaic way.

Regarding our choice of cross-checks, the Independent Panel suggested that while cross-checks have limitations, they all contain some information relevant to the overall rate of return.[616] Further, they highlighted that the AER:

> '…says that historical profitability, investment trends, other regulators' rates of return, and practitioners discount rates have 'no role' as cross-checks. We think that it is too extreme to discard these sources of information. Given that the use of cross-checks is the holistic one stated by the AER the evidence from cross-checks should be judged in the round without the necessity of attaching full weight to some and discarding others.' [617]

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[610] Ofgem, RIIO-ED2 Draft Determinations, June 2022, p. 50.

[611] Ofwat, *Draft Methodology for PR24*, July 2022, p. 87.

[612] Ofwat, *Draft Methodology for PR24*, July 2022, p. 94.

[613] Ofwat, *Draft Methodology for PR24*, July 2022, Appendix 11, p. 26.

[614] Ofwat, *Draft Methodology for PR24,* July 2022, p. 93.

[615] Ofwat, *Final Methodology for PR24,* December 2022, p. 58.

[616] AER, *Independent Panel report on draft rate of return instrument*, July 2022, p. 51.

[617] Ibid.

We agree with the Independent Panel that all cross checks are potential sources of information that can be considered holistically. We therefore have regard to all our cross-checks and have taken each into account when making our overall decision.

However, consideration of some cross-checks has encouraged us to investigate further. This has been the case with RAB multiples, financeability tests and scenario testing.

At this time, the information available from consideration of other cross-checks (historical profitability, investment trends, other regulators' rate of return and other practitioners' discount rates) has been noted but our analysis has been more limited.

The CRG suggested the proposed suite of cross-checks should be expanded, to assess impacts on, and outcomes for, consumers.[618] The CRG suggested a range of financial and performance cross-checks, including:

- financial measures, to include:
  - actual return on assets and actual return on equity (that is, historical profitability)
  - notional return on assets and return on equity
  - RAB multiples (disaggregated)
  - investment trends and capital availability
  - level of interest in investing in the regulated businesses
  - trends in credit ratings of the listed businesses
  - capital expenditure proposals of the networks
- operational performance indicators, to include:
  - trends in reliability measures, and performance against statutory and regulatory reliability requirements
  - trends in productivity, with a focus on capital expenditure productivity, using the AER's economic benchmarking tools
  - the level of and trend in utilisation of the network assets.

We have already considered some of the cross-checks mentioned by the CRG in our draft decision including historic profitability, RAB multiples and investment trends.

For the additional cross-checks proposed, we consider many will have similar limitations. As mentioned by the CRG, 'all the cross-checks face the problem of isolating the impact of the regulated rate of return'.[619] We consider this common limitation holds across all other proposed cross-checks, namely the inability to isolate the drivers of the financial and operational results and control for these when considering the impact of the rate of return.

For example, the level and trend in network utilisation has limited information about the rate of return. It is also difficult to isolate the impact of the Rate of Return Instrument on a particular metric, such as network utilisation, particularly when that metric is influenced by

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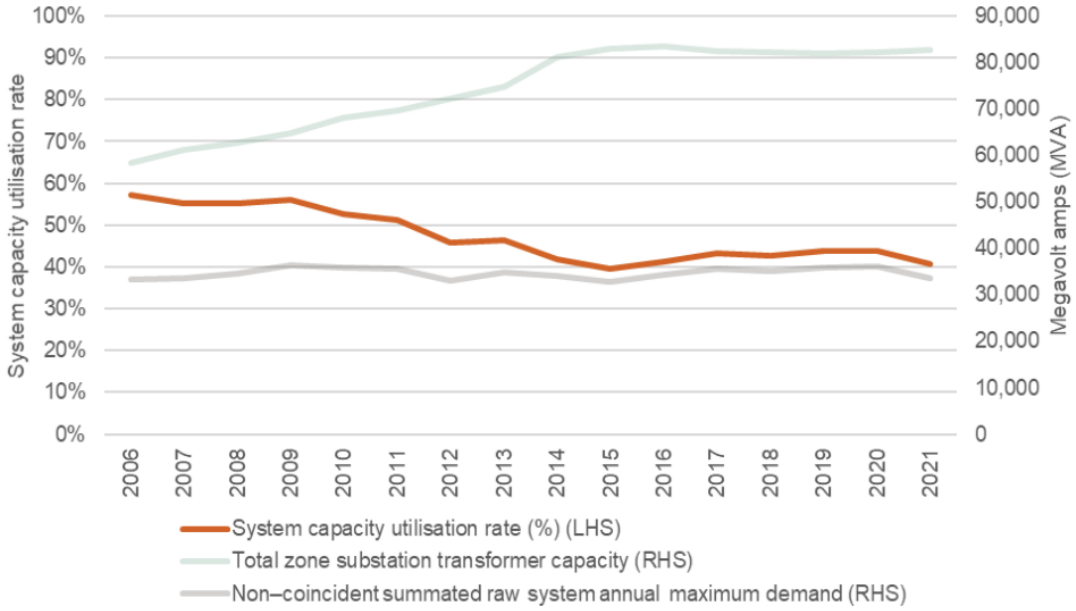
[618] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 62.

[619] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 55.

other factors. Similarly, the rate of return decision is only one of many factors that influence energy price levels, which the CRG (and the University of Wollongong report)[620] proposes has a direct impact on network utilisation.

For completeness and in view of the Independent Panel recommendation, we have included tracking of these operational performance measures drawn from our performance reporting and annual benchmarking (Figure 11.1, Figure 11.2 and Figure 11.3).

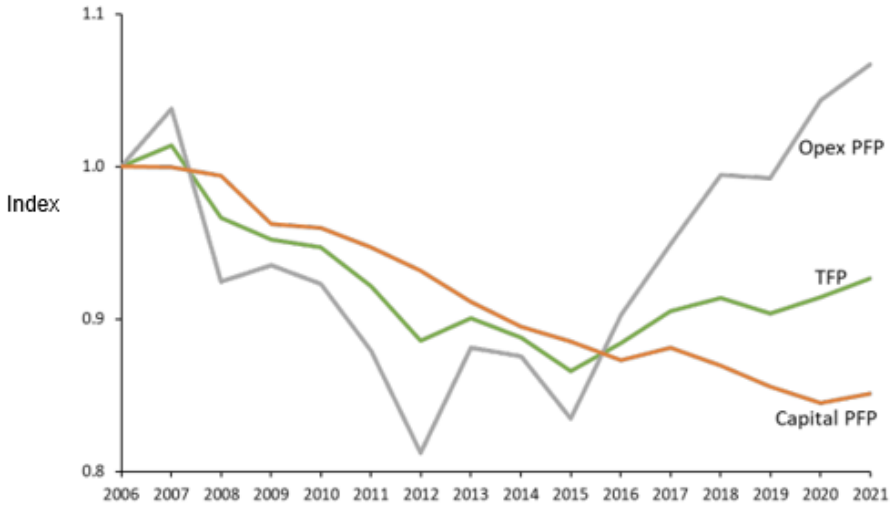
Figure 11.1 Distribution network utilisation – total DNSPs



Source: AER, *Electricity network performance report 2022*, p. 25

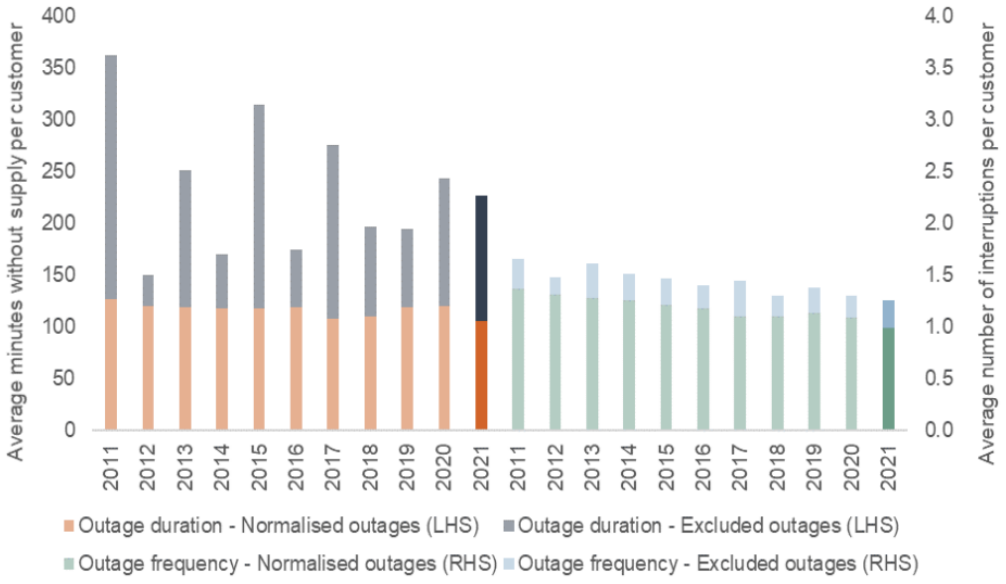
[620] Havyatt, Nepal & Johnstone, *AER consideration of demand side issues in making the Rate of Return Instrument*, report for CRG, August 2022.

Figure 11.2 Electricity distribution, total, capital and opex productivity[621]



Source: AER, 2022 *Annual benchmarking report – electricity distribution network service providers*, p. 18

Figure 11.3 Network reliability as measured by unplanned outages – DNSPs



Source: AER, *Electricity network performance report 2022*, p. 21

To the extent inferences about the rate of return can be drawn from these indicators we do not see a cause for concern. Reliability and productivity have been improving while there appears to be spare capacity within the system. Figure 11.2 above does show a sustained decline in capital PFP. If this was to be interpreted as being due to overinvestment, it could be suggested that this was driven by a high ROR. However, there are many factors outside the ROR that could contribute to this decline. For example, part of this decline can be attributed to network inputs (particularly transformers and underground cables) growing at a

[621] Capital stock, rather than capex, is used as an input in our annual benchmarking report. We do not currently track capex productivity and have not looked at any such information at this stage.

faster pace than key outputs (such as customers, ratcheted maximum demand, and energy throughput) which slightly fell.[622]

Regarding impacts on, and outcomes for, consumers, our continued engagement with the CRG has ensured that we have considered consumers' perspectives and concerns through the review process. Therefore, we have been conscious of potential impacts on consumers when we considered possible scenarios and workings of the Rate of Return Instrument, while remaining mindful of the NEO and our guiding principle.[623] In particular, consumer bill impacts have been one of our central considerations in scenario and sensitivity testing. We are confident that, wherever we have exercised judgement, we have considered the balance between both the bill impacts on consumers and efficient investments for increased reliability of service.

The following sections cover our continued analysis of the theory and application of our range of cross-checks to the overall Rate of Return Instrument.

11.3.1.1 RAB multiples

Regulated asset base multiples (RAB multiples) are a measure of the value of a firm compared with its RAB. RAB multiples can be calculated using:

- the existing share price of a business that has an equity ownership in a service provider, which can be observed continuously if the firm is listed on the stock market (known as trading multiples or trading data), and/or
- the purchase price when a large parcel of shares is exchanged, or through a takeover of the firm, observed at a point in time when a transaction of the service providers occurs (known as transaction multiples or acquisition data).

There are differing views on the role and usefulness of RAB multiples as a cross-check because they can be influenced by a range of factors beyond the regulated rate of return. These factors include:

- firms undertaking business activities beyond the regulated element (unregulated business)
- control premium, overpayment or 'winner's curse'
- incentive rewards and outperforming price control targets
- expected growth in unregulated business and/or incentive rewards or outperformance.

Notwithstanding these factors, RAB multiples are used by some international regulators. For example, as mentioned in section 11.3.1 above, Ofgem and Ofwat use RAB multiple or Market-to-Asset Ratios (MAR), which has historically been as a sense check for the cost of equity. However, in 2022, UK regulators issued a joint consultation which indicated a willingness to deviate from the mid-point of the CAPM cost of equity range if cross-check

[622] AER, 2022 *Annual benchmarking report – electricity distribution network service providers*, p. 18
[623] An unbiased estimate of the expected efficient return, consistent with the relevant risks involved in providing regulated network services.

evidence, specifically RAB multiples, were sufficiently compelling.[624] This suggests that UK regulators could adjust, instead of simply check, the allowed return if RAB multiples provided strong evidence to make an adjustment.

Responses to our December 2021 paper[625] show disagreement in the use of RAB multiples as a cross-check, through submissions and through the subsequent evidence sessions in February 2022.

Stakeholders and experts, including the CRG, Partington and Satchel, and James Hancock noted that RAB multiples:

- provide useful information and satisfy many of our assessment criteria[626]
- are important, cannot be ignored or assigned to simply a role as a sense check[627]
- if high, can lend credence to the idea that regulators have erred on the high side in past regulatory decisions.[628]

Conversely, submissions by stakeholders including the ENA, Transgrid, Grant Thornton, and NSG, as well as expert Dinesh Kumareswaran, suggested that RAB multiples and acquisition activity provide limited or no useful information on the reasonableness or adequacy of the allowed rate of return.[629, 630]

Overall, while we recognise that the application of RAB multiples requires due care and that there are other factors outside our rate of return that influence the value of the businesses we regulate, we do not accept that RAB multiples provide no useful information. We think there is value to be drawn from RAB multiples because they are a direct indicator of the value that investors place on the businesses we regulate. We think the rate of return these businesses derive from the RAB is an important influence on their value.

We have been tracking RAB multiples since 2007. In Figure 11.4, we use Spark Infrastructure and AusNet Services as examples to show performance over this period.

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624 UK Regulators Network, *UKRN guidance for regulators on the methodology for setting the cost of capital — consultation*, p.26.

625 AER, *Overall rate of return, equity and debt omnibus - final working paper*, December 2021, p. 129.

626 Partington and Satchel, *Report to the CRG: AER Cross-checks*, March 2022, pp. 5, 9.

627 CRG, *Advice to the Australian Energy Regulator: CRG Response to the AER's December 2021 Information paper*, March 2022, pp.116–117.

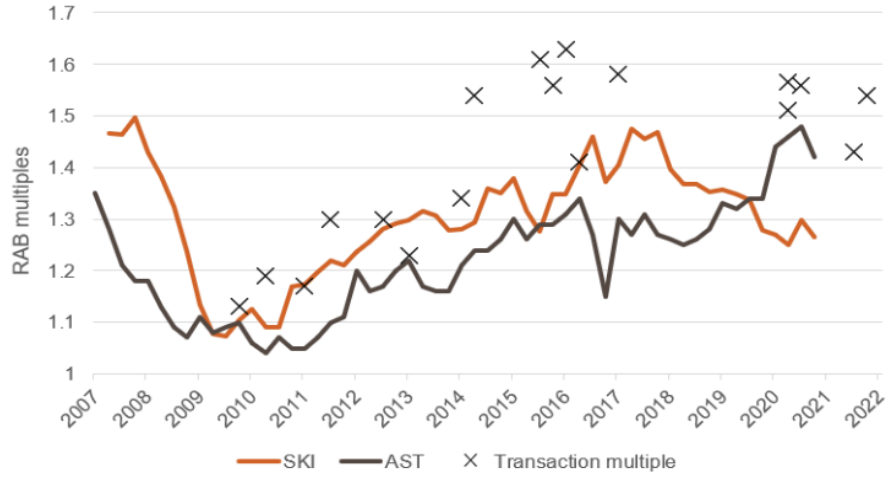
628 James Hancock, Presentation to AER for evidence session on RAB multiples, February 2022.

629 ENA, Rate *of Return Instrument Review: Response to AER's Final Omnibus and Information papers*, 11 March 2022, p. 126; TransGrid, *AER Rate of Return final Omnibus paper - Submission* 11 March 2022, p. 5; Grant Thornton, Energy Networks Australia, *RAB Multiple Project*, March 2022 p. 5; NSG, *Response to AER Rate of return information paper and Omnibus final working paper*, 11 March 2022, p. 2.

630 Dinesh Kumareswaran, Presentation to AER for evidence session on RAB multiples, February 2022.

Spark and AusNet derive around 72%[631] and 85%[632] of their revenue, respectively, from regulated activities. Observations from our tracking of RAB multiples are discussed in Table 11.1.

Figure 11.4 AER regulated networks – transaction and trading multiples



Note: These values are as reported by Morgan Stanley and have not been adjusted for factors that may drive RAB multiples above 1x. SKI is Spark Infrastructure, which holds ownership stakes in SA Power Networks (49%), Victoria Power Networks (49%) and TransGrid (15%). AST is AusNet Services, which owns a Victorian electricity distribution network, electricity transmission network and gas distribution network.
Source: AER, *Electricity network performance report 2022*, p. 32

Table 11.1 RAB multiples observation and analysis

Observation	Interpretation
RAB multiples have varied over time from a low of almost 1.0x to a high of approximately 1.6x.	RAB multiples materially above 0.9x-1.3x (Darryl Biggar's range from his 2018 report[633]) can demonstrate investor confidence that the overall calibration of the regulatory settlement is favourable (historically and prospectively) and may prompt further exploration and investigation.[634]
Transaction multiples have tended to be higher than trading multiples.	Despite differences in their levels, trading and transaction multiples provide a similar view overall.

[631] Regulated revenue has been sourced using figures from Spark Infrastructure's HY 2021 Fact Book. This was derived by combining the distribution revenue for Victoria Power Networks and SA Power Networks with the transmission revenue for Transgrid, over the total revenue for all 3 companies. Total revenue includes distribution, transmission, semi-regulated and unregulated revenue. We have taken this at an overall level, and not considered ownership stakes for Spark Infrastructure of these companies in our calculation.

[632] AusNet Services, Scheme Booklet and Grant Samuel's Independent Expert Report, December 2021, p. 126.

[633] Biggar D., *Understanding the role of RAB multiples in regulatory processes*, February 2018, p. 11.

[634] Different benchmark values can be used in the assessment of RAB multiple levels (1.0x is commonly used). In this final decision, we refer to Darryl Biggar's 2018 assessment of where one might expect EV/RABs to trade (0.9x-1.3x). This range has also been referenced in CEPA's analysis of RAB multiples.

Observation	Interpretation
After a period of decline seen across 2007 to 2009 during the global financial crisis, RAB multiples have generally shown an upward trend since 2010 (albeit some downward movements are observed, for SKI for example and some stability since 2016 can be inferred). This has been over the period where our regulated return on equity has been tracking lower with the risk-free rate.	An upward trend between 2010 and 2016 with many RAB multiples above 1.3x since 2016, through periods of macroeconomic changes, suggests that investors remain confident.

In our *Overall rate of return, equity and debt omnibus - final working paper* from December 2021,[635] we cautiously concluded that the information from RAB multiples would suggest our current and expected rates of return are at least sufficient (as part of the overall regulatory compensation to investors) and potentially higher than that needed to attract investment.[636]

These early findings, and the contrary opinions of stakeholders and experts, encouraged us to examine RAB multiples further though continued internal analysis and engagement of external expertise.

In our draft decision, we reviewed the acquisition of AusNet Services and the competing bids by Brookfield and APA. We note that an independent report by Grant Samuel dated 21 December 2021 refers to a RAB multiple for the Brookfield acquisition of Ausnet of between 1.53x and 1.61x.[637] The report by KPMG dated 11 October 2021 refers to a RAB multiple for Spark Infrastructure Group of 1.52x.[638,639] We think this acquisition and valuation activity suggests investor interest in the assets we regulate and supports the conclusion we reached in our working paper.

We also considered the findings of a report provided by ENA from Grant Thornton,[640] which examined the extent to which RAB multiples can be used in assessing the adequacy of allowed regulatory returns. Grant Thornton suggested that RAB multiples do not provide an adequate benchmark to consider the adequacy of the regulatory rate of return based on, but not limited to, the following:

- future positive NPV projects, which can involve both regulated and unregulated activities

[635] AER, *Overall rate of return, equity and debt omnibus - final working paper*, December 2021, p. 129

[636] AER, *Overall rate of return, equity and debt omnibus - final working paper*, December 2021, p. 131.

[637] AusNet Services, *Scheme Booklet and Grant Samuel's Independent Expert Report*, December 2021, p. 3.

[638] Spark Infrastructure Group, *Scheme Booklet and KPMG's Independent Expert Report*, October 2021, p. 217.

[639] Spark Infrastructure Group holds ownership stakes in SA Power Networks (49%), Victoria Power Networks (49%) and TransGrid (15%). KPMG's Independent Expert Report from October 2021 provides RAB multiple ranges for these as follows: 1.38x-1.47x for SA Power Networks (p.175), 1.35x-1.44x for Victoria Power Networks (p.181), and 1.75x-1.92x for Transgrid (p.184).

[640] ENA, *Grant Thornton expert report*, March 2022.

- assumed regulatory returns over the life of the asset as opposed to a 5-year time horizon and terminal value assumptions
- differing required rates of return from those underpinning the regulatory pricing
- variations in cashflows from regulatory returns from those underpinning pricing determinations, including incentive payments
- other investor-specific assumptions.

Further, Grant Thornton submitted that a "combination of the above factors, and possibly others, has led to observed RAB multiples in excess of 1.0x".[641] As such, they suggest that the use of RAB multiples as a measure by which to determine the adequacy of regulated returns can be misleading and may result in returns on the standalone regulated assets being insufficient to attract investment and financing over the longer term.

We accept that the factors identified by Grant Thornton are relevant to our consideration. However, we have seen:

- that the businesses we regulate have been traded at multiples well above 0.9x-1.3x
- vigorous competition among investors for these assets.

In our draft decision we concluded that it appeared that investors were confident in the current and future regulatory returns being sufficiently high to remunerate their costs, and that our current and expected rates of return appeared to be sufficient (as part of the overall regulatory compensation to investors) and potentially higher than that needed to attract investment.[642]

At first instance, RAB multiples well in excess of 0.9x-1.3x might raise the prospect that our rate of return is more than the efficient cost of capital. As such, we have undertaken considerable assessment to more fully understand the drivers of RAB multiples and the conclusions that may be drawn from them. The Independent Panel considered that RAB multiples were an important cross check and recommended we undertake further work to better understand them.

> If […] used to inform decisions on the cost of capital considered alone, the RAB multiple must be decomposed using evidence that attempts to quantify the extent to which the ratio is affected by [other] issues, and to remove the effects from sources other than the cost of capital estimate.' [643]

In May 2022 we published a report prepared by CEPA undertaking analysis of RAB multiples.[644] However, when our draft decision was published in June, we had not yet had the

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641 ENA, *Grant Thornton expert report*, March 2022, p.4.

642 AER, *Draft 2022 Rate of Return Instrument Explanatory Statement*, June 2022, p. 266.

643 AER, *Independent Panel report on draft rate of return instrument*, July 2022, p. 52.

644 CEPA, *Report to the AER – EV:RAB multiples*, May 2022.

opportunity to test the findings of the CEPA work with stakeholders and so did not give it weight in our draft decision.

Responses to our draft decision provided some commentary on the use of RAB multiples as a cross-check, with more discussion focused on the findings of CEPA's May 2022 report.

The Independent Panel asked us to confirm how we will deal with the declining number of relevant regulated firms with observable share prices.[645] However, at this time we have not considered this issue in detail. We intend to consider this, and a similar question about the number of comparators available for the estimation of beta, at a later stage.

While the CRG expressed support for the use of RAB multiples,[646] other stakeholders expressed concerns about their suitability for use as a cross-check due to the potential to capture other sources of value and difficulties with disaggregation.[647,648,649]

Stakeholders expressed concerns with CEPA's May 2022 report, suggesting that the findings should not be relied on due to serious methodological flaws.[650,651]

CEPA subsequently updated its analysis.[652] We published this in October 2022 and requested submissions from stakeholders. In summary, CEPA's updated work indicated to us that rate of return could not be excluded as a contributor to the RAB multiples greater than 0.9x-1.3x. CEPA's work suggests to us that it was necessary to adopt extreme assumptions about the value to be derived from other factors to bring the RAB multiples back to 0.9x-1.3x.

We consider that the revised CEPA report of October 2022 provides additional insights into the sufficiency of the overall expected returns from the regulatory regime and in relation to the adequacy of the return on equity. We drew insight in this work in the following ways:

- the support for the view that the allowed return has not been below investor expectations for assets with comparable systematic risk
- the analysis of a RAB premium from expected outperformance on opex, capex and incentive schemes, which increases the RAB multiple for Ausnet from 1.06 to 1.47
- the supporting modelling suggests that (even when setting the value of unregulated assets to the upper end of the range for AusNet) RAB growth of more than 3% p.a. in real terms combined with expectations of excess allowance returns (opex, capex and

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645 AER, *Independent Panel report on draft rate of return instrument*, July 2022, p. 57.

646 CRG, *Response to the AER's call for submissions on RAB multiples*, November 2022.

647 APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 55.

648 ENA, *Response AER 2022 Draft Rate of Return Instrument*, September 2022, p.16.

649 NSG, *Submission to AER Draft Decision*, September 2022, p. 17.

650 ENA, *Response AER 2022 Draft Rate of Return Instrument*, September 2022, p. 16.

651 AusNet, *Response to the Draft 2022 Rate of Return Instrument*, September 2022, p. 1.

652 CEPA, *Report to the AER – EV:RAB multiples*, October 2022.

incentives) of 1.6% per annum, would be required for the allowed return on equity to be below the required return on equity.

We summarise the feedback from stakeholders on CEPA's October 2022 analysis below.

ENA,[653] with analysis provided by Frontier,[654] proposed no weight should be given to CEPA's October 2022 report given that it:

- continues to employ highly contestable assumptions of the inputs such as the valuation of non-regulated revenues, capex levels and the terminal RAB values, which differ materially from independent market evidence
- adopts a different analytical approach, which does not report a fully disaggregated RAB multiple sought by the Independent Panel and the AER
- produces implausible outcomes, with the analysis indicating a real required return on equity of 0.5% and a long-run required return on equity material below its cost of debt estimate and at values not supported by any other information.

Frontier reiterated the view expressed in its May 2022 report[655] that the RAB multiple for AusNet is less than 1.0x if particular changes are made to CEPA's input assumptions. These suggested changes, and coverage of CEPA's approach from its updated report, are shown in Table 11.2.

Table 11.2 Input assumptions suggestions by Frontier and CEPA's approach

Input assumption	Frontier assumption	CEPA approach
Value of unregulated assets	Frontier proposed an estimate of $3.15 billion, which is the midpoint of the independent expert's estimate.[656] Frontier suggest that using this higher unregulated asset value for AusNet alone closed the RAB multiple to 1.06.	The updated CEPA report indicates a range of $652 million to $3.15 billion, using Grant Samuel's estimate as the upper bound.
Terminal RAB multiple value	Frontier assumed the current RAB multiple of 1.41x continues.	CEPA's new approach adopted a terminal value of 1.09x based on an equilibrium set of assumptions. This is in line with the 1.1x value used in its May 2022 report.
Value of nominal growth in the RAB	Frontier assumed 4% for the nominal growth in the RAB.	CEPA applied a real RAB growth in the next 30 years of a range of 0 to 1.9%, with a base case real RAB growth of 0.95%.
Tax step-up benefits	Frontier assumed a value of around $180 million as a tax step-up benefit.	CEPA adopted $180 million in its updated report.

[653] ENA, *2022 Rate of Return Instrument Review - CEPA Report EV:RAB Multiples*, November 2022.

[654] Frontier, *Updated RAB multiple analysis*, November 2022.

[655] Frontier, *Updated RAB multiple analysis*, May 2022.

[656] Grant Samuel, *Independent Expert Report*, December 2021.

The CRG supports CEPA's approach and considers that:

- analysis of RAB multiples meets an important criterion of engendering confidence in the regulatory framework657
- evidence supports that the 2018 RORI is at least equal, or may well exceed, NSPs' actual cost of capital
- if the 2022 Instrument takes a similar approach, it will at least be sufficient for an efficient NSP to finance its activities
- an unbiased decision can still be made if the AER is confident in its analysis that some 2022 RORI parameters can be set lower
- the AER should not put any great weight on individual expert reports, such as by Grant Samuel or KPMG.

The Australian Energy Council (AEC) agrees with CEPA that, notwithstanding uncertainties, conclusions about return expectations can be drawn from RAB multiples and they are an appropriate cross-check on the adequacy of allowed returns.[658]

Overall, our further investigation leads us to conclude that our current and expected rates of return are at least sufficient (as part of the overall regulatory compensation to investors) and that the allowed return has not been below investor expectations.

However, in view of the limitations with this type of analysis, we do not consider the evidence is sufficiently strong to make an adjustment to the position we have reached in our consideration of individual parameters.

11.3.1.2 Financeability tests

Financeability refers to a service provider's ability to meet its financing requirements.

Financeability tests consider whether a business can raise debt capital, and fund interest costs, at a given credit rating. In practice, credit assessments are undertaken by rating agencies and are informed by subjective judgements and financial metrics. Therefore, it is not possible to precisely replicate rating agency views by conducting a hypothetical assessment for a benchmark. As such, regulators typically condense their analysis to a review of financial metrics against a benchmark rule of thumb. We have previously raised concerns about potential changes to gearing if such a rule of thumb was to be used.[659] However, we ultimately found that the allowed rate of return is relatively invariant to changes in gearing and that, under our modelling assumptions, allowed regulated revenue would decrease slightly if gearing assumptions were lowered.[660]

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657 CRG, *Response to the AER's call for submissions on RAB multiples*, November 2022.

658 AEC, *Draft Rate of Return Instrument 2022*, November 2022.

659 AER, *Rate of return instrument, Explanatory Statement*, December 2018, p. 403

660 AER, *Rate of return instrument, Explanatory Statement*, December 2018, p. 404.

The most common ratio used is funds from operations to net debt (FFO to net debt). It is a measure of free cashflow relative to borrowings.[661] This analysis is limited because:

- it does not include the subjective component undertaken by rating agencies
- the 7% benchmark is itself subjective
- financeability is actively managed by the firm to optimise debt costs – it is especially sensitive to the choice of amount of debt compared with equity. In the past few years, we have seen regulated firms actively choose a higher level of debt, recognising this could lead to a credit rating downgrade.

In 2018 we calculated FFO to net debt for each of the businesses we regulate at our benchmark gearing of 60%.[662] This analysis showed variation across businesses, but 21 out of 29 were able to meet the 7% benchmark.

When we repeated this analysis for our December 2021 paper, using 2021 data and based on submissions from regulated networks, we found that 24 of the 32 firms met the 7% benchmark. We had expected to see a deterioration in the results as our return on equity had tracked lower with a lower risk-free rate.

Because we did not see a deterioration in FFO to net debt as we had expected, we have undertaken further investigation to better understand the outcome and the conclusions that can be drawn.

There were differing views on the role and usefulness of financeability tests as a cross-check in response to our December 2021 working paper[663], through submissions and through the subsequent evidence sessions in February 2022.

Our draft decision noted that our financeability tests did not suggest that financeability had emerged as a problem under our 2018 Instrument. Stakeholder response to our draft decision was varied.

The CRG expressed concerns around the AER's financeability test because the CRG say the methodology, implementation and use remain unclear. The CRG also agreed with Ofgem's assessment that financeability should have no role in determining or amending the rate of return.[664] Nevertheless, we consider that financeability tests can provide information to inform decision-making on the overall rate of return.

Some stakeholders supported the use of financeability assessments, in particular consideration of FFO/net debt, noting that these tests can provide a useful indicator of the

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[661] Benchmark sourced from confidential rating agency report.

[662] Calculation of financeability metrics use benchmark gearing of 60%, rather than actual gearing.

[663] AER, *Overall rate of return, equity and debt omnibus - final working paper*, December 2021, p. 129.

[664] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, pp. 57–58.

appropriateness of the overall rate of return[665,666] and to determine whether the regulatory allowances based on the benchmark assumptions for a benchmark firm are internally consistent.[667]

However, while both ENA and Endeavour Energy support the use of financeability as a cross-check, concern was expressed about the performance of network companies against the 7% benchmark.

ENA noted that the target FFO to net debt threshold is unreasonably low at 7% and suggested that, should this be revised to 9%, 66% of NSPs would fail. ENA suggested that this demonstrates that the rate of return is not set at an appropriate level and passing can be attributed to other factors, such as higher depreciation allowances.[668]

However, we take a different view from the ENA, for the following two reasons in particular.

Firstly, these financeability tests/ratios, in and of themselves, are unlikely to indicate that the allowed return (on equity, or on total capital) are set at an inappropriate level. For example, the threshold levels, for financeability tests/ratios, do not regularly change to reflect market costs over time, as would be necessary if there was a mechanical link between financeability tests/ratios and the optimal allowed return (on equity, or on total capital). Further, the WACC should be relatively invariant to gearing, whereas financial ratios, such as FFO/net Debt, are very sensitive to debt levels. It would be easy to draw an inaccurate conclusion if debt levels were too high (or too low).

Secondly, credit assessments undertaken by rating agencies are informed by subjective judgements and financial metrics, which cannot be precisely replicated by conducting a hypothetical assessment for a benchmark. We acknowledge that the 7% benchmark is itself subjective. However, using this 7% benchmark allows for a sustained comparison across time. We are aware of rating agencies that use the 7% rule of thumb as a guide for further analysis.[669] As such, we consider maintaining the benchmark at 7% is appropriate and aligns with the benchmark we have used in previous determinations.

ENA also highlighted that stronger credit metrics are seen for networks in the UK regulated by Ofgem, compared with those regulated by the AER.[670] However, this comparison may exclude relevant information because the FFO/net debt of UK electricity distribution networks, derived under Ofgem's TOTEX approach, will reflect higher depreciation allowances than those in Australia.[671] This would support ENA's earlier suggestion that higher depreciation allowances will influence results when considering financeability.

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[665] APA, *APA submission on the Draft Rate of Return Instrument 2022*, September 2022, p. 68.

[666] Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 8.

[667] Ausgrid, *Submission Draft RoRI*, September 2022, p. 6.

[668] ENA, *Response AER 2022 Draft Rate of Return Instrument*, September 2022, pp. 130–131.

[669] Sourced from confidential rating agency report.

[670] ENA, *Response AER 2022 Draft Rate of Return Instrument*, September 2022, pp. 131–132.

[671] Ofgem, *RIIO-ED2 Draft Determinations*, June 2022, p. 50.

We have updated our financeability analysis since our draft decision (see Table 11.3 below). This includes an estimate of FFO to net debt if a new regulatory determination was to be conducted at this time based on this final decision.

We consider that this updated analysis continues to support our conclusion that financeability has not emerged as a problem under our 2018 Instrument. We do not consider the evidence is sufficiently strong to make an adjustment to the position we have reached in our consideration of individual parameters.

Table 11.3 Update of 2018 Instrument FFO/net debt analysis for final decision

Measure	2018	2021 (2018 firms)	2021 (all firms)	2021 (not in 2018 analysis)	2022 (all firms)*
Number of firms	29	29	32	3	32
Average FFO/net debt	8.44%	8.32%	8.33%	8.42%	8.07%
Industry average return on equity	7.06%	5.86%	5.78%	5.00%	5.78%
Number of firms with less than 7% FFO/net debt	8	7	8	1	10
Number of firms with higher FFO/net debt compared with 2018	–	12 out of 29	–	–	8 out of 32
Average increase in FFO/net debt	–	0.89%	–	–	1.19%
Average decrease in FFO/net debt	–	−0.82%	–	–	−1.06%
Gearing estimate (5-year average)	–	–	51.99%	–	–

Note: Net debt is estimated as the average of opening and closing debt proportion (60%) of the RAB. Average change in FFO/net debt is the simple average of the difference between each firm's 2018 estimate and their 2021. We estimated each firm's FFO/net debt as the average over the relevant 5-year period. Average increases and decreases in FFO/net debt take a simple average of the % change in FFO/net debt for all companies that had an increase or decrease from 2018 to 2021. Gearing estimate is based on a 5-year average for APA, AST, SKI from 2017-2021.
* The 2022 column is a hypothetical FFO estimate for illustrative purposes, which assumes cash flow is fixed and makes updates to inflation and return on equity.
Source: AER analysis

11.3.1.3 Historical profitability

Historical profitability measures are backward-looking measures of actual returns earnt by businesses.

In response to our December 2021 paper, some stakeholders noted in submissions and subsequent evidence sessions that considering profitability, and particularly accounting profitability, has little value because:

- it does not provide information on the expected rate of return672
- it has fundamental problems when used as a cross-check, due to cost allocation, accounting profit measures (which differ from economic profit), the potential for the adoption of income reducing policies and gaming problems673
- there is limited applicability to either the rate of return that investors earn or the rate of return that investors require674
- there are issues when taking into account the reliability of the underlying information.675

However, the CRG noted that profitability could have a role and be used as a qualitative 'conditioning variable' given its importance to consumers in evaluating the overall framework.[676]

When we examine the use of historical profitability, we acknowledge that there are strengths to using the actual profitability of regulated businesses to assess the regulatory regime in aggregate because it:

- informs the historical effectiveness of our regulatory framework and the total return achieved by businesses
- is relatively easy to understand and compare over time (at first glance)
- can potentially help to identify areas that require further investigation
- may be helpful in identifying whether the actual cost of debt has been systematically higher or lower than the cost of debt assumption in the rate of return.

However, extensive decomposition analysis similar to the RAB multiple analysis is necessary to draw conclusions from past trends to the setting of the ROR on a forward-looking basis.

We have reviewed the return on regulated equity over the period 2014 to 2021. Figure 11.5 suggests that average electricity network returns on regulated equity declined materially over this period.

This occurred against a backdrop of declining forecast returns on equity, reflecting:

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672 APA, *APA submission on the Rate of Return Information Paper, Omnibus Paper, and Expert Evidence*, 11 March 2022, p. 66; ENA, *Rate of Return Instrument Review: Response to AER's Final Omnibus and Information papers*, 11 March 2022, p. 140; Partington and Satchel, *Report to the CRG: AER Cross-checks*, March 2022, pp. 36-40; AER, Concurrent evidence session 4 – proofed transcript, February 2022, p. 16; AER, Concurrent evidence session 4 – proofed transcript, February 2022, p. 32.

673 Ibid.

674 Ibid.

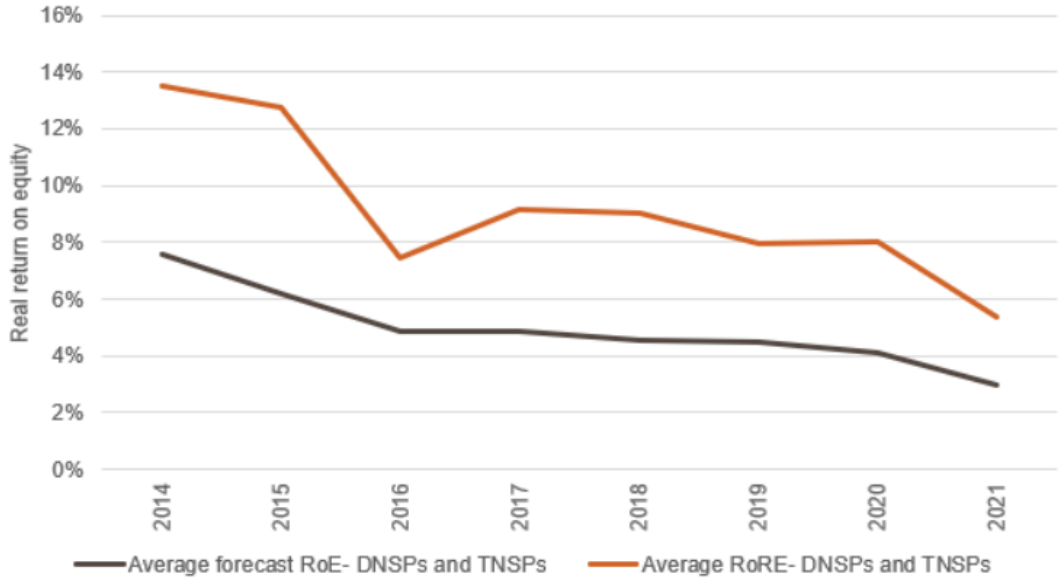
675 AER, Concurrent evidence session 4 – proofed transcript, February 2022, p. 15.

676 CRG, *Advice to the Australian Energy Regulator: CRG Response to the AER's December 2021 Information paper*, March 2022, pp. 109, 119–120.

- declining interest rates, including the rates on Commonwealth Government Securities (on which we base the risk-free rate)
- the 2013 Rate of Return Guideline and, from 2020, the 2018 Rate of Return Instrument.

Despite this, electricity networks achieved returns on regulated equity that exceeded forecast returns on equity by approximately 4.2 percentage points.[677] This is due to a range of factors, including the incentive framework we operate. The difference between forecast and realised returns was higher in the earlier years and narrowed materially after the introduction of the 2013 Rate of Return Guideline.

Figure 11.5 Real returns on regulated equity compared with forecast returns on equity – DNSPs and TNSPs



Source: AER, *Electricity network performance report 2022*, July 2022, p. 34

We suggest that analysis of historical profitability does not provide an insight into whether lower returns on equity, of themselves, are appropriate or problematic. This is mainly due to historical profitability being a backward-looking measure of actual returns earnt by businesses rather than expected returns. Most stakeholders were supportive of our December 2021 position on the limited use of historical profitability as a cross-check.

Our draft decision was that we did not consider that useful conclusions about the rate of return could be drawn from analysis of historical profitability at this time.

Stakeholder responses to our draft position were limited.

The CRG encouraged the use of historical profitability as a cross-check because it suggested it provides an insight into the outcomes of the 2018 Rate of Return Instrument and

[677] This difference was 2.4 percentage points in 2021.

could provide guidance on AER's current decision-making.[678] The CRG also highlighted the Independent Panel's support of historical profitability as a cross-check. The Independent Panel suggests that analysis of the historical excess return over the regulated return is vital to the decomposition of RAB multiples, as a guide for expectations of future outperformance.[679] We have recognised this advice and see that historic achieved returns on equity are considered as core information within the analysis of RAB multiples completed by CEPA.

The CRG also suggested that the AER has changed its position since the 2018 review, despite similar issues being raised during both reviews about it being a backward-looking measure and issues with accounting treatments.[680]

In our 2018 review, we stated that 'the substantial difficulty in disaggregating the information contained in […] historical profitability measures means that this information cannot currently be used to reliably determine the degree of outperformance of the allowed rate of return. However, they may provide contextual information that can assist our investigation of other evidence and our risk-cost trade-off assessment.'[681]

We do not consider there is a material change in our view, as suggested by the CRG. We consider it is consistent to state that historical profitability may provide contextual information while also stating, as we did in our draft decision from the 2022 review, that we do not consider that useful conclusions about the rate of return can be drawn from analysis of historical profitability.

Our use of historical profitability has also remained the same, as neither the 2018 nor 2022 review used it in any material way when deciding the overall rate of return.

11.3.1.4 Investment trends

Examining investment trends may be useful when considering the rate of return because:

- an allowed rate of return that is too high may encourage inefficient over-investment
- an allowed rate of return that is too low may discourage efficient investment.

We have previously considered whether investment trends may provide some indication about whether the allowed rate of return in past regulatory determinations was too high or too low.[682] Our previous positions, such as that posited in our December 2021 working paper,

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[678] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 60.

[679] AER, *Independent Panel report on draft rate of return instrument*, July 2022

[680] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 60.

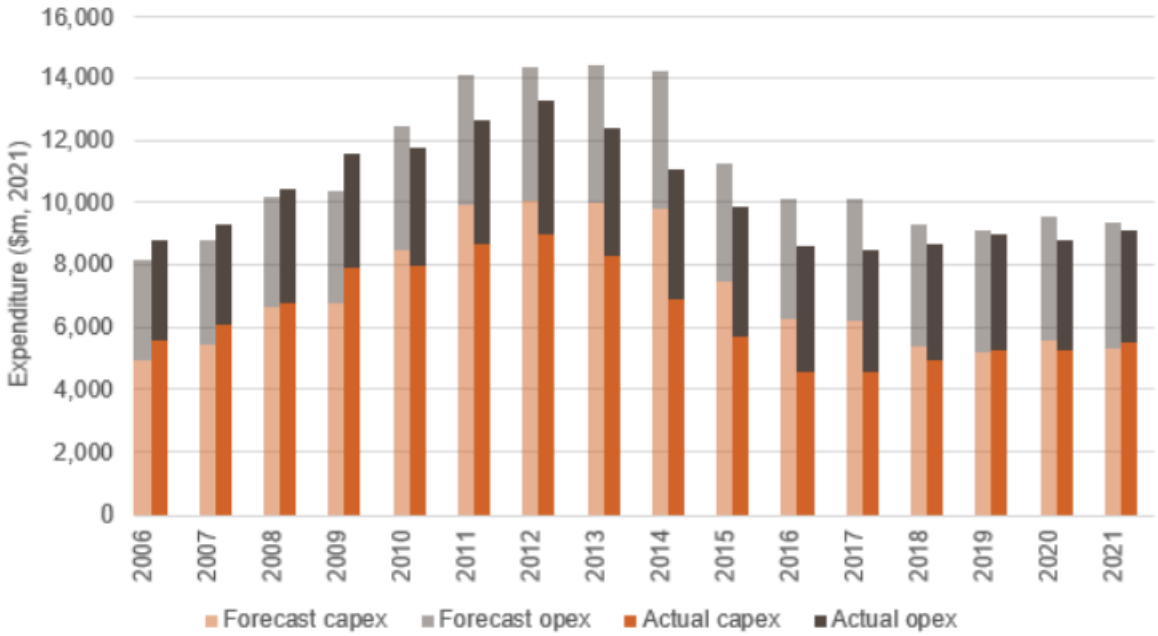
[681] AER, *Rate of return instrument Explanatory statement*, December 2018, p. 388.

[682] AER, *Rate of return instrument Explanatory statement*, December 2018, p. 388.

have stated that investment trends offer little value as a cross-check. Stakeholders have generally agreed with this position.[683]

Our examination of investment trends suggests that the key issue is that investment levels are determined by many factors. We believe that external factors, such as changes in the market with the emergence of reliability standards and smart meters, have contributed to substantial swings in network investment over the past 15 years (see Figure 11.6).

Figure 11.6 Total expenditure – DNSPs and TNSPs



Source: AER, *Electricity network performance report 2022*, July 2022, p. 15

In 2020 Transgrid[684] and ElectraNet[685] submitted rule changes to the Australian Energy Market Commission (AEMC) to allow for changes to their return profiles to support the financeability of their upcoming investment in the new South Australia to New South Wales interconnector. The AEMC concluded that changes to the rules were not needed for Transgrid[686] and ElectraNet[687] to support the financeability of the project, which suggests a supportive investment environment for the networks we regulate.

Feedback in response to our draft position was limited.

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[683] APA, *APA submission on the Rate of Return Information Paper, Omnibus Paper, and Expert Evidence*, 11 March 2022, p. 65; CRG, *Advice to the Australian Energy Regulator: CRG Response to the AER's December 2021 Information paper*, March 2022, p. 104.

[684] TransGrid, *Rule change proposal – making ISP projects financeable*, September 2020.

[685] ElectraNet, *Rule change proposal – making ISP projects financeable*, October 2020.

[686] AEMC, *Participant derogation – financeability of ISP projects (TransGrid)*, April 2021.

[687] AEMC, *Participant derogation – financeability of ISP projects (ElectraNet)*, April 2021.

The CRG suggested that investment trends could assist the AER.[688] We note that this would represent a change in the CRG's view – the CRG's submission in March 2022 supported the exclusion of investment trends.[689] Though investment trends have been included in the CRG's table of additional cross-checks, no further detail has been provided by the CRG in support of its September 2022 view.

The Independent Panel suggested that consideration is given to investment trends and how this is considered by other regulators. We discuss the incentive to invest from the Rate of Return Instrument in our findings on our overall rate of return in section 11.5.

We have also looked at the use of investment trends by other regulators (Ofgem[690] and Ofwat[691]) and find that MAR analysis (known to the AER as RAB multiples) is typically used to understand the investment environment. However, specific analysis of investment trends does not typically appear to be conducted by these other regulators in assessing the appropriate levels of investment.

As such, our view remains that investment trends are determined by many factors, which can make it difficult to infer anything meaningful from them as a cross-check at this time. Nevertheless, we have considered the information available from investment trends in assessing our overall rate of return.

11.3.1.5 Other regulators' rate of return decisions

Other regulators' decisions may be useful to compare with our rate of return when businesses have similar risks and when those regulators have similar objectives to us.

In previous submissions and evidence sessions, stakeholders have identified potential issues in comparing values for the ROR and its components between regulators, including:[692]

- geographical differences in risks, taxes, costs and data
- business differences in risks and challenges
- differences in methods, objectives, context and capture

Adjustments for these factors need to be made if values are to be compared meaningfully.

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[688] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 62.

[689] CRG, *Advice to the Australian Energy Regulator: CRG Response to the AER's December 2021 Information paper*, March 2022, p. 105.

[690] Ofgem, *RIIO-ED2 Draft Determinations*, June 2022.

[691] Ofwat, *Draft Methodology for PR24*, July 2022.

[692] Partington and Satchel, *Report to the CRG: AER Cross-checks*, March 2022, p. 5; CRG, *Advice to the Australian Energy Regulator: CRG Response to the AER's December 2021 Information paper*, March 2022, p. 104.

Stakeholders also identified potential benefits, including:[693]

- congruency in tasks and objectives[694]
- potential to gain an indication of the rate of return expected by investors
- identifying red flags
- identifying innovation and options for estimating the cost of equity and setting the return for authorised revenues[695]
- considering the approaches of other regulators as a useful source of evidence or of additional matters to consider696
- providing a useful cross-check on the return on equity.[697]

Stakeholder responses to our draft position were limited.

ENA suggest that consideration of other regulators' estimation approaches, data and methods has value, particularly as other regulators share common objectives with the AER.[698] This view was shared by Endeavour Energy, which similarly supported the use of other regulators' rate of return as a cross-check given the similarity in other regulators' frameworks and tasks.[699]

ENA also submitted a report by the Brattle Group,[700] which provided an update of the original review of international approaches to regulated rates of return published by the AER in June 2020.[701] This report supported ENA's belief that other regulators' methods are potentially informative as a cross-check.[702] It also suggested that the regulatory frameworks, and nature of regulated business in different jurisdictions, are sufficiently similar to allow for informative

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693 APA, *APA submission on the Rate of Return Information Paper, Omnibus Paper, and Expert Evidence*, 11 March 2022, p. 65; ENA, *Rate of Return Instrument Review: Response to AER's Final Omnibus and Information papers*, 11 March 2022, p. 135; APGA, *APGA Submission to the AER: Rate of return final omnibus paper and information paper*, 11 March 2022, p. 25; GIIA, *Response to AER Final Omnibus Paper*, 11 March 2022, p. 2; Endeavour Energy, *Rate of return information paper and call for submissions*, 11 March 2022, p. 5.

694 The Brattle Group, *International approaches to regulated rates of return – a review for AER*, September 2020.

695 AER, Concurrent evidence session 4 – proofed transcript, February 2022, p. 7.

696 Ibid.

697 ENA, *Rate of Return Instrument Review: Response to AER's Final Omnibus and Information papers*, 11 March 2022, pp. 138–139; NSG, *Response to AER Rate of return information paper and Omnibus final working paper*, March 2022, p. 11.

698 ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022.

699 Endeavour Energy, *Draft 2022 Rate of Return Instrument (RORI)*, September 2022, p. 6.

700 The Brattle Group, *International Rate of Return Methods—Recent Developments*, September 2022.

701 The Brattle Group, *A review of international approaches to regulated rates of return*, June 2020.

702 The Brattle Group, *International Rate of Return Methods—Recent Developments*, September 2022, p. 14.

comparisons.[703] The Independent Panel also suggest that consideration of other regulator's methodological approaches can highlight issues and areas that require further investigation.[704]

We agree that there may be some comparability between regulators in terms of objectives, and some value in understanding alternative methods, approaches and data. The differences in methodologies across regulators is covered extensively in the Brattle Group report prepared for the AER in June 2020[705] and in the September 2022 report.[706] We acknowledge that consideration of other regulators' methodologies can be useful in highlighting differences and similarities to our own methods.

One of the most important factors to consider when comparing decisions by regulators is the market conditions at the time the decision is made and how market data is incorporated into the decision. For example, our return on equity is calculated using an estimate of the spot rate for the risk-free rate while some other regulators and market analysts use a long term average of the risk free rate. Over the past few years our return on equity has looked low compared to some other regulators because we have used the prevailing risk-free rate, which happened to be lower than the long-term average. Now that interest rates and the risk-free rate have increased our return on equity might appear more comparable (or even higher) than regulators that use a long-term average.

To account for differences in methodology we have looked at decisions by other regulators from two different perspectives: the total return on equity and a methodological comparison.

The information in Figure 11.7 and Figure 11.8 compares the return on equity and TMR that would be produced using this final Instrument with the return on equity and TMR of other Australian regulators.[707]

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[703] Ibid.

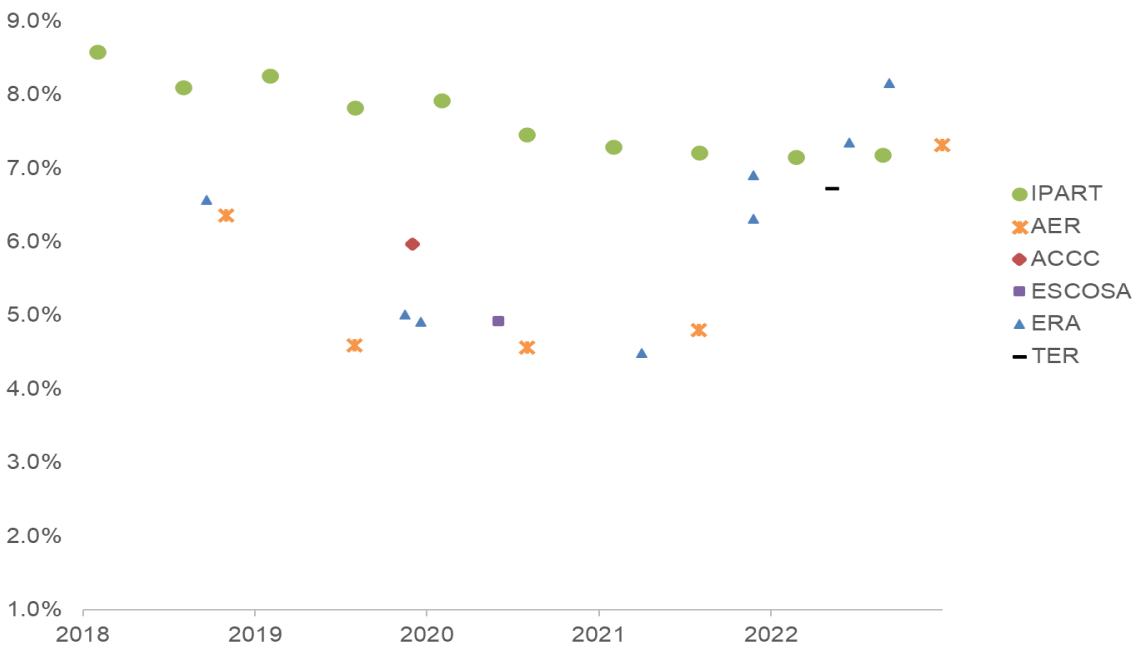
[704] AER, Independent Panel report on draft rate of return instrument, July 2022, p. 55

[705] The Brattle Group, *A review of international approaches to regulated rates of return*, June 2020.

[706] The Brattle Group, *International Rate of Return Methods—Recent Developments*, September 2022.

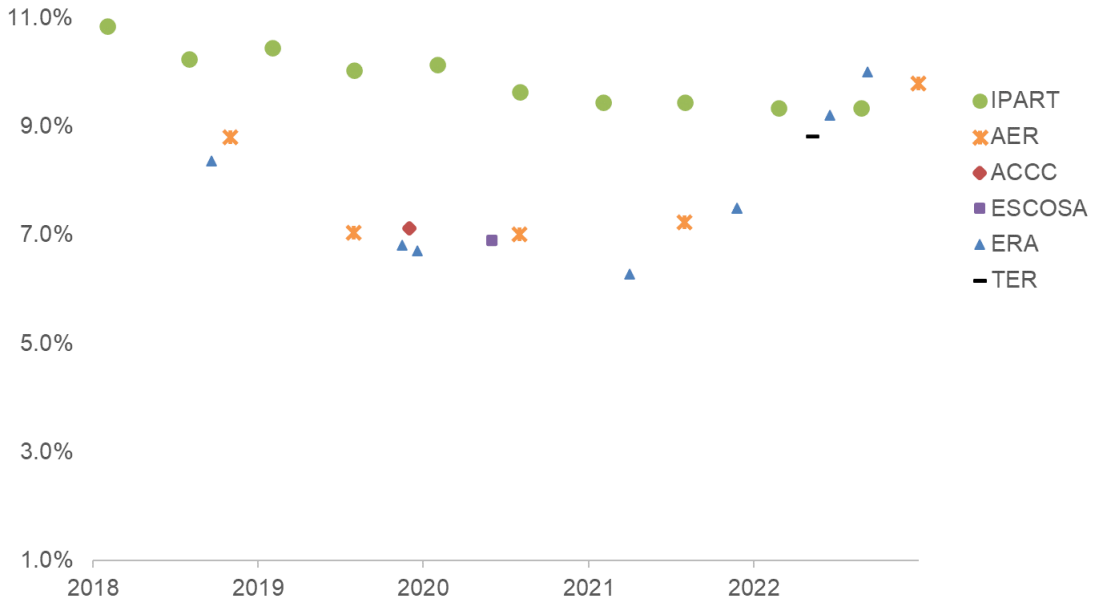
[707] Using data as at month end December 2022.

Figure 11.7 Return on equity comparison – AER and local regulators



Source: AER analysis
Note: The AER values for 2018 to 2021 are based on the indicative returns from the annual update report from December 2021. AER's 2022 value is 7.32%, using 10-year term values as follows: risk-free rate of 3.60%, MRP of 6.2% and equity beta of 0.6. The risk-free rate value of 3.60% reflects data up to the end of December 2022.

Figure 11.8 Total market return comparison – AER and local regulators



Source: AER analysis
Note: The AER values for 2018 to 2021 are based on the indicative returns from the annual update report from December 2021 Rate of Return annual update paper. AER's 2022 value is 9.80%, using 10-year term values as follows: risk-free rate of 3.60% from data up to the end of December 2022 and MRP of 6.2%.

In Table 11.4, we see a comparison with international regulators, based on a table in the Brattle Group's report published in September 2022. This report stated that 'AER's draft 2022 Rate of Return Instrument is lower than most of the recent decisions of international regulators we have reviewed'[708] and that 'other regulators have higher betas or higher risk-free rates or higher MRPs, whereas the AER is among the lowest on all three, leading to a materially lower authorised return on equity than other regulators'.[709]

Table 11.4 The Brattle Group's comparison of regulators' equity decisions – September 2022

Regulator	Decision year	MRP	Equity beta	RFR	TMR	ROE (post tax)
STB (US)	2021	7.46%	1.07	1.98%	9.44%	12.03%
FERC (US)	2021	10.20%	0.55	3.14%	13.34%	9.21%
NZCC (New Zealand)	2022	7.40%	0.74	2.36%	9.76%	7.84%
ARERA (Italy)	2022	5.85%	0.70	2.96%	8.81%	7.08%
OFWAT (UK)	2022	8.15%	0.71	0.66%	8.81%	6.73%
OFGEM (UK)	2021	8.08%	0.76	0.42%	8.50%	6.55%
AER	2022 Draft Instrument	6.81%	0.60	1.82%	8.63%	5.90%
ACM (Netherlands)	2016	5.00%	0.63	−0.01%	4.99%	3.15%

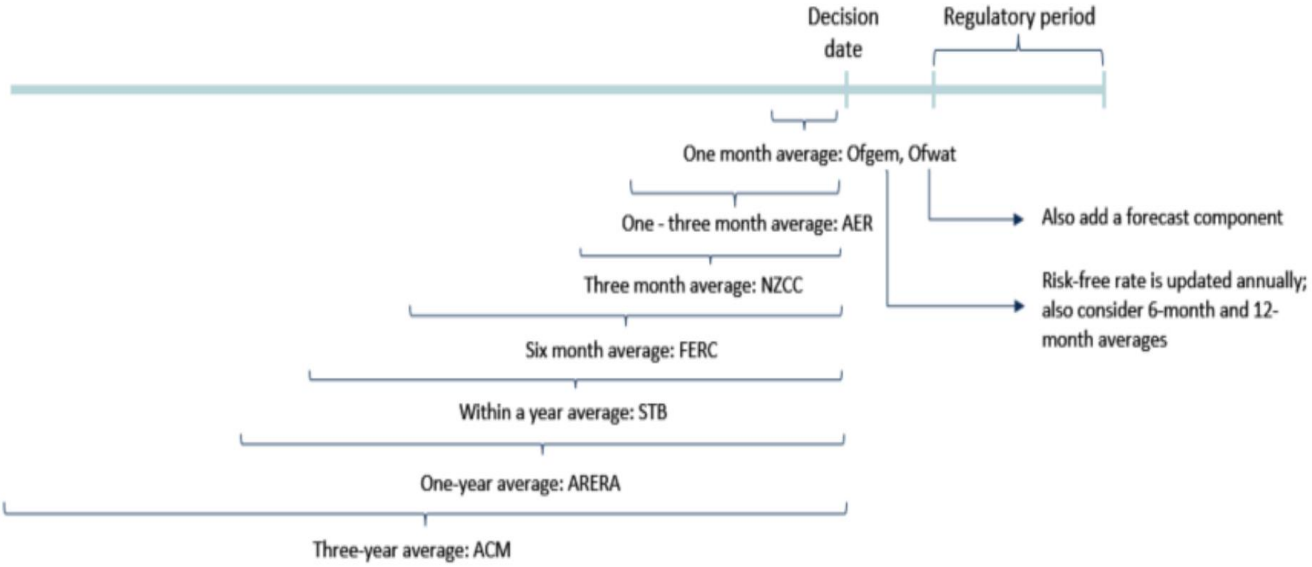
Note: Inflation assumed to be 2% if not stated by each regulator. STB: Uses 2 equally weighted methods to determine return on equity (ROE). FERC: Uses 3 equally weighted methods to determine ROE. MRP: Market risk premium. RFR: Risk-free rate. TMR: Total market return (nominal).

We note that differing timing approaches exist for estimating the risk-free rate (as shown in Figure 11.9), for example, which can determine how, and to what degree, movements in the interest rates will affect the return on equity for each regulator.

[708] The Brattle Group, *International Rate of Return Methods—Recent Developments*, September 2022, p. 4.

[709] The Brattle Group, *A review of international approaches to regulated rates of return*, September 2022, p. 5.

Figure 11.9: Approaches to timing for estimating the risk-free rate



Source: Brattle Group, A review of international approaches to regulated rates of return, June 2020

We must also consider the combination of different regulators' approaches for estimating the risk-free rate and MRP. NERA's May 2020 analysis suggests that the combination of methods differ such that no regulators are identical, as shown in Table 11.5. This suggests that other options are available and used elsewhere in regulatory decision-making.

Table 11.5 Approaches to estimating RFR and MRP

Country	Sector	Regulator	RFR approach	MRP approach
Australia	Energy	AER	Current estimate (< 60 days)	HER
Italy	Airports	ART	1-year average	HER
Switzerland	Energy	SFOE	1-year average bounded (2.5–6.5)	HER bounded
Netherlands	Energy	ACM	3-year average	HER
Spain	Energy	CNMC	6-year average	HER
Germany	Energy	BNetzA	10-year average	HER
Sweden	Energy	EI (gas)	Long-run average	HER
France	Energy	CRE	8 to 10-year average (varies)	HER + surveys
Sweden	Energy	EI (electricity)	4-year average + current	Survey
US	Transport	STB	1-year average	DGM + HER
US	Energy	Ca/NY/Pa	Implied in DDM	DDM
NZ	Energy	ComCom	3-month average	HER + Wright + DGM
UK	Water	Ofwat	Current (1-month) indexed bonds	Wright + DGM
UK	Airports	CAA	Current (1-month) indexed bonds + convenience yield	Wright + DDM + investor studies + reg precedent
Ireland	Airports	CAR	1-year average	Wright + DGM
UK	Telco	Ofcom	Spot – 5-year average + forecast (no clear weights)	Wright + DGM (limited weight)
UK	Energy	Ofgem	Current (1-month) indexed bonds	Wright + DGM (cross-check)
UK	Airports	CMA	1-year average	Wright + DGM (cross-check)

Italy	Energy	ARERA	1-year average	Wright

Source: NERA, *Review of Regulators Approaches to Determination of the market Risk Premium*, May 2020, submitted by Port of Melbourne to ESCV; The Brattle Group, *A review of international approaches to regulated rates of return*, June 2020

Over the past few years, our return on equity has been lower than other regulators primarily because of our approach to estimating the risk-free rate. When the spot risk free rate is in line with the long-term average risk-free rate, our return on equity is likely to be in line with other regulators who use longer term averages. We have chosen to use the spot risk free rate because we think it is important our return on equity reflects current market conditions at the time we make our decision. Other regulators have chosen a different approach.

In view of the limitations with this type of analysis, we do not consider the evidence is sufficiently strong to make an adjustment to the position we have reached in our consideration of individual parameters.

11.3.1.6 Analysts' discount rates

Discount rates used by market analysts and valuation reports may be an indication of the rate of return expected by investors.

There are differing views from stakeholders on the role and usefulness of analysts' discount rates. For example, the ENA notes that independent expert reports can provide direct evidence of the material inadequacy of the current level of the allowed return on equity.[710] Stronger support can be found from the NSG, who view the use of market analyst and valuation expert estimates as the most critical cross-check.[711]

However, in contrast, APA suggests that there is limited usefulness.[712] The CRG goes further in noting that there is a potential lack of comparability as well as methodological issues. One such issue is that market practitioners may use a long-run or blended risk-free rate rather than our current approach of the prevailing risk-free rate.[713]

Our analysis finds that there may be issues with comparability and methodology.

In our evaluation of the return on equity cross-checks, we consider broker reports. From these, we can derive a range for their estimated ERPs.[714] We use the range informatively since there may be a degree of circularity between our decisions and broker estimates. We place greater weight on more recent reports since broker reports can provide targeted and

[710] ENA, *Rate of Return Instrument Review: Response to AER's Final Omnibus and Information papers*, 11 March 2022, p. 132.

[711] NSG, *Response to AER Rate of return information paper and Omnibus final working paper*, 11 March 2022, p. 11.

[712] APA, *APA submission on the Rate of Return Information Paper, Omnibus Paper, and Expert Evidence*, 11 March 2022, p. 66.

[713] CRG, *Advice to the Australian Energy Regulator: CRG Response to the AER's December 2021 Information paper*, March 2022, pp.123, 125.

[714] AER, *Rate of return Guideline 2013, Explanatory Statement*, December 2013, p. 30.

timely information on returns for regulated utilities. We consider both the current assumptions and changes over time, as tracked by the firms providing the reports.

Figure 11.10 shows broker ERP estimates. While our final ERP estimate of 3.72% is within the range estimated from broker reports for 2021, it is lower than the range seen in broker reports for 2022. However, there are two primary issues with this comparison, as explained below.

Firstly, due to the takeover of SP AusNet and Spark Infrastructure, broker reports relate to a single network company (APA) only. Further, APA's revenues are mostly from unregulated activities and therefore it is likely to have higher systematic risk exposure than a regulated energy network. All else equal, a higher beta value results in a higher ERP.

Secondly, brokers will have different approaches to the risk-free rate which may in turn impact their ERP assumption. Some will use spot rates, as we do, but some will use long run averages, some will use their own forecasts/expectations, and some may not state a clear method/approach for their assumptions.

Therefore, a comparison between our ERP and broker's ERP may have limited value. Nonetheless, we include Figure 11.10 below for completeness and consistency with our previous analysis.

Figure 11.10 Broker ERP ranges for 2021 and 2022

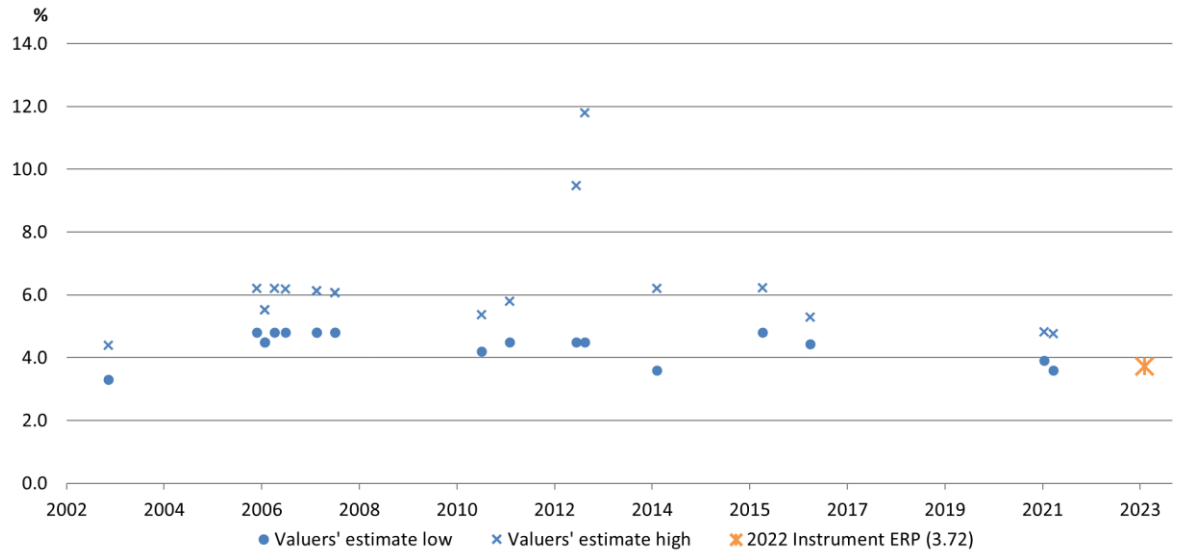
Source: AER analysis of broker reports that include a valuation for AusNet Services, Spark Infrastructure, APA Group

Independent valuation reports can also provide information on the discount rate used for valuing energy network businesses. However, there are limitations with these estimates due to:

- concentration of available reports across a few valuation firms[715]
- the estimates could reflect a range of factors that do not warrant inclusion in the rate of return as required by our legislative objectives (for example, non-systematic risks, term structure of the chosen equity proxies and the relevant investment period exceeding the term of the proxies)
- lack of clarity around adjustments for dividend imputations.

The equity risk premium and return on equity ranges from independent valuation reports are shown in Figure 11.11 and Figure 11.12.

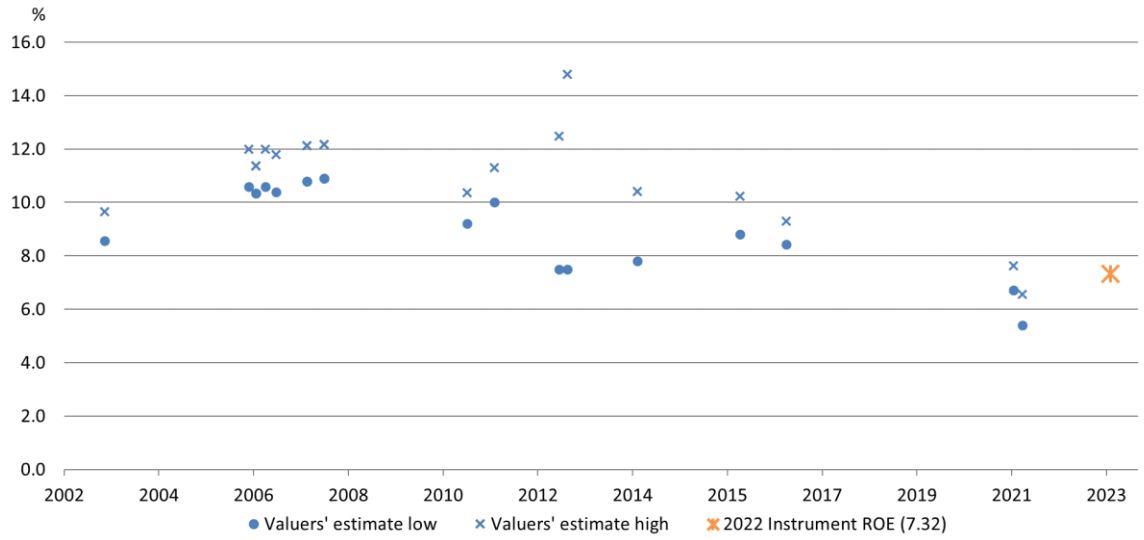
Figure 11.11 Independent valuation reports ERP estimates



Notes: We have shown the equity risk premium based on a nominal vanilla WACC. Valuation reports using a different form have been adjusted accordingly. This equity risk premium ('valuers' estimate high') also reflects the impact of any discretionary uplifts applied by the independent valuer.
Source: AER analysis of reports from Refinitiv

[715] There have been only 21 relevant independent valuation reports spanning a period going back to 1991. Only 15 reports included a discounted cashflow analysis with information on a return on equity estimate. These 15 reports were provided by only 4 independent valuation firms, with 10 of the 15 reports being provided by Grant Samuel & Associates.

Figure 11.12: Independent valuation reports ROE estimates



Notes: We have shown the return on equity based on a nominal vanilla WACC. Valuation reports using a different form have been adjusted accordingly. This return on equity ('valuers' estimate high') also reflects the impact of any discretionary uplifts applied by the independent valuer.
Source: AER analysis of reports from Refinitiv

Recognising the limitations highlighted above, our draft decision found that there was limited value in comparing our decision with analysts' discount rates or independent valuation reports.

In response to our draft decision, there was limited stakeholder feedback.

NSG suggested that discount rates used by market analysts and valuation practitioners are used by investors in establishing target IRRs.[716]

However, in the absence of any meaningful evidence to the contrary, and despite their use by other practitioners, we remain of the view that there are limitations to the use of analysts' discount rates.

11.3.1.7 Sensitivity testing

Table 11.6 provides a list of sensitivity tests and the subsequent section provides additional detail. These sensitivity tests across multiple facets of the Instrument are then used to inform the subsequent discussion on how the Instrument might fare in different states of the world, which we then describe as scenario tests.

In our draft decision, we also considered using a 5-year term of the return on equity. However, in this final decision, for the reasons discussed in chapter 6, we use a 10-year term.[717] Therefore, in this final decision we have not included sensitivity tests analysing differences in term.

[716] NSG, *Submission to AER Draft Decision*, September 2022, p 14.

[717] As used in the 2018 Rate of Return Instrument.

Table 11.6 Sensitivity tests

Test undertaken	Description	Results
1) Market Risk Premium (MRP)	Comparing outcomes of the following MRP options: • historical excess returns (HER) • combined HER and 3-stage DGM.	Under the option 1 approach (historical excess returns, HER), if interest rates change by ±3% we estimate: • an ROE impact of ±3% • a household bill impact of ±$96. Under the option 3b approach (combined HER and 3-Stage Dividend Growth Model, DGM), if interest rates change by ±3%, we estimate: • an ROE impact of ±2.3% • a household bill impact of ±$74.
2) Beta	Using differing beta values to examine the impact on: • ROE • revenues • household bills.	We estimate that each ± 0.1 change in beta has the following impacts: • ± 0.6% on ROE • ± 2.0% on revenues • ± $20 per year on household bills.

Note: Our calculation of bill impacts is based on an assumption that a 1% change in the ROR results in an 8.2% impact on NSPs' unsmoothed revenues. Assuming a 50% network component of the $2,000 average household bill, this results in a 4.1% bill impact. This calculation ignores demand impacts.

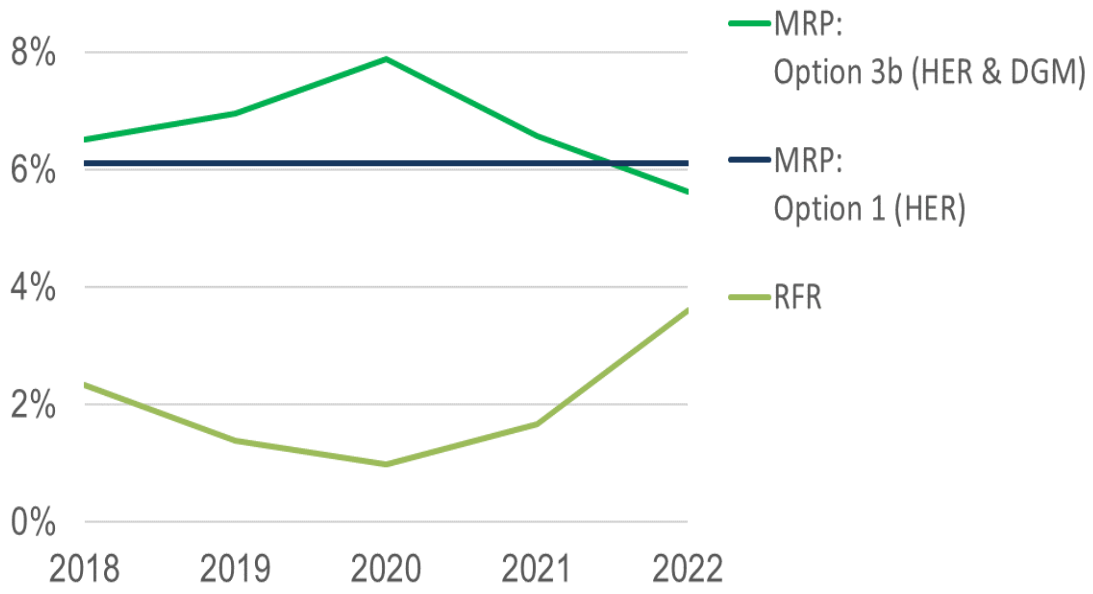
5) MRP test – How does the return on equity vary with the risk-free rate?

For this sensitivity test, we explore movements in the return on equity for differing values of the risk-free rate under the 2 approaches canvassed in our draft decision for setting the market risk premium, namely:

- setting a fixed MRP based on option 1 (HER)
- allowing the MRP to vary based on option 3b (combined HER and 3-stageDGM).

The difference in MRP across the prior regulatory period, based on the approach used, is shown in Figure 11.13.

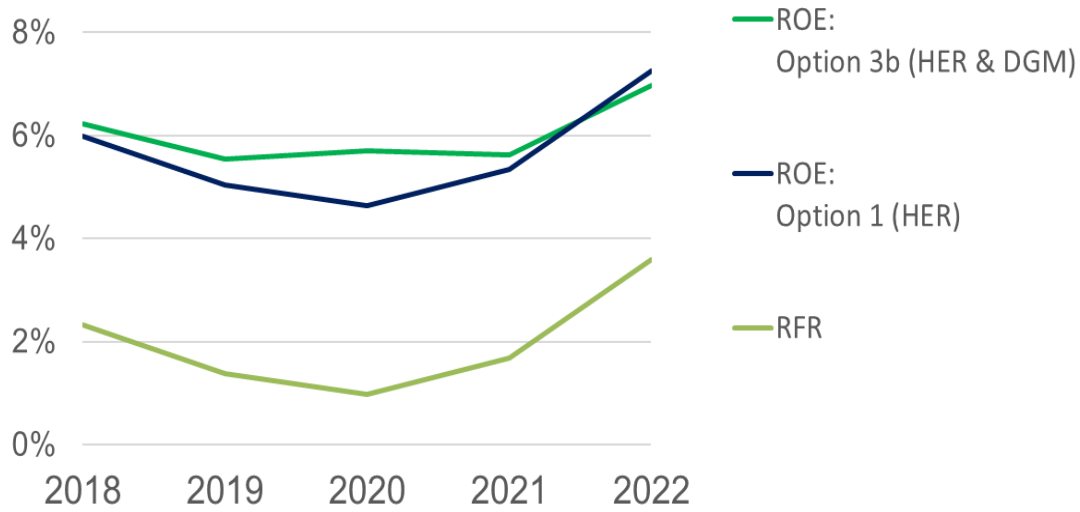
Figure 11.13 Comparison of MRP for option 1 and option 3b



Note: Option 1 uses AER's value of 6.1% for MRP from the 2018 Instrument, option 3b uses an average of the annual figures from our historical excess returns and 3-stage dividend growth model. RFR uses annualised 10-year CGS yields from 2018 to 2021, and the 20-day average for 2022, as at the end of December 2022.
Source: AER analysis

We find that the return on equity is similar under our 2 options for determining the MRP. However, the ROE was more volatile under option 1 than it would have been under option 3b (as shown in Figure 11.14).

Figure 11.14 Comparison of ROE for option 1 and option 3b



Note: Option 1 resulted in a lower return on equity for most of the 2018 Instrument years, although rising risk-free rate values in 2022 results in a higher return on equity than Option 3b. ROE is derived using the MRP values detailed in Figure 11.13, and a beta value of 0.6.
Source: AER analysis

We see that option 3b would also have produced a more stable and higher return on equity than option 1. We estimate that the return on equity could have been approximately 0.37 percentage points higher, on average, over the 2018 to 2022 period. This would have increased household bills by an estimated $12 per year.

If the risk-free rate changes in the future, option 3b (combined HER and 3-stage DGM) is likely to generate a more stable return on equity. For any given risk-free rate at any given point in time, a ±3% change could cause the return on equity to change by ±2.3% for the HER and DGM combination approach compared with a ±3% change for the HER approach. The extent of stability depends on how the DGM reacts to changes in the risk-free rate over time.

6) Beta test – How does the return on equity vary with beta?

We considered whether there was evidence to support an equity beta between 0.5 and 0.7. The 2018 Instrument used an equity beta of 0.6. We estimate that each ± 0.1 change in beta has the following impacts:

- ± 0.6% on ROE
- ± 2.0% on revenues
- ± $20 per year on household bills.

Overall, we are satisfied that an equity beta of 0.6 is supported by the evidence.

11.3.1.8 Scenario testing

Scenario testing is a technique where we project outcomes under our draft Instrument based on potential movements in underlying inputs and parameters. Scenario testing allows us to model the rate of return (and regulated revenue) across a range of scenarios.[718] This exercise can also help stakeholders to better understand the impact of alternative proposals on prices levels, price stability and price changes over time.

The outcome of most interest for this review is variations in the return on equity, but with some assumptions these results can be extended to the overall rate of return, revenues and prices.

There has been some debate among stakeholders about the value of this type of analysis and the methodology that should be employed. The strengths of scenario testing are that:

- it allows stakeholders, including us, to see the rate of return under different conditions and assumptions as well as to examine how it responds to changes in the underlying parameters
- it may act as a sense check for our rate of return if properly implemented especially because the Rate of Return Instrument is fixed for the duration of its application (that is, 4 years).

[718] AER, *Overall rate of return, equity and debt omnibus - final working paper*, December 2021, p. 141.

Over the course of our engagement with stakeholders, some have suggested that scenario testing:

- is important for testing whether the Instrument is robust,[719] especially considering its binding nature over 4 years[720]
- can be a useful cross-check[721]
- may have limited value within an inflexible scheme set by the national energy laws[722]
- should ensure that the Rate of Return Instrument is responsive to a wider set of scenarios to reflect market dynamics.[723]

Our analysis finds that scenarios can help explore potential issues, without providing definitive solutions. As such, we have developed scenario tests to allow us and stakeholders to see how the Rate of Return Instrument operates in different states of the world, including the impact on consumer bills through time.

We initially tested 3 possible states of the world in our draft decision, looking at environments where there could be low interest rates, high interest rates and high inflation rates, and low growth over a short period of time (0 to 5 years).

Some stakeholders,[724,725,726] as well as the Independent Panel,[727] suggested that scenario testing could look at a wider range to understand rate of return Instrument limitations and consumer impacts. We have therefore undertaken further investigation to better understand possible limitations and customer impacts.

As such, we consider 3 additional scenarios, which look at:

- higher inflation over a prolonged period of time (5 to 10 years)
- lower inflation over a prolonged period of time (5 to 10 years)
- a scenario with extremely high interest and inflation rates.

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[719] ENA, *Rate of Return Instrument Review: Response to AER's Final Omnibus and Information papers*, 11 March 2022, p. 140.

[720] AGIG, *Response to AER Rate of Return Final Working Papers*, p. 7; Endeavour Energy, *Rate of return information paper and call for submissions*, 11 March 2022, p. 6.

[721] CRG, *Advice to the Australian Energy Regulator: CRG Response to the AER's December 2021 Information paper*, March 2022, p. 104.

[722] APA, *APA submission on the Rate of Return Information Paper, Omnibus Paper, and Expert Evidence*, 11 March 2022, p. 63.

[723] GIIA, *Response to AER Final Omnibus Paper*, 11 March 2022, p. 3.

[724] APGA, *Draft 2022 Rate of Return Instrument*, September 2022, p. 19.

[725] CRG, *Advice to the Australian Energy Regulator - CRG Response to the AER's Draft Rate of Return Instrument*, September 2022, p. 54.

[726] ENA, *Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p. 133.

[727] AER, *Independent Panel report on draft rate of return instrument*, July 2022.

We do not express any view about the likelihood of these scenarios. We have chosen them because they span a range of environments.

Table 11.7 shows the features of the 6 scenarios and detail is provided in subsequent sections.

Table 11.7 Summary of how the Instrument would work in different scenarios

Scenario / state of the world	Summary findings	Findings for specific parameters
Higher interest rates and higher inflation rates (0 to 5 years)	For the reasons explained in section 0 about the practical and periodic updates of the Rate of Return Instrument and the periodic nature of regulatory determinations, we find that energy consumers are protected in the short term from rises in interest rates and inflation rates.	We note that our proposed MRP approach (see chapter 7) means that the return on equity would increase in step changes every 5 years as each regulatory determination falls due, to reflect the higher interest rates. We considered other approaches to estimating the MRP, such as the use of a DGM model. These may result in consumer bills that are even less sensitive to high interest rates. However, as we explain in chapter 7, our objective when setting the MRP is to set the most appropriate value that best reflects the cost of equity, rather than to maximise stability of consumer bills. This means that the most appropriate ROE is the one that best reflects the cost of equity, not the one that maximises stability. We also consider our approach to debt is robust to this scenario.
Low interest rate scenario (0 to 5 years)	We find that the 2022 Instrument would navigate the low interest rate scenario well, considering it shares many aspects with the 2018 Instrument. The 2018 Instrument was applied during a period of low interest rates and low inflation. Demand from investors, as measured in our RAB multiples, actually increased.	Our proposed MRP approach means that the return on equity would decrease, as each regulatory determination falls due, to reflect the lower interest rates. We also consider our approach to debt is robust to this scenario.
Low growth scenario (0 to 5 years)	We find that the 2022 Instrument is robust to this scenario.	A low growth scenario could be associated with increasing or decreasing interest rates and with increasing or decreasing risks for investors. The Instrument will reflect this in various ways. Our proposed MRP approach means that the return on equity changes, as each regulatory determination falls due, to reflect interest rate changes. However, our approach to beta uses long-run averages, and therefore brings a stability to the Instrument. Therefore, the overall impact of low growth, and the associated impact on the Instrument, will depend on the overall impact on interest rates and risk metrics such as beta.
Additional scenarios	We find that the Instrument navigates the additional scenarios in a similar fashion to those outlined above, given the same external variables are used but exaggerated across a prolonged period.	Given the similarity in impacts and ability of the Instrument to navigate changes in the macroeconomic environment, we find the Instrument will be robust in this scenario.

11.3.1.8.1 Higher interest rates and higher inflation rates (0 to 5 years)

During 2022 there was a global concern that the impacts of supply disruptions, rising shipping costs and other global and domestic inflationary factors could lead to an environment of higher inflation and higher interest rates.

In our draft decision we noted that inflation in Australia was growing at its fastest pace in 20 years, with renewed RBA forecasts warning that core inflation could reach 4.6% by the end of 2022, an increase of 200 basis points on the previous year end result.[728] Since our draft decision, this has escalated – the RBA had forecasted inflation to be at 8.0% by the end of 2022, before reducing to 6.3% by June 2023.[729]

In our draft decision we also noted that rising inflation had led the RBA to raise interest rates by 25 basis points in May 2022.[730] This has been followed by 8 consecutive interest rate rises, bringing the cash rate target from 0.35% in May 2022 to 3.35% as of 8 February 2023.[731]

Possible impacts on consumers and the wider economy include:

- increases in cost of living (due to rising costs of fuel, food and energy)
- decreased value of consumer savings
- increases in mortgage costs (when central banks react to curb inflation) and general borrowing rates (including on-the-day interest rates and risk-free rates)
- reduced investment potential leading to lack of job creation.

We considered what this would mean for our Rate of Return Instrument and the wider context in which the Instrument would apply. We examined whether our current decisions are likely to best achieve the National Electricity Objective (NEO) and National Gas Objective (NGO) in such a scenario.

The Rate of Return Instrument will reflect higher interest rates in 2 primary ways.

7) The allowance for debt costs will increase each year to reflect a 10-year trailing average. As the rates increase, the trailing average cost of debt will increase. We have applied this approach since 2013 and all stakeholders are aware of the reasons and benefits of this approach. We consider this approach is appropriate to closely reflect company costs on an ongoing basis.
8) The allowed return on equity will increase at the time of each regulatory determination during the life of the Rate of Return Instrument. A periodic update at each regulatory price/revenue reset using market data at the time the determination is made means that energy consumers will not see interest rates reflected in energy bills until each reset falls

[728] RBA, Forecast table of key macroeconomics variables, May 2022.

[729] RBA, Forecast table of key macroeconomics variables, November 2022.

[730] RBA, Forecast table of key macroeconomics variables, May 2022.

[731] RBA, Cash rate target, February 2023.

due. We consider that setting the return on equity at each decision point, based on the most recent market data for SL CAPM and cross-checks, is a fair approach. This approach helps to secure that consumers' bills closely reflect costs, as estimated at each determination. The key benefit of this approach is that it allows us to consider the best information at regular intervals without over relying on mechanical updates, which would not be appropriate (or possible) when judgement is required.

Therefore, consumers' energy bills will increase progressively in line with high interest rates over the short term.

As noted in our discussion paper, higher inflation rates are reflected in allowed revenues, network costs and the RAB. Over time, inflation rates will lead to higher RAB values, which are then recovered from consumers in subsequent years over a longer period of time. Higher inflation will also flow through to higher prices via the annual CPI-X pricing adjustment. This means that energy consumers will see some current inflation rates reflected in short-term bill increases.

Overall, we consider that the Instrument is robust to a scenario of high inflation and high interest rates[732] because it:

- automatically reflects market conditions for corporate debt rates through the trailing average debt mechanism
- reflects changing equity markets at each regulatory determination
- reflects inflation over the long term (via additions to RAB) and protects consumers from short-term spikes.

When energy consumers are experiencing large increases in their other costs of living (for example, fuel and mortgage costs) it is beneficial that the cost of energy network services are not increasing to the same degree. It is also appropriate that essential energy services have these stable features. Immediate increases in consumer bills are mitigated through the trailing average return on debt and the delay in escalating RAB values for inflation.

Using the alternative MRP option covered in our sensitivity tests (combined HER and 3-stage DGM) could potentially mitigate the impact on consumers of materially higher interest rates, but this depends on how the DGM responds over time.

Further, if higher interest rates or higher inflation rates cause network costs to materially deviate from allowed revenues, this could cause problems for both consumers and network companies if either:

- consumers pay too little (this could deter investment)
- consumers pay too much (investors would receive windfall profits).

[732] We focus on a scenario where outturn levels (of inflation rates and interest rates) are high, but in line with expectations embedded in the price control as opposed to the scenario where outturn levels (inflation rates and interest rates) differ materially from expectations in the long-run.

We consider that the overall Rate of Return Instrument is sufficiently robust against the risks outlined in this scenario.

11.3.1.8.2 Lower interest rate (0 to 5 years)

In our September 2021 working paper,[733] we examined whether we would be setting the appropriate rate of return and cashflows in a low interest rate environment.

From 2010 until 2021 we see falling interest rates for both shorter-term debt (for example, debt maturing in less than a year) and longer-term debt (for example, those maturing in 5 to 10 years). Such changes in interest rates are important to the networks we regulate and their customers. Changes in interest rates affect the level of revenues and prices that we allow the regulated networks to charge, the costs that networks face in providing services and, ultimately, the prices consumers pay.

In a low interest rate environment, we observe that the return on debt estimates (BBB rated debt) decline in line with a decrease in interest rates (as shown in Figure 11.15). This trend continues when interest rates begin to increase, as we have seen since 2021.

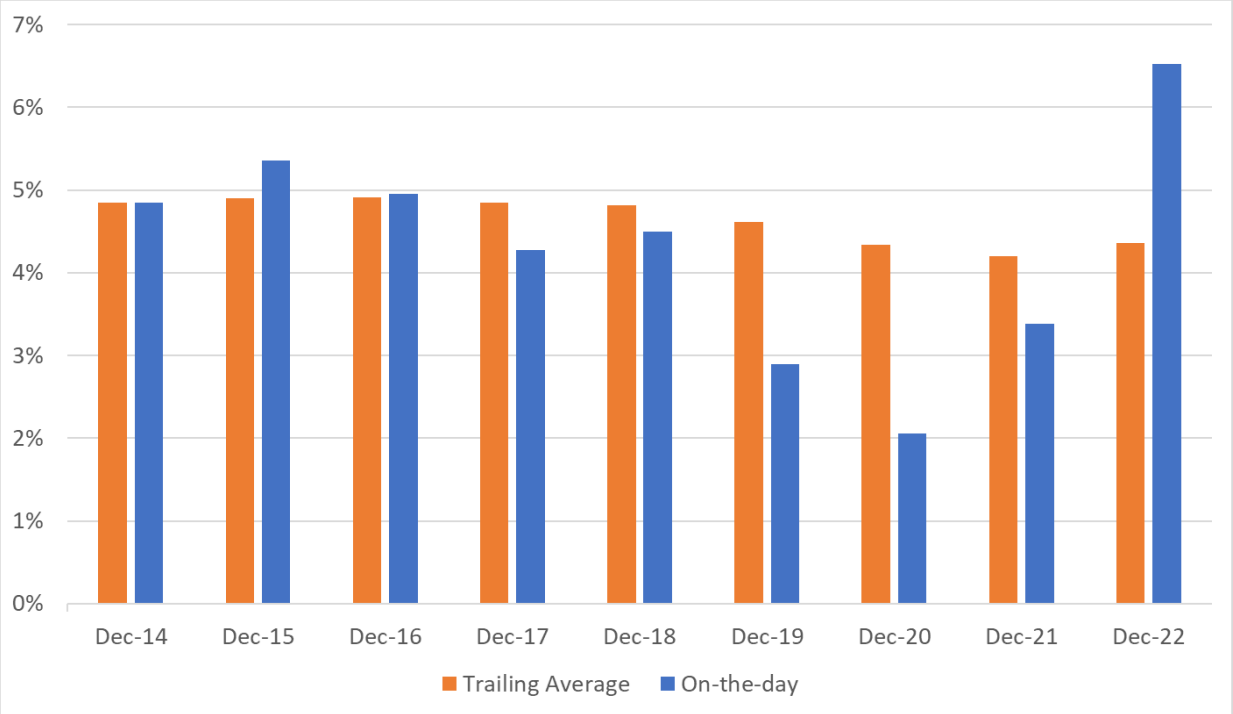
Figure 11.15 Comparison of AER BBB estimate and AER risk-free rate estimate

Sources: RBA; Bloomberg; AER
Note: Both the AER BBB estimate and risk-free rate included represent spot rates from 2010 to the end of December 2022.

However, the trailing average return on debt allowance has usually exceeded the on-the-day rates during a downward trend in interest rates (as shown in Figure 11.16).

[733] AER, *Term of the rate of return and rate of return and cashflows in a low interest rate environment*, September 2021.

Figure 11.16 AER BBB+ return on debt, 10-year trailing average approach vs on the day return on debt (December 2014 to December 2022)



Source: RBA, Bloomberg, Refinitiv
Note: The whole month of December is used as averaging periods for both approaches. The trailing average is calculated by applying equal weights to each annual return on debt estimate feeding into it, other than the first year where the transition commenced. We selected 1st January 2015 as the starting point for the transition, with the corresponding averaging period of one month (December 2014). As such, this example is still transitioning to the 10-year trailing average, with December 2022 being the 8th year.

Our position remains 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.[734]

We also considered changes to the cost of equity in this scenario.

Our estimates of the cost of equity have also declined from 2010 to 2021 because they are directly linked to Commonwealth Government Securities (CGS). This lower estimate has also had an impact on networks' cashflows. This can be attributed to lower estimates of return on equity and our RAB indexation adjustments to cashflows.

For NSPs, the return on equity is updated at the time of each regulatory determination during the life of the Instrument, the impact of which would be a reduction in the calculated return on equity. As such, consumers may see a reduction in prices they pay, but this would only be at the time of our regulatory determination for each NSP.

[734] AER, *Term of the rate of return and rate of return and cashflows in a low interest rate environment*, September 2021.

Stakeholders previously suggested a floor to the risk-free rate to ensure the real risk-free rate does not become negative.[735] The proposed benefits to this approach are that it would not require a discretionary change to implement and could be built into the existing formula.[736] Additionally, the floor would provide some stability and robustness to the Instrument and prevent short-term market movements from having an effect on the networks and investors.[737] However, a floor would not operate symmetrically and could distort investment signals. Further, for Australia, the RBA has considered that negative nominal interest rates are improbable in the future.[738] On this basis, we have decided not to introduce a floor to the nominal risk-free rate, including a basis for such, for the estimate of the cost of equity.[739]

We note that the 2018 Instrument was applied during periods of low interest rates and low inflation. During this time, demand from investors, as measured in our RAB multiples in Figure 11.4, has remained strong. This gives us confidence that the 2022 Instrument would also be reasonable, given our proposal to use the same approach for risk-free rate and MRP.

Therefore, we consider our approach to return on equity in a low interest environment remains appropriate.

11.3.1.8.3 Low growth scenario (0 to 5 years)

We considered what a low growth scenario could mean for our Rate of Return Instrument.

Possible impacts of this scenario on consumers and the wider economy include:

- decrease in business and consumer spending (as economic activity slows)
- increases in unemployment (as businesses look to reduce costs)
- changes in debt and equity markets. For example, the dividend growth model (DGM) suggests that equity prices will fall as growth falls. In this case, investors may look for safe stocks in a 'flight to safety' and demand for network assets may actually increase.

Overall, it is unclear how a low growth scenario would impact on the Rate of Return Instrument as low growth can be associated with various impacts on interest rates, inflation rates and risk metrics such as ERP and beta.

However, we can observe how the 2018 Instrument performed across time. In all of our determinations since the 2013 Guidelines we have had regard to the ERP margin over the

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[735] CRG, *The Overall Rate of Return, Debt Omnibus and Equity Omnibus paper — Volume 1: Technical*, 3 September 2021, pp. 86–87.

[736] Ibid.

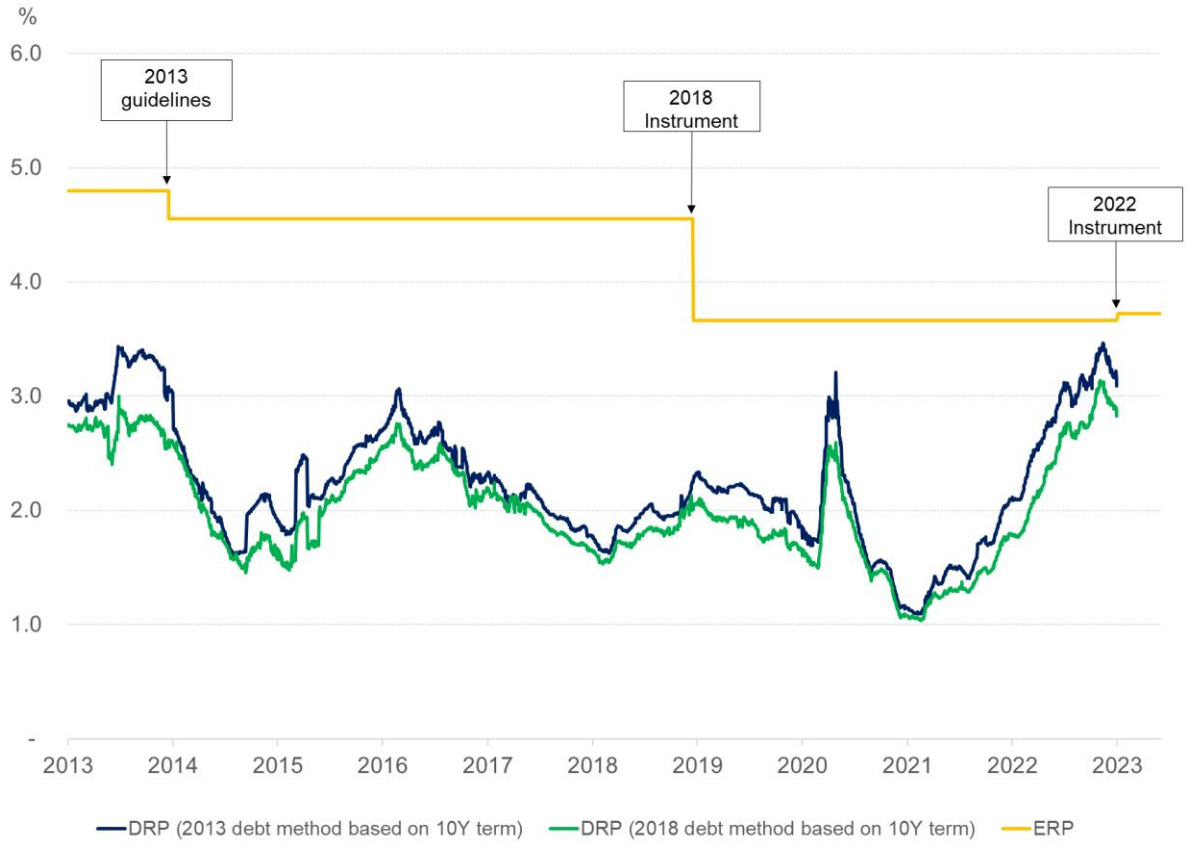
[737] Jemena, *Submission on the rate of return omnibus papers*, 3 September 2021, p.9; Endeavour Energy, *Draft working omnibus papers: Overall rate of return, equity and debt*, 3 September 2021, p.8; ENA, *Estimating the cost of equity: Response to AER's Pathway to 2022 Rate of Return Instrument Draft Equity Omnibus Working Paper*, 3 September 2021.

[738] Monetary Policy During COVID – speech by RBA Deputy Governor Guy Debelle, May 2021; Unconventional Monetary Policy: Some Lessons from Overseas – speech by RBA Governor Philip Lowe, November 2019.

[739] AER, *Overall rate of return, equity and debt omnibus - final working paper*, December 2021, p. 68.

debt risk premium (DRP) as a relative indicator.[740] As seen in Figure 11.17, the comparative and relative positions of the ERP and DRP show that a visible spread has been maintained over this period from 2018. This could give us confidence that the 2022 Instrument would be robust through a low growth scenario.

Figure 11.17 Comparison of ERP and DRP



Source: AER analysis; Bloomberg; Refinitiv; RBA.

However, the gap between the ERP and DRP appears to be narrowing. This could be due to several factors, such as:

- increasing debt risk premium
- the sampling period for HER
- our method for calculating ERP
- effects of inflation.

[740] AER, *Better Regulation, Rate of Return Guideline*, December 2013, appendix B - p. 33.

We also take comfort from our approach to estimating beta. As covered in our December 2021 working papers,[741] our approach of placing most weight on the longest-period estimates means that the Instrument will reflect long-run rather than short-run market data.

A key reason for our approach of using long-term estimates is that we consider the beta for the benchmark business is likely to remain relatively stable over the long term. This view is reinforced by revenues and share prices of the Australian regulated energy businesses having shown a relatively high degree of stability during recent times of market volatility, such as COVID-19 and recent takeover bids. A fundamental reason that these firms have high-level stability in their revenues and cashflows is because they have strong natural monopoly characteristics and operate in a stable regulatory framework.

We find that our current approach will promote stability and predictability through this scenario by using beta estimates from the longest period available to control for short-term fluctuations in growth or impacts of growth that are not easily observed. Therefore, we consider the Instrument is sufficiently robust against the risks outlined in this scenario.

11.3.1.8.4 Additional scenarios

For additional scenarios, we have considered the possible impacts of movements in inflation and interest rates over prolonged periods, namely:

- higher inflation and higher interest rates (5 to 10 years)
- lower inflation and interest rates (5 to 10 years)
- very high inflation and interest rates (no end point)

We see that many of the impacts covered in the previous scenarios are similar, although they are more pronounced given the enhanced levels and extended time frame.

For movements in interest rates, we have modelled the RFR while holding the value for MRP constant. We then compare the high, low and very high scenarios to a base case ('mid'). We also present the historical high and low RFR values in Table 11.8, and model their impacts, to provide additional context.

Table 11.8 Impacts of movements in risk-free rates

RFR scenario	RFR	Return on Equity (RoE)	Return on Equity Impact (RoEI)	Impact on Rate of Return (IRoR)	Revenue Impact (RI)	Household Bill impact (HBI)	
A: High	10.78%	14.50%	+7.18%	+2.9%	+23.0%	+11.5%	+$230
B: Mid	3.60%	7.32%					
C: Low	0.01%	3.73%	-3.59%	-1.4%	-11.5%	-5.7%	-$115
Z: Very High	21.55%	25.27%	+17.95%	+7.2%	+57.4%	+28.7%	+$574
Historic high (1982)	15.38%	19.10%	+11.77%	+4.7%	+37.7%	+18.8%	+$377

[741] AER, *Overall rate of return, equity and debt omnibus - final working paper*, December 2021, pp. 104–107.

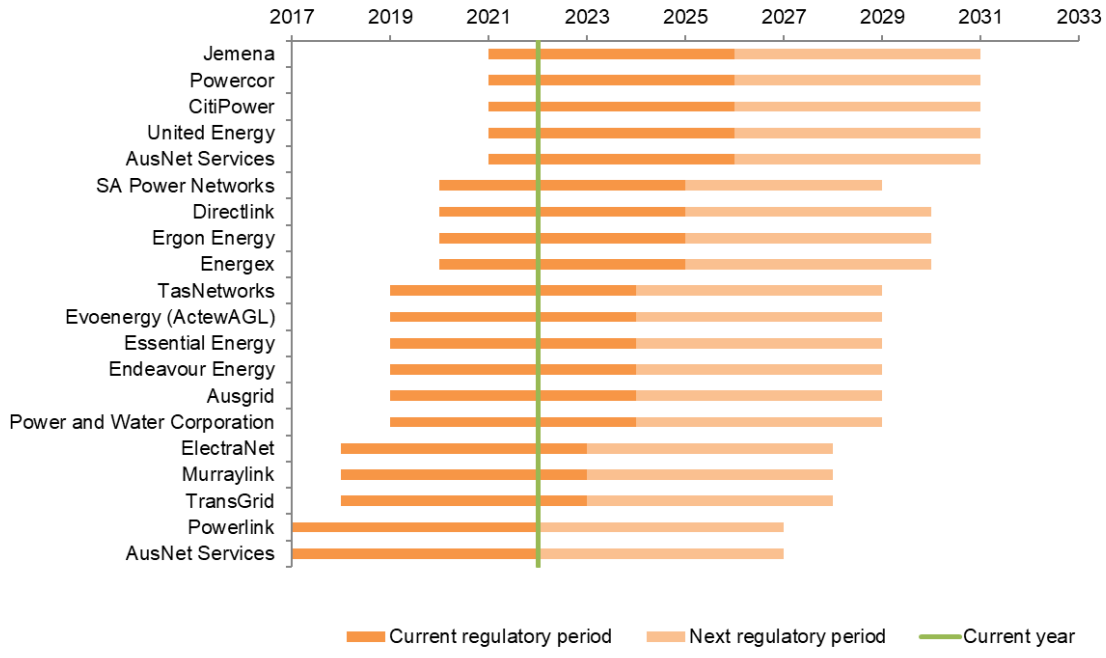
Historic low (2020)	0.92%	4.64%	-2.68%	-1.1%	-8.6%	-4.3%	-$86

Notes: RoE assumes beta of 0.6; Impact on rate of return assumes gearing of 60%; RI assumes 1% increase in RoR results in 8% increase in revenue; HBI assumes 50% network component and $2,000 average household bill. Ignores demand impacts; MRP held constant for scenarios and historic lines, using the average 10-year per this final decision (6.2%); Mid RFR sourced from AER model, using the averaging period of 20 business days to the end of December 2022.

As seen in Table 11.8, interest rate movements will flow though to energy consumers, and impact on NSPs, in all scenarios.

However, the impact on bills for consumers and rates of return for NSPs will be delayed, given the risk free rate is only updated at the time of each regulatory determination. As shown in Figure 11.18, this can mean that consumers can be protected from sharp increases in interest rates to some extent, as seen over 2022. Conversely, if a regulatory determination is made at a time where the RFR is on a declining trajectory, bills may be higher across the subsequent regulatory period. However, we consider that these impacts are symmetrical, that possible mismatches can affect both NSPs and energy consumers, and that these will over time offset each other.

Figure 11.18 Timeline of regulatory periods for electricity NSPs



Source: AER analysis

Inflation is considered across a number of regulatory processes, through the:

- post-tax revenue model (PTRM), which uses expected inflation to set the total revenue requirements for the entire regulatory period and a starting revenue for year one
- annual pricing, which escalates allowed revenue for years 2 to 5 using a CPI-X formula and actual inflation
- roll-forward model, which escalates the RAB by movements in actual inflation at the end of the regulatory period.

As such, automatic adjustments are made for movements in actual inflation.[742]

When we consider prices, and therefore consumer bills, we see that these are influenced by actual inflation (CPI) and so vary year to year when the annual pricing process is undertaken. This means that prices for electricity and gas services will move in line with the price of other goods in the economy.

However, if actual inflation is higher (or lower) than expected inflation, there is a potential for prices for consumer and compensation for network companies to be higher (or lower) than expected.

As noted in our discussion of interest rates, while these mismatches are possible if there are changes to inflation in the short term, it is important to remember that these can go either way in impacting consumers and network companies and should net out over time if a long-term view is considered. These mismatches have previously been highlighted by the ENA during the review of the regulatory treatment of inflation.[743] At the time it was noted that 'the deduction for the AER's estimate of expected inflation is greater than any reasonable expectation of actual inflation outcomes.'[744] However, it could be argued that the opposite is occurring currently, given the recent sharp increases in inflation rates.

Overall, considering the evidence from additional scenario testing, we consider the overall Rate of Return Instrument is sufficiently robust against the risks outlined.

While we have used impacts and risks to customers as a central consideration in these scenarios, we consider that mechanisms exist in the macroeconomic environment that are likely to contribute to mitigating these directly, particularly for vulnerable customers. These include:

- indexation of wages to inflation
- indexation of certain benefit payments to inflation, such as pension and JobSeeker benefits, which are updated twice yearly in line with CPI movements[745]
- changes to government policy and provisions in response to inflation, such as the minimum wages increases recently announced in the Annual Wage Review 2021–22.[746]

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[742] AER, Regulatory treatment of inflation, December 2020.

[743] ENA, *A hybrid approach that has regard to market data -Response to AER Review of Regulatory Treatment of Inflation, July 2020*, p. 4.

[744] ENA, *A hybrid approach that has regard to market data -Response to AER Review of Regulatory Treatment of Inflation*, July 2020, p. 4.

[745] Australian Government, *Guides to Social policy law: social security guide* (version 1.300), November 2022; Parliament of Australia, Higher inflation = higher social security rate increases, September 2022.

[746] Fair Work Commission, *Annual Wage Review 2021–22 C2022/1 [2022] FWCFB 3501,* 2021–22.

11.4 Assessment criteria

Our consideration of issues shows that we need to exercise our discretion on the evidence and methods that are available. Where necessary we have applied our assessment criteria to help us exercise our judgement. Table 11.9 sets out our assessment criteria and key areas where they have assisted us to make our decision.

Table 11.9 Criteria of final decision cross-checks assessment

Assessment criteria		Final decision
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.	Our assessment of the overall rate of return through cross-checks considers relevant and verifiable market information and reflects well-accepted economic and finance principles. For some individual cross-checks, such as RAB multiples, we have sourced independent insights to support their use.
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 consider the limitations of that purpose (b) promote simple over complex approaches where appropriate.	This final decision is informed by the use of: • market data • financial models • other evidence (expert views, independent analysis). Our approach uses simple methods for estimation and testing.
3	Implemented in accordance with good practice: (a) supported by robust, transparent and replicable analysis that is derived from available credible datasets.	Our approach to applying cross-checks is based on robust, transparent and replicable market-based analysis in accordance with good practice.
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 inputs estimation (b) based on quantitative modelling that avoids arbitrary filtering or adjustment of data that does not have a sound rationale.	Models underlying cross-check analysis of overall rate of return are based on robust quantitative modelling and avoid arbitrary adjustments without sound rationale.
5	Where market data and other information is used, this information is: (a) credible and verifiable (b) comparable and timely (c) clearly sourced.	Market data and other evidence used for cross-checks are from credible and verifiable and reflect latest data available at the time.
6	Sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.	Cross-checks have used the latest information available and consider shorter-term outcomes to the extent they reflect changing market conditions.
7	The materiality of any proposed change.	Compared to our approach from the 2018 Instrument, this final decision has considered a broader range of cross checks. Our disaggregation of RAB multiples provides additional insights into the sufficiency of the overall expected returns from the regulatory regime and the return on equity. However, the use of cross-checks, as a sense check of the overall rate of return, remains consistent.

Assessment criteria		Final decision
8	The longevity or sustainability of new arrangements.	The final Instrument is largely a continuation of the 2018 Instrument. Our scenario testing shows how the final Instrument would perform in a range of potential states of the world. Our decision is also supported by the extended review we have undertaken to assess RAB multiples.

11.5 Our findings on our overall rate of return

When we consider the findings of our analysis on our overall rate of return, we find that RAB multiples, financeability tests and scenario testing were most likely to encourage us to ask more questions. We also reviewed historical profitability, investment trends, other regulators' decisions and other practitioners' discount rates and had regard to findings from these. We consider these findings when we assess our overall rate of return using our assessment criteria, as seen in Table 11.9.[747]

Subject to the limitations of the cross-checks we examined, they do not appear to suggest major concerns with our current approach to the rate of return.

However, stakeholder responses have reflected a difference of opinion on the performance of the 2018 instrument.

For example, the submission by the CRG in September 2022 suggested that the 2018 Instrument is upwardly biased, which 'enabled networks to consistently achieve financial returns in excess of the efficient requirements'.[748]

Conversely, other stakeholders suggest that rates of return under the 2018 Instrument were below an efficient level and refer to the return on equity allowed by comparable regulators and market practice.[749]

In our consideration of cross-checks, we see that different conclusions could also be reached.

For example, the CRG suggests that the RAB multiples in the range of 1.5x–1.7x, as noted in the CEPA report from May 2022, can be taken together with other measures as evidence of excess returns.[750] We can acknowledge that analysis of RAB multiples indicates that investors have been confident that returns would be favourable given transaction multiples have been materially above 0.9x-1.3x. This has been supported by the iterative analysis

[747] AER, *Overall rate of return, equity and debt omnibus - final working paper*, December 2021, p. 129.

[748] CRG, *Response to the AER's Draft Rate of Return Instrument*, September 2022, p.63

[749] ENA, *Rate of Return Instrument Review Response to AER's Draft Instrument and Explanatory Statement*, September 2022, p.3; AusNet, *Response to the Draft 2022 Rate of Return Instrument*, September 2022, p.1; Energy Queensland, *Draft 2022 Rate of Return Instrument*, September 2022, p.2; Evoenergy, *Submission to AER's 2022 rate of return instrument draft decision*, September 2022, p.3; Jemena, *Submission on AER's draft Rate of Return Instrument (RORI)*, September 2022, p2; NSG, *Response to AER RORI 2022 Draft Decision*, September 2022, p.2

[750] CRG, *Response to the AER's Draft Rate of Return Instrument*, September 2022, p.62

commissioned by the AER in response to stakeholder feedback,[751] and discussed in detail in section 11.3.1.1. Despite CEPA's updated analysis in October 2022 showing a lower range for observed RAB multiples than those stated in their May 2022 report,[752] the levels seen could indicate that investors expected returns in excess of their costs.

Conversely, analysis by the Brattle Group suggests the return on equity through the 2018 Instrument was lower than other international regulators.[753] While there are difficulties with comparing end estimates across regulators, this information does provide a counterpoint to that suggested by the CRG. From the selected international regulators that were considered in the reports by the Brattle Group, the AER's return on equity through the 2018 Instrument was lower than other international regulators.

We acknowledge concerns about the sufficiency of our return on equity during the low interest rate period. The available evidence suggests overall returns achieved under our regulatory regime during that low interest rate period were not inadequate. We note that interest rates have recently moved back up from the low rates seen from mid-2020 through to early 2022 towards rates seen before we made our 2018 Instrument.

Despite the opposing arguments from stakeholders and observed through our consideration of cross-checks, we consider a balanced assessment of our cross-checks leads us to reasonably conclude that the 2018 Instrument has broadly performed adequately.

Two important contextual positions emerged in the September 2022 stakeholder submissions that focused on:

- consumer impacts of the current economic climate, energy prices and cost of living pressures
- the need for investment in transmission networks, particularly when considering the level of investment required to support the energy transition.

We consider that policy options exist outside of the Rate of Return Instrument to address potential concerns about investment in transmission. The Australian and New South Wales governments have announced specific financial support for transmission investment.

Considering this, and the long-term interest of consumers, we consider we are justified in maintaining an unbiased approach (neither upwards nor downwards) when setting the rate of return.

The Independent Panel also recommended that a conclusive analysis of the efficacy of the Instrument, and the incentive that it provides, should be conducted in assessing the

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[751] CEPA, *Report to the AER – EV:RAB multiples*, May 2022; CEPA, *Report to the AER – EV:RAB multiples*, October 2022.

[752] CEPA, *Report to the AER – EV:RAB multiples*, October 2022.

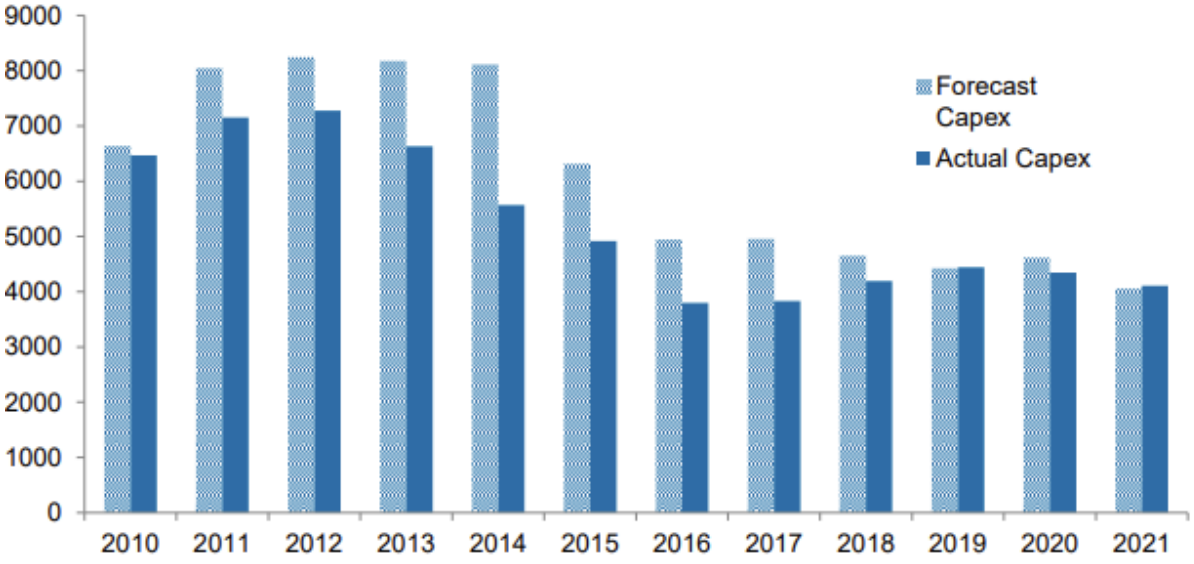
[753] AER, The Brattle Group, *A review of international approaches to regulated rates of return*, June 2020.

performance of the 2018 Instrument.[754] The panel suggested analysis of regulated companies' applications for approval of discretionary capital expenditure, given such expenditure is not mandatory and applications to undertake it could be evidence that the allowed rate of return is providing an incentive for investment.[755]

A desire to invest in discretionary capex may, in some regulatory regimes, indicate that allowed returns are attractive. This is not an appropriate inference for the Australian system.[756] As reported in our annual electricity network performance reports,[757] network companies have received significant rewards for underspending on their capex allowance. A capital expenditure incentive is available to Australian licensees in the form of the Capital Expenditure Sharing Scheme (CESS). The CESS provides networks with financial incentives to undertake efficient capital expenditure over time to ensure that only efficient capital expenditure is added to the regulated asset base (RAB). Under the CESS, a service provider receives a fixed reward equivalent to 30% of capital expenditure efficiency gains made within a regulatory period (and equivalent penalty for efficiency losses).

This has been discussed further in our ongoing review of expenditure incentive schemes, with evidence that network companies are generally spending less than their allowance, as seen in Figure 11.19.[758]

Figure 11.19 Forecast and actual capital expenditure – all electricity distribution



Source: AER, *Review of expenditure incentive schemes – Draft decision*, December 2022

Given the way in which our incentive-based framework is designed, network companies have a financial incentive to receive capital allowances that are as high as possible and to

[754] Independent Panel Report, *AER Draft Rate of Return Instrument*, July 2022, p. 10.

[755] Independent Panel Report, *AER Draft Rate of Return Instrument*, July 2022, p. 55.

[756] CEPA, *EV: RAB multiples*, 24 October 2022, p. 33.

[757] AER, *Electricity network performance report*, July 2022.

[758] AER, *Review of expenditure incentive schemes – Draft decision*, December 2022.

minimise actual capital expenditure incurred while meeting service standards. This is due to rewards and penalties being based on actual capital expenditure relative to allowances. Applications for discretionary expenditure, while rare, could indicate that the design of the CESS incentivises the network to pursue a high capital expenditure allowance.[759]

Accordingly, NSPs would consider the trade-off between the incentives available for not investing (such as the CESS) and investing to earn a return above its cost of capital (as noted by the Independent Panel).

We consider that NSPs would, in all likelihood, consider the CESS incentives available to be more attractive than undertaking discretionary investments not included in our capex determinations.

In conclusion, after our sense check of this final rate of return using the methods outlined above, we are satisfied that our decision in the round will, or is most likely to, contribute to the achievement of the NEO/NGO.

While we acknowledge that in coming to this final 2022 Instrument position, we have exercised our judgement across the parameters that inherently have a reasonable range and/or methodological choices, our cross-checks provide us a level of comfort.

If we found the Instrument did not perform well in a future scenario, we would consider options for making changes and the trade-off with other issues that could also arise.

For example, if we were not satisfied that the decision in the round is likely to contribute to the achievement of the NEO/NGO, we would reconsider:

- SL CAPM input parameters (for example, equity beta)
- cost of debt assumptions
- broader adjustments (such as the notional gearing assumption, revenue profile and use of DGM to set MRP).

However, our view remains that we do not consider that the evidence available supports the application of a bias towards a higher or lower expected rate of return.[760]

If the rate of return is upwardly biased:

- investors will be overcompensated for the risk involved in supplying capital to networks, and could show increased willingness to invest in regulatory assets in comparison with other investments in the economy
- networks could have an incentive to overinvest in regulated assets over the longer term, increasing the regulatory asset base above the efficient level (noting the interaction with other regulatory incentives, such as the CESS)

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[759] CEPA, *EV: RAB multiples*, 24 October 2022, p. 8.

[760] AER, *Rate of return: Assessing the long-term interests of consumers – position paper*, May 2021, p. 13.

- 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 downwardly biased:

- investors will be undercompensated for the risk involved in supplying capital to networks and could 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 (noting the interaction with other regulatory incentives, such as the CESS)
- consumers of energy will pay lower prices, at least in the short term, but will wear 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.

11.6 Decision in the round

We now step back and consider this final decision. In particular, we consider whether the NEO and NGO would be better advanced by continuing the 2018 Instrument (with parameters updated for latest data) or whether we can improve against the objectives by making changes.

Continuing the 2018 approach has aspects to commend it. Much of the data we have available to inform our decision is at similar levels now compared with 2018. The CRG has submitted that we should employ a principle of a high bar for change. While we do not use the same terminology proposed by the CRG, we do accept the general principle. Stability and predictability of the regulatory framework and its application is important for both investors and consumers. Stability and predictability promote efficient investment because investors and consumers can make commitments with confidence. They can reasonably foresee how they will be treated under the regulatory framework.

Although we are broadly satisfied with how the 2018 Instrument has performed, the review process for the 2022 RORI did suggest that some aspects should be further investigated, and options considered.

For example, we identified an option for estimating the market risk premium that may give a more stable return on equity through time (although that is not our preferred choice). This option involves using a combination of historical excess returns and outcomes from a dividend growth model to vary the market risk premium at each regulatory decision. This option may introduce a more forward-looking element if dividend growth models are able to reflect future changes in market conditions. This option also means our return on equity may not move one-for-one with the risk-free rate.

However, we think our current approach to estimating the market risk premium is a safer option because it is a well understood approach and can be readily estimated in advance. It has the advantage of allowing the return on equity to vary with movements in market conditions (as reflected in movements in the risk-free rate). Our current approach also avoids implicitly introducing a relationship between the market risk premium and risk-free rate when such a relationship cannot be estimated with confidence.

We also explored changing the term on equity and discuss this in detail in chapter 6.

To assist in resolving these choices we have returned to our overarching principle:

- an unbiased estimate of the expected efficient return, consistent with the relevant risks involved in providing regulated network services.

We consider that the approach in the 2018 Instrument has delivered outcomes that are consistent with the relevant risks. As such, we think the NEO and NGO are best advanced by largely continuing our current approach. Minimising change is likely to promote stability and predictability and, therefore, efficient investment.

Appendix A List of submissions

The following stakeholders made submissions in response to our draft Rate of Return Instrument.

On the 2nd of September 2022, the following stakeholders made submissions on our draft Rate of Return Instrument and Explanatory Statement:

1) Australian Energy Council (AEC)

2) Australian Gas Infrastructure Group (AGIG)

3) APA Group

4) Australian Pipelines and Gas Association (APGA)

5) Ausgrid

6) AusNet

7) CANEGROWERS

8) Clean Energy Council (CEC)

9) Consumer Reference Group (CRG)

10) Energy Networks Australia

11) Endeavour Energy

12) Energy Queensland

13) Energy Users Association of Australia (EUAA)

14) Evoenergy

15) Global Infrastructure Investor Association (GIIA)

16) Infrastructure Partnerships Australia (IPA)

17) Jemena

18) Kevin Cox

19) Marinus Link

20) Mark Matheson (consumer)

21) Network Shareholder Group (NSG)

22) Queensland Treasury Corporation (QTC)

23) TransGrid

On the 9th of November 2022, the following stakeholders made submissions on CEPA's 24th October 2022 report on Regulated Asset Base (RAB) multiples:

1) Australian Energy Council (AEC)

2) Energy Networks Australia (ENA)

3) Consumer Reference Group (CRG)

On the 25th November 2022, the following stakeholders made submissions on if and how we should adjust the HER sample period considering The Treasury advice:

1) Consumer Reference Group (CRG)

2) Energy Networks Australia (ENA)

3) Energy Users Association of Australia (EUAA)

4) Australian Pipelines and Gas Association (APGA)

5) APA Group

6) Network Shareholders Group (NSG)

7) Australian Energy Council (AEC)

Appendix B Submission summaries

The tables below summarise the key points made by stakeholders in response to our 2022 Draft Rate of Return Instrument (draft Instrument), CEPA's 24th October 2022 report on Regulated Asset Base (RAB) multiples and The Commonwealth Treasury (The Treasury) advice and identify the sections in this decision that discuss stakeholders' key points.

2nd September submissions on our draft Instrument

Consumer Reference Group findings

CRG's consumer engagement/research

Issue	Summary of submissions	AER consideration

Consumer engagement overview	• CRG conducted Consumer Survey 3 in August 2022, the aim of which was to reassess consumer sensitivity to price increases, considering the changed economic circumstances since Consumer Survey 2 in August 2021. The survey included 2,501 energy consumers (1,500 residential and 501 commercial).
	• CRG also conducted:
	  ○ Two consumer representative workshops (10th & 12th August 2022); and
	  ○ Two in-depth discussion groups with individuals recruited by two social service organisations (16th August 2022).
		Section 2.3
		Section 11.3

Key survey findings and comparisons to prior period	• CRG (p.4) suggest that:
	  ○ 30 per cent of respondents reported difficulties in paying energy bills in last 12 months
	  ○ 40 per cent of respondents are anticipating having difficulties being able to afford to pay their bills in the next few years, due to expectations of energy price increases.
	  ○ Residential consumers are more likely to be concerned about the cost of energy than reliable supply, where commercial consumers are concerned about both cost and reliability.
	  ○ 22 per cent of both consumer groups are in longer-term financial stress, with many looking at ways to reduce dependence on networked energy (p.5).
	• CRG found that, compared to August 2021 (p.4):
	  ○ Residential consumers are more likely to respond to minor price increases by looking at ways to use less energy and to invest in reducing their dependence on energy.
	  ○ Consumers (residential and commercial) are increasingly considering ways to invest in reducing their dependence on energy, when the prospect of larger price increases is contemplated.
		Section 2.3
		Section 11.3

Stability of process versus price	• CRG states strong support for stability and predictability in price from consumer discussion groups (p.102).	

	• CRG found that consumers may be ready to accept a change in the process if clear explanations for this change are provided. This was due to differences between groups views where:
	  ○ Group 1 strongly preferred stability in the process; while
	  ○ Group 2 expressed views that the framework may need to change.
	• CRG suggest that findings of Consumer Survey 2 support this, as consumers agreed that the AER should only change the way it makes decisions when there is strong evidence to do so (p.103).	

Reliability is important but the price of network services is a priority	• CRG note sensitivity to, and concern for, price increases was found across consumer representatives' workshops, discussion groups, and consumer surveys (p.104).
	• CRG found that some discussion group consumers (p.105):
	  ○ expressed an interest in trading off reliability for price
	  ○ would consider paying less if short-duration outages could be pre-planned.
	• Though survey results show different views exist on the relative importance of network reliability and affordability, CRG finds that, with deteriorating economic conditions compared to 12 months ago, greater proportions of consumers are placing greater emphasis on affordability than reliability.
		Section 2.3
		Section 11.3

Consumer difficulty managing energy bills	• CRG suggest that their consumer engagement provides ample evidence of consumer difficulties in managing energy bills (p.107).	Section 2.3 Section 11.3
Consumers expect energy costs to worsen	• CRG suggest that consumers express a high level of concern about future energy price increases, alongside concern for the general economy due to the current economic conditions, with many anticipating financial vulnerabilities as a result (p.111). • CRG suggest that findings of the ECA's June 2022 Consumer Sentiment Survey and Pulse Surveys support their view on the concern being experienced by consumers.	Section 2.3 Section 11.3
Many consumers are at a point of 'despair'	• CRG note that, due to increasing hardship, consumers may seek to reduce their expenses in other areas, as they have exhausted actions to reduce their energy bills (p.113).	Section 2.3 Section 11.3
Some consumers are looking at ways to reduce energy network dependence	• CRG suggest that there is a high risk of consumers disconnecting from the grid with a continued increase in network prices. • This is based on an interest in reducing dependence on networked energy expressed in consumer representative workshops, consumer discussion groups, and both previous consumer surveys (p.116).	Section 2.3 Section 11.3
Consumers need to have confidence in Australia's energy system	• CRG emphasises the support that exists for CRG's consumer-oriented principles, particularly the principle that a "regulatory framework serving the long-term interests of consumers must promote behaviours that engender consumer confidence in the framework." • CRG noted that evidence from its consumer representatives, consumer surveys, and ECA's Consumer Sentiment and Pulse surveys suggest that confidence in Australia's energy system is declining, as Australians respond to rising energy prices (p.118). • The CRG suggest that this is a serious concern relevant to the AER's judgement.	Section 2.3 Section 11.3

Term

Summary of submissions to Term issues

Issue	Summary of submissions	AER consideration

Support	• A 10-year term is likely to lead to a biased outcome because the task is to set an efficient return for the next regulatory period (AEC, pp. 1-2).
	• Conditional support:
	  ○ The CRG does not have a singular answer to the AER's overly simplistic question about whether the CRG would prefer the AER adopt 5 or 10-year estimation term for the return on equity. The CRG's position on this matter depends on how the AER's final decision treats other elements in the Rate of Return Instrument (CRG p. 87).
	  ○ If the AER wishes to adopt a 5-year estimation term it is free to do so, but it cannot rely on Dr Lally's advice (or similar arguments) when making that decision. Another reason must be found (CRG p. 86).
	  ○ Put simply, the Independent Panel makes clear that the AER has not identified the problem it is seeking to fix by shortening the estimation term to 5 years (CRG p. 86).
		Executive summary and section 6.3.1.5

Regulatory task	• Applying the conceptual framework of setting a rate of return for a benchmark efficient entity properly involves looking at the outcomes of a workably competitive market and making no assumptions about the regulated status of the benchmark entity. This is in direct conflict with the fundamental conceptual basis of the AER's draft proposals to move to 'term-matching' (ENA, pp. 5, 63-70). • When given a stable meaning and correctly interpreted, the NPV=0 principle is an appropriate consideration, and its satisfaction a desirable economic outcome. It cannot, however, be used to create a simple formulaic test which effectively supplants or replaces the contents of the NEO/NGO and RPP. This is a material risk in proposal to move to a term-matching approach, in rejecting a longstanding approach to determining the return on equity primarily on the basis that it (supposedly) fails the NPV=0 condition. The AER's analysis does not properly demonstrate that a 10-year return on equity cannot contribute to the achievement of the NEO and NGO, or that the use of a 5-year return on equity does, and does so to a greater degree (ENA, pp. 63-68). • The key question is whether the allowed return should be set to match the return that real-world investors actually do require or according to what the AER considers investors should require to compensate them for risk, based on the outworking of some mathematical analysis (ENA, pp. 10, 26, 31). • In its previous decisions, and in the current Explanatory Statement, the AER has interpreted the NPV=0 as setting the allowed return to match the return that real-world investors actually require. This creates the right incentive for efficient investment, which best promotes the NEO and NGO. The draft RoRI proposes a new interpretation of NPV=0 (ENA, pp. 13, 28, 31-36, 47-49, 61). • Even if the AER's mathematical analysis was correct, the AER's new approach would be problematic because it, by design, breaks the nexus between NPV=0 and efficient investment (because network investment decisions	Section 6.3.1.5

	are made with reference to the returns that network investors actually require), and therefore does not best promote the NEO and NGO; and elevates the conclusions from the AER's mathematical analysis above all other considerations (ENA, pp. 13, 28-29, 61-62). • NGL and NGO sets the AER's regulatory task as to promote efficient investment for the long-term interests of consumers. Decisions by Federal Court and Australian Competition Tribunal in interpreting the NGO and NEO 'requires prices to reflect the long run cost of supply… providing investors with a return which covers the opportunity cost of capital required to deliver the services' (APGA, pp. 6-7). • The AER also notes that 'economic efficiency more generally is advanced by employing a rate of return that reflects rates in the market for capital finance.' This involves first understanding what return investors require and then designing an approach to include in the RoRI (APGA, p. 7). • What AER views investor should require is unlikely to influence what investors actually require. Investors operate in a commercial context, and the distinction drawn between commercial and regulatory context has no bearing on the required return (APGA, p. 7-8). • It is inappropriate to elevate AER's mathematical analysis above evidence about required returns in the market. Such elevation cannot be held to meet the AER's legislative obligations (APGA, p. 12).	
Precedent and other regulators	• ERA, who has a comparable regulatory task as the AER, has proposed to move to a 10-year term. QCA also moved to a 10-year term. This leaves the AER as the only regulator to use a 5-year term if adopted (NSG, p. 8, Jemena, p. 4, IPA, p. 2, Ausgrid, p. 4, AusNet, p. 3, QTC, p. 4, ENA, pp. 38-40). • If the AER and ERA proceed as flagged in their respective draft decisions, the AER will be the only Australian regulator to apply a 5-year term when estimating the return on equity. The CRG notes the AER has previously cited the ERA's use of a 5-year term in support of its own proposal (CRG p. 86). • Changing the term from 10 to 5 years is inconsistent with previous AER decisions, approach to allowed return on debt, other regulators' decisions and independent expert valuation reports, market practice and approach recommended by leading textbooks (Transgrid, p. 3, IPA, p. 2, Evoenergy, pp. 3-4, Energy Queensland, p. 2, CEC, pp. 1-2, GIIA, p.2, Endeavour, pp. 5-6, ENA, pp. 48-53). • Allowed return should reflect the market cost of capital – the return that real-world investors require. The AER has previously concluded that a 10-year risk-free rate reflects the practice of investors, is consistent with NPV=0, and best promotes the NEO and NGO (Transgrid, p. 3, NSG, p. 2, 15-16, Evoenergy, p. 4, Ausgrid, p. 2, AGIG, p. 1, Endeavour, pp. 2-3, ENA, pp. 33-37, 69). • Regulatory inflation and the return on equity have different roles to play so one has no implications on the term for the other. Inconsistency in the logic adopted in the draft instrument, which ties change to term of equity to inflation (Transgrid, p. 3, Ausgrid, p. 3, Endeavour, p. 4, APA, pp. 27-28, ENA, pp. 40-47). • Change in the term has been driven by the AER instead of stakeholders, and is not based on new evidence not previously considered when setting the term of equity at 10 years. The 2018 RORI rebuffed Dr Lally's assumptions (Transgrid, p. 3, NSG, pp. 7-8, Jemena, pp. 3-4, Energy Queensland, p. 2, AusNet, p. 2, Endeavour, pp. 4-7, QTC, pp. 4-6, APGA, p. 13). • Setting the return on equity at 5-years is inconsistent with the statement made – 'We consider employing a rate of return that is commensurate with the prevailing market cost of capital (or WACC) is consistent with the NPV=0 investment condition.' (Endeavour, p. 2).	Sections 6.3.1.5 and 6.3.1.6

Impacts	• One implication of the proposed change is higher prices for consumers during deep recessions and financial crises, when the 5-year rate tends to be higher than the 10-year rate (ENA, pp. 4, 10, 26, 29). • With 5-year term of the risk-free rate, the resulting allowed return in every year will, on average, be lower than investors' required return (ENA, pp. 5, 10). • Network investors are very concerned about the proposed change to a 5-year term, itself; and the implications for the stability and predictability of the regime and confidence in the regulator (ENA, pp. 4, 10, 25, 30). • Elements of the June draft Explanatory Statement re-interpreting the conditions for meeting NPV=0 represent a significant potential disruption to regulatory confidence, stability and predictability (ENA, p. 4). • Implications for the stability and predictability of the regulatory regime which is essential to attract the capital needed to fund the transition. Stability, transparency and predictability of regulatory framework is critical to investments (Transgrid, p. 3, NSG, p. 3-4, 8-9, IPA, p. 2, AGIG, p. 2, GIIA, p. 2, ENA, p. 30). • 5-year CGS does not produce a lower return on equity during recessions, which would adversely impact the long run interest of consumers. Currently in the US, we have an inverted yield curve, and this change would result in higher prices. (Evoenergy, p. 5, AusNet, p. 2, ENA, p. 29). • 5-year term results in increased volatility of equity returns, requires changes to other parameters of the CAPM, leads to lower returns required by investors, implies low beta firms have a lower return on equity over the shorter term than longer term, and impact real world capital budgeting (APGA, pp. 12-13).	Sections 6.3.1.5 and 6.3.1.7
Other considerations	• ENA: ○ The change to the term of the risk-free rate would be inconsistent with every previous decision made by the AER; the AER's approach to the allowed return on debt; the approach adopted by every other Australian regulator; the approach adopted in every independent expert report, including those for networks regulated by the AER; the clear evidence of market practice, including the practice of infrastructure investors; and the approach recommended by leading textbooks (ENA, pp. 4, 10, 25, 29, 33-40). ○ The change is being considered in circumstances where the change has been driven by the AER and not stakeholders; there is no new evidence or argument that has not been previously considered by the AER on many prior occasions; and record network investment is required over the coming decade to meet Australia's decarbonisation commitments and unlock cost savings for consumers; there is no agreement between multiple stakeholder groups on the conceptual and empirical basis for the change (ENA, pp. 4, 10, 25, 29). ○ Regulatory inflation and the allowed return on equity are independent parameters that have different roles in the AER's regulatory framework, such that the term adopted for one has no implications for the other (ENA, pp. 11, 27). ○ The new position in relation to equity is inconsistent with the AER's position in relation to debt (ENA, pp. 12, 27, 36-38). It is not based on any new evidence since the working papers in which the AER concluded that the terms for inflation and equity are independent (ENA, pp. 12, 27, 40-47). ○ The mathematical analysis that is used to support a 5-year term is flawed, for reasons explained in this submission and the Schmalensee report (ENA, pp. 4, 11, 12, 26, 53-61).	Section 6.3.1

	○ NPV=0 is satisfied if the allowed return always matches the market-determined cost of capital (ENA, pp. 31, 57). ○ The careful and detailed analysis from QTC shows that Dr Lally's 'resetting bond' interpretation of regulatory cash flows is incorrect. The whole basis for the 5-year approach is that investors do not consider cash flows after the regulatory allowance re-sets, similar to a 'resetting bond.' But QTC shows that the yields on long-term floating rate bonds are higher than on shorter-term floating rate bonds – proof that investors do indeed look beyond the next re-set (ENA, pp. 31, 62-63). • APGA submission and CEG report: ○ The AER does not reference any evidence that investors in a regulated energy network would adopt a term of equity that matches the length of the regulatory period. This appears to be based on a belief that the relevant interest rate risks are only those that exist within a regulatory period, and that longer term risk is eliminated due to price resets (APGA, p. 9). ○ Professor Schmalensee notes the assumptions underpinning the maths are not defensible (APGA, p. 11). ○ The AER has combined its adoption of the 5-year risk-free rate with an arbitrary set of assumptions about the term structure of the MRP. They imply that high (low) beta firms will have a downward (upward) sloping term structure of return on equity. If this were true, then high risk firms would prefer long term projects, and low risk firms preferring short term projects (APGA, p. 12, CEG, pp. 7-8). ○ Valuers are taking a very different approach to what the AER assumes as the approach that investors would take. This is a weakness of the AER logic that cannot be ignored on the grounds that there are different objectives for the AER versus valuers (CEG, pp. 9-10). ○ The AER's proposal will tend to result in less accurate estimates of the cost of equity. This is because the AER is proposing to hold the term structure of the MRP constant and adopt a much more volatile and procyclical risk-free rate proxy. The volatility of the 5-year RoE would materially overstate the volatility in the true return on equity. Literature finds that yield for RFR and MRP term structures move in opposite directions, this results in a stable RoE, and consistent with valuation experts' use of stable RoE (CEG, pp. 11-17). ○ The credibility of the AER's desire to achieve zero NPV by adopting a 5-year risk-free rate is seriously undermined by both: its unwillingness to attempt to estimate the MRP at the same point in time; and its failure to even consider the potential that the volatility in the 5-year risk-free rate would not be reflected in the 5-year RoE (CEG, pp. 18). ○ If a 5-year risk-free rate is adopted, beta and credit risk must be expected to increase (CEG, p. 19-28). ○ The AER's approach is a 2-factor model, where the RoE are explained by both beta and duration over which revenues(prices) are set. According to the AER's approach, the CFO of a firm in a competitive market (where prices are continuously reset) should adopt a higher MRP and a shorter tenor risk free rate than the CFO of the firm with long-term contracts. Similarly, finance academics should have built up a literature demonstrating that firms with more frequent pricing resets have different risk premiums and have returns that are more sensitive to short-term risk-free rates than firms with revenues governed by long-term contracts (CEG, pp. 5, 29-31).	

	○ Using the AER's WACC has the potential to materially tip the balance of the present value assessments in favour of more capital intensive network solutions. The length of time between when the AER resets the cost of equity allowance should have no relationship to whether a particular expenditure is efficient (CEG, pp. 32-34). • APA's submission and Professor Wright's report: ○ NPV = 0 does not specifically require that the equity term matches the length of the regulatory control period. If equity investors expect to receive cashflows over a longer period (because investments in regulated assets are seen as being long term investments) then, provided the regulator takes a long-term view of the allowed rate of return, NPV = 0 (APA, pp. i, ii, 5-9). ○ The investment horizon of equity investors cannot be assumed to be the length of regulatory control period. The investment horizon must be established by reference to evidence of investor practice (APA, pp. i, 5-9). ○ Corporate finance theory and commercial evidence may indicate that investors' required returns vary with the length of the period over which those returns are expected to be recovered, but this does not establish that that period should match the length of the regulatory control period (APA, pp. i, 9-12). ○ The conclusion that the best estimate of a discount rate to be applied to cashflows extending over a period of five years is unlikely to be based on 10-year CGS yields, is unsupported (APA, pp. i, 4, 9-12). ○ No guidance on the setting of the term of the proxy for the risk-free asset of the CAPM is to be found in section 6.2.1.6 of the Draft Explanatory Statement (APA, pp. i, 9-12). ○ Rate of return on equity may or may not have a term structure (APA, pp. i, 12-15). ○ Even if rate of return on equity has a term structure: – The rate of return on equity has no term structure under the CAPM. This is because CAPM is a single-period model. This means a term structure should not be attributed to the risk-free rate of the CAPM. If a term structure is not to be attributed to the risk-free rate, then there is no reason for the proxy for the risk-free asset to have a term which matches the length of the regulatory control period. – We cannot assume that that term structure follows the term structure of CGS (APA, pp. i-ii, 12-15). ○ Hence, the question of how the risk-free rate should be estimated under CAPM is left open (APA, pp. ii, 15). ○ The report of Professor S. Wright provides advice on an alternative perspective (APA, pp. ii, 16-26). ○ Professor Wright advised: – The term of the proxy for the risk-free asset should be set equal to the assumed investment horizon of equity investors since the return on even a default-free long-term bond is only risk-free if the bond is held to maturity; – Establishing the investment horizon of equity investors is not clear-cut, but there is a strong case for assuming an investment horizon, and hence a term for the risk-free asset, that is distinctly longer than five years (the length of the regulatory control period); – The preceding conclusions are consistent with well-established practice by regulators both in the United Kingdom and (until recently) in Australia; and	

	– The terms of the bonds used to estimate the risk-free rate of the CAPM in recent United Kingdom regulatory decisions are 10 years and longer (APA, pp. ii-iii, 16-26). o The bond which provides a precise estimate of the risk-free rate for a chosen investment horizon will be a default-free zero-coupon bond with term equal to that horizon (APA, pp. iii, 26-27). o Given the current practical constraints, the appropriate pragmatic choice is the market practice of using CGS with terms of 10-years as a proxy for the risk-free asset of the CAPM (APA, pp. iii, 26-27). o There is no need to specify different procedures for setting the risk-free rate of return for regulatory control periods of different lengths, since the investment horizon is not linked to the length of the regulatory control period (APA, pp. iii, 28-29). o Consistency in the application of the AER's conceptual framework, including across regulatory decisions, is desirable. However, a superficial requirement for consistency (with the AER's position on inflation) should not override the recognition of fundamental economic differences between different aspects of the regulatory task (APA, pp. iii-iv, 5, 15-16). • QTC: o The Draft Explanatory Statement includes no response to, or assessment of the QTC example. QTC has effectively been denied a round of consultation on an important issue relating to the allowed return on equity. QTC does not consider this outcome to be consistent with good regulatory practice. QTC expects the AER to clearly set out the reasons why it does or does not agree with its views, especially when topic being considered relates to interest rates and the pricing of debt instruments (QTC, p. 11). o Dr. Martin Lally advised the AER that regulated equity can be viewed as a long-term floating-rate bond with a coupon that is reset at the start of each 5-year regulatory period. The floating rate bond analogy is essential to the AER's term matching proposal (QTC, pp. 1, 4-7). o If regulated equity is viewed as a long-term floating-rate bond with 5-yearly coupon resets, the risk-free rate in the allowed return on equity should be materially higher than the 5-year risk-free yield. This conclusion is supported by: – a first principles analysis based on the incremental cost of locking in funds for longer periods of time while maintaining the same exposure to interest rate risk – the positive slope of the trading margin term structure for floating-rate CGS, and – the expected cost/return of a CGS swap package, which is a portfolio of CGS and swap transactions that approximates the cash flows on a long-term coupon-resetting CGS (QTC, pp. 1, 4-5,7-11, 11-24). o As a consequence, the AER's term-matching proposal can be expected to significantly under-estimate the risk-free rate in the allowed return on equity, which will lead to NPV<0 outcomes for equity providers to network businesses regulated by the AER (QTC, pp. 1, 4-5, 11, 17-24). o This is strong market-based evidence against the AER's proposal to depart from the AER's long-standing practice of using a 10-year CGS yield to calculate the allowed return on equity (QTC, pp. 1, 24). o Finally, term-matching is out of step with contemporary regulatory practice in Australia (QTC, pp. 1, 4).	

	• Other stakeholders:
	  ○ Assumptions made by the AER about how investors form return expectations are different from actual practice, that is what investors actually require vs should require. Consideration needs to be given to investor practice for efficient investments and positive outcome under the NEO/NGO (NSG, pp. 2-3, 9-15, Jemena, p. 3, IPA, p. 3, APGA, p. 9, ENA, pp. 47-48).
	  ○ Investments in long life infrastructure span more than one regulatory period, and investors are not getting capital back or make new investment decisions at the end of each regulatory period (NSG, p. 7).
	  ○ Investors use a 10-year risk free rate, contrary to the Draft RORI suggesting that the assumptions are consistent with valuation practices described in stakeholder submissions, especially footnote references to ENA submission (Ausgrid, p. 3).
	  ○ Time over which invested capital is exposed to interest rate risk is ignored – with capital deployed over the life of the asset, rather the focus is on the resetting process and exposure to that interest rate risk (AGIG, p. 1, GIIA, p. 2-3, QTC, p. 4, APGA, pp. 10-11).
	  ○ Investors have expectations beyond the next re-set as yields on long-term floating rate bonds are higher than on shorter-term floating rate bonds (Endeavour, p. 3).
	  ○ Assumptions underpinning the math is predicated on a backwards understanding of Schmalensee (Endeavour, p. 3).	

Market risk premium

Summary of submissions to MRP issues

Issue	Summary of submissions	AER consideration

The Dividend Growth Model (DGM)	• Use Calibrated DGM to inform MRP estimates. This would provide greater stability in allowed return on equity estimates, and network charges. It would also provide a more forward-looking risk premium estimate, avoiding sole reliance on an untestable assumption that expectations exactly match long-term historical returns, improving the likely quality of the resulting rate of return estimate. *(ENA page 7)*
	• A key requirement of any DGM estimate is that it must produce estimates that are unbiased over time. Any DGM specification that produces estimates that are systematically different from observed outcomes (i.e., the HER estimate) should not be used. In this regard: *(ENA, page 74)*
	  ○ The calibrated DGM produces an unbiased average estimate by construction
	  ○ By contrast, the AER's proposed specification produces estimates that are materially lower than observed outcomes, on average. This introduces a bias into allowed returns.
	• There are number of other problems with AER's analysis of the DGM approach: *(ENA, page 14)*
	  ○ Having identified in 2018 a number of issues that led to the AER giving no weight to the DGM evidence, the AER has rejected ENA's approach that addresses those issues and reverted to the specification that was previously so problematic that it received no weight.
		Section 7.3.2.2

	○ There appears to be an error in the formula that the AER proposes to use for long-run growth. ○ The proposed approach introduces unnecessary noise by first estimating the 10-year MRP and then making an unexplained adjustment, rather than simply estimating the 5-year MRP directly. ○ The AER's key criticisms of the calibrated DGM approach apply equally to the AER specification. • In terms of the growth used in the model, the ENA prefers to use the Intergenerational Report estimates – as they are long-run estimates, whereas the Consensus Economics estimates are not. Whatever approach is taken for estimating long-run growth, the AER must ensure that the resulting MRP estimates are unbiased. Some method must be adopted to ensure that the average of the DGM estimates is equal to the HER estimate, or a bias will be introduced. *(ENA, page 84-85)* • The deduction for new equity is inconsistent with the observed evidence. *(ENA, page 85-86)* ○ Since 1990 (when central banks began targeting inflation), the growth in dividends per share has been equal to (or slightly higher than) the growth in GDP. ○ No reason has been proposed for why investors would expect the relationship between growth in GDP and dividends per share to be materially different over the next 30 years than what has been observed over the last 30 years. ○ The notion that dividend growth must be capped at GDP growth or else the corporate sector will account for a growing proportion of total economic activity over time has no material effect. • The volatility produced by ENA's calibrated Dividend Growth Model (DGM) is the same as the volatility in the AER's preferred DGM. *(Ausgrid, page 4-5)* ○ It is unclear why the same volatility is considered an issue for one, but not the other. Further, the DGMs deliver a more stable return on equity than the historical excess returns (HER) method. This is because they smooth out some of the volatility of the risk-free rates. ○ The long-term dividend growth assumption of 6% is used because that drives the long-term HER estimate that is being calibrated. It is not an input selected by ENA, but a back-solved input to ensure the long-term HER is maintained on average. Maintaining the long-term HER is the key principle that makes the ENA's calibrated DGM superior to other DGMs because it produces an unbiased Market Risk Premium (MRP). • AER should only rely on the Dividend Growth Model (DGM) to estimate the Market Risk Premium (MRP) if ENA's calibrated DGM is used. The AER has repeatedly raised concerns about the stability of DGMs and the assumptions required to parameterise the model. ENA's calibrated DGM ensures the average estimate of the MRP matches the Historical Excess Returns (HER) estimate applied by the AER, and therefore eliminates any bias. *(AusNet Services, page 3)* ○ The AER proposes to use the 3-stage model (despite disregarding this same model in the 2018 RORI), however, this gives average results materially below the HER estimates. Applying this model introduces inconsistency between the two estimation techniques and a downward bias in the MRP. • Supports the AER giving some material weight to an unbiased Dividend Growth Model (DGM) approach, such as the calibrated DGM approach proposed by the ENA, that could be updated at the time of each determination. However, Evoenergy does not support an approach to incorporate a DGM that produces an unbiased estimate, relative to the HER approach over the same time period. Incorporating or giving weight to a DGM approach will produce a better and more stable estimate of the MRP over longer time horizons. *(Evoenergy, pages 5-6)* • Should continue to review opportunities, either in this RORI or the next, to have regard to other sources of evidence such as Dividend Growth Model (DGM) estimates. (*Endeavour Energy*, page 7)	

	○ Disappointed that the AER has rejected ENA's calibrated DGM in favour of its own DGM specification from the 2018 RORI which was previously rejected and produces demonstrably low bias estimates. The ENA's calibration was developed to address the concerns raised by the AER in the 2018 RORI and should be given further consideration. • Use of the DGM provides an approach to MRP estimation. Such approach is very different compared to MRP estimation using HER. Compared to the HER, the DGM better captures the changes in asset risks and investor willingness to bear those risks that seem to underlie time variation in the MRP. *(APA, page 7)* • In respect of the market risk premium (MRP), the AER favours a fixed, unconditional mean based on historical excess returns (HER) data but is considering the use of the dividend growth model (representing the conditional mean) and a mechanistic updating of the market risk premium whilst the RoRI is in force. AGIG favours this alternative as they believe, along with the ENA, APGA and the experts in the AER's expert conclave, that the true market risk premium is informed by both the unconditional and conditional means. AGIG agrees with the ENA and APGA that the version of the dividend growth model the AER has suggested produces a conditional mean whose long-term component is inconsistent with the unconditional mean the AER is using. For this reason, AGIG submits that the version of the dividend growth model put forward by Frontier, which fixes this inconsistency, should be use. *(AGIG, page 2)* • The AER should consider adopting an approach that updates the MRP at the same time as the risk-free rate using the method proposed by ENA, including a calibrated dividend growth model (DGM*). (APGA, page 4)* • The AER continues to evaluate an alternative approach that incorporates estimates from Dividend Growth Models (DGMs). The NSG is concerned that the AER's DGM would result in estimates that are systematically below average historical observations. To ensure that any such estimate is unbiased, NSG endorses the approach put forward by the ENA. *(NSG, page 18)* • The CRG consider that the use of Dividend Growth Models (DGMs) to generate estimates of MRP carries the risk of resulting in volatile estimates, given that several of the inputs to a DGM are subject to variation over time and that these variations feed through to variations in the output. Accordingly, the CRG does not support further consideration of the Option 3b outlined in the Explanatory Statement. ○ The alternative, Option 3b, gives 50% weight to DGM estimates. DGMs tend to be upward biased due to analyst optimism and the AER's model uses the ASX 200 which likely overestimates the returns to the overall stock market. The CRG agrees with the AER's decision not to further consider the calibrated DGM. The results are highly volatile, the terminal growth rate is implausibly high and the AER's finding that "there may be a material time varying error in the model created from using a constant growth rate" is further cause for concern. *(CRG, page 4,40)*	
Historical Excess Returns	• The AER draft approach to set the MRP based on estimates of historical excess returns is consistent with the 2018 Instrument, and a consistent and coherent approach to the rate of return framework. (*AEC, page 2)* ○ Using HER does not mean an MRP estimate is backward-looking. The HER is commonly used by both regulators and market practitioners to inform their estimates of the MRP within a forward-looking rate of return. The AEC supports the setting of the MRP based on the HER, consistent with the AER's past practice and with the principle of providing a consistent framework.	Section 7.3.2.1

	○ The HER method is not perfect, but as noted by the CRG, there is an absence of empirical evidence that the prevailing approach has had a detrimental impact[761]. The CRG has further stated that the HER method is the most appropriate for long-lived assets with long-term investors. Whilst an academic or theoretical case can be made for greater weight to other information in determining the MRP, there is no compelling case made that there is a problem with the current method that must be addressed. • The AER should disregard the Independent panel's criticism that it is being inconsistent in approach to MRP and equity beta. *(APGA, page 14-15)* ○ Judgement is used to determine both the MRP and equity beta. The difference is how it is used. ○ In the case of MRP, the AER uses its judgement to determine the MRP using the historical excess returns approach. It considered other approaches and different ways of applying that approach (e.g., time periods, data sources) before settling on one. True to that approach, the AER ultimately decides to use the longest period of data available following the introduction of dividend imputation in Australia. These are all out-workings of judgement • The CRG continues to favour the use of Historical Excess Returns (HER) data to inform the estimate of the MRP. This approach provides a stable, consistent signal to investors and consumers based on long-term evidence of returns to Australian equities. *(CRG, page 4, 33)* ○ However, while the CRG support the stability of process associated with continued reliance on HER data, they do not consider it necessary or desirable that the AER chooses a specific single estimate based on one specific combination from amongst the several combinations of averaging type, term and sampling period that it has reviewed. They consider that these estimates are all relevant factors that should be potentially given some weight in the AER's judgment of the best estimate. The final estimate need not correspond to any single estimate, but rather should account for the limitations of any single estimate. ○ The AER's choice of HER estimate does not account for potential upward bias from: exclusion of geometric averages, interim dividends, survivorship bias and the fact that the data series stops at a point close to the ASX all-time record. • The point estimate of 6.8 per cent selected by the AER is too high. The CRG recognises that the difference between the two estimates is partly due to the change in term, however that only accounts for 30 basis points of difference. Considers that the 6.1% estimate used in the 2018 RoRI should serve as the upper bound, given the work the AER has done to establish the adequacy of the 2018 decision. However, the best estimate consistent with the AER's objective of an unbiased estimate could be lower than 6.1%. *(CRG, page 33)* • There is 'systematic upward bias' across the key building blocks - beta, market risk premium, return on debt and equity premium - where the AER is called on to exercise its judgement. *(EUAA, page 1)* The Independent panel contemplated the possibility that the four additional years since 2018 might be somehow special and less representative of future expectations. It would not be appropriate for the AER to contemplate picking and choosing data points to omit from its HER calculations. The whole point of the HER approach is to obtain an	

[761] Rate of Return Instrument Review: CRG Response to AER's Final Omnibus and Information papers, P. 11, 69, 76.

	estimate of the long-run average MRP that has occurred in the Australian market. Every data point contributes equally to that exercise. *(ENA, page 79)* The Independent panel has suggested that the AER obtain expert advice in relation to central bank liquidity expansion and the potential future normalisation of central bank balance sheets. In light of the above submissions, ENA see no utility in such an exercise for the narrow purpose of estimation of MRP or a narrow set of parameters. Any such advice should be holistic and consider in comprehensive detail potential and actual interlinkages between all elements of the AER's parameter considerations and cross checks. ENA considers that the examination of this issue and testing of conclusions prior to the final Instrument is unlikely to be feasible. *(ENA, page 80)*	
Methodology used to calculate a 5-year MRP	• The DGM estimates a total market return (TMR) at a point in time, and the prevailing 5-year risk free rate would be deducted from the TMR to compute the 5-year MRP. However, the AER suggests that it will estimate the 5-year MRP by subtracting the 10-year risk free rate from the TMR to calculate a 10-year MRP, then adjust the 10-year MRP for the difference between historical 5 and 10-year risk free rates. It would be helpful if the AER could explain why it proposes this method rather than the conventional method. *(Ausgrid, page 5)* • The AER is proposing to implement the DGM in a most unusual way. The draft decision proposes to subtract the prevailing 10-year risk-free rate, adjusted by the historical average difference between the 10-year and 5-year risk-free rates. The ENA does not understand why the AER does not deduct the prevailing 5-year risk-free rate in the usual manner. A better and more standard approach would be to estimate the DGM relative to the prevailing 5-year rate – rather than a mixture of current and historical risk-free rates of different terms. Such an approach would preserve the key benefit of the DGM approach – prevailing and consistent estimates of the risk-free rate and MRP. The ENA does not see any benefit in the noise that is introduced under the proposed approach and the rationale for it is not explained in the draft decision. *(ENA, page 86-87)*	Section 7.3.2.1
Wright approach or Total Market Returns (TMR) approach	• There remains merit in having regard to the Wright approach to which the AER is setting an impossibly high evidentiary standard to be considered. There is no single perfect method for estimating market returns. The Wright approach is used by other regulators and supported by compelling evidence that there is a negative relationship between the MRP and risk-free rate. *(Endeavour Energy, page 7)* • The assessment of the theoretical basis for the Wright approach was not done good faith, or in a way that is consistent with good regulatory practice. *(QTC, page 2-3)* o The draft explanatory statement does not address the main theoretical points in Wright, Mason and Miles (2003). The section appears to be more concerned with making a case against the Wright approach rather than genuinely engaging with the research and academic literature to determine an appropriate weight for the Wright approach. o Most of the points raised relate to empirical issues rather than theoretical issues. Even so, a more comprehensive analysis of the empirical issues cited leads to different conclusions. • It is too late for the AER to make a proper assessment of the Wright approach, because stakeholders will have no opportunity to respond. Therefore, QTC considers the most appropriate course of action for the AER when making the Final 2022 RoRI is to *(QTC, page 2-3)*: o Place no weight on the conclusions of the Draft Explanatory Statement, and o Follow the advice already provided by its consultants and give weight to the HER and Wright approaches	Section 7.3.2.5

	• A weighted average of the Wright and HER approaches is an estimate of the expected MRP based on historical data. This estimate can be combined with the forward-looking implied MRP from the calibrated dividend growth model (DGM) to calculate the expected MRP under the 2022 RoRI. (*QTC, page 2-3)*
	• The AER appears to apply an impossibly high standard of theory to the Wright approach, and none at all to the HER approach. Empirical evidence supports weight being given to the Wright approach: *(ENA, page 75)*
	  ○ There is compelling evidence of a negative relationship between MRP and risk-free rates over the last 30 years, which the AER has concluded is the period of most relevance. This evidence favours the Wright approach.
	  ○ The draft decision relies heavily on the stability tests conducted by Dr Lally. However:
	  ○ Those tests do not relate to the 30-year period that the AER has concluded to be most relevant in forming investor expectations. Over the relevant period, the two approaches have similar stability.
	  ○ In any event, the stability tests do not support weights of 100% and 0%, respectively; and
	  ○ The AER's conclusions in relation to these stability tests are inconsistent with Dr Lally's recommendation that the AER should apply equal weight to the HER and Wright estimates.	

Fixed Market Risk Premium approach	• The AER's proposed approach to estimating the return on equity as a fixed margin above the risk-free rate will lead to a 'lottery' for regulated energy networks and their customers. Stakeholders have proposed ways to lower that volatility and reduce the risk that it leads to outcomes inconsistent with the NEO and NGO. The AER does not appear to have properly engaged with those proposals or concerns about volatility. *(Jemena, page 4-5)*
	  ○ If the AER is minded to address that volatility which Jemena believe it should, then it should adopt ENA's proposed formulaic approach: whereby the MRP is automatically determined at the same time as the risk-free rate by combining estimates from a calibrated dividend growth model and historical excess returns
	  ○ If, however, the AER is not so minded, then it should simply retain its current fixed MRP approach. The decision largely depends on whether the AER considers the MRP to be time varying or not. It was noted that during the AER's expert concurrent session, the experts did not reach a unanimous decision on this matter.
	• No consideration should be given to the desirability of the allowed return on equity moving point-for-point with changes in the risk-free rate when the AER makes the Final 2022 RoRI. *(QTC, page 43)*
	• The ENA maintains the view of recognising greater stability of the overall cost of equity estimates than risk-free rates. ENA remains concerned about the robustness of the AER's preferred approach to unusual economic conditions, such as a return to the low-rate conditions that eventuated after the 2018 RoRI. *(ENA, page 5)*
		Section 7.3

Arithmetic vs geometric means, survey responses and conditioning variables	• Only arithmetic means should be used, and a clear statement about this could prevent this debate from continuing in 2026 and 2030. The Mathews (2019) estimates are unreliable and should receive no weight. *(ENA page 13, 74)* • ENA agrees that there is no useful role for survey responses or conditioning variables. *(ENA, page 14)* ○ If the survey data were to be relied upon, it is important that the survey responses on the risk-free rate should also be considered. It would be highly misleading to give weight to survey responses on MRP, but to ignore the fact that those same respondents tend to pair their MRP estimates with a risk-free rate materially higher than the prevailing government bond yield.	Sections 7.3.2.1 Section 7.3.2.3 Section 7.3.2.4

	• Supports the AER not giving weight to geometric means, survey responses or conditioning variables in setting the MRP *(Endeavour Energy, page 7)*. • In estimation of the MRP for the Rate of Return Instrument, there is no forecasting of the HER series forward at a rate of return implied by the historical series available at the time. The unbiased estimator of the mean of the series is the arithmetic average. This is unaffected by any considerations of the presence of autocorrelation in the excess return series, or by variance volatility. An estimate of the MRP for the 2022 Instrument, which is made from HER, should be made as the arithmetic average of those returns. *(APA, page 8)* • The AER should not move the HER estimate of the MRP, or provide an uplift to the risk-free rate, based on survey results. *(APA, page 8)* • The AER should not move the HER estimate of the MRP based on the observation of conditioning variables. *(APA, page 8)* • In accounting for the fact that neither arithmetic nor geometric averages are straightforwardly the best estimate, the AER should select a figure that lies between the arithmetic averages and the geometric averages. By taking account of only the arithmetic average, the AER has ignored its own assessment that arithmetic averages will overstate the MRP. *(CRG, page 33)*	

HER sampling periods	• Does not agree with the Independent panel that the AER should selectively remove periods of high returns when estimating the average historical excess return. Any adjustment to historical series will inadvertently require judgement to be exercised over the entire historical series and result in bias being introduced, making historical estimate of MRP redundant for setting unconditional MRP. *(Jemena, pages 4-5)*
	• None of the periods can be considered a priori, as more representative than others of the true market risk premium. *(CRG, page 35,36)*
	  ○ In general, a longer data series is most likely to provide an unbiased estimate of the unconditional MRP.
	  ○ The relatively short period used to construct what is intended to be an unconditional estimate is a relevant concern because of the surprisingly large movement in the HER data over this shorter period between 2018 and 2022.
	• The Independent panel considered that the time series used to estimate historical excess returns should be adjusted to exclude periods of unusual market circumstances. In APGA's view, such adjustment will be arbitrary, and undermine the use of that method by biasing estimates. *(APGA, page 15)*
	  ○ If the AER were to head down the path of adjusting out all time periods that were affected by unique circumstances, then the AER would end up with a very patchy time series that will make the historical excess return estimates highly unreliable. The resulting MRP estimate will be heavily influenced by what periods the AER decides to exclude – which could introduce bias.
	• For MRP estimation from HER, the longest - and most appropriate - series available is the Brailsford, Handley and Maheswaran series for 1958 to 2010, extended, using the Brailsford, Handley and Maheswaran methods, for 2011 to 2021. Estimation of the MRP as an average of HER has some validity only if a very long series of those HER is used: the series from 1958 (64 observations) might be long enough. No evidence of a structural break around 1988 has been put forward to justify a focus on the series from 1988, which is simply too short for reliable estimation. *(APA, page 8)*
		Section 7.3.2.1

	• ENA's preference is to use the sample period from 1958. This is a period that is long enough to provide statistical reliability, consists exclusively of reliable data that is not subject to alternative estimates, and for which does not vary materially with the introduction of each additional year of data. *(ENA, page 81)*	
Weighting the HER and DGM estimates under option 3b	• As a matter of regulatory principle, the CRG is concerned that the AER is still leaving open in the Draft Decision the prospect of adopting an MRP based on an equally weighted HER and DGM (Option 3b). The introduction Option 3b has significant implications not only for the AER's initial return on equity, but for the operation of the RoRI framework over the next four years. The full implications of this approach are not adequately canvassed in the Draft Decision. *(CRG, page 38)* o A major concern with the alternative option is the use of the DGM in setting the estimate and the broader implications on the operation of the RoRI. The AER and many other stakeholders will be familiar with the critiques of the DGM • The 50:50 weight given to HER and DGM is arbitrary, and it is not clear whether or how the AER has satisfied itself that this is an appropriate weight. *(CRG, page 40)* o Partington and Satchell critique this aspect of the AER's approach. More fundamentally they question the premise of averaging an unconditional estimate of MRP with a conditional estimate of MRP. o CRG agrees with this assessment. There is a fundamental problem with taking an average of two very different ways of analysing the MRP. The mathematics is easy, but the resulting figure has no conceptual or theoretical foundation; it is more a convenience than an attempt to decide an unbiased estimate. o The HER approach provides a sensible statistically sound methodology for estimating future expectations on the overall returns on equity and is widely used for this purpose. The DGM approach relies on subjective forecasts (often derived based on short-term recent market events) and with no statistical framework for assessing the probabilities of these events in the future. • The CRG puts very little weight on the putative stability benefits of Option 3b. *(CRG, page 41-42)* o Stability is somewhat important to many consumers. However, this does not mean that consumers in general are interested in "buying" stability through higher prices. o Whether Option 3b is more stable in the future is unclear because the stability benefits from the interaction with the risk-free rate may be outweighed by variability due to variations in the other inputs. The outcomes of DGMs are typically highly sensitive to variations in inputs. Partington and Satchell compared the statistical stability of Option 1 and Option 3b including variations in other inputs but not g, as a single value of g was used by the AER in computing their MRP estimates. They find that Option 3b appears to be more stable, however the differences are not great and the result must be treated as contingent on the stability of g, which cannot be taken as a given. • The ENA prefers an approach that applies some weight to an unbiased DGM approach – such as option 3b using the calibrated DGM or some other specification that produces estimates that are consistent with observed historical outcomes, on average. Any DGM specification that produces estimates that are systematically different from observed outcomes (i.e. the HER estimate) should not be used. The AER's proposed specification does this, producing estimates that are materially lower than observed outcomes, on average. This introduces a downward bias into allowed returns. (*ENA, page 5*)	Section 7.3.2.2

Equity beta

Summary of submissions on equity beta issues

Issue	Summary of submissions	AER consideration
Overall draft decision of 0.6	• Agree with our draft decision and support a value of at least 0.6. (APA p.40) • Disagree with our draft decision: empirical evidence supports a beta value of 0.5 or lower and exceeds the high bar for change. The AER should not interpret stability and predictability as support for status quo bias. In previous instruments such as in 2018, the principles of stability and predictability has been used to avoid a large change in beta of greater than 0.1. In this sense, the AER may drop in the value of beta from 0.6 to 0.5. (CRG pp.30-32) • Disagree with our draft decision: the value of beta should be higher because many other regulators set beta value that are around 0.8 or higher (adjusted to 60% gearing). (ENA pp.99-102)	Sections 8.1, 8.3 and 8.3.8.1
Estimation period and macroeconomic factors	• Only the longest period estimates should be considered. (CRG p.23) • If the AER decides to give some weight to short-term estimates, then it needs to be consistent. Short-term estimates have been higher than 0.6 in 2018 and has declined significantly to lower than 0.6 in 2022, while the longest period estimates have been stable. This should warrant a decrease in the value of beta. (CRG p.27) • The AER should consider the effect of macroeconomic factors. The beta estimates of Spark and AusNet were both higher prior to the period affected by takeover and COVID-19. (ENA p.107) • The AER should use shorter estimation periods in line with other regulators. (Brattle p. iv) • Agree with the AER's draft decision, but not confident in the long-term stability of beta. Energy transition is likely to increase the value of beta, particularly for gas businesses, even though this may not yet be evident in the data. (APA pp.42-45)	Section 8.3.2
Impact of change in term on beta	• By moving to a 5-year term, the AER is creating an upward bias in the equity premium. It is not clear why the equity term premium should be negative, i.e. the MRP being higher over 5 years than over 10 years. The AER can correct for this by reducing the value of beta. (CRG pp.67-68) • By moving to a 5-year term, the NSPs' return on equity allowances will be more volatile and more pro-cyclical. This means that the NSPs will be exposed to higher systematic risk. Therefore, an upward adjustment to beta may be warranted. (APGA pp.12-13, CEG pp.19-27)	Section 8.3.3
Comparator set	• The AER should give less weight to long delisted/defunct firms; to firms with a low proportion of regulated revenue, such as APA; to portfolios with limited data. (CRG pp.31-32) • The AER should not give weight to international energy firms or domestic infrastructure firms for the purpose of the 2022 Instrument. (CRG p.32, APA p.40) • A comparator set with only a single live firm is statistically unreliable and may not be adequately forward-looking. (ENA p.99, APGA pp.15-17, NSG p.17, AGIG p.2, Endeavour p.7, Evoenergy p.6, Transgrid p.5) • The AER should consider international energy firms. Many other domestic and international regulators undertaking the same regulatory task include international energy firms in their comparator set, despite there	Section 8.3.4

	being some differences between domestic and international firms. (ENA p.106, Brattle p.iv, APGA pp.15-17, NSG p.17, AGIG p.2, Ausgrid p.5, Endeavour p.7, Evoenergy p.6, Transgrid p.5) • The AER should also consider domestic infrastructure firms. (ENA p.106)	
Other regulators' decisions and other relevant evidence	• Many other regulators set a value of beta of 0.8 or higher (adjusted to 60% gearing). The AER should consider the estimates of other regulators as it relates to the same regulatory task. (ENA pp.99-102, AGIG p.2, Endeavour p.7, Transgrid p.5) • The AER should consider the approaches of other regulators and give weight to international energy firms. (ENA pp.103-106, Brattle p.iv, APGA p.16, Ausgrid p.5, Endeavour p.7, Evoenergy p.6, Transgrid p.5) • The AER should use shorter estimation periods in line with other regulators. (Brattle p.iv) • The AER should also engage with funds that invest in unlisted assets, as the Independent Panel suggested. (ENA p.107)	Section 8.3.7
Low beta bias and other issues	• The AER should reject claims that its point estimates beta should account for stranding risk or low beta bias. (CRG p.32) • There is evidence demonstrating low beta bias and AER should consider this evidence. But this is not a priority issue for the 2022 Instrument. (ENA p.109)	Section 8.3.6

Use of the industry debt Index

Summary of submissions to EICSI issues

Issue	Summary of submissions	AER consideration
Support maintaining 2018 approach (use as sense check)	• Support the AER's draft decision to maintain its approach to using the EICSI as a sense check (AGIG p.1, APA p.47, APGA p. 17, Ausgrid p. 5, AusNet, p. 3, ENA p. 113, Endeavour Energy p. 8, Evoenergy p. 6).	Section 9.3.2
Support using to determine benchmark return on debt	• The CRG agrees with the Panel's request for the AER to give further consideration to using the EICSI. In an incentive regime, consumers should over time share in the benefits when there is clear evidence of continuing outperformance (CRG p. 44).	Section 9.3.2
Insufficient data	• The Energy Industry Credit Spread Index is constructed from a sample of firms which is not sufficiently large to average out inefficiency in debt raising, or to reflect the wide range of contractual responses to risk management found in debt instruments; it should not be used to adjust the benchmark cost of debt (APA p. 47). • The index is still very much in its infancy. It is too early to say whether it reflects the cost of debt that a benchmark efficient entity would incur. It has been heavily influenced by unique corporate activity, such as	Section 9.3.2.2

	takeovers, and it does not reflect the efficient financing practices assumed in the AER's trailing average approach (APGA p. 17).	
Outperformance	There is outperformance: • The CRG notes that while the AER has described the ways in which the outperformance fluctuates, it has not formally defined the benchmarks for either "persistent" or "material". Nor has the AER explained how it applies such criteria – materiality in particular – consistently across the different parameters. We consider that in assessing the outperformance as neither persistent nor material, and even in choosing those criteria as the basis for assessing whether or not an adjustment to the benchmark return on debt is warranted, the AER is not applying objective standards, but rather using its judgment. This is well within its remit of, but we consider that in exercising its judgment in this way, the AER is applying upward bias in its decision, and we consider that it should use its judgment differently. We consider it is imperative that consumers see some benefit of this outperformance as well as networks (CRG p. 43). • In short, we consider the priority is to address the outperformance and we are relatively agnostic as to which of the available methods the AER uses. However, we note that one drawback of the change in term would be that it would be unlikely to result in a consistent term with the term of equity (CRG, p. 45). No outperformance: • In summary, there is no evidence of persistent or expected outperformance. Networks do not systematically issue debt at a yield below that of the independent third-party benchmark. And any difference in term is explained entirely by the necessity of issuing short-term debt after a transaction and by the AER's exclusion of a relevant form of debt (ENA p. 113).	Section 9.3.2.3
Independence	• Using the EICSI in the way recommended by the Panel would have no practical effect on the cost of debt estimates at the present time as the two measures are not statistically significantly different from each other. However, it would lead to a benchmark that incentivises networks to continually find ways to revise their debt financing approach by shortening tenor even if other networks do not. This means that forces other than the efficient debt financing practices may come into play (APGA pp. 17-18). • Risk of permanent underfunding and potential for increased refinancing risk and higher volatility (APGA, p. 18). • Moreover, there are material advantages in continuing to use independent third-party data sources, rather than a system in which each network's own debt management practice feeds back into its regulatory allowance (ENA p. 113).	Section 9.3.2.3
Continued collection	• The AER should continue to collect the EICSI data and evaluate how it might be best used as part of its considerations in the 2026 RoRI process (ENA p. 113, AusNet p. 3).	Section 9.3.2.4

Weighted trailing average return on debt

Summary of submissions to weighted trailing average issues

Issue	Summary of submissions	AER consideration
NPV=0	• If the debt raising profile is uneven, the approach of refinancing 10% of a company's total debt portfolio each year over a 10-year period will not be NPV=0 (Marinus, pp. 1-2). • The majority of Marinus' debt will be raised in the first 4 years, as the project may not be commissioned until year 4 or 5. As such, the relatively high weighting that applies to year 1 debt will not provide an appropriate benchmark cost of debt (Marinus, p. 2).	Section 9.3.7.2
Support	• Support the AER's draft decision to maintain its approach to calculating the return on debt, including use of the simple trailing average (Evoenergy, p.6, Ausgrid, p. 5, APA, p. 9, Endeavour, p. 8, CRG, p. 46, ENA, p. 112). • Implementation of the change to a weighted trailing average could add considerable complexity to estimation of the rate of return on debt and to determination of the rate of return on debt allowance (APA, p. 62).	Section 9.3.7.2
Future work	• A specific proposal through which the change might be implemented is needed (APA, p. 62).	Section 9.3.7.2

Other debt issues

Summary of submissions to other debt issues

Issue	Summary of submissions	AER consideration
Support for maintaining current debt methodology	• AGIG p. 1, APGA p. 17, Ausgrid p. 5, AusNet (except averaging periods) p. 3, ENA p. 111, Endeavour Energy p. 8, Evoenergy p. 6.	Section 9.3
Averaging periods	Support: • These changes to the provisions for debt averaging period proposed in the 2022 Draft Instrument should be incorporated into the 2022 Rate of Return Instrument (AGIG p. 1, APA p. 53). • ENA supports the AER's proposed changes to the averaging period for the allowed return on debt. We do, however, note that this change to the return on debt averaging period will result in increased costs for some networks (ENA p. 114). Against: • Regarding the AER's proposal to move forward the timing of the allowed debt averaging periods by a month, we do not support this change. This will increase the costs for some networks, as debt raising that is anticipated to	Section 9.3.5

	occur 5 months prior to the commencement of a regulatory year will now no longer be eligible to set debt revenues for the next regulatory year. For businesses that seek to hedge their debt portfolio, forward-starting hedges for debt raised in this month would need to be extended by a year (AusNet, p. 3).	
Credit rating	Against: • In 2018, APA did not support the use of a benchmark credit rating of BBB+, and remains of the view that the benchmark should be BBB (APA p. 49).	Section 9.3.3
Credit rating blend	• If a benchmark credit rating of BBB+ is to be retained, then its implementation as a weighted average of debt costs for A-rated and broad BBB-rated entities, with weightings of one-third and two-thirds, respectively, should be retained (APA p. 49).	Section 9.3.1.1

Crosschecks of the rate of return

Summary of submissions to crosscheck issues

Issue	Summary of submissions	AER consideration

General feedback on the use of cross checks	Supportive comments with suggested modifications were noted as follows:
	• APGA support AER's proposal for the use of cross checks. Further, they express support for ENA's submission on cross checks (p.19).
	• APA support AER's proposal for the use of cross checks, as a sense check and not in a formulaic way, though they note that the scope for cross-checks could be limited through a careful specification and application of the approach to the rate of return determination (p.67).
	• CRG support AER's proposal for the use of cross checks as a sense check on the overall allowed rate of return (p.47). However, CRG doubt the extent to which the outcome of the cross-checks could impact AER's parameter estimates. CRG suggest the proposed suite of cross-checks should be expanded to assess impacts on, and outcomes for, consumers (p.62):
	• Financial measures:
	  ○ Actual return on assets and actual return on equity (i.e., historical profitability)
	  ○ Notional return on assets and return on equity (i.e., the AER's proposed financeability tests)
	  ○ RAB multiples (disaggregated)
	  ○ Investment trends and capital availability
	  ○ Level of interest in investing in the regulated businesses
	  ○ Trends in credit ratings of the listed businesses
	  ○ Capital expenditure proposals of the networks
		Section 11.3.1

	• Operational performance indicators
	  ○ Trends in reliability measures, and performance against statutory and regulatory reliability requirements
	  ○ Trends in productivity, with a focus on capital expenditure productivity, using the AER's economic benchmarking tools
	  ○ The level of and trend in utilisation of the network assets.
	• CRG cover the last point, on utilisation of network assets, more extensively in a supplementary submission, where the CRG reiterate the legislative objective of the AER to ensure efficient use of energy network services and reference a commissioned University of Wollongong report. The CRG (*Advice to AER*, p.65) suggest that this report provides a regulatory framework to further investigate consumption efficiency, as it provides:
	  ○ A review the regulatory framework and AER's NEL/NER tasks
	  ○ A description of the market impact of the allowed ROR
	  ○ A demonstration that investment can be neither too low nor too high while the utilisation is low. The CRG conclude that it is therefore insufficient for the AER to base the RoRI only on an unbiased estimate concerning investment, and that the development of a crosscheck to measure efficient utilisation of the network is required for the AER to meet its regulatory objectives (p.65).
	• Endeavour Energy support the AER's use of cross checks, particularly financeability and scenario testing, but not the conclusions that have been drawn from them.
	Reservations were noted as follows:
	• Ausgrid express concerns over the use of cross checks in the way proposed by AER (p.6).
	• GIIA suggest that, compared to AER, other international regulators employ a much wider range of models and cross-checks to inform forward-looking return estimates (p.8). This is evidenced with reference to findings of the 2020 Brattle Report.
	• ENA note that recent transaction evidence and independent expert estimates of required returns are relevant and informative sources of evidence but were not considered in the AER's draft decision (p.122).	

The use of RAB multiples as a cross check on the rate of return	• RAB multiples are unsuitable for use as cross-checks on the rate of return. (APA p.55; ENA p.16; NSG p.14) • There can be factors outside the regulatory framework that have impacted the RAB multiple, such as portfolio benefits of investing in the relevant assets (for diversification or other reasons), and also the future opportunities to provide unregulated services. (NSG p.17) • A RAB multiple above 1 indicates only that investors are prepared to pay more than the current RAB for the sum of the allowed returns on the current RAB, incentive payments, unregulated assets, future projects, and all other sources of value. (ENA p.16) • It is unreasonable and misleading that the AER in the draft RORI considered that the aggregate multiples, which compares the market value of regulated plus unregulated assets to the regulatory RAB, indicates the allowed return is more than adequate. (ENA p.16) • The aggregated RAB multiple is only informative if a reliable disaggregation can be performed. However, as disaggregating RAB multiples requires a large number of assumptions, a reliable disaggregation is an impossible task. (ENA, p.16; TransGrid, p.6; Frontier for ENA p.1; NSG, p.17)	Section 11.3.1.1

	• The CRG supports the use of RAB multiple as part of the cross-checks. It also supports the independent panel's recommendation for the AER to 'expedite' its work on decomposing RAB multiple. It considered the recent trend of RAB multiples continue to be around 1.5 to 1.7 supports the current rate of return decision has continued the historical trends that enabled networks to consistently achieve financial returns in excess of the efficient requirements while also delivering (on average) overinvestment in an already underutilised network system. (CRG, p.55-57, 62-63)	
The direct estimates of required return on capital in the independent expert reports	• The report also provides an estimate of the RAB multiple after deducting the value of unregulated assets that is considered to be more relevant. (Transgrid p.6; ENA, p.120) • The AER's June 2022 draft decision does not respond to our submission about these market estimates of the market cost of equity capital. (ENA, p. 126)	Section 11.3.1.1

CEPA's report on RAB multiple	• CEPA's report that attempts to disaggregate RAB multiples should not be relied on as the analysis contains serious flaws. (ENA p. 16; AusNet)
	• Ausnet proposed that its current Contracted Asset Base value of $0.9bn is more than double CEPA's 'high end' valuation. It considered that CEPA's valuation methodology is inappropriate which does not reflect the nature of the business and ignoring key evidence in the Independent Expert Report prepared for the AusNet acquisition.
	• It would be poor process if the AER give any weight to CEPA's report as its own interpretation of the report including its views on its relevance to the RORI has not been presented for stakeholders' consultation or considered by the Independent Panel. (ENA p. 16; Ausnet)
	• ENA raised its concerns with CEPA's report:
	  ○ Adopt a range of invalid or unrealistic assumptions which drive a significant mis-estimation of the resulting multiple outcomes.
	  ○ Fails to meaningfully assess the sensitivity of the conclusions of the report to adopted assumptions.
	  ○ Fails to engage with relevant expert evidence provided to the AER in RORI process in March. The report fails to consider the disaggregation issues raised in Grant Thornton's expert report.
	  ○ Fails to consider directly relevant evidence provided in the AST and SKI independent expert reports. The independent expert reports suggest the estimated required return on equity are higher than the allowed return on equity.
	• Frontier, the consultant for the ENA, proposed a number of issues with CEPA's report. It proposed four changes to CEPA's input assumption that would give a RAB multiple of 0.87 for AusNet:
	  ○ The value of unregulated assets:
	  – CEPA estimated a value of $370M
	  – Frontier estimated this as $3.15 billion which is the midpoint of the independent expert's (Grant Samuel's) estimate
	  ○ The terminal RAB multiple value:
	  – CEPA assumed a value of 1.1. This assumption is consistent with a paper by Dr Darryl Biggar, *Understanding the role of RAB multiples in regulatory processes* (2018).
		Section 11.3.1.1

	– Frontier assumed the current RAB multiple continues (of 1.41 for the regulated only assets after altering the estimated value associated with non-regulated assets to $3.15 billion). o The value of nominal growth in the RAB: – CEPA assumed zero under the baseline scenario, but vary the cost of equity and RAB growth to fill the remaining unexplained gap between RAB and enterprise value later in the report – Frontier assumed 4% o Tax step up benefits: – CEPA assumed zero – Frontier assumed a value of around $180M (from the independent expert's report). • Frontier also proposed a number of errors with CEPA's analysis on Spark and considered the analysis should be disregarded entirely. This includes the following: o There is an error in CEPA's calculation that the total value of all businesses is used in some calculations while Spark's proportionate share is inconsistently used in other calculation. o CEPA underestimates Spark's unregulated revenue by applying multiples of 1 and 3 times historical earnings and also by setting the development pipeline of Spark Renewables to zero. o CEPA's analysis of total debt includes bank debt facilities for SPARK but apparently inadvertently omits bank debt facilities for AusNet o CEPA appears to have assumed that all debt relates to the regulated entity, whereas a portion of that debt is likely to have been used to fund unregulated activities. • Other issues proposed by Frontier: o CEPA's analysis relies heavily on the assumption that incentive payments continue in the future according to the historical average rate (from 2014). However, CEPA's figure 4.8 shows that there is considerable variability in past incentive payments (even after averaging over 7 entities) and that the most recent incentive payments are above the long-run mean. It is unclear what assumptions about incentive payments might have been adopted by the winning bidders o CEPA's analysis relies heavily on the assumption that OPEX outperformance continues in the future according to the historical average rate (from 2006). However, CEPA's figure 4.9 shows that there is considerable variability in past OPEX outperformance (even after averaging over 7 entities) and that the most recent OPEX outperformance above the long-run mean. It is unclear what assumptions about OPEX outperformance might have been adopted by the winning bidders.	
Financeability	Supportive and mixed views on financeability were as follows: • APA suggest that financeability assessments can provide a useful indicator of the appropriateness of the overall rate of return (p.68). • Ausgrid favour using FFO/debt as a proxy for financeability tests to assess the key question of whether the regulatory allowances based on the benchmark assumptions for a benchmark firm are internally consistent (p.6). • ENA support the use of financeability assessments but suggest that the impact of the RORI on a benchmark basis should be assessed as a key decision cross-check. ENA note that the target FFO to net debt threshold is	Section 11.3.1.2

	unreasonably low at 7% and should be revised to 9% (where 66% of NSPs would fail). The ENA suggest that this demonstrates that the ROR is not set at an appropriate level and passing can be attributed to other factors (such as higher depreciation allowances) (pp.130-131). • GIIA encourages AER to expand financeability assessment models, and cross-checks generally, to ensure consistency in regulatory assumptions (p.9). • Endeavor Energy supports the use of financeability as a cross-check, while expressing concern that network companies continue to fail the 7% benchmark seen in the FFO/net debt analysis by the AER. Endeavour Energy note that the AER should consider the ENA's analysis on the ability of network companies to cover interest costs, when considering financeability (p.8). • CRG expresses concerns around AER's financeability test as the methodology, implementation, and use remain unclear. CRG states its agreement with Ofgem's assessment that financeability should have no role in determining or amending the rate of return (pp. 57-58).	
Scenario testing and sensitivity analysis	Supportive comments with suggested modifications were noted as follows: • APGA suggest that scenario testing could look at a wider and more extreme range of scenarios to better understand the RORI's limitations (p.19). • APA suggest that scenario testing has some limited value as a cross-check (p.68). • ENA suggest that a range of scenarios should be considered to see how the model could "break", a similar approach to stress testing in the banking industry. ENA note that a low-rate scenario may result in a ROR lower than comparable regulators, a negative NPAT, and an insufficient cash allowance (pp133-134). • Endeavor Energy supports the use of scenario testing by the AER but not the conclusions drawn from it (p.8). • CRG support the use of sensitivity and scenario testing as they can provide useful insights on the risks to consumers, to the extent that they are appropriately designed and symmetrical (p.54). • In response to the AER's statement on the 2018 RORI's application and performance in a low interest rate scenario, NSG suggest that the rates or return under the 2018 RORI under-stated actual required rates of return (p.15).	Sections 11.3.1.7 and 11.3.1.8
Historical profitability	• CRG encourage the use of historical profitability as a cross check, as it provides an insight into the outcomes of the AER's 2018 RoRI and could provide guidance on AER's current decision making. CRG note that AER have changed their position since the 2018 review, despite similar issues being raised during both reviews regarding it being a backward-looking measure and issues with accounting treatments. CRG highlight the Independent Panel's disagreement on dismissing historical profitability as a cross check and urge the AER to revisit the draft decision and include this measure as a crosscheck (p.60).	Section 11.3.1.3
Investment trends	• As noted above, CRG included investment trends and capital availability as a possible financial measures crosscheck that could assist the AER (p.62).	Section 11.3.1.4
Other regulators' rate of return	• ENA disagree with AER on the usefulness of this cross-check, as consideration of other regulator's estimation approaches, data and methods has value, particularly as other regulators share common objectives with AER (p.127).	Section 11.3.1.5

	• The Brattle Report submitted by ENA, dated September 2022, agrees with the ENA that other regulators' methods are potentially informative as a cross-check, and that the regulatory frameworks and nature of regulated business in different jurisdictions is sufficiently similar to allow for informative comparisons (p.14). The 2022 Brattle Report also: ○ points to Ofgem's proposed use of cross-checks to adjust cost of equity for RIIO-2 (p.13) ○ says "AER's draft 2022 RORI is lower than most of the recent decisions of international regulators we have reviewed" and "other regulators have higher betas or higher risk-free rates or higher MRPs, whereas the AER is among the lowest on all three, leading to a materially lower authorised return on equity than other regulators" (p.4). • Endeavor Energy, opposing AER's position, supports the use of other regulators' rate of return as a cross-check given the similarity in other regulators' frameworks and tasks (p.6).	
Analysts/practitioners discount rates	• NSG note that discount rates used by market analysts and valuation practitioners are also used by investors to establish target internal rates of returns (IRRs) (p.14). • The independent expert reports by KPMG and Grant Samuel provide direct estimates of the required return on capital that is directly relevant to the AER's task. The reports indicate the required return on capital is materially higher than the AER's regulatory allowance. (ENA, p.122; Endeavour p.8; Transgrid p.6) • The report also provides an estimate of the RAB multiple after deducting the value of unregulated assets that is considered to be more relevant. (Transgrid p.6; ENA, p.120) • The AER's June 2022 draft decision does not respond to our submission about these market estimates of the market cost of equity capital. (ENA, p. 126)	Section 11.3.1.6

Overall positions and discussion of 2018 RoRI performance

Summary of submissions to overall positions and discussion of 2018 RoRI performance

Issue	Summary of submissions	AER consideration
Overall context of position – consumer impacts	• AEC (p.1) acknowledge the challenging and changing economic outlook, with increasing cost of living pressures on consumers and increasing network costs on retailers. • Ausgrid (p.1) note the cost of living pressures on consumers, the increased costs in the energy sector, and the expectations of consumers on networks to mitigate the impacts of climate change. • CRG (p.10) highlight the economic challenges facing consumers, the declining consumer confidence in the energy market and energy regulators, and the potential impacts on network utilisation. CRG (p.3) suggest that these issues will be exacerbated by a systemic upward bias in the 2022 RoRI, leading to a higher rate of return than is otherwise justified. • EUAA (p.1) note the increasing financial stress of its membership due to escalating energy prices, and support the CRG's assertion that a systemic upwards bias is present in the 2022 RoRI.	Section 11.5

	• Kevin Cox (p.1) suggests that the AER should set a RoR that lowers electricity prices due to favourable actual returns for network companies in the past. • Mark Matheson (p.4) highlights the stress caused by energy prices on residential consumers, and the possible impacts of forecasted inflation and wages on the average consumer. • Queensland Cane Growers Association (p.1) suggest that their members are facing increasing economic pressure, and therefore support the CRG's assertion that the AER must address the systemic upwards bias present in the 2022 RoRI.	

Overall context of position – energy transition and the need for investment	• Ausgrid (p.1) note the transition to a low carbon economy, and the need for networks to have appropriate investment incentives to facilitate the energy transition, integrate distributed energy resources, and build resilience to extreme weather risks.
	• AusNet (p.1) highlight that the 2022 RoRI will be active during a period economic uncertainty, and a critical period for investment in the energy transition. AusNet (p.1) also suggest that the AER will not achieve its guiding principle as the 2022 RoRI will result in volatile returns, which may result in higher bills for consumers
	• CEC (p.1) stress the need for sufficient investment in transmission infrastructure to facilitate the energy transition, highlighting that a change in term:
	  ○ is inconsistent with the AER's previous practice
	  ○ may lead to volatility in returns allowed under future determinations
	• CRG (p.10) note the significant investment in the electricity transmission network needed to facilitate rapid decarbonisation.
	• ENA (p.1) emphasise that the 2022 RoRI will be active during unprecedented global market conditions, associated volatility in capital markets, and urgency for future investment in the energy transition (with reference to the AEMO ISP).
	• Endeavour Energy (p.1) note that the 2022 RoRI will cover a critical period in Australia's energy transition.
	• Energy Queensland (p.1) suggest that the AER are developing the 2022 RoRI at an inflection stage of the energy transition, where substantial investment is required to decarbonise the electricity system and move towards distributed energy resources.
	• Evoenergy (p.1) highlight the need for prudent investment during the energy transition and transformation of the national energy market to a low carbon future (with reference to the AEMO Integrated System Plan (ISP) investment roadmap). Envoenergy also note that a benchmark gas business might need to be considered in future RoRI reviews, given the impact of the energy transition on the associated risk of gas infrastructure assets (p.7)
	• GIIA (p.1) highlight:
	  ○ the global economic conditions and constraints on public and private investors
	  ○ the risk of constraining energy network infrastructure investment in Australia if a more open and flexible approach seen with other regulators is not adopted
		Section 11.5

	○ the significant investment needed in network infrastructure for the energy transition and to meet decarbonisation commitments (p.1), which they believe will be jeopardised by a change in term that results in less attractive returns for investors and exposes consumers to the risk of higher relative prices (p.3). • IPA (p.1) emphasise the need to sustain long-term signals to drive capital investment in the energy transition, to benefit energy consumers and to deliver on net zero omission commitments. IPA (p.2) reference AEMO ISP as evidence of the scale of urgent investment is required for transmission infrastructure. IPA (p.2) suggest that changing the term of equity will introduce uncertainty and may risk: ○ making network investment less attractive ○ generating higher customer prices ○ worsen existing financing challenges facing major interconnector projects • Marinus Link (p.1) highlights the challenges for new infrastructure projects during the project approval, construction, and capital raising stages. • NSG (p.1) highlight the investment requirements of the energy transition (citing AEMO ISP), the acceleration towards achieving net zero ambitions, and the need to continue delivering safe and reliable supply. • Transgrid (p.1) emphasise the significant network investment required for decarbonisation and the wider energy transition (citing AEMO ISP). Transgrid (p.3) suggest that the change to the term of equity may have implications for the stability and predictability of the regulatory regime which is essential to attract the capital needed to fund the energy transition.	
How the 2018 Instrument is performing	• AEC (p.2) suggest that: ○ the AER has consistently set a rate of return that attracts investors to the sector, which provides market-based evidence that the revenue streams offered by regulated network businesses have been attractive. ○ estimating MRP based on HER (maintaining the 2018 RoRI approach) is a consistent and coherent approach for the RoRI, agreeing with CRG's assertion that there is a lack of empirical evidence that this method has had a detrimental impact. • AGIG (p.2) suggest that: ○ a mechanistic update of the MRP while the RoRI is in force would be favourable ○ the beta estimate was too low, pointing to differences in the risk evaluation of assets regulated by AER and by ERA (operating under the same regulatory framework) • APA suggest that much of the 2018 RoRI should be retained, such as the approach to: ○ the term for RFR as it reflects market practice of using CGS with terms of 10 years (p.4) ○ the form of the allowed rate of return, a nominal vanilla weighted average of returns on equity and debt (p.7) ○ gearing, as it continues to be appropriate (p.7) ○ beta, as there is insufficient evidence to change, despite beta values rising (p.8) ○ return on debt estimation using a simple trailing average (p.9) • APGA suggest that:	Section 11.5

	○ the cost of debt approach (indices to estimate BBB+ rate 10 year debt) for the 2018 RoRI should be retained (p.17) ○ the gearing assumption used in the 2018 RoRI is still consistent with market data (p.18) • Ausgrid (p.5) suggest the 2018 RoRI approach for estimating beta is no longer appropriate as the comparator set is reduced to one firm. • AusNet (p.1) suggest 2018 RoRI was challenged by a low interest rate environment, resulting in lower equity returns than any comparable jurisdiction/international regulator. AusNet (p.3) support retaining the 2018 RoRI benchmark approach for setting the return on debt. • CRG (p.4) note that the 2018 RoRI has not impeded network companies': ○ operational performance ○ ability to access equity or debt ○ financeability ○ maintenance of credit ratings • ENA (p.3) suggest that the 2018 RoRI was severely tested by financial and market conditions, and thus produced outcomes in network revenue determinations which were unprecedented, such as: ○ a difference of 200 basis points between the market cost of capital and allowance under the 2018 RoRI (evidenced by the Spark Infrastructure and AusNet transaction valuations) ○ allowed returns that resulted in negative net profit after tax across the period of the determination (evidenced by the 2020 SAPN decision) ○ cash allowances not sufficient to pay the benchmark firms interest bill (evidenced by the 2020 SAPN decision) • ENA (p.3) also reference the Brattle Report (2020), which they suggest demonstrated that, under the 2018 RoRI, the AER had an allowed return on equity lower than all comparable regulators, by every metric. ENA (p.3) suggest that the updated report, commissioned by ENA, continues to support these findings. • Endeavour Energy (p.7) support maintaining the current approach for calculating: ○ MRP, consistent with term of RFR (noting that the Calibrated DGM should be considered) ○ cost of debt, gamma, and gearing (p.8) • Energy Queensland (p.2) suggest that the 2018 RoRI: ○ had significant shortcomings ○ did not deliver robust outcomes for the economic conditions that prevailed ○ had the lowest equity returns against international comparators, citing the Brattle Report's findings • EUAA (p.2) suggests that there is no evidence that the 2018 RoRI has impacted networks willingness to invest. • Evoenergy (p.3) suggest that the 2018 RoRI resulted in abnormally low returns, due to the low interest rate environment. Evoenergy (p.6) support maintaining the 2018 RoRI approach for calculating the return on debt, as it is symmetrical over market cycles and allows network businesses to plan over long time horizons.	

	• Jemena (p.2) suggest that the 2018 RoRI did not deliver efficient returns to investors during the low interest rate environment, due to the AER's fixed MRP and changing RFR approach, which results in low returns and volatility of outcomes.
	• Kevin Cox (p.1) suggests that consumers have been disadvantaged over the last 10 years due to favourable actual returns that were well above the regulated goal.
	• Marinus Link (p.1) suggest that the simple trailing average return on debt in the 2018 RoRI is not appropriate if the debt raising profile is uneven.
	• NSG suggest (p.2) that the rates or return under the 2018 RORI:
	  ○ have been below an efficient level and are therefore unsustainable
	  ○ under-stated actual required rates of return (evidenced by differences in required ERP between NSG member data and the 2018 RoRI)
	  ○ had an allowance 200 basis points under the market return on equity (as evidence by the Spark Infrastructure and AusNet transaction valuations)
	  ○ is under target benchmarks for known Australian fund investors' infrastructure portfolio	

Other issues

Summary of submissions to other issues

Issue	Summary of submissions	AER consideration
Gearing	• Gearing of 60 per cent continues to be appropriate for the 2022 Rate of Return Instrument (APA, p. 7, APGA, p. 18, Endeavour, p. 8, ENA, p. 111). • Market data, and not historical book values, provide the conceptually correct measure of gearing to be used in calculating the forward-looking allowed rate of return. There is no simple method for hybrid securities to be allocated between equity and debt, and these securities should not form part of the portfolio of financing instruments used by a benchmark service provider (APA, p. 15).	Section 4.3
Gamma	• Broadly agree with our overall draft decision approach. (APGA p.4, AGIG p.1, APA p.54) • Gamma should be interpreted as the market value of dividend imputation franking credits. It should be estimated relative to the value of the dividends and capital gains that they replace. This is consistent with NPV=0 principle. (ENA p.114, NSG p.14, Endeavour p.8) • The AER should engage further with the ATO to better understand its data in relation to the utilisation rate, as the Independent Panel suggested. (APGA p.19) • Gamma should be rounded to 2 decimal places as the Independent Panel suggested, but only in the final step. This would result in a gamma value of 0.57 (from the current 0.585). (ENA p.114, APGA p.18)	Section 10.3

CEPA's 24th October 2022 Report

Submissions on the CEPA's October Report

Issue	Summary of Submissions	AER consideration
CEPA's updated report on RAB multiple	• AEC supports CEPA's conclusion in its updated report. It considered that the report is logical and methodical in its approach and uses appropriate assumptions and sources. • ENA and Frontier considered that the AER should not give any weights to CEPA's updated analysis for the following reasons:(ENA p.1-2, Frontier p.1- 4) ○ The updated analysis continues to employ highly contestable assumptions of the inputs such as the valuation of DFN revenues, capex levels and the terminal RAB values which differ materially from independent market evidence. ○ The updated report adopts a different analytical approach which does not report a fully disaggregated RAB multiple sought by the independent panel and AER. ○ CEPA's updated approach produces implausible outcomes. The analysis indicates a real required return on equity of 0.5% and a long run required return on equity material below its cost of debt estimate and at values not supported by any other information (e.g. a real required return on equity of 0.5 per cent). • Frontier remains its view in its May 2022 report on RAB multiple that a RAB multiple estimate of AusNet less than one if four changes are made to CEPA's input assumptions: (p.5) ○ The value of unregulated assets: – Frontier proposed an estimate of $3.15 billion which is the midpoint of the independent expert's (Grant Samuel's) estimate. – The updated CEPA report indicates a range of $652 million to $3.15 billion, using Grant Samuel's estimate as the upper bound. ○ The terminal RAB multiple value: – Frontier assumed the current RAB multiple of 1.41 continues. – CEPA's new approach adopted a terminal value of 1.09 based on an equilibrium set of assumptions. This is in line with the 1.1 value used in its May 2022 report. ○ The value of nominal growth in the RAB: – Frontier assumed 4% for the nominal growth in the RAB – CEPA applied a real RAB growth in the next 30 years of a range of 0 to 1.9%, with a base case real RAB growth of 0.95%. ○ Tax step up benefits: – Frontier assumed a value of around $180 million – CEPA adopted $180 million in its updated report	Section 11.3.1.1

	• Frontier considers AusNet's valuation of $913 mil for DFN assets that are contracted or currently under construction as at 30 Sept 2021 and also the DFN business's asset of a lessor receivable of $318.9 million and a license receivable of $161.9 million identified by Grant Samuel suggest CEPA's lower end estimate is too low. It also disagrees with CEPA that Grant Samuel's estimates for DFN has not accounted for future regulatory or competitive responses in its valuation. (p.7)
	• Frontier does not consider RAB multiples provide useful information about the adequacy of the AER's allowed return, its analysis is a demonstration that a small number of changes to CEPA's assumption would produce a disaggregated RAB multiple below 1. (p.8)
	• ENA stated that the AER should give balanced consideration to all evidence and ensure a robust engagement with the substance of evidence put forward by all review participants. (p.2-3)
	• CRG continue to support the use of RAB multiple as a cross-check and considers the evidence supports the view that the current (2018) RoRI is at least equal to and may well exceed NSPs' actual cost of capital. The AER should be confident that if its analysis indicates that one or more of the parameters of the 2022 RoRI can be set lower than in the 2018 decision, this can still reflect an unbiased decision. (p.5-6)
	• CRG acknowledged CEPA's updated terminal value assumption. It considers that if the alternative assumption proposed by the Frontier that the level of outperformance will continue in perpetuity at their current levels is true, then it is evidence of a failure of the incentive regulation and represents poor value for NSP customers from the regulatory outcomes. (p.5)
	• CRG considers that if there is potential value of a tax 'step-up' from the change of ownership, the AER should consider if this is appropriate or if regulatory tax allowances should take some account of such benefits so that customers can share in them. (p.5)
	• CRG considers that there are a range of plausible assumptions that can be taken in valuing the DFN business and proposed several issues with Grant Samuel's estimates: (p.8-9)
	  ○ Grant Samuel values the DFN business at around two thirds of the transmission network ($4.4-$4.6bn). The latter representing a certain, ongoing stream of income based on the existing RAB while the former (the DFN value) largely represents potential future income streams, many of which may not manifest for several years, if at all.
	  ○ To the extent the income streams arise from construction of new assets, there is cost risk to factor in, as well as the possibility of new competitors, which is likely to reduce the profitability of such projects. The 2021 EBITDA of DFN was $122.6mil or only one third of the transmission EBITDA of $366mil.
	  ○ The transaction took place at the end of a long period of low interest rates, there is a possibility that future discount rates will be higher than those used in the valuation. This would reduce the net present value of the future cashflows.
	  ○ Grant Samuel's valuation is based on AST's internal projection and do not constitute a forecast or projection by Grant Samuel	

The Australian Government Treasury's 26 October 2022 Advice

Submissions on The Treasury Advice

Issue	Summary of submissions	AER consideration
HER sample periods options – using 1988-2022 end year data	• The CRG considers that, if the AER continues with this preferred method (HER method) and given the AER's recent announcement to defer publication of the final Rate of Return Instrument (RoRI) until February 2023, the sample period should run to 31 December 2022. (CRG, p. 3) ○ This is consistent with the CRG's preference for an unconditional estimate of HER, which requires the longest possible sample period. ○ It is also consistent with the AER's view that the sample period should be the period "most likely to be reflective of recent market structure, conditions and investor expectations." • The CRG does not support cherry-picking dates, or excluding certain data, to suit a particular outcome. Such practices lead to extensive debates over which data to include or exclude. For the MRP the CRG therefore favour an unconditional estimate best served by an HER estimate based on the longest possible sample period, which includes the impacts of periods of unusually high or low returns, but no individual short period should materially impact the estimate. As Sapere pointed out in their expert report to the CRG, reasons for favouring an unconditional MRP estimate include: (CRG, p.7) ○ "Time variation in the MRP may reflect irrational under-and-over pricing, not rational risk pricing… ○ Use of the conditional MRP, if variable enough, might induce large swings in the allowed return… ○ The MRP is set for four years and any attempt to impose a conditional MRP that is correct today will by definition be incorrect for a network facing a new determination in, say, 3.5 years' time." The CRG considers that these reasons all point to an approach of accommodating the latest available data. • The EUAA supports the recommendation of the CRG that the sample period for estimating Historical Excess Returns should run to the 31st December 2022. This is consistent with: (EUAA, p. 1) ○ The AER's delay in the publication of the final Rate of Return Instrument until February 2023 ○ EUAA's support for the CRG's view of an unconditional HER estimate requiring the longest possible sample period ○ Consistent with the Treasury advice that the sample period should be extended to include as much as possible of 2022 to account for central bank tightening of monetary policy to balance the easing of monetary policy during COVID ○ The AER's view that the sample period should be reflective of recent market structure, conditions, and expectations. • If the AER is minded to make a change to using 2022 end year data, the AER would have to weigh it against the risk of a perception of regulatory asymmetry to arise in that: (ENA, page 5-6) ○ this would involve a major change in the AER's approach to HER estimates	Sections 7.3 and 7.3.2.1

	○ it would seem to be based on advice which was limited to highlighting possible implications, and caveated by the fact that available evidence drawn from overseas experience was conflicting, and that the Treasury has undertaken no specific work on the equity risk premium since 2018 ○ data from RoRI years in 2013 and 2018 were not included when they would have had the effect of increasing the MRP allowance ○ the 2022 review has proceeded on the basis that there should be a 'high bar' to support any material changes in approach. • If the AER is minded to make a change, and use the 2022 end year data, an annual update must occur at the end of each year. There is no logical basis for delaying the final Instrument to include 2022 data, but then not updating for new data that becomes available each year. (ENA, page 7, 24) ○ This would have the benefit of future MRP estimates used in future determination being based on the fullest set of easily available data, best supporting an unbiased unconditional HER estimation. It is unclear how it could be essential to include the most recent 2022 data when it becomes available, but also then in any sense counterproductive to include the 2023 data when it becomes available. ○ It would be straightforward for the AER to write an annual update of its HER estimate into the Instrument. The AER already performs this task and releases the results to stakeholders as part of its annual rate of return update publication. ○ it would be logical and improve the quality of estimates over time to routinely update the estimate each year as new data becomes available. ○ The Panel clearly appears to be considering a conditional MRP – where the MRP varies according the level of interest rates, as affected by different monetary policies. Thus, the AER needs to determine whether it will continue to use an unconditional MRP or change to a conditional MRP. • Adoption of HER data to December 2022 would use the most recent excess returns data to make an estimate of the MRP reflective of current market conditions. (APA, page 3) ○ this would also effectively produce a conditional estimate of the MRP and not the unconditional estimate which estimation using HER is intended to provide. ○ If the AER now intends the estimate of the MRP to be a conditional estimate, that estimate should be made using the dividend growth model, and it should be updated throughout the period of the 2022 Rate of Return Instrument. • NSG are unaware of any real-life investor practise around formation of long-term equity return expectations that support extending measurement periods to capture restrictive policies that may reverse this impact. (NSG, page 2) ○ Rather, long-term historical MRP estimates are typically formed based on long-term historical series, encompassing a consistent range of data observations, without arbitrary exclusions or extensions. Moreover, departing from the draft RORI's measurement methodology without robust and evidence-based rationale, create further uncertainty as to when departures from methodology may be arbitrarily applied in the future.	

	• A decision at the end of a substantial multi-staged process to depart from regulatory precedent on the basis of limited and equivocal advice, resulting in selection of a known value which is lower than its standard approach, would increase investor perceptions of regulatory risk. This is unnecessary in the circumstances as presented. (NSG, page 3). • If the AER is seeking to reflect recent information then it should use a proper model of the conditional mean, as detailed within APGA's submission on how to implement Option 3b from the Draft RoRI. At a minimum, updating the measure of the MRP through the period of the RoRI is the only approach which is consistent with the view that recent information has special weight. (APGA, page 3) o APGA suggests an assumption that one year of recent data is able to better reflect current investor expectations than a DGM is a bold, untested assumption that risks far greater issues than any flaws in the DGM might create. • The AEC supports delaying the 2022 RORI into 2023 until the full calendar year data is available. (AEC, page 1) o AEC do not believe there is a benefit with the incorporation of a mechanistic formula into the 2022 instrument to be applied post determination. o The timely publication of network tariffs should not be impacted by this proposed delay.	
HER sample periods options – using 1988-2021 end year data	• There is no obvious logic in a cut-off date of 2019 to avoid pandemic era data, but there is also no reason to end the period at December 2021, when there is now an opportunity to include the full 2022 year's data (given publication of the final Instrument is deferred to 2023). (CRG, p.7) • In the 2018 final decision, the AER noted the downward trend in excess returns. Using the HER sample period from 1988 to 2021 appears to conflict with this argument on the long-term trend, given it results in higher estimates than 1988-2017, which contributed to the 2018 decision and no theoretical basis has been presented for such a change in the long-term trend observed in 2018. This highlights the importance of incorporating the maximum number of additional observations to assess whether the significant impact of quantitative easing in 2020 and 2021 created a temporary distortion in the equity markets and is not indicative of the HER long-term average or expectations. (CRG, p.8) • The AER should recognise the need for regulatory stability, predictability and consistency. The AER should not make a major change to its approach to compiling HER estimates of the MRP at this late stage of the process. (ENA, page 5) o There is insufficient time to properly reconsider the evidence on this point or to properly consult on approaches that do recognise a relationship between monetary policy/interest rates and the MRP. o The Treasury advice is limited and inconclusive, and it has been published late in a two-and-a-half-year process. Moreover, Treasury is not in the usual practice of estimating the historical MRP in Australia or providing advice relating to appropriate values for a forward-looking MRP. By contrast, the AER itself has, as part of the review process, spent considerable time and resources collecting and weighing expert and other evidence relating to the estimation of the MRP.	Sections 7.3 and 7.3.2.1

	○ All of these features of the advice, and the fact that the AER has always used the same approach for compiling its HER estimates since its inception, mean that changes should only be contemplated in light of the most compelling new evidence. • Adoption of HER data until December 2021 would ignore current market data, but continue past practice, ensuring certainty and predictability in the regulatory process. (APA, page 3) • NSG considers that a late change to the measurement period for the HER estimation does not meet the underlying principles of good and prudent regulatory practise and therefore support retaining the methodology in the draft RORI. (NSG, page 1, 2) ○ The Treasury advice does not result in the 'high bar for change' being met – a threshold which has informed other key design and methodology decisions taken by the AER. As Treasury notes, academic and empirical evidence on the impact of the unwinding of highly accommodative monetary policy is limited, mixed, and based largely on observations of a variety of varying policies adopted in different circumstances and countries over time. ○ Unless there are compelling reasons for change based on strongly evidenced view that the existing approach will result in a biased and inefficient estimate – which in our view, the AER has not provided – principles of stability, regulatory confidence and predictability are best served by maintain the estimation sample and approach consistent with the draft RORI.	
HER sample periods options – using 1988-2022 September data	• No consideration should be given to a part-year data point. The inclusion of an end-September data point for 2022 would be problematic and is unnecessary. (ENA, page 6) ○ The AER's practice has always been to compute excess returns on an annual basis as the difference between an annual stock market return and an annual government bond yield. It is not clear how a part-year market return would be converted into an annual figure, nor how the part-year figure might be weighted relative to the annual figures for every other year. ○ Due to the pattern of returns data through this year, the use of an end-September period for 2022 would also have the disadvantage of being capable of being interpreted by existing and potential capital providers - and other stakeholders - as being selected ex post to minimise the resulting HER estimate. ○ This risk of potential interpretation is now entirely avoidable. Fortunately, there is no reason to consider a part-year figure now that the AER has delayed publication of the final Instrument until early 2023 – at which time the full year of data will be available. • Updating data to only September 2022, which may appear to investors as selectively picking a low point in the year to lower returns to them and is likely to be seen by investors as untenable under the remit of the NGO. (APA, page 4)	Sections 7.3 and 7.3.2.1
HER sample periods options – using 1988-2019 end year data	• The AER should avoid arbitrary filtering or elimination of data points. The AER should not consider any new approach that eliminates observed data points – particularly when seeking to estimate an unconditional mean. (ENA, page 5) ○ ENA is strongly opposed to any approach of subjectively including or excluding recent data points to produce higher or lower estimates that might be more consistent with a particular pre-determined view – whether that view is consistent with the limited advice from Treasury.	Sections 7.3 and 7.3.2.1

	○ The whole basis of the HER approach is to produce an estimate of the unconditional MRP that reflects the average outcome over a long period of time. That average outcome includes large positive observations, large negative observations, and it certainly includes unremarkable observations like the last three. ○ The removal of data points would raise a range of new areas of subjective judgement which would adversely affect regulatory predictability, confidence, and replicability. It is not clear how data points would be classified as 'unrepresentative' such that they would be removed. The large negative observation in 2008 driven by the GFC remains in the current dataset, however this may also be considered to be 'unrepresentative'. A clear and consistent approach to identifying outliers would need to be developed rather than focussing only on the last three years. • Adoption of HER until December 2019 would arbitrarily remove excess returns data for three years from an already short data series, potentially biasing the MRP estimate. (APA, page 3, 6) ○ APA notes that The Treasury qualified its advice by stating that it "has not conducted analysis of changes in the equity market risk premium in Australia from late 2018 to now". ○ This means The Treasury has not provided the advice based on analysis of data for the period which the AER is seeking to exclude. The Treasury's advice does not prove that inclusion of data for 2020-2022 would bias the measured HER. • APGA considers that selectively removing data from a historical series introduces bias. This is especially the case if only some data points in some parameters are considered. Moreover, introducing a practise whereby judgement calls are made on data removal is a needless risk. There will also be extensive debate as views on what should be removed will differ widely. (APGA, page 4) ○ Removing some years of MRP estimates due to concerns about monetary policy and its influence on the MRP as per the Treasury note suggests that the risk-free rate proxy in those years is affected by government policy and may not reflect market movements. This suggests in turn that it is not appropriate to assume that the MRP is constant, but rather that the AER should incorporate the conditional mean into its estimation of MRP. • NSG are unaware of any real-life investor practise around formation of long-term equity return expectations that support removing actual out-turn market returns from 2020 onwards on the basis that monetary policies may have impacted these returns. (NSG, page 2)	
Longer sample period option	• A longer historical data period would eliminate the controversy. The historical period should start in 1958. (ENA, page 6) ○ The purpose of the HER approach is to estimate the unconditional MRP which is, by definition, a constant. This additional consultation process has arisen because the AER's preferred HER estimate is sensitive to whether or not a small number of recent data points are included. In particular, the estimate varies depending on whether or not the post-2018 data points are included, and even whether or not the 2022 data point is included. ○ The instability in the AER's preferred estimate indicates that it is a poor estimate of the (constant) unconditional MRP. That instability results from the use of a very short sample period, consisting of only 30 or so observations.	Sections 7.3 and 7.3.2.1

	○ It is for these reasons that the network sector has previously supported the use of the period from 1958. The estimate from that period is not subject to material variation from year to year such that the question of whether or not an individual year is included becomes unimportant and uncontroversial. • If the AER intends to use the unconditional mean approach for estimating the MRP, an HER series should commence long before 1988 (and before 1972). (APA, page 3,9,10) ○ APA considers it ambiguous as to whether the AER is adopting the unconditional mean approach as the AER uses HER series from 1988. ○ All options put forward by the AER produce a conditional estimate of the MRP because they use a short HER series which commences in 1988. ○ A longer data series (i.e., from 1883) can be adopted for the purpose of producing a stable long-term average if the data is stationary. Dr Lally has concluded that the HER data series is mean-stationary. Hence, the unconditional mean with the full data series can be adopted for the purpose of estimating MRP. ○ Using the shortened data series (i.e., from 1988), additional of an extra year of data point significantly change the average HER. This is because the data series is too short. • If the AER is seeking a better estimate of the unconditional mean, it should use the decades of historical data which are available to it, rather than a single recent datapoint. This would be consistent with technical advice it has received on the nature of the MRP, and with the views of experts in the conclaves who advocated a much longer time series. (APGA, p. 2, 3) ○ Dr Lally's advice to the AER is that the MRP is mean stationary and thus it has no trend. This in turn means that 2022 data is no more valuable than any other year in respect of informing the MRP. Indeed, if the MRP cycles it may be less valuable than more data on past cycles. • AEC do not believe there is a benefit to using very old historical data (AEC, page 1).	

Appendix C Independent Panel recommendations

The table below lists the Independent Panel recommendations and identify the sections in this decision that discuss our responses.

AER's consideration of the Independent Panel recommendations

Independent Panel recommendation	Section number
1. Considers the extent to which the recent data used in the analysis of MRP, and beta have been distorted by the temporary policy responses to the COVID-19 pandemic - extraordinarily low interest rates and unprecedented quantitative easing - which are now being rapidly reversed. Decisions in the draft RORI should be re-assessed considering this reversal. (p. 14)	Section 7.3
2. Undertakes a more conclusive analysis of the efficacy of the RORI, including, for example by: (p. 16) a. Expediting the process of consulting on the decomposition of the RAB ratio, which is a central part of its cross-check's analysis; b. Assessing the incentive, the RORI provides for investment by analysing regulated companies' applications for approval of capital expenditure that is discretionary e.g., increases reliability above minimum quality standards. Since such expenditure is not mandatory, applications to undertake it are evidence that the allowed rate of return on it is attractive; and c. Examining other regulators' ways of addressing this issue.	Section 11.3.1.1 Section 11.5 Section 11.3.1.5
3. Discusses the effect of the RORI under a wider range of scenarios so as to better inform consumers regarding the potential impact of the regulatory system combined with changes in macroeconomic variables on energy bills and thus help to retain their confidence. (p. 17)	Section 11.3.1.8.4
4. In communicating its decisions to both consumers and other non-specialist audiences, provide the clearest possible answers to the following questions: (p. 19) a) Does the explanatory statement demonstrate that the interests of consumers have been given due weight in the review process? b) Does the evidence, e.g., from assessment of the efficacy of the 2018 RORI, show that the AER's decisions are likely to produce an outcome that is neither too high nor too low in terms of consumer bills and investor returns? c) What will be the impact on bills of different plausible scenarios (such as much higher inflation or interest rates)? d) Is the RORI likely to enable the necessary investment in the coming period?	Section 2.3.2.3 Section 11.3.1.8 Section 11.5

Independent Panel recommendation	Section number
5. Explain in greater detail the means of dealing with unusual circumstances, such as COVID-19 and the war in Ukraine and to be more transparent about the way in which these issues have been taken into account in arriving at the estimates of market risk premium (MRP) and beta. (p. 21)	Section 7.3
6. Explain in greater detail the use of a mechanical method for MRP and the overlaying of judgement in the estimation of beta. The Panel is explicitly not asking the AER to make a general policy statement on when it will use mechanical rules and when it will use judgement. (p. 23)	Section 7.1 Section 7.3.2.2
7. Uses more conclusive analysis on the efficacy of the 2018 RORI - a key recommendation of this report - in its commentary on the Energy Objectives with its final decisions. (p. 25)	Section 2.3.2.3 Section 11.3.1.1 Section 11.5
8. Justify the change in MRP from 6.1% to 6.5% that results from using a single estimator of MRP in the context of other data and indicators. (p. 28)	Section 7.1 Section 7.3
9. Examine whether the adoption of a more mechanical approach to MRP estimation is robust. (p. 28)	Section 7.1 Section 7.3.2.2
10. Seek expert advice on the implications of central bank liquidity expansion (following the onset of the Global financial crisis and during the COVID-19 pandemic) on the valuation of financial assets and the implications that this may have for historical excess returns (HER) based estimates of the long term MRP. (p. 29)	Section 7.1 Section 7.3
11. Seek expert advice on the potential implications of the normalization of central bank balance sheets for future valuations of financial assets and the associated implications for HER-based estimates of the MRP. (p. 29)	Section 7.3
12. Examine and seek advice on the reliability and unbiasedness of the externally sourced inputs to the dividend growth model. (p. 33)	Section 7.3.2.2
13. Justify the choice of weights for the dividend growth model (DGM) and HER. (p. 33)	Section 7.3.2.2

Independent Panel recommendation	Section number
14. Explain more fully the interpretation and use of DGM output: if it is only an indicator of changes rather than level of MRP how should it be used? (p. 33)	Section 7.3.2.2
15. Explain how it will deal with the fact that some of the short-term variation that the DGM picks up may reflect variations in market sentiment rather than fundamentals. (p. 33)	Section 7.3.2.2
16. Make available the spreadsheet with its DGM model and the data it has used. (p. 33)	Section 7.3.2.2
17. Clarify whether it will include DGM information in its current rate of return, and it is soliciting more views on that? Or whether it is soliciting views in anticipation of the next 5-year review. In either case, be clear about the process. (p. 33)	Section 7.3.2.2
18. Include in its final report, a discussion of the impact of macroeconomic cycles on regulated network service providers (NSPs) and the interplay between market conditions and short-term parameter estimates. (p. 42)	Section 8.3.2.1
19. Include in the final explanatory statement beta estimates for APA Group (APA). (p. 42)	Section 8.3.8
20. Detail the nature of the research it proposes to conduct or commission both on the use of international companies as proxies for Australian regulated NSPs and on other methodologies. (p. 42)	Section 8.3.4
21. Consider using the EICSI as the primary source of data relating to credit spreads and using the Yield Curve approach as the cross check. (p. 45)	Section 9.3.2
22. Consider in greater depth options to achieve alignment with consumers' interests of incentives on NSPs regarding the term of debt issuance. (p. 45)	Section 9.3.1

Independent Panel recommendation	Section number
23. Undertake further work prior to the 2026 Review on the methodology involved in moving away from equal annual weighting of debt, in order that modifications can be introduced if circumstances require. (p. 46)	Section 9.3.7.2
24. Engage further with the ATO to gain a better understanding of any data issues that may have a bearing on the accuracy of this source of information in order to generate estimates of the Utilisation Rate in which it has greater confidence. (p. 49)	Section 10.3.2
25. In calculating the Distribution Rate, the Utilisation Rate and gamma utilises a policy of rounding to two decimal places. (p. 49)	Section 10.3.3
26. Consider the practices of other regulators regarding the use of crosschecks, which include using benchmarking exercises and various indicators of investment demand. (p. 56)	Section 11.3.1.5
27. Engage in more sensitivity testing and scenario analysis that is motivated by possible future scenarios rather than by past variation. To that end, the AER should develop a series of scenarios and stress tests that represent a broad possible range of outcomes given the challenges facing the economy at the moment. (p. 56)	Sections 11.3.1.7 and 11.3.1.8
28. Judge the evidence from crosschecks in the round without attaching full weight to some and discarding others. (p. 56)	Section 11.1.2
29. Expedite the process of consulting on and using the decomposition of RAB ratios and complete it before the RORI is finalised. (p. 56)	Section 11.3.1.1
30. Say how it will deal with another important issue regarding the use of RAB ratios: given the declining number of relevant regulated firms with observable share prices, there may be a problem with obtaining adequate data in the future. This is a broader issue that also affects the estimation of beta. (p. 57)	Section 11.3.1.1

Shortened forms

Term	Definition
2013 Guidelines	Refers to AER, *Rate of Return Guidelines*, December 2013; AER, *Rate of Return Guidelines - Explanatory Statement*, December 2013; and/or AER, *Rate of Return Guidelines - Explanatory Statement - Appendices*, December 2013
2018 Instrument	Refers to AER, *Rate of return instrument*, December 2018; and/or AER, *Rate of return instrument - Explanatory Statement*, December 2018
2022 Instrument	Refers to the Rate of Return Instrument published in February 2023
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
ACM	Authority for Consumers and Markets (a Dutch regulator)
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ARERA	Italian Regulatory Authority for Energy, Networks & the Environment
ASX	Australian Securities Exchange
ATO	Australian Taxation Office
Brattle	The Brattle Group
Capex	Capital expenditures
CAPM or SL CAPM	Sharpe-Lintner Capital Asset Pricing Model
CEPA	Cambridge Economic Policy Associates
CGS	Commonwealth Government Securities
CPI	Consumer Price Index
CRG	AER's Consumer Reference Group
Determination or regulatory determination	Refers to an electricity distribution regulatory determination, electricity transmission revenue determination, and/or a gas access arrangement determination
DGM	Dividend growth model
Draft decision or draft Instrument	This document and/or AER, Draft Rate of Return Instrument, June 2022
EICSI	Energy Industry Credit Spreads Index
FERC	Federal Energy Regulatory Commission (a US regulator)
FFO/net debt	Funds from operations to net debt
HER	Historical Excess Returns
Information paper	Refers to AER, *Rate of return Information paper and call for submissions*, December 2021
ISP	Integrated System Plan
Legislative objectives	Collectively the NEO, NGO and RPPs
MRP	Market Risk Premium
NEL	National Electricity Law
NEO	National Electricity Objective
NER	National Electricity Rules
NGL	National Gas Law
NGO	National Gas Objectives

Term	Definition
NGR	National Gas Rules
NPAT	Net profit after tax
NPV	Net present value
NSPs	Network Services Providers
NZCC	New Zealand Commerce Commission
Ofgem	Office of Gas and Electricity Markets (a UK regulator)
Ofwat	Office of Water Services (a UK regulator)
Opex	Operating expenses
PTRM	Post-tax revenue model
RAB	Regulatory Asset Base
RBA	Reserve Bank of Australia
Regulatory period	Refers to a regulatory control period and/or an access arrangement period
Regulatory proposal	Refers to a regulatory proposal, revenue proposal, or gas access arrangement proposal
Regulatory year	Refers to a year within a regulatory period
REU	ACCC's Regulatory Economic Unit
RFM	Roll forward model
RFR	Risk-free rate
RIN	Regulatory Information Notice
ROE	Return on Equity
ROR	Rate of Return
RORI	Rate of return instrument
RPPs	Revenue and Pricing Principles
STB	Surface Transportation Board (a US regulator)
WACC	Weighted Average Cost of Capital
WATMI	Weighted average term to maturity at issuance
Working papers or work paper series or draft working paper or final working paper	Refers to AER, *Energy Network Debt Data – Final working paper*, 18 November 2021; AER, *International regulatory approaches to rate of return – Final working paper*, 16 December 2020; AER, *CAPM and alternative return on equity models – Final working paper*, 16 December 2020; AER, *Term of the rate of return & Rate of return and cashflows in a low interest rate environment - Final working paper*, September 2021; AER, *Rate of return - Overall rate of return draft working paper*, July 2021; AER, *Rate of return - Equity draft working paper*, July 2021; AER, *Rate of return - Debt draft working paper*, July 2021; and/or AER, *Rate of return - Final omnibus paper*, December 2021